**Multi Department Activities**

Science Express-The Chemistry, Biological Sciences, Earth and Atmospheric and Planetary Sciences, and Physics Departments of the Purdue College of Science deliver research-grade instruments to high schools in 17 Indiana counties. Numbers for the month of November are as follows:

Department       School Visits       Student/Instrument Interactions

Chemistry           27                           1649

Biology                 23                           1185

Physics                 10                             500

EAPS                      14                           1445

Advanced Placement Fridays- Earth, Atmospheric, and Planetary Science Outreach, in conjunction with Chemistry Outreach, is excited to offer AP Lab sessions during the Fall 2017 semester at Purdue University.

Math Field Day

This is a campus activity, put on annually by Math Outreach. The program engages local middle school students in a competitive exercise to test their math skills and promote excellence in teaching/learning of math in school. Approximately 90 students from two local middle schools participated in the event. The event is run by the Math Club and K-12 Outreach.

**Biology Outreach**

Visited Lafayette Christian School and made presentation to 18 3rd grade students and their teacher about Biology Outreach’s “Ecology and Art program”. The class visit to the Ross Reserve where programmatic activities takes place had to be postponed. The field trip will be rescheduled.

Biology Outreach participated in “Math Field Day”.

NMSI. (National Math Science Initiative) AP Biology Presentation.

Biology Outreach Coordinator was a presenter at a NMSI AP Biology Study session to approximately 60 high school students at Central High school in Grand Forks ND.  AP biology curriculum topics addressed during this presentation were A) Big Idea #2: Osmosis/diffusion: Photosynthesis and Respiration, and B) Cellular Functions. The opportunity was also taken to provide students with information about the Department Of Biological Sciences at Purdue and encourage them to consider Purdue's Biology program for their tertiary studies at college.

**Physics Outreach**

SMAP – Saturday Morning Astrophysics

We held November Saturday Morning Astrophysics at the Prairie Grass Observatory at Camp Cullom in Frankfort. As a special treat Physics and Astronomy provided dinner for each student in attendance and one accompanying parent. Additional family and friends were also welcomed for a nominal donation.

Work is in progress for two up-coming SMAP sessions; for January, I am collaborating with post doc Avery Archer for a lesson on gravity waves, and with faculty member Rafael Lang for the February session on Dark Matter.

Faculty Grants Proposals

Outreach coordinator David Sederberg worked with Kyound-Soo Lee on composing a broader impact proposal for two NSF research grant proposals. In addition to allocating funds for equipment loan and classroom use, we also proposed hosting a one week summer program for underrepresented middle school girls.

Physics and Astronomy Outreach also contributed to a second NSF proposal, submitted Purdue faculty member Dimitrios Giannios as co-PI. Other PIs are Rodolfo Duran from Sacramento State, and Adithan Kathirgamaraju from Northwestern University. A principal component of the broader impact will be targeting Saturday Morning Astrophysics and Purdue, and similar endeavors at the other tow institutions.

Indiana Eclipse 2024

With Physics and Astronomy professor Rafael Lang, Outreach Coordinator David Sederberg met with College of Science Dean Patrick Wolfe to propose our idea and begin discussion for the eclipse in April, 2024 – to provide every public school K-12 student with glasses to observe the eclipse. In addition, we will provide teacher PD and community programs building momentum leading to the event.

Service learning

Graduate service learning student and local teacher Debbie Beck piloted rotational motion devices she has been working on with her physics classes at Jefferson High School. The devices and instructional materials will be used in the February session of SMAP. Debbie consulted with faculty member Rafael Lang and Outreach Coordinator David Sederberg in the preparation of the materials. A complete set of these devices will be designed and machined for classroom distribution with Science Express.

STEM Ed Study Abroad in China

Work continues on the promotion and recruitment of students for the Maymester study abroad service learning program in Nanjing China.

