Dear FGSA members,

Although summer is in “full swing”, FGSA has been as busy as ever! This July edition highlights FGSA’s recent activities to keep you up-to-date and actively engaged while you enjoy your summer months.

To begin with, there was sizeable representation of FGSA at the APS March and April meetings this year. We would like to thank you all for attending and making it a big success by actively participating in our sponsored sessions.

As in the past, FGSA strives hard to get the best speakers and organize the most relevant sessions for graduate students, and I am sure we will carry on that tradition in coming years. That being said, we hope to continue to see all of you at future meetings.

At the APS April meeting, I had the pleasure of meeting some of you personally and was able to receive some great feedback on both the newsletter and FGSA Facebook page. With our page now boasting three hundred or so “likes”, we strive to continuously improve the content of our posts and welcome and appreciate any feedback sent our way.

In addition to posting a variety of physics jobs on this page to improve access to physics employment opportunities for our members, the FGSA will occasionally post articles and relevant media from other sources, i.e. PhysicsFrontline and other prominent physics blogs; a great source for news related to physics, science and technology. Our mission is clear: To make the most cohesive and convenient page for our members. With your help, we can spread the word and create a unified online community of fellow scientists and graduate students.

While I’d like to thank everyone who contributed to this edition, I would like to send out a special thanks to Dr. Crystal Bailey for sharing such a thought provoking article; I am sure this piece will help graduate students expand their perspectives when making difficult decisions while choosing a career path, be it in academia or industry.

On behalf of the FGSA executive committee I wish you all a wonderful summer.

Thank you and kind regards.

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Building Roads to Your Future: The Importance of Career Self-Advocacy

Crystal Bailey

As careers program manager at the American Physical Society, I spend a lot of time talking to students about post-graduate career options. Sometimes students’ questions are about academic paths—but increasingly, more students are asking about careers in industry and other non-academic areas. In some cases, the student is exploring careers outside of academia because they have always been interested in working in the private sector, and want to learn more about how to be successful in those fields. Other times, the student has shifted their focus because they have experienced difficulty in securing an academic job after finishing their degree (and often several postdocs), or because they have been told by their advisor or peers that academic jobs are hard to come by. Regardless of motivation, these students all seem to have one thing in common: they have finished their degrees with little access to non-academic mentors, and have received little information from their departments on non-academic paths.

At the same time, more faculty seem to be understanding that the “standard path” for physics PhD students—that the student will follow in the footsteps of their mentor, become a permanent faculty member in an academic institution, take on students and postdocs, write research grants, etc.—is not as common as one supposes. Perhaps they have observed some of their most thoroughly-prepared students having difficulty securing an academic job, or choosing to pursue careers outside of academia. Or perhaps they have become aware of the growing body of data which suggests the academic job market has become extremely competitive. For example, the AIP Statistical Research Center Reports on physics PhD employment, and the NSF Integrated Survey Reports indicate that permanent academic jobs are relatively scarce (accounting for 15-20% of physics PhD graduates) compared to other sectors.

Yet while more faculty advisors have begun advising their students that academic career paths are not so common, few seem to follow up with information on career paths that are (e.g. industrial research and development, finance, law, and medicine, just to name a few. According to the same reports mentioned above, the private sector accounts for 40-50% of all physics PhD employment). It is not enough to deliver the message that academic jobs are scarce: both students and faculty need to understand that opportunities are readily available—and lead to rewarding, well-paying scientific careers—in non-academic sectors.

Shaping The Pathway Forward: Career Self-Advocacy

An example of a “top-down” approach to improving career mentorship in physics departments might include recruiting more physics faculty with industrial experience. A major obstacle to effective career mentorship is a lack of industrial cohorts, experience, or networks among physics faculty. Engineering departments, which feature a robust pipeline into industry for their graduates, employ a large number of faculty with industrial experience (and, accordingly, solid industrial networks—which plays a major role in the career mentorship they are able to provide). Another approach might be sponsoring regular symposia which feature non-academic speakers. These would provide a way for students to learn about these careers and build their non-academic network—possibly even getting an “inside lead” on jobs.

