Thursday, March 24, 2011 8:00AM - 11:00AM
Session V8 FEd FGSA: Enhancing Graduate Education in Physics: Focus on Skills  Ballroom C4

8:00AM V8.00001 Teaching graduate students The Art of Being a Scientist  ROEL SNIEDER — Graduate education in the classroom traditionally focuses on disciplinary topics, with non-disciplinary skills only marginally discussed, if at all, between graduate student and adviser. Given the wide range of advisers with different types and quality of communication skill (or lack thereof), the professional coaching delivered to students often is restricted to just the technical aspects of research. Yet graduate students have a great need to receive professional training aimed at, among other things, helping their graduate career be more efficient, less frustrating and less needlessly time-consuming. We have addressed this gap in graduate education by developing the one-credit course “The Art of Being a Scientist.” This course covers a diverse range of topics of importance to being an effective and creative researcher. Topics covered include the following: What is science? Choosing a research topic, department, and adviser. The adviser and thesis committee. Making a work plan. Setting goals. Ethics of research. Using the scientific literature. Perfecting oral and written communication. Publishing papers and writing proposals. Managing time effectively. Planning a scientific career. Applying for jobs in academia or industry. In evaluations of the course, students invariably comment that they could have avoided significant problems in their graduate study and saved valuable time if they would have taken the course earlier on. This is an indication that the course not only useful for students, but also that it is best taken early in their graduate career. The material covered in the course is captured in the book “The Art of Being a Scientist: A Guide for Graduate Students and Their Mentors,” published by Cambridge University Press; more information can be found at www.mines.edu/~rnsieder/ArtOfScience.html From this website one can download a description of the curriculum used in the class, including homework exercises. Currently we are expanding of professional education by offering more lectures and workshops in order to better prepare graduate students for a career in science.

8:36AM V8.00002 Got Skills? On-the-Job Activities of Physicists  RACHEL IVIE, American Institute of Physics — It goes almost without saying that physics doctors do a lot more than just physics research or teaching at their jobs. But what exactly do they do? First, I will share basic data showing where physics doctors are employed. Then I will present data from two of AIP’s surveys about the employment of physicists. The first set of data comes from our survey of physics PhDs one year after doctorate. We will consider how often physicians doctors do a variety of activities on the job, including management, technical writing, teamwork, design and development, programming, and advanced mathematics. The second set of data comes from AIP’s new survey of PhDs in physics 10 to 13 years after graduation. Data for many of the same activities will be shown for physics doctors who have been in the workplace about a decade. Depending on the type of job, most industrially employed physics doctors do some type of physics at work, but they are also very likely to report managing projects, writing for technical audiences, working on a team, and collaborating with non-physicists, among many other activities. This examination of the types of activities physics doctors perform in the workplace will provide insight on the non-scientific training that would benefit graduate students the most.

9:12AM V8.00003 Communication and Critical Thinking Skills  ELIZABETH H. SIMMONS, Michigan State University — This talk will discuss how faculty can help graduate students (and even postdocs) improve non-technical professional skills required for success in scientific careers. Examples to be covered will include a) planning and delivering high-quality presentations b) listening critically to others’ presentations c) writing grant proposals, cover letters, and CV’s d) reviewing manuscripts and responding to referee reports. The faculty member(s) involved must be prepared to project a welcoming attitude, to convey the importance of these skills, and to make a consistent investment of time.

9:48AM V8.00004 Tuning Higher Education  BRADLEY CARROLL, Weber State University — In April 2009, the Lumina Foundation launched its Tuning USA project. Faculty teams in selected disciplines from Indiana, Minnesota, and Utah started pilot Tuning programs at their home institutions. Using Europe’s Bologna Process as a guide, Utah physicists worked to reach a consensus about the knowledge and skills that should characterize the 2-year, bachelors, and master’s degree levels. I will share my experience as a member of Utah’s physics Tuning team, and describe our progress, frustrations, and evolving understanding of the Tuning project’s history, methods, and goals.

