APS physics

CSWP & COM Gazette

Vol. 31, No. 1 Spring 2012

Newsletter of the Committee on the Status of Women in Physics & the Committee on Minorities of the American Physical Society

INSIDE

Guest Editorial: On Disability

Amanda Peet, Associate Professor, University of Toronto, Member of CSWP

For some people, their first experience of a person with a disability occurs with a family member. For others, it occurs at school or college with a friend or acquaintance. Yet others have encountered disability first hand, like I did in my early thirties. Even if we happen to be able-bodied over the majority of our lives, all of us will eventually encounter age-related disability. Societies in many first-world countries have greying demographics, meaning that a higher proportion of their population will have disabilities in future. In the US and Canada, the Baby Boomer demographic bulge and the phasing out of mandatory retirement have brought age-related disability in the workplace out of the shadows. In parallel, worldwide attitudes to disability are shifting positively, albeit slowly. As a local colleague explained to me, changing attitudes to disability is a bit like steering a cruise ship: if you turn too quickly, people will start vomiting or fall off. Initiatives are more likely to succeed if they are gradual and sustainable in nature.

How many disabled people are there? Numbers reported in different countries vary, as they depend sensitively on cultural attitudes to disability as well as on census metrics. In the 2006 Canadian census [1], 14% of the population reported having disabilities. In the 2000 US census [2], the figure was 19%.

Categories surveyed included sensory disabilities such as sight or hearing impairment, motor disabilities, mental or emotional health disabilities, and limitations in self-care or independent transportation. According to a 2008 survey by the National Science Foundation [3], American undergraduate students with disabilities number about 11%, with the figure dropping to 7% at the graduate level. Faculty with disabilities are scarce. The fraction of scientists and engineers not in the labour force is twice as high for people with disabilities compared to their able-bodied counterparts. About two-thirds of scientists and engineers with disabilities became disabled at age 30 or older.

The best known disabled physicist on Earth is Stephen Hawking. His disability is (currently) obvious at a glance. But not all disabilities are visible. Invisibility makes a disability trickier to negotiate socially.

continued on page 2

Dr. Aziza Baccouche: Overcoming the "Illusion of Inclusion"

By Bushraa Khatib, APS Education & Diversity Programs Coordinator

Dr. Aziza Baccouche grew up speaking English, French, and Arabic, and is also familiar with Spanish and Italian, so perhaps it isn't surprising that she sometimes finds it easier to express certain concepts in one language or another. When asked what motivated her to earn her Ph.D. in physics and start her own media production company, all while being legally blind, Baccouche responds that it is her *baseera*, Arabic for "vision" or inward sight and mindset, that has kept her focused on her life's purpose and allowed her to achieve so much as a physicist.

A different ability

When Baccouche was eight years old, a benign tumor developed in her brain's third ventricle and impeded the natural flow of cerebral fluid. The resulting build up of pressure caused damage to her optic nerve, resulting in near total vision loss. She has undergone five brain operations over the course of her life to manage the tumor, and currently has about five percent of normal sight. Baccouche thinks of her sight as a different ability rather than a disability. "People who have sight see with their eyes. I see using my ears, hands, and fingers as I read Braille," she says.

Baccouche says that having to navigate life in a different way requires patience and endurance, and relates this idea to the physics equation that many scientists are familiar with: power is equal to work over time. "I think of power as strength and work as endurance or otherwise stated, that strength is a function of endurance over time," she says.

Why physics

Baccouche had always excelled in math throughout school, but in her senior year of high school she dis-

continued on page 4

Publication Information
The COM/CSWP GAZETTE, a newsletter of the American Physical Society Committee on Minorities (COM) and Committee on the Status of Women in Physics (CSWP), is mailed free of charge to all those listed on the Roster of Women and Minorities in Physics, all U.S. physics department chairs, and others upon request. Because editorial responsibility rotates among COM and CSWP members, please address all correspondence to: COM/CSWP Gazette, American Physical Society, One Physics Ellipse, College Park, MD 20740-3844, or email to: ratnikova@aps.org. Opinions expressed are those of the authors and do not necessarily reflect the views of the APS or of the COM and CSWP.

Guest Editorial *continued from page 1*

Some able-bodied people respond with snap judgements that the invisible disability must be invented in order to gain sympathy or other advantages like a disabled parking permit. Others stigmatize people with disabilities, overtly or behind their backs, as often happens to people managing mental health conditions. But determination of a person's disability status is a private matter between them and their doctor. It is not up to onlookers to decide whether a person is disabled. Breaking down the stigma of disability, on the other hand, is a joint responsibility that everybody shares.

