**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           36 2731

Biology                 16 1544

Physics                 19 2050

EAPS                      37 3322

Planning for the Summer Middle School teacher’s workshop. We have Over 50 Middle School teachers coming to participate in multiple labs in different content.

Planning for the Lafayette Jefferson and Central Catholic summer teacher workshop. We are working with teachers to enhance the one to one technology used in their classrooms.

**Biology Outreach**

  1.) National Association of Black Chemists and Engineers (NOBCCHE) Students visits Biology.

        North Central High School of Indianapolis student chapter of NOBCCHE and their teacher advisors visited the Department of Biological sciences and participated in a series of activities during their day long stay. They attended presentations on opportunities for studying Biology at Purdue, and visited research labs. They also spent time at the Purdue Cancer Center and attended a presentation by Dr. Ignacio Camarillo, professor of Biology in the Cancer center.

2.) South Western MS visits Purdue;

      72 students from South Western MS in Lafayette visited Purdue with their teachers on Friday April 13, 2018.They participated in a series of activities across all Science disciplines. Biology Outreach presented in two sessions, the activity: “Extraction of DNA from strawberries”.

3.) Montessori School of West Lafayette visits the Ross reserve:

     On Wednesday April 18, 2018, 17 students and their teachers visited the Ross Reserve (Department of Biological Sciences Ecological Field Station), and participated in the ' Ecology and Conservation in Art' for 1st thru 3rd.graders. Led by Ms.Gabriela Sincich, the Biological Sciences artist in residence, students engaged in making their favorite animal and/or plant using recycled materials ( paper, plastic cups, cans etc.). Students learned the value of recycling, conservation and protection of the environment.

4.) Biology Outreach Presents SSS session in AP Biology.

      In Association with NMSI (National Math and Science Initiative), Biology Outreach presented a Student Study Session in AP Biology for students at the David Speer Academy in Chicago Illinois. David Speer Academy is Charter school for primarily Hispanic students with the potential to be the first generation college bound. The opportunity was taken to tell them about Purdue University and encourage them to consider the university as they make college choices.

5.) Wirt HS. Gary IN. visits the Outreach Lab in Biology.

     19 AP Biology students together with their teacher from Wirt HS. In Gary IN. visited the Purdue Biology Outreach Lab. On Wednesday April 25 2018. They participated in doing the AP Lab #6. ‘Electrophoresis and Simulated Genetic Screen’. I addition to doing the lab they are given information on how to prepare and be successful in the AP exam. Students were pleased and excited that they had the opportunity to use the laboratory equipment ( not present at their school) to perform their experiment. They indicated that was a great learning experience and thanked Biology Outreach for making the facility available.

**Physics Outreach**

SMAP – Saturday Morning Astrophysics

Our April SMAP, a collaboration between Physics and Astronomy Outreach and Aviation Technology, was held at Niswonger at the Purdue Airport. Students had the unique opportunity to learn about Forces in Flight, with first hand exploration of various aircraft, sitting in the cockpit and maneuvering flight surfaces. Professor Sergey Dubikovsky worked with Outreach Coordinator David Sederberg in organizing the event, with Aero Engineering student Yahia Aly in charge of the activity.

The Physics Teacher

In collaboration, Post Doc Avery Archer, service learning student Guna Kondapaneni, and Outreach Coordinators Phil Sands and David Sederberg, submitted an article for review to The Physics Teacher. The focus of the article was the culmination of three semester’s work on Searching for Exoplanets, a computer simulation originally created for SMAP.

NanoDays

The Department of Physics and Astronomy contributed to the annual NanoDays this year at Birck Nanotechnology Center. Outreach Coordinator David Sederberg recruited student volunteers for the event as well as conducted activities for attending elementary grade students. Just under 1000 students attended NanoDays this year.

Service Learning

Work continued this month with Professor Chen-Lung Hung and service learning students Alex Loomis and Mitch Brown on the Michaelson Interferometer project. We have completed final design of the components and continue 3D printing and preparation of a prototype device, the purpose of which is to create 8 of these devices for SMAP and Science Express classroom use.