Yet as simple as these suggestions seem, physics as a discipline is slow to adopt such measures. You may be surprised to hear that some faculty claim that they aren’t motivated to provide better information to students because their students “aren’t interested” in non-academic careers (a claim which seems rather puzzling, given the interest I have witnessed in this topic at every student event I have attended at APS Meetings). In truth, if students have no awareness of the other options—are only exposed to the idea academic employment—then they won’t know what questions to ask. To such a student, the phrase “finding academic employment with a PhD is difficult” translates to “finding a job with a PhD is difficult,” and it is this fallacy that creates unnecessary frustration on the part of hard-working young scientists (or worse, drives them out of the discipline altogether, thinking that jobs are more plentiful elsewhere).

This is why students need to be vocal about their interest in learning about careers outside of academia to their mentors and departments—and follow up with suggestions about what they would like to see happening. The truth is that most physics faculty heartily wish for their students’ success and support such efforts to whatever extent that they can, but are limited by time constraints, budget constraints, and (most importantly) little understanding of what is needed. It is said that necessity is the mother of invention, so the force which shapes how career information is made available to students—both individually, and as a part of a broader scientific

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Get Involved! STEM-Ed issues affect graduate students

Tyler Glembo

The decisions made by the federal government affect you, as a graduate student in physics, in a myriad of ways. For instance, Congressional appropriators decide funding levels for the science agencies that directly affect the number of grants that can be given out and in turn affect graduate students’ ability to get a research assistantship. When the executive branch gives federal agencies direction, old programs are cancelled and new programs spring up, such as is happening right now with the National Science Foundation (NSF). What all of this means is that if you are interested in having a say in your future then you need to become involved in the policy discussions that happen within government. But, what is currently happening and how does one get involved?

One current issue in Science, Technology, Engineering, and Mathematics education (STEM-ed) comes from the President’s proposed STEM realignment as outlined in his Fiscal Year 2014 budget request. The realignment would increase overall funding to STEM-ed programs while simultaneously cancelling or consolidating half of the existing government STEM-ed programs. There would also be a few new programs of larger scope created at specific agencies. In short, the Department of Education (ED) would take over K-12 STEM-ed, the NSF would take over undergraduate and graduate STEM-Ed programs, and the Smithsonian institute would assume responsibility for informal STEM-ed and public outreach.

Whether or not this is a good thing depends to some degree on which community you are a part of.

As a graduate student you may be excited to learn that the realignment would increase the number of Pell grants. You might also be excited to learn about the proposed increase to the NSF’s Research Experience for Undergraduates program, as you just might get an undergraduate working with you in the lab for the summer.

However, if you are studying in the field of astrophysics you might be troubled by the fact that the National Aeronautics and Space Administration’s (NASA) Education and Public Outreach (E/PO) budget is being cut in half with 36 programs being cancelled. These include programs that have done outreach to thousands of students and have been, upon review, shown to be a good use of taxpayer money and highly effective.

Of concern to any community, however, is the lack of details in the President’s budget request. How programs are to be transitioned is not clear. These are the questions that have lawmakers from both sides of the aisle concerned about the proposal. As Rep. Eddie Bernice Johnson (D-TX) said, “I have serious concerns about the budget proposal itself. To be blunt, it seems to me it was not very well thought out.”

Another current issue is the appropriations from the House and Senate. This year, the House and Senate have very different appropriations numbers for science accounts. For instance, the Senate appropriations bill for NSF is $430M larger than the House bill. $430M at NSF would mean 1,350 more grants which greatly affects how many post docs can be hired and how many graduate students can be funded.

Not all issues in Washington D.C. revolve around funding. There are bills, such as the Science Laureates bill that have no money associated with them. The Science laureates bill (H.R. 1891) would create a Science Laureate position within the U.S., appointed by the President. The Laureate would act as a spokesperson for science, helping to raise public awareness and understanding.

So, as a concerned graduate student, what can you do? Well, the first step is to understand more of what is going on. Stay current with events by watching the FGSA facebook page for updates from the APS Office of Public Affairs.