How can able-bodied folks help?

Here is an example to which we can all relate: an older family member or friend who is hard of hearing. We understand that they may not want to admit to a hearing impairment because of the stigma or because they worry that people will stop wanting to talk to them. We also know that the person after hearing loss is no less intelligent than before: it was their hearing that went, not their mind or personality! The environment clearly needs to change to accommodate this person in their everyday life. Using microphones and amplification is a suitably inclusive response. A speaker in a meeting room can easily repeat a question into the microphone so that everyone can hear it along with the answer. Other examples are easy to brainstorm with a little imagination.

Laws mandating accommodation or accessibility for people with disabilities make a tangible difference to millions of lives. The best-known law in the USA is the federal Americans with Disabilities Act (ADA) of 1990. In the province of Ontario, Canada, our legislative leader is the Accessibility for Ontarians with Disabilities Act (AODA) of 2005, which was inspired by the ADA. An example of progress sparked by the AODA is the Council of Ontario Universities' Accessibility Toolkit [4], a comprehensive open resource developed collaboratively by a number of universities including ours. Between countries, the quality of accessibility varies widely, depending on both political will and economic might. An example that a law might mandate is installation of a ramp when a student with a mobility disability enrolls in college, which would be classified as an accommodation. Ensuring that all classrooms, labs, libraries and student meeting spaces have built-in or retrofitted ramps would be closer to the ideal for accessibility. The overall goal is to mainstream people with disabilities, primarily by removing barriers to accessibility and secondarily by providing reasonable accommodations. Experts are needed to implement accommodations, but the entire community can get behind accessibility.

How do we encourage everybody to take responsibility for accessibility?

Mainly by engaging groups of people in non-intimidating conversations. It is crucial that able-bodied people do not feel lectured into silence by disability equity experts or threatened into compliance by legal sticks. Explaining why a proposed accessibility initiative makes sense helps in building a community of allies. Different individuals will engage at different levels of commitment. At the institutional level, colleges and universities have a particularly strong responsibility to become more inclusive of people with disabilities. Paid employment opportunities available to qualified people with disabilities are improved across the board when they can participate unhindered in higher education. Until the fraction of people with disabilities in the student body and the paid workforce reflects their occurrence in the wider population, we still have work to do. If our society is shunting people with disabilities into education and employment ghettos, it is missing out on a huge talent pool.

How do able-bodied folk generally react to disability in their midst?

Usually with some degree of discomfort and avoidance. These behaviours are obvious even in small children. Among adults with more nuanced reactions, there are two common themes. One is to pity the person with a disability, labelling their circumstances as tragic or unfortunate. The other is to designate the person with a disability as courageous or heroic for struggling daily against the Sisyphean task of their everyday life. In both cases, the person with the disability is looked down upon. This is unhelpful, because the person has already figured out many clever solutions to everyday challenges and is uninterested in being lionized for it. Disability may take as much time to manage as having a family, but it is part of life.

Fortunately, education is a reliable method for reducing clumsy etiquette around people with disabilities. A particularly good pamphlet available online [5] contains dozens of easily implementable suggestions. Here are a few examples.

Ask permission before touching someone's wheelchair: it is part of their personal bodily space. Ask before helping a person with a disability. Speak directly to them, not to their companion or sign language interpreter. Don't make assumptions about what they can or cannot do: they have far more experience than you and are the best judge of their capabilities. Avoid terms like "victim of AIDS" or "AIDS sufferer"; instead, just say "person with AIDS". Never lock bicycles onto accessibility ramp handrails. Don't touch a guide dog or other service animal while it is working: it is not a pet. Avoid the temptation to complete a stutterer's words or to hurry the pace of their speech. Don't pat or kiss people of short stature on their head. Take a community first aid course so that you know what to do if someone has an epileptic seizure. Try not to use words describing disabilities like "lame" as insults. Finally, never reveal a person's disability status to another person: always respect their right to privacy.

