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2016 Biennial Council on Undergraduate Research Conference

Advancing Undergraduate Research:
Collaboration and Innovation in a Global Society

University of South Florida (USF), Tampa
Marshall Student Center
June 26-28, 2016

CUR Conference Planning Committee

Christopher Kim, Co-Chair
Associate Dean of Academic Programs
Schmid College of Science and Technology
Chapman University

Ruth J. Palmer, Co-Chair
Associate Professor of Educational Psychology & Affiliate Professor of African American Studies
School of Education
The College of New Jersey

Bridget Gourley (DePauw University)
Julie Langford (University of South Florida)
Rick Pollenz (University of South Florida)
Bethany M. Usher (George Mason University)
Larry Wimmers (Towson University)
Elizabeth Ambos (CUR)
Tavia S. Cummings (CUR)
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Welcome from the CUR President

It is my pleasure to welcome you to the 2016 Council on Undergraduate Research (CUR) Biennial Conference. The conference focus this year, “Advancing Undergraduate Research: Collaboration and Innovation in a Global Society,” features a program that embodies CUR’s commitment to its strategic pillars:

- Integrating and building undergraduate research into the curriculum
- Assessment of the impact of undergraduate research
- Diversity and inclusion in undergraduate research
- Innovation and collaboration in undergraduate research
- Internationalization of undergraduate research

CUR is the leading voice of undergraduate research, and this meeting is a showcase of some of the expertise of our 10,000+ individual and more than 700 institutional members. During this meeting you will discover a diverse menu of short presentations, panel discussions, workshops, performance displays and poster sessions to enrich your understanding of the practice of undergraduate research, and stimulate discussion and the exchange of ideas. I hope you will also enjoy thought-provoking and inspirational presentations by our plenary lecturers, Tia Brown McNair, David Asai, and Stuart Hampton-Reeves.

Of course, such a large event requires long and careful planning. I'd like to call attention to the CUR 2016 Conference Planning Committee, co-chaired by Ruth Palmer and Christopher Kim, Executive Officer Beth Ambos, Tavia Cummings (Manager of Institutes and Meeting Services) and the entire National Office staff, and our host institution, the University of South Florida for their efforts in making this event possible.

My first CUR Biennial Conference experience was at the inaugural meeting in 1985, held at my home institution, Colgate University. That meeting was inspiring and career-changing for me, and resulted in my becoming a member of CUR. I hope this meeting will similarly inspire you to advance your personal and institutional undergraduate research goals and aspirations. I also hope that you will not hesitate to take advantage of your CUR membership and its many benefits to assist you in realizing your goals. If you are not a member, I hope you will consider becoming one, joining and contributing to our passionate and dedicated community. Thank you for attending, and have a great meeting!

Roger S. Rowlett
President, Council on Undergraduate Research (2015-2016)
Gordon & Dorothy Kline Professor of Chemistry, Colgate University
Welcome from the Program Planning Committee

On behalf of the CUR 2016 Conference Program Planning Committee, we welcome you to CUR’s 19th Biennial Conference on the beautiful campus of the University of South Florida. We are eager to share nearly two years of planning and preparation on behalf of you, the advocates everywhere for the practice of faculty-student collaborative scholarly and creative activity. In that spirit, we have chosen the theme: “Advancing Undergraduate Research: Collaboration and Innovation in a Global Society.”

This theme captures our vision for the conference, specifically to provide opportunities for all participants to share individual and collaborative investigations across local, national and international contexts. We believe the program highlights exemplary models of undergraduate research, and calls attention to the impact of this work on all participants. Furthermore, the conference features nationally and internationally recognized plenary speakers who provide insight into current national/global trends in undergraduate research and who can serve as catalysts for further thought and discussion.

We hope you will take advantage of the many programmatic features designed to create an environment of engagement, dialogue among participants, networking and planning for future action. We encourage you to use the formal and informal networking opportunities that are available to you; in this way, you continue the collaborative tradition that is one of the hallmarks of the CUR biennial conferences.

In preparing for this conference, we have worked with an excellent team of colleagues who were instrumental in developing the program alongside the continuing support of the entire CUR National Office Staff.

We sincerely thank them for their service:

Bridget Gourley (DePauw University)
Julie Langford (University of South Florida)
Rick Pollenz (University of South Florida)
Bethany M. Usher (George Mason University)
Larry Wimmers (Towson University)
Elizabeth Ambos, Executive Officer, CUR
Tavia Cummings, Manager, Institutes and Meeting Services, CUR

We are grateful to them, and in particular to our very hospitable conference host, the University of South Florida.

Welcome to CUR 2016! Your participation and engagement will shape the expected outcomes of this event: new knowledge, valued and constructive networking, an expanded vision of our global agency, and renewed inspiration to instill positive change at your own institutions.

Co-Chairs

Christopher Kim
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Schmid College of Science and Technology
Chapman University
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Ruth J. Palmer
Associate Professor of Educational Psychology & Affiliate Professor of African American Studies
School of Education
The College of New Jersey
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Welcome to the 2016 Biennial CUR Conference!

Welcome to the 2016 Biennial CUR Conference! On behalf of the CUR National Office staff, I want to express deep appreciation for the dynamic and hard-working conference organizing committee, led by Christopher Kim of Chapman University and Ruth Palmer of The College of New Jersey, and for the effective and supportive leadership of Dr. Roger Rowlett, President of the 2015-16 CUR Executive Board, and the entire Executive Board and General Council in building a strong community of undergraduate researchers and scholars. Special thanks goes to my National Office staff colleagues, particularly Tavia Cummings, CUR’s Manager for Institutes and Meeting Services, who has coordinated much of the planning and logistics for this meeting. We are deeply grateful to our conference host, University of South Florida, and most prominently, Dr. Rick Pollenz, for creating a wonderful environment for our Biennial Conference, and sharing their beautiful facilities.

CUR’s mission is to build and enhance high-quality undergraduate student-faculty collaborative research, scholarship, and creative inquiry. Our organization is still growing and diversifying rapidly, and over 720 institutions and more than 11,000 individuals now belong to CUR. Since 2013, we have added divisions of Engineering and Education and instituted two new award programs. We support the global undergraduate research enterprise, through a variety of programs, services, and advocacy, and in November 2016, anticipate the inaugural World Congress on Undergraduate Research, to be hosted by Qatar University. Spring of 2016 saw two important milestones: the 30th National Conference of Undergraduate Research, held at the founding host institution, University of North Carolina, Asheville, and the 20th Posters on the Hill event, held on Capitol Hill in Washington, DC.

I encourage all CUR Conference attendees to stop by the conference registration desk to meet the CUR National Office staff, and to talk with Executive Board and General Council members about how you can become more engaged with CUR. We would like to hear from you as to how we can improve what we do to support undergraduate research in its manifold aspects and to broaden our contributions to your success.

-Elizabeth Ambos, Executive Officer

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Welcome to the University of South Florida!

On behalf of the entire campus community, it is our pleasure to host the Council on Undergraduate Research Biennial Conference. We look forward to learning, engaging and collaborating with colleagues from institutions nationwide as we work to improve and expand undergraduate research opportunities.

The theme of this year’s conference – Advancing Undergraduate Research: Collaboration and Innovation in a Global Society – could not be more appropriate or timelier. The globalized future requires our students to not only gain the skills honed in undergraduate research, but to apply those skills to solving problems in our interconnected world. As the academic home to one of the nation’s most diverse student bodies as well as to students from about 120 nations, USF has committed itself to preparing students to be true global citizens. Our greatest hope for students is they graduate with the skills necessary to be successful in the global marketplace; capable of working and living productively and positively with people from other nations and cultures; and are thoughtful of our shared humanity. I am excited to see where the CUR conversation on this topic takes us!

As we tell our students, one of the great advantages of attending a research university is the opportunity for experiential learning. We are proud that USF’s Office of Undergraduate Research has built one of the largest such programs in the nation. As a young institution recently joining the National Science Foundation’s ranking of the Top 25 of American public research universities, we are committed to creating a dynamic, progressive and inclusive learning environment that fully embraces research as part of the undergraduate experience. Thank you for joining us as a community of educators eager to learn from each other for the benefit of students, both now and in the future.

Have a wonderful conference!

Sincerely,

Judy Genschaf
USF System President
GRADUATE EXPERIENCE

OFFERS a diverse range of programs and certificates, with 50 master's and specialist's programs, 40 doctoral programs, a doctor of medicine, and more than 100 graduate certificates. Located in Tampa, the 18th largest metro area in the nation, students have an abundance of opportunities to stand-out and make meaningful contributions to society while gaining real-world professional experience.

OPPORTUNITY MEETS TALENT

Ranked No. 25 among all public universities in research expenditures rankings and No. 41 in both public and private institutions nationwide. USF graduate students are engaged in cutting-edge work across disciplinary units with internationally known faculty and researchers to translate innovative research into practical solutions to today's global challenges.

Few universities nationwide have four health colleges aligned with a large multispecialty physicians group. USF's Morsani College of Medicine, College of Nursing, College of Pharmacy, and the College of Public Health all enjoy access to a state-of-the-art simulation training facility, the Center for Advanced Medical Learning & Simulation (CAMS) in downtown Tampa.

Graduate students may also choose to pursue degrees in a broad array of degrees including art, music, and architecture while others may work on challenges facing K-12 education and higher education or face the threats posed by ever-increasing risks involving cybersecurity.

To learn more about graduate education at the USF and its many programs, please visit the Office of Graduate Studies at: www.grad.usf.edu

USF graduate level programs continue to be ranked among the best according to the 2016 U.S. News & World Report Graduate School Rankings.

USF GRADUATE PROGRAMS IN THE TOP 50 INCLUDE

- Industrial and Organizational Psychology
- Audiology
- Public Health
- Criminology
- Library and Information Studies
- Rehabilitation Counseling
- Nursing Nationally
- Industrial/Manufacturing Engineering
- Nursing in Florida

The Princeton Review and Entrepreneur Magazine ranked the graduate entrepreneurship program No. 11 nationwide and the best in the southeast.

Bloomberg ranked USF's part-time MBA program No. 22 in the nation.

Florida Center for Cybersecurity has been designated as a National Center of Academic Excellence in Information Assurance/Cybersecurity (CAE IA/Cybersecurity).
Program at a Glance

Saturday, June 25th
5:00 p.m.—Welcome
5:30 p.m.—7:30 p.m.—Buffet Dinner / Divisional Mix and Mingle

Sunday, June 26th
7:30 a.m.—8:30 a.m.—Breakfast & Poster I Setup
8:30 a.m.—9:30 a.m.—Plenary I: Tia Brown McNair, AACU
9:30 a.m.—9:45 a.m.—Break
9:45 a.m.—10:45 a.m.—Concurrent Session 1 (60 min panel presentations)
10:45 a.m.—11:00 a.m.—Break
11:00 a.m.—12:00 p.m.—Concurrent Session 2 (60 min panel presentations)
12:00 p.m.—1:30 p.m.—Lunch
1:30 p.m.—2:40 p.m.—Concurrent Session 3 (20 min single presenter presentations)
2:40 p.m.—3:00 p.m.—Break
3:00 p.m.—5:00 p.m.—Concurrent Session 4 (120 min workshops)
5:15 p.m.—6:15 p.m.—CUR Fellows Addresses
   Jeffrey M. Osborn, Dean of the School of Science, The College of New Jersey
   Jill Singer, Professor of Earth Sciences and Director of the Office of Undergraduate Research, The State University of New York (SUNY)-Buffalo State
6:30–8:30 p.m.—Dinner
6:30 p.m.—9:00 p.m.—Poster Session I
### Monday, June 27th

- **7:30 a.m.–8:30 a.m.**—Breakfast & Poster II Setup
- **8:30 a.m.–9:30 a.m.**—Plenary 2: David J. Asai, Howard Hughes Medical Institute
- **9:30 a.m.–9:45 a.m.**—Break
- **9:45 a.m.–10:45 a.m.**—Concurrent Session 5 (60 min panel presentations)
- **9:45 a.m.–11:45 a.m.**—Concurrent Session 6 (120 min workshops)
- **11:00 a.m.–12:00 p.m.**—Concurrent Session 7 (60 min panel presentations)
- **12:00 p.m.–1:30 p.m.**—Lunch
- **1:45 p.m.–3:25 p.m.**—Concurrent Session 8 (30 min dual presenter presentations and 30 min performances)
- **3:25 p.m.–3:45 p.m.**—Break
- **3:45 p.m.–4:30 p.m.**—Concurrent Session 9 (20 min single presenter presentations)
- **4:30 p.m.–5:30 p.m.**—CUR-Goldwater Scholars Faculty Mentor Award Recognition
  - Carol Parish, Professor of Chemistry, University of Richmond
- **5:30 p.m.–7:30 p.m.**—Dinner
- **5:30 p.m.–8:00 p.m.**—Poster Session II

### Tuesday, June 28th

- **7:30 a.m.–8:30 a.m.**—Breakfast
- **8:30 a.m.–9:30 a.m.**—Plenary 3: Stuart Hampton-Reeves, University of Central Lancashire
- **9:30 a.m.–9:45 a.m.**—Break
- **9:45 a.m.–10:45 a.m.**—Concurrent Session 10 (20 min single presenter presentations, 30 min dual presenter presentations, and 60 min panel presentations)
- **10:55 a.m.–11:45 a.m.**—Concurrent Session 11 (60 min panel presentations, 30 min dual presenter presentations, and 20 min single presenter presentations)
- **11:45 a.m.**—Conference Ends
General Information

Conference Registration

The Registration Desk (including on-campus dorm housing) will be located on the first-floor atrium level in the Marshall Student Center (MSC). Staff will be available to check in participants and guests, distribute conference materials and answer any questions that you may have. The hours of operation for the Registration Desk are as follows:

- Thursday, June 23: 9:00 a.m. – 6:00 p.m.
- Friday, June 24: 7:30 a.m. – 8:00 p.m.
- Saturday, June 25: 7:30 a.m. – 9:00 p.m.
- Sunday, June 26: 7:00 a.m. – 7:00 p.m.
- Monday, June 27: 7:00 a.m. – 7:00 p.m.
- Tuesday, June 28: 7:30 a.m. – 12:00 p.m.

Guest Wireless Access

USF provides a wireless network named “USF_Guest” which allows visitors to self-register for Internet access.

Follow these steps to complete the registration process:

1. Turn on your computer and enable your wireless network card
2. Select “USF_Guest” from the list of available wireless networks
3. Open a web browser and go to any web site (e.g., www.google.com) and you will be automatically redirected to the registration web page
4. Select if you’d prefer to receive a SMS (text) message or a cell phone call with your access code
5. Enter the code you receive into the registration page and your registration is complete

Session Formats

**Single presenter** presentations will typically summarize research in progress and/or study results, models, or other innovative programs and techniques. These presentations are relatively short (20 minutes) and allow limited time for extended discussion. It is recommended that presenters provide handouts and contact information for attendees who may be interested in continuing the discussion at a later time.

**Dual presenter** presentations involve two people presenting jointly on a topic of common focus and allows more time (30 minutes) for presentation and discussion.

**Panel presentations** typically take the form of a series of related presentations on a shared topic by three to four (or more) presenters, including a moderator who should coordinate the session (60 minutes). Panels work best when the presenters interact with one another and the audience, and are organized around a series of questions. Presenters should represent a variety of perspectives on the panel topic.

**Performances or displays** (30 or 60 minutes) are means of highlighting faculty-student collaborative creative work and should include discussion by the presenter(s) about the process of engaging the students. A wide variety of projects are invited; performances can be live or on video, and displays can be either physical or digital.

**Workshops** (2 hours) are experiential participatory events on a topic or theme related to undergraduate research. After completing the workshop, participants should know or be able to do something new. Describe the activity and the specific learning objective(s) of the workshop in your abstract. Also note what materials you may want to share with your audience in advance (keeping in mind ease of access and limited preparation time) or that participants will need to bring (for example, a computer or mobile device).
Posters are intended to afford a more informal atmosphere in which participants can share their ideas with conference participants across a wide variety of disciplines and institutions. Posters can share work done to develop or strengthen undergraduate research institutionally or share examples of student projects, highlighting the various disciplinary models of undergraduate research. Posters will be on display for an extended time during the conference. Presenters should be present for a portion of their designated poster session time to be available to discuss their work with attendees. Poster boards measuring 40” (width) by 30” (height) will be provided by CUR.

Setup
All posters will be shown in the second floor atrium. If you are presenting a poster during Poster Session 1 on Sunday, June 26, we ask that you mount your poster between 7:30 a.m. and 8:30 a.m. If you are in Poster Session 2, Monday, June 27 between 7:30 a.m. and 8:30 a.m. The setup process should take about 15 minutes.

If you need assistance with finding your poster location and/or mounting your poster, please come by the registration desk where staff will be able to assist you.

Posters will be mounted on foam poster boards that will be on easels.

Removal
Please do not remove your poster before 9:00 pm on either Sunday or 8:00 p.m. on Monday. Posters left remaining at the session end time will be discarded.
Meeting Program

Saturday, June 25

Annual Business and Councilors’ Meeting ends approximately noon

Executive Board Meeting ends approximately 2 pm

5:00 p.m.—Welcome (Oval Theatre)

5:30-7:30 p.m.—Buffet Dinner/ Divisional Mix and Mingle (Royal Palm Ballroom)

Sunday, June 26

7:30 a.m.—Breakfast (Royal Palm Ballroom)* / Poster Session I Set-up for Sunday

* Breakfast – Many Hotel and Dorm Packages include Breakfast. We will have limited breakfast items available for those that will not receive breakfast elsewhere.

8:30 a.m.-9:30 a.m.—Plenary 1 (Oval Theatre)

Speaker: Tia Brown McNair

Vice President, Office of Diversity, Equity, and Student Success
Association of American Colleges and Universities (AACU)


What are promising strategies for designing high-impact practices (HIPs) that are intentionally designed to be inclusive? How can we avoid the perceptions of trade-offs between broadening access to engage more students from diverse backgrounds in undergraduate research, and the very real resource limitations that many institutions have to devote to such high-impact practices? How can we more directly connect measurement of the benefits of high-impact practices, including direct and indirect assessment of student learning outcomes, with justification for the resources needed to expand their usage? Through a discussion of the lessons learned from the Association of American College and Universities’ projects and institutes on high-impact practices, we will explore the necessary steps to effectively utilize a campus assessment plan to examine equity, inclusive excellence, and student learning as a result of the design, implementation, and student participation in HIPs.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Workshop

Presentation Date and Time: 6/26/2016—9:00 AM-5:00 PM—Room Assignment: ATRIUM – First Floor

Facilitating Instruction and Research with Undergraduates Using Remotely Operable Microbeam Instrumentation

Presenters: Jeffrey G. Ryan | Sven Paul Holbik | James MacDonald | Mary Beck

University of South Florida | Florida International University | Florida Gulf Coast University | Valencia College

Making use of research instrumentation in undergraduate science courses is a common practice, but one that has historically been limited by access to instrumentation, which creates a range of challenges in providing a classroom of undergraduate students with substantive hands-on educational experiences. This NSF-TUES funded Expansion project is building on the success of a CCLI Program funded pilot effort at USF-Tampa in integrating the use of both electron probe micro-analysis (EPMA) and scanning electron microsocopy (SEM) intro introductory and upper-level courses in the earth sciences via remote operation technologies. Students use these instruments [housed at the Florida Center for Analytical Electron Microscopy at FIU in Miami, FL] in real time in their classrooms, conducting both structured laboratory activities and open-ended investigations of collected samples. In this “workshop” you will get hands-on experiences with the FCAEM EPMA and SEM instrumentation as well as an overview of instructor and student instructional resources which are provided via the FCAEM website, and a summary of our salient results in terms of student engagement and facilitation of undergraduate research. You will have the opportunity to discuss with our investigator team how you might take advantage of the FCAEM instruments and resources in your own courses, and the chance to schedule mentored use time on one of the FCAEM instruments to familiarize yourself with the system, and try out your analytical/educational strategies. Our TUES project includes funding to support “tryout days” for new instructional users.

Break

9:30-9:45 a.m.—Break (Royal Palm Ballroom)
Assessment of Impact of Undergraduate Research

Quality Assurance in Undergraduate Research

Presenters: Graeme Harper | Marilyn Hart | Gregory M. Wilson
Oakland University | Minnesota State University Mankato | University of Central Oklahoma

The panel, consisting of councilors from the At-Large Division who are currently discussing this topic as a group of councilors within the Division, will explore key topics in quality assurance in undergraduate research, including mentoring, research practice training, u/g programmatic shape and intention and its impact on quality, useful comparators (using models from different institutions, and providing national and international models), notions of quality and how to define these for your institution, student perspectives, practices as these relate to expectations and to outcomes, and consider variations and similarities between disciplines. The panel will also discuss current available resources for the support of any quality assurance strategy in undergraduate research, and also explore the strengthening of resources in this key area. The aim will be to provide a conference platform on which current work by the At-Large Councilor group might assist others to advance both their own strategies and their institutional strategies as well as our wider CUR commitment to quality in undergraduate research.

Diversity and Inclusion in Undergraduate Research

The Summer Undergraduate Research Fellowship in Earth and Environmental Sciences (SURFEES) Program: Targeting Community College Students through Research Experiences at 4-Year Colleges

Presenters: Christopher Kim | Hesham El-Askary | Rosalee Hellberg
Chapman University

Effectively recruiting and engaging diverse community college students in STEM research experiences is an increasingly important goal of the National Science Foundation, but has not historically been the primary focus of most NSF-REU (Research Experiences for Undergraduates) Site programs. The Summer Undergraduate Research Fellowship in Earth and Environmental Sciences (SURFEES) program at Chapman University, a primarily undergraduate institution in Southern California, is the site of the first NSF-REU program in NSF’s Division of Earth Sciences that selects participants exclusively from local partnering community colleges. The SURFEES program incorporates specific mentor and participant pre-experience training, pre-, mid-, and post-assessment instruments, and programming targeted to the earth and environmental sciences as well as to community college students. Perhaps most importantly, the application, selection and pairing of student participants with faculty mentors was conducted with specific goals of identifying those applicants with the greatest potential for a transformative experience while also meeting self-defined targets of under-represented minority, female, and low-income participants. In this panel discussion, the program’s principal investigator along with SURFEES faculty mentors from disciplines including biology, earth system science and food science will present initial assessment results of the first two participant cohorts from summer 2014 and 2015, discuss lessons learned for creating/adapting an NSF-REU site to involve community college students, and share individual observations about the student-faculty mentoring and research experience associated with this unique program.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Panel Presentation
Presentation Date and Time: 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 2707 Spirit

A Model for Building Research into the Undergraduate Curriculum: Georgia College Moves Full STEAM Ahead
Presenters: Steven G. Jones
Georgia College and State University

Over two years, supported by MURACE planning and implementation grants, both the Theatre and Environmental Science programs have restructured their curricula so that all students experience undergraduate research. These two very different disciplines are highlighted as case studies herein to demonstrate how GC departments/programs successfully build undergraduate research experiences into their curricula. Both programs acted at the curriculum level to ensure that all students within each had research opportunities available to them. Both programs created and redesigned courses and both programs provide substantial support for students to present at state, regional and national conferences. In both programs, students make original intellectual and creative contributions and these experiences are directly linked to student success after graduation. The programs truly are models for scaffolding undergraduate research into the curriculum to reach the greatest numbers of undergraduates possible. The focus of this panel is twofold. First, panelists will describe how MURACE facilitates the integration of UR into the curriculum through its departmental programming and implementation grants. Panelists will provide two examples of departments that received planning and implementation grants that personify how UR is successfully scaffolded into the curriculum to reach the greatest number of students.

Session Type: Panel Presentation
Presentation Date and Time: 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3707 Oak

Investigating the Earth and Other Planets Via Virtual Globes such as Google Earth, NASA World Wind, and Cesium
Presenters: Jeffrey G. Ryan
University of South Florida

Aside from serving as a widely used geospatial visualization platform, Google Earth provides ready access to a large and growing collection of earth and planetary observation datasets, as well as to “crowd-sourced” imagery and visualizations which students can investigate through course-based structured research experiences as well as via independent investigations. These and other geospatial visualization platforms (examples include GeoMapApp/Virtual Ocean, focused on observational data from the world’s oceans and seafloor; and Cesium, a new open-source virtual map and globe engine) present a wealth of opportunities for engaging undergraduates in the interrogation of global datasets. This set of Presentations will highlight investigations of Earth observation datasets accessible through Google Earth Engine, of the extensive NASA database for Lunar and Mars imagery accessible through the Planets option in GE, and of time-slider, Gigapan, and new 3D visualization resources available through the NSF-funded GEODE project (Google Earth in Onsite and Distance Education). Participants will have the opportunity to delve into and evaluate a range of open-source global geo-data resources and visualization tools.

Session Type: Panel Presentation
Presentation Date and Time: 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3709 Heron

Integration of Research into the Formal Chemistry Curriculum
Presenters: Robert E. Bachman | Rebecca M. Jones | Bridget L. Gourley | Amy M. Deveau
University of the South | George Mason University | DePauw University | University of New England

For many faculty sufficient time is among the most significant impediments to research productivity. The issue of time is made more acute by the practice at many institutions of counting such work as outside of the formal curricular workload. Additionally, pedagogic research has increasingly questioned the developmental impact of traditional “cookbook” laboratories. Integration of authentic original research into the formal curriculum offers an effective way to address both issues simultaneously. In this session we will share key findings about the pedagogic impact of integration of research into teaching that also allow faculty more time for their scholarly work. We will also discuss several approaches to achieving these goals, ranging from the level of an individual course to the design of a research supportive curriculum, and address common challenges encountered in these approaches. While the presentation will focus on our experiences within the field of chemistry, many of the strategies to be presented are of broad applicability to the sciences and beyond.
Implementing Course-Based Undergraduate Research Experiences at Virginia Union University

Presenters: Carzza DuRose | Carleitta L. Paige-Anderson | Peter Sutton | Shannan Wilson
Virginia Union University

For 150 years, Virginia Union University (VUU) has provided a broad range of educational opportunities that advance liberal arts education. The undergraduate academic programs are organized in four undergraduate academic schools, the School of Business, the School of Education, Psychology and Interdisciplinary Studies, the School of Humanities and Social Sciences, and the School of Mathematics, Science and Technology. Collectively, the academic curriculum integrates understanding and celebration of African-American heritage, while responding to the needs of the global 21st century. This provides a strong foundation for integrating undergraduate research opportunities that will engage students to broaden their knowledge base, develop skills to contribute to and impact society, and be more competitive for graduate school and professional opportunities. The VUU Center for Undergraduate Research is the newest university resource designed to facilitate these efforts. The challenges associated with pursuing extended learning opportunities is evidenced by student deficiencies in reading, writing, critical thinking, and analytical skills. Moreover, the faculty in these disciplines are overwhelmed with teaching commitments, thus, limiting the time necessary to engage in productive and authentic creative inquiry/research experiences limited. In an effort to ensure access to research endeavors for all university students and maximize the teaching time investments, faculty in the Departments of Languages and Literature, Philosophy and Religious Studies, and Natural Science have identified courses in the general education curriculum to provide course-based undergraduate research experiences. This classroom based approach has provided an institutional model for implementing research as high-impact pedagogical practice.

Preventing the Next Generation of Engineers through Undergraduate Research Experience: Visions and Methods

Presenters: Kambiz Alavi | Jonathan W. Bredow | Reza Matthew Moghadam
University of Texas at Arlington

There is a general gap in engineering education between undergraduate and graduate levels, since the former focuses on basic skills development, whereas the latter focuses on garnering new knowledge through research. Throughout the past three decades, the EE department has provided opportunities and incentives for undergraduate students to engage in research and bridge this gap. Several generations of students have been engaged in a variety of research topics. In this panel discussion, we focus on a recent NSF funded REU site “Sensors and Applications”. This topic has a wide spectrum of applications, plus the added advantage that projects can be defined so that undergraduates can progress in a short period of time. Beside the traditional educational methods such as Bloom’s taxonomy and 5E method, during this program the learning process started from the final stages of the known models. This approach enables students to develop broader understanding of research. The program starts with an introduction to presentation skills, including methods of professional and scientific public speaking, power point presentation and poster presentation. The capability and enthusiasm of presenting results appear to be an essential motivation for undergraduate students to pursue research in higher education. Specific elements of this program were designed to help participants achieve the joy of research and involvement in the active research environment. Invited speakers talked about their successes, challenges and opportunities in various interdisciplinary research topics. Through this educational process, students were empowered to identify and develop their own research approach. These active learning and student centered methods were effective in planting the seeds of questioning in undergraduate mind. This method appears to be more interesting for students and establishes the lifelong culture of questioning. This project was supported by the NSF Grant # EEC-1156801 for three years.
Collaborations between undergraduates and faculty at Stetson University, (DeLand, Florida) have led to two partnered entrepreneurial organizations in the School of Business and the College of Arts and Sciences. Students and faculty working through ENACTUS, an international social enterprise organization, developed software enabling users to record personal historic data. Research conducted by ENACTUS students suggested that the very elderly show signs of improved mental health when given the chance to narrate their histories. The software product, TSOLife.com, is a proposed route to facilitating this narration. TSOLife.com is an online platform that preserves digital life legacies. The goal of the for-profit side of this student start-up is to scale the company into a large public enterprise. The non-profit side of the company seeks to improve the wellbeing of socially excluded populations that are nearing the end of their lives. Students in History, working with the Coleman Foundation and the undergraduate faculty in Public History, have developed an historical consulting firm (Historical Consultants of DeLand or HC) that will partner with TSO to make the software understandable to its users. HC will use the research skills learned in Public History to help interested residents of DeLand discover and organize data about their personal past. In this panel, the advising faculty and students from both organizations will discuss the pitfalls and potential of collaborations bringing entrepreneurial research from two very different disciplines together.
**Session Type: Panel Presentation**

**Presentation Date and Time:** 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3705 Sabal

**Institution Review Board 101—What You Need to Know from Insiders**

Presenters: Sarah K. Johnson | Tsu-Ming Chiang | Scott Bates | Laurie L. Couch
Moravian College | Georgia College and State University | Utah State University | Morehead State University

Institutional Review Boards (IRB) were established following the National Research Act of 1974 and the Belmont Report, which outlined primary ethical principles in conducting human participant studies. Despite the goal of protecting human participants, IRBs are perceived by many researchers as a stumbling block between them and data collection. The IRB processes are particularly mysterious for undergraduate researchers who have not received much ethical training. A panel of IRB chairs from various types of institutions will aim to unlock the mystery at multiple levels. The presentation will start with the basics of IRB function, composition, and processes, including a discussion of what constitutes “research,” i.e. what needs to go through review and the related IRB categories (exempt vs. expedited vs. full review). We will address key exemption categories and discuss recently expanding areas of research that can straddle exemption criteria, such as assessment research aimed at publication and recruitment via social networking sites. Panelists will share their experiences with IRB design and implementation, its relation to different types of projects (student vs. faculty, grant proposals, etc.), and the composition of the committee (including competency level and workload issues). Various roles of IRB members will be explained and examples of documents commonly submitted to the IRB will be used to highlight IRB members’ tasks. Institution-level decisions, such as the type of submission system used (e.g. contracted paid systems vs. in-house system, hard copy vs. online submissions, etc.) and possible training programs (e.g. CITI) will be discussed. We will close with a Q&A to promote audience-directed exploration of the topic. As the range of undergraduates undertaking research with human participants increases, so too does the need for understanding of IRB processes across disciplines. Our panel will be geared toward those who are helping students navigate these processes.

**Session Type: Panel Presentation**

**Presentation Date and Time:** 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3702 Orchid

**Mentoring Undergraduate Research Handbook 2.0**

Presenters: Robin S. Lewis | Rebecca McMullen | Jennifer Hammack | Jeanetta D. Sims
Georgia College and State University

It has been 2 years since our teaching circle e-published this handbook and it has moved from an interdisciplinary work at Georgia College to an inter-institutional endeavor. Many partners in the teaching circle have advanced their careers at new institutions and as a whole we have updated the content. In addition, Dr. Jeanetta Sims of the University of Central Oklahoma has added a chapter on “Mentoring and Organizing Research Activity”. From this session and publication, you will take away tips, tricks and artifacts to help painlessly embed mentoring undergraduates in research into your academic workload. It is also the goal for this session to be open and collaborative in order to share what works or to problem-solve your unique issues. Please grab your copy at: http://kb.gcsu.edu/urace/1/ and join us to discuss this valuable resource in Undergraduate Research.

**Session Type: Panel Presentation**

**Presentation Date and Time:** 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3705 Manatee

**Funding Undergraduate Research: The Mom’s Project**

Presenters: Mary L. Armstrong | Catherine Jean Batsche | Roger Boothroyd
University of South Florida

The benefits of undergraduate research are well documented and include gains in student technical skills (e.g. understanding the research process) and interpersonal skills (e.g. improved self-confidence) (Hart, 2012; Hathaway, Hensel, 2012; Ishiyama, 2002; Kardesh, 2000; Kinkead, 2011; Tatalovic, 2008). Despite the benefits, funding undergraduate research can be challenging. (Dorff & Narayan, nd; Petrella & Jung, 2008). The Mom’s Project was initiated by three faculty members at USF as a mechanism to support undergraduate research in the college. The project honored the faculty members’ mothers, all in their late 80s and early 90s, by establishing an endowed scholarship to fund undergraduate research. The name of the fund emerged when the three faculty members started asking each other if “the Moms” wanted to go along with them to a dinner or other social event. Each scholarship recognizes an area important to one of the Moms. Ellen graduated from college at age 90 so her scholarship supports research on positive aging. A member of Alice’s family had a substance abuse problem and her scholarship supports research on substance abuse. WWII interrupted Ruth’s plans to become a dietician so her scholarship supports research on nutrition and healthy living. As support for the Mom’s Project grew, a fund to accept one-time donations was added, i.e. the Moms Honor Roll. Donors often contribute on Mother’s Day, their birthday, or other occasions. Each spring semester, the College awards up to three $500 research awards to support student research. The Mom’s Project was briefly highlighted in the CUR special issue on creative fundraising strategies for undergraduate research. This presentation will provide an in-depth discussion of the procedures for establishing an endowed scholarship, an approach that can make an endowed fund more feasible for faculty contributors, the criteria used for awarding scholarships, and the impact of the scholarship on students.
Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—9:45 AM-10:45 AM—Room Assignment: 3711 Egret

Explosions, Rocket Launchers, and Lawsuits: How to Successfully Navigate the Risks of Undergraduate Research

Presenters: John Augusto | Jennifer Harris | Sheila Pedigo | Dyan Morgan
University of Kansas | University of Washington | Case Western Reserve University | University of Kansas

Undergraduate research is a high impact learning practice that we value and support on our campuses. However, this great experience does not come without risks for the student, mentor, and university. Our panelists will discuss ways in which their respective campuses attempt to minimize the risks and liabilities associated with undergraduate research. Topics to be discussed include but are not limited to: lab and art safety, wage claims, minors in research, insurance for summer scholars, personal injury claims, travel abroad, and strategies for reducing risk for all involved.