Purdue Club – Battle Ground Middle School

Service learning student Hunter Vaught and a team of volunteers held an afterschool activity on water bottle rockets at Battle Ground in April, with 25 students in attendance.

Solar Scopes on the Mall

Outreach Coordinator David Sederberg continued to collaborate with undergraduate astronomy students in providing passersby on the Engineering Mall opportunities to view the sun.

Southwestern Day of Discovery

Outreach Coordinator David Sederberg organized an on-campus event for the entire 7th grade student body of Southwestern Middle School. The 155 students attending learned and conducted activities related to flight, DNA, spectroscopy and waves, with activities led by Outreach Coordinators from the Departments of EAPS, Chemistry and Biology, in addition to Physics and Astronomy.

**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.
    - We have a number of **EAPS kits and small equipment** items that we loan out to teachers as well as university faculty and students. EAPS 102 borrowed a number of items this month.
    - Imagination Station has our **Traveling Solar System Wall** on display.  Hundreds of visitors to the museum see the exhibit monthly.
  + **GLOBE** 
    - **Professional development** workshop.
      * Collaborating with Chemistry’s K-12 Outreach Coordinator (Sarah Nern) on planning and advertising summer Teacher Professional Development.
    - Attended meetings for the **GLOBE U.S. Partner Forum**. Steven Smith (EAPS K-12 Outreach Coordinator) is the U.S. At Large Representative.
    - **GLOBE Weather Network**:
      * We are working with central Indiana locations that have a weather station, to post their data to the GLOBE web site under the Purdue University partnership.
      * We are working on installing one at Imagination Station.
      * EAPS faculty are still blowing off the opportunity of having a station representing Purdue, West Lafayette.
  + **Collaborations,  including broader impacts and instrumentation**
    - Help Dr. Nate Slade with Atmospheric Chemistry days.
    - Assisted instructing EAPS 102 class and presented to a couple of others
    - 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.
      * We are planning a summer professional development for the other spheres and for student research projects using data.
  + **Student events:**
    - Farm Education Conservation  Days
      * Worked with 420 4th grade  students in learning about soils during this 2 day event.
    - Student groups visited campus
      * Visitor center groups
      * SouthWestern Middle School
    - AP Friday’s had a group visit campus.
      * <http://www.eaps.purdue.edu/outreach/ap_friday.html>
    - Helped with Atmospheric Chemistry days on campus.
  + **Outreach Newsletter**
    - Reached 360 teachers that have signed up!
    - Collaborating with Chemistry’s K-12 Outreach Coordinator (Sarah Nern) on the content of the newsletter.
* **Looking forward**
  + In May we will have a couple of groups visiting campus and start planning summer teacher professional development workshops.

