



### *View from the Chair*

Welcome to the newly elected “class of 2023” CUR Councilors: Maria Bautista, Mark Biermann, Derek Buzasi, Beth Cunningham, Jason Diebel, Brian Murphy, Chitra Salomonson, and Richard Thompson! Their contact information is below—drop them a note of welcome. We’ll ask each of them to provide a short biography and a few words about why they joined CUR for an upcoming issue of this newsletter. All will begin their three-year term of service in June at the CUR Annual Business Meeting.

Here’s a quick rundown on what you’ll find in this issue of *CURPA Diem*. Rae Anderson led the division’s efforts to continue the Student Travel Grant program. This year, we posted two opportunities to request travel support on the division website and in *CUR E-News*. In response to the Feb. 22 due date, we made two awards. Madison Francis, a biophysics major from the University of California San Diego, reported on her research at the APS March meeting. Dylan McKelvey, an engineering technology major minoring in physics from the University of North Alabama, reported on his research at NCUR. Brief reports summarizing their projects and meeting experiences are included in this issue. By the time you receive this issue, the second due date for CURPA Student Travel Awards will have passed. However, you can expect a new travel award announcement in late summer or early fall. Information on this program can be found [here](#).

CURPA councilor Carol Hood led the division’s efforts to revise and renew the

### **About CUR’s Physics & Astronomy Division**

The P&A Division of the Council on Undergraduate Research provides networking opportunities, activities, and resources to assist Physics and Astronomy administrators, faculty members, students, practitioners, and others in advancing undergraduate research.

#### • **Newsletter Editor**

Richard Thompson  
Cabrini University  
[rt533@cabrini.edu](mailto:rt533@cabrini.edu)

#### • **Division Chair**

Terry Oswalt  
Embry-Riddle Aeronautical  
University  
[Terry.Oswalt@ERAU.edu](mailto:Terry.Oswalt@ERAU.edu)

The Council on Undergraduate Research  
734 15th Street, NW • Suite 850  
Washington, DC 20005-1013  
Tel: 202/793-4810 • Email: [CUR@cur.org](mailto:CUR@cur.org)  
WWW: [www.cur.org](http://www.cur.org)  
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Mentor Award program this year. This opportunity was recently posted on the division website and in a division-wide email. Please consider nominating someone

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you think epitomizes excellence in mentoring undergraduate physics and/or astronomy researchers. *Note the due date is May 3, 2019*, so don't delay! The Mentor Award application page can be found [here](#).

About 10 years ago, the division was the first CUR division to reach out to the other societies that serve our community to encourage adoption of statements on the importance of supporting undergraduate research. The American Association of Physics Teachers was one of the first societies to respond to our appeal. The AAPT statement, which is exactly the kind we hope other societies will adopt, can be found [here](#). We began reaching out again this year, urging societies to renew/update their statements and commitments to supporting undergraduate research. We need your help to identify as many of the societies that serve physics and astronomy as possible—especially those that serve very narrow specialties that are not often listed.

Another part of efforts to form ties to other societies involves supporting a CUR presence at meetings. CURPA Councilor Toni Sauncy arranged and staffed a CUR booth at the January 2019 AAPT meeting in Houston, Texas. The division and the CUR Geosciences Division will be cosponsoring a booth at the December 2019 meeting of the American Geophysical Union. Are you willing to help staff a CUR booth or to arrange one at a meeting that serves your research specialty? The goal is to engage every physicist and astronomer who is an undergraduate research mentor in CURPA!

This summer, the CUR Annual Business Meeting is June 25–27, just prior to the CUR Undergraduate Research Programs Conference (June 27–29). Both are in Columbus,

Ohio, at The Ohio State University (see the [meeting website](#) for details). Columbus has a wide selection of activities outside the meeting venue as well. Even if you cannot attend the meeting, we invite you to suggest topics for the division's ABM agenda. Here are a few things already on the “to-do list:”

- (1) Status and plans for the division's advocacy efforts and outreach to other physics & astronomy societies;
- (2) Results of CURPA membership outreach to physics departments;
- (3) Recognition to the 2019 CURPA Travel and Mentor Award winners and planning for the 2020 programs;
- (4) FY2020 budget commitments;
- (5) Election of new CURPA officers;
- (6) New CURPA initiatives for 2019–2020.