Break

10:45-11:00 a.m.—Break [Royal Palm Ballroom]
Diversity and Inclusion in Undergraduate Research

Session Type: Panel Presentation
Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 3700 Sabal

Diversifying Undergraduate Study Abroad: Collaboration between College of Mount Saint Vincent’s Center for Undergraduate Research and IPSL’s Advocacy Research™ Program
Presenters: Emma Newton | Arianne Newton | Leondra Fair
IPSL | IPSL | College of Mount Saint Vincent

IPSL Study Abroad + Service-Learning™ Programs and College of Mount Saint Vincent (CMSV) Center for Undergraduate Research have collaborated to create access to Undergraduate Research opportunities for historically underrepresented students. Both CMSV and IPSL have, in their mission and practices, sustained a commitment to increase diversity in higher education, study abroad and undergraduate research. The College of Mount Saint Vincent is a small liberal arts college in the Bronx, New York offering many first generation and minority populations access to top quality undergraduate and graduate programs. This commitment to educational opportunities for historically underrepresented students is reflected in the creation of the CMSV Center for Undergraduate Research and the partnership of the center with IPSL’s Advocacy Research™ program. Though opportunities are available to students to engage in international research, few students from minority or first generation populations are taking advantage of these unique opportunities that provide valuable learning experiences for graduate school and beyond. The partnership between IPSL and CMSV’s Center for UG research has allowed both entities to identify the roadblocks to student participation in international research and create sustainable and practical solutions to assist minority students in participating in international research abroad.

Diversity in Academia: Creating Inclusive Research and Classroom Spaces
Presenters: Susan E. Safford | Vanessa McRae | Maria Bautista
Lincoln University | University of Central Florida | Kapi`olani Community College

This presentation is designed to help faculty members recognize diversity in all its manifestations in the workplace, classroom, research lab and research team. Presenters will discuss ways for faculty to create inclusive classroom and research spaces, to learn how to work with diverse student research teams, and the value of creating a diverse research team. Presenters will then guide participants in brainstorming approaches to [1] Methods to signal that their professional spaces are open and safe places for everyone, (2) Recognizing diversity, especially individuals who fall into nonprotected categories, (3) Identifying resources and support for faculty to learn how to become more aware and sensitive to various types of diversity, and (4) Learning how to discuss diversity with students and colleagues, while minimizing discomfort or insensitivity. Participants will articulate the main points they expect to take away from this session, and provide suggestions or anecdotes from their own experiences. Participants will work in small groups to provide suggestions for each of the points above. The groups will discuss these issues for about 20 minutes before sharing their ideas with the whole workshop. A 10-15 minute discussion will ensue to contribute to diversity plans participants will write. Participants will outline a “Diversity Plan” for themselves that will work for their institution and the student body they serve. Resource lists, ideas and processes will be recorded by a facilitator and an electronic copy will be made available to all participants.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 3702 Orchid

Mentoring Undergraduate Research in STEM Fields—Challenges and Solutions

Presenters: Tsu-Ming Chiang | Chavonda Mills | J.F. Yao
Georgia College and State University

Scientific inquiry through research is an integral part of Science, Technology Engineering and Mathematics (STEM) disciplines. Early access to mentored research in undergraduate education yields long-term benefits in motivating students to explore areas of interest and in building research skills to pursue advanced studies. However, mentoring undergraduate researchers in STEM fields holds inherent challenges. In this proposed panel presentation, faculty from four disciplines: Chemistry (CHEM), Environmental Science (ENSC), Computer Science (CS), and Psychology (PSYC), will describe how they address their unique challenges for further dialogues. Areas of challenges for faculty mentoring UR include workload, time commitment, and resources. For example, as a university, undergraduate research (UR) is embedded in every program with a designation of x999 to separate it from content courses. Each major can further set level restriction, such as 2999 (sophomore), 3999 (junior) and 4999 (senior). Despite 12-credit-hours teaching loads per semester, the resources in different disciplines vary, thus these x999 courses may or may not be counted in teaching loads. To address these challenges, CHEM established a faculty reward structure and annual faculty performance evaluation which uses criteria that place high value on activities associated with UR. Further challenges for STEM fields include building skills (programming in CS, statistics in PSYC) that require significant student training and faculty time commitment. Addressing these challenges involves faculty mentoring and an introduction to discipline-specific content early in CS and PSYC programs so that students can make educated decisions regarding what would be the best fit for their interest and build skills accordingly. Additional solutions to challenges faced by programs will be presented by ENSC, which recently implemented a curriculum where 100% of the majors have opportunities to do original research starting in the classroom. This presentation is tailored to faculty, staff, and administrators seeking value-added interventions to similar challenges.

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 3712 Columbia

Holistic Pedagogical Approach to Research Application and Effectiveness within Undergraduate Studies

Presenters: Ebony L. Hall | Nathalie P. Jones
Tarleton State University

Many social sciences have implemented active learning strategies to assist with student learning. More so, social work programs across the nation have incorporated innovative methods in an effort to observe the student application of core curriculum objectives. The social work program at Tarleton State University has developed as part of the curriculum design, a course sequence that captures a holistic pedagogical approach to ensure students are able to practice research effectively. Research components are embedded within specific courses sequentially over four semesters. This presentation focuses primarily on the development and implementation of the overall student research experience which has led to local, state, and national student presentation and publications. From the inception of a pre-professional course, students are taught to conduct an extensive literature review on an identified social issue through an established partnership within the community to the development of an actual research question. The next two courses are part of the professional sequence where students complete a detailed policy analysis about the social issue surrounding the target population. Students also develop hypotheses and objectives, collect data and analyze the data through the use of Excel and the Statistical Package for the Social Sciences (SPSS). The final semester consists of students considering the research findings to write a grant and present an inclusive learning portfolio which provides evidence of their overall research experience. The TSU Social Work program has graduated over 60 students since the inception of the course sequence. With the intentional exposure of research during undergraduate studies, TSU social work students are more marketable upon graduation to employers and graduate schools. Discussion will focus on the embedded nature of research within the sequential courses and highlight the practical and effective outcomes of the first cohort of students.
Innovation and Collaboration in Undergraduate Research

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 2703 Honors

Collaborative Undergraduate Humanities Research through Summer Seminars and Writing Communities

Presenters: Duncan MacKenzie | Sarah Misemer | Valerie Balester
Texas A & M University

In contrast to STEM disciplines at large research universities, undergraduate research in the humanities faces unique challenges: limited space and financial support, emphasis on individual scholarship, and restricted faculty availability in the summer. At Texas A&M only 6% of graduating senior humanities majors indicate that they have participated in faculty-mentored independent research compared to 15-25% of graduates in STEM colleges. In an effort to foster broader participation and greater visibility for undergraduate research in the humanities we have developed an innovative research program modeled on National Endowment for the Humanities seminars. Following two-week, intensive seminars around a common theme led by faculty in early summer, groups of 2-5 students develop independent research proposals. Students then transition into our established undergraduate research thesis program (traditionally dominated by STEM disciplines) and complete a formal research thesis and public presentation during the academic year. To support these collaborative groups of students addressing related research topics, we established a partnership among three campus programs: The Glasscock Center for the Humanities contributed space to build research communities, access to research-active faculty, and endowment support; the Undergraduate Research office provided structure for students to complete the formal research thesis; and the University Writing Center conducted summer writing studios to help students clarify their research questions and develop formal oral and written research proposals. In this presentation we will discuss pedagogical, cultural, legal, funding, and logistical challenges that were resolved during development of this program. By increasing the number of humanities theses completed, the Glasscock Summer Scholars program has successfully increased the visibility of humanities research on campus, positively impacted career plans of students as well as scholarly productivity of faculty, and provided a model for integrating diverse campus resources to promote undergraduate humanities research.

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 3708 Sandhill Crane

Collaboration Across Programs: How Do We Help Our Students Develop Competitive Scholarship and Fellowship Applications?

Presenters: Anne A. Boettcher | Tim Parshall | Meredith Wooten | Joanna Dickert | Adelia Rose Humme | Karen G. Havholm
Embry—Riddle Aeronautical University | University of Missouri—Columbia | Drexel University | Carnegie Mellon University | Texas A & M University | University of Wisconsin—Eau Claire

In developing competitive scholarship and fellowship applications (Goldwater, Marshall, NSF-GFRP….), students draw on their varied curricular and co-curricular experiences. However, in many cases, students are not sure which experiences to include and how best to integrate them. Moreover, those assisting students are often limited in their knowledge of students’ total accomplishments. In this panel we consider how offices across campuses can work together to help students with this process. The panel includes members from campuses with varied models for supporting these students. Panel members have expertise in undergraduate research, service learning, study abroad, as well as those focused on fellowship and scholarship advising. Panel members will provide examples and discuss formal and informal ways program offices interact including: workshops, review and interview panels, recruitment, and individualized advising. We hope that those in attendance will share their experiences, providing additional approaches and ideas that will encourage collaboration at their own and other institutions.
Internationalization and Undergraduate Research

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 4200 The Chamber

Comprehensive Undergraduate Research Program For Associate Degree Students at the City University of New York

Presenters: Maria Mercedes Franco | Ronald J. Nerio | Avrom J. Caplan
City University of New York- Queensborough | City University of New York | City University of New York

The City University of New York has launched a system wide undergraduate research program for associate degree students among its seven community colleges and three comprehensive schools for over 180 students per year. Our panel will discuss the challenges of promoting undergraduate research at a system-wide scale among colleges where research has not traditionally been emphasized. Now in its second year, the CUNY Research Scholars Program (CRSP) is funded by the New York City mayor’s office and provides associate degree students with authentic, year-long mentored research experiences in STEM fields. At each of the participating colleges, 10 to 20 students are paired with faculty mentors for 400 hours of laboratory research. Students receive stipends and a chance to compete for travel awards and their faculty mentors receive funding for laboratory supplies. Each campus provides special programming for CRSP students ranging from lab safety and public speaking to poster preparation. The program culminates in a summer symposium in which students present their work through short talks and posters to an audience composed of CRSP student participants, mentors, college administrators, and family members. We will discuss how the program was initiated and developed at each of the participating campuses and the complexities of bringing authentic research experiences to associate degree-granting institutions. We will also discuss our formative and summative assessment strategy including results of student and mentor surveys, tracking of longitudinal student data, and interviews with selected participants. Our discussion will detail the program at Queensborough Community College in terms of programming for STEM students, effective mentoring, and the impact of research experiences on students. In addition, we will discuss how this university-wide program is changing the landscape for undergraduate research across campuses with a more detailed discussion of its impact at Queensborough.

Other

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 2702 Legacy

Advancing Research and Teaching Through NSF-MRI Instrumentation Grants

Presenters: Robert E. Bachman | Sunghee Lee | Kraig A. Wheeler | Jennifer A. Swift
University of the South | Iona College | Eastern Illinois University | Georgetown University

Undergraduate research and teaching in STEM fields requires access to appropriate instrumentation, which is often quite costly and requires securing extramural funding. In this interactive session, participants will explore strategies, challenges, realities, and rewards of securing instrumentation grants via the National Science Foundation Major Research Instrumentation (NSF-MRI) program. The diverse group of presenters will ensure broad perspectives and practical insight to navigating NSF-MRI opportunities that lead to professional growth of both faculty and students.

Session Type: Panel Presentation

Presentation Date and Time: 6/26/2016—11:00 AM-12:00 PM—Room Assignment: 2707 Spirit

Integrating URSCA and other High-Impact Practices into Tenure and Promotion Guidelines

Presenters: Aimee C. Knupsky | Ian Binnington | Bradley Hersh
Allegheny College

In this panel presentation, faculty from Allegheny College will discuss the process by which we integrated URSCA and other high-impact practices into a revision of tenure and promotion guidelines. Specifically, we will address the impetus for this initiative and how it was driven by various stakeholders on campus and discuss how we used outside experts and internal surveys of current practices to prepare the campus community to implement the change. Furthermore, we will present the process by which the new language was developed, revised, and vetted across campus. In particular we will highlight key aspects of the language and its evolution during the vetting process, and consider the initial reception and conversations it generated. Finally, we will focus on future plans for full implementation in terms of faculty development and evaluation. The second half of the panel will allow participants to raise questions and discuss their goals for such an endeavor. Panelists will include the current director of URSCA, the former chair of Faculty Review Committee (elected evaluation committee), the chair of Faculty Council (elected faculty governing committee), and former chair of the Curriculum Committee. Two of these panelists are also members of the steering committee for the Andrew W. Mellon Collaborative Undergraduate Research in the Humanities grant. We will emphasize how previous participation in several CUR workshops facilitated the work we pursued to adopt these guidelines. We will share a detailed timeline of the multi-year process as well as key documents created and used. The panel model allows for the most effective format as each panelist brings unique expertise and experience. The proposed panel touches upon all the conference themes given that valuing and recognizing URSCA and other high-impact practices is essential for any efforts to advance undergraduate research.
Lessons Learned from Working with Systems and Consortia: Strategies for Embedding Undergraduate Research across Campuses

Presenters: Mitchell Malachowski | Jeffrey M. Osborn | Kerry K. Karukstis | Elizabeth L. Ambos

University of San Diego | The College of New Jersey | Harvey Mudd College | Council on Undergraduate Research

The Council on Undergraduate Research (CUR) worked with six state systems and public and private consortia to improve the quality of undergraduate education at each of the constituent campuses and within the larger systems/consortia by focusing on institutionalizing undergraduate research, scholarship, and creative activity within each system and consortium. The systems/consortia include the Council of Public Liberal Arts Colleges, University of Wisconsin System, California State University System, City University of New York System, Great Lakes Colleges Association, and Pennsylvania State System of Higher Education. The panel will include the PI's on the grant who will describe the lessons learned from this large scale project that included 80 institutions. Using case studies, panelists will discuss what has worked, common challenges and ongoing implementation issues and then apply what they have uncovered to assist other institutions interested in institutionalizing undergraduate research. Participants will be led through an exercise that helps them generate a series of goals and strategies to embed undergraduate research across their own campus.

Coordination of Multiple Summer Programs: Three Campus-Wide Models

Presenters: Linda Blockus | Helene Cweren | Iain Crawford | Lauren Elyse Barsky | Michael E. Cohen

University of Missouri | The Ohio State University | University of Delaware | University of Delaware | University of Missouri

Universities may host multiple on-campus summer research programs including NSF REU sites, campus-funded programs, and even independent student researchers. The Undergraduate Research Offices at Delaware, Missouri, and Ohio State will share how they have created umbrella programs to provide services and educational programming for a variety of individual programs. A comparison of these three campuses will reveal the benefits of coordination for faculty, interns, and the institution. At Delaware ~300 students participate under the aegis of the Summer Scholars and Summer Fellows programs. They and an additional 100+ students participate in an August Celebratory Symposium. The Office provides logistical support throughout the summer and, during the academic year, brings together programs and units from across campus in the Alliance of Summer Scholars to increase communication and coordination. At Missouri, 100 students funded by 10 programs and 8 individual PI grants, participate in a common summer program including orientation, evening seminars and social events, and one of 12 different small group seminars. The staff provide logistical and fiscal services including application processing, travel, housing, registration, and evaluation. After years of tracking expenses, we can provide faculty members with accurate figures for grant budgets to support summer interns from Missouri or other institutions. At Ohio State, the Summer Undergraduate Research Institute (SURI) has grown to 600 students each summer with more than two dozen campus partners. Participation in SURI is completely voluntary and provides 10 weeks of social, professional development and sports events, communication and support to any student receiving summer funding, participating in a sponsored program, or conducting research independently. SURI participants are eligible to present at the campus Fall Undergraduate Research Student Poster Forum. Funding, staffing, and needed infrastructure at each campus will be shared.

Advancing Undergraduate Research at Your Institution Through a CUR URPD Program Review

Presenters: Joseph O'Shea | Janice DeCosmo

Florida State University | University of Washington

CUR URPD program reviews offer institutions a comprehensive assessment of their undergraduate research programming and ecosystem, as well as recommendation for how to improve. This session explores the process of a URPD program review and draws on examples to help illustrate how the review progresses and potential outcomes for the institution requesting a URPD program review. Drawing on a panel of three recent URPD program reviewers, this session details the process of a CUR URPD program review from start to finish, beginning with making contact with CUR, engaging in an institutional self-study period, facilitating on-campus visit(s), drafting a report, developing recommendations, and leveraging the program review to advance the undergraduate research ecosystem at your university.

Lunch

12:00 p.m. – 1:30 p.m.—Lunch (Royal Palm Ballroom) and 2708 (Plaza)/2709 (Hillsboro) – overflow rooms
**Assessment of Impact of Undergraduate Research**

**Session Type:** Single Presenter  

**Presentation Date and Time:** 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 3707 Oak

**Tracking Undergraduate Research: Ohio State’s Portfolio of Undergraduate Research Experiences (PURE)**  

Presenter: Helene Cweren  
The Ohio State University

We’ve all been asked: How many undergraduates are conducting research on our campus? However, few of us at large public universities, can provide an accurate response to this question without a centralized reporting system in place. During this session, the presenter will share information about the development and maintenance of Ohio State’s Portfolio of Undergraduate Research Experiences [PURE]. PURE, launched during mid-2014, is a comprehensive database designed to capture information about all undergraduate researchers, whether conducting research for credit, receiving scholarship or pay, or simply volunteering. Additionally, data collected via PURE (e.g. tracking student Presentation and publications) will also be discussed. The presenter will explain sources of data collected and used, challenges of developing and maintaining PURE, and share preliminary results, successes, and lessons to date.

**Diversity and Inclusion in Undergraduate Research**

**Session Type:** Single Presenter  

**Presentation Date and Time:** 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 2702 Legacy

**STILAS: An Innovative Model in Support of a Diverse and Inclusive STEM Community**  

Presenter: Karen H. Bilotti  
Roger Williams University

Roger Williams University (RWU) was awarded a $586,500 National Science Foundation grant in 2012 to provide scholarship funds and academic support to increase the number and retention of underrepresented students majoring in science, technology, engineering and math (STEM) fields at RWU. This program, known as STILAS, is a cross-departmental endeavor that incorporates faculty in their roles as advisors, mentors, instructors and departmental liaisons; RWU Intercultural Leadership Ambassador program members; and grant office members. In partnership with these groups, the STILAS students receive individualized support through course-specific tutoring, field trips to research facilities, seminars presented by leaders in the field, and community building activities. As a result of the infrastructure that we have created, we have been extremely successful in placing these historically underrepresented students in STEM-related research and internship opportunities. Thus far, over half of the STILAS students have engaged in on- and off-campus internships or research experiences. That number is significant considering that the biggest cohort of freshman students matriculated in fall 2014, meaning the bulk of our students are just beginning their progress through their major. The students’ research experiences extend to their attendance at conferences to explore the communication of science, as well as present their own work. As a result of these placements, as well as the one-to-one mentoring provided through the STILAS program, the students have gained crucial post-graduate skills and insights into STEM careers. Of the two STILAS graduates to date, both have secured jobs in their STEM disciplines. The institutions in which they worked have benefitted from a productive research experience within an inclusive and diverse community. Our talk will highlight the successes and challenges of STILAS and what we foresee as the next steps in the development of a sustainable undergraduate program that supports and advances underrepresented students in the STEM fields.
Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 2703 Honors

Whom Do We Serve? Addressing Diversity and Inclusion in Undergraduate Research at Florida State University
Presenter: Latika L. Young
Florida State University

The diversity of the student body is not fully represented in undergraduate research and related high-impact practices. This session will provide an overview of how Florida State University’s Center for Undergraduate Research and Academic Engagement (CRE) is striving to be inclusive, through campus partnerships, outreach, funding, and individualized support. Intentional campus partnerships have been forged with the Center for Academic Retention and Enhancement, which provides financial and other support services for low-income, first generation students, as well as runs Unconquered Scholars, which supports students who have experienced homelessness, foster care, or relative care. The CRE also collaborates with the Veterans Center to make research accessible to our students who have served in the military, helping FSU in its mission to become the most “veteran-friendly” school in the nation. An arrangement with Financial Aid has allowed our Federal Work Study-eligible students to apply their FWS funding to their research assistantships in the Undergraduate Research Opportunity Program, and fundraising is conducted to provide travel grants for our low-income and first generation students participating in the Global Scholars program, a rigorous two-month international service learning program that also introduces students to basic qualitative research methods. Finally, individualized support and mentorship is provided through various programs, including FSU’s branch of the Florida Georgia Louis Stokes Alliance for Minority Participation, which partners graduate students completing STEM PhDs with underrepresented undergraduates, with the goal of inspiring increased diversity within our PhD programs; the Garnet and Gold Scholars Society, which encourages students to engage in at least three of five high-impact practices (i.e. research, international, leadership, service, and internship), also partners students with an Overall Program Advisor, a mentor who helps them determine how to engage outside of the classroom throughout their career here at FSU.

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 2707 Spirit

Building Undergraduate Research with Diversity and Inclusion: Simple Steps Lead to Measurable Outcomes
Presenter: Patricia A. Morrale
Kean University

The importance of undergraduate research experiences for all students is well known, but particularly important for underrepresented minorities and women. Beginning the past decade, one undergraduate department has developed diverse, inclusive teams of undergraduate researchers where none existed before, with measurable student outcomes including awards, and long term student success. This culture of undergraduate research has been established at Kean University, a predominantly undergraduate institution with a highly diverse student body. This session will first present the specific, measurable actions taken to build a cohort, with dedicated space, positive reflection, and faculty support, and then explain how several small, repeated steps have yielded measurable outcomes contributing to the growth of the department and programs. Lessons learned, student and faculty adjustments, changes over time, and future directions will be discussed. This interactive session will explore how simple, reproducible steps yielded measurable results and undergraduate research topics and teams with diversity and inclusion. We will discuss lessons learned and future ideas. The focus of the interactive part of the session is how to create and grow undergraduate research teams at a predominantly undergraduate institution. First, the environment is presented as it first existed, and now, identifying contrasts and changes. Next, by exploring what worked and what didn’t work, methods to develop diverse undergraduate research teams are used. Then, ideas for the future are shared and the audience is asked which ideas they would try. Finally, the results of the polling are used in to identify characteristics of successful undergraduate research team building for diversity and inclusion.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 3704 Tarpon

A Summer Research Course at the End of the First Year of College Benefits At-Risk STEM Majors

Presenter: Tom Cheatham
Middle Tennessee State University

Early research experiences, while rare, are believed to have a positive impact on undergraduate students (Hoke & Gentile, 2008; National Research Council, 2003). Among the benefits of early research experiences for college students are self-confidence, teamwork, and communication skills. Nagda, et al. (1998) found that undergraduate research significantly improved retention for sophomore research participants. It is difficult for students, especially freshman/sophomore, first-generation and/or underrepresented minority students to become engaged in undergraduate research (Boyd, & Wesemann, 2009). At MTSU we have facilitated an early research experience by inviting incoming freshmen STEM majors to join the NSF STEP project (DUE #0969571) called “Mathematics as a First Step to Success in STEM (FirstSTEP).” FirstSTEP has been successful at retaining at-risk STEM majors in STEM through a sequence of interventions, one of which is an undergraduate research immersion experience in the summer after their freshman year. FirstSTEP participants have an opportunity to select and join a research team project from a list of faculty-led research opportunities. Each team costs around $10,000, making it difficult to sustain once grant funding ends. The sustainability model we are experimenting with is a May term research class. The 10-12 students in the class are divided into three teams, each with their own research project, perhaps all small parts of a larger project. The three-credit course combines library time, faculty instruction about research, field work, and laboratory time. This mix of activities allowed students to remain engaged and even energized. Assessment of the course was based on evidence collected from observations, a student perception survey, a communication rubric, and the Depth of Science Experience (DOSE) instrument (Smith, et al. 2014). All of these measures indicate that, at the end of their first year of college, at-risk STEM majors were successful on multiple levels in a research course.

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—1:30 PM-1:50 PM—Room Assignment: 3705 Manatee

Engaging Undergraduates in Original Research in Their First College Course

Presenter: Kristine Lang
Colorado College

In this presentation, the author will discuss her experience teaching a course in which about 20 first-year students engage in original research during their first months at college. At the beginning of their first year, all students at Colorado College take a two month long First Year Experience (FYE) course. This course, which can be taught by any faculty on any topic, has a goal of introducing students to core college skills such as writing, critical reading, and library research. In the FYE course discussed here, we add scientific research to this list of core skills. The course comprises a month of classroom learning in theory underlying the research project, laboratory skills, and how to find and read journal articles. In the second month, the students work in groups of 3 on an original research project that is part of the instructors’ ongoing research program. The two course instructors, a microbiologist and a physicist, have a joint interdisciplinary NSF-funded project to study natural transformation in bacteria. As part of this project, each student group is assigned an unstudied mutant bacterium deficient in a gene of interest. The student groups prepare bacterial samples, image them by atomic force microscopy, and analyze the resulting data. The class data are pooled to give students access to more data than they would generate in this short time. Using this original data, the culminating project is a scientific journal article written by each student. Thus each student in the course experiences many aspects of a scientific research project during their first months in college. In addition, several FYE students immediately continue as research assistants in our lab, and later serve as teaching assistants in subsequent offerings of the course, thus creating a clear path into research for first-year students.
The Undergraduate Research Certificate: Developing a Certificate Program that Recognizes Arts and Humanities Research
Presenter: Cheryl L. Nixon
University of Massachusetts Boston

This session explores the creation of an “Undergraduate Research Certificate” program as a means of recognizing a wide variety of high-impact undergraduate research activities and practices. Using UMass Boston as a model, this session explains the goals, structure, and implementation of a certificate program. For example, the UMass Boston program allows students to count coursework, presentation and performances, event attendance, advising session attendance, and service learning towards the certificate. When certain amounts and types of undergraduate research experiences are completed and certified, a student earns an Undergraduate Research Certificate and a notation on his/her transcript. This session explains the on-going development of the Undergraduate Research Certificate at UMass Boston, sharing “lessons learned” from the process and information on how a certificate could take different forms at different institutions. The session emphasizes the usefulness of the certificate model for arts and humanities work, which often takes creative and innovative forms. For example, at UMass Boston, the certificate was developed by the College of Liberal Arts as an alternative to our traditional honors thesis program. The certificate allows a wide variety of arts activities and capstone projects to count as research experiences. This session also emphasizes the logistical benefits of a certificate. Most notably, the certificate model allows a program to bring together existing research practices rather than invent new structures. I’ll briefly note that I am a CUR councilor and recently served as a facilitator at the Arts and Humanities Institute. I mentioned the UMass Boston Undergraduate Research Certificate at one of our sessions, and it generated widespread interest. I was encouraged to present on this topic at the CUR conference as a result.

Innovation and Collaboration in Undergraduate Research

Interprofessional Innovations in a Maker Space
Presenter: Patrice M. Ludwig
James Madison University

Research is an interdisciplinary endeavor, yet the expectation is that students just “know” how to work across disciplines. Multiple courses at James Madison University are using Maker Spaces (studios with 3D printers, laser cutters, and other “making” materials) as a venue for interdisciplinary student research. These courses focus on explicitly teaching students to collaborate across disciplines on problems such as habitat modeling for endangered species, developing tangible solutions to metabolic syndrome, and land mine detection. Students in the courses represent a very wide distribution of disciplines: biology, nursing, engineering, physics, writing and rhetoric, industrial design, computer science, and health sciences. The faculty teaching the courses are from biology, nursing, engineering, physics, industrial design, and writing and rhetoric. We analyzed reflective writing assignments, oral responses, and surveys for emergent themes in students’ attitudes toward using Maker technology, working in teams, and working across disciplines. Initial results of the qualitative content analysis of oral interviews suggest that students value working in teams in general but specifically in interdisciplinary teams. One exciting emergent theme is students’ realization that creativity is a learned skill that is valuable in all disciplines.

Internationalization and Undergraduate Research

Small-Scale Quantitative Research in Short-Term Study Abroad Programs
Presenter: Steven Surrency
University of South Florida

The session will explore how the Communication Sciences and Disorders Study Abroad program has been augmented with a small research component. In past study abroad trips students recorded reflections about their experiences in journal form. In the 2016 iteration of the course, students will conduct a very small research project. Students might examine cultural, clinical, or even social questions. Projects will generally center on differences between US and host country practices. In particular, we will discuss the experiences in Italy and Brazil. The presentation will compare what the study abroad experience was like before the research component was added and what the experience looks like with the research component. The perspectives of multiple instructors and students involved in the research will be explored. Samples of student projects will be displayed and ideas for improvement and replication will be discussed.
Finding Small Grant Opportunities to Jump-Start your Research
Presenter: Bridget L. Gourley
dePauw University

Are you just getting started in research? Pursing a new area of research? Need a little bit of money to get some preliminary data? Trying to find summer salary for one more student? Looking for ways to stretch and leverage start-up funds? Interested in establishing a track record to become more competitive with major funding agencies? Often small pockets are available from internal sources, state science academies, local industry, local and regional granting agencies, etc. that can help get a new project off the ground. Examples of small pockets of funding will be described, strategies for learning about other opportunities in your area will be suggested, and approaches to securing funding from atypical sources discussed. This talk will help individuals brainstorm about possibilities in their own geographic area and research subfield. The goal of this presentation is to help members of the audience create a personal action plan to put in place after the conference.

Fundraising for Undergraduate Research Programming
Presenter: Joseph O’Shea
Florida State University

Finding funding to support undergraduate programming is a challenge facing nearly every undergraduate research program, especially in times of reduced government support. Increasingly, undergraduate research programs are turning to private support for undergraduate research, but building a private development infrastructure can seem daunting and challenging. This session explores how to get started in fundraising and outlines successful examples of robust private fundraising for undergraduate research. The session draws on the research on philanthropic giving and on examples of how to begin to establish a network of supporters for your efforts. The session explores different fundraising strategies, including development boards, donor stewardship, annual giving campaigns, student philanthropy, endowment gifts, corporate philanthropy, among others, and attendees will dialogue about fundraising efforts and challenges on their campus.

Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 2702 Legacy

Capitalizing on the Strengths of Academic Societies to Broaden Participation in STEM fields
Presenter: Mary L. Crowe
Florida Southern College

This program links the resources of three professional societies to develop innovative initiatives that will address the recruitment of undergraduate under-represented minority students into graduate programs in Integrative Organismal System (IOS) fields and the retention of under-representative minority graduate students and post-doctoral researchers in IOS fields. The initiatives concentrate on key transitions of the educational pathway – advanced undergraduates, early graduate students [within the first two years of graduate school], and the progression of post-doctoral researchers into faculty careers. During our session I provide an update of the programs we have successfully implemented. I will also talk about some of the problems we have faced and how we adapted our models to compensate.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 2707 Spirit

Students as Global Citizens: Engaging Human Trafficking through Project Based Learning in the Classroom
Presenter: Johannes Burgers
City University of New York- Queensborough

Service Learning research shows that students who participate in SL projects have a richer college experience than those who do not, especially non-traditional students whose educational background does not always align with the implicit skills necessary in the classroom. When coupled with the prolonged inquiry required for Undergraduate Research, SL's real-world project based learning can be a real boon to students. Yet, the students who could benefit the most, those in Freshman Composition, are rarely exposed to these advanced pedagogies due to logistical and administrative challenges. This is why over the years, I have created a teaching module in my Freshman Composition classroom that is based on the principles of Service Learning and Undergraduate Research, but does not rely on an external partner, thereby ameliorating the students' and by extension, the college's obligation. The project requires students to work in teams for a fictional non-profit called Transglobal Relief for which they are tasked with doing original, collaborative research to find a localized, community-centered approach to curbing human trafficking within a stipulated budget. For the purposes of this paper, I have been collecting both quantitative and qualitative data on the student experience in different modalities of Freshman Composition, including: An honors class at a four year school, an advanced class at a two year college, and last a nightly class at a two year school. My paper argues that, in general, students who do collaborative undergraduate research in the Humanities have a very positive and formative experience. Nevertheless, collaboration, especially at a two year college, raises both logistic, pedagogical, and ethical concerns that need to be addressed early on in the semester. These downsides do not, however, outweigh the net positives.

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 3702 Orchid

Creative Interdisciplinarity in the Curriculum
Presenter: Gregory Young
Montana State University Bozeman

Building upon a transformation of the general education program at Montana State University to include four inquiry courses and a research/creativity course for all students, Greg Young and his colleagues have designed interdisciplinary capstone courses to help students integrate professional skills with analysis, creativity, and collaboration. Team-taught seminars such as “Musi-Tecture: Seeking Useful Correlations Between Music & Architecture,” “London and the Lakes: Music and Economics from Handel to McCartney” and “Music and the Brain” allow students to design their own projects, conduct original interdisciplinary research, present them in class, and write summative essays. Student work has been published in peer-reviewed journals and presented at national conferences. He will also provide examples from the required senior capstone undergraduate research course in music that he oversees, with participation by other faculty mentors. These faculty mentors often benefit by having senior students help them with aspects of their own research and creativity. Having been a Vice Provost and served in various other administrative roles for 21 years, he often finds that younger faculty members can use some of these ideas and become empowered to redesign course work and curriculum requirements for the benefit of students. It also makes their teaching more interesting, in many cases. Participants will be invited to share specific models, and to ask questions.

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 3704 Tarpon

Incorporating Authentic Research into A Cancer Biology Course Using Student-Driven, Investigative Lab Projects
Presenter: Roslyn Nicole Crowder
Stetson University

An authentic research experience for undergraduate students must include experience with primary literature, introduction to appropriate experimental design, and mastery of data collection and analysis. In the spring semester of 2015, I taught an upper division Cancer Biology course. This was an investigative course that allowed upperclassmen to receive an authentic, research-based lab experience. Students were charged with designing a novel cancer biology research project to investigate the ability of a chemotherapy agent to induce cell death in a human cancer cell line. Students selected the cell death or cell viability assay, the human cancer cell line and the chemotherapy reagent used. Students also selected the chemotherapy dose and time point for the cancer cell treatment. Students were responsible for maintaining the cells, seeding and treating the cells and all sample preparation for subsequent cell death and cell viability analysis. In this presentation, I will review the schedule of major course activities and course learning objectives, show examples of student data obtained from the student lab projects, and discuss problems I incurred throughout the semester.
Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 3705 Manatee

Reshaping Science Courses For Students’ Success
Presenter: Huda A. Makhluf
National University

Undergraduate research experiences are considered high impact educational practices. In a laboratory course for pre-health sciences, students were asked to formulate their own scientific questions and hypotheses. Students collected household toothbrushes and cultured bacterial isolates while learning microbial aseptic techniques on selective and differential media. Research methodology, data collection and analysis were emphasized throughout the course. We tested the hypothesis that adapting an authentic research approach to our curriculum could lead to increased student satisfaction and enhanced learning. To that end, we performed a preliminary assessment of the Classroom Undergraduate Research Experience (CURE) using surveys and collected student artifacts for assessment. Students were shocked that there would be fecal traces on their toothbrushes albeit while living in a microbial world. The results triggered lively discussions on oral flora, microbiome, hygiene and proper storage of toothbrushes to avoid fecal contamination. Student engagement—by doing relevant and current research activities—and subsequently student satisfaction were increased compared to a control class.