To help build a truly accessible society, each of us needs to get comfortable with our inabilities as well as with our (identity-defining) abilities. Ability/disability is not a binary concept; in the real world, it is a continuum. This point is especially important for able-bodied physicists in leadership positions to understand. An example illustrating disability stigma is the fact that the fraction of the professoriate self-

continued on page 5

Ramon Lopez Receives 2012 Bouchet Award

By Mike Lucibella, APS Staff Writer

Every year APS awards the Edward A. Bouchet award to an underrepresented minority physicist who has made major contributions to physics research. This year's winner is Ramon Lopez of the University of Texas, Arlington for his research into understanding space weather and magnetic storms, as well as his work in improving science education standards and efforts to communicate science to the general public. He will receive $3,500, plus travel to an APS Meeting to receive the award and deliver a presentation on his work, as well invitations to at least three academic institutions to talk about his research.

Lopez's passion for space and space weather can be traced back to July 20, 1969. The Moon landing made a big impression on Lopez, and was one of his biggest influences when he was young. "I was a child of Apollo," Lopez said. "Those were some very strong early memories of mine."

It sparked in him an interest in outer space that stuck with him ever since. In addition he became fascinated with learning what makes the universe tick from the bottom up.

"I was always interested in how things work. Then in middle school, I learned there was something called physics." Lopez was hooked. He started reading about nuclear physics, and how it made everything in the universe behave the way it did. For him, it was settled. When he was 11-years-old he proudly announced to his parents that he would become a nuclear physicist when he grew up. "That was one idea I never really changed," Lopez said.

After finishing his undergraduate degree in physics at the University of Illinois, Urbana-Champaign in 1980, he found himself once again drawn to the mysteries of the cosmos and started looking around for graduate school programs to study space. He found Rice University's department of space physics, and enrolled in its PhD program.

"I had a professor who tried to persuade me to switch to nuclear or high energy physics, but I was really interested in space physics," Lopez said. "Space science and our place in the universe is something that's always fascinated me."

While studying space physics, Lopez was required to take a single graduate level quantum mechanics class. However while enrolled in it, he found that it was so interesting and so intimately tied to understanding how the universe works, he ended up taking quantum mechanics classes all the way up through quantum field theory. Even today, he tries to keep up on the latest advances in quantum and nuclear physics, despite the fact that he says it has virtually no crossover with space weather, his main focus of research.

"In space plasma, I work on solar wind magnetosphere interactions," Lopez said. He described his work as studying the interactions between the Sun's solar wind and the Earth's magnetosphere under heavy magnetic fields in hopes of better understanding the causes of major magnetic storms. These magnetic storms have the potential to wreak havoc with electrical grids around the world. These storms cause anomalies in the Earth's magnetic field, and as a result powerful ones can induce electrical currents into power lines, overloading them.

The most powerful solar storm, called the Carrington Event, happened in 1859, where a massive solar flare blew out telegraph lines all over Europe and North America. Legend has it that there was an aurora in New England bright enough to read a newspaper at night. Lopez said that should such an event happen today it would have "a devastating impact on the U.S. economy."

"Most people really don't realize how much of human civilization is based on the control of electromagnetism," Lopez said. "Our civilization is really founded on that, and Maxwell's equations are really the crown jewel of 19th century physics because of that."

Inspired by the desire to show the public how space weather can impact them, Lopez teamed up with NASA's science writer Michael Carlowicz to write the 2002 book "Storms of the Sun."

"I wanted to communicate about space weather and space science," Lopez said. "Each chapter is about some aspect on space weather, and it's told as a series of stories."

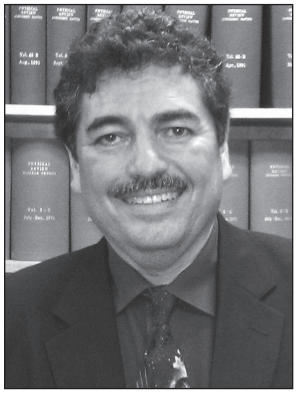
Since its original publication, Lopez and Carlowicz's book sold more than 20,000 copies. It is now freely available as a pdf file from the National Academies Press.

In addition to his space weather research, Lopez also studies physics education, specializing in how spatial intelligence relates to cognition and learning. He's conducted numerous experiments looking at how a student might better understand a physics concept when a flat two-dimensional image is replaced with a three-dimensional stereoscopic image. He's found there are times when the extra dimension can help a student grasp a concept in ways that two-dimensional images sometimes can't.

"The problem wasn't the physics. The problem was the spatial relationship between all of the pieces," Lopez said. "Science education is a parallel career for me."

Lopez has also been helping to develop the Next Generation Science Standards, a joint effort between the National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve to develop a framework of standards for science across the country.

