



Eyes on **iisME**

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IISME Fellow and Mentor co-author an article in the Journal of Chemical Education

Kathryn Davis and her mentor Dr. Linda S. Brunauer, of Santa Clara University, have co-authored an article published in the May edition of the Journal of Chemical Education. The article is based on the Education Transfer Plan (ETP) developed during Kathryn's 2007 IISME Summer Fellowship. The article title is, "Size Exclusion Chromatography: An Experiment for High School and Community College Chemistry and Biotechnology Laboratory Programs." The article outlines a column chromatography experiment designed and fine tuned during the Fellowship and is complete with student handouts, instructor notes, reagent chemical catalog numbers and preparations, equipment needs, cost analysis, and suggestions for potential experimental variations. The process of developing and fine-tuning the lab, publishing it, and using it with her students was one that Kathryn highly values and will not soon forget.

Teachers don't often have time to develop a lab or activity and then work to refine it to perfection. This experiment was conducted over and over with small modifications until the highest level of repeatability was achieved while being realistically conducted during a series of standard 1-hour class periods. Kathryn's completed IISME ETP was 25 pages in length. Dr. Brunauer suggested they condense

the information and submit it to a couple of different journals for publication. The ETP was condensed into three pages and sent out for

review. A five member panel from the Journal of Chemical Education reviewed the article and posed questions to Ms. Davis and Dr. Brunauer; the article was subsequently approved. Next came the editing process, and though the lab did not change significantly, many drafts followed until Dr. Brunauer, Kathryn, and the Journal were all satisfied.

The opportunity to utilize the lab with her students was a thrill for Kathryn. Column chromatography is a very useful technique with highly visual components that make it very understandable for students. The process separates and allows for the characterization of biomolecules including hemoglobin. (Paper chromatography and thin-layer chromatography are much more commonly used in labs for students this age.) Kathryn's students visited Dr. Brunauer's lab at Santa Clara University; this was an inspiring experience for her students, many of whom had never been on a college campus before, much less in a college science lab. The students were proud to see that they were



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doing college level work. Kathryn noted, "Dr. Brunauer was very committed to both the IISME program and my students. She was gracious enough to share her laboratory with the high school students, making college level science exciting as well as accessible."

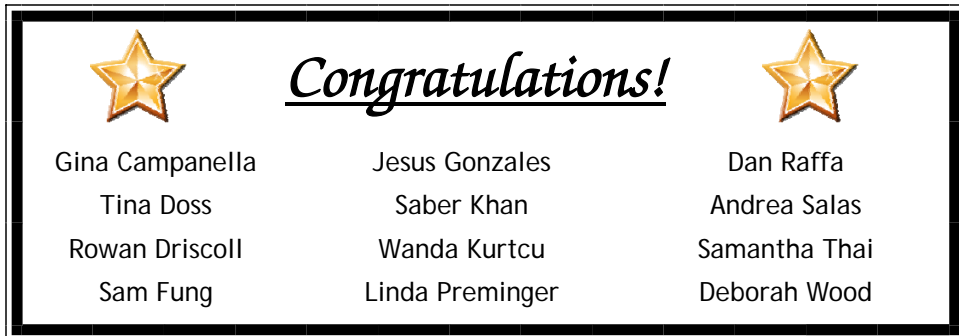
It is an honor to be published in a scientific journal and Kathryn was excited to receive a copy of the May edition of the Journal of Chemical Education directly from JCE. Summer 2007 was Kathryn's first year at IISME and what an experience it was. "I want to do this every year!"

Source: Abstract and Supplement which are available at <http://jchemed.chem.wisc.edu/journal/Issues/2008/May/abs683.html>

Subscribers can view the full article at the same site.

Distinguished Fellows

The following 2008 IISME Fellows were recognized by their Peer Coaches as Distinguished Fellows for their dedication, leadership, and outstanding curriculum development.



IISME Fellows Spend a Summer at NASA Exploring Astrobiology



Allison Pfeifer and Jan Winter in Yellowstone Park at a NASA teacher workshop

NASA has a rich history filled with scientific and technological achievements in aeronautics, space science, space applications, and human space flight (www.history.nasa.gov). This rich history also includes the less widely known study of astrobiology, the study of life in space. 2008 NASA Curriculum Developer Fellows, Jan Winter and Allison Pfeifer, spent their summer learning about astrobiology with NASA scientists and crafting that information into lessons for teachers to use in their classrooms.