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 3708 Sandhill Crane

Curricular Scaffolding for Undergraduate Research: Using Deep Learning to Grow Toward Deeper Learning
Presenter: Elizabeth A. Perry-Sizemore
Randolph College

Faculty sometimes shy away from undergraduate research from fear that students lack the prerequisite skills for all parts of a project. It is critical to ask where in the curriculum these skills should be developed, and how they should be developed. Drawing from McGoldrick’s identification of the relationship between the research process and the expected proficiencies of economics majors (2007) and DeLoach et al’s taxonomy of undergraduate research (2012), this project shares how learning objectives can inform curricular scaffolding in support of undergraduate research experiences. It offers a specific example of how a CBR/SL experience in an intermediate level course can engage students in early steps of the research process with limited to moderate autonomy, thus serving as a springboard for the development of student involvement in more sophisticated aspects of the same project and others later, through summer research experiences, independent studies, or capstone experiences, all of which can offer deeper learning and mentoring. While the specific example is from the field of public economics, the overarching framework for operationalizing this scaffolding can be adapted for use in other disciplines.

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—1:55 PM-2:15 PM—Room Assignment: 2703 Honors

Beyond the Classroom: Undergraduate Research and Digital Humanities
Presenter: Crystal S. Anderson
Longwood University

Undergraduate research is often constructed within a curricular context, focusing on the face-to-face experience between an instructor and student as crucial to mentoring and the transmission of inquiry and research skills. This presentation shares the experience of a collaborative digital humanities project conducted through the Internet. Because of its digital nature, the project invited students globally to participate as research assistants. Students were trained, received feedback on their work and participated in a research community almost entirely in a digital environment. As a result, new models of engaging students online emerged from the project. The project introduced students to an array of digital tools and trained them in skills that they could use in their curricular lives beyond the project. At the same time, the project encountered several challenges involved with motivating an undergraduate population outside of a course working on an unfunded project. The presentation will explore how the digital presents new opportunities for undergraduate research, especially in areas where faculty mentorship exists outside of the institution.
The UConn IDEA Grant: A Model for Expanding Support for Student-Designed Projects
Presenter: Caroline McGuire
University of Connecticut

The UConn IDEA Grant program was launched in 2013 with the mission of supporting student-designed projects in a range of forms, including original research, creative endeavors, community service initiatives, and entrepreneurial ventures. The structure of this program complements other funding opportunities at the University of Connecticut by offering both academic year and summer funding cycles; by accepting applications from individuals and from small groups; by scaffolding the evolution of student projects through an intensive, staff-led project development phase; by welcoming project proposals that break the mold of conventional research and scholarly projects; and by engaging members of the broader community as project mentors. In this presentation, I will share examples of the types of innovative student projects that have been pursued through this program, ranging from app development to documentary film, from community garden construction to giant Pacific octopus creature suit construction. Further, I will discuss the strategies we have used to support student inquiry that moves beyond the boundaries of traditional scholarship across the disciplines. The UConn IDEA Grant program illustrates how offices that promote undergraduate research can leverage their expertise to support a broad range of student-designed learning opportunities in collaboration with campus and community partners.

Challenges to Undergraduate Research due to "Tennessee Promise" and New Self-Assessment by Tennessee Board of Regents
Presenter: Ed C. Lisic
Tennessee Technological University

New challenges in enrollment and undergraduate research are now being seen at the 2-yr colleges and 4-yr institutions in Tennessee due to the “Tennessee Promise” initiative, which ensures “free” college tuition to graduating high school seniors. Along with these challenges, the Tennessee Board of Regents (TBR) has engaged us in Fall 2015 in new definitions and new assessment rubrics for high impact practices, which includes undergraduate research. And, as of the very hour that this abstract was submitted, our Tennessee Governor Haslam has announced that the six 4-yr institutions will now be split off from the TBR system, which will now only include the 2-yr community colleges and technical colleges. This striking new development has far-reaching consequences, some of which we can prepare for, and some which will disturb our current undergraduate research process at the University level. We will address the self-assessment rubric for undergraduate research at both the 4-yr and 2-yr universities and colleges. This presentation will focus on the need for across the board changes that must or should be implemented for the successful evolution of our undergraduate research courses and programs.

Towards a New Model for Engaging Younger and Diverse Undergraduate Students in Research
Presenter: Oludurotimi Adetunji
Brown University

The Karen T. Romer Undergraduate Teaching and Research Awards (UTRA), initiated in 1986 at Brown University, are designed to strengthen undergraduate education through supporting course development, teaching activities, and collaborative research between faculty members and students in all academic disciplines. The degree of collaboration—as evidenced by how well the faculty mentor and students have worked together to create a proposal—is at least as important as the quality of the research being proposed. The UTRA program provides students with valuable academic experience that prepares them for graduate study and also has contributed directly to course development at Brown University. A general overview of both the UTRA program, which has sponsored over 1,200 undergraduate research projects in the last four years, and of the new, innovative Interdisciplinary Team UTRA (i-Team UTRA) model launched in 2014 will be provided. 1-Team UTRA has enhanced the participation of younger students and of students from diverse backgrounds in undergraduate research, increased student intellectual growth through peer mentorship and collaborative learning, and facilitated interdisciplinary scholarship between and among Brown University faculty. It has quadrupled rising sophomore participation rates from 6-7% to almost 30% and increased underrepresented minority (URM) student participation rates from 10-14% to almost 22%. The benefits of the UTRA program for undergraduate students and faculty, the overall impact of the UTRA program on student participants, and the key elements of the program responsible for its success will be discussed.
Monmouth University Summer Research Program

Presenter: Michael A. Palladino
Monmouth University

In 2009, the Monmouth University School of Science introduced the Summer Research Program (SRP, www.monmouth.edu/srp) as a key new initiative to help train next generation scientists, mathematicians and engineers, and a program designed to foster a research culture among students and faculty. The SRP is a 12-week, intensive, student-faculty collaborative research experience for undergraduate students, graduate students, and selected high school students. Students work closely with faculty on original research projects in a range of different disciplines. Students experience a comprehensive immersion in the research process from reviewing background literature and project funding through developing research questions, designing, carrying out and troubleshooting experiments, analyzing data and presenting their work. Each summer ~65-95 students and 24 faculty, including tenured and tenure-track and non-tenure track faculty, participate in the program. This session is ideally suited for faculty and administrators interested in developing a summer research program. This session will provide an overview of how the SRP was developed, funded and sustained. Specific examples of individual and corporate philanthropy models to support the program will be discussed. Programmatic elements of the SRP will also be discussed including: the application and acceptance process, building faculty and student research communities through the SRP, including high school partners in the SRP for STEM student recruitment, social and professional programming including a culminating Symposium, and program assessment.

2:20-2:40 p.m.
20 min single presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 2707 Spirit

An Integrative Model to Support the Creative Activities in Undergraduate Research and New Faculty

Presenter: Bryan L. Dawson
University of North Georgia

The current proposal seeks to demonstrate the effectiveness of integrating undergraduate research ambassadors [in our Center for Undergraduate Research and Creative Activities-CURCA] across four campuses at a four year liberal arts institution. Over the course of the past academic year, our ambassadors have created and hosted workshops geared toward helping undergraduate students talk about research with faculty, apply to conference, create effective Presentation and posters, and apply to graduate school. In addition to these workshops our ambassadors have worked to increase student participation in our university wide undergraduate research conference and most recently have met with all campus student organizations to understand how our own CURCA office can better support undergraduate research. Because of these efforts our University recently established a student submitted summer research program [with 13 high quality applications many of which were centered on Creative activities- ie. paintings, sculpting work, performance arts and film], far exceeding expectations for an inaugural research program, and from areas our university had not received submissions from ever before. Our presentation focuses on presenting a model to integrate the liberal arts and those student organizations who may have traditionally felt excluded from university wide research programs. In this we present models for creating interdisciplinary research and matching undergraduate students with interested Faculty. We will also discuss the model and its effects on newly hired faculty, many of whom are seeking undergraduate students with whom to collaborate. Finally we seek to demonstrate the tangible return on investments regarding our University’s internal and external conference attendance, increases in student travel applications, and increases in creative activity proposals across all campuses.
Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 2702 Legacy

Research Outside the Beaker: Reaching out to Humanities Students

Presenter: Helene Cweren
The Ohio State University

Promoting research and scholarly activity among undergraduates in the Humanities poses challenges and opportunities. At large public universities, the following questions often come to light: (1) How can we best communicate what research looks like in the humanities and entice involvement? (2) What does faculty mentorship in these fields look like and how is it different from other research mentorship across campus? (3) What is the typical timeframe for research in the humanities? (4) What resources and support do humanities students need to effectively conduct research? and (5) Are there any models that can facilitate undergraduate research in the humanities? In this session, the presenter will outline how Ohio State University has and continues to address these challenges, share ideas for better outreach and ideas for moving forward.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3704 Tarpon

Development of a Summer Research Course to Springboard the Development of a Research-Intensive Bioinformatics Concentration

Presenters: Lindsey Blais Cundra | Reid Schwebach
George Mason University

A summer undergraduate research course was created to offer both undergraduates and high school students an opportunity to participate in environmental microbiology and introductory bioinformatics research. Although this was the initial goal, our Department realized during the proceedings of an NSF-funded faculty professional development endeavor named “SIMPLE” during the past year, that the course is a good capstone opportunity for a new bioinformatics concentration that engages all students in the concentration with undergraduate research opportunities. The SIMPLE method is one aspect for fostering a department’s efforts to develop courses that engage students with undergraduate research. As a result of the initial efforts, Mason’s Provost Office is now supporting the development of the Bioinformatics Concentration through a Scholarship Development opportunity. Additional Virginia state funding has been received to develop this research-intensive concentration, and to support the research initiatives of a small faculty research team. The interdisciplinary nature of the summer course allows students to generate baseline data for the recurring bioinformatics course that will follow the course in sequence, to be taught for the first time in the fall of 2016. SALG survey results indicate that students have the need for integrated research experiences and that the course provides them with hands on research skills. The course is fostering these longer term outcomes: (1) helping students progress from course-based research experiences to more sophisticated in-course independent research projects; (2) creating baseline data for a bioinformatics course that will be in the second stage of the bioinformatics concentration; (3) spawning the creation of additional research-intensive undergraduate courses in the department, and (4) generating authentic research outcomes that benefit the department interests of the student in ecology and evolution. These initial evaluation data show that students and the department had made great strides in this first year of course development and implementation.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3705 Manatee

Partners in the Process: Service Learning Impacts on Community Partners, Service-Learners and Student Researchers in an Underserved Rural Community
Presenter: Cynthia A. Merriwether-DeVries
Juniata College

The current research details a semester long project exploring the perceived impact of service-learning on student participants in service-learning, community partners and on the student researchers who conducted the assessments. Community partners completed surveys and participated in focus groups to determine their perspectives on the impact of service learning. Student participants in service learning were surveyed to determine their perceptions of service-learning participation. Finally the student researchers who conducted the assessments of community partners and service-learning participants conducted auto-ethnography to explore the growth and development of their identities as undergraduate researchers. The goal of the auto-ethnography is to explore how the exposure to both participants in service-learning and community partners’ perspectives impacted development of the researcher identity.

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3708 Sandhill Crane

Embedding Research in the Curriculum
Presenter: Jane Rogan
Indiana University

In its campus strategic plan in 2015, Indiana University Bloomington identified undergraduate research as a focus, and the Office of Engaged Learning was tasked with building and assessing a more centralized approach to undergraduate research on a campus with over 40,000 students. In order to promote undergraduate research and to prepare undergraduates to participate in research experiences at such scale, innovative programs needed to be created. Embedding research within preexisting course offerings was deemed to be an appropriate starting point. A pilot program was started in the Hutton Honors College where a small number of courses and faculty were identified to participate. The pilot included developing the curriculum development workshops needed to assist faculty in converting their established courses into embedded-research offerings. In addition, course attribute tags had to be created in order to identify embedded-research offerings within the schedule of classes so that courses could be promoted and assessed over time. This presentation will identify the many steps needed to start such a curricular approach to undergraduate research: involving faculty; developing curriculum workshops; building campus partnerships; creating assessment models; building internal processes for course approvals. While in its infancy at Indiana University, this model offers a promising way to promote undergraduate research and to prepare students for its challenges on a larger scale.
Innovation and Collaboration in Undergraduate Research

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM—2:40 PM—Room Assignment: 2703 Honors

Taking Students With You on Your Sabbatical: Lessons Learned
Presenter: Barbara Blonder
Flagler College

Flagler College has a small but growing Undergraduate Research program and launched its first science major – Coastal Environmental Science – in 2013. That major was built on the mainstay of an undergraduate research component whereby students are encouraged to engage in this high-impact activity right from the beginning of their academic careers. Although none of the above is particularly unique, this investigator was awarded one of two annual, single-semester College sabbaticals to be conducted during the spring semester of 2016. One of the major persuasive themes in this sabbatical application was that of including student research assistants during, and as an essential element of, this sabbatical. In particular, the research centers on vegetative species data collection in the very challenging field conditions of the Guana-Tolomato-Matanzas National Estuarine Research Reserve Coastal Strand Ecosystem. Both logistically and for safety reasons, it is work that cannot be accomplished alone. During May, 2015 and again in September through October, 2015 ten student research volunteers were recruited. Several became especially engaged, dependable and committed to the research. With the support of my Department Chair, I then offered four of them variable Research Assistant credit hours to assist me with both field and laboratory research during this sabbatical. This presentation will highlight the student researcher recruitment process, modes of training these students and insights into what was learned about crafting a mutually-successful research and mentoring experience during a sabbatical. As might be expected, the investigator had a number of reservations about actively mentoring, training, and managing students during what is traditionally a time to spend away from them. The three syllabi (1, 3 and 4-credit hour) will be shared, as will specific lessons learned that led to both successes and areas for improvement, and recommendations for those who might consider a similar effort.

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM—2:40 PM—Room Assignment: 3700 Sabal

Starting Early: Two Undergraduate Research Programs Targeting First and Second-Year Students
Presenter: Justin Micomonaco
Michigan State University

As an identified high impact educational practice, there is continued interest in how to expand access to undergraduate research opportunities. One challenge facing colleges and universities is how to engage students in undergraduate research earlier in their college career. At many institutions, undergraduate research is often seen as an activity for upper division students (i.e. juniors and seniors) who are familiar with their discipline and considered better prepared to engage in scholarly work. However, given the links to a host of student outcomes (e.g. retention, academic understanding, professional development, etc.), there is a benefit to engaging students early in their undergraduate career. Further, prolonged engagement in research increases the likelihood that scholarly products (e.g. publications) can result from the experience. In this session, two programs that engage first and second-year students at a large, research university will be described. The first program uses a conventional model where students are placed individually with a faculty mentor. In this program, high-achieving high school students are offered the position prior to matriculation and are provided funding for up to two years of research. The second is a course-based research seminar. These courses are designed by faculty members to provide students with a hands-on, research experience over two semesters in a group setting (normally 6-15 students). Faculty introduce students to the discipline and mentor students through the research process, including reviewing the literature, generating research questions and hypotheses, gathering and analyzing data and developing conclusions. An overview of the administration of these programs will be provided to share challenges and lessons learned (e.g. faculty recruitment, student placement, etc.). Finally results of an undergraduate research survey will be shared that will highlight the similarities and differences in outcomes reported by participants in these programs.
Internationalization and Undergraduate Research

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3702 Orchid

Infuse Cross-Cultural Undergraduate Research into Study Abroad Courses
Presenter: Tsu-Ming Chiang
Georgia College and State University

As the world becomes more interconnected, cross-cultural research would create global impact that expands our understanding of human behaviors in the 21st century. Furthermore, it is highly beneficial for college students to be exposed to cross-cultural knowledge and experiences to build cultural competence that will equip them to be global citizens with high sensitivity to appreciate cultural influences on behaviors. The proposed presentation is to illustrate how to accomplish these two goals in collaboration with university International Education Office to conduct undergraduate cross-cultural research through teaching abroad courses. With careful planning and front-loading research preparations prior to arriving in a foreign country, faculty members are able to infuse their contents and undergraduate research into field trips and site visits. The proposed presentation will share how these preparations are made and provide examples and dialogues for a successful infusion of undergraduate research into study abroad classes. The model has been tested through teaching in five different countries for 5-week summer collaborative programs in the past 7 years. The proposed presentation will suggest how undergraduate research efforts can partner with campus international education offices to sustain a long-term relationship in cross-cultural research. Infusing undergraduate research pedagogy in these courses not only enriches faculty’s cultural knowledge, but it also provides students with opportunities to build cultural competence through observing cultural similarities and differences with guided sets of hypotheses. As an outcome, these undergraduate researchers gained both undergraduate research experiences and cultural competence. Students’ brief comments on how the experiences have benefitted them as learners were documented.

Other

Session Type: Single Presenter
Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3712 Columbia

Research Rookies: A Program to Introduce Freshmen to the University’s Culture of Undergraduate Research
Presenter: Joanne D. Altman
High Point University

For years CUR has advocated for getting students involved in research early in their academic careers. However, too often underclassmen aren’t prepared for research and faculty are more comfortable tapping advanced students. At High Point University we developed a program that engages students in their first year and puts them on a path toward collaborative scholarship with faculty mentors. Our Research Rookies Program is a voluntary non-credit 2-semester program designed to introduce students to our culture of undergraduate research and creative works and to build research-related skills. Students are required to complete a series of tasks that include training sessions, workshops, discussions, attending events, and testing. Students do not do research in this program; they build skills. As a result, we also have students do a project or assignment that models at least one part of the research process. The program is run through our learning management system and includes both online and in-person activities. Students who complete the program are elevated to the title of Research Apprentice and advertised to the faculty. Successful completion of the program demonstrates a student’s ability to follow through, dedication to going above and beyond the course curriculum, and awareness of the value of individual scholarship. These qualities, along with the skills developed from the program, make students valued candidates as research assistants and collaborators. In this presentation I will demonstrate how we run the program and address our response and completion rates, benefits and challenges, and our program assessment. I also hope to generate additional ideas from the audience for programming and on-line resources. This is a program that should be easy to duplicate at any institution.
Session Type: Single Presenter

Presentation Date and Time: 6/26/2016—2:20 PM-2:40 PM—Room Assignment: 3713 Challenger

What Do We Mean by "Research" in the Arts?
Presenter: Nicole Perry
University of Kansas

Many undergraduate research offices and programs strive to be inclusive of the different academic traditions found on their campuses. Yet when it comes to students in the arts, we often struggle to find the right words to describe their scholarship and the right types of programs that support them in discipline-appropriate ways. This session will present findings from a year-long faculty working group about undergraduate research in the arts at the University of Kansas. This committee of seven faculty members used the 2014 CUR publication “How to Get Started in Arts and Humanities Research with Undergraduates” as a starting point to discuss the nature of creative work and what role a central campus office could play in supporting students and mentors. The group expressed concerns that the CUR publication and our campus undergraduate research office were only supporting certain types of creative work—that which looked the most like other forms of research—to the detriment of emphasizing important facets of the creative process, such as articulating a creative vision or reflection. This session will present an alternative model for understanding creative work. It will present three things in particular that should be useful for participants with different roles on their campuses: 1. A visual representation of the creative cycle that could be adapted for use on other campuses; 2. A discussion of the faculty working group as a model for faculty engagement; and 3. A discussion of the ways that KU’s Center for Undergraduate Research has incorporated this changed understanding of the creative cycle into existing programs.

Break

2:40-3:00 p.m.—Break (Royal Palm Ballroom)
**Integrating and Building Undergraduate Research into Curriculum and Coursework**

**Session Type: Workshop**

Presentation Date and Time: 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 3713 Challenger

**Incorporating Undergraduate Research at Various Levels within a STEM Curriculum**

Presenters: Sarah Fankhauser | LaTonia Taliaferro-Smith | Effrosyni Seitaridou

Oxford College of Emory University

Evidence already indicates the powerful impact of undergraduate research on the development of students, their sustained interest in science, and the shaping of their future careers. Developing an undergraduate curriculum that incorporates scientific exploration to facilitate student-centered learning is a key recommendation in reports such as “Vision and Change in Undergraduate Biology Education: A Call to Action” (2011) and “Adapting to a Changing World—Challenges and Opportunities in Undergraduate Physics Education” (2013). Upper level STEM courses are typically a natural fit for integrating research into a curriculum, given the more specialized content and better preparation of students at this level. However, the impact of course-based research has a broader impact when practiced throughout the curriculum, including non-majors courses. In this workshop, we will first engage participants in discussing which critical competencies might serve as the ideal framework for designing a curriculum or coursework that incorporates research. The presenters will then share our efforts towards this goal within a STEM curriculum at Oxford College, a two-year undergraduate division of Emory University. We will illustrate how curricula can be designed to actively expose students to research by integrating practices such as reading primary literature, conducting original research, and engaging students in the cross-disciplinary nature of modern research. We will specifically showcase examples from a non-majors biology course, an introductory biology course series, an intermediate research practices course, and an intermediate level physics course with an emphasis on biophysics. Creating experiences for students to engage in research that cross-cut the curriculum broadens opportunities while also fostering collaboration between faculty within a department and across STEM disciplines. We will lead participants in activities that generate ideas and an action plan for how they might be able to create similar opportunities on their own campuses.

**Engaging Students in Course-Based Research: Reports from PCAST, NAS, and Examples from Earth/Environmental Sciences**

Presenters: Laura A. Guertin | Mark L. Lord | Sarah K. Fortner

Penn State Brandywine | Western Carolina University | Wittenberg University

The national “Engage to Excel” PCAST report (2012) and “Integrating Discovery-Based Research into the Undergraduate Curriculum” NAS Convocation Report (2015) makes a strong call for using research in our courses. Course-based research offers students training and practice with what we do as scientists and helps to bridge the gap between our teaching and our research. In addition, course-based research is inclusive and supports student success. In this session, we will share information from these published reports, provide examples of successful undergraduate research projects in courses, and strategies for involving different components of research into courses at all levels. Participants will leave with a concrete plan for integrating research in one of their own courses.
Mapping and Scaffolding Research Skills Across the Humanities Curriculum, from the First Year to Capstone
Presenter: Jenny Olin Shanahan
Bridgewater State University

Integrating research assignments in the curriculum gives all students access to the benefits and rewards of conducting scholarly work. Disciplinarily appropriate, inquiry-driven assignments can be “scaffolded” throughout a humanities curriculum, intentionally building students’ research skills, including creative and critical thinking, analysis, and oral and written communication. This workshop provides practical ideas for creating scaffolded, inquiry-based assignments and research-rich courses across the curriculum—with appropriate supports in lower-division courses and intentional advancement of skills in the transition to upper-division work, ultimately leading to more independent scholarship in the last year of undergraduate study. We will begin with curriculum mapping, first identifying the most important outcomes for graduates of a program and where in the current curriculum those outcomes are addressed. Where are the gaps? Where are redundancies? With what kinds of assignments and skills do students in the program/major tend to struggle most? Departmental/program-wide conversations about course goals, assignments, rubrics, and explicit and implicit faculty expectations are foundational to creating meaningful curriculum maps that guide the design of shared, department-owned learning objectives. When all members of a department/program have had a voice in, and have clarity about, the goals and the plan for achieving them, faculty members can design courses and assignments that work in integrated ways with what their colleagues are doing. That complementary approach to curriculum mapping and design is key to scaffolding scholarly experiences throughout an undergraduate program. Students in clearly mapped, thoughtfully designed programs recognize how courses and assignments build upon one another, deliberately developing their skills and competencies. A well scaffolded curriculum of scholarly research opportunities has been shown to increase student achievement and excitement about the field of study, as well as better prepare students for post-college demands. It likewise promotes what the AAC&U has termed an “integrated and integrating” undergraduate education.

Introducing and Reanimating Research Skills in Your Discipline or Context
Presenter: John Willison
University of Adelaide

In this highly interactive workshop, from the get-go you will be discussing and collaboratively developing ways that students can be introduced to and develop research skills that are pertinent to your context. Using examples from a number of discipline areas, spanning Engineering, Education, Business, the Arts and the Health Sciences, you will be stimulated to develop your own discipline-specific introductions and reinforcements of the facets of research, structured according to the Research Skill Development (RSD) framework (Willison & O’Regan, 2006/2015). For those who are familiar with the use of the RSD from any of the previous 4 CUR conferences or elsewhere, we the presenters have learned a lot in the two years since the previous conference, and seen students and tutors actively building and developing approaches to understanding the RSD. These approaches that we will consider are: • Stimulating activities that elicit the facets of research from students’ own mouths. • Simple-to-manage sequencing tasks that provoke higher-order thinking and metathinking about the RSD facets. • Application of the RSD facets to significant events/experiences that drives students analytical thinking to new levels in a highly social strategy that works well with audiences of 15-400. • Student assessment of others and self-assessment. You will be able to walk away with specific activities that you have adapted in conversation with others, and that can dynamically drive your student research learning deeper. Reference Willison, J. & O’Regan, K.[2006/2015]. The Research Skill Development framework. Accessed 11/29/15 from www.adelaide.edu.au/rsd
Empowering Early Engagement in Undergraduate Research Workshop
RS Pollenz, Associate Dean and Dir. USF Office for Undergraduate Research (OUR)
Lisa Piazza, Assistant Dir. USF Office for Undergraduate Research (OUR)
Sunday June 26—3:00-5:00pm

Early engagement of undergraduate students in research experiences is a high impact practice that is known to impact integration with the discipline, academic performance and student persistence (especially in STEM majors). To empower incoming students about the resources and processes to obtain a research experience and assist them in the development of an action plan for engagement, the Office for Undergraduate Research (OUR) at USF offers over 40 interactive Getting Started in UG Research workshops each academic year. This session will simulate the Getting Started workshop and will be held in the USF OUR suite. Attendees of this interactive workshop will, 1) understand the structure and organization of the USF-OUR and participate in an demo assessment exercise, 2) actively participate in various engagement exercises that promote an understanding of the importance of research, 3) evaluate several case-studies describing the integration of research into the curriculum, and 4) develop an “action plan” that incorporates the described practices that is customized to their institutional context. During the workshop attendees will have the opportunity to network with practitioners who can help inform their practice. This session should be of interest to all attendees but should be especially relevant to those who are developing a new undergraduate research office or revising their processes for student engagement.

This workshop will be delivered in the OUR suite on the 2nd floor in the main USF library (LIB210) to showcase the organization of the office and its central location to serve all students as part of the USF Learning Commons. The library is a short 5 min walk from the Marshall Student Center (MSC).
Innovation and Collaboration in Undergraduate Research

Session Type: Workshop
Presentation Date and Time: 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 3711 Egret

Nurturing Scholarly Voice: an Interactive Workshop Using Appreciative Advising to Strengthen Mentoring Across the Disciplines
Presenters: Susan Mendoza | Amanda Cuevas
Grand Valley State University

Empirical studies demonstrate that undergraduate research experiences (URE) are directly related to increased student learning and development, increased enrollment in graduate school, and an increased understanding of research as a vocation and profession. The role of the faculty in facilitating these high impact learning experiences is well documented in the literature; however, most faculty members do not receive formal training or guidance on how to serve as a research mentor. By utilizing theoretically grounded models for mentoring and advising, faculty members and UR administrators can increase the capacity and depth of UREs for students, moving beyond program satisfaction to a model that cultivates and nurtures student skills and scholarly voice. Through this interactive workshop, the presenters will tie together mentoring of undergraduate researchers with Appreciative Advising, which is an internationally renown framework, theoretically grounded in Appreciative Inquiry, and designed to increase advisor and student success. First, the presenters will share key findings and implications from a dissertation study which explored how models of disciplinary culture and paradigms of research impact how faculty describe the meaning of scholarship, scholarly process, and how that process influences how they work with undergraduate researchers and scholars. Participants will be invited to share their own stories and approaches to mentoring undergraduate students. Second, they will introduce participants to the Appreciative Advising Framework which is “the intentional collaborative practice of asking positive, open-ended questions that help students optimize their educational experiences and achieve their dreams, goals, and potentials” (www.appreciativeadvising.net) and will guide participants through hands-on activities to equip them in practically applying the framework within their own mentoring, regardless of discipline.

Session Type: Workshop
Presentation Date and Time: 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 4200 The Chamber

Designing, Implementing and Assessing Community Engagement Projects – A Continuum from Outreach to Engagement
Presenter: Lynnette Y. Overby
University of Delaware

An engineering student travels to Guatemala to help the residents develop a sustainable method for clean water supply. A visual arts major, enables third grade students to connect mathematical concepts with visual art content. Each of these examples has the potential to become scholarly community engagement projects. However, to move from outreach (going into the community, doing work, leaving the community) to engagement (co-creating, co-implementing, co-assessing and co-disseminating) requires community engagement knowledge and skills. The purpose of this workshop is to guide participants who mentor undergraduate students, in gaining and applying this knowledge. Community engagement describes collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity (Carnegie Foundation for the Advancement of Teaching, 2015). In the first part of this workshop, participants will view and discuss examples of community engagement research/creative activities projects that range from outreach to engagement. The examples will include arts, humanities, social sciences, science, engineering and multidisciplinary projects. A community engagement rubric will be utilized as an assessment tool. Next, the participants will participate in a synthesis activity. Participants will gather in small groups and each group will receive written descriptions of community engagement projects. The groups will identify where the example belongs on the outreach and engagement continuum and explain why. Each group will then present their rationale for the location of the project on the rubric, and the facilitator will lead a discussion about how to enhance the level of community engagement. Finally, the participants will form new groups and design a community engagement project that fulfills the Carnegie definition. In sum, this workshop will provide the participants with specific guidelines to use in mentoring undergraduate students to conduct scholarly community engagement projects.
Internationalization and Undergraduate Research

**Session Type: Workshop**

**Presentation Date and Time:** 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 2702 Legacy

**Culture and Ethics Abroad: Tools for Supporting Students in the Creation of Ethical and Culturally Sensitive Research Abroad**

**Presenters:** Emma Newton | Andrea Losada  
IPS | Universidad de Especialidades Espiritu Santo

IPS has long been a partner with Universidad de Especialidades Espiritu Santo for the semester and summer undergraduate study abroad and service-learning programs. This partnership, built on reciprocity, provided a solid foundation from which to grow the partnership through the implementation of the IPSL Advocacy Research™ program at partner NGO’s and community development organizations in Guayaquil, Ecuador. Though the IPSL Advocacy Research™ original and sponsored research program was intentionally developed with reciprocal communication and cross-cultural sensitivity in its foundation, both IPSL and UEES wished to communicate this same intention to the student researchers. Already equipped to deal with cross-cultural communication between students and service organizations, IPSL and UEES worked to develop more comprehensive tools to inform their Advocacy Research™ students. These tools include the creation of professional roles such as the IPSL International Community Ethics Advisors (CEA™s) and the Local Advocacy Research Liaisons (LARL™s) to help support students as they navigate unexpected situations. These roles, and the subsequent academic tools used by the CEA™s and LARL™s, have proven useful to instruct and inform research students about effective methods to conduct international research, in an ethically and culturally sensitive manner, thus leading to better partnerships, clearer intentions and more useful information for the organizations themselves.

**Other**

**Session Type: Workshop**

**Presentation Date and Time:** 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 2707 Spirit

**Writing and Mentoring Together: Supporting Professional Writing Practices Through Modeling with Undergraduate Researchers**

**Presenters:** Aparna Sreenivasan | Natasha D. Oehlman  
California State University—Monterey Bay

Successful scientific writers at the post baccalaureate level are self reliant, independent, and higher order critical thinkers that engage in critical self reflection and employ metacognition when engaged in the writing process. However, cultivating these skills at a metacognitive level demands, at times, more than what the classroom environment can provide—and is too onerous a task for faculty to tackle alone. At California State University, Monterey Bay (CSUMB), faculty have a strong link with the Undergraduate Opportunities Center (UROC) to support students applying for rigorous and prestigious fellowships with a high rate of return. Together UROC and individual science faculty mentors have established a cooperative and collaborative model, based on Socratic questioning, that supports students with the planning, drafting, and execution of high-stakes, competitive fellowships like the National Science Foundation Graduate Research Fellowship (NSF-GRFP). CSUMB has the highest rate of NSF-GRFP awardees in the CSU system. In this way, faculty and staff mentors teach students strategies to successfully learn to write their own products, maintain voice, and constructively incorporate feedback. This presentation will cover specific faculty mentoring approaches that build trust, confidence, and independence as well as the interaction with writing feedback groups as a model for stretching students’ thinking and writing. By focusing on key fellowships we are developing an integrative and collaborative process that involves deep reflection in mentoring writing to use as a model to build out to the larger scientific and writing community. This proposed workshop will share with participants specific writing process models used with students, including small group practices, one-on-one mentoring, and writing feedback practices that invite revision and deep student reflection.

**Session Type: Workshop**

**Presentation Date and Time:** 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 3702 Orchid

**Funding Undergraduate Research in Fundamental Petroleum Science by ACS PRF Grants**

**Presenters:** Dean A. Dunn  
American Chemical Society

The ACS Petroleum Research Fund supports “advanced scientific education and fundamental research in the petroleum field,” and has provided grants to researchers in Chemistry, Geosciences, Materials Science, and Chemical/Petroleum Engineering departments, for over sixty years. Distinctive attributes of ACS PRF are support of new investigators in their first three years of independent research as an Assistant Professor (Undergraduate New Investigator (UNI) grants), and “seed money” support for professors in departments which do not offer the doctoral degree, who are initiating a new research direction in fundamental petroleum science (Undergraduate Research [UR] grants).
Session Type: Workshop

Presentation Date and Time: 6/26/2016—3:00 PM-5:00 PM—Room Assignment: 3704 Tarpon

How to Get Started in Research with Undergraduates in the Natural Sciences

Presenters: Melvin L. Druelinger | Michael Castellani  
Colorado State University—Pueblo | Marshall University

The process from negotiating a start-up package to navigating the process of interacting with the administration and recruiting and managing students is something that few prospective PUI faculty are trained for. This workshop covers the following topics: project selection, student selection and management, benefits and risks of collaboration, working/negotiating with your chair and dean for institutional support, understanding institutional culture, and the basics of proposal writing.