10:24AM V8.00005 Shedding light on molecular dynamics: The role of physicists in the age of biomedical science  FU-JEN KAO, Institute of Biophotonics, National Yang-Ming University, Taipei, Taiwan — Fundamental discoveries of the physics of imaging in the areas of microscopy, MRI, and CCD image sensing have produced innovations throughout the 20th century and continuing into the 21st. Not only have these fundamental discoveries received recognition from the Nobel Foundation in 1953, 1986, 1986, 2003, and 2009, but they have also revolutionized basic interdisciplinary research in areas such as biophysics and biomedical physics to the point at which applied physicists, engineers, and medical clinicians are working together to design experiments and develop tools for use in a broad range of areas including clinical diagnosis and pharmaceutical clinical trials. In this presentation, I will describe several innovative approaches in physics combined with engineering that have revolutionized the frontier in the biomedical sciences. Specifically, I will present examples of basic research as well as design, development, and commercialization of photons research in the biomedical area within the context of biophotonics. I will also be sharing my personal experiences in overcoming the cultural barriers and in transitioning from a country that is traditionally underrepresented in science.

Friday, March 25, 2011 8:00AM - 11:00AM
Session Y8 FGSA FIP: Experiences and Issues for Young Physicists in the International Arena: Impact on the Future of Physics followed by Panel Discussion  Ballroom C4

8:00AM Y8.00001 Impact of Visa Issues on an International Physics Graduate Student in the U.S.  AZADEH KEIVANI, Louisiana State University — More than 35 percent of the physics graduate students in the US are temporary visa holders. Many of these students work in large international collaborations and must travel abroad for research and international conferences, sometimes more than once a year. In many cases, students have to reapply for their visas in order to return to the U.S., a process that can be time-consuming and costly. Furthermore, many international students cannot leave the U.S. even in the case of an emergency because a slow visa process may mean deferring for a semester or losing financial support. Thus visa issues affect not only the scholastic life of students but also their personal lives. Finding ways to resolve these issues could positively affect the quality of graduate research by eliminating these extra hurdles to the progress of international physics graduate students.

8:20AM Y8.00002 Overcoming the Cultural Barrier: An International Physicist’s Experience  J. PEDRO OCHOA, Berkeley lab — Doing experimental physics in the midst of an international community, a necessity in certain fields due to the breadth and complexity of the projects involved, is a task that presents many advantages but also challenges. I will be reviewing some of these from the point of view of an international physicist working in China. I will also be sharing my personal experiences in overcoming the cultural barriers and in transitioning from a country that is traditionally underrepresented in science.
8:40AM Y8.00003 Life In a large scientific collaboration, RISHIRAJ PRAVAHAN — I will be talking about life in a large scientific collaboration. The dynamics of dealing with many groups, collaborating with people from various linguistic and cultural origins can be a daunting experience. However, it is exactly this diversity of culture and learning that can make it an invigorating journey. You need to find your place in terms of professional contribution as well as personal liaisons to be productive and innovative in a large work culture. Scientific problems today are not solved by one person hunched over an old notebook. It is solved by sharing computer codes, experimental infrastructure and your questions over coffee with your colleagues. An affinity to take in and impart healthy criticism is a must for productive throughput of work. I will discuss all these aspects as well as issues that may arise from adjusting to a new country, customs, food, transportation or health-care system. The purpose of the talk is to familiarize you with what I have learned through my past five years of stay at CERN and working in the ATLAS collaboration.

9:00AM Y8.00004 Perspectives from an International Female Physicist in Academia, TULIKA BOSE, Boston University — I will bring my perspective as an international physicist in academia to the discussion of issues facing international physicists. I will also talk about issues facing women physicists worldwide.

9:20AM Y8.00005 Panel Discussion: Issues Facing International Physicists and the Future of Physics, AMY FLATTEN¹, American Physical Society — The panel will discuss the challenges and key issues faced by today’s young physicists, especially when participating in international collaborations.

¹APS Director of International Affairs