In his spare time, Lopez has been putting together a cookbook of recipes made from ingredients solely from the Western Hemisphere. ■



Ramon Lopez

"Our physical abilities may be impaired but our intellect is still functioning and is certainly worthy of being tapped into."

covered that she had a passion for physics. "I fell in love with physics because it boiled down to numbers that connected to life phenomenon," she says. Her high school physics teacher, Dane Toler, made sure that there were no barriers in the way to her learning physics. Baccouche read books through a live reader or through talking books and completed lab assignments with the help of a lab assistant who would describe the experimental setup to her.

Her experiences motivated her to pursue physics in and beyond college. "I found physics very intellectually stimulating. I enjoy problem solving," she says. Her graduate study was in theoretical nuclear physics, which suited her intellectual curiosity and interest.

In addition to being intellectually challenging, Baccouche finds physics exciting and dynamic. "The physics might not change but the way of measuring it and exploring it does," she says. There is also plenty of opportunity to be creative in the field.

Naturally Baccouche's path to a Ph.D. in physics was not easy. She encountered roadblocks along the way, particularly when she first started off majoring in physics in college. "I had to deal a lot with my professors' perceptions and attitudes about blindness and the ability of blind people like myself to do physics," she recounts. Particularly memorable was the freshman advisor that told her "it takes sight to do physics" and suggested that she consider pursuing a degree in a field less visually based, such as a language since she is already fluent in several.

Baccouche says that society struggles with an "illusion of inclusion," the idea that ideals and goals in place to protect those with disabilities are simply that: ideals without functionality or implementation.

Despite the advice, Baccouche accepted the challenge and pursued advanced degrees in physics. It took Baccouche longer than her classmates to do her homework; "This wasn't because the assigned problems were particularly difficult but because it took a lot of time to navigate print materials to include textbooks via audio means," she said. Unlike her sighted peers, she didn't have the flexibility of flipping through pages to find an equation or formula. She found that she had to memorize much of the content in order to be able to access it quickly.

The National Society of Black Physicists (NSBP) was a tremendously helpful resource to Baccouche in finding mentors, connecting to a larger community of physicists, and attending conferences. She also lists Recording for the Blind as very useful in finding readers for many of the math and physics textbooks that were not available in another format.

Although finding her niche in the physics community was a challenge at first, she found a nurturing and empowering environment at historically black Hampton University, where she completed her Master's degree in theoretical nuclear physics. "I was surrounded by mentors and professors who looked like me and believed in my abilities," she said.

Acceptance in the physics community

Baccouche strongly believes that the physics community should be receptive to the fact that physicists facing physical challenges execute tasks in different ways and may require a little more time to do so. "Our physical abilities may be impaired but our intellect is still functioning and is certainly worthy of being tapped into. Stephen Hawking is a great example," she said.

Baccouche passionately advocates for the mainstream inclusion of differently-abled people in society. She says that society struggles with an "illusion of inclusion," the idea that ideals and goals in place to protect those with disabilities are simply that: ideals without functionality or implementation. Although we have laws to protect the rights of people with disabilities, these efforts of inclusion are superficial at best.

Baccouche says that getting through the educational process is not so difficult comparatively because these opportunities must be provided by law. However, problems arise upon leaving academia: "Once you're done, you have the same skill set and the intellect as your peers, but are severely limited by your disability because that is the first thing that people see," she says. She says that people with disabilities are really at the "bottom of the barrel."

She references the fact that about 70% of working-age blind people in the U.S. are unemployed. This is something Baccouche experienced first hand when she finished her Ph.D. "We are still struggling within the blind community here in the United States for mainstream inclusion in society and this inclusion starts with job security. Like many of my blind peers, I continue to have to deal with people's perceptions and attitudes about the abilities of people who are blind like me," she says.

Media production company

Baccouche did not stop by earning advanced degrees in physics and finding employment despite the odds. Her philosophy is that you have to be proactive about the things that are important to you, so she went on to launch her own media production company, AZIZA Productions, to promote science literacy through films.

When she was in college, Baccouche was inspired by a series of documentaries on cosmology that aired on PBS. She was particularly impressed by Dr. Carl Sagan's style of communicating science to the lay audience and decided to pursue her interest in producing science-based news for television.