Contrary to the ever so popular Hollywood version of green little aliens, most scientists believe we will find microbial life in space. As Allison describes, "Whether it's a

mission to Mars or satellites orbiting Jupiter or Saturn's famous moons, when searching for life on other planets, astrobiologists search for answers to three unifying questions: 1) How does life begin and evolve? 2) Does life exist elsewhere in the universe? and 3) What is the future of life on Earth and beyond?"

Understanding the breadth of microbial life is a vital component to the mission of the astrobiologist and has provided both extensive knowledge and a few very interesting experiences for Jan and Allison. One such experience took them to Yellowstone Park as part of a teacher training workshop where they spent two days with professors that explained extremophiles, which are microbes who can survive in extreme temperatures or high acidity or high salt. "We also participated in lab activities that we could use in our classrooms," said Jan. The duo also collected "smelly" mud samples with NASA scientists at local estuaries to be used for growing microbial mats in the lab. The purpose was two-fold, figure out the most efficient way to make a mat for classroom teachers and look for colors indicating the presence of certain microbes. Another highlight of their learning about microbial life was to work in the lab on practical applications for NASA, including research about using algae to produce biofuels.

The information and lab skills

acquired throughout this experience have been incorporated into lesson plans to be used in the classroom. Jan and Allison felt it was very important to have the lessons also convey their enthusiasm for science and the importance of astrobiology as a science of the future. It is the generations of students to come that will go to Mars and beyond. People may even inhabit another planet as early as our grandchildren's generation. In addition, microbial research is paramount in helping to preserve Earth's fragile ecosystem because of the varied and important functions of microbes. From recycling nutrients, to decomposing organic matter, to fixing nitrogen from plants, the health of the Earth depends on microbes.

Other highlights of the Fellowship include listening to lectures given by NASA scientists and visiting the largest wind tunnel in the world where Allison and Jan saw the parachute that will be used on the next Mars rover.

"NASA's mission is not only to explore space for the sake of knowledge but also to contribute to society by using science for practical applications. We are impressed with NASA's emphasis on educating teachers as well as kids. The importance of shaping the next generation of scientists is evident in their education and public outreach materials. . . We feel very fortunate to have had this experience."

Judy Young – IISME Fellow, Peer Coach, and Board Member – Retires After 40 Years in Education

After 40 years in education, we are calling my retirement a graduation!

IISME was a very positive chapter in my career. The IISME staff valued my skills, and told me so. My self esteem grew as I discovered additional talents to teaching.

I think my first job was in 1988 at Pacific Bell working with technology consultants. They would make presentations using many acronyms and my job was to translate those and make a glossary. In addition, I developed a user manual for new software that they were installing.

The next year I was at the Pleasanton headquarters of AT&T. I spent the summer doing an in-house evaluation. Since I was an impartial outsider, I picked truly random samples, gathered the confidential responses, and put them into a summary form comparing individual departments to the average of all.

The next year, I worked with Kaiser in the computer software development in Shadelands. I wrote a manual for the Kaiser staff to use, as teachers have the skill of speaking "plain English."

I worked for the Kaiser Claims Department in 1991 and redesigned their claim form, formed focus groups to address the needs of the Complaint Dept., and many other rather odd things.

Karin Rosman, of IISME, invited me to be a "Peer Advisor", but I changed the name to Coach. I visited all teachers and developed the midsummer program. . . I coached for IISME for approximately 3 years.

In 1996, the IISME Director from Santa Cruz had me work on a special project interviewing top teachers in

IISME with structured questions and a tape recorder. UCSC grad students in education interpreted the answers. We were looking for common qualities of top teachers, knowing that these skills also translated to ESL students. (The research was funded from an ESL grant.)

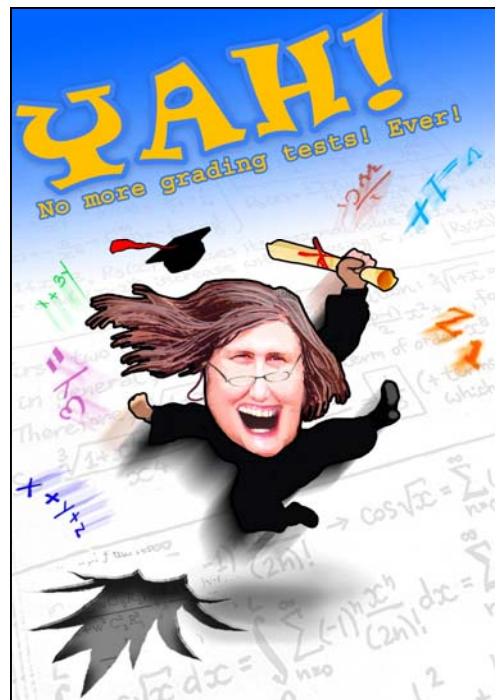
"IISME has been powerful in my life . . . It probably was the extra that kept me enthused."

