**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 February are as follows:

Department       School Visits       Student/Instrument Interactions

Chemistry           14                        1121

Biology                 10                        400

Physics                 13                         758

EAPS                      12                         626

Attended HASTI Convention February 14th in Indianapolis. There were around 700 science teachers from the state of Indiana at the convention. The College of Science Outreach team had a booth in the exhibit hall and presented multiple sessions.

Traveled to Polytechnic High School (with the Purdue outreach team) to tour their facility and observe students during a regular school day.

**Biology Outreach**

Attended HASTI Convention February 14th. Indianapolis, and the Annual meeting of Indiana Association of Biology teachers (IABT).

AP Biology Student Study Session. Presented an AP BIOLOGY Student Study Session to AP biology students at Red River High School in Grand Forks ND. February 17.

Visit to PPHS; February 22. As part of the COS Outreach team, visited the PPHS (Purdue Polytechnic High School). The Outreach team met with officials of the school, visited classrooms and met with teachers and students. Discussions centered around opportunities for working with PPHS on curricular enhancement and how the Outreach Team can assist PPHS to address their programatic needs.

AP Fridays:  Presented an “AP FRIDAYS” Session to students from Fountain HS and Seeger HS. 24 students from Fountain HS and Seeger HS participated in the AP Biology Laboratory session, “Electrophoresis and Simulated Genetic Screen”. This Laboratory exercise (recommend by the College Board) meets the requirement of the AP curriculum in Molecular Biology. The Lab. Session was conducted in the Biology Outreach Lab, Rm: 1-407 Lilly Hall. February 23.

**Physics Outreach**

SMAP – Saturday Morning Astrophysics

We had a great SMAP in February with a presentation about dark matter by Abigail Kopec, graduate researcher with Rafael Lang’s group. Debbie Beck from Jefferson High School co-led the activity with Outreach Coordinator Dave Sederberg, which consisted of a series of experiments with the Feel the Force rotational motion apparatus created and fabricated as a service learning project with Physics undergrad Colin Burke. Beck wrote the lab based on these devices, which will now be available to participating teachers through Science Express.

Service learning

Service learning student Colin Burke was trained, and has taken on a fabrication project, at the relocated ALF (Artisan Fabrication Lab) in the new Bechtel Innovation and Design Building. Colin is made a classroom set of a rotational motion device that allows students to measure force as a function of radius, mass, or angular velocity. The “Feel the Force” apparatus made its debut at the February SMAP, and thereafter be available for teachers in Science Express.

Science Express

Physics and Astronomy Outreach Coordinator David Sederberg led sessions for the January SE Teacher training held on Purdue’s campus. The focus of the training for physics teachers was in the use of Vernier probe ware. Teachers were also given a briefing on the iO Lab data collection devices.

Sederberg, with Crown Point Physics teacher Maryanne Nicks, participated in the Virtual Reality training session at the Envision Center, in preparation for the upcoming summer SE teacher training workshop.

Faculty Broader Impact

Outreach Coordinator David Sederberg assisted Rudro Biswas in the broader impact segment of a funding proposal to NSF. The impact will be directed toward our summer middle school Physics Inside Out program.

Sederberg also met with Andrew Mugler regarding possible directions for broader impact for an upcoming career grant proposal.

**Earth, Atmospheric, and Planetary Sciences Outreach**

**Equipment loan**

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.

Science Express numbers for EAPS for February: 12 – Schools visited, classrooms visited, teachers participating and 626 Student/instrument interactions.

We have a number of kits and items that we loan out to teachers as well as university faculty and students. EAPS 102 and 312 borrowed a number of items this month.

**Imagination Station has our Traveling Solar System Wall on display.**

**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 Pedosphere.

**Attended meetings for the GLOBE U.S. Partner Forum.**

Working with locations that have a weather station, to post their data to the GLOBE web site under the Purdue University partnership.

**Planning the Disasters Happen: Are You Ready event at Imagination Station**

Planning of this event is taking a lot of time. We will have the DOW, and other vehicles present as well as running activities inside.

**Collaborations,  including broader impacts and instrumentation**

Worked with Rebecca Smith, EAPS. for use of Spectrometers in NSF grant and to create a new outreach lab.

Assisted instructing EAPS 102 class and presented to a couple of others

Visited Polytech high school in Indy to discuss collaborations.

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>

We are having EAPS 137 students make videos for this as a project.

Teaches are coming to the soils workshop in March

**Student events:**

Student groups visited campus

We are planning a Community Day at ImaginationStation

AP Friday’s had a couple of cancellations this month.

