**Biology Outreach**

Biology Outreach’s "Ecology in Art” Program hosted 92  2nd graders, three teachers and several parent ‘helpers’ from Glen Acres elementary School, Lafayette at the Department’s Biological research field station, The Ross Reserve, September 14th.

The students were divided into two groups, each with 46 students. Program activities were conducted for group 1 in the morning, and repeated for group 2 in the afternoon.

In each session, students were given a walking tour (appropriate for the age group) on the trails of the reserve. Along the trails they were instructed on how to identify some the common shrubs and trees found in Indiana. Of particular interest in this session students were taught how to identify three species of invasive plants (based on leaf shape and stem size) that are found at the Ross. They then took samples of each plant back to the field lab and instructed how to make simple drawings of the leaf and stems of each plant. Students then colored their drawings and made a simple booklet to take back to their classroom.

As a permanent member of  the Indiana Association of Biology teachers (IABT) executive Board, I attended the association's fall planning meeting to prepare for IABT's  2018 annual meeting held in conjunction with HASTI next February.

Biology outreach participated in the Science Express refresher workshop for Science express teachers held September 21st at Purdue. Chemistry department. Science Express refresher workshops are designed to give participant teachers the opportunity to keep updated on the proper use and care of the research equipment used in the program. I conducted a session on the use and care of Electrophoresis equipment on Science Express, both new and used.

Bio –Focus day:  Bio- Focus day is a program held in the Fall semester every year in the Department of Biological Sciences for extremely well qualified high school juniors and seniors. On the recommendation of their teachers, high School juniors and seniors with extremely good grades and profound interest in the Biological Sciences, are invited to visit the Department of biological sciences at Purdue for a day. They are introduced to the opportunities and careers available in considering tertiary studies in Biology in college. Students are given lectures by Departmental Faculty, Tour research laboratories, talk to undergraduate and graduate students and encouraged to consider the Biological sciences as a career. Each year a theme in biology is emphasized. Twenty seven(27) students participated this year. They represented high schools from all over the State.

This year the theme focused on Neurobiology. Students heard from Professor Donna Fekete; The John and Donna Kreniicki Directorship of Integrative Neuroscience; Professors Qing Deng; Estuardo Robles; and Daniel Suter. Graduate student Logan Ganzen and undergraduate student Morgan Shafer also participated. Laboratory visits were made to the Medical school and the Hockmeyer Hall of structural Biology among others.

**Physics Outreach**

September SMAP

We held the September Saturday Morning Physics on campus with 30 students attending. We currently have 40 students in grades 9-12 registered for this program. The topic for this month was eclipses. Faculty member, Sanjay Rebello collaborated in designing instructional activities and 11 grad and undergrad students worked as mentors.

Homecoming

In concert with Society of Physics Students volunteers, we presented three interactive exhibits to homecoming attendees; the vortex canon, a bed of nails demo using balloons as subjects, and a giant teeter totter to illustrated leverage. There were about 300 children and parents who used the exhibits.

Service learning

Two undergrad students are enrolled in PHYS 295, my service learning course. Trey Roob is splitting his time between helping with outreach projects, and preparing test, drawings, materials lists, and technical research, the goal for which is the publication of a journal article featuring his development and construction of the Too Cool to Resist apparatus for Science Express. Professor Gabor Csathy is a technical advisor and mentor for Trey’s work, the culmination of a two-year project.

Guna Kondapaneni is doing similar pre-publication preparation for our creation of a computer simulation for SMAP, illustrating how astronomers are searching for planets outside our own solar system. Outreach Coordinator Phillip Sands is collaborating on Guna’s work.

Debbie Beck is enrolled this semester in my PHYS 595 graduate level service learning course. Debbie is working on several projects, one of which is design of a laboratory experience in which high school students will use rotational motion s a foundation for learning about the existence of dark matter. Debbie’s work will be an activity for an upcoming SMAP, as well as provide a lab for her own classroom.

Awarded 10 K for STEM Ed Study Abroad in China

As a co-leader with faculty member Lynn Bryan, I was awarded 10K with 2K matching funds to once again conduct a service learning study abroad in Nanjing, China. In the course, Purdue undergrads and grad students will create and implement course materials to teach STEM in an elementary school in Nanjing.

Web page

I’ve continued to make significant changes to the organization and content to the outreach section of the Physics and Astronomy Department webpage. Most notably, this month, I revised the text and images on the Physics on the Road article, as well as the navigation bar. More improvements are on the way.

Earth, Atmospheric, and Planetary Sciences Outreach

**Open house for Black and Gold celebration went well.**

The K-12 Outreach room was staffed by Steven Smith (EAPS outreach) Sarah Nern (Chemistry outreach/ Science Express Director), and Bill Bayley (COS Director of Outreach. Many alumni and departmental persons visited the room and interacted with Outreach equipment. Smith also assisted in the design of the wall wraps that were installed in the department.

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**AP Friday’s are going strong. Teachers and students are enjoying the events.**

We have had 3 of these events thus far and they all have been a success. High School students have enjoyed doing the labs and being able to learn on campus. The interactions with College of Science faculty and students has been a strong component of the program. Teachers have informed us that they would not have been able to do these labs at their schools due to lack of resources.

**School visits went well.**

A number of school visits took place this month and were all well received.

**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.  The teacher training this month went well and teachers are excited about all of the new EAPS items being included in the program.

We also have a number of kits and items that we loan out to teachers as well as university faculty and students. It has proven to be beneficial to EAPS faculty who have borrowed demos and other items for instruction.

