



View from the Chair

Hello, Y'all! *Change*...the simple, little innocuous word is severely inadequate to describe the events of the past three months, at least for most of us. There are few among us who are not profoundly impacted by the challenges of the COVID-19 world pandemic. At minimum, our professional and personal lives have been turned upside down, and, for many, life has been lost, cut short by a pathogen that the scientific community does not yet fully understand.

In my local sphere, the transition began in mid-March as our school headed into the scheduled spring break with a bonus week "to prepare." In my mind, the community of physics and astronomy educators was well poised to meet the challenges of "remote-only" learning. This initial thought has proven largely true, with a rally across the nation of educators sharing resources, ideas, successes, and failures in making sure that our students were served.

Our problem-solving skills have come to the forefront, with creativity, energy, innovation and remarkable ingenuity applied to serving our students. I am certain that most of us have experienced a roller coaster-like experience as we faced this unexpected challenge. The physics and astronomy community writ large has responded to these challenges with vigor, with abundant resources and listserves full of advice, for which I am deeply grateful. I include just a short list of those that I have found most helpful for my labs and courses at the end of this column. Also see the column by Beth Cunningham at the end of the newsletter for additional resources.

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.

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Council on Undergraduate
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The CUR community immediately began to rally as we all tried to wrap our heads around what this means for undergraduate research this year and beyond. *continued on next page*

View from the Chair

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Spring is usually the time when the accomplishments of undergraduate researchers around the country are celebrated with campus wide symposia, recognition banquets, and poster expos—and when thousands of students would typically gather and share their work at NCUR.

While many campuses chose to postpone or cancel many of these events, several did not. Many of the virtual events were driven by CUR community members at campuses across the country. CUR carried out a successful (virtual) Posters on the Hill event via Twitter, bringing honor and recognition to some of the most outstanding young scholars in the country. CUR members gathered in virtual chat groups to discuss innovative ways to continue working with students, to begin to understand the impact of social distancing on laboratory research, and to brainstorm how to make lemonade out of a worldwide pandemic of lemons.

These sessions ranged in topics, all centered on *Undergraduate Research in the Era of COVID-19*, with specific discussions on faculty response, summer research, summer employment, and more. These have been driven by Charles “billy” Gunnels (Florida Gulf Coast University, CUR URPD and Biology Division). These virtual sessions were recorded and can be found on the CUR Community forum. I highly recommend these. The premise of these gatherings was the notion that none of us may have *the* answer, but collectively, we are certainly likely to develop the best ways to move forward.

Other CUR groups have been active in thinking about how CUR might best support the undergraduate research community. The Student Programs Task Force has continued

to meet and will present a number of student-focused resources and enrichment activities at the upcoming [\(virtual\) Biennial Conference](#). Another important CUR resource for these challenging times is the [CUR Member Resource Library](#), where you will find a collection of articles and inspiration for how to move forward with your research, even in these challenging times. I urge you to take advantage of these resources and find the time to engage with the vibrant CUR Community.

We have been alerted that the Biennial (June 28–July 1) and the [Annual Business Meeting](#) (June 25–27) will be held virtually in 2020. CURPA will meet and do its usual business—with attention to how the work of CURPA influences the success of the CUR Strategic Plan. We encourage all physics and astronomy mentors who are committed to furthering the impact of undergraduate research to weigh in on our planning. More on the CUR Strategic Plan will be posted on the CUR website shortly. Contact any elected councilor of the CUR Physics & Astronomy Division to have your ideas, thoughts, and suggestions included in the conversations when we gather (virtually) this summer. The list of CURPA councilors can be found [here](#) (click on the Physics and Astronomy division link) as well as at the end of this newsletter. Speak up, early and often. We would love to hear from you.

In the meantime, please consider nominating a colleague for the CURPA Division Faculty Mentor Award. Last year, two outstanding nominees were selected, and we know that there are lots of outstanding, inspirational mentors out there who are deserving of this national-level recognition of their work with undergraduate researchers. To be inspired, see the write-up about the [2019 honorees](#) on the CUR website.