As you may already know, CUR Executive Officer Beth Ambos will be stepping down this year. Her leadership will be sorely missed! The division has participated in the national search for a new EO. If it is concluded soon enough, the new EO will be introduced at the June ABM.

Keep us up-to-date on your CUR-related activities by posting on our PA Division Facebook Page (click [here](#)) and sending a report for this newsletter to Editor Rick Thompson at [rt533@cabrini.edu](mailto:rt533@cabrini.edu). Also, help get the word out that faculty at “enhanced institutional members of CUR” are automatically individual members. More than 750 institutions are members of CUR. That means there are several thousand faculty mentoring students who have not yet claimed their free membership.

See you in Columbus, Ohio!



*Terry Oswalt*  
 Chair, CUR Division of Physics and Astronomy  
 Embry-Riddle Aeronautical University  
[Terry.Oswalt@ERAU.edu](mailto:Terry.Oswalt@ERAU.edu)

### ***Goldwater Scholarship Nomination Cycle for 2020 Opens on the First Tuesday after Labor Day***

As you provide your second- and third-year students with research opportunities this summer, please make your students—particularly those who you believe are likely to pursue research careers—aware of the Goldwater Scholarship. To be eligible for a Goldwater Scholarship, a student must (1) be a full-time matriculated second- or third-year student; (2) intend to pursue a research career in a natural science, engineering, or mathematics; (3) have a GPA of at least 3.00 on a 4.00 scale; and (4) be a U.S. citizen from the 50 states or the District of Columbia, a U.S. national (for students from institutions in Puerto Rico, Guam, Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands), or a permanent resident.

Over the past three years, Goldwater awards have closely tracked the percentage of students nominated for the award by discipline. For the 2019 competition, physics and astronomy represented approximately 15 percent of the nominations. Physics and astronomy students received approximately 15 percent of the scholarships. This suggests that if the physics and astronomy communities would like to see more of their majors awarded Goldwater Scholarship, more physics and astronomy majors need to be nominated.

For the past two years, Goldwater and APS have worked closely with one another to celebrate the success of physics and astronomy students and their mentors. For 2018, the *APS News* published the names of the 33 physics and astronomy majors who won Goldwater Scholarships (list [here](#)) and followed up with a second *APS News* article that featured three of the scholarship awardees (found [here](#)).

While the 2019 Goldwater award receipts have not been named, APS is planning a similar set of articles to celebrate the 2019 awardees.

As part of your student's summer activities, please consider having them read the APS articles on the Goldwater awardees and have them review the scholarship application materials found on the Goldwater website [here](#). Please have your students contact me directly if they have any questions regarding the application process or the Goldwater Scholarship ([goldwaterpres@goldwaterscholarship.gov](mailto:goldwaterpres@goldwaterscholarship.gov)). I would be very happy to talk with them.

*John Mateja, PhD  
President*

*Goldwater Scholarship Foundation  
goldwaterpres@goldwaterscholarship.gov*

### ***2019 Posters on the Hill***

CUR's Posters on the Hill will be held on April 30 in the Rayburn Office building, Washington, DC. This year, 60 posters were selected from more than 360 completed applications. The students selected to represent the Physics and Astronomy Division were the following:

- Seejia Scarlett Yu (University of California, Los Angeles; Advisor: Dr. Wesley Campbell), "A Strong, Stimulated Optical Force for Decelerating Molecular Beams."
- Emily A. Churchman and Sherry Yennello (Texas Lutheran University; Advisors: Dr. Toni Sauncy, TLU and Dr. Sherry Yennello, Texas A&M University), "Characterization of ParTI Phoswiches Using Charged Pion Beams."

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- Joseph Dees, Rebecca A. Voss, Jarvis Warren, and Thomas Hodges (Henderson State University; Advisor: Dr. Shannon Clardy), “Low-Cost Laminar Flow Wind Tunnel Design and Testing.”

Additionally, the following students from the Physics and Astronomy Division received an honorable mention:

- Lauren Zundel (University of New Mexico; Advisor: Dr. Alejandro Manjavacas), “Time-Dependent Radiative Heat Transfer between Graphene Nanodisks.”
- Justin A. Castaneda, Mike P. Ortiz, Edgar Marrufo Villalpando, and Benjamin Pieczynski (Northern Arizona University; Advisors: Dr. Lisa L.-H. Chien and Dr. Ethan Dolle), “Simulating Dark Matter Deficient Galaxies.”