5:15-6:15 p.m.—CUR Fellows Addresses—Location: Oval Theatre

Jeffrey M. Osborn, Dean of the School of Science, The College of New Jersey  
Jill Singer, Professor of Earth Sciences and Director of the Office of Undergraduate Research,  
SUNY Buffalo State

Dinner

6:30-8:30 p.m.—Dinner.—(Royal Palm Ballroom) and  
2708 (Plaza)/2709 (Hillsboro) – overflow rooms
Sunday, June 26

Poster Session I

6:30-9:00 p.m.—Poster Location: ATRIUM—SECOND FLOOR
poster sessions

Assessment of Impact of Undergraduate Research

Poster #1—Mentor Perspectives on the Place of Undergraduate Research Mentoring in Career Development
Presenters: Eric E. Hall | Jenny Olin Shanahan
Elon University | Bridgewater State University

Poster #2—Summer Mentor Orientation: Using Data to Promote Best Practices
Presenters: Linda Blockus | Michael E. Cohen
University of Missouri—Columbia

Diversity and Inclusion in Undergraduate Research

Poster #3—The LEARN Consortium: A Three-Institution Initiative to Impact STEM Retention of Freshmen and Transfer Students through Research Communities
Presenters: Donna Chamely-Wiik | Kimberly R. Schneider | William R. Kwochka | Michael Aldarondo-Jeffries
Florida Atlantic University | University of Central Florida | Western Carolina University | College of Central Florida

Poster #4—A Model for Early Engagement of Underrepresented Student Groups in Undergraduate Research
Presenters: Prajuki Bhattacharyya | Catherine Chan
University of Wisconsin—Whitewater

Poster #5—Exploring Faculty Perspectives on Undergraduate Research: A Multi-Institutional Assessment
Presenters: Rebecca M. Jones
George Mason University

Poster #6—An Exploratory Interview Study of What Factors Impact Student Participation in Undergraduate Research
Presenter: Katelyn M. Cooper
Arizona State University Main

Poster #7—Integrating Universal Design for Learning into Undergraduate Research Programming
Presenter: Effie S. MacLachlan
City University of New York

Integrating and Building Undergraduate Research into Curriculum and Coursework

Poster #8—Is the Research Skills Development Framework a Useful Tool for Mapping Research Across the Curriculum?
Presenter: Karen G. Havholm
University of Wisconsin—Eau Claire

Poster #9—Using the One-Room Schoolhouse Method to Integrate Undergraduate Research into the Biology Undergraduate Experience
Presenters: Lindsey Blais Cundra | Jennifer Jones | Caroline Benzel
George Mason University

Poster #10—Changing a College Culture through Curricular Innovation
Presenter: Joy Drinnon
Milligan College

Poster #11—Implementation of the Freshmen Research Initiative at Iowa State University
Presenter: Elizabeth J. Sandquist
Iowa State University
Poster #12—New Sound Collective: A Collaborative Approach to Writing, Rehearsing, and Performing Chamber Music
Presenter: Andrew C. Cote
George Mason University

Innovation and Collaboration in Undergraduate Research

Poster #13—Council on Undergraduate Research Professional Development Workshops: A Resource for the Undergraduate Research Community
Presenters: Elizabeth L. Ambos | Tavia S. Cummings
Council on Undergraduate Research

Poster #14—USF Research in Arts Scholarship: An Innovative Program in Undergraduate Research in the Arts
Presenter: Lisa M. Piazza
University of South Florida

Poster #15—Collaboration in Undergraduate Research between a Small Liberal Arts University and a Local STEM Academy
Presenter: Christine S. Anderson
Capital University

Poster #16—Increasing Undergraduate Research Engagement and Presence through Social Media
Presenters: Lizzy King | Korine Steinke Wawrzynski
Michigan State University | Michigan State University

Innovation and Collaboration in Undergraduate Research

Poster #17—Connecting Undergraduate Research to Health Professions Goals
Presenter: Kelaine Haas
University of Minnesota—Twin Cities Campus

Internationalization and Undergraduate Research

Poster #18—Publishing Undergraduate Research in Germany
Presenters: Susanne Haberstroh | Maren Petersen
University of Oldenburg

Other

Poster #19—Caravel: The University of South Carolina's Journey to an Undergraduate Research Journal
Presenter: Julie Morris
University of South Carolina—Columbia

Poster #20—Supporting and Studying Globally Engaged Undergraduate Research: An Institutional Case Study
Presenters: Paul C. Miller | Maureen Vandermaas-Peeler | Tim Peeples
Elon University

Poster #21—Posters on the Hill
Presenters: Michael Jackson | Larry E. Wimers
Millersville University | Towson University

Poster #22—Gaining Insight into Undergraduate Students’ Knowledge, Attitudes, and Practices of Undergraduate Research: A Campus-Wide Survey
Presenters: Sarah D. Ferstel | Carol O’Neil
Louisiana State University

Poster #23—CUR Fellows Awards
Presenter: Nadine G. Barlow
Northern Arizona University

Sunday, June 26, 2016—6:30 p.m.–9:00 p.m.
Poster #24—How Internships Mimic (and do not Mimic) Student Learning Gains from Undergraduate Research Experiences
Presenter: Mary L. Crowe
Florida Southern College

Poster #25—Re-imagining the Journal of Undergraduate Research at Ohio State: a New Model for Sustaining a Student-Led Undergraduate Research Journal
Presenter: Jackie Lipphardt
The Ohio State University

Poster #26—Freshman Research In Plant Sciences: An Early Entry Undergraduate Research Experience
Presenter: Tim Parshall
University of Missouri—Columbia
Monday, June 27

7:30 a.m.—Breakfast (Royal Palm Ballroom)* / Poster Session II Set-up for Monday

* Breakfast—Many Hotel and Dorm Packages include Breakfast. We will have limited breakfast items available for those that will not receive breakfast elsewhere.

8:30 a.m.—9:30 a.m.—Plenary 2—Location: Oval Theatre

Speaker: David J. Asai
Senior Director, Science Education, Howard Hughes Medical Institute

“Four D’s and an F”

In his book, *The Geography of Genius*, Eric Weiner summarizes his travels with the “three D’s” that characterize an environment from which “genius” emerges: Disorder, Diversity, and Discernment. For colleges and universities that seek to establish a Culture of Creativity, I would add Development with a steady view of the Future.

Authentic research experiences can be an effective way for undergraduates to be introduced to a discipline. What are the elements of an effective research experience, how can we scale the experience, and why does this matter?

Break

9:30-9:45 a.m— Break (Royal Palm Ballroom)

Concurrent Session 5

9:45-10:45 a.m.
60 min panel presentations

Innovation and Collaboration in Undergraduate Research

Session Type: Panel Presentation

Presentation Date and Time: 6/27/2016—9:45 AM-10:45 AM—Room Assignment: 2707 Spirit

How the Scholarship of Teaching & Learning Can Advance Undergraduate Research

Presenters: Trent W. Maurer | Karen Manarin | Paul Taylor | Ben Connolly
Georgia Southern University | Mount Royal University | University of Leeds | University of Leeds

This international panel will discuss synergistic connections between the Scholarship of Teaching & Learning [SoTL] and undergraduate research [UR]. SoTL “involves systematic study of teaching and/or learning and the public sharing and review of such work through Presentation, performance, or publications” [McKinney, 2006, p. 39]. UR is a high impact experience for promoting student learning gains [Kuh, 2008; Lopatto, 2010], and SoTL offers tools, techniques, approaches, and perspectives that help to assess, document, and further enhance student learning from UR experiences. Faculty from Canada, the U.S. and the U.K. and one undergraduate student, representing the natural sciences, the social sciences, and the humanities, will discuss how SoTL informs and advances UR. After a brief introduction to SoTL, panelists will share their experiences with UR and SoTL at different levels in the classroom and other educational settings. Topics will include the disconnect between UR-driven focus on process and assessment-driven focus on products, how to use a SoTL framework to assess student learning from UR, the political issues involved in evaluating UR through a SoTL lens, and the limits of assessing UR only in classroom contexts. This panel will also discuss ways SoTL can enhance UR outside of the classroom, including peer review, collaborative projects and shared authorship issues, different UR pathways, and resources. The discussants will frame these topics in the larger global context of informal international collaboration among scholars interested in UR and highlight how such international collaborations—particularly with a SoTL focus—both inform and advance UR.
Innovation and Collaboration in Undergraduate Research

Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—9:45 AM-10:45 AM—Room Assignment: 3702 Orchid

An Army of One: Launching an Undergraduate Research Office and Maximizing Resources
Presenters: Korine Steinke Wawrzynski | Julie Morris | Kimberly R. Schneider
Michigan State University | University of South Carolina—Columbia | University of Central Florida

Many campus-wide undergraduate research programs begin with an office of “one,” with a single individual directing, guiding, and managing the entire initiative. New directors often feel overwhelmed by the amount of work and unclear of how to build an office for the campus community, as financial, administrative, and faculty support varies. In this panel, experienced undergraduate research program directors will discuss best practices and lessons learned related to establishing a new office with emphasis on office organization, evaluating campus climate and institutional support for undergraduate research, and maximizing partnerships to develop an action plan to create a successful office or program. Each of the panelist started as “one” approximately ten years ago but expanded their units over time through different ways. Through small and large group discussion, participants will discuss how to create an effective “army of one” using administrative models, program examples, and strategies that can be adapted and utilized at institutions of varying size. Participants will evaluate their own institutional mission and campus culture to develop a plan with guidance from provided examples. In addition, participants will identify institutional allies and resources to enhance programming and outreach to maximize campus impact with minimal staffing and financial resources. Examples include creating student and faculty councils, writing internal and external proposals, partnering with student affairs, academic advisors, student government, and other campus units.

Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—9:45 AM-10:45 AM—Room Assignment: 3704 Tarpon

Deliberation on Campus and in the Community: Undergraduate Research, Interdisciplinary Learning, and Civic Engagement
Presenters: Sara A.M. Drury | Laura Marie Wysocki | Amanda Ingram | Isaac Empson | Jack Kellerman
Wabash College

Deliberation is a participatory group discussion process that encourages group members to identify aspects of a public problem, consider multiple approaches to addressing that problem, weigh tradeoffs and benefits of each approach, and ultimately move towards determining preferred actions. Creating deliberative processes is a form of undergraduate research, and can foster interdisciplinary partnerships between faculty and students. Deliberation can be used to address community concerns, and it also can be used as a way of preparing undergraduate students in the habits of future public participation. As an undergraduate research experience, students research the topic for deliberation (often working with faculty and/or community partners), frame a conversation guide for participants, and conduct survey research to analyze the impact of the deliberation. This experience draws on critical-interpretative and social scientific methodologies. In this presentation, faculty and students from Wabash College will share experiences, including lessons learned and best practices, from research collaborations on deliberation both on and off campus. Specifically, we will discuss deliberations in science courses on topics such as climate change, gene editing technologies, and energy policy, and off-campus community conversations on substance abuse, quality of place, and the accessibility of childcare. Attendees will learn about deliberation as a collaborative, interdisciplinary research process for undergraduate students, hear about the results of deliberation experiences and research, and consider applications for their own campus settings.
Session Type: Panel Presentation

Presentation Date and Time: 6/27/2016—9:45 AM-10:45 AM—Room Assignment: 3707 Oak

CRASsH and BURN: a Transdisciplinary Model for Student Research in the Arts, Humanities, and Social Sciences
Presenters: Patrick Fuery | Chris Bader | Kelli Fuery | Kerk Kee | Natalie C Lawler
Chapman University

“What increment or bonus of knowing follows from combining information from two or more sources?” --Bateson
CRASsH (Chapman Research in Arts, Social Sciences, and Humanities) and BURN (Building Undergraduate Research Networks) is a model for developing collaborative projects between faculty and students. It has been highly effective in forming a new type of research agenda as well as producing innovative approaches to student research in the Arts, Humanities, and Social Sciences. One of the fundamental ideas behind the CRASsH and BURN model is this sense that we gain an increment/bonus in knowing by operating in transdisciplinary and interdisciplinary exchanges; at the same time, the ‘two or more’ sources are not just types of disciplines, but also the [re]sources of faculty and students. Launched three years ago, CRASsH and BURN has seen a series of measurable successes as well as a paradigm shift in undergraduate research in the Arts, Humanities, and Social Sciences at Chapman University. This panel will outline the CRASsH and BURN model and give examples of student-based research. The three exemplars will include: the Fear Project (notably, student engagement with survey design and its successes in marketing research to the wider population), a National Science Foundation project based specifically on teacher-scholar activity and how students have been integrated into the project, from inception, grant application, and final implementation; and the Creative Industries Group (that is developing global network research projects with student involvement and working internationally). All three examples are strongly interdisciplinary and have engaged students in a variety of ways. They have successfully attracted large grants, produced joint publications, and have shifted ways that faculty and students work together. The projects will also allow us to explore related themes of student research, including globalization, large grant applications, and marketing of research.

Internationalization and Undergraduate Research

Session Type: Panel Presentation

Presentation Date and Time: 6/27/2016—9:45 AM-10:45 AM—Room Assignment: 3711 Egret

Acting Local, Thinking Global: Cultivating an International Network of Undergraduate Scholars
Presenters: Eric A. Goedereis | Mary Lai Preuss | Danielle MacCartney
Webster University

With campuses in the United States, Ghana, Austria, China, the Netherlands, Switzerland, Thailand, the United Kingdom, and Greece, Webster University [WU] is well-positioned to deliver opportunities for research in international settings. In this session, we describe recent initiatives aimed at promoting undergraduate research both domestically and internationally, including the creation and implementation of the Provost’s Student/Faculty Collaborative Research Grant (SFCRG). These projects have been conducted in collaboration with motivated, engaged faculty representing diverse disciplines throughout WU’s system of campuses across the world. Importantly, the only requirement is that a student applicant in any discipline has a strong idea and can connect with a faculty member committed to mentoring the project. After just two years, our students, faculty, and administrators are already experiencing tangible benefits. To date, over 40 projects—covering topics as diverse as a photography installation utilizing found imagery and analog technology to examine human relationships, both past and present, to an investigation of the microbial environment of the Mississippi River—have been funded by the SFCRG. Research has been better integrated into the curriculum in many units because there now exists a funding mechanism for students to pursue Senior Thesis research projects they may not have otherwise pursued. In addition, students from WU’s international campuses will present their work at the home campus during the Spring semester Taken together, the current model of the SFCRG at WU is successfully creating a campus culture that values and rewards student-driven scholarship by providing an administrative commitment to collaborative undergraduate research. Opportunities for student-faculty research at primarily undergraduate institution such as WU provide great value at the level of the students, faculty and the institution itself. With its recent expansion to WU’s international campuses, the SFCRG program is being utilized by a broad range of students throughout the university’s global network.
**Leveraging an Institutional Re-Accreditation Process to Enhance Undergraduate Research as a High-Impact Practice at Your Institution**

**Presenters:** Donna Chamely-Wiik | Bethany M. Usher | Anne A. Boettcher  
Florida Atlantic University | George Mason University | Embry—Riddle Aeronautical University

Institutions nationwide engage in re-accreditation initiatives to ensure they are providing a quality education and academic experience to their students. Embry-Riddle Aeronautical University, Florida Atlantic University and George Mason University, three institutions under the Southern Association of Colleges and Schools: Council on Colleges, SACSCOC, have prioritized a university-wide expansion of undergraduate research, aligned with their institutional missions through developing Quality Enhancement Plans (QEP) focused on undergraduate research for all students. Key components of this expansion include integrating research practices into the curriculum, offering co-curricular support for faculty-mentored research, as well as other characteristics of undergraduate research excellence outlined in the recent COEUR publication. For each program, a priority has been placed on scaffolding student development of core research skills and positively impacting student learning. Additionally, programs have been put in place designed to support faculty efforts at integrating undergraduate research experiences into the curriculum at all levels. We will discuss how institutions can (1) utilize a QEP focused on undergraduate research to develop or expand a presence on your campus, (2) define research to meet the broad needs of varying disciplines, (3) scaffold student development in core research skills (4) assess learning through established student learning outcomes (5) ensure undergraduate research remains as an institutional priority beyond re-accreditation requirements.

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**Broadening Participation: Building a High Impact Practices Office**

**Presenters:** John F. Barthell | Dana Jackson-Hardwick | Charlotte K Simmons | Michael S Springer | Gregory M. Wilson  
University of Central Oklahoma

The panelists will overview the rationale for creating an Office of High-Impact Practices (OHIP) at the University of Central Oklahoma, a predominantly undergraduate institution of 17,000 students with five academic colleges. The Office was established with the explicit goal of increasing the involvement of students from a broader array of disciplines in High-Impact Educational Practices with an emphasis on undergraduate research (one of 10 areas highlighted by George Kuh in his seminal 2008 publication on the subject). Utilizing a pre-existing successful on-campus grant program entitled Research, Creative, and Scholarly Activities (RCSA), OHIP has increased the involvement of students from across the colleges in undergraduate research and promoted their involvement at the annual National Conference on Undergraduate Research (NCUR). In this discussion, we chronicle the process of establishing OHIP with commentary from the principal colleagues involved in the process: the Provost, the Associate Vice President of Academic Affairs, the Assistant Vice President of Research and Sponsored Programs, and the OHIP Director and Assistant Director. In addition to describing unique features of OHIP such as the financial planning and the establishment of the Central Undergraduate Research Board (CURB), we review perceived best practices and lessons learned from our experience as a basis for interacting with audience members. This presentation and discussion should be of interest to anyone planning a similar campus office, as well as to those attendees interested in expanding the involvement of academic disciplines beyond those traditionally associated with undergraduate research (e.g. STEM).
Diversity and Inclusion in Undergraduate Research

Session Type: Workshop
Presentation Date and Time: 6/27/2016—9:45 AM-11:45 AM—Room Assignment: 3713 Challenger

Engaging Underrepresented Students in Undergraduate Research: The William and Mary Scholars Undergraduate Research Experience (WMSURE)
Presenters: Anne Harper Charity-Hudley | Cheryl L. Dickter | Hannah A. Franz
The College of William & Mary

A frequent challenge for students from backgrounds that are underrepresented in higher education, particularly at predominantly White institutions, is a lack of dedicated academic and research support from faculty members. In order to address and research such issues, we created The William and Mary Scholars Undergraduate Research Experience (WMSURE) program. WMSURE is a faculty-led program that provides increased research opportunities to underrepresented students. WMSURE embraces a community based participatory approach to research and as such, students have been fully involved in the articulation of their academic goals and research interests and in the development of the WMSURE curriculum. WMSURE hosts weekly workshops and provides advising and mentoring on a regular basis, all of which engages scholars throughout all four years of their college experience. The program is also personalized around each student’s academic goals, with a focus on finding the right resources for the students’ particular interests. This workshop will provide participants with strategies to help high-achieving students from underrepresented backgrounds take full advantage of academic resources using the WMSURE model. We will share content from our WMSURE programming and provide opportunities for participants to discuss how the content can be adapted for the academic and research goals of their own students. Participants will leave the workshop with an understanding of how high-achieving African-American, Latino/a, and first generation college students might be supported in undergraduate research and a list of topics that our students have found to be essential for their transition to college academics and research. Participants will also develop a list of questions to ask students in order to learn how to support them in reaching their full research potential and ideas for how to adapt one or more structures from the WMSURE model to their own settings or create their own structure for supporting high-achieving underrepresented students.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Workshop
Presentation Date and Time: 6/27/2016—9:45 AM-11:45 AM—Room Assignment: 4200 The Chamber

Making it R.E.I.L. (Research Experiences in Introductory Laboratories)
Presenters: Rachelle M. Spell | Nitya Jacob | Larry E. Wimmers
Emory University | Oxford College of Emory University | Towson University

Faculty interested in incorporating their research into laboratory courses will hear from REIL Biology faculty teams who are developing such experiences. The goal of these efforts is to meet the challenge of both the Vision and Change and the Engage to Excel reports to give all students authentic research experiences through laboratory courses. Workshop attendees will work on defining components of research in the curriculum and the objectives for incorporating their own research in the curriculum at their institution. Breakout sessions with faculty teams who are currently developing such lab courses will disseminate the critical background and sample development plans that other faculty can use to create their own course-based research experiences. Furthermore, feedback from workshop attendees will serve to improve curriculum development plans of the presenting faculty teams. This workshop is sponsored by the REIL Biology Network, an NSF-funded Research Coordination Network in Undergraduate Biology Education (RCN-UBE). We sponsor teams of a researcher and an educator to develop course-based research experiences for introductory biology laboratory courses at pre-conference workshops. Faculty interested in participating in the REIL-Biology network or applying for future network sponsorship of curriculum development should attend this workshop and see www.rcn.ableweb.org.
Innovation and Collaboration in Undergraduate Research

Session Type: Workshop
Presentation Date and Time: 6/27/2016—9:45 AM-11:45 AM—Room Assignment: 2702 Legacy

Turning Deficiency into Efficiency: Foreign Language in Collaborative Research with Undergraduates
Presenters: Briana L. Lewis | Barbara D. Riess
Allegheny College | Allegheny College

Among the perceived barriers to faculty research collaboration with undergraduates, particularly in the humanities and humanistic disciplines, is the need for foreign language skills. Even for those working outside of the foreign languages per se, high-level research in a global society often requires reading knowledge or other specialized abilities in a language other than English that undergraduates are unlikely to have. In this workshop, participants will develop strategies for including undergraduates in their projects with foreign language components. Participants will bring a current project to the table and work together with facilitators to address the challenges they foresee in including undergraduate students as part of their research team. In the discussion of these specific projects, participants will consider the possible role(s) of students, the skill-levels necessary for specific tasks, and faculty assumptions about the outcome of collaboration with undergraduates. Rather than considering students without fully-developed foreign language skills to be “deficient” in the language, we will examine which “efficiencies” their status as language learners has given them towards productively contributing to a research project. We will consider the construction of the projects in terms of discrete tasks and evaluate the language skill needed to complete each task. Finally, we will explore the relationship of process to product in a discussion of possible outcomes of collaboration with undergraduate students of foreign languages. Participants will be asked to complete a worksheet in preparation for our session.

Session Type: Workshop
Presentation Date and Time: 6/27/2016—9:45 AM-11:45 AM—Room Assignment: 3712 Columbia

Innovation and Collaboration: Creating Opportunities without Reinventing the Wheel
Presenters: Cynthia A Merriwether-DeVries | Sarah K. Fortner | Jon Grahe
Juniata College | Wittenberg University | Pacific Lutheran University

The session will begin with a brief introduction to the history of the Innovation and Collaboration Task Force and the activities conducted in support of the CUR Innovation and Collaboration Strategic Pillar. Participants will be introduced to the newly launched Case Studies in Innovation & Collaboration website to glean ideas for collaboration opportunities applicable to their home institutional environment. Participants will develop a preliminary plan to implement and analyze a project upon their return to their home campuses. Participants will interact with faculty who have successfully implemented demonstration projects presented on the case study website. Participants will be encouraged to consider supports and challenges related to the application of collaboration strategies in their specific discipline and in their specific community contexts. Participants are encouraged to come with specific illustrations of the corporate, public sector and social service organizations in their home communities that could serve as potential community partners. Project ideas generated by faculty or community partners should be summarized by participants prior to the workshop. PLEASE NOTE: If the participant does not have project ideas it is important to consider the unmet needs in their home community and or potential industry partners to approach on return to their home campus. Participants are encouraged to visit the Case Studies website in advance of the workshop.
Sticky Situations: Play and Active Learning Strategies for Engaging in Ethical Decision Making

Presenters: Carla Fresquez | John Banks | Megan Bassett
California State University—Monterey Bay

Understanding and following ethical research practices is an essential component of undergraduate research. In addition, many grants that support student research require explicit demonstration of how programs provide discussion-based training to students on responsible conduct in research. However, despite this, many undergraduate research programs struggle with finding effective ways to help students appreciate the importance of considering ethics in the research environment. Moving beyond outlining the rules of ethical conduct in research, this session will present a model of active learning through an interactive game, Sticky Situations, which immerses participants in the complex nuances of ethical decision making. This game was designed to complement online Responsible Conduct of Research modules and to engage students in developing strategies for managing difficult or confusing situations that may arise in research. To allow students to work through ethically complex situations and practice the principles of responsible conduct of research, Baird’s [2009] model for ethical decision making was adapted into a game that addresses ethical dilemmas in research (e.g. issues of authorship, errors in data, deviation from research protocols...). Sticky Situations asks students to address dilemmas as a team with each member looking at the problems through one of four “lenses”: Rights and responsibilities, Relationships, Results, and Reputation. Students play by collectively negotiating a solution to difficult situations while representing their “lens” and advocating for a solution that does not damage their area of focus. The game yields lively debate and a deep appreciation for the challenges of ethical decision making. This session will present the Sticky Situations game, strategies for facilitation to various groups, and results from pre/post-game tests. In addition, participants will learn how to adapt the game to their campus and create custom ‘sticky’ situations for their students to address.
**Assessment of Impact of Undergraduate Research**

**Session Type:** Panel Presentation

Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3704 Tarpon

**The Undergraduate Research Count: Exploring Different Approaches to Assess Student Involvement and Engagement**

Presenters: Kimberly R. Schneider | Joseph O’Shea | Donna Chamely-Wiik
University of Central Florida | Florida State University | Florida Atlantic University

Determining how many students are involved in any high-impact practice can be difficult, especially at large institutions where programs and opportunities are located throughout the campus. This is especially true with undergraduate research, where type and duration of involvement can vary widely throughout a campus. “The Challenge of the Count” was addressed in a Council on Undergraduate Research Quarterly focus in 2012 and remains a challenge for most campuses. Universities have used a variety of metrics to quantify participation, including but not limited to, [1] surveys, which includes nationally developed surveys such as the NESE, graduating senior surveys, and specific undergraduate research focused campus surveys; [2] course enrollment data or program counts, which is often used to get a basic review of the campus undergraduate research population; [3] self-reporting by students and/or faculty that relies on online reporting or tenure file reviews; and [4] campus-wide databases in which research programs upload involvement to a university database. These systems are not mutually exclusive because campuses often employ more than one metric for their assessment purposes. This panel will discuss each type of “counting” system and provide examples of how these are used at a variety of institutions. The merits and potential costs of each system will be reviewed, and attendees will also share how their campuses document involvement.

**Diversity and Inclusion in Undergraduate Research**

**Session Type:** Panel Presentation

Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3709 Heron

**National Science Foundation (NSF) Research Experiences for Undergraduates (REU) Sites: Models for Successful Projects**

Presenters: Bethany M. Usher | Julio Rivera | Sally O’Connor
George Mason University | Carthage College | NSF

The National Science Foundation (NSF) supports a large number of research opportunities for undergraduate students through the Research Experiences for Undergraduates (REU) Sites Program. The REU program seeks to expand student participation in all kinds of research—whether disciplinary, interdisciplinary, or educational in focus—encompassing efforts by individual investigators, groups, centers, national facilities, and others. The program seeks to attract a diversified pool of talented students into careers in science and engineering and to help ensure that they receive the best education possible. This panel includes an NSF program officer, experienced reviewers, and successful REU Site PIs. In this panel, we will share strategies for planning, proposing, and running an REU Site. Experience shows that successful REU Sites programs include student projects that are unified by a common research question or theme. The research itself has substantial intellectual merit, and the students’ projects have the potential to advance knowledge in the field. At the same time, the projects provide broader impacts by educating a new generation of students, and include educational opportunities that put their research into a larger context and include professional development opportunities. REU Sites can be initiated by faculty at all types of colleges. The programs should be designed to attract students from under-represented groups, including minorities, women, persons with disabilities and students without research opportunities at their home institution. Undergraduate research program offices, with experience supporting student projects and faculty mentors, as well as assessment of undergraduate research, should help develop REU Site proposals. Our goal is to encourage more programs to develop REU Site proposals, with the support of undergraduate research offices.
Integrating and Building Undergraduate Research into Curriculum and Coursework

**Session Type:** Panel Presentation  
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3700 Sabal

**Preparing Thoughtful, Data Literate Educators: Incorporating Undergraduate Research into Teacher Education**  
Presenters: Jennifer Manak | Dennis Munk  
Bridgewater State University | Carthage College

Considering the outstanding benefits of undergraduate research (UR) for students, it is important for teacher education programs to find ways to incorporate UR into the curriculum in order to prepare future educators to most effectively teach the next generation of students. When preservice teachers engage in undergraduate research, they refine their teaching skills, develop an appreciation for research, broaden their knowledge of the discipline, and enhance their understanding of the relationship between educational theory and practice. Furthermore, undergraduate research develops preservice teachers’ data literacy skills and informs how they will collect, analyze, interpret, and utilize multiple forms of data in their future classrooms to improve teaching and learning. While many teacher education programs regularly engage preservice teachers in scholarly experiences such as student case studies, the development and implementation of curriculum units, and action research projects, it is not typically referred to as “undergraduate research.” This session shares successful UR models in Elementary and Special Education from coursework, grant-funded summer research, research abroad, and honors thesis projects in diverse content areas. In addition, this session demonstrates how existing scholarly practices in the field of Education meet the criteria for “undergraduate research.” Session participants will have opportunities to brainstorm ways to incorporate UR into current education courses and curricula in order prepare thoughtful, data literate professional educators who are prepared to teach in the 21st century and become leaders in their schools and communities.

**Session Type:** Panel Presentation  
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3705 Manatee

**How to Advance Undergraduate Research: Lessons Learned from Different Types of Institutions**  
Presenters: Sandra K. Webster | Tsu-Ming Chiang | Amy M. Buddie  
Westminster College | Georgia College and State University | Kennesaw State University

This panel of three CUR Psychology Division Councilors represents three different institutional types and has served in different administrative capacities within those institutions [faculty development, undergraduate research director, IRB chair]. We will address questions of advancing undergraduate research at our institutions, including the following. 1. How can undergraduate research get a bigger profile at the institution? 2. How can we secure more funding for undergraduate research? 3. How can we increase the number of students engaged in research [e.g. increase number sent to NCUR]? 4. How do we start and sustain a faculty council for undergraduate research? 5. How do we get buy-in from administrators, faculty, and students? 6. How do we develop a culture of research on our campuses? 7. How do we get undergraduate research included in the curriculum? 8. How do we get IRB procedures that foster undergraduate research? We will examine each of these questions in terms of what has been most successful and what we would have done differently. The discussion will be interactive with the audience. The goal of the session is to produce innovative and creative ideas for ramping up undergraduate research across different types of institutions.

**Innovation and Collaboration in Undergraduate Research**

**Session Type:** Panel Presentation  
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 2707 Spirit

**Research Abroad in the Academic Context: IPSL/CWU’s Summer Academic Advocacy Research™ Program**  
Presenters: Emma Newton | Arianne Newton  
IPSL

IPSL Study Abroad + Service-Learning has collaborated with CentralWashington University’s International Sustainable Development Institute (ISDI) to create an innovative, credit-bearing international research program focused on the creation and continuation of sustainable community development. The impetus for this collaboration was a noticed lack of programs that offered a balance between the experiential and the academic for interested research students. Marrying both the experiential and the academic in an international research setting confronts students with a new set of questions about research, service ethics and sustainable development that have previously proved difficult to explore on a more traditional program that lacks all three components. Using IPSL’s extensive international research relationships and resources and CWU ISDI’s foundation of academic service theory pedagogy, the IPSL/CWU partnership leverages critical academic opportunities for UGS to expand their experience in international research beyond the traditional avenues.
Internationalization and Undergraduate Research

Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3707 Oak

Mentored undergraduate research: A Multi-Institutional Investigation of Students’ Perceptions of Identity Shifts in this Learning Sphere
Presenters: Ruth J. Palmer | Brad Wuetherick
The College of New Jersey | Dalhousie University

This multi-institutional effort represents an extension of earlier scholarly work developed at Elon University’s Center for Engaged Learning Seminar (2014-16) on Excellence in Mentoring Undergraduate Research. Building on our conceptual model of the interrelationship among mentoring, undergraduate research and identity development, the current submission investigates undergraduate students’ perceptions of the influences of their mentored research experience on their identity development. Regarding identity development, we adopted an approach that combines both the sociocultural and mediated action approaches where the unit of analysis is on (a) identity as situated in personal and cultural contexts; and (b) positioned at the intersection of other related constructs, and not the individuals in isolation. Consequently, the guiding question was: Given the experience/s of mentored undergraduate research, what do undergraduate participants from different institutional contexts report as (a) the specific elements that contributed to change in their personal and professional identity orientation, and (b) the specific dimensions of identity orientation where they perceived change to have occurred? Data were obtained from selected open-ended responses in a broader survey conducted in 2015. Preliminary results from summative content analyses indicate notable outcomes related to student academic levels and the nature and quality of the mentored undergraduate experiences. We plan to use these findings as a prologue to a conversation with our audience about (a) multi-institutional research related to mentored undergraduate research and identity development, (b) variations across the mentored undergraduate research experience and their impact on students’ perceptions of their learning benefits; and, (c) students’ perceptions of the relationship between their mentored research experiences and their identity development. We anticipate multiple benefits from this interactive discussion including first, advancing the discussion regarding internationalization and undergraduate research; and second, the strengthening of research collaboration related to mentored undergraduate research and identity development.

Other

Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3702 Orchid

Mechanisms for Effective Mentoring of Undergraduates in Research Projects
Presenters: Lance F. Barton | Karen K. Resendes | Sherell K. Byrd
Austin College | Westminster College | Fort Lewis College

Whether you are running a laboratory where undergraduates are the sole contributors to research progress or you are a faculty member, post-doc or graduate student mentoring undergraduates in a larger lab setting, this session aims to provide you with examples of effective methods for organizing the progress of undergraduate researchers, while providing them with a well mentored experience. The presenters each mentor anywhere from 2-8 undergraduates each semester and use a variety of techniques to set expectations early while providing support throughout the semester to guide the development of their students in the laboratory. A commonly used method for establishing clear expectations when starting a student in the laboratory is through a research contract. This document can be part of an independent study course syllabus or a stand-alone document for any student. We will provide examples of documents that include details on student expectations in areas including, but not limited to, work hours, laboratory documentation, progress reports, research training, presentation, and assessment instruments. As students progress throughout the semester, mentoring progresses in both one on one and group settings. Weekly individual meetings can be used to discuss research progress or train students in advanced techniques. Regular laboratory meetings can be designed to introduce undergraduates to the value of the collaborative research team, provide experience presenting their work as well as giving and receiving constructive feedback, and helping students utilize their research experience to achieve post-graduate career goals. The benefits and organization of such meetings will be described in detail. Additionally, we will discuss the benefits and limitations of peer mentoring between undergraduates in the laboratory and how to promote good mentoring practices more broadly within a department or institution. Finally, time will be provided for attendees to consider ways to incorporate ideas into their own practice and for discussion.
Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 3711 Egret

Expanding URSCA in the Arts and Humanities at Research-Intensive Universities
Presenters: Linda Blockus | Iain Crawford | Michael E. Cohen
University of Missouri | University of Delaware | University of Missouri—Columbia

Expanding undergraduate research into the arts and humanities can be challenging on campuses with a history of STEM-centric student research. Rather than trying to implement systemic change throughout the campus, the University of Missouri and the University of Delaware have embarked on a series of smaller initiatives to make inroads with the arts and humanities to begin to increase their visibility in the campus undergraduate research community. Examples of these include efforts at Missouri to bring together students in a 3-D design art class and student STEM researchers to collaborate on artwork displayed in one of the science buildings, revising submission categories for the spring celebration of undergraduate research to more explicitly welcome participation from the arts and humanities students, and establishing a “class research project poster day” on the last day of each semester to encourage sharing of course-based projects to a larger audience. New for 2016 is a Visual Art & Design Showcase to complement the traditional poster session. At Delaware, similar efforts include the restructuring of multiple spring events into a single campus celebration of undergraduate research and creative activity with a renewed emphasis upon including presenters from the arts and humanities, and outreach to and support of both course and project-based student research ranging from work in writing studies to the interdisciplinary Colored Conventions Project. This presentation will provide more specific details on the initiatives, including costs, lessons learned, and future directions, and it will discuss the ways in which participation in the CUR Institute on Creative Inquiry in the Arts and Humanities can be used to leverage campus efforts to broaden engagement in undergraduate research.