Next, consider what other resources are available to you. The APS Office of Public Affairs maintains an Advocacy Tools webpage at www.aps.org/policy/tools/index.cfm. There are tips on writing to Congress, how to have a meeting with Congress and more. If you are interested in further opportunities, such as joining in during Congressional Visits Days and coming to Washington D.C., you can contact the Washington office directly at 202.662.8700 or by emailing opa@aps.org.

If you are interested in doing something local you can also approach the government relations individual at your university. University government relations are there to represent the interest of the University, but consider having a discussion with them.

Finally, contact your Senators and Representatives. Write on their facebook walls, write them a letter, or pick up the phone for a 2 minute phone call. Their offices are there to serve you, as a voter, and when they pick up the phone that will be exactly what they do. Tell them you’d like to speak with the staffer who works on

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A March Meeting... a time for giving lightning-fast talks, reuniting with old friends and collaborators, job-hunting, and learning about new ideas and recent progress. This year's March Meeting took place in Baltimore, MD, and drew over 7,500 attendees, 780 of which were grad students (along with 546 undergraduates). This year, thanks to a travel grant from the APS Topical Group on Magnetism and its Applications (GMAG), I was able to attend the entire meeting. The March Meeting can be a bit overwhelming, especially for a graduate student, so it was great to be able to stay all week and settle in as much as possible. Still, analogous to summing up what might be a year's worth of research in a ten-minute talk, a week isn't nearly enough time to squeeze in all the physics and networking opportunities available at the March Meeting!

Planning a schedule for a full week of physics is a daunting task. What's a grad student to do? There were talks "strongly recommended" by my advisor that were first added to my schedule, then some excellent invited sessions, a handful of must-see talks given by friends, and of course the blockbusters like the Kavli Foundation and Nobel Prize sessions! And in the evenings, receptions and other social events need to be penciled in to make the experience special. In the time in between all the talks and receptions, the collegial atmosphere of the meeting makes seeing collaborators and friends from all over the world (and from many sub-genres of physics) as easy as walking across a convention center - this is perhaps the best and most useful feature of the meeting.

This year's meeting featured a couple notable events for graduate students. FGSA sponsored the session "Physics Jobs in Government and Science Policy," which consisted of three invited speakers followed by a panel discussion. The first speaker of the session, Amy Flatten (APS Director of International Affairs), gave a talk entitled "Off the Beaten Path: A Journey to a Career Beyond the Laboratory," in which she discussed various skills obtained in a graduate education in science, along with diverse ways to apply these skills in careers outside of the traditional research environment. The next talk, "Political Science," was given by 2010-'11 APS Congressional Fellow Laura Berzak Hopkins. Laura described her experience working as a scientific advisor on Capitol Hill and the importance of scientists' involvement in policy. The final talk of the session, "A Career Path in Science, Policy, and Politics," was given by John Looney, chairman of the Sustainable Energy Technologies Department at Brookhaven National Laboratory. A lively panel discussion followed. In addition to this session, FGSA was involved in a graduate student reception featuring travel award presentations and fabulous refreshments (very important for a grad student get-together, as we all know!). Several APS staffers were in attendance, as well as members of the FGSA executive board; the reception was an enjoyable way to network with these and other FGSA members.

Among the graduate students I was able to connect with at the meeting is University of Toronto student Ashley Cook, who had the following to say about her first March Meeting experience: "The APS March Meeting was a great opportunity to meet friends from a winter school again, bond with the other condensed matter grad students in my department, and learn about the latest research! The talks by two Nobel laureates were also incredibly inspiring, in particular because I had the chance to ask a question. All in all, this was a great chance to meet friends new and old, and connect with the condensed matter physics community at large."

This sentiment sums it up well, and overall, my experience as a graduate student at the March meeting was stimulating, motivating, and memorable, along with being totally exhausting, as all quality physics conferences should be. See you in Denver!

Kelly Reidy is currently a graduate student at Kent State University working in theoretical condensed matter physics. She is also an adjunct lecturer at the City University of New York and member-at-large of FGSA.

