**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 – 97

Student/Instrument Interactions - 7248

**Biology Outreach**

1.)  Summer Pre- Professional Experience Program; Met with the planning committee coordinating plans for the summer(2019) first presentation of  the summer pre professional program for high school students. This program exposes high school students to exploring University Majors; planning for medical, Veterinary and other Professional Schools after College. Biology Outreach will be presenting a class in this program entitled “Simulated Genetic Screening: Biomedical Research and ethics in Bio-medical Research”.

2.) Hosted 15 Middle and High School students and their parents from the Briarwood community of Lafayette (Part of Biology Outreach’s Community outreach Initiative) during Spring fest days on Campus. Presented a hands –on activity, “The chick embryo, Development and growth in chickens”. Students extracted the developing embryo from the yolk of fertilized eggs to observe early development in chicks. Students were able to see a beating heart, one of the first organs to form in development.

3.) Weekend workshop for Biology Teachers. In collaboration with IABT (Indiana Assoc. Of Biology Teachers) presented a workshop, 'Analysis and sizing of DNA Digest using Electrophoresis”.

4.) Attended planning meeting  for the second annual  “Grand Parents University” program to be held on Campus this coming June. Biology Outreach will be presenting a class in this program.

5.) NMSI (National Math and Science Initiative) presentation: Presented a NMSI sponsored AP Biology Student Study Session to 80 AP high school students from David Speer Academy Chicago IL. Topics covered were 1.) Biological Structure and Function in organisms. And 2.) Big Idea Lab.3; Mitosis, Meiosis, Bacterial transformation, Restriction enzymes, Electrophoresis and Plasmids.

6.) Met with Professor Ignacio Camarillo (Biology), director of the LSAMP program on Purdue's Campus to learn about LSAMP”s effort to support underrepresented students in STEM careers, and future graduate programs. Wrote a letter of support for broader impact in support of his grant application to NSF.

7.) Met with Joe Rhul (Biology Teacher Jeff High School, Lafayette) and assisted him in identifying teachers from IABT Membership as potential recruits for summer professional development program. “High School Pollinator Protection Project”.

8.) Establish a collaboration with Carolina Biological to learn, familiarize and use their laboratory kits in working with High school biology teachers to understand a Standards approach to Three – Dimensional Learning.

**Physics Outreach**

Faculty Broader Impact and Teacher PD

Working with Physics professor Housseini and Engineering professor Menekse, writing a broader impact segment for an upcoming NSF grant.

Working with Physics professor Chen-Lung Hung to implement broader impact ideas for a recent NSF award.

SMAP

SMAP for April presented the topic of gravitational waves, utilizing interferometers in a faculty/service learning project. Two Physics faculty (Hung and Lyudikov) presented the topic

Faculty support

Physics and Astronomy Outreach coordinator Sederberg demonstrated the use of cloud chambers to two undergrad lectures for Physics professor Andy Jung.

Study Abroad

Outreach began drafting preliminary ideas for the next study abroad program with Physics professor Lynn Bryan.

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

**Goal 1: Support for K-12 science and mathematics educators**

Teacher Professional development

Working with conferences to organize a STEM professional development for high school and middle school teachers in July of 2019.

Co-instructed classes for preservice math education on campus about using science to teach mathematics.

Consulted with a local middle school teacher to incorporate GLOBE/ research projects in her curriculum next fall.

Equipment loan programs

We have equipment and labs going out to schools that are part of the Science Express program.

EAPS students used some small equipment for semester projects.

Getting information out

We have a Facebook for EAPS Outreach <https://www.facebook.com/EAPS.out/>

Teacher Resources:

We have a EAPS K-12 Outreach Pinterest page to help teachers find resources in our content area.

Worked the NOAA booth at NSTA to help teachers learn about the GLOBE program.

**Goal 2:Create and facilitate programs that develop scientifically literate K-12 students**

Student groups visited campus

Working with Purdue Libraries and Geographical Education Network of Indiana (GENI) to host High School GIS day in Fall 2019.

AP Friday Atmospheric Science Winamac High School.

School /event visits

Mentored Jeff HS students in completing research projects and presented at 2019 Midwest regional science symposium in Iowa

**Goal 3:Create opportunities for broader impact**

Met with faculty and staff from around campus collaborating on a STEM Summer Professional Development for educators.

Meet with faculty and staff from Forestry, Anthropology, Physics, EAPS, Chemistry to discuss next falls AP Fridays

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

Additional outreach efforts this month included:

Networked at a National Geographic Educator event,  a NESTA event, and NSTA.