Earth, Atmospheric, and Planetary Sciences Outreach

* + K-12 Outreach Coordinator, Seven Smith, had another publication:[**https://nagt.org/nagt/publications/trenches/v7-n4/191028.html**](https://nagt.org/nagt/publications/trenches/v7-n4/191028.html)
  + Developed new lessons in coding (with the help of Phil Sands from Computer Science)  and fossils. Both lessons were taught at schools in Indianapolis and will received by teachers and students.
  + [**http://www.eaps.purdue.edu/outreach/people.html**](http://www.eaps.purdue.edu/outreach/people.html)is live! We are having EAPS graduate students and faculty make short introductory videos to allow K-12 students to know a little about them.
  + **Equipment loan**
    - Imagination Station has our Traveling Solar System Wall on display.
    - Our participation is Science Express is proving to be beneficial in that we have teachers of college bound students using equipment in our content areas.  The teacher training this month went well and teachers are excited about all of the new EAPS items being included in the program.
    - We also have a number of kits and items that we loan out to teachers as well as university faculty and students. It has proven to be beneficial to EAPS faculty who have borrowed demos and other items for instruction.
  + **Planning for the GLOBE North American Meeting and GLOBE Train the Trainer workshop**
    - Planning has begun for this March 2018 event. We have reserved the John S. Wright Forestry Center for the training and a room in Stewart Center for the meeting. A planning committee of GLOBE partners have been created and chosen the theme of the Pedoshpere.
    - Attended meetings for the GLOBE U.S. Partner Forum.
    - Working with EAPS faculty to get our rooftop weather station going so that it can post data to the GLOBE web site under the Purdue University partnership.
  + **Collaborations,  including broader impacts and instrumentation**
    - GIS Day on Campus went very well. EAPS Outreach collaborated with persons all over campus to make the event a success.
    - Working with the director of Imagination Station and a local software developer to design an augmented reality experience to accompany our traveling wall displays.
    - Met with Dan Dawson discussing a portable weather instrument. Steven Smith and Bill Bayley have begun constructing the apparatus.
    - Collaborated with Prof. Lisa Welp on organizing our Halliburton Foundation grant.
      * We are having EAPS grad students make introductory videos to allow K-12 students to know who they are. Steven Smith has begun recording and posting the videos. <http://www.eaps.purdue.edu/outreach/people.html>
  + **Student events:**
    - AP Friday’s are going strong. Teachers and students are enjoying the events.
      * We have put together our Spring offerings for this program and teachers are already signing up for dates. <http://www.eaps.purdue.edu/outreach/ap_friday.html>
    - Science fair mentoring
      * Dr. Robin L. Tanamachi, has worked with outreach to help a local student work on a tornado project.
      * Outreach is helping students on projects including carbon storage and parks to human impacts on soil chemistry.

**Chemistry Outreach**

Last month I attended an NSF GLOBE Training in New Orleans, Louisiana. The training was titled “STEM Equity Bootcamp”. This was a weeklong training that was attended by professionals throughout the United States with an interest in the GLOBE program and STEM education. I met many people who provide science-based programs for K-12 youth and professional development opportunities for K-16 educators. Some of the highlights included interacting with Dr. Ivan Gill’s students (University of New Orleans) as they worked on a research project for their science methods course, visiting Xavier University of Louisiana (XULA) and listening to Dr. Rosalind Hale, and traveling to the INFINITY Science Center on the Mississippi Gulf Coast. At the INFINITY center, we were able to participate in a few of the GLOBE protocols. By attending this GLOBE Training, I became registered as a full GLOBE member as well as a GLOBE Teacher and Trainer. Because Purdue University is a GLOBE Partner, my involvement with the GLOBE program will allow me to more easily include GLOBE protocols with professional development opportunities and workshops that I will already be organizing. GLOBE is such an incredible program because it provides a way for both children and adults to make real observations of the world around them and upload these observations in the form of data to the GLOBE website. Observations entered into the GLOBE website feed into a database with which every GLOBE member in the world has access. This puts loads of real-world data at the fingertips of both teachers and students. GLOBE makes everyone in the world a potential scientist! I am excited to develop ways that this real-world data, available online through GLOBE, can be implemented into the Indiana K-12 science classrooms.