Congratulations to these students and their advisors. As one might expect, reviewers were impressed by the overall quality of the applications and the research being conducted by undergraduates. The Posters on the Hill event is held annually, typically during April. If you are mentoring undergraduate students this summer or know someone who is, please keep this program in mind and encourage your undergraduate students to apply. More information about this program can be found [here](#).

*Michael Jackson  
Millersville University  
[mjackson@millersville.edu](mailto:mjackson@millersville.edu)*

### ***Posters on the Hill Research Description***

***Emily Churchman***

Using the Partially Truncated Icosahedron (ParTI Ball), I studied the events that occur in

pionic fusion reactions. Pionic fusion is the process in which two nuclei fuse together to make one compound nucleus and emit a single pion ( $\pi$ ). My research specifically entailed the characterization of the detection capabilities of the phoswich (phosphoric sandwich) detectors in the ParTI Ball that are made of a thallium-doped cesium iodide crystal and a EJ-212 scintillating plastic to detect the pions during these events. To do this, 4 of the 15 phoswiches in the detector were taken to the Paul Scherrer Institute where  $\pi^+$ ,  $\pi^-$ , and proton beams were impinged upon them.

I analyzed the data to ensure the particles being collected were in fact pions. These analysis techniques included Particle Identification (PID) via energy decomposition and the investigation of the decay curves of the muons which are the decay products of the implanted pions. Both these techniques proved adequate in examining the existence of pions in the detectors.

This research convinced me that nuclear physics was the field that was right for me. The topic allowed to me to continue nuclear research as an undergraduate and propelled me to apply to nuclear physics graduate schools. This specific research has opened opportunities I could have never imagined, including the publication of a peer-reviewed paper as a third-year undergraduate student. •

***CUR P&A Mentor Awards***

The CUR Physics and Astronomy Division would like to honor mentors in its disciplines for their long-term efforts in mentoring undergraduate research (UGR) students. Individuals may be nominated by CUR Institutional or Institutional-Enhanced members, or individual CUR members of the Physics and Astronomy Division.

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## Mentor Awards

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Faculty mentoring interdisciplinary projects are eligible as long as those projects involve a major physical or astronomical component. Applications/Nominations process must be submitted in their entirety by **11:59 pm (EDT), Friday, May 3, 2019**, to [this link](#).

Mentors with three or more years of experience in a primary role are eligible to apply. While this generally corresponds to assistant professors and above, the committee recognizes that many mentors are not in tenure-track positions and that some scientists begin significant undergraduate research mentoring before they obtain a permanent position. Nominations must be made by colleagues or students who know the nominee well. Self-nominations will not be accepted.

Application requirements:

- (1) **Online application form** at [this link](#)
- (2) **Nomination Letter** (three-page limit)—a nomination letter submitted to the link above that specifically addresses the nominee's mentoring of UGR students. In this letter, the nominator should describe:
  - (a) The nominee's long-term personal commitment to mentoring;
  - (b) How the nominee's mentoring strategies fit student needs and limitations; and
  - (c) Additional information that the nominator feels is warranted.
- (3) **Nominee Resume** (two-page limit) – Submitted to the link above. This document should provide information on the cumulative UGR mentoring activities. All publications and presentations with undergraduate coauthors within the past five years should be listed.
- (4) **Two recommendation letters from UGR students** (two-page limit for each letter) –

These students must have been mentored by the nominee within the past five years. Each letter should detail:

- (a) How their mentor helped them achieve in areas of their life that mean the most to them (i.e., academic, career, or personal growth);
- (b) How their mentor modeled positive behaviors and successful research outcomes.
- (c) Additional details about the mentor's work with the student is welcome.

Recommendation letters should be submitted separately to [this link](#).

The CUR Physics and Astronomy Councilors will review all completed applications and select this year's winner(s). The awardee(s) will be notified in late May 2019. Awardees will receive a plaque recognizing their significant contributions to mentoring undergraduate researchers. Letters of recognition also will be sent to identified superiors (department chair, dean, provost, center head, etc.).