In graduate school, Baccouche completed a fellowship with the American Association for the Advancement of Science (AAAS) at CNN's headquarters in Atlanta where she wrote and produced science news segments. After completing the fellowship, she continued producing for the CNN Washington bureau on a free-lance basis while completing her Ph.D. work at the University of Maryland at College Park. "I was the first on-air correspondent for the network who just happened to be legally blind," she says.

While at CNN, Baccouche produced a short documentary film profiling the achievements of young African-American students in science titled *The Changing Face & Image of Science*. This experience inspired Baccouche to establish her own media production company, which would also ensure intellectual property over her productions.

Baccouche is currently working on a pilot documentary titled *Dr. Z: Exploring the Universe Through the Eyes of a Blind Scientist*. This is the launching point of what Baccouche hopes will be a longer-running television documentary film series that highlights the achievements of women, people with disabilities, and people of color. The film series, which aims to be launched in 2012, aspires to connect science with everyday life.

She is also producing a personal documentary titled Seeking Vision, chronicling her most recent surgery to manage her tumor. In it, her neurosurgeons gave permission to film the surgery, and Baccouche offers a personal narrative about her experiences. She also goes back to Tunis to visit the school for the blind that she attended as a child.

Although it follows the drama of whether or not Baccouche regains her sight, the film focuses on highlighting ability and "seeks vision, not sight," she says. The film's purpose is in line with Baccouche's philosophy of holding on to her inner vision, *baseera*. She hopes that her story will change perceptions and attitudes towards blindness and prompt efforts to promote inclusion in society. ■

Guest Editorial *continued from page 2*

identifying as having disabilities is low compared to the fraction of working-age adults with disabilities in the general population. At our university, for instance, it is roughly five times lower.

Further complicating the picture, demographic data on disability at any given institution may be unavailable because numbers are so small that anonymity of individuals sampled could be compromised by reporting statistics. The fact that even tenured professors feel unable to be openly disabled on modern university and college campuses is telling.

As physicists, you can help make the professional climate more accessible by advocating for barrier-free meeting space and making disability accommodations as needed. For example, if you organize a session at an APS meeting, ensure that the hotel and meeting venues are fully wheelchair and mobility scooter accessible - with user-operated elevators, without obstruction from winter ice or snow. Ask all participants well ahead of time to alert you to any accommodation needs they may have, such as special furniture, room placement, or dietary constraints. If you are more ambitious, work with physicists with disabilities to create opportunities for networking and to build traditional or horizontal mentoring alliances. Our sister organization the American Chemical Society has a Committee on Chemists with Disabilities which maintains a resources web site [6] of relevance for physical scientists. One of its prominent links is to DO-IT [7], the Disabilities, Opportunity, Internetworking, and Technology Center of the University of Washington in the US.

This extensive resource includes a compendium of online disability resources geared towards higher education institutions, specifics on disability accommodation strategies, and dozens of examples of promising accessibility practices. People looking for role models may wish to highlight women with disabilities in science, technology, engineering and mathematics from the radio series 'Access to Advancement' [8].

Accessibility is precious. It can make all the difference to a curious child becoming a physicist later in life. The long-term goal is to make our homes, educational institutions, workplaces, and centres of community life as accessible as possible, so that people with disabilities have barrier-free access to life opportunities just as people who are able-bodied do. People of all ages can contribute to accessibility, working alongside experts in disability accommodation.

An important part of this process is for each of us to carefully examine our attitudes to disabilities and abilities, both our own and other people's.

On a personal note, this is the first time I have written openly about my disability status in a professional context. I currently manage acute vertigo, chronic pain, and digestive dysfunction while working full-time. It is my hope that bringing disability more out into the open will help contribute to improving the climate for other physicists with less employment security than the privilege of tenure. We all deserve the opportunity to reach our fullest human potential, regardless of our disability status. ■

The author thanks Andrea Carter, University of Toronto Employment Equity AODA Officer, and Per Arne Rikvold, Distinguished Research Professor at Florida State University, for helpful suggestions and analogies.