Session Type: Panel Presentation
Presentation Date and Time: 6/27/2016—11:00 AM-12:00 PM—Room Assignment: 2703 Honors

CUR Psychology Division Mid-Career Mentoring Award Presentation
Presenters: Robert F. Rycek | Guillermo Wated
University of Nebraska at Kearney | Barry University

The Psychology Division will present its Second Mid-Career Mentoring Award to Dr. Teresa Dzieweczynski of the University of New England. Immediately following the presentation of the award, Dr. Dzieweczynski will give a short presentation entitled: “Reflections on Undergraduate Research in Psychology.”

Lunch
12:00 p.m. – 1:30 p.m.—Lunch (Royal Palm Ballroom) and
2708 (Plaza)/2709 (Hillsboro) – overflow rooms
Monday, June 27
Concurrent Session 8

1:45-2:15 p.m.
30 min dual presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 2702 Legacy

Assessing Undergraduate Researchers’ Conference Experiences: What Do Students Learn?
Presenters: Amy M. Buddie | Sarah K Johnson
Kennesaw State University | Moravian College

One of the key components of an undergraduate research experience is dissemination (e.g. Hakim, 1998), and undergraduate researchers commonly disseminate their work by presenting their work at conferences (Hu et al. 2008). There are numerous potential benefits of conferences; for example, students can become socialized into their discipline, they have the opportunity to network with like-minded peers and professionals, they should become more proficient in communication skills, and they have the opportunity to learn about other cutting-edge research as a result of attending other sessions. There is little empirical research, however, on the extent to which students actually benefit from attending and presenting at conferences. Therefore, in this session, we will discuss ways in which we have assessed student engagement and learning associated with conferences. Some questions we will examine include: 1. What do students think will be the benefits of the conference before they attend versus afterwards? 2. What is the quality of their presentation (as determined by rubrics)? 3. What are the differences in experiences for students who are conducting their first or second research project versus those doing a summative (senior-level) research project? 4. How many sessions do students attend on average, and what are they learning about their discipline or research in general as a result of attending these sessions? 5. To what extent do students network at conferences, and does the networking lead to tangible benefits after the conference? We will briefly present our own research on undergraduate researchers’ conference experiences, and then we will facilitate a discussion of these issues with attendees. Our session relates to Conference Theme #2: Assessment of Impact of Undergraduate Research. We will present data specifically on the ways in which we have assessed the conference experience for undergraduate researchers and will discuss challenges and opportunities associated with such assessment.

Diversity and Inclusion in Undergraduate Research

Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 2703 Honors

Strategies for the Recruitment and Retention of Faculty of Color for STEM Tenure-Track Faculty Positions
Presenters: Bridget L. Gourley | Eileen M. Spain
DePauw University | Occidental College

Higher education recognizes the national imperative to increase the number of faculty from historically underrepresented communities. This is particularly needed in STEM fields where our nation can best capitalize on an increasingly diverse citizenry. Many institutional obstacles have hampered this objective including structural racism that block equity in the educational programs our colleges and universities provide. Two perspectives and experiences of hiring faculty of color in chemistry are presented and will guide discussion. Emphasis will be placed on structural changes at all levels of recruitment and hiring. Such changes include the ways institutions advertise, recruit, and ultimately select candidates within a search committee. Strategies to retain faculty of color and insure their success through tenure and promotion processes will be offered.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 2707 Spirit

Scholarship in Practice: Bringing Authentic Research Into General Education for Faculty, Students and Research Programs
Presenters: Patrick J. Killion | Ann C. Smith
University of Maryland, College Park | The University of Maryland, College Park

In Fall 2012, the University of Maryland [UMD] instituted a new category of courses into the General Education: Scholarship in Practice (SP). Project category brings research experiences into courses to meet the mission of engaging students in work authentic to all academic disciplines. Scholarship in Practice courses must be completed by all UMD students and have a common set of learning outcomes that are fulfilled through authentic research projects. This steps typically include completing a literature search, application of relevant methods to the completion of a project, revising and refining the project and communicating the findings. SP has spurred faculty to shift their courses to include authentic inquiry and many aspects of the research process. As of fall 2015, UMD faculty have created more than 300 SP courses, are invited to meet twice each semester to discuss best ways to integrate research experiences into courses and have developed rubrics that guide the normalized assessment and evaluation across SP courses. SP invites faculty to both reform and create courses based on their research in a manner that serves both majors in the faculty member’s department and students across the university. This category also brings research into the General Education curriculum through a new university-wide undergraduate research program at UMD. The UMD First-Year Innovation & Research Experience (FIRE) provides first-year students authentic research experience, broad mentorship and institutional connections that impact academic success, personal resilience and professional development. Adapting the proven Freshman Research Initiative (FRI) developed at the University of Texas at Austin (UT), UMD is extending the UT FRI model to include a broad spectrum of academic disciplines. UMD’s SP category enables FIRE to offer consistent academic credit to program-participating students of all majors no matter which faculty-led research group a student might join.

Session Type: Solo Presenters
Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 3704 Tarpon

From Term Paper to Conference Paper: Facilitating Undergraduate Participation in Professional Academic Conferences
Presenter: R. Bruce Anderson
Florida Southern College

This presentation discusses ways to design “project courses,” namely courses where students spend a major part of the semester designing and completing an original research project. The presenters discuss various ways to implement project courses, and also discuss how to prepare students to present their finished projects at regional and national academic conferences.

Innovation and Collaboration in Undergraduate Research

Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 3705 Manatee

Student Success at a Two-Year College with CUREs, Collaborations, and Community
Presenters: Virginia Balke | John V. McDowell
Delaware Technical Community College | Delaware Technical and Community College Stanton-W

Engaging students with course undergraduate research experiences (CUREs) is an effective means of increasing student retention and completion rates in STEM fields. With the call for students to begin research in their first two years, community colleges are increasingly using CUREs as high impact pedagogy. Community colleges have unique opportunities to impact students with small class sizes, a diverse student population, and connections to four-year institutions and industry. However, implementation of innovative programs is required to overcome barriers such as heavy teaching loads, lack of funds, and the need for professional development. In this presentation, we will discuss how faculty in the Biotechnology program at Delaware Technical Community College have overcome these barriers to create a unique program that provides students with multiple research opportunities. Instructors are provided opportunities to gain skills to develop effective CUREs, including collaborations with scientists at four-year institutions. Students can also participate in mentored research projects and summer internships at partner institutions. The synergy between the course and mentored research has driven the projects forward with critical input from student interns. The changes in the program have led to students having a greater sense of community and increased employability skills. In the five years that undergraduate research has been implemented in the department, enrollment has doubled with a significant increase in completion rates. Facets of this program will be of benefit to faculty at both community colleges and four-year institutions who are looking to use undergraduate research for increasing student success.
# 2016 Biennial Council on Undergraduate Research Conference

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Saturday 6/25

- 7:00 AM: Breakfast, Poster Setup
- 8:00 AM: Plenary 1
- 9:00 AM: Concurrent Session 1
- 11:00 AM: Lunch
- 12:30 PM: Concurrent Session 2
- 2:00 PM: Concurrent Session 3
- 4:00 PM: Concurrent Session 4
- 6:00 PM: Buffet Dinner

Sunday 6/26

- 7:00 AM: Breakfast, Poster Setup
- 8:00 AM: Plenary 2
- 9:00 AM: Concurrent Session 5
- 11:30 AM: Lunch
- 12:30 PM: Concurrent Session 6
- 2:00 PM: Concurrent Session 7
- 4:00 PM: Concurrent Session 8
- 6:00 PM: Poster Session II

Monday 6/27

- 7:00 AM: Breakfast, Poster Setup
- 8:00 AM: Plenary 3
- 9:00 AM: Concurrent Session 9
- 11:00 AM: Lunch
- 12:30 PM: Concurrent Session 10
- 2:00 PM: Concurrent Session 11
- 4:00 PM: Poster Session I

Tuesday 6/28

- 7:00 AM: Breakfast, Poster Setup
- 8:00 AM: CUR-Goldwater Scholars Faculty Mentor Award Recognition
- 9:00 AM: CUR Fellows Addresses
- 5:00 PM: Dinner
- 6:00 PM: Buffet Dinner, Divisional Mix and Mingle
Positioning Faculty at a Predominantly Undergraduate Institution for Success with Building a Funded Research Program
Presenters: Tracy Eisenhower | Lara M. Luetkehans
Indiana University of Pennsylvania

Indiana University of Pennsylvania is a predominantly undergraduate institution (PUI) with a doctoral research mission. IUP faculty define themselves as teacher-scholars with a commitment to scholarship to inform their teaching and use as a high-impact pedagogical tool to engage their students. While there are several internal sources for funding this work, it is becoming increasingly important for faculty to seek external funding to support their scholarship and their collaboration with students in their research programs. Faculty at PUIs have workloads that include heavy teaching assignments, student advising expectations, and institutional service expectations, presenting difficulties in developing a robust research agenda. Additionally, some faculty at PUIs may feel less ready to pursue external funding and need to develop their confidence and self-efficacy in order to position themselves for success in grantsmanship. This can make an uneven playing field when faculty from PUIs compete with faculty from research-oriented institutions for federal and agency grants. To assist IUP faculty in growing their research programs and building their confidence, and to remove other barriers that commonly exist at PUIs, the authors designed the Principal Investigator’s Mentorship Academy (PIMA), a professional development program aimed at supporting faculty in addressing these issues. The PIMA experience is customized by and for each participant derived from a self-assessment performed early in the year. Self-selected mentors help participants learn how to leverage their strengths while addressing any identified gaps. Discussions led by the convener and invited experts help PIMA faculty build an understanding of the skills needed for successful grantsmanship and promote collaborative research. PIMA represents the beginning of a cultural shift that more formally supports and recognizes sponsored scholarship. In this 30 minute session, presenters will share the design and structure of the program as well as outcomes from the first two faculty cohorts who participated in PIMA.

Overcoming the Barriers to a Common Understanding of Undergraduate Research
Presenters: Sylvia Tiala | John Willison
University of Wisconsin—Stout | University of Adelaide

For nearly a decade faculty at a Midwestern university led a grassroots effort to integrate undergraduate research into classes across campus. Students endorsed the idea of an undergraduate research experience for all by passing an official student senate motion. Yet efforts to move undergraduate research experiences beyond individual classrooms stalled. One major obstacle was that every discipline had its own unique definition of research and what that looked like for students. Over the course of a year, co-facilitators of a community of practice investigated implementation of the Research Skill Development (RSD) framework (Willison & O’Regan, 2007) as a guiding pedagogy to lead institution-wide undergraduate research. Buy-in from administrators, support of the professional development center, involvement of library personnel, and a structured format were keys to successful completion of the first-year implementation. One vital element for success of the project was the RSD’s ability to engage faculty in a Lingua Franca about research processes across disciplines, rather than engaging in arguments about the definition of research. Unexpected insights from implementing the RSD included effectively extending the framework across the campus through personal networks; the need for human subjects training across the campus; and data analysis techniques used for human subjects. Emerging discussions focused on who benefited most from the RSD, the faculty or the students? George, Hall, and Stiegelbaurer’s (2008) Stages of Concern Questionnaire was used at the beginning, middle and end of the process providing some insight as to the thinking of participants as they moved through the implementation of the RSD framework in their particular courses. Insights gained from this endeavor will be presented so that the audience may consider and discuss the possible implications of implementing the RSD in their own institution.
Internationalization and Undergraduate Research

Session Type: Dual Presenters

Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 3700 Sabal

**Advocating Through Research Abroad: IPSL’s Advocacy Research™ Program**

Presenters: Emma Newton | Arianne Newton

IPSL offers undergraduate study abroad and service-learning™ programs for academic credit with an emphasis on intercultural reciprocity and ethical service. In recent years IPSL heard from their international community partners about the need for research on the resulting impact of local service organization’s work. However, these communities communicated that they have limited resources and are unable to conduct this research themselves. At this time, IPSL was hearing from undergraduate participants about barriers for them to conduct humanities based research prior to graduate school, specifically on study abroad programs. A solution to these combined needs was the creation of IPSL’s Advocacy Research™ program. The IPSL Advocacy Research™ programs brings together students who wish to conduct undergraduate research with service organizations in international communities who need research and data to support their mission. Implementation of this program requires constant analysis as well as collaboration and sensitivity to cultural differences. Emphasis on the ethical nature of conducting research in an international setting is paramount. IPSL uses unique programmatic elements to share intercultural considerations with students beforehand, as well as support students and the local communities throughout the research collection process. Through these programmatic elements, IPSL is able to further support its mission to create avenues through which students, international communities, service organizations and home universities can form reciprocal partnerships.

Session Type: Dual Presenters

Presentation Date and Time: 6/27/2016—1:45 PM-2:15 PM—Room Assignment: 3711 Egret

**International Undergraduate Research Partnerships— Opportunities and Challenges**

Presenters: Suzanne E. Rocheleau | Pascale Lafrance

As internationalization becomes increasing popular in universities’ strategic plans, many institutions are looking at ways to diversify their student opportunities abroad. Although traditional mobility programs and agreements allow for students participation in international experiences, some universities can choose to send their students abroad for research internships, rather than courses. These types of programs can often be more flexible without bounding participation with concerns about reciprocity, tuition fees and credit equivalencies, but there are challenges, as well. The University of Ottawa (Canada) and Drexel University (Philadelphia) have each developed a solid International Undergraduate Research Exchange program. Over the last four years both have had a chance to develop best practices in order to optimize student experience, ease the process for partner institutions, provide greater institutional impact and take into account the organization's liability. During this session, we propose to highlight the program characteristics at each institution and give the audience a series of best practices for the smooth implementation of such programs. We will discuss programs with and without exchanges, internal and external administrative challenges, getting adequate status for incoming student-researchers, selection and matching process, sustainability plans and how to link it with the institution’s strategic goals.
Getting What You Ask for... Now What? Institutionalizing Undergraduate Research via Grass Roots Efforts at Primarily Undergraduate Institutions

Presenters: Lance Barton | Karen T. Lee
Austin College | University of Pittsburgh—Johnstown Campus

Due to the size and scope of research endeavors that include undergraduates, most large research universities have centralized undergraduate research offices funded from indirect costs or administrative efforts. However, at smaller colleges and universities, where programs can be more idiosyncratic or less standardized, centralization and institutionalization can be slower with different barriers among the constituents. Dr. Karen Lee, Undergraduate Research Coordinator, at the University of Pittsburgh at Johnstown and Dr. Lance Barton, C.R.E.A.T.E. Director, at Austin College are both founding “directors of undergraduate research” with full-time faculty appointments in addition to their undergraduate research duties. They have both facilitated the initial development of an undergraduate student research office and presentation forumconference, created through faculty interest and at faculty request. The presenters will discuss the process and timeline of developing the coordination of undergraduate research endeavors on their campus including such topics as the challenges of dual-role directors with limited support staff and both opportunities created and challenges faced from success as a small one person operation. Lessons learned through the process of developing this coordination will be discussed along with long-term strategic goals for their programs. The presentation will be followed by a discussion of challenges faced during early coordination and institutionalization of undergraduate research and strategies for success that might be applicable to other campuses.

Ten Salient Practices of Undergraduate Research Mentors

Presenters: Jenny Olin Shanahan | Eric E. Hall
Bridgewater State University | Elon University

The well-established benefits for students involved in undergraduate research are dependent, first and foremost, on high-quality mentoring. Mentorship is a defining feature of undergraduate research. As more and different types of colleges and universities strive to meet student demand for authentic scholarly experiences, it is imperative to identify what effective undergraduate research mentors do in order to ensure student engagement, quality enhancement, retention, and degree-completion. This presentation identifies ten salient practices of faculty mentors of undergraduate research as indicated in the extensive literature of the past two decades. To determine these salient practices, a comprehensive review of the literature was conducted by five researchers from five different institutions: Bridgewater State University, Duke University, Elon University, Oxford Brookes University, and Roanoke College. Based on this original analysis of the literature on undergraduate research mentoring we identified ten significant “lessons learned,” or evidence-based practices of effective undergraduate research mentors that apply broadly across disciplines, students, institutions, and mentoring approaches. This dual-presenter session (led by two of the five researchers) will explore each of the ten salient practices and implications for undergraduate research mentors. Handouts detailing the ten salient practices, including examples of each and recommended reading, will be provided. Participants will be invited to contribute experiences and ideas regarding how each of the practices relates to their discipline, institution type, and mentoring style.
Assessment of Impact of Undergraduate Research

Session Type: Dual Presenters

Structuring Undergraduate Research Experiences (UREs): Identifying the Key Characteristics that Promote Student Outcomes
Presenters: Justin Micomonaco | Korine Steinke Wawrzynski
Michigan State University

Undergraduate research experiences (UREs) have been identified in the literature as a high impact educational practice. Studies have demonstrated links between participation in UREs and a number of positive student outcomes, including improved persistence and graduation rates, improved analytical and academic skills, and improved understanding of the relevance of scientific/research findings. Although these studies have demonstrated the value of UREs in promoting student outcomes, previous research normally treats UREs as a uniform experience. Previous studies do not attempt to distinguish between the characteristics of UREs and their relative importance in the promotion of positive student outcomes. For example, is it necessary for the URE to be guided by a faculty mentor? Are there a certain number of meetings with a mentor that tend to promote the desired outcomes? This study examines the relationship between the characteristics of undergraduate research experiences (UREs) and the promotion of these positive student outcomes. Using regression modeling to control for individual characteristics and isolate the effects of different URE characteristics, we analyze data from multiple years of a survey administered to URE participants at a large, research institution (N =740). The findings help identify the key characteristics of UREs that promote student outcomes and have implications for how to structure UREs, including consideration for new models. In light of the findings, the session will engage in a discussion of the implications for current and future UREs, including how to increase research opportunities and recruit research mentors.

Diversity and Inclusion in Undergraduate Research

Session Type: Dual Presenters

Pathways to and through Undergraduate Research: A Multi-institutional Assessment
Presenters: Rebecca M. Jones | Janet A. Morrison
George Mason University | The College of New Jersey

Undergraduate research has become widely accepted as a best practice in higher education and many universities are investing significant resources into supporting it. Questions remain regarding the inclusion and diversity of these initiatives. We sought to learn who is participating in research/creative activity outside of regular course assignments, who is not participating, who plans to, and who does not plan to – and why. We deployed a survey instrument at four institutions (George Mason University, The College of New Jersey, Sewanee University of the South, and University of St. Thomas to capture a wide range of possible explanations for participation and non-participation, including aspects of mentoring. Analysis of our data from 991 responses explores the differences among defined groups and among institutions regarding the frequency of student participation in research/creative activity and identifying the factors that are motivators and barriers to participation. This presentation will summarize the survey instrument used, respondent demographics, frequency of participation, and our findings related to motivators and barriers to participation. Of the students surveyed, we found that 30.9% currently participate in an undergraduate research/creative activity, 42.5% intended to participate, and 26.6% have no plans to participate; there were minimal differences across institution and demographic groups. For those who currently or intended to participate, the common motivator was intrinsic (i.e. being personally interested or excited about the work). In this presentation, we will also discuss ongoing research evolving from this pilot study and invite collaboration with other colleges and universities. The presenting authors will represent the collaborative research team, which also includes Nancy Berner [University of the South], Shannon Davis [George Mason University], Jayna Ditty [University of St. Thomas], Pamela Garner [George Mason University], Duhita Mahatmya [University of Iowa], Jill Manske [University of St. Thomas], and Ann Johnson [University of St. Thomas].
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters  

Scholarly & Creative Undergraduate Learning Partnership Team: Triple Areas of Focus  
Presenters: Anne Arendt | Huda Al-Ghaib | Richard J. Tafalla  
Utah Valley University  
Utah Valley University (UVU) has implemented a Scholarly & Creative Undergraduate Learning Partnership Team (SCULPT) which has triple areas of focus: institutionalizing UR (including expanding it and collaboratives), integration into the curriculum, and advocacy – to support the other two areas. It currently consists of over 30 faculty and is entirely faculty-led and driven. SCULPT is a resource for teaching through inquiry-based learning. Inquiry-based learning, inside and outside the classroom, is research, scholarship, and creative activity. SCULPT provides resources for: a) developing inquiry-based pedagogy, b) encouraging undergraduate research, c) developing programs, d) mentoring students, e) developing skills and traits in students, and f) helping identify and pursue funding. As we see it, across our institution, we are eager to observe inquiry-based learning and research as pedagogy (Schantz, 2008). It is a creative process that encourages early professional experience in students' chosen careers. It encourages discovery based learning in classroom curriculum and encourages the use of peers as models for doing research. We need to expand beyond just a mentoring approach to a limited number of students, but instead reach out to more students and explore the benefits of collaborative research. Added to that, we need to help students understand that research and creative activities are not merely succeeding or failing in accomplishing a task, it is instead about getting better. Lastly, we need to understand that there will not be one-size-fits-all solutions to our issues. As Davis & Jacobsen (2014) note, a one-size-fits-all approach to increasing faculty participation in mentoring undergraduates is going to fail. Student scholarship is by its nature a disciplinary endeavor. Therefore, there will and should be disciplinary variation in the mechanisms, methods, and approaches to facilitating and evaluating student scholarship. (p. 28).

Session Type: Dual Presenters  

Supporting Undergraduate Researchers Across the Disciplines: Views from Writing Studies  
Presenters: Melissa Ianetta | Jennifer Wells  
University of Delaware | New College of Florida  
The discipline of writing studies originated in the nineteenth century college composition classroom, and the roles of student writers still ranks among the field's primary areas of concern. Scholars in this area investigate how students learn to write and how they transfer this knowledge from one writing context to the next. Drawing from this field's knowledge, the two presenters in this session focus on what writing studies specialists have to offer to both undergraduate researchers across the disciplines -- and to the faculty who support them. In the first portion of this presentation, Speaker One draws upon the knowledge of the field to look at the ways in which mentors can most productively construct the concept of audience in undergraduate research as a means to engaging undergraduate researchers. Drawing upon CUR documents, theories of audience and recent debates about student agency in writing studies research, this portion of the paper profits from inquiry-based undergraduate classrooms to look at ways the reconstitution of “audience” and “peer review” can increase student agency and ownership of research. Speaker Two expands upon this classroom focus by discussing what writing studies courses can offer to campus culture writ large, through students’ study of the campus writing culture and, more locally, via an undergraduate thesis writing class. On the one hand, undergraduate research can be used to document campus writing culture, supporting not only the intellectual growth of undergraduates in the class but enhancing the campus-wide writing culture. On the other hand, writing studies can reach out across campus by supporting the community of undergraduate researchers via an interdisciplinary thesis-writing course. Taken together, then, the materials shared in this presentation will offer attendees new models for supporting at both the classroom and programmatic level the writing of undergraduate researchers.
Distinguishing Performance Factors on the Business Major Field Test (MFT-B)

Presenters: D. Lance Revenaugh | Jeremiah Strand
Montana Tech of The University of Montana

In an effort to measure an educational institution’s success in educating its students, many business schools and departments administer the MFT-B (Major Field Test-Business) at the end of a student’s degree program. The MFT-B is a standardized US national exam developed by ETS testing services. This research is currently analyzing MFT-B data from the last three years at Montana Tech University. The purpose is to identify factors that lead to high and low scores on the exams. The data being analyzed comes from multiple data bases as well as from some paper-based sources. Thus, the research project includes the organizing, combining, and error checking of multi-sourced data to develop a complete and accurate comprehensive database for analysis. In addition, Montana Tech offers two degrees in business, a BS and a BAS. Both sets of students take the MFT-B. This research seeks to determine any differences in performance between BS and BAS students and what factors directly impact those differences. The final phase of the research is a comparative study with MFT-B (or equivalent) results from the four other major Montana universities with business programs. Results will also be compared to the nationwide data available from ETS. The culmination of the research will be the development of a framework for the five Montana institutions, the national results from ETS, and the key performance factors that are unique and/or common across all the data sources.

Innovation and Collaboration in Undergraduate Research

Explorations by Beginning Scholars: Benefits of an Entering Student Research Program

Presenters: Laura J. Moore | Christine D. Myers
Monmouth College

The Summer Opportunity for Intellectual Activity (SOfIA) program is an intensive 3-week research program that is conducted just before the beginning of the fall semester. It is based on the notion that entering students benefit from undergraduate research even before their first class. In our program, incoming students pursue a scholarly project in a small group (2-4 students) with a faculty member and returning students who act as mentors. Since 2010, 47 faculty and 280 students at Monmouth College have participated in the SOfIA program and have completed projects in the arts, humanities, social sciences and sciences. The projects have allowed students to explore an area of research that is new to them and faculty have the chance to work on topics that may diverge from their standard teaching obligations or from their current research area. Additionally, the interaction between faculty and students without the pressures of grading provides all participants to engage with research purely for the enjoyment of intellectual advancement. Finally, this program has allowed the faculty to develop collaborations with their colleagues. In our presentation, we will give specific examples of two successful projects, one in the sciences (Exploring the Nanoscience World) and one in the humanities (Spying on the Spies: Filming Location Research on TV’s Scarecrow and Mrs. King). Both projects have resulted in further work done by the students past the end of the SOfIA program, as well as continued research and publication opportunities on the part of the faculty members involved. The technologies and methods used in each project will be discussed, along with the goals and benefits of the research for all participants. Information will also be provided about other projects in the program as a basis for discussion of the possibilities of summer undergraduate research across a variety of disciplines.
Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—2:20 PM-2:50 PM—Room Assignment: 3709 Heron

A Model for Industry-University Partnership to Integrate Undergraduate Research into Curricula
Presenter: Stephen Tsui  
California State University—San Marcos

Industry-academic partnership is a viable avenue to introduce research into the undergraduate curriculum and ensure that the student learning objectives include marketable real world skills. In 2014, California State University San Marcos and the University of California San Diego began collaborating with Quantum Design, Inc. – a company whose roots and livelihood are tied to academic research – to develop and implement curricula centered on their VersaLab Physical Properties Measurement System. The VersaLab is an instrument designed to train the next generation of materials researchers in cutting edge measurement techniques and offer opportunities for senior capstone projects and faculty research efforts in physics, chemistry, and materials science. This collaboration culminated in the modification of two advanced physics laboratory courses, the creation of a public Quantum Design Education website, and the development of a network of material science educators who are contributing to a curriculum that can prepare students for careers in research. A unique aspect of this collaboration is that this network is comprised primarily of Quantum Design’s clientele of world class scientists. In this presentation, we will discuss the formation, outcomes, and outlook of this industry-academic partnership geared towards generating excitement for materials research in the undergraduate curriculum.

Session Type: Dual Presenters

This Is How It’s Done: Using “Think Alouds” to Support Writing Across the Science Curriculum
Presenters: Natasha D. Oehlman | Aparna Sreenivasan  
California State University—Monterey Bay

The Association of American Colleges and Universities (AAC&U) defines writing as a high-impact practice within the context of writing-intensive courses repeated at “all levels of instruction”. Classically, within the science curriculum, writing is emphasized at the early levels in the form of lab reports and data collection. But many departments struggle with incorporating writing throughout the curriculum for the following: 1) faculty feel like novices with regard to writing instruction; 2) grading writing can be arduous and time consuming; 3) students have trouble writing about new and unfamiliar content; and 4) the writing process is often difficult for students overall. California State University Monterey Bay (CSUMB) science faculty are collaborating with the University Writing Program (UWP) and the Undergraduate Research Opportunities Center (UROC) to develop a series of “think aloud” modules that highlight the writing or reading process and decision making that writers often engage in as they take on and execute a particular writing or reading task. These short vignettes focus on speciality areas of writing in the science curriculum, like interpreting data or critical reading of a peer-reviewed article in the sciences. These modules can be used in both the upper division and lower division core courses in the major as part or supplemental to the course curriculum.
Curricular Undergraduate Research (CUR) Conference 2016

Session Type: Dual Presenters
Presentation Date and Time: 6/27/2016—2:20 PM-2:50 PM—Room Assignment: 4200 The Chamber

The SRI@FMHI at Ten Years: The Evolution and Outcomes of a Summer Research Experience for Undergraduates
Presenters: Paul G. Stiles | Roger Boothroyd | Kathleen A. Moore
University of South Florida

Behavioral disorders, including mental and addictive disorders, are among the leading causes of disability world-wide. The Louis de la Parte Florida Mental Health Institute (FMHI) conducts research on mental illness, substance abuse, healthcare financing, juvenile justice, involuntary commitment, child abuse, developmental disabilities, and other pressing social issues. The Summer Research Institute was established to provide an intensive research experience for undergraduate student-scholars interested in research and to help them prepare for their senior thesis, or for application to medical or graduate school. Although geared toward behavioral health, the research methodologies studied apply to a wide range of scientific disciplines. The SRI began in 2005 and was funded initially by the NSF with additional support from NIDA. Since 2011, the program has been funded by NIMH and expanded to include neuroscience. The program begins in late May and culminates in early August with a Research Day where scholars present their research findings. Scholars are matched with faculty mentors with whom they conduct research projects over the 10-week period. In addition, scholars participate in: a substantive seminar series on research design, methods and processes; a proseminar series on topics ranging from ethics to graduate schools to funding sources and publications; a skills workshop series focusing on analytic tools, speaking/presentation skills and writing; and a broad array of community field experiences. In addition to an oral presentation at Research Day, each scholar prepares a written report describing summer research findings. Scholars are encouraged to submit papers for consideration at Undergraduate Research Conferences, as well as regional and national conferences. Many papers are also redrafted for submission to scholarly research journals. An outcomes evaluation including pre/post testing and longitudinal data collection has provided insights into the effectiveness of various program components. Discussion of the program evolution and findings from the evaluations will be provided.

2:55-3:25 p.m.
30 min single presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Dual Presenters

Early Undergraduate Research Programs—Springboards for Success
Presenters: Suzanne E. Rocheleau | Patrick J. Killion
Drexel University | University of Maryland, College Park

Early undergraduate research programs serving students during their first year of college provide an opportunity for universities to identify students with an interest in research early in their undergraduate matriculation. Early research opportunities have been associated with a number of positive student and institutional outcomes. Research experiences have the potential to impact STEM-retention during the period most associated with retention challenges and least associated with professional-relevant experiences. Additionally, early research experience has the capacity to catalyze major selection for students who begin their collegiate studies without a home department or college. Finally, student satisfaction, confidence and resilience are positively associated with undergraduate research experiences. Early development of these outcomes in the student population contributes to the development of a more capable sophomore class, which can then positively impact the research productivity of the faculty and institution and raises expectations for concepts and methods engaged throughout a student’s college experience in both courses and independent research activities. Both Drexel University and the University of Maryland have well-developed early undergraduate research programs that have evolved differently but with proven benefit to a wide range of constituencies. Focusing on first year students has allowed each of us to develop appropriate research-related programs that meet students’ evolving needs and interests and has produced numerous benefits to faculty and our respective institutions. During this presentation we will present our two programs, the perceived benefits of early undergraduate research and the challenges to implementation on our two campuses and show how a focus on early undergraduate research has led to the development of research-related programming, both international and domestic within our universities. We will also share the results of program assessments for our programs that have led to increased financial support and the development of vibrant research-friendly campus environments.

Monday, June 27, 2016—2:55 p.m.–3:25 p.m.
Diversity and Inclusion in Undergraduate Research

Session Type: Dual Presenters


A Model Partnership Demonstrates a Successful Pathway for Community College Students to Be Integrated and Retained in STEM fields

Presenter: Rachel Kennison
University of California—Los Angeles

Santa Monica College (SMC), a 2-year community college in close proximity to University of California Los Angeles (UCLA) is the number one transfer school in Los Angeles to UCLA and therefore in a perfect position to repair holes in the leaky STEM pipeline. The SMC/UCLA Title III funded Science and Research Initiative (SRI) program aims to increase the number of students from underrepresented minority (URM) groups who successfully transfer to a baccalaureate program in any STEM discipline and enter the STEM workforce. SRI is an academic support program providing specialized courses, STEM transfer counseling, supplemental instruction and exposure to careers in STEM fields. In a unique partnership with UCLA’s Undergraduate Research Center-Sciences, the SMC/UCLA Summer Scholars Research Program (SSRP), a 10 week summer research experience at UCLA, was offered as a capstone opportunity for SMC STEM students interested in research and ready to transfer to a 4-yr institution. In addition to completing an independent research project with a UCLA faculty, weekly professional development in research-related skills, effective communication and transfer strategies were provided. Interconnectedness between SMC and UCLA made the partnership successful in increasing diversity and providing underrepresented students with a transfer pathway to research by creating an inclusive environment and increased self-efficacy of students. Specialized courses at SMC increased student readiness for research and the UCLA Program Director was integrated throughout the year into the SMC STEM Program. In 3 years, applications increased from 15 to 40. Survey data showed after attending SSRP, Scholars experienced increased confidence with working in a lab, research skills, writing a science abstract and communication skills. Scholars reported improvements in their knowledge of research as well as increased certainty of their career goals and confidence in transferring. This model partnership demonstrates a successful pathway for URMs to be integrated and retained in STEM fields.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters


Designing Course-Embedded Research Projects for Sophomore-Level Courses in the Sciences

Presenters: Lance Barton | Ryan Felix
Austin College

Exposing young students to research-based activities promotes learning, achievement, retention, and interest in science among undergraduates. At Austin College, several sophomore-level courses in the sciences have introduced long-term, systematic research projects into their laboratory components. Drs. Barton and Felix will discuss two specific examples during this presentation. Dr. Felix will describe a 10-week long project in the large enrollment gateway course, Organic Chemistry II. This research project provides 60-70 students annually with experience searching and reading the primary literature, organizing and conducting a multi-step synthesis, collecting, sharing, and analyzing data, and communicating their results through both an oral presentation and a formal journal style report. Over the course of the semester, students working in teams are given instructions for unfamiliar techniques and provided deadlines for completion of the project; however, the mechanism to achieve those goals is at the discretion of the students. Dr. Barton will describe similar strategies used in a structured research project in his sophomore-level course, Cellular Physiology, which is similar to those employed in several sophomore-level courses in biology with enrollments from 16-36. The focus of the structured research component is on data analysis, representation, drawing appropriate conclusions, integrating multiple pieces of data to address complex problems, and designing follow-up experiments. Similarly, students are provided protocols that require them to design controls, select some variables, and appropriately prepare cells to perform work, but the results of the experiments are previously unknown to the instructor and students. Both presenters will discuss specific components of course design, challenges of converting existing courses to this model, the considerations for performing research with sophomore-level students, including non-majors, and the benefits for students and faculty. Finally, time will be provided for attendees to consider ways to incorporate ideas into their own courses, to share strategies and challenges, and for further discussion.

