**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 December are as follows:

Teachers/Classrooms Visited – 51

Student/Instrument Interactions - 3422

**Biology Outreach**

 1.) Purdue Regional Science and Engineering Fair: Participated as a judge in the annual Purdue regional Science and engineering Fair held Friday March 8th, 2019. Served on the Blue Ribbon Committee for the Junior (Middle School) Division.

2.) Weekend workshop for Teachers: In collaboration with IABT (Indiana Assoc. of Biology Teachers) offered AP Biology lab. # 3. BLAST. Comparing DNA sequences to Understand Evolutionary Relationships.

3.) Biology Outreach Visits John Strange Elementary in Indianapolis: Biology Outreach presented the activity “Chick Embryo Development” to 225 Elementary Students (1st and 2nd Graders) to the John Strange Elementary School in Indianapolis. Over a three day period students were able to observe the hatching of 36 fertilized eggs. They learned how long (21days) it took for the eggs to hatch and were shown the different stages of development to fully hatched chick.

4.) Biology Outreach visits Tuskegee University: At the invitation of Tuskegee Alumni, Biology Outreach visited Tuskegee University March 14 – 17. To meet with undergrad students wishing to consider Purdue University for graduate study in the Biological sciences.

5.) Shonan High School, Japan Visits Purdue: 15 Shonan High School students from japan visited the Department of Biological Sciences March 27th. While there they participated in a 3hr. Hands-on laboratory activity, interacted with local high school students to learn about high school biology teaching/learning in American schools and received information about studying at Purdue. Our new Department head Dr. Janice Evans also paid the students a visit.

6.) Started recruitment of students for the 2019 SBE (Summer Biology Experience) program.

**Physics Outreach**

Faculty Broader Impact and Teacher PD

Initial funding was awarded to a collaborative project with Engineering to prepare a summer workshop for teachers. Physics and Astronomy is working with engineering faculty Hosseini and Meneske to recruit teachers for the 2019 pilot summer workshop.

SMAP

SMAP teamed up with aviation technology professor Sergey Dubokovsky to take SMAP to the Purdue Airport. There were about 30 students in attendance for a great event.

Service Learning

Service learning students created three new table top activities for Sidewalk Science: Simple Machines, Objects at Rest, and The Two Ball Bounce. Final assembly of a set of 8 interferometers is completed, with the units available for the next SMAP class, and then to Science Express teachers and classes.

Japanese High School Students

Physics and Astronomy presented a series of activities to 15 Japanese high school students on the topic of radio astronomy and atmospheric scattering.

Sidewalk Science

Physics and Astronomy Outreach took 6 undergrad volunteers to Carmel Clay Public Library to present Sidewalk Science activities at the annual science and engineering fair. Approximately 200 students and parents participated in the event.

The Physics Teacher

The Physics Teacher accepted a paper for publication, written by Outreach Coordinator David Sederberg with faculty member Gabor Csathy and two undergraduate service learning students. The paper documents the two years of work in the conception, design and manufacture of the classroom set of Too Cool to Resist devices.

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

* + *Goal 1:* ***Support for K-12 science and mathematics educators***
    - Teacher Professional development
      * A Science Express teacher training was held on campus.
      * Hosted and co-facilitated a teacher professional development Using Lockboxed in your science instruction for 15 middle and high school teachers on campus.
      * Working with conferences to organize a STEM professional development for high school and middle school teachers in July of 2019.
      * Collaborating with Lafayette Jefferson High School to offer a Technology workshop for teachers summer 2019
      * Collaborating with Purdue University Fort Wayne to offer a middle school teacher workshop in the summer of 2019.
    - Equipment loan programs
      * Our participation is **Science Express** is proving to be beneficial in that we have high school science teachers.
      * We have small equipment that we loan out to faculty and students. It is mostly used by pre-service classes and some local in-service teachers.
    - Getting information out
      * We have Facebook accounts for both EAPS Outreach and the Science Express program
        + <https://www.facebook.com/EAPS.out/>
        + <https://www.facebook.com/PurdueSE/>
    - Teacher Resources:
      * We have an EAPS K-12 Outreach Pinterest page to help teachers find resources in our content area.
  + *Goal 2:****Create and facilitate programs that develop scientifically literate K-12 students***
    - Student groups visited campus
      * Pre-Destination Purdue minority recruitment event for the Diversity Office for the College of Science.
      * AP Friday Atmospheric Science with LaPort High school.
      * Collaborating with Purdue Conferences to offer Grandparents University summer 2019.
      * Collaborating with EAPS Graduate students to organize activities for the Apollo 11 50th Anniversary event
    - School /event visits
      * Mentoring Jeff HS students in completing research projects that will be presented at Spring 2019 Midwest regional science symposium in Iowa
  + *Goal 3:****Create opportunities for broader impact***
    - Collaborated with lead NASA scientist for aerosols campaign (Margaret Pippin)
    - Collaborated with Patrick Taylor, NASA scientist for atmospheric science research, and used resources for AP Friday atmospheric science event
    - Met with **faculty and staff** from around campus collaborating on a STEM Summer Professional Development for educators.
    - Attended planning meetings as a committee member for organizing the **GLOBE North American Regional Meeting** which will will be held at NASA Langley.
    - Attended meetings for the **GLOBE U.S. Partner Forum**. Steven Smith (EAPS K-12 Outreach Coordinator) is the U.S. At Large Representative and Chair of the forum.
    - Collaborating with **Lafayette Jefferson High Schoo**l to offer a Technology workshop for teachers summer 2019 as part of the Title 4 grant that we co-wrote with them.
    - Working with the **Indiana STEM Education Taskforce** to promote STEM education in Indiana.
    - Collaborating with **Purdue Conferences** to offer Grandparents University summer 2019.
    - Collaborating with **Clinton County Healthy Communities** on an outdoor educational area.
    - Collaborating with **Purdue University Fort Wayne** to offer a middle school teacher workshop in the summer of 2019.
    - Steven Smith is serving on the advisory board for **National Geographic Education** for Indiana
    - Funding for January 2019:
      * Met with alumni’s about funding an endowment for CoS K-12 Outreach and donating funds to support our summer GLOBE workshop.  They are donating