STEM-Ed Issues
FROM PAGE 3

science education issues. Ask that staffer how the office feels about the realignment, the Pell Grant proposal, the proposed Master Teacher Corps, or about any other program that will affect you.

If you are interested in other ways to get involved contact the Washington office with the above contact information.

Tyler Glembo currently works as a Government Relations Specialist at the American Physical Society. His background is in computational biophysics. He earned his Ph.D. from Arizona State University in 2011.
Though many of the April meeting sessions were academic talks, FGSA brought in invited speakers to discuss international science diplomacy, NASCAR and why flames burn. FGSA Officers also networked with other forums and APS offices to kick-off opportunities for our members.

Tyler Glembo is the Government Relations Specialist for APS. He is interested in getting graduate students more involved in science advocacy at the state level. Discussions between FGSA and the APS Office of Public Affairs have started; keep checking our Facebook page for more details as they come out!

After a successful Negotiations Workshop before the March Meeting sponsored by FGSA, the committee is looking into hosting a similar webinar this fall. This webinar will provide information to members of FGSA on how to benchmark their salary and benefits for their first job. The workshop received a great response and the FGSA Committee wants to extend this information to all members of our forum. Again, watch the Facebook page!

The APS April Meeting kicked off with a networking session for students, which highlighted a panel of physicists who discussed the many career opportunities for physics graduates outside of academia. The networking session was also an opportunity to unveil the Special Edition Newsletter that advertised FGSA sponsored, and student oriented sessions and events at the meeting. A copy of the newsletter can be found on the FGSA web-page.

I also had the opportunity to sit on a panel, answering questions of students considering attending graduate school. The students who attended were great, and asked a range of questions from applications, to advisors, to funding. The panelists, Azadesh Keivani (Louisiana State University), Jenne Driggers (Caltech) and Vikram Prasher (Umass Lowell) are shown in the top picture.

By pairing up with the APS Office of Public Affairs and the Forum on International Physics (FIP) FGSA was able to sponsor two diverse sessions. April 13th was the first session co-sponsored with the APS Office of Public Affairs titled ‘Science and Communication: A Potent Cocktail.’ The session featured three great speakers, Dr. Diandra Leslie-Pelecky, author of the book Physics of NASCAR, Dr. Sydney Perkowitz author of many popular science books, and Benjamin Ames, PhD student and winner of the 2012 Alan Alda ‘Flame Challenge’. Diandra and Sydney focused on how to get involved in science communication, and Ben ended the session by showing his award-winning video.

With the co-sponsorship of FIP we organized a session on science diplomacy. Nicholas Suntzeff gave a presentation titled ‘Science Foreign Policy at the State Department: Why would they need a Cosmologist?’ and E. William Colglazier, Science and Technology Advisor to the Secretary of State talked about the importance of science diplomacy, see picture below. FGSA was happy to see interest in both sessions from students and professionals alike.

As chair of the FGSA Program Committee I would like to thank the entire program committee for their time and input to a great program. I look forward to meeting the great speakers invited to the 2014 April Meeting.

Laura Boon is a 4th year graduate student at Purdue University, and current Chair of FGSA. Her research is in Accelerator physics and spends most of her time doing research at Argonne National Laboratory.
FGSA Travel Grant: proud to be excellent!

Maria Longobardi

The APS has developed many activities to help younger members to integrate in the physics community and to share their different experiences, such as the CAM conference and award programs, recognizing the key role of the networking between scientists as a fundamental factor for their scientific career.

Four times per year, the FGSA unit of the APS supports the research of graduate student members who have made exceptional progress in their research with the Travel Award for Excellence in Graduate Research providing travel expenses to present their work to the scientific community.

This award has an increasing success and attracts every year a great number of applicants from all countries. It is based on quarter calls with four round per year.

The applications are open every three months and the eligibility is reserved to graduate students who are U.S. or international members of APS and FGSA. The award cover the travel expenses to attend scientific events such as meetings, conferences, workshop or schools (all over the world) up to $500. The next call will be open approximately at the end of August 2013 to attend scientific events that take place in the fourth quarter of 2013. The exact date of the opening will be announced around one month in advance in the FGSA website.