Monday, June 27, 2016—2:55 p.m.–3:25 p.m.
The Flipped Lab: Reimagining Science Education with blended Next-generation Virtual Laboratories

Presenters: Maaroof Fakhri  
Labster (SPONSOR)

Creative thinkers, knowledge makers and innovative leaders are needed more than ever to tackle the future’s global problems such as climate change, pollution and diseases and therefore new tools, technologies and practices are increasingly needed to empower those people to change the world for the better. This adds to the increasing need of thinking big and thinking smart when designing the future curriculum and course work, and in many cases adopting innovative technological practices will greatly help achieve this. Now, imagine if your students could have unlimited access to multi-million dollar world-class laboratory facilities anywhere in the world, anytime. Labster (featured at TEDxCERN) has developed virtual laboratory simulations to increase student learning, knowledge retention and motivation when blended with traditional teaching methods. We show what technology can provide to enhance the learning experience—incorporating 3D-molecular animations, case-based narrative, advanced equipment and self-paced enquiry-based problems, which encourage students to use their critical thinking and reflect on the experiments they perform. Furthermore, Labster is currently doing extensive research within the use of Virtual reality and adaptive learning to incorporate those technologies into the curriculum in order to provide an even richer learning experience for the students. As part of our research [Nature Biotechnology, 2014] we conducted a study investigating effects on motivation and learning. When combining these next-generation of simulations with traditional teaching, students’ learning improved by over 76%, and indicated strong gains in motivation. A further study published in the BMC Medical Education journal found major gains in learning and self-efficacy in under-performing students. This blended approach could revitalize STEM undergraduate courses, but also provide the much needed support for faculty facing ever-increasing enrollment numbers and bottleneck lab courses, allowing them to provide a more enriching student experience.

National Science Foundation Research Experiences for Undergraduates (REU) Updates

Presenters: Sally E. O’Connor | John F. Barthell  
National Science Foundation | University of Central Oklahoma

The NSF’s REU program involves multiple directorates, supports several hundred intensive undergraduate research programs, and several thousand scholars yearly. It is the largest federally-funded investment in STEM undergraduate research, and a critical pipeline for STEM student success and engagement in post-baccalaureate study. Panelists will first describe the NSF REU program and recent trends in undergraduate student training. Second, panelists will discuss the design and outcomes of a two-day REU Principal Investigator meeting, held in late April of 2016, which involved all STEM disciplines. Both NSF program officer and REU principal investigator perspectives will be presented.

Student as Wikipedia Scholar

Presenters: Cynthia Tysick  
State University of New York- Buffalo

The University at Buffalo Libraries redesigned their two-credit information and research literacy course to incorporate experiential learning. The philosophy of student as knowledge creator was incorporated into a final project using Wikipedia for Education and Digication. Students were given instruction on the creating encyclopedia style topic entries for inclusion into Wikipedia as well as posted to their student account on Digication. The results were students taking ownership of their published work as content expert.
The Role of Mentoring Relationships in the Development of Novice Researchers

Presenters: Sarina J. Ergas | Allan Feldman
University of South Florida

The goal of this study was to explore changes in graduate students’ mentoring styles and undergraduate researchers’ mentoring preferences over the course of a NSF Research Experience for Undergraduates (REU) program. We also sought to understand the dissonance between reported mentor and mentee expectations and what actually happened within research groups. The study was conducted during the 10-week Tampa Interdisciplinary Environmental Research (TIER) program at the University of South Florida. Graduate student and post-doctoral mentors attended a 1-credit course entitled “Mentoring Novice Researchers” that taught mentoring skills and supported them in their roles as mentors. Data collection included mentor and mentee interviews, observations during lab work and meetings, and pre-, mid- and end-program surveys. Our research showed that some mentors explicitly “directed” the research of the mentees, while others played a “consultative” role and were called on when guidance was needed. REU learning styles ranged on a continuum from dependent to independent researchers. Although there was variable sensitivity to mentoring style among REUs, in general, those who were placed within high-support, high-quality mentoring relationships reported that they were more satisfied with the program, more comfortable with their research, and more likely to go to graduate school. In addition, REUs who reported the greatest gains in their ability to conduct research worked with graduate students whose mentoring style became more consultative as their REU mentee became more independent. The implication of this study is that simply having a mentor is not enough, one must also consider the match between the mentoring style of the mentor and the degree of independence of the mentee. The results have consequences for the structure of undergraduate mentoring programs and their ability to influence the development of novice researchers.

Technology for Innovative, Efficient, and Sustainable Proposal Review Processes

Presenters: Sheela Sharma | Nicole Schlaack
University of Hawaii at Manoa

This interactive session will encourage participants to explore and discuss the efficient and paperless reviewing processes for undergraduate research proposals through the experiences of the Undergraduate Research Opportunities Program (UROP) at the University of Hawaii at Manoa. This growing program, which currently reviews about 80 proposals per semester, utilizes technology to maintain an entirely paperless review process. This process includes determining qualified reviewers for each application, enabling reviewers to have access to all necessary resources, ensuring transparency and accountability, and organizing reviewers’ comments for decision-making and optimal student feedback. Presenters will discuss challenges in the proposal review process, and strategies to mitigate inefficiencies and redundancies, as well as share the continuing evolution of their system. Session participants will have opportunities to share their best practices and challenging obstacles.
Internationalization and Undergraduate Research

Session Type: Dual Presenters

Expanding the Reach of an Undergraduate Research Program Internationally: The University of Utah’s Asia Campus
Presenters: Stephanie M. Shiver | Janet Opel
University of Utah

Increasingly academic institutions are expanding their focus on global education, whether this means welcoming international students to our campuses or constructing international campuses. This expansion means that institutions are expected to provide similar educational opportunities to students in all associated locations. As a large research university, we both accept international students into our on-campus paid research program and recently began a similar program for students at our international campus in South Korea. We have a comprehensive undergraduate research program on our Utah campus; this means that offering a similar experience to students in South Korea involves several interesting challenges. Given the structure of our program, those challenges include: 1) connecting students to the small number of faculty currently available on the South Korea campus, 2) providing high quality remote advising, 3) hiring and paying students internationally and navigating multiple disjointed financial entities, 4) developing accessible ongoing research education and training opportunities, and 5) arranging authentic dissemination forums. As we are in our first year of integrating students from our South Korean campus into our program, we have only begun to identify the challenges inherent in this process and have had mixed success addressing those challenges. In this presentation we will share our experience of internationalizing our program, and the successes and challenges that we have encountered. We will also seek audience input on potential ways to move forward with the internationalization of undergraduate research. As this process has been an office-wide, indeed a campus-wide, collaborative project, we have two members from our office who focus on different areas of this transition presenting together to provide a fuller description of our experience. This presentation has several important details and, hopefully, will spark good conversation.

Other

Session Type: Dual Presenters

A Need to Revise How We Teach Scientific Methodologies in STEM and Non-majors Classes
Presenters: Katherine L. Robertson | Erin Wilson
Westminster College

The training of students in scientific methodology varies widely across scientific disciplines and reflects the history and culture of each. The way in which Scientific Method is taught in Biology for example, or not explicitly taught in Chemistry, and is subsequently understood by society, is often deficient. Scientific Method is often reduced to an algorithm of 4-5 steps and its complexities and limitations, and alternative means of conducting science are not discussed. Without a deep understanding, hypothesis-driven research suffers from confirmation bias; students seek evidence in literature and their own data that favors their existing beliefs. Students carefully scrutinize experiments that don’t support their hypothesis without devoting the same care to experiments that do, and often fail to do adequate controls. Students rarely understand that disproving your null hypothesis doesn’t prove your alternative hypothesis and are seldom encouraged to seek more than one. The term hypothesis is often misunderstood and applied to something that is merely statistical observation. The characteristics and limitations of different scientific approaches are often not addressed explicitly, leaving students to grope toward an understanding of what makes a good experimental process with little conceptual framework to scaffold that knowledge. Failure to robustly understand scientific methodologies causes students to design unsophisticated or flawed research. Discipline-driven differences in teaching scientific methodologies also make it more difficult for students to design and execute interdisciplinary research, where the approach and language used to describe it is unfamiliar to them or even “unscientific.” In an increasingly interdisciplinary landscape, there is a need to examine current educational practices in order to train future generations of scientists as robust researchers who can work seamlessly across disciplines. This presentation will explore common misconceptions in students about Scientific Method and discuss ways to foster deeper thinking in students about how to do science.

Break

3:25-3:45 p.m.—Break [Royal Palm Ballroom]
Monday, June 27

Concurrent Session 9

3:45-4:05 p.m.
20 min single presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Single Presenter
Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 2707 Spirit

Assessing Student Learning in Undergraduate Research Using the Principles of Undergraduate Learning
Presenter: Dominique M. Galli
Indiana University Purdue University Indianapolis

Indiana University Purdue University at Indianapolis (IUPUI) adopted its six Principles of Undergraduate Learning (PUL) in 1998 to clearly define student learning outcomes. Achievement of these PULs has not been systematically assessed in undergraduate research despite the fact that five of these principles (communication, critical thinking, application of knowledge, intellectual depth, and ethics) align very well with the research experience. The IUPUI Center for Research and Learning (CRL) directs various undergraduate research programs that are course independent. A model to qualitatively and quantitatively measure student learning over time was recently implemented. Students are required to submit multiple written progress reports that address specific issues related to their research project and the PULs. A final summary report at the end of the project includes a personal reflection page. The reflection piece is facilitated by guiding questions and links the student experience to the PULs. A standard survey for both students and mentors is used for quantitative student and program assessment. In its pilot phase, the qualitative piece of student learning and outcomes will be monitored by the CRL director. However, this responsibility will shift to faculty mentors if this assessment model proves successful. It is anticipated that some form of mentor training will be needed to ensure consistency in meeting the program goals.

Session Type: Single Presenter
Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 3705 Manatee

Inquiry and Reflection: The Points of Significance Project
Presenter: Megan O’Neill
Stetson University

The Points of Significance Project at Stetson University is the focus of this presentation, during which the presenter—alongside a student involved in the project—will explain the origin and outcome of this qualitative, collaborative project, outline the ways we can listen more effectively to the voices of our students (whose experience of our teaching is often different from what we assume), and project forward with how such listening can transform undergraduate research and writing experiences. Stetson University’s Writing Program is a forward-thinking model that incorporates four required writing experiences, both interdisciplinary and research-intensive, at separate, sequenced points over the course of four years. Strengthening student acquisition and retention of Writing and Information Literacy—two critically important skills that cut across every discipline in our LEAP-inspired General Education model—is the goal of the long-range qualitative research project initiated by the Writing Program in collaboration with the Writing Center, the DuPont-Ball Library, and approximately 40 first year undergraduate students, who have agreed to join with us for four years of investigation and reflection on their learning. In interviews and focus groups, students tell us in their own words when and where they are experiencing important moments of learning in writing and information literacy, revealing for us windows of opportunity: how can Stetson transform these student voices into significant gains in learning for all of us? In what ways can students and faculty collaborate to leverage curricular and pedagogical change? How can we encourage students to learn, transfer, and retain the vital skills we seek to teach them? How can we collaborate to share our results with others? And finally, how might these assessment efforts, whether quantitative or qualitative, enact true and lasting learning for students…and for faculty?
Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 2702 Legacy

Faculty Development around Diversity & Inclusion in Mentoring Traditionally Underrepresented Undergraduate Researchers

Presenter: Noya Kansky
California State Polytechnic University—San Luis

This presentation examines outcomes of faculty development workshops conducted with Science and Mathematics faculty researchers at a comprehensive polytechnic university, in efforts to increase mentorship capacity toward underrepresented undergraduate researchers. Undergraduate research is a proven practice in retaining traditionally underrepresented students, and effective research mentors are crucial in these experiences being positive and successful. Cal Poly San Luis Obispo is one of five polytechnic universities in the U.S. The campus’s “Learn By Doing” motto encourages consistent involvement with High Impact Practices. Its undergraduate focus and commitment to the teacher-scholar model creates a unique research/mentor environment. To assess the preparedness of faculty in working with underrepresented researchers, data were collected in 2015 about the landscape of undergraduate research at Cal Poly. The study identified 30% of faculty respondents felt they did not have the support, knowledge, or funding to properly conduct research experiences for underrepresented undergraduates. Additionally, 26% of faculty respondents operated with levels of “colorblindness” or lack of regard for students’ unique experiences. Colorblindness insists we exist in a post-racial society, and “explains contemporary racial inequality as the outcome of nonracial dynamics” (Bonilla-Silva, 2006, p. 2). In academics, colorblindness assumes all students (including underrepresented) start on an equal playing field, and any fallback is the student’s fault. In response, the Louis Stokes Alliance for Minority and Underrepresented Student Participation [LSAMP] in STEM collaborated with Cal Poly’s Center for Teaching to create workshops with these objectives: 1. Increase understanding of challenges and experiences of underrepresented undergraduate researchers; 2. Provide information and tools supporting inclusive interactions with underrepresented undergraduate researchers; 3. Create a mentor-mentee charter; 4. Provide information and practice with diversity and inclusivity-focused grant writing. Data were collected from participants and facilitator observations to create analysis for future campus-wide faculty development.

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Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 3704 Tarpon

Bringing a Passion for Research to Introductory Students: A Multidisciplinary, Project-Based, Supportive Model of Quantitative Research and Reasoning

Presenter: Lisa Dierker
Wesleyan University

Despite its central importance in research, the teaching of statistical inquiry is limited by numerous challenges that are not easily overcome with traditional pedagogical approaches. Through funding from the National Science Foundation, we have developed curriculum that directly and creatively tackles the most significant challenges faced by introductory students and instructors. The result is a passion-driven, project-based experience that provides greater access to the quantitative research process for large numbers of students and combines new learning materials and innovative teaching strategies for exposing students to a multidisciplinary model of quantitative inquiry. The curriculum provides training in flexible application of knowledge, opportunities to analyze data in real world contexts, and education about quantitative tools through computing. To date, the evaluation of this project-based course has demonstrated that it enrolls higher rates of under-represented (URM) students compared to a traditional introductory math statistics course. Further, our approach provides students experience with basic coding through work with SAS, R, Stata, Python and other code based programs. When compared to a traditional introductory programming course offered through a Computer Science department, we have demonstrated that the project-based course enrolls higher rates of women and URM students. Among those enrolled in the project-based courses, although URM students were found to consider the material presented in the course more difficult than non-URM students, URM students demonstrated similar levels of increased confidence in applied skills and interest in follow up courses as non-URM students. Further, URM students were also found to be twice as likely as non-URM students to report that their interest in conducting research increased. Taken together, this model provides students with a unique opportunity to get “hooked” on the power and excitement of quantitative research, regardless of level of preparation, learning style or initial interest.
Undergraduate research (UGR) is a growing trend in higher academia and has been shown to provide numerous benefits to student learning such as increased awareness and critical thinking. Most of the published literature on UGR evolves from STEM disciplines. The question remains unclear whether UGR experiences in non-STEM disciplines can elicit similar benefits. Additionally, the most effective and feasible method of implementation of an UGR experience remains to be elucidated. Therefore, the purpose of the present project was to investigate student responses to the implementation of an UGR course into the Exercise Science (ES) curriculum. Over the course of two semesters, 51 ES students enrolled in the ‘Special Topics: Exercise Science Project’ course. In this course, students were divided into groups of five and were assigned the task of creating, implementing, analyzing, and presenting a research experiment on a topic of their choice. Student responses to the course were obtained via a Likert-type (1=not at all…5=very much) survey administered at the end of the semester. Students responded that, “…the format of the class was helpful to the way that they learn” (4±1); “…thought the course format engaged their interest” (4±1); “…think that the course should continue to be offered within the curriculum” (4.5±1). Common themes that emerged from an open response survey revealed that 11.8% of the students would have like to have chosen their own group, 15.7% would have preferred more in-class meetings/instruction, and 29.4% indicated that an introductory research methods class should be a pre-requisite to the course. The findings of the present project add insight to the small, current body of knowledge on how to create and implement an UGR course into the ES curriculum and how students perceive such a course. The information obtained can be utilized to refine future UGR experiences within the ES curriculum.

Discovery-Based Learning: A Microcosm of the Emerging Professional Research Environment

Presenter: Amanda E. Brooks
North Dakota State University

A chorus of voices from our nation’s academies has consistently called for new methods to better prepare students for the future. This future is projected to require multi-disciplinary teams to make progress on vexing grand-challenge-level problems. To this end, our faculty mentor team across several departments and colleges has developed, implemented and proven a scalable innovative process that combines multi-disciplinary research, effective education, inclusion, and economic development which we term Discovery-Based-Learning on Multi-disciplinary teams (DBL-T). In the DBL-T model, students take control of their learning as they form multidisciplinary teams with faculty mentors form to pursue “real-world” research projects. Working with their faculty mentor, students from different disciplines (engineering, pharmaceutical sciences, exercise sciences, and animal and range science) are immersed in a four-semester medical device focused course sequence in which they (1) identify a research question, (2) define their own discipline specific learning objectives, (3) plan and implement an approach to address the research question, (4) control a research budget, and (5) effectively communicate their research to lay and professional audiences. In the DBL-T model, students make meaningful contributions to their faculty mentor’s research through a mutually beneficial relationship. Additionally, the teams determine team roles and expectations, manage intra-team relationships, and develop self-awareness as researchers within a complex professional research ecosystem. The overarching goals of DBL-T are to mimic the modern real world research ecosystem through immersive multidisciplinary discovery-based learning, foster an appropriate mindset, and produce STEM graduates capable of effective innovation regardless of their chosen career path (i.e. academia, industry, or government). After two years of implementation, the metrics of DBL are clear -- multiple research awards, conference papers/posters, grants, and publications have been achieved. Future work will evaluate student perception and team cohesion within DBL-T.
Gap Years as Catalysts for Undergraduate Research
Presenter: Joseph O’Shea
Florida State University

Taking a gap year before higher education is becoming increasingly common. However, higher education hasn’t determined how to best support and engage gap year students before and during college. In this session, we explore the growing gap year field and examine how higher education institutions can use gap year experiences as the foundation for students’ undergraduate research journeys. The session draws on examples of higher education partnerships with gap year organizations to examine how colleges empower students to leverage gap year experiences to launch their undergraduate research careers. The session will also include case studies of students whose gap year experiences ignited curiosity and animated their undergraduate research endeavors throughout college. Finally, session attendees will dialogue about gap year (deferment) policies and program options at their home institutions.

Redefining Significance: Experiences of Humanities Faculty Engaged in Undergraduate Research
Presenter: Susan Mendoza
Grand Valley State University

Programs that actively engage students in research and scholarship are the touchstone for integrating undergraduate education with authentic scholarly inquiry. Empirical studies demonstrate that undergraduate research experiences (URE) are related to increased student learning and development, increased levels of retention, increased enrollment in graduate school, and increased understanding of research as a vocation and profession. Although there are some studies that explore undergraduate research in the social sciences and humanities, the accepted models and best practices of undergraduate research are entrenched in the disciplinary culture of science. When overlaying the models of disciplinary culture and paradigms of research, it is clear that structures that support the scholarship enterprise in biology, for example, will not be as successful in history or philosophy. This study utilized a phenomenological approach to explore how faculty in the humanities describe the meaning of scholarship, scholarly process, and how that process influences how they work with undergraduate researchers and scholars. The researcher conducted in depth interviews with seven faculty members in the humanities who actively mentor undergraduate researchers. These interviews resulted in six themes that describe the essence of the faculty participants’ experiences. These themes illustrate how the very nature of the culture and epistemology of the humanities disciplines influences the nature of the undergraduate experience. In addition, faculty mentors emphasize the values and skills needed to engage in the “life of the mind” and how those skills benefit students’ ability to find their own scholarly voices and become engaged citizens. This study demystifies the nature of undergraduate research in the humanities from a faculty mentor perspective. The study also provides some guidance to faculty mentors for possible models for engaging with undergraduate researchers and administrators interested in increasing the capacity and depth of UREs for students in the humanities.
Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 3712 Columbia

Collaborative Mentoring—Working Across Departments to Enhance Student Success

Presenter: Megan Bassett
California State University—Monterey Bay

Mentorship is a key element in student success. This is especially true for traditionally underrepresented students. To increase retention, many universities incorporate programming aimed at increasing student success. These programs help students prioritize their studies, explore and prepare for professional careers, and identify and overcome barriers to student success. While many of these programs are successful, they often have specific eligibility requirements and serve a relatively small population of students. California State University, Monterey Bay (CSUMB) is a Hispanic Serving Institution, serving a large population of first-generation, low-income, and historically underrepresented minority students. CSUMB houses several mentoring programs specifically focused on peer mentoring. In Fall of 2015, three peer mentoring programs started a collaboration to increase awareness and overall success of CSUMB students. The SSS STEM/HS program is a U.S. Dept. of Education grant-funded program that provides academic, career development, and personal support for Science, Technology, Engineering, Mathematics (STEM) and Health Sciences (HS) students who are first-generation, low-income students and/or students with disabilities. SSS engages students through a variety of resources including peer coaching, which fosters an environment that is conducive to success. The Transfer, Excellence, Leadership, Opportunities in Science mentorship program connects science transfer students with peer mentors in similar fields to promote leadership development opportunities and connect students to resources essential for student success. The Peer to Peer (P2P) program offers mentorship to students from all majors. Peer mentors in the P2P program offer guidance on successfully navigating through CSUMB. These mentoring programs collaborate through combined peer mentor training, collective events, and aiding prospective students in selecting and applying for the mentoring program most appropriate for their needs. The goal of this collaboration is to give every student the opportunity to be supported through peer mentorship to contribute to student development and increase student success.

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—3:45 PM-4:05 PM—Room Assignment: 3713 Challenger

Are Your Students Effectively Marketing Their Research Experiences?

Presenter: Rosalie A. Richards
Stetson University

In a competitive global market, a student’s ability to map her experiences to the skills and dispositions desired by international employers and graduate schools sets her apart from other candidates. However, there is often a chasm between what is taught in the classroom and what students must demonstrate in order to transition successfully to post-baccalaureate endeavors. Undergraduate research as a pedagogy of engagement offers ample opportunity for mentors to evaluate a student’s level of preparation. At the same time, are mentors well-equipped to help students effectively articulate the competencies acquired as a result of participation in a research experience? During this interactive presentation, participants will engage with each other to help students, including marginalized students, effectively situate themselves in a position of advantage.
4:10-4:30 p.m.
20 min single presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Single Presenter
Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 2702 Legacy

Clemson University's Creative Inquiry Program: Complex Assessment to Identify Impacts and Return
Presenter: Cora Allard-Keese
Clemson University

Clemson University’s Creative Inquiry (CI) program is an innovative, unique model for supporting and assessing the impacts of team-based undergraduate research that spans all disciplines. Since its start in 2005, CI has produced more than 1,097 research projects, 218 professional publications, 453 Presentation at professional conferences, 20 books, and has garnered 38 awards. More than 4,000 undergraduate students enroll in faculty-mentored CI projects each year. Projects are described in an annual print magazine, Decipher, an iTunes app and video clips for ClemsonTV -- all are entirely produced by teams of students.

A complex assessment method comprised of a database, surveys and student clearance data has been developed to monitor the diversity, number and productivity of CI projects. To manage and analyze projects, a database integrated into the CI website and interfaced with the university’s student information system is used to collect and manage project information including proposals, goals, objectives, student enrollment, productivity (e.g. publications, patents, learning outcomes met) and financial expenditures. Surveys distributed to students, faculty and alumni are used to compare CI impacts, identify trends, and accentuate data in the CI database. Data are used to guide the future direction of Creative Inquiry and to establish this unique form of engaged, multi-disciplinary undergraduate research as a crucial feature of the university's long-term strategic plans. Assessment of the Creative Inquiry program is continuous and constantly expanding in scope and complexity. Access to institutional databases combined with long-term tracking of CI alumni is anticipated to provide profiles that can document the personal impacts and institutional return on Clemson’s substantial investments in this innovative undergraduate research program.

Session Type: Single Presenter
Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3705 Manatee

ScholarBridge: a Proven Online Resource for Student-Mentor Matching and Administrative Assessment
Presenter: Michael Rauch
ScholarBridge (SPONSOR)

At the institutional level, managing and maintaining an undergraduate research program comes with numerous challenges. Two of which in particular, (i) facilitating the process of matching students with mentors and (ii) overseeing the undergraduate research population for tracking and assessment, can be best tackled via the use of the online resource, ScholarBridge. ScholarBridge, at its core, is a searchable database of faculty and their research interests and opportunities, which students can navigate when they begin their search for an undergraduate research role. Faculty participate because ScholarBridge is built for their ease of use: opportunities are created by checking through simple surveys, the “opt in” function allows for their pages to be pre-populated from their current web presence, and settings are customizable. Students are eager to participate, as ScholarBridge provides the best answer to the most common first question: “How do I get started?” As an administrator, ScholarBridge provides institutional members access to a real-time data hub which includes hundreds of metrics regarding undergraduate research on campus. How many faculty have current summer opportunities? What are the qualifications mentors are looking for? How many female students are looking for STEM opportunities? What percent of first generation college students performed research this year? Tools are embedded in the hub to facilitate the administrative role: a contact portal to communicate with the undergraduate research campus community, a match-tracker to keep current lists of student researchers, reports downloadable to excel at any time and posting capabilities to share events at any time. ScholarBridge was founded, and is operated by, a group of former undergraduate researchers and current researchers. Join us in this session in which we will explain how to use ScholarBridge, mainly through case studies from a select group of our institutional members.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3704 Tarpon

Teaching Through Research in the Sciences: a Student Cohort Model

Presenter: Weston Dripps
Furman University

All Bachelor of Science students within the Department of Earth and Environmental Sciences are required to complete a senior thesis based on original research completed during the summer prior to the senior year. During fall of their senior year, students enroll in a course designed to methodically guide them through the process of writing their senior thesis. Students meet as a cohort with an instructor twice a week and then individually with their thesis advisor on a weekly basis. The course provides detailed instruction on writing the various components to a thesis and requires that students generate multiple drafts of each section of their thesis with set deadlines. Upon completion of the course, students have written a full draft of their thesis, and have submitted an abstract to a professional meeting. The spring term is used to further revise the thesis, present the work at a professional meeting, and defend the thesis at a public departmental defense. The recent addition of this course to the curriculum has provided substantially more instruction, structure, and collaboration within the research process, has significantly improved the quality of the research work, and has enhanced the thesis learning experience. The cohort model has changed what was previously an individual, independent, fairly isolating thesis experience to a peer supported, communal, collaborative bonding endeavor. This model requires a significant time commitment and active participation by all faculty overseeing thesis projects in order for it to be successful. From a curriculum development standpoint, the course has allowed the department to identify the core skills students need to successfully complete the senior thesis as well as exposed some competency weaknesses (e.g. graphing skills, hypothesis development, managing large datasets), which have subsequently been scaffolded throughout the curriculum, so that students build these skills prior to engaging in the senior thesis.

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3708 Sandhill Crane

Making the Invisible Materialize: Accounting for Undergraduate Research in Faculty Workload

Presenter: Alicia A. Slater
Stetson University

Participation in undergraduate research is a highly impactful experience for students, yet many institutions struggle with how to account for this valuable work when computing faculty workload. Assigning faculty appropriate credit for this work is essential to the sustainability of an undergraduate research program. Proper accounting of workload allows for strong mentoring and ongoing faculty interest in maintaining an undergraduate research program. A first step towards attaining a sustainable program is incorporation of undergraduate research into the curriculum. Many institutions do this without thought regarding how to account for the faculty contribution. The Biology Department at Stetson University, and the University in general, have a strong history of supporting undergraduate research for students. All students conduct a faculty mentored senior research project which, in Biology, comprises a 4-part course sequence including biostatistics, experimental design, proposal writing, execution of a project, and presentation of results. Faculty and student collaborations in the department have resulted in numerous publications and Presentation. However, for many years mentoring of senior research projects was not included in workload calculations. This presentation will describe how a Biology department at a PUI incorporated undergraduate research into the curriculum and, finally, into faculty workload. Accounting for mentoring of senior research ensures workload equity across faculty, strong mentoring of students, and helps support sustainability of a research-imbedded curriculum.
Innovation and Collaboration in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 2703 Honors

Industrial Research in Math, Stats, and Computing for Undergraduates

Presenters: Michael Dorff
Brigham Young University

PIC Math is a new program to prepare undergraduate students in the mathematics and statistics to succeed in careers in business, industry, and government (BIG). Funded by a $2 million NSF grant, this program strives to (a) increase awareness among faculty and students about non-academic career options, (b) provide undergraduate research experience using problems from industry, and (c) prepare students for industrial careers. The program includes a 3-day faculty summer training workshop, a spring semester course in which students learn skills and work on research problems from industry, and an end-of-program research conference at which the students present. For the semester course, we have developed a set of educational and informative videos and prepared materials for the course such as sample syllabi, set of sample research problems from industry, sample student solutions to industrial research problems, and sample videos of student presenting their research.

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3700 Sabal

Stimulating Undergraduate Research in Biological Sciences at Virginia Union University via Collaboration with the U.S. Department of Homeland Security

Presenter: Carleitta L. Paige-Anderson
Virginia Union University

Sponsored by the U.S. Department of Homeland Security (DHS) Scientific and Technology Directorate, Office of University Program, the Summer Research Team Program aims to increase and enhance the scientific leadership at Minority Serving Institutions in research areas that support the mission and goals of the agency. Virginia Union University (VUU), located in Richmond, VA, is one such institution where research activity is limited due to the faculty teaching demands. However, in the Department of Natural Science, there is a breadth of research interests and discipline-specific expertise. As a Biochemist with emphasis in pathogenic organisms, Dr. Carleitta Paige-Anderson was selected by DHS to lead two independent research programs through the Summer Research Team Program. Briefly, Dr. Paige-Anderson was responsible for developing and proposing scientific endeavors in collaboration with DHS Centers of Excellence. As a result of these efforts, VUU undergraduate students conducted basic science research in state-of-the-art laboratories. Dr. Paige-Anderson created laboratory modules to facilitate student learning and scientific career awareness. Further, these research endeavors have lead to a full undergraduate research program at VUU, and has strengthened the minority talent pool of scientists with experience in DHS research needs.
Internationalization and Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3702 Orchid

Internationalizing Undergraduate Chemistry Research at Northern Kentucky University
Presenter: Isabelle Lagadic
Northern Kentucky University

Recent surveys reported that 78% of employers think that all college students should gain intercultural skills and an understanding of societies and countries outside the United States. Employers also rate internationally educated students as higher performers on a range of competencies. Preparing undergraduate students to succeed in a society and work platforms rapidly moving toward globalization is becoming increasingly important in all fields. For the STEM (Science, Technology, Engineering and Mathematics) disciplines with sequential and tight curricula, providing undergraduates with study abroad experiences is very challenging. Yet, most of the future jobs awaiting current undergraduates will involve one or more STEM disciplines and will require a sense of global skills and ability to work effectively across cultures and languages. Internationalizing the chemistry curriculum is difficult due to language barriers, course contents and sequences. However, research is an area where these issues can easily be circumvented and is a way to provide chemistry students with exposure to today’s global society. Over the past five years, the department of chemistry at Northern Kentucky University (NKU) has established an International Summer Research Exchange program that hosted 25 students coming from China, Ecuador, France and Romania to conduct summer research alongside NKU chemistry faculty and students. Recently, two NKU chemistry majors had the opportunity to work on research projects at our partner institutions in France and Romania, and next summer, a cohort of five NKU science major students will join research groups in Ecuador, France and Romania to work on projects in environmental sciences, chemistry and biochemistry. This presentation will highlight the key features of this innovative program, and will discuss how faculty can develop successful international student exchange programs for undergraduate research in STEM disciplines, as well as how to find and secure funding through multiple institutional partners.

Preparing Future Faculty for Undergraduate Research Mentoring
Presenter: Candace Rypisi
California Institute of Technology

Although the impact of undergraduate research has been widely researched (Kuh, 2008; Lopatto, 2004, 2010; Hunter et al. 2007), there is less known about what constitutes high-quality, effective mentoring. This omission represents a critical gap in our ability to build effective systems for preparing and supporting faculty, and future faculty, mentors. In this session we will describe Caltech’s approach to better understanding 1) what characterizes the individual development of the undergraduate research mentor; 2) what experiences, perceptions, and conditions support or inhibit one’s individual development as an undergraduate research mentor; and 3) how can professional development programs foster the individual development of the undergraduate research mentor. Caltech is uniquely positioned to impact the future faculty pipeline. Caltech’s undergraduates go on to graduate study at high rates (79% of alumni ultimately obtain a graduate degree), and graduate students and postdocs pursue faculty careers in substantial numbers. Caltech is ranked a top (by institutional yield-ratio) baccalaureate-origin institution for doctoral recipients between 2002 and 2011 in the United States (NSF, 2014). Because of this, we chose to focus this study on the graduate student and postdoctoral scholar co-mentors who assist faculty in mentoring the undergraduate researcher. Using the Mentoring Competency Assessment, a 26-item validated tool designed by the University of Wisconsin-Madison, we conducted a pre and post survey of our 2015 undergraduate research co-mentors. This assessment aligns with six core mentoring competencies: aligning expectations; maintaining effective communication; assessing understanding; fostering independence, addressing diversity; and promoting professional development. We also conducted six, 1.5 hour workshops based on these competencies. The curriculum was based on materials from Mentor Training for Clinical and Translational Researchers (Plund et al. 2013) and Entering Mentoring (Plund et al. 2015). The curriculum was enhanced with information on student development theory, learning theory, and diversity concepts.
Session Type: Single Presenter

Presentation Date and Time: 6/27/2016—4:10 PM-4:30 PM—Room Assignment: 3709 Heron

A Study of Undergraduate Research Funding in Higher Education
Presenters: Marisa Moazen | Kolin A. Konjura
                 University of Tennessee at Knoxville | University of Tennessee at Knoxville

The purpose of this study was to understand the impact of resource allocation on undergraduate research activities within institutions of higher education. The research questions that will be addressed include: 1. What types of undergraduate research activities occur within institutions of higher education? 2. Is there a common funding model for undergraduate research? 3. Is there a correlation between student participation and institutional support for undergraduate research?

