# 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 October 57 school visits were made and there were 3939 student/equipment interactions.

## Biology Outreach

1. West Side HS Biology Club visits The Dept. Of Biol. Sci.  Purdue’s Biology Outreach was host to 10 members of the West Side HS Biology club and teacher advisor on their visit to the Biology department. The students participated a day long series of events that included visits to research labs, participated in hands-on lab activities and heard from undergrad and graduate students about what it’s like to study and do Biology at the college level.

2.) Consulted with teachers from Thea Bowman Academy and the Charter School of the Dunes in the Northwest Lake county area. Thea Bowman teacher’s wishes reentry into Science Express and the Charter school of the Dunes needs help with the creation of an outdoor environment site for field instruction. Ongoing discussions with these school are presently being undertaken.

3.) Biology Focus Day; The annual Bio Focus Day for high ability HS students took place October 19th. High school juniors and seniors from Indiana’s High schools who are interested in studying biology at the College level are invited to spend a day visiting the department of biological sciences. They learn about Biological research, Pre-med preparation and Professional school. This year the theme of the visit was: STEM; How important is a multidisciplinary Approach to a Life science Career.’ Group of 10 students, together with a teacher and a parent participated.

4.) Attended the first meeting of Purdue K-12 Stakeholders initiative.

5.) Briarwood Community Outreach: The monthly community outreach to Lafayette Briarwood took place October 21st. 5th and 6th graders participated in a lab activity “The scientific Method”. This activity showed students the approach scientists take when the engage in the scientific enterprise.

6.) Contacted two faculty (Biology) members on Broader impact (K-12) statements, as part of their grant applications.

## Physics Outreach

SMAP

October SMAP was held at Jefferson High School Planetarium with teacher Bill Huston presenting objects of the night sky.

Faculty Broader Impact

Submitted NSF broader impact proposal with Steve Durbin

Service Learning

Physics 295, Service Learning in Outreach continues to meet weekly. Outreach projects this month included creating an inventory of consumables used in outreach, and 3D printing components for upcoming SMAP.

Banners

Outreach met with marketing and media to explore ideas for a pop up banner for outreach programs.

QuarkNet

Physics and Astronomy hosted an introductory QuarkNet workshop, the first of a series, with four teachers attending. A follow-up session will follow in November.

Homecoming

Outreach presented pre-game activities for homecoming attendees with student volunteers from SPS.

## Earth, Atmospheric, and Planetary Sciences Outreach

* + *Goal 1:* ***Support for K-12 science and mathematics educators***
    - Teacher Professional development
      * Co-facilitated Professional Development workshops for teachers at Lowell Middle School, Pendleton Heights Middle School, and Greenwood High School,
      * Co-facilitated GLOBE professional development for teacher pd providers.
      * Working with various Purdue departments and teachers to create new AP learning experiences for our AP Friday program.
      * Loaned supplies to McCutcheon High School Earth Science teacher
      * GLOBE presentation/mini-workshop with Dan Shepardson's EDCI 506 students
    - 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 499 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 a **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***
    - Taught Weather and Climate lockbox activity at Camp Cullom Science Academy
    - AP Fridays October 8, 25
    - Purdue Homecoming pre-game event: set up activities with EAPS students
    - Working with various Purdue departments and teachers to create new AP learning experiences for our AP Friday program
  + *Goal 3:****Create opportunities for broader impact***
    - Released for the **Superheroes of Science Podcasts** this month:. recordings of  John Cushman, Marissa Tremblay, Jon Rienstra-Kiracofe, and Saad Haq.
    - Participated with the planning and facilitation of the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 **North American Regional Meeting (NARM)** University of California, Berkeley.
    - 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-taught a biometry lesson for Dr. Brooke Max (Purdue Mathematics) with her pre-service elementary math teachers.
  + Co-facilitated professional development workshops for teachers at Lowell Middle School, Pendleton Heights Middle School, and Greenwood High School.
  + GLOBE presentation/mini-workshop with Dan Shepardson’s EDCI 506 students.
  + Co-presented at the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 Professional Development: *Considerations for Designing a GLOBE STEM Professional Development*
  + Co-presented a Lightning Talk at the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 North American Regional Meeting: *Modeling a Student Micro-Research Project*
  + Sent follow-up communication, including certificates for PGP, to participants in the summer Elementary GLOBE professional development sessions at the Indianapolis Children’s Museum.
* **Programs to Develop Scientifically Literate K-12 Students**
  + Students from Avon High School came to Purdue to participate in an AP Friday lab session on October 8 over Atmospheric Chemistry.
  + Students from Benton Central High School and Pioneer High School came to Purdue to participate in an AP Friday lab session on October 25 over Electrochemistry.
* **Opportunities for Broader Impact**
  + 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 for this coming October at the University of California, Berkeley.
  + Professor John Cushman spoke about his research with electricity to students participating in an AP Friday lab session at Purdue.
  + October 2019 podcasts released for *Superheroes of Science* include episodes recorded with Professors John Cushman, Marissa Tremblay, Jon Rienstra-Kiracofe, and Saad Haq.
  + Attended the Global Learning and Observations to Benefit the Environment (GLOBE) 2019 North American Regional Meeting (NARM) and professional development.
  + Helped with broader impacts for an NSF grant that is being written by a graduate student, Chris Calvalege.

## Computer Science Outreach

The students in the MAGIC mentoring group are continuing their work with the four partner schools that we established at the start of the semester. Critical work was done this month in determining whether or not we could boost our student participation rate at Lafayette Jefferson High School, where our September efforts had been met with failure. We contacted a new potential partner teacher and went to visit the existing CS classes at Jeff to recruit students. I will keep you updated as to how these efforts go. Lafayette Jefferson provides one of our two local opportunities for reaching underrepresented minority students, and we would like to continue to work there if possible. The students in this group will be working with me to design a VR activity that we plan on running in Fishers, IN for CS Education Week in December with a pilot group of existing students, and then with our MAGIC mentees in Spring semester.

The second of our four six-week modules for the CS180x AP CS A MOOC launched this month with 387 student participating. This drop in overall student participants has followed the pattern that we’ve seen with each of our previous offerings of the course, where about 25% of those who started in the first module continue on to the second. Of these students, 23.8% are female and 54.6% are from the United States. My student TAs and I are incorporating new labs into this course to meet the requirements of the 2019-20 AP CS A course description. These labs now address a number of big concepts that go beyond the simple Java programming ideas that mirror our CS 180 course. The first lab that we are incorporating focuses on consumer reviews and the ability to determine whether the reviews were produced by a human or by a machine.

This month, the Indiana CSTA held several meetings to continue to develop more localized hubs of CS teachers. My role in this has been purely advisory, but I will be attending some of the kickoff meetings in the northern part of Indiana in the upcoming months. I will also continue to advise the CSTA as needed as they try to further solidify our teacher base.

I wanted to take this opportunity to mention that I have been contacted by Purdue’s Conferences division about our CS Summer Camp for 2020. I cannot take this project on, but some department-level decisions will have to be made about proceeding with the camp over the next two months. I would begin enrollment in January typically, and from this point the number of planning meetings will increase with camp staff and Conferences to make sure that the summer camp goes off without a hitch.

I will be presenting a paper at this year’s SIGCSE conference which looked at some data form the CS180x MOOC. The conference in in March in Portland, OR. I also have a paper that I co-authored with Dr. Brenda Capobianco of Purdue’s College of Education that I have submitted to the Journal of Women and Minorities in Science and Engineering that I am hoping to hear back from soon.