**Chemistry Outreach**

* **Outreach for Indiana K-12 Educators**
  + Helped develop the Purdue College of Science K-12 Outreach April newsletter
    - Theme: Plastic Pollution
    - Newsletter currently has over 350 subscribers
  + Contacted Indiana HS chemistry teachers about attending the 25th Biennial Conference on Chemical Education (BCCE) this July 2018 at the University of Notre Dame.
    - Purdue ACS will sponsor two Indiana teachers to attend.
  + Served as a member of an EPICS final design review for “Innovation 2 Reality” to help provide feedback to the team at the halfway mark of their project delivery to participating students.
  + Contacted Indiana high school chemistry teachers to participate in a Chemistry Demo summer workshop in June.
    - Met with Paul Smith and Bill Bayley to plan the demos we will do, reserve lab space, and discuss schedule for the three-day workshop.
    - Planning to implement a discussion on lab safety and chemical disposal into this workshop.
  + Started planning for “Physical Science” lessons for the Middle School science teacher workshop in June.
  + Met with Chris Bishop from Purdue Conferences and other members of K-12 Science Outreach to discuss involvement with Grandparents University program that will take place this June.
  + Helped develop the Purdue College of Science K-12 Outreach May newsletter
    - Theme: Summertime
    - Newsletter currently has over 430 subscribers
* **Faculty collaborations**
  + Met with Kavita Shah to finalize plans to advertise for high school teachers to visit her lab this summer.
    - Participating teachers will learn an assay for detecting the effectiveness of a cancer drug. They will receive a stipend after teaching this assay to students during the Fall 2018 semester.
    - Arranged/attended a planning meeting via Zoom with a teacher from Western High School who is interested in participating.
  + Met with Paul Wenthold and other members of the Chemistry Dept.’s Undergraduate Committee to discuss ways that Purdue can recruit future chemistry majors.
    - Committee is interested in continuing to promote faculty participation with AP Friday program.
  + Met with Christina Li to begin planning an AP Friday lab session for Fall 2018 on the topic of electrochemistry.
  + Helped with the first of three Atmospheric Chemistry lab days on campus (April 19), developed by Dr. Jonathan Slade and members of the Shepson research group. Students from Edinburgh High School came for a day of data collection, discussion, and analysis on the topic of Atmospheric Chemistry.
* **Science Express Labs and Instrumentation**
  + Consulted with David Sederberg and B.J. Moyars about the possibility of using an FTIR like those offered on Science Express for determining the purity of samples of polycarbonate chips.
    - Contacted Pete Kissinger who referred us to Dor Ben-Amotz. Dor responded that he would be happy to try using Raman spectroscopy with a sample.
  + Helped with a presentation on waves for a student group from Indianapolis Public Schools. Used the newly developed wave machine as a demonstration.
  + Total of 21 students from Lake Central High School came to Purdue to participate in an AP Friday lab session, April 6. Students used Science Express Labquest 2 along with CO2 probes, temperature probes, and relative humidity probes to complete different stations developed for collecting and analyzing Atmospheric Chemistry readings.
  + Participated in Southwestern Middle School field trip to Purdue. Taught two 45-minute sessions on the topic of light. Both student groups (total of 75 students) used a set of 12 Science Express Genesys spectrophotometers.
  + April 2018 Science Express totals
    - 36 high school chemistry classroom visits
    - 2,731 student/instrument interactions for the discipline of chemistry

**Computer Science Outreach**

The 2018 offering of CS180x concluded in mid-April. My teaching assistants and I will be coaching the students as they prepare for the AP CS exam in mid-May, but are otherwise finished with work on this year’s course. Once we are told whether or not the switch to Mimir from Vocareum is official, I will begin to work on transitioning our four courses to the new system.

Both of my service learning courses reached their completion this month, with MAGIC completing our 2018 visits at all four of the Lafayette-area high schools, and ROCS completing a number of excellent events. For MAGIC, we ended up working with 30 students this year between the four schools. The group will be branching out to the middle school level for 2018-19, as we’ve realized that the high school interest is low and that it has been hard to keep students engaged at that age level. By reaching the middle school level, we may create more of a pipeline that will sustain interest in the high school years. The ROCS group participated in the first “STEM Conference for Kids” put on by the College of Education and CATALYST. We offered two computer science sessions teaching binary and basic programming with Scratch to about 50 Lafayette-area middle school students. Mid-month, my students spent a Saturday afternoon split between Spring Fest - where we used some Raspberry Pi enabled computers to teach Python programming using Minecraft – and this year’s BoilerCode event. Both groups did an excellent job, and it appears that we will have a full set of students for Fall of 2018 ready to help us with our service learning efforts.

My last major effort of the month was to prepare and deliver an EDCI 365 lecture on computational thinking to 19 elementary education students. Now that these pre-service teachers will be expected to teach K-5 computer science as part of the new Indiana state science standards, I have been looking at ways that we can help prepare them to teach to those standards. Dr. Brenda Capobianco was nice enough to let me teach her course for one session, and we will look to continue and improve these lectures going forward.

Looking ahead, I will spend much of the month of May preparing for our 22nd annual CS summer camp, and for a middle school science teacher workshop that the College of Science will be offering in mid-June. This summer promises to be busy on the teacher front, with several other opportunities for outreach to work with in-service teachers to help them prepare for teaching CS in 2018-19.