**Chemistry Outreach**

* **Professional Development and Support for K-12 Educators**
	+ Co-presented a Biometry lesson with Steven Smith (EAPS Outreach) for pre-service teachers from Brooke Max’s (Dept. of Mathematics) MA 139 course.
	+ Met with member of University Residences, Purdue Conference Services, Steven Smith (EAPS Outreach), and Phil Sands (Computer Science Outreach) to organize a STEM professional development for high school and middle school teachers in July 2019.
	+ Worked with Steven Smith (EAPS Outreach) to help Melissa Heim (Clinton Prairie High School) set up data reporting from a local Davis Weather Station to support her students with data for developing science research projects.
	+ Volunteered at the National Oceanic and Atmospheric Administration booth during the National Science Teachers Association (NSTA) conference in St. Louis, MO to help visiting teachers learn more about the Global Learning and Observations to Benefit the Environment (GLOBE) program.
	+ Shared a lesson resource for a Chemistry I course with Bill Walker. Walker organized a workshop in mid-April (4/11/19) for a group of 10 high school science teachers.
* **Programs to Develop Scientifically Literate K-12 Students**
	+ Students from Winamac High School came to Purdue to participate in an AP Friday lab session on April 26 over Atmospheric Chemistry.
	+ Worked with Steven Smith (EAPS Outreach) to provide a set of Bernoulli wind tubes to Kristen Seward (Associate Director, GERI Program) during an event for 150 high-ability 4th and 5th grade students from Brownsburg Schools on Purdue’s campus.
	+ Co-presented a lesson on energy and waves to 4th grade students at West Lafayette Intermediate School.
* **Opportunities for Broader Impact**
	+ Collaborated with Megan Gunn, Department of Forestry and Natural Resources, to promote a summer 2019 teacher workshop: Purdue Agribusiness Science Academy (PASA) for 8th-11th grade science teachers.
	+ Attended the National Science Teachers Association (NSTA) conference in St. Louis, MO.
	+ Networked at a National Geographic Educator event held during the NSTA conference.
	+ Consulted with David and Christine Vernier and Steven Smith (EAPS Outreach) about the development of a sun photometer sensor while visiting the Vernier booth at the NSTA Exhibit hall.
	+ Provided documents and pictures from some Atmospheric Chemistry student events held at Purdue West Lafayette campus to Professor Jonathan Slade (University of California, San Diego) to help him and Professor Paul Shepson as they were compiling their annual NSF report.
	+ Attended an organizational meeting for 2019 Grandparents University that will be taking place on campus this June.
	+ Met with Andrew Flachs, (College of Liberal Arts), to discuss potential collaboration with an AP Friday event during Fall 2019 semester.

**Computer Science Outreach**

Both my service learning courses ended this month, with 185 hours of potential service time during the Spring semester. The ROCS group engaged in a number of April events including Spring Fest, the Minimake student hackathon, the ACM high school programming competition, student visits from Merrillville and Snider high schools, their weekly visits to the West Lafayette Public Library for open coding, and a canceled event in Fishers that my students designed two new activity plans for. Highlighting the high school visits, we managed to have 50 students come for a mixture of CS instruction, program information, and campus tour between the two schools. One school serves primarily African-American and Latinx students, and I think we were able to communicate some important information to them about college planning. Lillian Evans helped me to plan the Merrillville visit, and we had contributions at both events from Randy Bond, Buster Dunsmore, Petros Drineas, Nicole Towner, and a combination of ROCS and MAGIC students.

While I can’t take credit for her larger visit with our department, I did want to mention that I managed to arrange an hour of time for Dr. Colleen Lewis to meet with my MAGIC students. She spoke with them about implicit bias, issues of gender and computing, and advised them on pathways to graduate studies. I appreciated how thoughtful Huda Nassar was regarding my potential interest in connecting Dr. Lewis with my students. I have known Dr. Lewis for a number of years and it was good to be able to reconnect with her even if I didn’t get a chance to socialize much with her while she was on campus.

Our final section of CS180x ended this month, with 1140 students having participated in the course. We will be surveying these students in August to determine how they have done on the AP Computer Science A exam, but we are expecting another terrific group of students to do well when that event occurs.

As I did in past years, I spent a morning with Dr. Brenda Capobianco’s elementary education pre-service teachers helping Dr. Jim Lehman to talk to them about computational thinking. The class of 12 students seemed receptive to learning about these ideas, and I believe that one of the students will be joining me for summer camp this year.