# Multi Department Activities

Science Express-The Chemistry, Biological Sciences, and Physics Departments of the Purdue College of Science deliver research-grade instruments to high schools in 17 Indiana counties. Through the month of November 18 school visits were made and there were 1268 student/equipment interactions.

## Biology Outreach

1. Science Express Workshop: Participated with the Director of Science Express to conduct a teacher training workshop for high school Biology teachers. The workshop entitled “Electrophoresis; Theory and Practice” was attended by Four (4) Teachers and held in Biology lab 1-407.
2. Attended the NOBEchE (National Association of black Chemists and Engineers) student chapter annual meeting at North Central High School in Indianapolis. Presented a hands–on laboratory activity to 30 students and 10 teachers and in a professional development activity participated as a panelist in a discussion on teaching/learning of STEM among minority students.
3. Participated in AP-Fridays Event Nov.15. 2019. Worked with Rossville High School students (17) and their teachers on the Lab. Activity “Historical Ecology”. AP-Fridays is a weekly event organized by Chemistry and EAPS Outreach.
4. Ecology in Art Program:  Biology Outreach hosted 32 students (Gr. 3 – 6) and their teachers from MSD- Warren County on NOV. 25 at the Ross Biological Reserve for the ART in Ecology Program. This program led by Grabriela Sincich (Biological Sciences), seeks to engage students in the study of the environment through Art. Students made models of animals they chose and studied their habitats looking at the factors that ensure survival for the species chosen.

## Physics Outreach

### SMAP

November SMAP presented the topic of interferometry and gravitational waves. Faculty presenters were Chen-Lung Hung and Maxim Lyutikov.

### Faculty Broader Impact

Submitted NSF broader impact proposal with faculty members Kyoung Soo Lee and Leonid Rokhinson.

### Physics on the Road

Outreach presented a Force and Energy Show to 180 students in grades 3-5 at Sommer Elementary in Crawfordsville.

Outreach presented activities on sound to 120 first grade students. Along with service learning volunteers, Anne Sommers, Purdue audiologist demonstrated testing for hearing and hearing loss.

### Service Learning

Physics 295, Service Learning in Outreach continues to meet weekly. Student Sam Wanfor worked with Outreach to develop a protocol for using the Ruben’s Tube sound and flame apparatus.

Outreach began work with high school student Orion Vllasi, who will be doing a service project related to the interferometers being developed for Science Express. Orion will be creating an integrated circuit aimed at quantifying measured interference.

### Banners

Outreach continues to work with Marketing and Media in the design of a banner.

### Study Abroad Callout

Outreach and Professor Lynn Bryan created promotional materials and held a callout for the proposed summer 2020 Study Abroad in Singapore course.

### QuarkNet

Saturday, November 16, Quarknet workshop met with three teachers attending.

## Earth, Atmospheric, and Planetary Sciences Outreach

* ***Goal 1: Support for K-12 science and mathematics educators***
  + Teacher Professional development
    - Presented at the Environmental Education Association of Indiana 2019 Conference. Co-facilitated GLOBE professional development for elementary teachers.
  + Getting information out
    - Created web **calendar of events** for EAPS K-12 outreach: <http://www.eaps.purdue.edu/outreach/Outreach_News.html>
    - We have a **Facebook** for EAPS Outreach: <https://www.facebook.com/EAPS.out>
  + Purdue **Science K-12 Outreach newsletter** goes out to 500+ subscribers.

<https://us4.campaign-archive.com/home/?u=1bbd2c49c28247b75608f1d3d&id=87beefd504>

* + Teacher Resources:
    - **Superheroes of Science podcast!** Podcast for students and educators interviewing scientists and science education specialist.
    - We have an **EAPS K-12 Outreach Pinterest** page to help teachers find resources in our content area.
    - We have many resources posted on our departmental outreach web page: <http://www.eaps.purdue.edu/outreach/index.html>
* ***Goal 2: Create and facilitate programs that develop scientifically literate K-12 students***
  + Taught Weather and Climate lockbox activity at Gold Academy in Indianapolis
  + AP Friday with College of Liberal Arts
  + EAPS Passport Day at the Imagination Station
* ***Goal 3: Create opportunities for broader impact***
  + Met with Dr. Christopher Roemmele to discuss inter-university collaboration.
  + Released for the **Superheroes of Science Podcasts** this month: Brooke Max, Dan Cziczo, Bill Bayley, Pedro Falcon, Anne Lewis, Tony Murphy, Michael Jabot, Jessica Taylor.
  + 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.
  + Steven Smith is serving on the advisory board for **National Geographic Education** for Indiana