References

[1] Canadians in Context - People with Disabilities, Human Resources and Skills Development Canada, http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=40

[2] Disability Status: 2000, [U.S.] Census 2000 Brief, http://www.census.gov/prod/2003pubs/c2kbr-17.pdf

[3] Persons with Disabilities in Science and Engineering, National Science Foundation, http://www.nsf.gov/statistics/wmpd/digest/theme6.cfm

[4] Council of Ontario Universities Accessibility Toolkit, http://www.cou.on.ca/ issues-resources/key-issues/accessibility/accessible-toolkit-homepage.aspx

[5] Disability Etiquette pamphlet, United Spinal Association, http://www.unitedspinal.org/pdf/DisabilityEtiquette.pdf

[6] American Chemical Society (ACS) Chemists with Disabilities Committee Resources, http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=346

[7] Disabilities, Opportunity, Internetworking and Technology (DO-IT) Center, University of Washington, http://www.washington.edu/doit/

[8] Women in STEM On the Air, WAMC NorthEast Public Radio, http://www.womeninscience.org/series.php?seriesID=1

Please Update Your Address

Dear Gazette *Reader,*

The APS Roster of Women and Minorities is also used as the Gazette *mailing list.*

If your address has changed and you wish to continue receiving the Gazette*, please visit www.aps.org/programs/roster/enroll.cfm to re-register and select The* Gazette *Mailing List as your Roster group.*

Questions? Contact Arlene Modeste Knowles at roster@aps.org.

Keep reading the Gazette*!*

GPS Groups: A Peer Problem-Solving Approach to Mentorship

By Evgenya L. Shkolnik (Lowell Observatory), Alexandra Surcel (Johns Hopkins University School of Medicine), Anat Shahar (Carnegie Institution of Washington), Hannah Jang-Condell (University of Wyoming)

Peer problem-solving groups provide a level of support and professional and personal growth unattainable in traditional mentorship relationships. Participation in such groups can play a significant role in retaining URM individuals in the academic pipeline.

It has been well documented that women and other underrepresented minority (URM) groups in STEM disciplines have dismal retention rates in the academic pipeline. And yet having more diversity among STEM researchers means a greater pool of qualified scientists. As the saying goes, diversity equals excellence. Increasing the number of women (and other URM) requires repairing the `leaky pipeline', wherein they drop out of the academic system due to the lack of support, family commitments, and feelings of isolation and exclusion.

Closing the gap between education and retention requires significant changes, both at departmental and institutional levels. And, people can also take action on their own behalves. The identification of mentors has often been highlighted as an essential element in maintaining URM individuals in STEM fields. Traditional mentoring relationships are valuable but one-directional, i.e. senior mentors junior. Here, we argue that peer problem-solving groups provide a level of support and professional and personal growth unattainable in traditional mentorship relationships, and that participation in such groups can play a significant role in retaining URM individuals in the academic pipeline.

Peer-mentorship has been used successfully outside academic environments. Benjamin Franklin popularized the notion in his autobiography nearly 300 years ago. Napolean Hill's 1937 classic book *Think and Grow Rich* describes peer mentorship in a "Mastermind" setting for business entrepreneurs, which Hill defines as a place for "the coordination of knowledge and effort of two or more people, who work toward a definite purpose." Because scientific research in many ways can be considered entrepreneurial, application of a mastermind model in academic environments can have similar positive effects. More recently a group problem-solving approach was described in *Every Other Thursday: Stories and Strategies from Successful Women Scientists* by Ellen Daniell (2006). In this book, several women in Berkeley, California (including members of the National Academy of Sciences, researchers, professors and industry scientists) met every other Thursday for over 25 years, and credit the group for their many professional and personal successes.

Through GPS (Goals & Problem-Solving for Scientists), we reinvented a wheel which needed reinventing. Although the model we present here would benefit all scientists, the main focus of GPS is to cater to women and other URMs. We formed the first GPS group three years ago in the D.C.-Baltimore area, at a time when we were all postdoctoral fellows in the physical and biological sciences, and with young children, making us particularly vulnerable to the leaky pipeline statistics. Our GPS group was a life-saver, or rather a career-saver, for each of us.

Reflecting on our time together, meeting every other week, our group was by all measures a success:

- Three of us applied for and are now in tenure-track academic positions in our fields of choice.
- Three of us have had second or third children in this time and managed to avoid the leaky pipeline.
- Each of us is committed to beginning another GPS chapter in her new city, which mirrors her current career status.
- We successfully apply the problem-solving skills acquired in the GPS group to our other personal and professional relationships.
- GPS has propelled us to apply for fellowships/jobs/conferences outside of their normal bounds of motivation and confidence.

These achievements were possible in large part because of the peer-mentorship model - seeing how one's advice positively impacts others leads to enhanced self-confidence when it comes time to make key judgments about personal situations. Each of us has come away from GPS more empowered, more confident, and more focused.