Questions about the application process should be addressed to Carol Hood ([chood@csub.edu](mailto:chood@csub.edu))

## *Travel Award Reports*

### *Maddie Francis*

This past March, I attended the APS March meeting, my first physics conference where I presented my research on how crosslinking proteins affect the mechanics of the cytoskeleton. The weeks leading up to it were difficult to say the least. Sleepless nights with revision after revision of my poster presentation. Stress levels were high in the Department of Physics at the University of San Diego. Despite the chaos, I was comforted in knowing I had a reliable community to push me to succeed, especially

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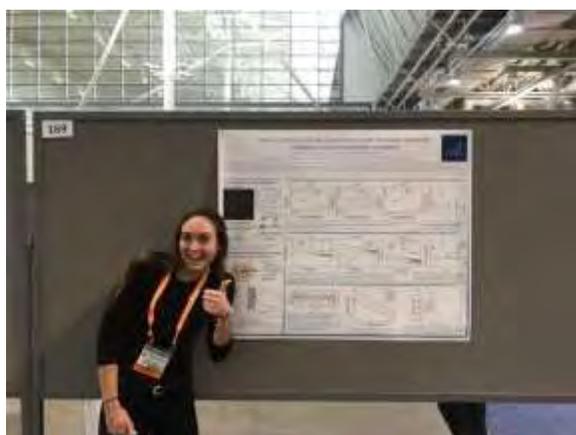
## Travel Award Reports

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thanks to my advisor, Dr. Anderson, and the other students in the physics and biophysics department who attended March meeting.

The day of my presentation, I was nervous. What if somebody asked me something I didn't know? What if I start stuttering? I am not a huge fan of public speaking. Or even worse; what if I bore them? These feelings of insecurity dissipated instantaneously after my first visitor. I found the words tumbling out of my mouth filled with enthusiasm. I had put so many hours over the past year acquiring and interpreting this research. I knew what I was talking about. This was my work! And it was fascinating!

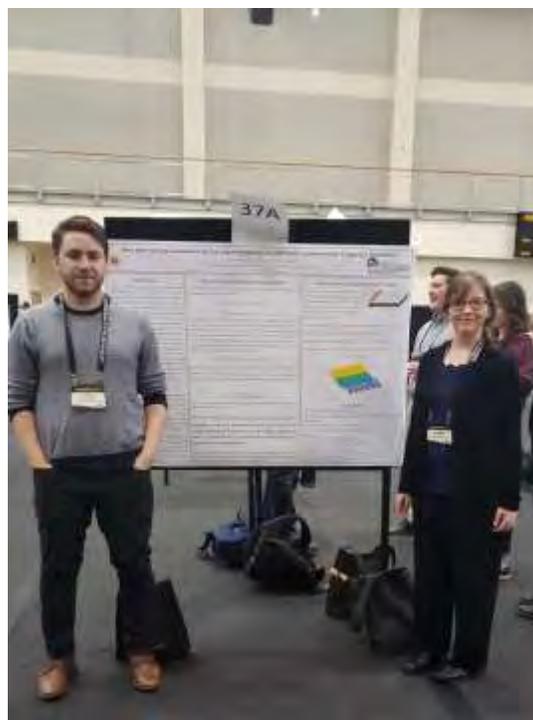
I was impressed with the wide range of people I interacted with—from undergraduates to PhD students. There were so many types of research, from small-scale intracellular studies to large-scale astronomical discoveries. I learned so much this year from my experience. I'm looking forward to seeing what next year's APS meeting has in store!•



*Maddie Francis presenting her poster at the APS March meeting*

## Dylan McKelvey

Dylan McKelvey presented his poster “*Does Time-Varying Modulation of Few-Layer-Graphene and Insulator System Provide Frequency Tunability?*” at the 2019 NCUR conference at Kennesaw State University. Dylan stated that “NCUR was a great experience for showcasing our research. The travel award provided us means to attend the conference and present our research. It was a great learning experience for presenting and being exposed to diverse areas of research. It was a great networking opportunity as well.”•



*Dylan McKelvey and Jennifer Olszyna presenting their work at NCUR 2019*

### ***CURPA Diem Deadline***

*CURPA Diem* is issued three times per year, and we welcome your contributions! Please send your submissions, comments, achievements, opportunities, etc., to Rick Thompson (rt533@cabrini.edu). Deadline for the fall 2019 issue is **September 13, 2019**.

