**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 February are as follows:

Department       School Visits       Student/Instrument Interactions

Chemistry           65 4805

Biology                 24 1492

Physics                 24 2254

EAPS                      27 2002

**Biology Outreach**

1) Met with the EPICS Program in the School of Engineering and worked with student Anna Bradley in developing two Biology lab/lessons for an EPICS proposed Mobile Science service for Faith in Action program in Haiti. The two lessons were A.) Ecology of earthworms: Importance in agriculture for developing countries. B.) Biotic and Abiotic factors affecting living things in the environment.

2.) Outreach visits to Frankfort and Clinton Prairie High Schools. Provided Information to teachers about Biology Outreach’s Focus Visit Program.

3.) The 3rd. Annual “BIOLOGY FOCUS DAY” took place Saturday Sept 29th. This program, under the auspices of the BSAC (Biological Sciences Advisory Committee), recruits highly qualified Biology students from Indiana to spend a day in the Department and learn about the opportunities for studying and doing research in the Biological Sciences at Purdue. Students participated in Hands-on activities and listen too lectures from Faculty members. This year, Professor Persistera Passhou presented a lecture on Human Genetics and Comparative Genomics. Students also heard from Professor Scott Pluta who presented a lecture on Neurobiology. A lecture on “A STEM Approach To Teaching and Learning The Biological Sciences” was presented br Dr. Clark Gedney. Fifteen (15) Highly Qualified Indiana High School students took part in this year’s program.

4.) Attended the Executive Board Meeting of IABT( Indiana Association Of Biology Teachers) held here at Purdue University September 30th 2018.After years of discussion and planning,  the Association will next year  with the support of Biology Outreach, organize its first Annual Teacher Conference as the Indiana affiliate of NABT(National Assoc. Of Biology Teachers).

**Physics Outreach**

SMAP – Saturday Morning Astrophysics

September SMAP was a collaboration between Outreach Coordinator David Sederberg, and graduate students Ridhi Mehta, Abby Kopec and Amanda Harris. During the activity, Scaling the Cosmos, students created scale model planets and then took them outside and arranged them (on the same scale) according to distance between them to create a model solar system.

The Physics Teacher

After review and revisions, David Sederberg, with Matthew Wiesner as first author, re-submitted and article, The Search for Dark Matter, to The Physics Teacher. The article describes an inquiry lab, derived from Saturday Morning Astrophysics.

Homecoming

Outreach collaborated with the Society of Physics Students to present several activities for passersby at the 2018 Homecoming. There were 7 SPS students involved.

PHYS 295 - Service Learning in Outreach

Outreach Coordinator David Sederberg is working with two undergrad Physics and Astronomy students on independent projects at the BIDC. The Feel the Force apparatus is a set of rotational motion detectors originally developed for SMAP, but will now be available as a classroom set to Science Express teachers. Modeling the AFM, is a nanoscience-related set-up with which students will use a model probe to map the surface of a hidden substrate. Undergrad Mitch Brown is designing and will 3D print components for the apparatus.

Liquid Nitrogen Night at Cary

Outreach conducted a night of demos and making ice cream with liquid nitrogen for the residents of Cary Quad Southeast residence hall.

Jefferson High School Planetarium

Outreach coordinator David Sederberg met with faculty member Rafael Lang and Bill Huston, astronomy teacher and director of the planetarium at Jefferson High School, the purpose of which was to explore options for using the planetarium with the Astronomy 263 and 264 students at Purdue for lab experience when the weather for outside viewing is poor.

Solar Scopes on the Mall

Outreach Coordinator David Sederberg continues to provide support for undergraduate astronomy students providing passersby on the Engineering Mall opportunities to view the sun.