Such a group also helps with identifying and conquering workplace bias and self-esteem issues, including the "imposter syndrome". Additionally, vetting concerns with other women helps relieve much of the competition often experienced among women in the workplace, a phenomenon Stone (2007) referred to as "horizontal hostility".

Want to start your own GPS group?

The goal of GPS is utilitarian: it exists to solve problems that individual members face in their professional environment involving, but not limited to, professional development, goal setting, productivity, conflict resolution, mentoring, scientific writing, interview skills, work-life balance, and harassment. The private and close-knit nature of the GPS group ensures that members can thoroughly explore concerns in an atmosphere that is both supportive and exacting. Members are required not only to resolve their own conflicts, but also to act as a sounding board, reference point, and source of perspective to others.

We have developed the following guidelines for people interested in starting their own GPS group.

1. Selection of members: A group consisting of four to six people is ideal and members should fit a criteria with regard to peer similarities, e.g. early-career women, scientists with children, etc. To set up a new group, we have found two approaches valuable: (1) Approach a like-minded individual not in your department with

the idea of forming a GPS group and inquire about other individuals who may be interested - this is in fact the way that the original GPS group was started. (2) Set-up a large informal get-together with other URM individuals across career stages. Such meetings, which we have held at our homes with 30-40 attendees, are not just a great way to recruit new members, but also serve as an excellent networking opportunity. Adding new members to an existing group should be a unanimous decision.

2. A commitment to meet every other week. One of the primary benefits of the GPS group is to leave each meeting with the expectation that one will be held accountable for following through on outlined solutions. Showing up at each meeting must be a top priority. Members should treat GPS meetings the same way that they adhere to other professional commitments. We have attended meetings on the eve of proposal deadlines, job interviews and with newborns in tow when necessary. This type of commitment, while perhaps initially difficult, engenders a feeling of mutual respect among members and ensures the long-term viability of the group.

3. A commitment to complete confidentiality. This creates a safe and comfortable environment to ask questions, show weaknesses, test ideas, and give advice.

4. Restricted times: Each meeting should be 2 hours in length. Meetings start with a 30-second "check-in" during which each member states her (or his) points of discussion for the meeting. Each member requests an amount of time she predicts will be sufficient for a thorough discussion of her issue(s) of choice. The group decides how strict they need to be to stay on track, but this step helps gauge the seriousness of the topics for that meeting, i.e. a member who only wants to speak for 5 minutes probably has a less pressing or more easily solvable issue than someone who allocates 20 minutes of the meeting.

5. Choosing topics of discussion: Members should focus discussions on problems where they seek an active resolution, or on issues relevant to all members. This is critical, as GPS meetings are not merely "venting sessions" – participants must then be willing to do the work needed to overcome pertinent issues. In the event that a member does not have an issue to be addressed, his/her role is still critical for the group. During those times, he/she fulfills the peer-mentorship component of GPS.

6. Honest feedback: The ability of members to both give and receive feedback makes the GPS model a mentoring success. Peer-mentorship means that individuals are likely to be more receptive to internal critical review than in the context of a traditional mentoring relationship. It is not enough to simply meet and discuss problems – it is essential that members be exacting and honest in their feedback. The hardest, but most rewarding part of GPS, is pinpointing personal weaknesses, and then having the support of a close-knit group to work through them.

7. Protocols for the beginning and end of each meeting: As with any group, inter-personal conflicts can arise. If an issue between two or more members is left over from the previous meeting, it should be discussed first thing during the next meeting (before the "check-in" time) in order that the meeting continues comfortably and productively for everyone. At the end of each meeting, members should list concrete goals to be achieved before the next meeting. This strengthens the sense of collegial accountability and is often the cornerstone for the next meeting.

Being part of a GPS group with other dedicated female scientists is one of the most important commitments each of us has ever made. And while working in an environment driven by competition and plagued by bias, this is HUGE. New GPS chapters are sprouting up around the globe. If you'd like to find out more information, or reach other people interested in forming a group, visit GPSGroups.com. ■

A version of this article appeared as a conference proceeding at the 2011 'Learning Across Disciplines' mentoring conference at the University of New Mexico and a version of this article will appear on ScienceCareers.ScienceMag.org.