Additional outreach efforts this month included:

* Finished all requirements for the National Geographic Educator certification course.
* Presentation at the Global Observations to Benefit the Environment (GLOBE) program North American Regional Meeting held at NASA Langley

**Chemistry Outreach**

* **Outreach for Indiana K-12 Educators**
  + Attended the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 North American Regional Meeting (NARM).
  + Co-presented a talk during the GLOBE 2019 NARM: Implementing a Statewide Virtual Science Symposium.
  + Students from LaPorte High School came to Purdue to participate in an AP Friday lab session on March 15 over Atmospheric Science.
  + Mentored students from Jeff High School as they completed research projects that will be presented at the Spring 2019 GLOBE Midwest Regional Science Symposium in Iowa.
  + Completed National Geographic Educator Certification Course as part of the winter 2019 cohort.
  + Worked with Graham Lyon, chemistry teacher at Tri-County High School in Remington, Indiana, to prepare a lesson: Chemistry of Air, for the GPI US Japanese student tour at Purdue University in late March.
* **Faculty collaborations**
  + Met with Professor Jon Rienstra-Kiracofe, Department of Chemistry at Purdue, to discuss possible collaborations with his work in developing technology for undergraduate labs (primarily gen chem labs) and programs run by the College of Science Outreach including Science Express and AP Fridays.
  + Participated with the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 North American Regional Meeting (NARM) planning committee to help organize the meeting scheduled at NASA Langley.
  + Attended the GLOBE US Partner Forum Meeting at NASA Langley.
  + Collaborated with lead NASA scientist, Dr. Margaret Pippin, for aerosols campaign.
  + Collaborated with Patrick Taylor, NASA scientist for atmospheric science research, Kristian Hajny, graduate student with the Department of Chemistry at Purdue University, and Professor Nate Slade, Department of Chemistry and Biochemistry at the University of California, San Diego.
  + Assisted Natasha Harris, Diversity Office for the College of Science, with Preview Destination Purdue.
* **Science Express Labs and Instrumentation**
  + Students participating in the March 15 AP Friday lab session used Science Express Vernier relative humidity sensors, CO2 probes, temperature probes and GLOBE Atmospheric kits.

**Computer Science Outreach**

The most substantial outreach effort of the month was the three teacher workshops that we were able to host during the week of spring break. Over three days, and in partnership with Nextech, we brought 80 educators and school administrators to the Lawson building to talk about K-8 computer science. The first day’s training was focused on what teachers could do to integrate CS into the middle school grades. On the second day, we had a mix of teachers and administrators from 6 school corporations with us to build their CS development plans based on the SCRIPT model developed by Leigh Ann DeLyser of CSforALL. The final day was focused on the elementary grades, and in particular how to engage students with a variety of hands-on activities and coding tools. The preliminary feedback was that the program was a success. I would like to take this opportunity to mention the supportive efforts of Allen Brooks and Emily Kinsell. I have attached a few of Emily’s pictures that she took, and will mention that she’s been doing a terrific job on Twitter supporting our outreach work.

My ROCS service learning group helped me with three events in March. As we did last year, we welcomed all of the Lafayette Catholic School System’s sixth grade students to campus. The 77 kids and 10 adults on the trip got a chance to see student projects from Professor Delaware’s software engineering class, and also went to visit the Envision center to see the VR and AR projects that research computing has developed for Purdue faculty. To my surprise, one of my former MAGIC students (Cora Chan) is now working at the Envision center doing some programming for them. The students really enjoyed what the software engineering students had to show, and I will mention that Ben Delaware was very supportive of our efforts to get some students to help for the day. In addition to this event, we have continued our work at the West Lafayette Public Library with a weekly coding program in the after-school period, and also continue to support the CoderDojo at the Anvil.

The MAGIC service learning group continued their weekly trips to schools, but I will mention one specific effort which we made in mid-March to take the participating high school students to Luther Consulting in Carmel, IN. The company contracts out to the CDC and does data collection and analysis for public health projects. One of our 2004 graduates, Beth Richardson, hosted a group of my college students and high school students for a full day visit with a tour of their office, a discussion of their approach to designing software, and even a lesson on recursion and how they use it with their product. It was a terrific trip, and the girls got a lot out of it. One, an incoming freshman here at Purdue for Fall 2019, expressed that she had no idea that software was used like they did at Luther. This kid is signed up in engineering, but I think there is a chance she ends up with us in the long run as we’ve made a big impression on her.

The CS180x course is now in the final 6 week module and we have 1,048 students (22.3% female) enrolled. As we discovered, there is still 2 years left on our edX grant, and so we will continue to run the course as long as we have funding.