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View from the Chair

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The virtual nature of academic life this year made it tough to carry out the celebration of Undergraduate Research Week with its usual exuberance. The online celebration continues... we hope that physics/ astronomy folk out there will find the time to post a photo on social media that celebrates your own success with your undergraduate researchers. You can post photos, inspiration, challenges and advice on the CURPA Facebook page—if you are not in our special group on Facebook, join us! (just click [here](#)) The page is only as good as the posts of the group, so please use this forum to show us what you and your students are up to. Even if it is remembering how much you miss being in the lab with students! Please share. Please also consider sharing your story in *CURPA Diem* (editor [Rick Thompson](#)), on our Facebook page, or if you are shy—just send me an email.

Again, I'll call for help with spreading the CURPA WORD throughout the physics and astronomy community. If you would like to be a CURPA Ambassador at your favorite meeting that encourages your undergraduate student researchers (virtual is OK!), please let us know.

I generally close with this: *“May your labs be buzzing with fully operational equipment, your data terminals be full with fantastic results, and your imaginations be inspired with all that is possible.”* But, as I write from my “virtual” office away from my students, away from my lab, worried about the future of higher education, facing a summer without research students for the first time in more than 20 years, I will simply say—I wish health and wellness to a group of individuals who are among the most innovative, creative, and resilient folks on the planet—I know that the physics and astronomy community will

be working to make all that is within our sphere of influence better.

The following are some physics and astronomy resources. This list is not exhaustive nor complete—just a glimpse of all that is out there!

- [AAPT Committees Listserve](#)
- [AAPT Advanced Labs Listserve](#)
- [Advanced Labs Physics Association ALPhA](#)
- [NSF physics classroom resources](#)
- [NSF astronomy and astrophysics classroom resources](#)
- [AstronomyTeacher.com](#)

I have also found the *American Journal of Physics* and *The Physics Teacher* invaluable as I try to figure out what an online advanced lab looks like...

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2019–2020 CURPA Chair

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2021 Goldwater Competition: Guidance for Applicants, Faculty Mentors, and Fellowship Advisers

The Goldwater Scholarship Foundation looks forward during its 2021 competition to selecting students who have the potential to become tomorrow's research leaders. As in past years, the foundation expects to open its nomination site on the first Tuesday after Labor Day.

The foundation understands these are unusual and difficult times and plans to be as flexible as possible in its 2021 nomination review. The foundation will, for selection purposes, continue to instruct its readers to review the applications holistically and to consider the impact of COVID-19 on the application materials.

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2021 Goldwater Competition

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As the landscape for universities and colleges has changed, we recognize that the applications submitted for the 2021 Goldwater competition will differ in character from those submitted in previous competitions. Changes that COVID-19 have caused include limited or curtailed access to traditional laboratory or field-based research experiences; modified course delivery; alterations to grading schemes; and health and economic issues faced by the students, their families, and their communities.

How will the Goldwater program use grades in academic terms impacted by COVID-19?

- When reporting their GPA, students will have the option to submit their cumulative GPA calculated as of the end of the fall 2019 or the fall 2020 terms and are eligible for nomination as long as either meets the program's GPA eligibility requirement (GPA > 3.0 is required). It should be remembered that grades are not a principal selection criterion for Goldwater Scholars.
- The foundation will, for selection purposes, instruct its readers to minimize the negative impacts of COVID-19 or subsequent changes to grading policies (pass/fail, letter grade, dropped courses, etc.) on a student's academic performance during COVID-19-affected terms. As the effects of COVID-19 may continue into fall 2020, it is possible that fall 2020 courses will be reviewed similarly.

What research expectations will there be in the 2021 Goldwater Scholarship Competition?

The foundation is aware that many traditional research experiences and opportunities to

disseminate research for undergraduates have been delayed, canceled or severely restricted. In the past, these experiences have been used as the basis of the Goldwater research essay. However, we see this as an opportunity to help students understand that research does not just exist within a traditional research laboratory but that research encompasses all the steps that create and disseminate new knowledge.

Students are encouraged to participate in any faculty-mentored research experiences that are still open to them, including literature reviews, design of experimental protocols, analysis of existing data sets, computational studies, and writing research proposals. The dissemination of this work in virtual or online conferences is a recognized milestone in students' scholarly development. Applicants who submit a research proposal for their research essay should highlight the motivation for the work, background literature, experimental design, as well as anticipated outcomes and proposed analysis of the data.