## Chemistry Outreach

* **Professional Development and Support for K-12 Educators**
  + Co-presented at the Environmental Education Association of Indiana (EEAI) Conference: *The GLOBE Observer Program*.
  + Co-facilitated STEM professional development workshop for elementary teachers at Purdue.
* **Programs to Develop Scientifically Literate K-12 Students**
  + Taught a lockbox lesson (Weather and Climate) to students at The Gold Academy (Indianapolis).
  + Students from both Valparaiso High School and Huntington North High School came to Purdue to participate in an AP Friday lab session on November 7 over Atmospheric Chemistry.
  + Students from Rossville High School came to Purdue to participate in an AP Friday lab session on November 15 over Historical Ecology.
  + Students from Twin Lakes High School came to Purdue to participate in an AP Friday lab session on November 22 over Buffer Design.
* **Opportunities for Broader Impact**
  + November 2019 podcasts released for *Superheroes of Science* include episodes recorded with Jessica Taylor (NASA Langley), Tony Murphy (GLOBE Implementation Office), Anne Lewis (National Geographic), Pedro Falcon (NASA JPL), Bill Bayley (Director of PU COS Outreach), and Professors Michael Jabot (SUNY Fredonia), Dan Cziczo (PU EAPS Dept. Head), and Brooke Max (PU Mathematics).

## Computer Science Outreach

Below is my final CS Outreach report. I will be officially departing Purdue at the end of the month. All of my work for December will be focused on the transition of tasks to Sean Flannery (a graduate student who will be assisting with the running of the MAGIC program), and to creating documentation for my replacement. I will note that I still do not have clarity on CS Summer Camp or CS180x, both projects that will need some attention if they are to be continued.

I was briefly on campus this month to address the moving of some of the outreach equipment that was stored in various places throughout the building. To my chagrin, this was moved before I had arrived and was placed into a storage closet in the graduate RA lab that was at a very high temperature. I did not have a chance to test the equipment, but we did throw out a large number of giveaway items that had been warped or damaged by the heat. The remaining items were moved to a series of cabinets outside of Victory Soe’s office in the Lawson basement. Other items can be found in my office, and in the cabinet across from the 2nd floor administrative assistant. In addition to this housekeeping task, I had a number of meetings to resolve lingering issues for Outreach in CS, particularly with regard to the continuation of existing programs after my departure, and the resolution of a few business office related items. I did pick up a parking ticket for parking in the structure during my final day on campus, which Dongyan has agreed to help cover, for which I am appreciative.

We are now wrapping up the second of four parts of the CS180x MOOC AP CS A course. This section involved the integration of new AP CS A labs that have been released for use in the 2019-20 school year. We have encountered some problems with the Vocareum autograding system in the last week which will need to be addressed going forward. My student TAs have not been able to solve them as of yet, and I will connect with Victory Soe (or Sean if this falls within his purview) to see if we can’t resolve them before the course closes next week. Our third course starts in January and currently has 377 students enrolled (34.8% female; 46.2% USA). The teaching assistants will need someone to connect with regarding the content of the course, and there should be someone in charge of the course for purposes of managing the edX system. I have enough funding from the original edX grant to continue paying the TAs through the end of the school year.

The MAGIC mentors have continued their work in the Lafayette school system working with both middle school and high school girls. They have been making weekly trips to Sunnyside Intermediate, Wea Ridge Middle, and McCutcheon High to serve about 30 total students. Going forward under the leadership of Sean Flannery and Sasha Kipnis, the women in the program are looking to expand to Tecumseh Middle School in Lafayette and will be taking a field trip to Raytheon in March. The funding for this program has been terrific, and I would like to advocate for its continuation. The work we have done in the local community has been well received, and the impact on the college students that participate has been immeasurable.