**Faculty collaboration included broader impacts and instrumentation**

* + - Met with Dan Dawson discussing a portable weather instrument. We are actively designing it at the moment.
    - Collaborated with Prof. Jim Ogg on an NSF grant related to timescale.
    - Worked with Prof. Robin L. Tanamachi on the PurRad: Enhancing Radar Education at Purdue University using the Doppler on Wheels grant.
    - Collaborated with Prof. Lisa Welp on organizing our Halliburton Foundation grant (received 8/31/17).
    - Collaborated with Graduate student Ashley Dicks on  a service learning grant.

**Planning for the GLOBE North American Meeting and GLOBE Train the Trainer workshop**

Planning has begun for this March 2018 event. We have reserved the John S. Wright Forestry Center for the training and a room in Stewart Center for the meeting. A planning committee of GLOBE partners have been created and chosen the theme of the Pedosphere.

**Chemistry Outreach**

September saw the beginning of the AP Friday program at Purdue. I collaborated with Steven Smith, EAPS Outreach Coordinator, to bring AP classes from local high schools to Purdue University to complete one of their required lab experiments in a college laboratory setting. Friday, September 1st, we hosted AP Environmental Science students from two different high schools. These students completed a lab on the topic of soils. Friday, September 15th, we hosted one AP Chemistry class and had students complete a lab over the topic of spectrophotometry that corresponded with a lab suggested by the College Board. The students who participated in the September 15th AP Friday at Purdue were excited to have had the opportunity to interact with Dr. Corey Thompson as they worked through their lab. Dr. Thompson was on call during the lab to address technique issues and talk through many of the questions that individual groups of students were asking. They also heard a brief lecture from Dr. David McMillin during their lab experience that tied the idea of spectroscopy to energy levels and orbital diagrams. Overall, the AP teacher and her students felt the day was an enormous success and many of the students commented that they learned a lot from their lab session.

On Friday, September 22, I was excited to help display some of the equipment from Science Express at the EAPS Black and Golden 50th Jubilee. This event saw the return of many alumni from the EAPS department along with faculty members, friends and family. It was a very exciting afternoon to watch faculty, alumni, and their families interact with Science Express equipment and listen to their questions about how the equipment is used in K-12 classrooms.

The Science Express program is in full swing now that the 2017-2018 school year is well under way. On Thursday, September 21, a total of 22 teachers who are actively involved with the Science Express program came to Purdue’s campus for a day-long recertification training. Along with Vernier data-collection equipment and nuclear scalers, teachers were also recertified on such equipment as the FT-IR, Genesys spectrophotometers, digital melting point, ground water simulation, electrophoresis, gas chromatographs, HPLC, UV/Vis, digital microscopes and liquid nitrogen. The teachers that attended this session will be able to continue using the equipment on which they were recertified for an additional 3-year period.

**Computer Science Outreach**

The first six-week module of CS180.1x launched on the day following Labor Day and we have had a successful first four weeks of the course thus far. Our enrollment is up to 1,550 students, with 25% of those students being young women. I think we’ve done a much better job of building this year’s students up to the more complicated programming tasks, and we’ve received good feedback thus far. I expect that we’ll have more students take the course as the year continues. The second module launches in mid-October and will carry through until the beginning of December.

Our other big starting event in September were our MAGIC Kickoffs, which had us heading to all four area high schools. We have about 30 kids spread between the four schools, and 13 MAGIC mentors that are travelling to each school once per week. To accomplish this, we are using Purdue vans on Mondays-Wednesdays and Fridays. This has added a lot of overhead to my schedule, as I am retrieving and returning vans every day but Thursday, and am attending MAGIC sessions on as many of the days as I can, at least until the students feel capable of running the activities on their own. In other MAGIC news, we’ll be sending our students to the Reshma Saujani event on Tuesday afternoon. I was intrigued by her recent New York Times editorial and passed it along to the students. It should make for an interesting discussion if the students can ask the right questions.

<https://www.nytimes.com/2017/09/28/opinion/girls-who-code-trump-stem.html?mcubz=0>

The ROCS service learning group had two major events this month, participating in the CoderDojo as they do every month, and also in Homecoming activities. Both went very well, and my students are actively planning their own event for November that we’ll be ready to share more information on in the coming weeks.

In September, I engaged with a number of state DOE, university advocates, and K-8 teachers regarding the new CS standards that have been inserted into the K-8 science standards for use this year. Based on conversations that I had with Jarred Corwin and Nick Flowers of the IDOE, the new standards will be tested this year in the ISTEP exams for 4th and 6th grade students. Most of the teachers that I met at the “Flipping the Switch” K-8 CS conference that I attended at UIndy mid-month told me that this meant teachers would mostly ignore them until they were tested in those grades. I’m working on a few proposals for the Purdue STEM conference and the Hoosier Association of Science Teachers Inc conference that will address integrated science and CS in the 4th and 6th grade classrooms. Sarah Nern from Chemistry Outreach is already working with me on these, and we’re hoping to bring Steve Smith from EAPS to help us with the implementation. I have been considering what Sunil suggested with regards to developing a resource for K-8 teachers interested in including CS in their classrooms and I’m planning on reaching out to some folks from the College of Ed to see if we could perhaps partner on developing some more integrated material.

On one last note, I met with Adrian Thomas and Nicole Towner about the Harris money that we have for recruitment and retention of URM students. We’re putting together a proposed budget and will report on that after Adrian gets back from Grace Hopper this week.