To partecipate to the selection for the travel award the students should provide the CV, a statement of purpose of maximum two pages describing their interest in the event, and a list of objectives they hope to accomplish from the partecipation to the event.

In the past months, the FGSA already awarded twelve students, recognized at the APS March and April meetings, during the Student Reception dinner sponsored by the FGSA.

The list of the excellent students awarded in the first half of the 2013 for the second and third quarter is:

- Charith Srian Peris
  Northeastern University
- Luke Walker Goetzke
  Columbia University
- Kumel Kagalwala
  University of Central Florida
- Dmitriy Mayorov
  Texas A&M University
- Hamed Simchi
  University of Delaware
- Wenhao Sun
  Massachusetts Institute of Technology
- Christopher Duston
  Florida State University
- Leah Kuritzky
  UC Santa Barbara
- Behrouz Tavakol
  Virginia Tech
- Orpheas Kypris
  Iowa State University
- Stacey Alberts
  UMass-Amherst
- Ken Chen
  University of Minnesota

For further information please visit: http://www.aps.org/units/fgsa/activities/travelgrants.cfm

Maria Longobardi was born in Naples, Italy. She is currently working at the University of Geneva in the Department of Condensed Matter Physics as postdoctoral researcher; Her research is focused on the electronic properties of 1D systems on the atomic scale by means of Scanning Tunneling Microscopy (STM) technique. She is serving the FGSA as International Student Affairs Officer since the beginning of 2013.
Career Self-Advocacy

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community—has to start with those whose need is greatest. In other words, it has to start with you.

So What Can You Do?

Luckily, there are a number of really excellent sources of information on how you can explore your options and plan your career. A good starting point is the excellent career workshop typically offered at the APS March Meeting, featuring celebrated author and science career coach Peter Fiske. This workshop, which is now archived and available as a webinar on the APS Careers site, provides in-depth information about self-assessment, career planning, building your network, applying and interviewing for jobs, and much more. This presentation is free to all APS Members, and can be accessed by visiting http://www.aps.org/careers/guidance/webinars/plus/fiskewkshp.cfm (please note that you will need your APS Web ID to access the page). I would encourage every single physics graduate student to watch this presentation—it tells you everything you need to know.

Once you have undergone the important step of career self-assessment and know what career you want to pursue, you need to begin networking—and APS meetings are an excellent way to accomplish this. Take advantage of the myriad networking receptions and career panels that take place at the March and April meetings. Junior Members who register for the March or April meetings are even eligible for 50 free business cards to use while networking. For more information on this member benefit, please contact membership@aps.org.

APS has also been working closely with FIAP (the Forum on Industrial and Applied Physics) on bringing more one-on-one interaction between students and industrial physicists at our March Meeting. This year FIAP hosted a workshop focused entirely on industrial careers that was extremely well-attended. FIAP also sponsored a large number of tables at the “Graduate Student Lunch with the Experts” event at the March Meeting. The easiest way to learn about FIAP activities for graduate students is to become a FIAP Member—industrially-focused events are advertised every year in the FIAP Newsletter.

However, there are a host of other things you can do at your home institution, to benefit yourself and your graduate colleagues. For example, you can see if your university’s career services office offers self-assessment exams (such as the Strong Interest Inventory®, recommended by Peter Fiske). Many universities have a paid subscription to services such as this which allows students to take the exams for free. And while many career services offices may not be able to give you great advice on how to pursue an academic faculty position (after all, you have faculty mentors for that!) they can tell you about those other careers—medicine, law, business and finance, among others—that a significant fraction of physics PhDs pursue. If you find that you have been successful in gleaning good information on your own, offer to host your own informal colloquium to help your fellow students (and their faculty advisors!) learn about resources which are available locally.

There are also a number of student organizations at universities, many of which have access to money and other shared resources which may not be available through your physics department. Physicists, engineers, and computer science graduates are often employed in the same jobs; collaborate with your university’s scientific graduate student associations to plan colloquia or to bring a group of working scientists to your campus to talk to students about their careers.