<http://www.eaps.purdue.edu/outreach/ap_friday.html>

Science fair mentoring

Outreach is helping middle and high school students on projects

**We started an Outreach News page**

<http://www.eaps.purdue.edu/outreach/Outreach_News.html> ​

**Chemistry Outreach**

* **Outreach for Indiana K-12 Educators**
  + Hosted a GLOBE professional development workshop for a group of Indianapolis homeschool teachers.
  + Traveled to Warren Central Elementary (West Lebanon, IN) with Computer Science outreach coordinator Phil Sands.
    - Taught a 4th grade science/computer science lesson with Mrs. Megan Reynolds’s students.
    - The lesson we prepared connected thermal energy and temperature values with writing code for a Micro:bit. Students developed an algorithm to compare collected temperature values of different socks under various classroom conditions.
  + Traveled to Columbus East high school with Bill Bayley and Zach Grigsby to evaluate the feasibility of repairing a donated FTIR.
    - Received confirmation later in the month that the local company that had made the donation was consulted and the FTIR instrument was successfully programmed and being utilized in the chemistry lab.
  + Attended 47th annual HASTI conference in Indianapolis, IN.
    - Served as an exhibitor for the Purdue College of Science K-12 Outreach
    - Presentation #1 with Steven Smith, EAPS outreach coordinator: “Literacy, Science, and Your Morning Calendar”
    - Presentation #2 with Phil Sands, Computer Science outreach coordinator: “Heat Transfer Computer Science Activity”
  + Traveled to Polytechnic High School (with the Purdue outreach team) to tour their facility and observe students during a regular school day.
  + Helped develop Purdue College of Science K-12 Outreach March newsletter
    - Theme: Waves and Energy
    - Newsletter has increased the number of subscribers from the first edition (February) by more than 100 members.
* **Faculty collaborations**
  + Helped Prof. Corey Thompson by contacting chemistry teachers in Lafayette, IN about recruiting students for 2018 Project SEED summer internship program.
  + Met with Dr. Jennifer Barce (College of Education) to discuss possible future collaborations between Purdue pre-service/student teachers and K-12 Outreach with the College of Science.
  + Prof. Dave McMillin prepared and delivered a mini-lecture related to spectrophotometry during the February 23 AP Friday Chemistry lab session.
  + Worked with Prof. Gaurav Chopra and George Takahashi to present a Virtual Reality pilot workshop for four Indiana high school teachers at the Envision Center.
    - Participating teachers learned about best practices when using the Science Express virtual reality equipment.
    - Participating teachers had the opportunity to speak directly with Dr. Chopra about science content classroom needs and the possibility of developing new programs to deliver relevant science content via virtual reality.
  + Worked with Steven Smith, EAPS outreach coordinator, to present information from HASTI conference: “Literacy, Science, and Your Morning Calendar”; by Skype for two groups of pre-service teachers at Purdue Fort Wayne with Professor Matthew Perkins Coppola.
  + Served as a member of an EPICS mid-semester design review to help provide input for the team to ensure that their project is appropriate, safe, and robust.
* **Science Express Labs and Instrumentation**
  + Worked with Prof. Gaurav Chopra and George Takahashi to update the MINT molecular modeling software on the Science Express virtual reality equipment for demonstration at HASTI.
  + Total of 34 students from four Indiana high schools came to Purdue to participate in an AP Chemistry lab session on Friday, February 23. Students used Science Express laptops along with the newly purchased Vernier Go Direct SpectroVis Plus Spectrophotometers during this lab session.
  + February 2018 Science Express totals
    - 14 high school chemistry classroom visits
    - 1,121 student/instrument interactions for the discipline of chemistry

**Computer Science Outreach**

Our third module of our online course, CS180.3x, ended this past week. We had a total of 1,415 students in this module (26.5% female), which is consistent with our previous module. The last portion of the course starts next week, and should see us cover the final content for students to be prepared for the AP CS A exam in May. With that in mind, I will mention that after a long process we now officially have the course acknowledged by the College Board, which had originally resisted approving us because of our university standing. They have remained resistant to having our students list Purdue as their content provider but I’m hopeful that we can collect more official data than what we currently receive (by way of self-report).

MAGIC continued their weekly trips to TSC, LSC, and WL high schools, working specifically on recruiting more students to the program and engaging the girls based on personal interests. Additionally, they were a vital part to our third annual CSWN Girl Scouts Event. We hosted about 40 people at our event, with the girls learning about data representation, and programming Virtual Pets on the Micro:Bit microcontrollers during the day-long session.

ROCS engaged in three events in February. In addition to helping with the Girl Scouts event, they helped me to host 12 high school seniors who had been admitted to Purdue, but who had not as of yet accepted, during what College of Science calls their “Destination: Purdue” weekend. Dr. Gustavo Rodriguez-Rivera and Victory Soe helped us to talk to the students about our virtual reality technology and course, and then worked with my students to answer questions about college CS and Purdue in general. Later in the month, my students also did their monthly session at the CoderDojo at the Anvil, where they taught middle school aged students about Python programming.

One event that we won’t be hosting is the “Code Café”, an event that was started by an IEEE student who had been privately tutoring Purdue students that were having trouble passing our introductory courses. We had previously sponsored the first Café, but as it overlaps with Supplemental Instruction, there appears to be little interest in continuing our support of this program. I will elect to send mentors here, even though it doesn’t directly address K-12 students, as it serves as an opportunity for our service learning students to practice working one-on-one with novice coders.

February also provided an opportunity for us to work with teachers, as Sarah Nern (the Chemistry Outreach Coordinator) and I shared an integrated STEM lesson with K-8 teachers at the Hoosier Association of Science Teachers Inc (HASTI) conference in Indianapolis. The lesson was focused on the ideas of heat transfer and insulators, and we used the aforementioned Micro:Bit microcontrollers as temperature sensors, writing code to convert the temperature from one scale to another. The conference sessions had about 20 attendees (I did a second session myself on block-based coding), and were well received. We’re looking at repeating this lesson at more schools, and developing more lessons that integrate science and computer science in order to help teachers transition to the new K-8 CS standards.

This past week, the K-12 Outreach team and I attended Purdue’s Polytechnic High School in Indianapolis for an exploratory visit. We’ll be evaluating how we may best help them going forward. Their work is project-based, and they are looking for faculty members that could help them to work on special aspects of these projects with the students. Both Bill Bayley and I can provide a list of their projects upon request, but I would appreciate suggestions on faculty members that may be interested in engaging in this work with us.

On a final note, I have begun enrollment for CS Summer Camp, which this year will run from June 10-15, 2018. We have already reached about 75% of our capacity and are expecting to have a full group this summer. The theme will be “Big Data” and “Data Science”. More information about camp can be found on the CS website. <https://www.cs.purdue.edu/outreach/adventures-in-cs.html>