We anticipate that there will be students who use this opportunity to pursue independent research—e.g., a student who is developing a data-driven website that tracks global COVID cases to study the impact of travel restrictions or a student who is investigating the efficacy of novel cleaning methods for N95 masks. All of the above examples can be used by students to develop their research essays and be reported in the research project section of the application. It remains important that the essay details the student's specific contributions to a project and indicates the specific skills/expertise the students developed as a result of participation in a project.

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2021 Goldwater Competition

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How will the 2021 Goldwater nomination packet differ from past application packets?

At this time, we anticipate adding two questions to the overall application packet. One question, to be completed by the student, will ask whether COVID-19 or other hardships affected the student's research career plans and how or if those events altered the student's ability to pursue those plans. The other question, to be completed by the campus representative, will ask how the institution responded to the pandemic, asking for information on how grades were handled, how long laboratories and field experiences were closed to undergraduates at the institution, and relevant information that is unique to the student's individual challenges during the COVID-19 response or other hardships.

Have the Goldwater eligibility requirements changed?

No. To be eligible for a Goldwater Scholarship, a student must:

- be a full-time, matriculated, second-year or third-year student
- intend to pursue a research career in natural science, engineering, or mathematics
- have a GPA of at least 3.00 on a 4.00 scale
- be a U.S. citizen from the 50 states or the District of Columbia; a US national for those students from institutions in Puerto Rico, Guam, US Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands; or a permanent resident.

The Goldwater Scholarship Foundation looks forward to selecting the 2021 scholarship recipients and appreciates the work that is

undertaken by physics and astronomy faculty and campuses to nurture the next generation of research leaders in these important fields.

*John Mateja
President*

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2020 Posters on the Hill

CUR's Posters on the Hill event was held this year on April 21 and presented via Twitter (#POH2020)! Although this was not how the event was originally planned, the CUR National Office worked exceptionally hard to create this online program—for which I am immensely grateful, particularly in the short amount of time it had to accomplish this. There was a lot of positive feedback and visibility we received from having an online presence—enough so that we will be looking to enhance the online presence at future in-person Posters on the Hill events.

This year, 60 posters were selected from over 340 completed applications. The students selected to represent the CUR Physics & Astronomy Division were the following:

- Josephine Spiegelberg, Rollins College, (Adviser: Christopher Fuse), “Formation of Ice Giant Satellites during Thommes Model Migration”
- Brian Blair and Jacen Urbaniak, Wright State University, (Adviser: Jason Deibel), “Advanced Terahertz Frequency Waveguides”
- Daniel Quispe, Lamar University, (Adviser: Cristian Bahrim), “Increasing the Efficiency of Solar Cells in Coastal Areas”

Additionally, the following student from the Physics & Astronomy Division received an honorable mention:

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Posters on the Hill

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- Olivia Young, West Virginia University, (Adviser: Maura McLaughlin), “Data Simulation to Constrain Fast Radio Burst Periodicity Search Techniques”

Congratulations to these students and their advisers. 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 event in mind and encourage your undergraduate students to apply. More information about this event can be found [here](#).

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2020 CUR Physics and Astronomy Faculty Mentor Award

The CUR Physics and Astronomy Division would like to honor mentors in physics and astronomy 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. Nominees are encouraged to be CUR members, but it is not required for nomination. Individuals mentoring interdisciplinary projects are eligible as long as those projects involve a major physical or astronomical component. Nominations and recommendations must be submitted in their entirety by 11:59 pm (EDT), Sunday, May 31, 2020, to this [link](#).

Mentors with 3 or more years of experience in a primary role are eligible. Although 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 of individuals at 2-year colleges, national labs, research centers, etc., are especially encouraged. Nominations must be made by colleagues who know the nominee well. Self-nominations will not be accepted.