### ***Your CURPA Councilors***

Rae Anderson, University of San Diego,  
[randerson@sandiego.edu](mailto:randerson@sandiego.edu)

Maria Bautista, Kapi`olani Community  
College. Diversity and Inclusion  
Task Force  
[mariab@hawaii.edu](mailto:mariab@hawaii.edu) \*\*

Matthew Beaky, Juniata College  
[beaky@juniata.edu](mailto:beaky@juniata.edu)

Mark Biermann, Valparaiso University  
Constitution and Bylaws  
Committee  
[mark.biermann@valpo.edu](mailto:mark.biermann@valpo.edu) \*\*

Derek Buzasi, Florida Gulf Coast University  
[dbuzasi@fgcu.edu](mailto:dbuzasi@fgcu.edu) \*

Saida Caballero-Nieves, FIT  
[scaballero@fit.edu](mailto:scaballero@fit.edu)

Beth Cunningham, AAPT. CURPA  
Mentoring program  
[bcunningham@aapt.org](mailto:bcunningham@aapt.org) \*\*

Jason Deibel, Wright State University  
[Jason.deibel@wright.edu](mailto:Jason.deibel@wright.edu) \*

Chris Fuse, Rollins College.  
Nominations Chair  
[cfuse@rollins.edu](mailto:cfuse@rollins.edu)

Taviare Hawkins, UW La Crosse  
[thawkins@uwlax.edu](mailto:thawkins@uwlax.edu)

Carol Hood, Cal State San Bernardino  
Diversity and Inclusion Task Force  
[chood@csusb.edu](mailto:chood@csusb.edu)

Chris Hughes, James Madison University  
[hugheswc@jmu.edu](mailto:hugheswc@jmu.edu)

Michael Jackson, Millersville University.  
CUR Posters on the Hill, Goldwater  
Faculty Mentor Award Committee  
[Michael.Jackson@millersville.edu](mailto:Michael.Jackson@millersville.edu)

Seth King, UW La Crosse  
[sking@uwlax.edu](mailto:sking@uwlax.edu) #

Lakshmi Krishna, Colorado School of Mines  
[lkrishna@mines.edu](mailto:lkrishna@mines.edu)

Hasitha Mahabaduge, Georgia College &  
State University  
[Hasitha.mahabaduge@gcsu.edu](mailto:Hasitha.mahabaduge@gcsu.edu)

John Mateja, Goldwater Foundation  
CUR/Barry Goldwater Scholar  
Faculty Mentor Award Committee  
and NCUR Oversight Committee  
[johnmateja2@gmail.com](mailto:johnmateja2@gmail.com)

Duncan McBride, formerly at the National  
Science Foundation. CUR Finance  
Committee, and CUR  
Investments Committee  
[demcbride@verizon.net](mailto:demcbride@verizon.net)

Brian Murphy, Butler University  
[bmurphy@butler.edu](mailto:bmurphy@butler.edu) \*

Terry Oswalt, Embry-Riddle Aeronautical  
University. CURPA Chair, Advocacy  
Advisory Committee, CUR Executive  
Board  
[Terry.Oswalt@ERAU.edu](mailto:Terry.Oswalt@ERAU.edu)

Kristin Rabosky, Weber State University  
Innovation and Collaboration  
Committee  
[kristinrabosky@weber.edu](mailto:kristinrabosky@weber.edu) #

Toni Sauncy, Texas Lutheran University,  
Student Programs  
[tsauncy@tlu.edu](mailto:tsauncy@tlu.edu) #

Allyn Smith, Austin Peay State University.  
CUR Posters on the Hill Review  
Committee  
[smithj@apsu.edu](mailto:smithj@apsu.edu)

Chitra Solomonson, Green River College  
[csolomonson@greenriver.edu](mailto:csolomonson@greenriver.edu) \*

Richard Thompson, Cabrini University.  
CURPA Newsletter Editor  
[rt533@cabrini.edu](mailto:rt533@cabrini.edu) \*\*

Francis Tuluri, Jackson State University,  
[Francis.tuluri@jsums.edu](mailto:Francis.tuluri@jsums.edu) #

Brian Utter, Bucknell University,  
Assessment, Program Review  
[Brian.utter@bucknell.edu](mailto:Brian.utter@bucknell.edu)

Karthik Vishwanath, U. Miami Ohio  
[vishwak@miamioh.edu](mailto:vishwak@miamioh.edu)

Gabriel Williams, College of Charleston  
Assessment  
[williamsgj@cofc.edu](mailto:williamsgj@cofc.edu) #

\* Term begins at June 2019 Business Meeting

\*\* Re-elected to new term

# Term ends at June 2019 Business Meeting