4:30 p.m.-5:30 p.m.—CUR-Goldwater Scholars Faculty Mentor Awardee celebration

Carol Parish, Professor of Chemistry, University of Richmond

Dinner

5:30-7:30 p.m.—Dinner (Royal Palm Ballroom) and
                 2708 (Plaza)/2709 (Hillsboro) – overflow rooms
Monday, June 27

Poster Session II

5:30-8:00 p.m.—Poster Location: ATRIUM—SECOND FLOOR
poster sessions

Assessment of Impact of Undergraduate Research

Poster #27—Utilizing Undergraduate Researchers to Assess and Share Undergraduate Research Outcomes
Presenter: Susan J. Larson
Concordia College—Moorhead

Diversity and Inclusion in Undergraduate Research

Poster #28—Equitable Distribution of Undergraduate Research Funds
Presenters: Sheela Sharma | Nicole Schlaack
University of Hawaii at Manoa

Poster #29—Mentoring Practices that Support Underrepresented Students in Research and Creative Scholarship
Presenter: Jenny Olin Shanahan
Bridgewater State University

Poster #30—A Winning Proposition: Engaging Student-Athletes in Mentored Undergraduate Research
Presenters: Paul C. Miller | Eric E. Hall
Elon University

Integrating and Building Undergraduate Research into Curriculum and Coursework

Poster #31—A Model for Providing Taste-of-Research Experiences within Mathematics Courses
Presenter: Patrick X. Rault
State University of New York—Geneseo

Poster #32—A Mosaic Presentation of Undergraduate Research in Computational Physics
Presenter: Haiying He
Valparaiso University

Poster #33—Model of Cross-Disciplinary Undergraduate Research Curriculum in Social Sciences: Preparing Political Science & Psychology Majors for Innovative Leadership
Presenter: Rachel F. Pickett
Concordia University Wisconsin

Integrating and Building Undergraduate Research into Curriculum and Coursework

Poster #34—Arts & Humanities Outreach and Inclusion
Presenters: Linda Blockus | Michael E. Cohen
University of Missouri | University of Missouri—Columbia

Poster #35—A Unique Training Program for Teaching Assistants in the Freshmen Research Initiative
Presenter: Elizabeth J. Sandquist
Iowa State University

Poster #36—Integrating Discovery-Based Research into the Undergraduate STEM Curriculum: A Convocation Report from NAS
Presenters: Laura A. Guertin | Elizabeth L. Ambos | Jeffrey G. Ryan
Penn State Brandywine | Council on Undergraduate Research | University of South Florida
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<td>Anunay Bhattacharya</td>
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### Innovation and Collaboration in Undergraduate Research

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### Internationalization and Undergraduate Research

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<td>The School for Field Studies</td>
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### Other

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<td>Scott Bates</td>
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Other

**Poster #50—The State of the Nation: Development Resources for Undergraduate Research Mentors in the US**
Presenter: Candace Rypisi  
California Institute of Technology

**Poster #51—Social Science Division Highlights**
Presenter: Cynthia A. Merriwether-DeVries  
Juniata College

**Poster #52—URMentoring: A New Resource for Faculty**
Presenter: Rebecca M. Jones  
George Mason University

**Poster #53—Leveraging Students to Launch an Undergraduate Research Journal**
Presenter: Jane Rogan  
Indiana University

**Poster #54—Promotion of Student Involvement in Research Pathways through Research and Career Oriented Activities**
Presenter: Elizabeth V. Velilla  
United States Military Academy at West Point

**Poster #55—Integrating Research Literacy into a First-Year Seminar Course**
Presenter: M.G. Aune  
California University of Pennsylvania
Tuesday, June 28

7:30 a.m.—Breakfast [Royal Palm Ballroom]*

* Breakfast—Many Hotel and Dorm Packages include Breakfast. We will have limited breakfast items available for those that will not receive breakfast elsewhere.

8:30 a.m.–9:30 a.m.—Plenary 3 (Oval Theatre)

Speaker: Stuart Hampton-Reeves  
BLaSS College Director of Research University of Central Lancashire

“All the World’s an Undergraduate Research Stage: Toward a Global and Multi-Disciplinary Model for Research-Informed Teaching”

Undergraduate research is becoming increasingly internationalized in a way that has the potential to transform the teaching-research nexus across the world. This year marks three very significant milestones – the 30th anniversary of the National Conference on Undergraduate Research, the first World Congress of Undergraduate Researchers and … the 400th anniversary of the death of William Shakespeare. As I am also a Shakespearean scholar, this is a prompt for me to reach into my own discipline to think about what lessons Shakespeare might have for today’s undergraduate researchers. Shakespeare often used the theatre as a way of conceptualizing the world and I will adopt the same approach. I will argue that an ensemble approach to research at an undergraduate level can lay the foundation for a new model of scholarship fit for the 21st Century.

Break

9:30-9:45 a.m.—Break (Royal Palm Ballroom)

Concurrent Session 10

9:45-10:55 a.m.
20 min single presenter presentations, 30 min dual presentations, and 60 min panel presentations

9:45-10:05 a.m.
20 min single presenter presentations

Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—9:45 AM-10:05 AM—Room Assignment: 2702 Legacy

Undergraduates and American Indians: Developing a Diverse Research Program
Presenter: Gary L. Padgett  
University of North Alabama

Over the last three years, the author has been working to develop both an undergraduate research program as well as a relationship between the university and American Indian communities. These two goals have coalesced into a program in which undergraduate researchers have traveled to, and conducted research within, American Indian communities. This attracted undergraduate researchers and helped to establish professional ties within these communities. Using a community based participatory model, which was modified to include the undergraduates as well as the American Indian communities, the research resulting from this program has been rewarding. This presentation will focus on the development of this program and the process of creating a similar undergraduate research program. It will also address the challenges that arise during the building of such a program and possible solutions to them. The success of this program will also be analyzed, as well as the increased level of diversity this has brought at the college and university level.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—9:45 AM-10:05 AM—Room Assignment: 3704 Tarpon

The Communication Capstone: a Flexible Undergraduate Research Experience that Caters to Diverse Individual Student Needs

Presenter: Lois Foreman-Wernet
Capital University

Like many colleges across the country, Capital University has for the past decade made increasing efforts to engage undergraduate students in research projects guided by, or in collaboration with, faculty mentors. This presentation will provide an in-depth look at the development of the current capstone course within the Department of Communication, a review of successes and challenges, and a discussion of preliminary assessment efforts. The capstone course grew out of a desire on the part of faculty to create a more flexible and relevant scholarly experience for students, replacing the existing communication research class that was required for all departmental majors. The Department of Communication serves students with a broad range of interests and abilities, and it includes majors in communication studies, organizational communication, public relations, electronic media and film, and theatre studies. The capstone course is intended to provide each student in the department with an opportunity to produce scholarship that highlights the integration of his or her interests, coursework, knowledge, skill, and experiential learning. During the semester the student is enrolled in the capstone course, he or she works individually with a faculty mentor to conduct research, do in-depth study of a specialized topic, or develop a substantial creative project. Thus, the capstone also can help to bridge the undergraduate experience and professional employment or graduate school. This approach to undergraduate scholarship may offer a useful model for other schools looking to accommodate the needs of a diverse group of students and a curriculum that straddles the liberal arts and professional orientations.

Innovation and Collaboration in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—9:45 AM-10:05 AM—Room Assignment: 2703 Honors

Matching Student Ability with Institutional Need: A Model for Integrating First-Year STEM Majors into Developmentally Appropriate Research Projects at a Liberal Arts College

Presenter: Angelia D. Gibson
Maryville College

The Scots Science Scholars [S3] program is funded by the National Science Foundation to increase the number of graduates in science, technology, engineering and math (STEM) majors at Maryville College, a liberal arts college in East Tennessee. A summer bridge program, a STEM-focused seminar course, and participation in research are fundamental aspects of the first-year of S3 for students. While early participation in research is known to be a predictor for retention in STEM, meaningful integration of first-year students in STEM research projects can be especially challenging at strictly undergraduate institutions. First-year students often lack necessary analytical and technical skills to function effectively and independently thus requiring extensive training and close supervision; without a team of graduate students, post-docs or lab techs, faculty members often struggle to find the time to mentor students while also carrying heavy teaching and administrative loads. We describe a model for matching students in the S3 program with developmentally appropriate research projects that fulfill a variety of needs at the college. While some projects, for capable and interested students, are scholarly in nature, others fulfill institutional needs at the college or assist with course improvements. Some are individual research projects; many are small group or even class projects. Regardless of the nature and format, the students gain experience with data collection, analysis, and presentation while working with a faculty member or senior student. Students gain a sense of ownership, while fulfilling institutional needs and often learning skills that will be essential for more independent research in their fields. We will discuss the successes and pitfalls of the model and describe both student and institutional outcomes.
Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—9:45 AM-10:05 AM—Room Assignment: 3700 Sabal

Peer-Assisted Team Research: A Method for Undergraduate Research

Presenter: Lori Sims
City University of New York-Brooklyn College

Peer-led teams design and conduct a series of increasingly complex research studies on interdisciplinary topics. PATR students who practice and master scientific reasoning begin to see themselves as “scientists”, become more engaged in science and are motivated to take more STEM classes. PATR provides a basic template, readily adaptable to a variety of institutional settings: general education and introductory major’s courses, honors supplements to STEM classes without labs, and co-curricular activities such as science clubs. A PATR module consists of: An article from the popular media to engage interest; a professional article on the same topic students read using a method that links key concepts and helps them visualize the experiment; an open-ended set of experiments students plan and analyze; a discussion component encouraging students to think about the research’s broader applications and implications. Some of tested topics include: Effects of Stress on Cortisol Levels; Effects of Xenoestrogen on Guppies; Science of Junk Food; Experimental Evolution of Multicellularity. Preliminary data reveal PATR students understand the research process better, 57% of students felt they understood the research process after one module, compared to 100% after three modules. Only 43% of the students felt confident in their ability to design a good experiment before doing any modules, increasing to 63% after completing one module, and 80% after completing three. We are currently working with representatives from four community colleges to distill the most important elements of the PATR method, expand the cache of tested module topics, and disseminate them broadly so that others in different academic settings can test and adapt PATR to fit their institutional needs. The project will also generate research findings on the correlations between participating in PATR and higher-level abstract reasoning abilities required to plan and conduct research, using behavioral assessment and standardized test instruments.

9:45-10:15 a.m.
30 min dual presentations

Assessment of Impact of Undergraduate Research

Session Type: Dual Presenters

Presentation Date and Time: 6/28/2016—9:45 AM-10:15 AM—Room Assignment: 3708 Sandhill Crane

Improving Undergraduate Education Through Community Building and Adoption of an Evidence-Based Practice To Evaluate Undergraduate Research

Presenters: Jill Singer | Elizabeth L. Ambos
State University of New York-Buffalo State | Council on Undergraduate Research

With funding from the NSF Division of Undergraduate Education’s WIDER program, an evidence-based evaluation model for guiding undergraduate research (UR) is being scaled up to the national level. The project is a collaboration among SUNY—Buffalo State, Science Education Resource Center (SERC) at Carleton College, CUR, Finger Lakes Community College, and CSU Channel Islands. The model, developed at Buffalo State in 2008, has been proven effective with both new and experienced faculty mentors from a wide range of academic disciplines. The model includes multiple assessments for 11 outcome categories each defined by 3-4 components. Repeated structured interactions between the student and faculty member provide mentoring and help the student recognize and better understand their strengths and areas for improvement. The evaluation is being established at SERC using its Content Management System and resources are being developed to explain how the evaluation is implemented. Pilot testing at a limited number of institutions is taking place in 2016-2017 with expansion to more institutions in 2018. CUR is responsible for recruiting 2- and 4-year institutions to participate in pilot testing of the evaluation. This session will provide an update on the project’s progress and next steps, including the process for applying to be a pilot test site providing feedback about implementing the evaluation.
Diversity and Inclusion in Undergraduate Research

Session Type: Dual Presenters

Presentation Date and Time: 6/28/2016—9:45 AM-10:15 AM—Room Assignment: 3711 Egret

Entering the Disciplinary Discourse Community: Undergraduate Researchers Navigating Disciplinary Norms of Written and Spoken Communication

Presenter: Natasha D. Oehlman
California State University—Monterey Bay

A key component of undergraduate research is the generation of new information and the communication of these findings to multiple audiences. In order to do this, students must take the leap from writing class assignments to writing and presenting academic research in specific disciplinary contexts (i.e. conference sessions). Students often have difficulty grasping abstract concepts like audience, purpose and genre within their discipline. Mastering the norms of communication in their disciplinary discourse community can be difficult for students because they are moving into a new domain of trying to understand the discipline while also being expected to write with four discrete kinds of knowledge: writing process knowledge, subject matter knowledge, rhetorical knowledge, and genre knowledge (Beauford, 2007, 17). Before students take this leap, it’s helpful to ground the discussion in learning about the discourse community: language used by speakers and writers in actual communicative contexts (Kutz, Groden & Zamel, 1993). Learning about and situating themselves in their home, school, and disciplinary discourse communities can help students see that language is used in particular rhetorical contexts for particular purposes. This session will present a series of writing, listening, and observational activities designed specifically for undergraduate researchers—a diverse population of students, mostly first-generation in college, underrepresented minority, and/or low-income—to introduce to them the concept of discourse community. Specific modules will be presented along with results from students’ reflections about their experience with observing and entering their discourse communities. Information on how to adapt and implement these models will also be provided.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters

Presentation Date and Time: 6/28/2016—9:45 AM-10:15 AM—Room Assignment: 3705 Manatee

Multidisciplinary Undergraduate Research Certificate With Community-Based Research

Presenters: Catherine Jean Batsche | Kathleen A. Moore
University of South Florida

RISE is a multidisciplinary undergraduate research certificate that provides students with a Research Intensive Undergraduate Experience. The certificate includes 16—20 hours of coursework that builds on courses in five academic majors as well as courses specifically designed for the certificate. Students complete introductory courses in research and community-based research, statistics, research methods, applied research methods, writing for research and publication, and mentored research/thesis. The certificate is posted on the university transcript thus providing students who are applying to graduate school or jobs with a credential signifying their completion of a systematic undergraduate research preparation program. The certificate was designed to encourage students to begin participating in research early in their undergraduate career and to pursue continuous research mentorships that lead to completion of an independent research project by the time they graduate. In addition, the certificate guides students toward the goal of disseminating the results of their research at a national conference or in a peer-reviewed publication. After students complete the Introduction to Research course, they are eligible to apply for Undergraduate Research Assistantships. As they gain more research experience, they may be promoted from Research Assistant I to Research Assistant II and III, until they reach the highest level, RISE Scholar. RISE students participate in community field experiences to gain experience interacting with professionals who rely on the results of research to enhance services and who inform the research conducted in their disciplines from a community perspective. They have the opportunity to learn about factors that influence the implementation of evidence-based practices in the field. This session will describe the structure of the Undergraduate Research Certificate, community field experiences, the process for matching students with faculty mentors, and program outcomes. The certificate will be described from the viewpoint of faculty, students, and community members.
Session Type: Dual Presenters
Presentation Date and Time: 6/28/2016—9:45 AM-10:15 AM—Room Assignment: 3713 Challenger

The Confluence of High Impact Practices: Undergraduate Research and Common Intellectual Experiences, Learning Communities, and Global Learning
Presenters: Mary Ann Studer | Jo Ann Burkhardt
Defiance College

This session will focus on one institution's model of undergraduate research that was intentionally designed to combine several high impact practices under a specific short-term study abroad initiative. The presenters will briefly review the high impact practices (Kuh, 2008) and their benefits. Following this brief introduction, the presenters will describe the model and provide information pertaining to methods of developing international community partners. These partnerships allow students to explore specific cultures and consider the professional implications of developing a broader world view. Undergraduates participating in this model engage in research to work, in partnership with international partners, on their identified needs. These needs have included water testing, sanitation, diagnosing tuberculosis and malaria, understanding intellectual disabilities and understanding natural forms of birth control. In addition, the presenters will provide information pertaining to the design and establishment of year-long learning communities. Within these learning communities, undergraduate students participate in common intellectual experiences. These experiences include writing cogent research question, developing literature reviews, and participating in collaborative assignments designed to promote intercultural competence. Throughout this year-long experience, undergraduates begin to view the world through their own disciplinary lens and initiate an understanding of the interdisciplinary nature of undergraduate research.

Session Type: Dual Presenters
Presentation Date and Time: 6/28/2016—9:45 AM-10:15 AM—Room Assignment: 4200 The Chamber

Credit Where Credit Is Due: The Faculty-Student Research Banking System as a Means to Incentivize Faculty-Mentored Research
Presenters: Christopher Kim | Anna Leahy | Lisa Kendrick
Chapman University

Chapman University, a 4-year comprehensive masters university located in Southern California, has developed a system that aims to facilitate independent research for undergraduate students who wish to receive academic credit while simultaneously awarding teaching credit to faculty members who mentor this research. This faculty-student research banking (FSRB) system, developed by Chapman's Office of Undergraduate Research and Creative Activity (OURCA) with feedback and support from the Faculty Senate, Senate Executive Board, and Offices of the Chancellor and Chief Operating Officer, addresses the faculty time issue by counting student research credits towards faculty teaching loads, enabling the accumulation of a set number of credits (24) to be exchanged for a 1-course reduced teaching load in a subsequent academic term, effectively considering the mentorship of student research as equivalent to teaching. Details of the fiscal model created to establish financial support of the FSRB program by the university, iterative adjustments to the program guidelines implemented after an initial 1-year trial period, and data/assessment from the first 3 years of its operation including demographics, participation rates and financial implications will be provided, with focus on the specific structures developed and lessons learned. This should ideally provide a template/pathway for other institutions to apply and create similar banking systems that effectively support and incentivize faculty participation in student research and creative activity.
9:45-10:45 a.m.
60 min panel presentations

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Panel Presentation
Presentation Date and Time: 6/28/2016—9:45 AM-10:45 AM—Room Assignment: 3702 Orchid

Preparing Students for the CURE Environment: Perspectives in Implementing Active Learning to Develop Critical Thinking and Research Design Skills
Presenters: Lynnsay A. Marsan | Christina E. D’Arcy | Danielle X. Morales
University of Texas at El Paso

During their college years many students change from their planned major in the STEM disciplines to another, non-STEM, major. When students come from underrepresented minority or underprivileged groups, retention rates in STEM significantly drop when compared to non-minority students. Contributing factors among minority students include self-perceived and actual lack of preparation, and quality of the research education experience at their institution. The University of Texas at El Paso (UTEP) has traditionally served underrepresented minorities in the STEM fields. As of Fall 2015, approximately 83% of UTEPs 22,220 undergraduate students are of Hispanic ethnicity, 65% are Pell Grant eligible, and 57% are first-in-family to attend college. Thus there is an impetus at UTEP to train and retain students in STEM fields, through participation in undergraduate research experiences, one of the highest educational impact practices. Recently, as a recipient of NIH-BUILD and HHMI-Sustaining Excellence grants, UTEP launched faculty-led, research-intensive lecture and laboratory courses. The goal is to increase the number of opportunities for students to have authentic research experiences, spark their interest, and increase retention in STEM. Before engaging in these classroom undergraduate research experiences (CUREs), freshmen students enter a research foundations preparatory course. This course is designed to introduce students to basic aspects of scientific research, irrespective of discipline. Special attention is given to the development of essential skills such as oral and written communication, record-keeping, finding and analyzing primary peer-reviewed literature, data presentation, responsible conduct in research, hypothesis development and critical analysis of experimental design. Classes take place in Student Centered Active Learning Environment for Upside Down Programs (SCALE UP) facilities with curricula designed to engage students in group discussions, facilitate peer-teaching and learning, and make use of technology and traditional resources to engage and maintain students’ interest. In this panel, instructors discuss successful strategies and challenges to this approach.

Innovation and Collaboration in Undergraduate Research

Session Type: Panel Presentation
Presentation Date and Time: 6/28/2016—9:45 AM-10:45 AM—Room Assignment: 3707 Oak

From Research to Innovation: Undergraduate Research to Address Societal Needs
Presenters: Janice DeCosmo | Anne A. Boettcher | Patrick J. Killion | Sean T. Ma
University of Washington | Embry—Riddle Aeronautical University | University of Maryland, College Park | University of Michigan—Ann Arbor

Over the past two decades, universities have built campus initiatives that now provide student access to undergraduate research. We are involved in new collaborative work that builds on undergraduate research to engage students in innovative thinking to solve critical social problems. Bringing together faculty and staff skilled at leading students through undergraduate research, civic engagement, and entrepreneurship-based activities, this interdisciplinary, integrated approach requires students to draw upon their skills and knowledge in diverse areas of experience to solve authentic social problems. This effort combines students’ and employers’ interests in developing career-ready skills with a desire to guide students to address critical social needs in creative and unusual ways. We seek to inspire students to develop a personal practice of examining how research and technology can contribute to improving societies, while preparing them for an employment landscape dominated by startups and rapidly evolving work environments. The Universities of Michigan, Maryland, Washington, and Embry-Riddle Aeronautical University have developed initiatives that provide this type of integrated learning environment for their students, each with a slightly different focus. This session will explore models of this type of learning, and will invite audience members to create ideas for their own campuses, selecting unique combinations of goals, approaches, and collaborations that could work in similar ways for their students. Models include research focused entrepreneurial training for students to work with local businesses that serve community needs; community-defined research projects that engage undergraduates to benefit organizations and communities; entrepreneur-mentored, student team-based approaches to developing solutions to community challenges; and one model that targets first-year students to engage in faculty-mentored research that engages emergent social issues. These models will be presented in a panel format, followed by audience participation in creating new campus-centered ideas and discussion of various attributes of successful programs.
Session Type: Panel Presentation

Presentation Date and Time: 6/28/2016—9:45 AM-10:45 AM—Room Assignment: 3709 Heron

Advancing Undergraduate Research in Professional Schools: A Focus on Models that Serve Teacher Preparation Programs

Presenters: Ruth J. Palmer | Dennis Munk | Kymberly Harris | Deborah L. Thompson | Jennifer Manak
The College of New Jersey | Carthage College | Georgia Southern University | The College of New Jersey | Bridgewater State University

Schools of Education, in building their preparation programs, must respond to rigorous accreditation standards and critical state credentialing requirements. Thus, curriculum renewal and/or instructional re-design processes, even when they include the incorporation of high impact learning experiences, require deliberations and negotiations across multiple departments and specializations. Like other professional schools, Schools of Education face the challenge of the full adoption of undergraduate research, despite the fact that the practice of teacher research has had a long, rich history in the professional development of practicing teachers (Lytle & Cochran-Smith, 1992). However, over the decades, teacher educators have adopted best practices and programs that incorporate undergraduate research (UR) opportunities across the teacher education curriculum. This proposed session features four cases of these practices/models, both traditional and evolving, that teacher educators have introduced and implemented in their courses and/or programs. Traditional models are those adopted into education from practices in other disciplines; evolving models represent a range of approaches that have emerged primarily from an ideological position of extending UR to all students. Our singular goal is to extend the on-going conversation among teacher educators regarding how to add to the transformation of undergraduate education through the critical thinking that undergraduate research supports. This presentation will be organized in two sections: first, four (4) five-minute descriptions of how the identified program/practice/research projects were initiated and got established. These will serve as the basis for the second session—a guided discussion, aimed at generating the sharing of other approaches. Specific attention in the discussion will be given to the assessment of these practices. This session is conceptualized as a valuable and generative networking session for members of the new Education division. It has the potential of contributing significantly to an agenda of active CUR advocacy on behalf of professional schools.

10:10-10:30 a.m.
20 min single presenter presentations

Assessment of Impact of Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—10:10 AM-10:30 AM—Room Assignment: 2707 Spirit

Impact of STEM Capstone Undergraduate Research Courses at Saint Augustine’s University

Presenter: Mark A. Melton
Saint Augustine’s University

We provide strong evidence supporting a model of success for students who gain undergraduate research experiences in two capstone courses. Results show in a variety of ways how exposure to undergraduate research throughout the academic year, enhances the STEM preparation process. Further, STEM graduation rates increased overall and acceptance of students into graduate or professional school increased. The improvements in student preparation for graduate school and entry directly into the STEM workforce are likely due in part to the hands-on learning opportunities from exposure to undergraduate research. This capstone course model is broadly applicable for STEM programs at other institutions in general and HBCUs, in particular. Students are also exposed to extensive research training and graduate school opportunities as part of the Science Seminar Series. Coupled with extensive research training, rigorous curriculum, meaningful faculty mentoring and advising, students are more likely to remain and flourish in STEM careers. Despite the financial challenges, lack of infrastructure and limited resources, Saint Augustine's University has been successful recruiting, retaining, and preparing underrepresented students for graduate/professional school and careers in STEM.

Tuesday, June 28, 2016—10:10 a.m.—10:30 a.m.
Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—10:10 AM-10:30 AM—Room Assignment: 2702 Legacy

Virginia Union University: Undergraduate Research at a Small Liberal Arts and Minority-Serving Institution
Presenter: Carleitta L. Paige-Anderson
Virginia Union University

Established in October 2014, the Virginia Union University (VUU) Center for Undergraduate Research (CUR) is designed to provide interdisciplinary research experiences that increase student competitiveness for professional careers and/or graduate studies. Virginia Union University is a liberal arts university deeply-rooted in effective teaching. However, undergraduate research as a pedagogical practice has been under-utilized. As a result of new institutional strategic priorities, the university administration has emphasized undergraduate research for all students. “Panther Pipelines: Aspire. Inspire. Be Transformed” was the inaugural event for the CUR. In addition to introducing the CUR to the VUU community, the event informed students of the different ways in which research skills can be used across various academic disciplines and careers. To encourage active engagement of undergraduate students in the research process, the CUR hosted “Panther Pipelines: Discovery Day” to highlight the research and creative inquiry activities and interests of VUU’s undergraduate students and university stakeholders (faculty, staff, alumni, and community partners). Further, the CUR also launched the PantherQuest interdisciplinary team program to stimulate scholarly endeavors. As a new institutional resource, the VUU CUR has implemented a student-centered approach to develop an effective paradigm for undergraduate research.

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—10:10 AM-10:30 AM—Room Assignment: 3704 Tarpon

An Integrated Scaffolded Research Experience for Psychology Majors
Presenter: Karen L. Gunther
Wabash College

In 2007 we re-vamped the psychology major to scaffold the research experience of our students. Introductory Psychology (PSY101) focuses not only on the content, but also on the science behind how we learned the facts we know, and how to gather data. Research Methods & Statistics (PSY201 & 202) encompasses two semesters. In the first semester we focus on the philosophy of science, experimental design, descriptive statistics, and elementary inferential statistics. The students conduct replication projects of faculty-chosen published studies (from a list of approximately 10). In the second semester the students learn more inferential statistics, SPSS, and they create stats binders with instructions on when and how to use each statistic – they reference these binders throughout the rest of the major. The students also expand their replication projects by testing a second factor. Each psychology major is also required to take two of the five sequences in the content areas that the faculty specialize in (sensation & perception, cognitive, social, developmental, and behavioral neuroscience). The first semester (200-level courses) is primarily content. The second semester (300-level courses) is a Research in [Content Area] course. These range from journal-club format to replication projects to novel research conducted by the class as a whole. Majors are also required to take Literature Review (PSY301), where they conduct a review of the literature in an area of interest to them, using a minimum of 20 peer-reviewed sources. The literature review may provide the background for the senior year capstone research project (PSY495/496) that all psychology majors complete. In the capstone, students perform novel faculty-initiated research in one of our labs. All students give an oral presentation at the MidAmerica Undergraduate Psychology Research Conference, and a poster presentation on campus. In addition, several capstone projects have resulted in publications in peer-reviewed journals.
Urban Regeneration Collaborative: Stakeholder and Data Analyses for Catalytic Projects in Vacant Parcels
Presenter: Samia R. Kirchner
Morgan State University

ARCH403 Studio is an Urban Regeneration Collaborative where Bachelor of Architecture and Urban Design students use Stakeholder Surveys, Design Dialogue, Baltimore City Data as tools to generate Baseline Priorities for catalytic “infill” projects in vacant parcels. This semester, students examined an area equivalent to six blocks where the city demolished 98 homes to create a redevelopment site. They partnered with the Neighborhood Community Organization, the University Initiative on Leadership and Excellence, a non-profit organization, and the City’s Housing and Community Development, Parks and Recreation, and Planning Departments. Community engagement activities and stakeholder surveys shaped the Master Vision comprising of 10 projects that collectively: • Promote economic development through small manufacturing incubator spaces that link the site to an anchor institution and a local Urban Food Farm • Build diversity through a mix of new housing types and sizes for residents of all ages and incomes while retaining the historic character of the place • Create vibrant public spaces while promoting bio-diversity through a series of linked neighborhood parks • Increase residents’ walkability and alternative modes of transportation while linking the site to the adjacent amenities [schools, parks, landmarks and public buildings] Collectively, the 10 proposed urban interventions are research and data driven, shaped by a collaborative coalescing of priorities. Smart Growth Strategies that are Data-Driven and pursued through Design Dialogues can turn blighted neighborhoods into a revitalized, physically compact and connected mixed-use community.

Integrating Experiments into Research Design Curricula: Obstacles and Innovations
Presenter: Sandra K. Webster
Westminster College

This session summarizes the problems and solutions discovered through intensive individual interviews with educators about their needs and major pain points in research methods curricula. The interviews were conducted as part of an NSF Innovation Corps—Learning [I-Corps L] funded project to scale student designed research into the core curriculum. I-Corps L is the science education version of the canonical I-Corps whose purpose is to disseminate and propagate the results of basic science research through entrepreneurship. Our project was to scale up a research design program that incorporated student developed experiments using E-Prime experiment authoring software. The curriculum had been developed and assessed through a previous NSF grant and demonstrated high student research competencies and positive attitudes. After learning the basics of entrepreneurship our team engaged in 124 customer discovery interviews, not to sell our curriculum, but to find out what faculty members need to improve research design and statistics courses. The individual interviews were conducted in person, via Skype or telephone. The sample included both veteran and novice faculty members as well as administrators and technology service providers who serve the research market. Through these interviews we discovered four areas of concern that are relevant for integrating research into courses and curricula. They are: institutional approval [IRB], time [faculty and student], laboratory resources, and student engagement. It was interesting to see that the insurmountable obstacles for some faculty members had been surmounted by others. In addition to student skills in research design and statistics, faculty members also want to see early positive attitude development and critical thinking enhancement. The presentation will conclude with a set of lessons learned regarding scaling of educational innovations and new directions.
**Assessment of Impact of Undergraduate Research**

**Session Type: Dual Presenters**


**Understanding the Impact of Undergraduate Research on Faculty Productivity and Career Advancement**

Presenters: Korine Steinke Wawrzynski | Justin Micomonaco
Michigan State University

While much literature focuses on the benefits of students engaging in undergraduate research, a dearth exists regarding the motivations of and benefits to faculty who mentor undergraduate researchers. This study examined the impact of mentoring an undergraduate researcher on faculty productivity and career advancement at a large, research intensive institution. Individual interviews were conducted with faculty representing a variety of academic disciplines (i.e. STEM, social sciences, humanities) and in different stages of their careers (i.e. assistant, associate, and full professors) who had an established record of mentoring undergraduate researchers. The goal of this study is to develop a better understanding of the motivations, barriers, and rewards for faculty members mentoring undergraduate researchers as well as identify best practices and/or viable training models. Through group discussion, the presenters will share preliminary findings and seek feedback for implications on future practice.

**Diversity and Inclusion in Undergraduate Research**

**Session Type: Dual Presenters**


**A Moral Imperative: Sustaining and Scaling What We Learn from Grant-funded Projects**

Presenters: Jeffrey M. Osborn | Janet A. Morrison
The College of New Jersey

Many wonderful undergraduate research-based programs have been initiated across the country with financial support from an array of granting agencies and foundations. As academic leaders, faculty members, and citizens, we have a moral imperative to build on what we learn from grant-funded projects, to expand these initiatives to support all students and faculty who could benefit from them, and to strategically mobilize institutional resources to support them. At TCNJ, with initial funding from several NSF grants, we have created new programs to provide scholarships, mentored research experiences, and coordinated support programs to undergraduates who have been underserved by higher education and are typically underrepresented in the sciences and mathematics. The success of these programs is exemplified by PERSIST (Program to Enhance Retention of Students in Science Trajectories), which has served Biology and Chemistry majors. The 4-year graduation rate for the 45 PERSIST Scholars who have participated rose to 89%. To sustain and scale the successes of these initially grant-funded programs through our internal funding, we have now extended the best practices across all of our School of Science departments. For example, we have modified the curriculum of our first-semester orientation classes, expanded support for peer mentors and peer tutors, expanded support for student travel and summer research stipends, and created a new “Gateway to Research Careers in Science” program with significant scholarship, research, and programming support. We have also made significant progress in supporting the professional development and promotion of women faculty members, with some funding from an NSF Advance award. As with our student programs, we have worked to sustain and scale these outcomes with new and expanded programs, now internally funded. To support faculty we have new mentoring programs, new mini-grant and external mentor programs, and new professional development funding for travel, scholarly writing, and fostering interdisciplinary/multidisciplinary collaboration.
Integrating and Building Undergraduate Research into Curriculum and Coursework

**Session Type: Dual Presenters**


**Bringing Us Together: Supporting Interdisciplinary URSCA**

**Presenter:** Aimee C. Knupsky  
Allegheny College

In this presentation, we focus on mentoring undergraduate interdisciplinary experiences inside and outside the classroom. We make a case for the value of these experiences for our students and faculty. These opportunities provide a unique opportunity for students to approach complicated problems through multiple, intersecting lens and prepares them to engage similar work after graduation. For faculty, this work allows us to renew our pedagogies and to develop collaborative projects to bridge the gap between the arts/humanities and sciences. With the support of a Great Lakes College Association grant (GLCA), the presenters developed an interdisciplinary team-taught course on emotion from the perspective of cognitive psychology and literature. As a part of this course, students were required to participate in two lab-based experiences (one science, one theater), as well as develop collaborative proposals for interdisciplinary URSCA. We share the benefits and challenges of incorporating these interdisciplinary research experiences in the classroom, paying particular attention to the preparation required, the resources needed, and a process by which to facilitate student reflection on their experiences. Finally, the presenters describe a new grant-funded initiative to expand these courses across other GLCA institutions. Also, the presenters discuss the mentoring process used to support student/faculty collaborative interdisciplinary projects inspired by the work from the classes. We highlight our process for recruiting students to participate in these projects and the processes we have utilized to facilitate faculty/student collaboration. For example we discuss a peer-to-peer mentoring approach that allows upperclass students to train and mentor younger students, who will then become mentors themselves. In addition, we address the benefits and challenges to interdisciplinary URSCA in light of institutional and curricular structures. Our presentation explicitly addresses the conference themes of Integrating and Building Undergraduate Research into Curriculum and Coursework as well as Innovation and Collaboration in Undergraduate Research.