I was on the IISME Board for three years. We put on a Scientific Work Experience Programs for Teachers (SWEPT) convention with leaders from across the country. One summer I used a FAX machine at home and collected questionnaires about SWEPTs across the country. I collected data and summarized. I even went to Columbia in NYC to learn about a program with top science teachers.

I was on the National Science Foundation panel researching the value of SWEPTs. I went to Washington DC one weekend a year for 3 years to participate.

My last IISME placement was with Intel. I did research from my home to assess the influence of computers on children. There was a book that I wrote the "Cliff Notes" for describing all the negative research about computers and kids. I presented to many teams of managers and it was kept "company private".

I must say that my projects developed for school while at IISME were very influential. At open house a parent thanked me for the extra stuff I do besides math including KAIZEN, something I presented at the SWEPT conference and have used for years that I learned from NUMMI while coaching for IISME. My "project manager" process for group projects led me to speak at the University of Chicago Math Project three times, all expenses paid. I also spoke at a Conference Board program on



Judy's daughters created this playful graphic to celebrate her career and commemorate her retirement.

Education & Business in San Francisco with IISME.

This has been very healthy for me to review just before I move on to something else. IISME has been powerful in my life. It probably was the extra that kept me enthused.

My next plans . . . Today we booked a tour to Bhutan and India in early September when I would normally be going back to school. I got a very good digital piano for retirement and began piano lessons at a community college the Monday after school was out. I expect a second grandson late June. I'll take a year of FALLOW time, and then figure where I can put my teaching skills to use, which may be internationally since my daughter is with the United Nations in Kenya.

Judy Young

May 2008

Quotes from 2008 Fellows

"I feel this Fellowship will help me help my students learn about the environment they will face when they go to work."

"IISME is the best opportunity to put real life issues before my students on a real time basis."

"IISME has done it again!
What a wonderful experience Intel and my mentor provided for me. Every time I turned the corner somebody was there to help. I learned about technology today and where it is going in the future which is ultimately where my students will be."

"(My IISME Fellowship was) absolutely fantastic - more than met my expectations. My mentors were great teachers and the work was interesting and satisfying."

"I really enjoyed my Fellowship and the people I worked with. My work was genuinely valued."

"IISME is a phenomenal experience."

"I had a wonderful experience at IBM this summer. I felt that I worked on a very meaningful project with a wonderful team who treated me as an equal team member. I was very busy and enjoyed every minute of it. My mentor was great and provided wonderful support. It was a great first experience and I hope to be a part of IISME again next year."

"My Summer Fellowship experience has been among the most important steps I've taken as a professional. I have a renewed sense of how I might contribute to the overall endeavor of improving science teaching and learning, and I have a renewed desire to grow and stretch myself professionally."

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Want to stay on top of the latest and greatest opportunities available to Bay Area teachers?

Join IISME-L for regular postings of grants, workshops, and events for educators.

<http://lists1.safesecureweb.com/mailman/listinfo/iisme-l>

"I can't think of anything I would rather have done this summer. I have made connections that will be very helpful for my teaching later. I plan to take students on field trips to SMUD facilities as part of my physics curriculum. I will use the ETP lessons with both 9th graders and physics students. I would not have created the lessons had it not been for IISME."

About IISME

IISME transforms teaching and learning through paid summer Fellowships. IISME provides Bay Area K-16 teachers with experiences and tools they need to update their content knowledge and adapt their teaching practices in order to prepare their students to be lifelong learners, responsible citizens, and productive employees.

IISME Summer Fellowships remove teachers for an extended period from the culture of education to immerse them in the culture of industry and research and allow them to become contributors in this new environment. This is key to the transformational nature of IISME's unique type of professional development.

IISME engages the resources of the Bay Area's high performance corporate workplaces and research institutions—especially the expertise of their scientists, engineers and technologists—and involves them in the process of improving education, one teacher at a time.

IISME exists to address the critical need for a strong, highly skilled workforce in mathematics, science and technological fields. This industry-education partnership focuses on teachers as the primary agents for effecting meaningful change in mathematics and science education.


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Industry Initiatives for Science and Math Education

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