**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. Through the duration of the year 1096 school visits were made. A total of 103 teachers in 38 schools were visited throughout the school year. There were 39,400 student/equipment interactions.

**Biology Outreach**

1.) Biology Outreach Community Partnership; Lafayette Briarwood Community:  Hosted 10 middle school students and 3 parents from the Briar wood community on a visit to the Dept. Of Biological Sciences. Students participated in a hands-on laboratory activity exploring vision in birds. They also interacted with Biology Graduate students observing work in research labs and what it takes to be a scientist. They were encouraged to study the STEM subjects in school.

2.) Collaborated with Dr. Mohit Verma Professor in Biomedical engineering and wrote letter in support of Dr. Verma’s NSF Grant application. Provided letter on broader impact statement.

3.) Participated in Science Express New teacher training workshop, July 15 thru 19, 2019. Teachers were trained on the use and care of Science Express equipment that will be available to them in their classroom throughout the coming academic year.

4.) Participated in EAPS sponsored GLOBE workshop; Integrating STEM in The Environment. This workshop was held at the Ross Reserve, Biological field station of the Department of Biological Sciences. Nineteen (19) teachers participated in the 4 day workshop. Topics included hydrology, Biometry and soil analysis techniques. Biodiversity index analysis and invasive species found at the Ross were also discussed.

**Physics Outreach**

Grant submission

Included on faculty broader impact section of NSF Career proposal for $512 K with Mahdi Hosseini and career grant with Rudro Biswas.

ICP Lessons

Sederberg, along with Zach Grigsby, met with teacher Cheryl Meyer to review progress for Science Express ICP lessons on the topic of forces.

Science Express PD

Conducted continued PD for Science Express teachers

Design Thinking Workshop

Participated in and presented Interferometer Project at a Design Thinking workshop at the Lubar Entrepreneurship Center, University of Wisconsin, Milwaukee.

TPT Article

The Physics Teacher accepted for publication, Searching for Exoplanets, the product of a year-long service learning project for SMAP

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

* + *Goal 1:* ***Support for K-12 science and mathematics educators***
    - Teacher Professional development
      * PD for Math teachers
        + Assisted Dr. Brooke Max with a day-long professional development for math teachers.
      * Assisted Science Express with teacher training
      * Integrating STEM in the Environment professional development for classroom teachers
      * STEM professional development experience for elementary educators at The Children’s Museum of Indianapolis
      * Working with Chemistry outreach and teachers to create new AP learning experiences for our AP Friday program.
    - Getting information out
      * We have a Facebook for EAPS Outreach <https://www.facebook.com/EAPS.out/>
    - Teacher Resources:
      * Worked with teacher on ICP lessons
      * 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**
    - Worked with teachers in professional development workshops to create student research projects
  + Goal 3:**Create opportunities for broader impact**
    - 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**
  + Assisted Dr. Brooke Max, Department of Mathematics, with the second of two summer workshops: Exploring Cognitive Demand of Mathematical Tasks and Assessments.
  + Assisted Science Express with new teacher equipment training.
  + Integrating STEM in the Environment Professional Development for middle and high school classroom teachers at Ross Biological Reserve.
  + Elementary STEM professional development experience at The Children’s Museum of Indianapolis.
  + Development and release of Purdue University K-12 Chemistry Outreach Facebook page: [https://www.facebook.com/PurdueChem/](https://www.facebook.com/PurdueChem/?modal=admin_todo_tour)
  + Redesign and update of the K-12 Chemistry Outreach webpage.
  + Continued work with Integrated Chemistry-Physics (ICP) teachers in the development of ICP lab kits for teachers to check out through the Science Express program.
* **Programs to Develop Scientifically Literate K-12 Students**
  + Worked on planning and developing Google Form sign-up for Fall 2019 AP Friday lab sessions.
  + Created an outline of the 2019 Indiana Virtual Science Symposium and worked with teachers during summer professional development to facilitate adding student research projects to class curricula.
* **Opportunities for Broader Impact**
  + Provided letter of support towards NSF Career Grant for Professor Corey Thompson.
  + Provided letter of support towards NSF Career Grant for Professor Christina Li.
  + Provided letter of support towards NSF Career Grant for Professor Gaurav Chopra.
  + Coordinated the borrowing of equipment towards support of a research project conducted by graduate student, Anahita Aghili, Department of Veterinary Clinical Sciences.
  + Worked with Kavita Shah to provide an opportunity for teacher training over the Malachite Green Reaction Protocol for Measuring Phosphate Concentration. This assay was developed by Professor Shah’s group.

**Computer Science Outreach**

While we are still a month or so from the launch of the CS180x course for 2019-20, I wanted to mention that the courses have been renewed and are ready for enrollment. I will work to hire new undergraduate teaching assistants and will work during August to update the content based on the feedback from 2018-19. A link to the course enrollment page was included in multiple Tweets and an email announcement. I also updated information on the CS departmental page for the course which can be found below.

<https://www.cs.purdue.edu/outreach/cs180x-students.html>

In early July, I traveled up to South Bend to participate in the Trustey Felllows Workshop, a middle school STEM program for teachers located in areas across the country (including Indiana). During the one day that I was on campus, I worked with about 25 teachers on issues related to the current CS education landscape, which included a review of the standards. I also advised a smaller group of teachers as they planned their Fall curriculum. This program will run over the course of three years and I will continue to do work with them on occasion.

In mid-month, I collaborated with Lillian Evans and one of her graduate students on a machine learning activity for the Indiana Black Expo. Here, we used IBM’s Watson API to classify images by color and used them to identify the color of new photographs. This activity was intended to help Lillian engage the audience at the expo, which happened on July 19.

My final activity for the month was to participate in a Robin Hood Foundation Teacher Workshop in New York City. While this is obviously focused on teachers outside of Indiana, it was an opportunity to engage new teachers on issues related to computational thinking at the K-5 level. The workshop had 10 in-service teachers and 8 pre-service teachers and is connected to the development of a pre-service teacher program at Hunter College. This work will also continue for roughly 3 years, and is connected to my graduate program at Michigan State University. In spite of this, I was able to speak about my work at Purdue University with the teachers and plan on using some of what I learned during the program with teachers here in Indiana.