**Session Type: Dual Presenters**


**Coaching the “Research Arc” through First-Year Course-based Research Experiences**

**Presenters:** Laura Zink | Kara Loy  
University of Saskatchewan

In 2013, one of Canada’s top research-intensive universities set out to ensure that every undergraduate student receives a chance to experience research for themselves, with an initial 5-year target of a 20% increase. A campus-wide undertaking, the Undergraduate Research Initiative has expanded opportunities, raised visibility, and celebrated student's accomplishments. Central to the initiative has been the integration of undergraduate research into first-year courses. In the initial pilot, faculty in Agriculture, Kinesiology, and the Social Sciences at the University of Saskatchewan were empowered through investments including: curriculum innovation expertise, funding for research coaches and dissemination activities, and a “community-of-action” faculty group. Professors access expertise to innovate their pedagogical practices by embedding research experiences into coursework aligned with learning outcomes. Further, they employ experienced students as “research coaches” to guide and facilitate freshman, and host opportunities for students to share findings. An integrated assessment strategy monitors progress, ensures data so faculty can reflect on classroom innovation, and will track long-term outcomes. The “Community-of-Action” enables interdisciplinary collaboration as new and experienced professors across departments share practices, exchange ideas, and facilitate knowledge mobilization Central to the Undergraduate Research Initiative's success throughout the pilot phase was finding a common definition everyone could endorse. The “research arc”, a common, simple, yet flexible definition of the three steps involved in the research process, refers to students’ forming a question, investigating, and sharing findings. Momentum is building as the initiative expands into new departments, and piques interest among students of various years of study. Now advancing into the second year of the Initiative, the University of Saskatchewan is poised to achieve more in terms of students’ skill-development, and faculty invigoration of teaching and research through innovative collaborations and targeted support. In so doing, it can serve as an example to other institutes interested in similar outcomes.
Session Type: Dual Presenters

Presentation Date and Time: 6/28/2016—10:20 AM-10:50 AM—Room Assignment: 4200 The Chamber

What We Have Learned through 10 Years of Explicit Research Skill Development and Assessment Across Degrees

Presenter: John W illison
University of Adelaide

Since the time that the Research Skill Development (RSD) framework was developed and made public (Willison & O'Regan, 2006) the framework's implementation in ever-broadening contexts has been piloted, adapted, evaluated and researched primarily in-curriculum, but also in mentored research. In-curricular implementations were conducted in: an individual course initially; in 29 diverse individual courses across all major faculty groupings; and then across multiple courses of a degree, including Medical Sciences, Electrical Engineering, Animal Science, Media and Oral Health. Some of the big picture findings from the research to date are: 1. The move from implicit to explicit is a game changer for many faculty and students; 2. For single courses, the research skills that are developed are subsequently at risk of atrophying, and the revisitation and redevelopment in multiple contexts of a degree is necessary; 3. Interdisciplinary communication using the RSD can enable educational reinforcement across many contexts and purposes; 4. If students don't 'get it' RSD can be counterproductive; 5. A balance of learning tasks, formative assessment, self-assessment, peer assessment and teacher summative assessment enhances learning; 6. Researching, problem solving, critical thinking, and evidence decision making are mutually inclusive in their cognitive skill sets, and the similarities have profound implications for formal education; 7. The RSD is, and needs to be, highly adaptable. It is not an off-the-shelf solution; 8. The RSD can provide a sense of big picture purpose for Higher Education, especially as determined by interviews with graduates who are employees. The good news is that you can use the RSD slowly at first, trying small changes in courses that you have control over. Expansion towards program-level can be rolled out dependent on how effectively the RSD is helping you solve curriculum problems or supervision of internship issues.

10:35-10:55 a.m.
20 min single presenter presentations

Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter


Improving Access for All to Undergraduate Research through a Short-term Online Course in Career Development

Presenter: MaryLynn T. Quartaroli
Northern Arizona University

Among the many challenges that students face in becoming involved in faculty-mentored undergraduate research are a lack of knowledge about how to find potential opportunities and a lack of skill in preparing appropriate communications and materials. These issues were brought to our attention during the application process for our Interns-to-Scholars program; we noticed that very few students provided targeted, thoughtful, and articulate responses to the application questions or effective one-page-only resumes. Rather than trying to schedule multiple face-to-face meetings that students might fit into their class and work schedules or duplicate the general professional development sessions provided by the Career Services staff, we created a 5-week online one-credit course to introduce students to the basic knowledge and skills necessary to become a qualified candidate to conduct faculty-mentored independent research, creative, or scholarly projects as an undergraduate. The course is offered during the middle five weeks of the semester and once during the summer break. Five week-long modules focus on determining whether undergraduate research is an appropriate career choice; creating a researcher mindset and profile; evaluating ethical issues in the responsible conduct of research; preparing outstanding “business” communication materials such as letters of application, statement of goals, focused resumes and LinkedIn profiles, and responses to potential interview questions; and creating a detailed action plan that can be used after the course to find and apply for a research opportunity with a faculty mentor. Each module includes very short readings and videos and small group online discussions and assignment draft critiques. Since Fall 2014, 102 students of all academic levels and majors have successfully completed the course. Of these students 41% are first generation and 27% are from underrepresented groups in the sciences. In final evaluations, students indicated that the class aroused their curiosity (75%) and encouraged development of new viewpoints (83%).
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Single Presenter

Failure Is an Option: Research as a Pedagogical Tool
Presenter: Frank Holiwski
South Georgia College

The session aims to inform on lessons learned after approximately four years of using undergraduate research as the primary means of pedagogy in psychology courses at South Georgia State College. During this session, lessons learned from successes and failures will be shared, with an aim toward helping those who might consider such an approach. The approach to be shared is novel in that South Georgia State College is a two year school with limited bachelor's programs and an open institution. Thus, the students who enter are not especially prepared to conduct research and the learning curve is quite sharp. However, the experience has been that student grades have mostly been the same or better than the grades for the same classes when lectures were the dominant method of instruction and test the primary means of assessment. What has changed is the normal sequence of events. Where students had struggled in silence, even pretending to have grasped materials only to fail when tests were administered, now students encounter a series of micro-failures that help better prepare them for their final research papers. This short presentation will describe the project students are challenged to complete, including a brief glimpse at the evolution of the process and focus on the ways this approach has improved the student experience.

Innovation and Collaboration in Undergraduate Research

Session Type: Single Presenter

Building a Truly Interdisciplinary Summer Research Program the Liberal Arts Way
Presenter: Melanie J. Lee-Brown
Guilford College

What do a liberal arts institution and summer research programs have in common? The answer: A rich opportunity to build an interdisciplinary summer research program! The Summer Research Scholars Program (SRSP) at Guilford College incorporates student-faculty teams conducting discipline specific research based on the work of a selected community partner. Guilford College's SRSP blends the best of a liberal arts education into an interdisciplinary, multifaceted, research experience. SRSP faculty-student research teams prepare and submit a proposal, in the faculty member's area of expertise, based on the community partner chosen for that year. Previous partners have included the Greensboro Bog Garden, Healing Seekers and Guilford College (an introspective). Each proposal must engage an ethical premise or concern shaped by one or more of Guilford College's core values of community, diversity, equality, excellence, integrity, justice and stewardship. In this session we will discuss how this program is structured, funded and assessed. We will explore whether this model could work for your institution to build community relationships and extend the reach of faculty/student research.
Tuesday, June 28

Concurrent Session 1.1

10:45-11:45 a.m.
60 min panel presentations, 30 min dual presentations, and 20 min single presenter presentations

10:45-11:45 a.m.
60 min panel presentations

Internationalization and Undergraduate Research

Session Type: Panel Presentation
Presentation Date and Time: 6/28/2016—10:45 AM-11:45 AM—Room Assignment: 3709 Heron

International Sabbaticals and Research Experiences
Presenters: Robert E. Bachman | Kraig A. Wheeler
University of the South | Eastern Illinois University

The increasing internationalization of research has led to increased opportunities for researchers at all levels to experience the benefits of cross-cultural collaborations and research experiences. In this session, we will present a variety of opportunities to support research stays abroad, discuss the steps in planning such an experience, and share our own experiences as a scholar abroad. This will be an interactive session designed to address specific questions and concerns of attendees.

Other

Session Type: Panel Presentation
Presentation Date and Time: 6/28/2016—10:45 AM-11:45 AM—Room Assignment: 3702 Orchid

Undergraduate Research Ambassadors: Peer Leadership in Undergraduate Research, Scholarship, and Creative Activity
Presenters: Lizzy King | Michael E. Cohen
Michigan State University | University of Missouri—Columbia

Peer leadership provides numerous benefits to students as they navigate their academic careers and professional futures. This session will focus on how three institutions utilize undergraduate research peer leaders in ambassador programs that promote and explain undergraduate research to students. Panelists will share how to organize, manage, and recruit effective undergraduate research peer ambassadors. Peer leaders offer an important perspective for high impact practices, such as undergraduate research. Research shows that “the student’s peer group is the single most potent source of influence on growth and development during the undergraduate years” (Astin, 1993, p. 398). As undergraduate research programs continue to grow and institutional and state funds decrease, peer leaders provide a vital low-cost resource. “The use of peer mentors is a valuable way to help other students learn and an effective use of resources that yields benefits for the target group of students, mentors themselves, the faculty and student affairs professionals who are associated with serving the institution as a whole” (Minor, 2007, p. 11). In creating a peer leader program, faculty and administration must consider the goals and learning outcomes, as well as structure and size of the program. During this session, panelists will provide an overview of their respective programs and discuss how ambassadors are utilized on each campus. Through discussion, effective strategies will be identified in the following program components: recruitment and selection; training and development; assessment and evaluation; and risks and challenges, including the benefits and best practices of incorporating peer leaders into undergraduate research offices as a way to share their message, market to students, and educate peers.
Session Type: Panel Presentation
Presentation Date and Time: 6/28/2016—10:45 AM-11:45 AM—Room Assignment: 3707 Oak

The NSF Innovations in Undergraduate STEM Education (IUSE) Program
Presenters: Jeffrey G. Ryan | Jill Singer
University of South Florida | State University of New York Buffalo State

In 2014 the NSF-Innovations in Undergraduate STEM Education (IUSE) Program replaced a number of funding opportunities in the Division of Undergraduate Education (DUE) which had historically supported studies of undergraduate education as a STEM pedagogy and the development of undergraduate research-focused “bridge” programs to increase and/or support STEM majors. In this event a panel including former NSF-DUE Program Officers, frequent IUSE reviewers and IUSE PIs discuss the NSF-IUSE Program, its objectives and structure, characteristics of successful IUSE proposals, and resources available to support potential proposers.

10:55-11:25 a.m.
30 min dual presentations

Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters

Big City, Big Data: Scalable Undergraduate Research Experience in Urban Microbial Community Analysis
Presenters: Avrom J. Caplan | Theodore Muth
City University of New York | CUNY Brooklyn College

The increasing accessibility and affordability of next-generation sequencing, in combination with metagenomic strategies, has opened the door to an exciting range of hands-on research projects for undergraduates. We have developed the Authentic Research Experience in Microbiology (AREM) program to take advantage of these technological advances and to broaden the horizons of students by introducing them to another aspect of their environment. AREM started at Brooklyn College of the City University of New York (CUNY) with a novel urban microbiome project in a single undergraduate microbiology lab of 18 students. It has developed into a scalable research module, which is currently incorporated into courses at over 10 campuses across the CUNY system, involving nearly 200 students per semester. Participating students have broad backgrounds as science and non-science majors. They may be taking introductory biology or upper-level capstone courses and attending four-year schools or community colleges. Our focus on the city is significant because urban environments, where our students live and study, have largely been overlooked for microbiome research – even though a majority of the world’s population now resides in cities. The AREM program introduces students to a number of important concepts including: human influences on the dynamics of microbial communities, the relationship between the environment and metabolic characteristics required for growth, and changes that result from the interaction between the human microbiome and urban microbial communities. The project encourages students to use quantitative reasoning and analytical skills in assessing the microbial diversity and provides an opportunity to formulate questions and develop hypotheses based on their microbial community investigation. AREM is a successful program in New York City and can be a model for undergraduate microbiome research projects at a wide range of other campuses. We describe resources that are available for the adoption of AREM at different schools.
Integrating and Building Undergraduate Research into Curriculum and Coursework

Session Type: Dual Presenters


Building Research into a Biology Curriculum as a Scaffold for Success in Capstone

Presenters: Katherine L. Robertson | Karen K. Resendes
Westminster College

At Westminster College, senior Capstone research is a graduation requirement. The Capstone work involves writing a proposal, carrying out a project and presenting the results publically in a poster. Assessment of past proposals and posters indicated that the quality of research was below faculty expectations; students were unprepared for such an undertaking because they lacked basic skills in research methods and scientific literacy, and were unmotivated because we were failing to help them understand the relevance of Capstone to real-life professions. To address these shortcomings we redesigned the labs of our introductory classes. We replaced cookbook-style labs with three-week-long research modules in which students engage in every aspect of a mini research project; searching literature, formulating questions, testing their own hypotheses and reporting their results in the style of a primary research article. The modules are interlaced with skills workshops in which students learn basic skills and instrumentation. This approach is reinforced in upper level electives and we have added a biostatistics course to the curriculum to reinforce experimental design and data analysis. Finally, to make the proposal writing process more relevant we switched from using departmental guidelines to using NIH grant writing guidelines. Our students are now better prepared for Capstone and are more motivated. Writing research articles rather than formulaic lab reports and NIH grants rather than project proposals has made their experiences more relevant. As a result of our continuous integration of research into the curriculum, the quality of the Capstone projects has improved. This panel will be a forum to discuss the strategies used to implement this new curriculum and explore other relevant ways of integrating research into the curriculum in order to bolster students overall experience and development.

Session Type: Performance—30 Minutes


In Synch: Synchronizing Undergraduate Research with An Interdisciplinary Freshman STEM Seminar Unit on Synchrony

Presenters: Angelia D. Gibson | Evan Ezell
Maryville College

The Scots Science Scholars (S3) program is a multi-faceted program that provides support and enrichment for students pursuing majors in science, technology, engineering and math (STEM) at Maryville College, a liberal arts college in East Tennessee. A summer bridge program for incoming freshman, a STEM-focused first-year seminar course, and early integration to research are fundamental aspects of the program. The first-year seminar course fulfills objectives of preparing students with academic and professional skills in their field of interest, while introducing the liberal arts. We describe the inception of an educational unit on synchrony based on TEDTalks® by Uri Alon and Steven Strogatz. Students are first asked to consider a universal challenge in science, dealing with defeat and frustration and overcoming them with improvised and synchronous support from peers and mentors. Students are then introduced to primary literature, through which, they consider the topic of synchrony, how it can be quantified, and how it manifests in biological and psychological systems. The unit has inspired an undergraduate research project that utilizes computer-integrated physics equipment to track and quantitatively evaluate synchrony in hand movements between the participants. The research project has been integrated into the S3 summer bridge experience, providing students an opportunity to collect and analyze data on the topic of synchrony in the summer prior to exploring the theme of synchrony in greater detail in their first-year seminar course. This performance includes a demonstration of the equipment, methodology, and mathematical analyses used in the undergraduate research as well as a discussion of how the unit supports both objective and affective learning outcomes for students in the S3 program and in Calculus II. The performance also includes a discussion on the emergence of a meaningful multidisciplinary research-based educational unit that resulted from unintentional synchrony between teacher/researchers with seemingly unrelated scholarly interests.
Integrating Scaffolded Research with Service-Learning into a First-Year Two Semester Course Sequence

Presenters: Trent W. Maurer | Jerri J. Kropp | Caroline Lathi
Georgia Southern University

This presentation will discuss a first-year seminar format that spans two semesters, incorporates both individual and team-based undergraduate research and service-learning, and keeps the class cohort of students and faculty together for the full academic year. Participants will learn about this course sequence from administrative, faculty, and student perspectives. Two professors who have collaborated in this sequence, along with a former student, will discuss their approach toward connecting undergraduate research and service-learning in the seminar, which is focused on animal-assisted activities in the fall and animals in the lives of children, families, and communities in the spring. In this sequence, students complete a research project in multiple scaffolded steps, first at an individual level by identifying a topic related to the course, finding five relevant research articles, critiquing those articles, and presenting one article to the class. At the end of the fall semester, students create a poster presentation which synthesizes all five articles. In the spring semester, students are placed into small groups around common topic themes, expand their literature search to include global perspectives, integrate their individual research findings, and work toward a final product presenting multiple research studies as a cohesive whole to the class. Students also complete 25 hours of service-learning across the sequence. After each service-learning experience, students are required to document their learning and digitally disseminate it by blogging about how their experience connects to the published research on animal-assisted activities. The integration of the research and service-learning experiences will be a central focus of this presentation. Additionally, one program administrator will discuss how this sequence fits into the larger curriculum generally, and the curricular focus on undergraduate research specifically, particularly with respect to building foundational research skills in the first year.

Innovation and Collaboration in Undergraduate Research

The Other Side of Innovation: Material and Digital Culture and the Interdisciplinary Classroom

Presenter: Amy Woodbury Tease
Norwich University

This session will draw on our experience co-teaching a first-year interdisciplinary Honors seminar titled “The Other Side of Innovation.” We envision this session as a conversation about how to create opportunities for cross-disciplinary teaching and research that enhances student learning experiences via material and digital culture. The course integrated students across multiple academic disciplines and takes as its premise that innovative products, actions, and ideas often have positive global implications. However, there is also an underexplored side to the creative process that is perhaps more ambiguous and worthy of interrogation. We argue that this “other side of innovation” introduces a critical layer of analysis that examines the unpredictability of innovative ideas and objects as they evolve across geographical, historical, and cultural boundaries. Much like the process of innovation itself, this course fostered an interactive environment that was kinetic and inquiry-driven. It challenged students to analyze innovative processes and outcomes through interdisciplinary lenses. The course incorporated high-impact pedagogical practices including student-led laboratories, presentation, and a culminating research project: an interactive virtual exhibit developed, designed, and curated by our students. In designing this course, we consulted with staff, archivists, and directors of the Norwich University Sullivan Museum and History Center as well as the Smithsonian Center for Learning and Digital Access to think about how a virtual exhibit engages the intersections of material and digital culture. Through these conversations, we initiated partnerships that our students could pursue during the construction of the exhibit. Students benefited from conducting research on both material objects and digital archives and unveiled the exhibit to the Norwich University community at the end of the semester. The virtual exhibit will be housed on the websites of Norwich University Sullivan Museum and History Center and the Smithsonian Center for Learning and Digital Access.
Assessment of Impact of Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—11:00 AM-11:20 AM—Room Assignment: 2707 Spirit

Determinants of Research Productivity in Undergraduate Research: A Faculty Perspective

Presenters: Danielle Xiaodan Morales | Lourdes E. Echegoyen
University of Texas at El Paso

Collaborative faculty-student research publications are important outcomes of undergraduate research experiences (UREs). Conducting and publishing original research by collaborating with a faculty mentor is valuable for undergraduate students, and publishing research is of central importance to faculty members. However, little attention has been paid to understanding faculty-student productivity via UREs, defined in terms of collaborative peer-reviewed publications, from the faculty member’s perspective. This study examines predictors of collaborative faculty-student publications resulting from mentored UREs such as demographic factors and faculty characteristics, mentorship duration, funding, and institutional reward system. It provides insight into the question: Why are some faculty mentors more productive than others, in terms of publishing research findings with their undergraduate student-mentees? We employ hierarchical generalized linear modeling to analyze data from 541 faculty members across 14 research-intensive institutions, collected by a cross-sectional survey in 2013. We examine predictors at both institutional and individual faculty levels. Results provide insight into factors influencing productive faculty-student collaborations and may inform strategies for enhancing productivity of UREs.

Diversity and Inclusion in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—11:00 AM-11:20 AM—Room Assignment: 2702 Legacy

Using Hops as a Tool to Integrate Research into the Introductory Biology Classroom

Presenter: Michael J. Wolyniak
Hampden-Sydney College

Integrating authentic research experiences into the classroom is especially challenging for introductory biology coursework, as it is the first exposure that many students receive not only to the fundamental concepts of life science but also to the processes by which scientists make discoveries. A further challenge comes with developing experiences that accessible to students from all backgrounds. These challenges must be met to help bring the overall state of American undergraduate life science education in line with recognized best teaching practices. Here, we present our efforts to develop a semester-long research experience for introductory biology students utilizing the common hop as its central organism. Hops represent a commercially relevant, easily accessible, relatively inexpensive model system that can serve as a source for developing several lines of basic or applied research questions. In our model, students focused on the microbes that can be found on hops plants to design and implement research questions seeking to understand how to better control hops pathogens and manage commercial hops growth. Students used concepts of ecology, physiology, and molecular biology to isolate and characterize a microbe found on hops and explore how this microbe responded to competition with the known hops pathogens downy mildew and powdery mildew. They also worked to uncover what chemical agents could best control their microbe and if continued exposure to these agents could result in the development of natural resistance. Student assessment was done through scaffolded writing assignments for the production of a final research paper as well as a poster presented in a public session attended by local experts in hops cultivation. In both the 4-year and 2-year educational model, semester-long introductory classroom research experiences such as this can provide the foundation necessary to receive a strong experiential-based education in preparation for a career in the life sciences.
Innovation and Collaboration in Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—11:00 AM—11:20 AM—Room Assignment: 2703 Honors

Space, Place, and Literature: A Collaborative Approach to Multi-Ethnic Literature and Geography
Presenter: Anastasia W. Lin
University of North Georgia

Literary Cartography is an evolving field that utilizes Geographic Information Science to craft layered maps of novels that in turn allow for the visualization of an author’s themes and motifs. Over the past years, I’ve worked with research students trained in GIS to create these maps, which have then become teaching tools in sophomore literature survey courses on American multi-ethnic literature. Using these maps has allowed students to read novels spatially, offering different perspectives and new directions for research. Yet, involving literature students in the very creation of these maps can further deepen spatial understanding as well as give students the opportunity to work on a multidisciplinary undergraduate research project. However, humanities projects like this one are limited due to the extensive amount of training required to master the mapping software (ArcGIS). This talk describes a “virtual learning community” approach to involve undergraduates in a collaborative cross-disciplinary literary cartography project. In the fall 2015 iteration of this “virtual learning community,” two separate classes—one of English majors and one of GIS majors—engage in a hands-on collaborative literary cartography project focused on several texts in a multi-ethnic literature senior seminar. The project asks the English majors to look at the text spatially and suggest ideas they would like to see maps; the GIS majors independently create these maps, and both classes use the final maps in research essays. This presentation will describe the creation, execution, and outcome of the learning community, focusing on undergraduate research skills gained, lessons learned, and future directions. I will also discuss alternate ways to involve small-scale literary cartography projects that do not require ArcGIS training.

Internationalization and Undergraduate Research

Session Type: Single Presenter

Presentation Date and Time: 6/28/2016—11:00 AM—11:20 AM—Room Assignment: 3704 Tarpon

Where in the World is Undergraduate Research?! Developing International Research Experiences for Lower-Division Undergraduates
Presenter: John Banks
California State University—Monterey Bay

Both research and international experiences have been shown to bolster a suite of positive indicators for academic success and intellectual development for undergraduate students. Building on earlier research indicating that participating in educational experiences abroad can (i) increase college completion rates and (ii) dramatically improve the intellectual development of participating students who have had little or no previous international academic experience, we describe a program that was developed to provide a brief yet intense academic exploration of global issues in both international and domestic settings for students early in their academic careers. The program expressly incorporated several of Kuh’s well-known “high-impact practices”, including (i) a common intellectual experience, (ii) diversity/global learning, (iii) service learning, and (iv) undergraduate research, in an international setting. Providing lower-division undergraduates with the chance to travel with faculty experts to international settings and explore important issues from both an international and a local perspective creates a high potential for a transformative experience for students. Furthermore, stacking high impact practices may be an effective way of engaging more URM and first-generation students to participate. We discuss strategies for success in developing and implementing these programs.
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June 27: 9:00 am – 5:00 p.m.
Plenary Speaker Biographies

Sunday, June 26 8:30 a.m.–9:30 a.m.

**Tia Brown McNair** is the Vice President in the Office of Diversity, Equity, and Student Success at Association of American Colleges and Universities (AAC&U) in Washington, D.C. She oversees both funded projects and AAC&U’s continuing programs on equity, diversity, inclusive excellence, high-impact educational practices, and student success, including AAC&U’s Network for Academic Renewal series of yearly working conferences. McNair also directs AAC&U’s Summer Institute of High-Impact Educational Practices and Student Success. McNair serves at the Project Director for AAC&U’s “Advancing Roadmaps for Community Colleges Leadership to Improve Student Learning and Success,” and a newly funded LEAP project “Committing to Equity and Inclusive Excellence: Campus-Based Strategies for Student Success.” She is a Co-PI on another project “Advancing Underserved Student Success through Faculty Intentionality in Problem Centered Learning.” McNair chaired AAC&U’s Equity Working Group that was part of the General Education Maps and Markers (GEMs) project that represented a large-scale, systematic effort to provide “design principles” for 21st-century learning and long-term student success. She is a co-author on the publication *Assessing Underserved Students' Engagement in High-Impact Practices*. Prior to joining AAC&U, McNair served as the Assistant Director of the National College Access Network (NCAN) in Washington, DC. McNair’s previous experience also includes serving as a Social Scientist/Assistant Program Director in Directorate for Education and Human Resources at the National Science Foundation (NSF), Director of University Relations at the University of Charleston in Charleston, West Virginia; the Statewide Coordinator for the Educational Talent Search Project at the West Virginia Higher Education Policy Commission; and the Interim Associate Director of Admissions and Recruitment Services at West Virginia State University. She has served as an adjunct faculty member at several institutions. McNair earned her bachelor’s degree in political science and English at James Madison University and holds an M.A. in English from Radford University and a Doctorate in Higher Education Administration from George Washington University.

Monday, June 27 8:30 a.m.–9:30 a.m.

**David Asai** is Senior Director of Science Education at the Howard Hughes Medical Institute. His team, the Undergraduate and Graduate Programs group, managed several programs including a number of initiatives aimed at undergraduate science education: institutional grants to colleges and universities, the Inclusive Excellence Initiative, the HHMI Professors program, the Science Education Alliance project, Phage Hunters Advancing Genetic and Evolutionary Science (PHAGES). Prior to his arrival at HHMI in 2008, David was on the faculties of Purdue University for 18.5 years, and Harvey Mudd College for five years. He served as Head of Biological Sciences at Purdue and Stuart Mudd Professor and Chair of Biology at Harvey Mudd. Among the escaped inmates are 77 then undergraduates who conducted research in the Asailum.

Tuesday, June 28 8:30 a.m.–9:30 a.m.

**Stuart Hampton-Reeves** is Professor of Shakespeare Studies and Research Informed Teaching and Chair of the British Conference of Undergraduate Research. He is the author of several books on Shakespeare and co-editor of the Palgrave Monograph series, *Shakespeare in Practice*. He is also the current Head of the British Shakespeare Association and the Director of Research for the College of Business, Law and Applied Social Studies at the University of Central Lancashire.
CUR Fellow Award Recipients

Dr. Jeffrey M. Osborn
Dean of the School of Science and Professor of Biology, The College of New Jersey (TCNJ)

Jeffrey M. Osborn is Dean of the School of Science and Professor of Biology at The College of New Jersey (TCNJ). Professor Osborn received a B.S. in Biology, with honors, and an M.S. in Botany, from Texas State University-San Marcos, and a Ph.D. in Plant Biology from Ohio State University. Prior to joining TCNJ, he served on the faculty and in many leadership roles at Truman State University in Missouri. He has taught a range of disciplinary and interdisciplinary courses, employs an array of pedagogical methods, and directly incorporates authentic research into his courses. Dr. Osborn has led several institutional and multi-institutional programs to support the institutionalization of undergraduate research, as well as the advancement of undergraduates and faculty who are underrepresented in higher education. Through these efforts, he has worked with over 400 colleges and universities across the U.S. Jeff Osborn is an administrator-teacher-scholar. He and his students conduct research in plant evolutionary biology, studying both fossil and living plants. His research program also encompasses several areas of higher education, including the teacher-scholar role of faculty, faculty workload models, and the integration of undergraduate research and other high-impact practices into the curriculum. Dr. Osborn has received over $7 million in extramural funding as PI/Co-PI from a variety of sources. Several of his honors include the Centennial Award from the Botanical Society of America, the Antarctica Service Medal of the United States of America from the National Science Foundation, and the Walker and Doris Allen Fellowship for Faculty Excellence-Truman's highest award for recognizing outstanding faculty. He serves as an Associate Editor for the American Journal of Botany and as a member of several advisory boards. Dr. Osborn is very active in CUR, serving as CUR President (2008-2009), a PI/co-PI for several of CUR’s NSF-funded national projects, as a prolific writer in CUR publications, and a speaker at CUR events.

Dr. Jill Singer
Professor of Earth Sciences, SUNY Buffalo State

Dr. Jill Singer, Professor of Earth Sciences at SUNY-Buffalo State, received her B.A. in geology from Buffalo State in 1979 and her M.A. (1982) and Ph.D. (1987) in geology from Rice University. She joined the faculty at Buffalo State in 1986. In 1988, she initiated and coordinated several campus-wide undergraduate research programs and in 2003, she was appointed Director of the College’s newly established Office of Undergraduate Research. Dr. Singer is the recipient of Buffalo State’s President’s Award for Excellence as an Undergraduate Research Mentor (2007) and the SUNY Chancellor’s Award for Scholarship and Creative Activities (2008). From 2001 to 2003 and 2007 to 2009, she served as a program director in the Division of Undergraduate Education (DUE) at the National Science Foundation. She was recently elected a Geological Society of America Fellow (2016). Jill Singer teaches geosciences courses including sedimentology, oceanography, and environmental geology and she maintains an active research program in applied sedimentology. Her research focuses on sediment transport and river hydrodynamics and much of her work has been related to environmental restoration of the Buffalo River, on of the EPA’s Great Lake Areas of Concern. The NSF, EPA, and U.S. Department of Justice have funded Dr. Singer’s research. She mentors undergraduates in class, laboratory, and field research projects and has mentored/co-mentored over 75 students in the past 20 years. Jill Singer is an active member of the Council on Undergraduate Research and has been involved in CUR activities for over 25 years, including serving as a co-PI for NSF-funded professional development institutes, frequent presenter at CUR events, Chair of the Geosciences Division (1998-2002) and CUR President (2003-2004). Over the last decade, Dr. Singer and her research collaborators have developed at Buffalo State an evaluation method to measure undergraduate researchers’ skills and knowledge development. With funding from the NSF WIDER program, Dr. Singer currently is leading the scaling up and national dissemination of the Buffalo State evaluation model, in partnership with SERC (Science Education Research Center at Carleton College) and CUR.
Dr. Carol Parish
Professor of Chemistry University of Richmond

Dr. Carol Parish is Professor of Chemistry at University of Richmond. Research in the Parish group focuses on understanding the dynamical behavior of interesting molecular systems. The tools of quantum mechanics, conformational searching and free energy simulation are used to answer questions about the structure, energy and dynamics of HIV-1 protease inhibitor drugs, Bergman cyclization in enediyne anti-cancer warhead drugs, homology modeling of membrane-bound desaturase enzymes investigations of the flexibility of polyoligomeric silsesquioxane cages (POSS), the role of O-to-N acyl migration in insect defense secretions and oligomeric models for synthetic enzymes that display enzyme-like acyltransferase activity. The physical nature of her research work is diverse; however, the unifying theme is her methodological, physical-chemistry based approach, and the emphasis on undergraduate research mentorship and support. Dr. Parish received her B.S. in Chemistry from Indiana Purdue University Indianapolis (IUPUI), and her doctorate in physical chemistry from Purdue University.
CUR Events and Institutes

The Council on Undergraduate Research is pleased to share a calendar of coming events with you.

August 2016

August 4-8, Kellogg West Conference Center & Hotel, Pomona CA

Proposal Writing Institute (PNI)—This institute brings together faculty and administrators interested in preparing proposals for submission to external funding agencies. The institute has been developed to assist novice to experienced proposal writers in drafting complete proposals for submission. This institute is particularly recommended for individuals who have attended CUR Dialogues 2016. Application deadline is June 17, 2016.

October 2016

October 27-29, Carleton University, Ottawa, ON

Initiating and Sustaining Undergraduate Research Programs (ISURP)—This institute is designed for campuses that are establishing new undergraduate research programs or centralized undergraduate research offices and those expanding undergraduate research opportunities from a single department to a campus wide program. It is also valuable for campuses interested in serving new student constituencies. Application deadline is September 26, 2016.

October 23-24, Arlington, VA

Research Experiences for Undergraduates Symposium (REUS)—This conference features keynote presentations, presentations by students from REU programs in all disciplines, sessions for REU students, faculty, and administrators, and opportunities to present to representatives from NSF. (Nominations due summer of 2016.)

November 2016

November 13-15, Qatar University, Doha, Qatar

World Congress on Undergraduate Research (WorldCUR)—The Council on Undergraduate Research (CUR), Qatar University (host site), the British Conference of Undergraduate Research (BCUR), and the Australasian Conference of Undergraduate Research (ACUR), are working together to create the first ever World Congress on Undergraduate Research.

The aim is to bring together the best undergraduate research in the world to focus our collective minds on some of the most significant challenges facing the global community today. Conference themes include: climate change, global health, the global and the local, information and technology, war and peace in the 21st century, and the world we live in and the world we make.

November 18-20, Arlington, VA

Creative Inquiry in the Arts and Humanities Institute (A&H)—This institute will assist campus-based teams in developing transformative opportunities for Undergraduate Research, Scholarship, and Creativity (URSC) in the arts and humanities. The goal of the institute is to inform participants about current research on learning outcomes for students engaging in URSC. Application deadline is October 17, 2017.

November 18-20, Arlington, VA

Beginning a Research Program in the Natural Sciences at a Predominantly Undergraduate Institution Institute (BRP)—The goal of the institute is to give individual pre-tenured faculty members the opportunity to learn from and discuss with experienced faculty how to establish and manage a research program with undergraduates. While at the institute, participants will also prepare plans for starting and/or advancing their individual research programs at their respective campuses. A range of topics will be covered during the institute that show ways to achieve career success in undergraduate research. Application deadline is October 17, 2017.
February 2017

February 16-18, Renaissance and Residence Inn Arlington Capital View, Arlington, VA

CUR Dialogues—This conference is designed to bring faculty and administrators to the Washington, D.C. metropolitan area to interact with federal agency program officers and other grant funders. Attendees will also have the chance to engage in several networking opportunities.

April 2017

April 5-8, University of Memphis, TN

National Conference on Undergraduate Research (NCUR)—National Conference dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study for students. (Applications accepted each fall)

April 2017, Undergraduate Research Week

How will you celebrate? Send a short description of your event along with a photograph and your campus logo to robin@cur.org to be listed on our Undergraduate Research Week website.

April 2017, Washington, D.C.

Posters on the Hill (POH)—An evening poster session and reception where students will have the opportunity to speak directly to members of Congress and demonstrate how they have been impacted by these programs. Call is open September 17, 2016. Applications are due November 2, 2016.

June 2017

June 27-29, 2017, Northern Arizona University, Flagstaff

Undergraduate Research Program Director’s (URPD) Meeting—This 1-day conference is aimed at faculty and academic professionals interested in the improvement, management, and promotion of undergraduate research and creative activities. Faculty, undergraduate research program directors, and administrators will share ideas, strategies, and best practices.

Intrigued by our events? Please see our website at www.cur.org for more information or contact Tavia S. Cummings at tcummings@cur.org or 202.783.4810 x204
Registry of Undergraduate Researchers

Are you a graduate school interested in recruiting top quality undergraduate students with research experience? Why not join the CUR Registry of Undergraduate Researchers?

What is it? CUR facilitates a registry of undergraduate researchers who plan to attend graduate school. Its purpose is to connect undergraduate students with research experience and a desire to pursue an advanced degree, and graduate schools seeking high quality students who are well prepared for research.

How does it work? The registry is a database where students can fill out information such as GPA, research experience, and geographic and sub-disciplinary preferences. Schools/employers who contract with CUR are able to contact students with information specific to their opportunities.

For more information visit: http://www.cur.org/projects_and_services/registry/students/

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“Posters on the Hill was an exciting and unique experience. I got the opportunity to meet many important members of the scientific community—all of whom loved to hear about my chemistry research! Sharing my passion and emphasizing the importance of undergraduate research to members of Congress was so special to me.”

-Kaylee Docker, Minot State University, 2015 Participant

In spring of 2017, the Council on Undergraduate Research will host its annual undergraduate poster session on capitol hill.

This event helps members of congress understand the importance of undergraduate research by connecting them directly with students involved in such studies.

Call is open September 7, 2016. Applications are due November 2, 2016.

www.cur.org/conferences_and_events/student_events/posters_on_the_hill/
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