On August 20, 2013, APS Webinars is hosting a presentation on Career Self-Advocacy featuring former FGSA Chair Meghan Anzelc. Meghan conducted and published the series of informative interviews with non-academic physicists which appears on the FGSA website, and has a great deal of advice to share on how graduate students can leverage local, university, and association resources to learn about non-academic career paths, without having to rely on resources within physics departments to bridge the gap. Look out for announcements about this presentation on the APS Webinars page, the FGSA Facebook page, and the APS Wavefront. If you would like to be added to the webinar mailing list to receive an announcement when registration becomes available, please email me at bailey@aps.org.

Though the prospect of forging your own career pathway may seem daunting, there are actually a number of resources available to help you move forward, not the least of which is your own intelligence and resourcefulness (indeed, these are two big reasons that physicists make such highly sought-after job candidates). As you walk toward the “finish line”, there is no better opportunity to continue honing these skills than by finding creative ways to leverage existing career resources, and mapping your own way forward. You expect no less from yourself regarding your thesis research—why should your career path be any different?

1 NSF Integrated Survey Data, 2010. Permanent private sector employment accounted for 47% of surveyed PhDs, while permanent academic employment in the field of physics accounted for 18% of surveyed PhDs.


3 According to the AIP Statistical Research Center Report, “Recent Physics Doctorates: Skills Used and Satisfaction with Employment,” physics PhDs who were initially employed in potentially permanent positions (most of these in the private sector) ranked their faculty advisors lower in career planning helpfulness than their academically-employed counterparts.

Dr. Crystal Bailey is Education and Careers Program Manager at the American Physical Society. Dr. Bailey manages programs geared toward bringing career information and professional development resources to students and early career physicists, such as career events for undergraduate and graduate students at the APS annual meetings, APS Webinars, the APS Careers website, and the APS Job Board and Job Fairs. She can be reached at bailey@aps.org.
Advertisements: Student Visitation Programs

The American Physical Society is now accepting applications from U.S. applicants for the Brazil-U.S. Exchange Program.

Through the Brazil-U.S. Physics Graduate Student and Postdoc Visitation Program, graduate students and postdocs can apply for travel funds to pursue a breadth of opportunities in physics, such as: 1) attend a short-course or summer institute; 2) visit with a professor in his/her field of study; 3) work temporarily in a lab; or 4) any other opportunity that the applicant and host deem worthy of travel support. Grants are for up to USD $3,000.

The Brazil-U.S. Professorship/Lectureship Program funds physicists in Brazil and the United States wishing to visit overseas to teach a short course or deliver a lecture series in the other country. Grants are for up to USD $4,000. Professors from the United States who will travel to Brazil are invited to include an option to bring a U.S. graduate student from their department on the trip.

The deadline for U.S. applicants traveling to Brazil is Friday, 1 November 2013. More application information: http://www.aps.org/international/programs/brazil.cfm

This program is sponsored by the Societade Brasileira de Fisica (SBF) and APS.

Physicists, physics graduate students, and postdocs in India and the United States can apply for travel grants to pursue opportunities in the other country.

The APS-IUSSTF Professorship Awards in Physics funds physicists in India or the United States wishing to visit overseas to teach short courses or provide a physics lecture series delivered at a U.S. or Indian university. Awards are up to U.S. $4,000.

Through the APS-IUSSTF Physics Graduate Student and Postdoc Visitation Program, U.S. and Indian graduate students and postdocs may apply for travel funds to pursue a breadth of opportunities in physics, such as: 1) attend a short-course or summer institute; 2) visit with a professor in his/her field of study; 3) work temporarily in a lab; or 4) any other opportunity that the applicant and host deem worthy of travel support. Grants are for up to USD $3,000. This program aims to support travel to India by U.S. graduate students and postdocs, and enable graduate students and postdocs from India to travel to the United States.

This program is sponsored by the Indo-U.S. Science and Technology Forum (IUSSTF) and administered by the American Physical Society (APS).

Application Deadline: Friday, 1 November 2013

Application information: www.aps.org/programs/international/us-india-travel.cfm