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

* + Equipment loan
    - Our participation is Science Express is proving to be beneficial in that we have teachers of college bound students using equipment in our content areas.
    - We have a number of EAPS kits and small equipment items that we loan out to teachers as well as university faculty and students. EAPS 102 borrowed a number of  items this month.
    - Imagination Station has our Traveling Solar System Wall on display.  Hundreds of visitors to the museum see the exhibit monthly.
  + GLOBE
    - Set up the Indiana GLOBE Virtual Science Symposium
      * Grad students will be mentoring high school and middle school students projects.
      * This is funded through last years Halliburton Foundation grant.
    - Attended meetings for the GLOBE U.S. Partner Forum. Steven Smith (EAPS K-12 Outreach Coordinator) is the U.S. At Large Representative.
    - GLOBE Weather Network:
      * We are working with central Indiana locations that have a weather station, to post their data to the GLOBE web site under the Purdue University partnership.
      * We are working on installing one at Imagination Station.
  + Collaborations,  including broader impacts and instrumentation
    - Have been working with Prof. Dan Dawson on Disdrometer station.
    - Collaborated with Prof. Lisa Welp on organizing our 2017 Halliburton Foundation  grant activities.
      * We are having EAPS grad students make introductory videos to allow K-12 students to know who they are.
      * <http://www.eaps.purdue.edu/outreach/people.html>
      * We are having EAPS 137 students make videos for this as a project.
      * The Indiana Virtual Science Symposium is coming together.
    - Met with Dr. Lisa Welp on Broader Impacts for a new NSF grant.
    - Met with Grad student Brandon Keough about his NSF fellowship grant.
    - Meeting with Dan Chavas on Broader Impacts for an NSF grant
    - Sarah Neran and I met with Department of Mathematics Professor and grad student on GLOBE implementation in the preservice classes and to show them how to do some activities.
    - Met with EAPS PRF person (Jimmy Parker) on funding possibilities.
    - Collaborated with Imagination Station on a new grant: Altering Reality: Virtual and Augmented Reality
    - Collaborated with Sarah Nern on submission of a Pre-Service teacher grant
    - Working with Sarah Nern on submitting a grant to the Constellation E2 Energy to Educate SM grant program
  + Student events:
    - Student groups visited campus
      * Purdue high school GIS Day
      * AP: Electrochemistry
      * Middle School, Elements of the Earth and Sky
      * AP Spectroscopy
    - School /event visits
      * Visited Gold Academy in Indy teaching about moon phases and research projects.
      * Visited Northwestern Middle School and taught about density and how to write procedures for a lab report.
      * Wonders on the Wabash student rafting/ Hydrology event. This was a 3 day event for over 400 6th grade students.
  + Getting information out
    - The outreach Newsletter: (<http://www.eaps.purdue.edu/outreach/newsletter.html>)
      * Reached 448 teachers that have signed up!
      * Collaborating with Chemistry’s K-12 Outreach Coordinator (Sarah Nern) and Computer Science K-12 Outreach Coordinator (Phil Sands) on the content of the newsletter.
      * September was Computer Science focused as we collaborated  with Phil Sands form CS to put that issue together.
    - Made a number of posts on Facebook through <https://www.facebook.com/EAPS.out/>  and <https://www.facebook.com/PurdueSE/>
* Looking forward
  + In October we will be very busy with finishing up grant submissions, groups visiting campus, and school/community visits!