Application requirements

- (1) Online [application form](#), to be completed by the nominator, and includes submitting items 2 and 3 below.
- (2) Nomination letter—submit a 2- to 3-page letter at the link above that specifically addresses the nominee’s mentoring of UGR students. The letter should describe:
 - a. The nominee’s long-term personal commitment to mentoring;
 - b. How the nominee’s mentoring strategies fit student needs and limitations;
 - c. Additional information that the nominator feels is warranted.
- (3) Nominee CV/résumé (2-page limit)—submitted to the link above. This document should provide information on the cumulative UGR mentoring activities. All publications and presentations with undergrad coauthors within the past 5 years should be listed.
- (4) Two recommendation letters from undergraduate research students (2-page limit for each letter)—At least one student must have been mentored by the nominee within the past five years.

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Faculty Mentor Award

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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 information about the mentor's work with the student is welcome. Recommendation letters should be submitted separately by each recommender to this [link](#).

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

Questions about the application process should be addressed to [Carol Hood](#).

Resources to Help You Deliver Your Remote Courses

Many physics educators had to make dramatic changes to their courses in March to convert them from face-to-face delivery to remote learning. For many faculty, this has been challenging, since they only teach face-to-face with students and have no experience teaching remotely. Furthermore, many institutions have built success on close student-faculty interactions. This has left many faculty scrambling to provide a

satisfactory learning experience for their students. The American Association of Physics Teachers (AAPT) and other physics and astronomy professional societies have shared resources to help physics educators during this challenging time. Below is a list of some of the most used resources.

PhysPort is a great source for ideas and resources that align with research-based pedagogical principles and research-validated resources for teaching online. It also has great ideas that can be used to make the online teaching process easier.

- [For general information about teaching remotely](#)
- [For information about teaching labs in a remote setting](#)
- [For helping students continue to frame their "in-class" activity as sense-making](#)

The Physics Teacher (TPT) and the *American Journal of Physics* (AJP) have compiled a collection of specialized articles that focus on remote learning. These articles highlight the use of smartphones for lab experiments as well as other activities that can be adapted for use by students at home. The articles have been made free to read, download, and share for a limited time at this [link](#).

[ComPADRE](#) (the Physics Digital Library) has many different resources such as Open Source Physics, Interactive Video Vignettes, and computational materials for physics classes that can be used to teach courses remotely.

AAPT also has many discussion groups of active members and friends that allow the sharing of ideas, plans, activities, labs, lesson, etc. To join a discussion list, use this [link](#).

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Remote Course Resources

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Physlet Physics provides recommendations for ways to use 158 STEM simulations (83 in HTML5) to support your student's learning.

- Physlet books online: [here](#) and [here](#)
- Instructor Guide and [Answer key](#)

Interactive Lecture Demonstrations (ILDs) are a great active learning tool that students can use at home. ILDs are designed to enhance conceptual learning of physics lectures through active engagement of students in the learning process. ILDs consist of pictures, videos, displays, and real physics simulations that are available to substitute for hands-on experiments. See this [link](#).

[Diagnoser Tools](#) is a coordinated and coherent suite of free online tools that teachers use with their students to scaffold and monitor the development of deep understanding in science.

The APS April Back Page is “Moving Physics Courses Online on Short Notice” by Chandralekha Singh. [This article](#) includes links to a number of different resources.

The American Astronomical Society (AAS) has a [website](#) that lists a number of resources, including AAS-curated online teaching resources, community-submitted online teaching resources, and YouTube videos on tools and tips of teaching astronomy online.

The American Sociological Association (ASA) has a [webinar](#) on “Transitioning to Online Teaching in the Face of COVID-19.”

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CURPA Diem Deadline

CURPA Diem comes out three times per year and welcomes your contributions! Please send your submissions, comments, achievements, opportunities, etc., to Rick Thompson (rt533@cabrini.edu). Deadline for the fall 2020 issue is **September 11, 2020**.

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* Term begins at Summer 2020 Annual Business Meeting

** Re-elected to new term

Term ends at Summer 2020 Annual Business Meeting

Calls for Papers, Scholarship and Practice of Undergraduate Research (SPUR)

- “[Undergraduate Research during Times of Disruption](#)” (ongoing theme; proposal deadline June 22, 2020)
- “[Undergraduate Research and Climate Change](#)” (proposal deadline July 27, 2020)



Interested in serving as a reviewer for SPUR?

Please send an email to SPUR@cur.org indicating areas of interest/expertise (e.g., assessment). Experience with qualitative/quantitative methods is especially desired.