AP Fridays at Purdue continued in the month of November as 66 students (total) from three different high schools traveled to the West Lafayette campus to conduct a Kinetics lab where they learned about rate laws. One of these lab sessions took place in BROWN 3165 while the other lab session took place in HAMP 2244. Professor Corey Thompson was once again available during the second lab session to help students with lab techniques and to answer questions. I also submitted pictures and press releases to the local newspapers of every high school that has come to campus so far this semester to participate in an AP Friday at Purdue lab session. I am slowly receiving confirmation that these press releases have been included in the newspapers. The teachers who have been involved in these lab sessions are excited to see their students recognized in their community newspapers. I am hoping to have confirmation of every press release by the end of December.

I was invited to participate in the judging process for Professor Roberts’ CHM 294 video assignment. I watched 15 videos about chemistry at Purdue University created by students in this course. In the process of judging these videos, I also became FERPA certified through the WebCert Purdue page. I especially liked that Professor Roberts was seeking nominations for the “Chemmy Awards”. I nominated student teams for the following categories: Most Exciting, Most Artistic, Most Persuasive, Most Realistic, Best Recruitment Video, Most Historically Relevant, and Most Colorful Reactions. I am really looking forward to joining the CHM 294 class for the award ceremony on Tuesday, December 5th.

**Computer Science Outreach**

This month was the bulk of the second module of CS180x. Our enrollment settled around 900 students and we were able to exceed expectations on our gender balance (26%). The students have covered most of the introductory CS180 topics, and are now moving into object-oriented programming. In preparation for the 2018-19 edition of the course, my teaching assistants and I are working on re-editing videos for length, and adding more practice activities to help students develop programming skills independently of problem-solving tasks. We will be on a recess from the course from December 2nd through January 16th due to the holiday season.

My ROCS and MAGIC students were involved in a number of service learning activities in November. ROCS organized our first “Code with the Kids” night in late November, during which we had 14 families come for a night of coding activities focused on building the connection between the parent and the youngster. The event was a success and received a lot of positive feedback. We will look to run another “Code with the Kids” event in the Spring semester. ROCS also continues to support the CoderDojo group running out of the Purdue Anvil, and joins MAGIC on their weekly visits to local high schools for mentoring. MAGIC made 14 visits to local high schools this month, and are simultaneously working on plans for our two special events during the Spring semester (a field trip to an Indiana computing business, and our special event with CSWN and the Girl Scouts of America).

Specifically addressing our diversity goal, my ROCS and MAGIC students joined me on a trip to Chicago Math and Science Academy. The trip was arranged by Connie Brophy from our Women in Science program as part of their recruitment for the ScienceScape program. At the school, we taught 64 African-American and Hispanic students about computer science and sorting. We’re looking to work with the school in the future, and will encourage these students to join us for our CS Summer Camp program next June.

My month also included a trip to the Indiana Business Educators Association annual conference, at which I presented two sessions. The first was a general “tips and tricks” session for new CS teachers that I co-presented with Indiana CSTA chapter president Julie Alano from Fishers, and Karen Podell from Westfield. The second session promoted our online CS180 course and the teacher cohort that we have to support those interested in teaching computer science with the help of a community. I will continue promoting this course at the state science teachers conference (HASTI) in February, and at the Indiana STEM conference here at Purdue in January.

My graduate semester is coming to a close, as I am finishing two courses this upcoming month. I had a recent paper accepted at the SITE conference related to some work that my Michigan State colleagues and I did looking at diversity issues in CS1 courses. I also have a handbook chapter being published next year, and am working through what will hopefully be the last revision of an article that I have submitted to the ACM’s education journal. Thanks again for supporting my ambitions with regard to graduate education and my ability to contribute to CS Education issues at the state and national levels.