**Chemistry Outreach**

* Outreach for Indiana K-12 Educators
  + Helped develop the Purdue College of Science K-12 Outreach September newsletter
    - Theme: Computer Science
    - Newsletter currently has over 445 subscribers
  + Collaborated with Steven Smith (EAPS) to submit a Procter and Gamble U.S. Higher Education Grant: Taking Environmental Chemistry to the Classroom
  + Volunteered as a raft leader and helped teach water quality lessons to Tippecanoe County middle school students at the Wonders on the Wabash rafting field trip.
  + Worked with Steven Smith (EAPS) to develop and present a break out activity: Elements of the Earth and Sky; to two groups of Indiana middle school students visiting Purdue’s West Lafayette campus. As part of the activity, students used a diffraction grating to identify a mystery element based on its line spectrum generated from a spectral tube borrowed from Science Express.
* Faculty collaborations
  + Met with Brooke Max (Mathematics) and Mike Lolkus (Curriculum and Instruction) along with Steven Smith (EAPS Outreach) to discuss collaborating on an activity that would help pre-service elementary education teachers learn how to incorporate science into the math concepts they are teaching.
  + Students from Frontier High School came to Purdue to participate in an AP Friday lab session on September 14. Students used Science Express Labquest 2s along with Vernier voltmeters to complete an electrochemistry lab developed by Professor Christina Li. <https://www.chem.purdue.edu/media/news/2018/ap_friday_professor_li.php>
  + Attended Success Factors Engagement Session meeting to learn about changes that will be taking place in January 2019.
* Science Express Labs and Instrumentation
  + AP Environmental Science students from Michigan City High School came to Purdue to participate in the High School GIS Day on campus, September 7. Students used Science Express GLOBE Atmosphere Kits to conduct various atmosphere protocols and uploaded to GLOBE Data Entry.
  + Provided half-day Science Express training with 6 Integrated Chemistry Physics teachers. They were trained on 4 new kits that are now offered on Science Express: Exploring Kinematics, Exploring Kinetics, Exploring Mechanical Waves, and Exploring Electricity.
  + Students from Frontier High School and Southwood High School came to Purdue to participate in an AP Friday lab session on September 28. Students used Science Express Laptops and Spectrovis Plus spectrophotometers to complete a spectrophotometry lab. Professor Dave McMillin started this lab session with an introduction to spectroscopy.
  + Worked with Zach Grigsby and Steven Smith to add a Solar System Wall to the Science Express equipment list.

**Computer Science Outreach**

September marks the time of year when both of my service learning groups really begin to do their heavy work. The MAGIC Mentoring group began visiting schools, and will be making weekly trips to both middle schools and high schools. Our schedule involves Tuesday visits to West Lafayette Jr/Sr High, Wednesday visits to Wea Ridge Middle, Thursday visits to Jefferson High, and Friday visits to McCutcheon High. It is early, but we have roughly 35-40 students between the four schools, and my group of 23 mentors are spending 90 minutes with these students per week. Our goal is to schedule one on-campus activity in the Fall for our students to come and see Lawson and engage in some kind of activity on our turf. I will mention that Lillian Evans has attended the MAGIC class and provided some nice insight on how to help me get started more quickly with such a large group of students.

My other service learning group, ROCS, has 19 students this semester and has started to assist with events. In September, they attended four separate activities. At the start of the month, a group attended the Lafayette Sunnyside STEM night and introduced students to programming using Minecraft and Python. We have a group attending weekly sessions at the West Lafayette Public Library where they are running a robotics program for elementary students. A large group of my students assisted with Homecoming, talking with alumni and working with the younger kids that attended the event. Lastly, we have a group that collaborated with CSWN to run the monthly CoderDojo at the Anvil. I am still in the process of training these students, but we are making process.

In addition to the service learning activities, I went to run a day-long workshop for 9 AP CS A teachers through a partnership that I am fostering with the AP TIP-IN program. These teachers were new to teaching the AP course and needed support in both content knowledge and pedagogy. In addition to this session, I was able to connect them to the online CS180x course so that they could use it with their students and as an extra resource for learning more complex topics.

Speaking of CS180x, we are almost finished with the first 6-week segment of the course and have raised our student total to 1080 students. In this group, we have almost 30% female participation and just over 50% of our students located in the United States. My group of TAs has done a nice job of managing the course this semester, and I have been able to reduce my time on this task to a reasonable minimum.

This month we also met with the Corporate Partners, and I only mention this to make sure that I address our pursuit of scholarship funds for CS Camp in 2019. My goal is to continue our partnership with 21st Century Charter School in Gary, and to find at least one more partner school that we can bring students to camp from. Lillian will be assisting me with this effort.