Guidelines for starting your own GPS group:

Selection of members

A commitment to meet every other week

Complete confidentiality

Restricted times

Choosing topics of discussion

Honest feedback

Protocols

Nadya Mason is the 2012 Maria Goeppert Mayer Award Recipient

By Mike Lucibella, APS Staff Writer

Nadya Mason
By Thompson/McClellan Photography

Each year APS presents the Maria Goeppert Mayer Award to recognize the work and achievements of a woman physicist early in her career. This year's recipient is Nadya Mason, an assistant professor of physics at the University of Illinois at Urbana-Champaign. In addition to a certificate honoring her achievement, she will receive $2,500 plus $4,000 in travel allowances to be used towards speaking at up to four U.S. universities and an APS Meeting.

Mason's research focus has been on the unique electrical properties of carbon nanotubes, graphene and other superconducting nanostructured materials. She has been focusing on how individual electrons behave in these kinds of low-dimensional nanomaterial materials. She's researched the tunneling spectroscopy of carbon nanotubes and graphene, superconducting bound states in quantum dots and phase transitions in nano-patterned two-dimensional superconductors.

"I'm interested in the electronic properties of small scale structures," Mason said. "In these materials, the electronic properties are much more interesting than in larger scale versions of these materials."

She likes seeing the practical applications that come out of research into condensed matter. There's a tremendous amount of potential that quantum computing holds for future generations of ultra-fast processors. In order to get to a usable quantum computer, Mason said that you have to start out by understanding the physics work the way that they do at a fundamental level and build up from there. One starts out understanding the behavior of quantum dots at the nano level, and move up to processors at the micro level and ultimately to whole computers at the macro level.

"In all science you ask why. In solid state, you ask why about materials," Mason said. She added that when conducting her research, she likes to keep in her mind the interrelated questions of "how can we really understand the physics going on, and how do we use this knowledge to build new and exciting devices?"

Photo by Ivan Petrov

Mason said she's always had an interested in nature and math, but it wasn't until high school that she began to seriously consider science research as a career. When she was a junior, Mason worked for a summer at a biochemistry research lab at Rice University. While there, she found she had a real passion for working with her hands, doing hands-on research in a laboratory. Up to that point, she didn't have much of a history of doing hands-on science or physics, but her summer at Rice University sparked an interest in doing science that's stuck with her ever since. "It showed I really like experiments," Mason said.

Mason was accepted to Harvard's physics program. She started taking a wide variety of science classes, including chemistry, biology and math, but she found the physics classes she was taking were the ones that most excited her.

Knowing she wanted to get into experimental physics, she sought out as much experience working in laboratories as she could. She worked at a geophysics lab for Exxon, worked on plasma physics for General Atomics and first worked on condensed matter at Bell Laboratories under a Consortium Research Fellows Program fellowship.

After receiving her bachelor's degree in physics from Harvard, she attended Stanford for her doctorate. Once she completed her PhD, she returned to Harvard for her post-doc work, until taking a position as assistant professor at the University of Illinois at Urbana-Champaign's department of physics. In 2011 she was promoted to associate professor.

Mason says it's an exciting time for materials research, and she's pressing ahead with her work. Topological insulators have burst on the scene in recent years, and Mason said she is keen to investigate them. In the meantime she's been using tunnel probes and local gates to study the conductance of different materials. In addition, she plans on using the tunnel probes to locally isolate puddles of electrons in materials, and measure conductance through them.

"It's a more sensitive way of measuring the energy of these things," Mason said. "There's a lot of things we're very excited to study right now."

With the Maria Goeppert Mayer award, Mason is excited to travel to different institutions and give talks to students and researchers. "I'm certainly looking forward to giving talks at these institutions. I like giving lectures," she said.

"It's just a great honor…this sort of award is extremely nice for recognizing the work we've done here," Mason said. "Maria Goeppert Mayer is one of the biggest role models you can find." ■

Gender Issues with Chinese Characteristics

By Betty Tsang, National Superconducting Cyclotron Laboratory, Michigan State University

The Seventh Joint Meeting of Chinese Physicists Worldwide (OCPA7) was held at the National Sun Yat Sen University in Kaohsiung, Taiwan, Aug 1-5, 2011. This series of conferences has been organized about every three years chiefly by the Overseas Chinese Physics Association (OCPA).

The OCPA was founded in 1991 by a group of ethnic Chinese physicists mainly from the US, mainland China, Taiwan, Hong Kong, and Singapore. Due to the politically sensitive situation in mainland China and Taiwan, the OCPA has consistently advocated the promotion of physics among ethnic Chinese physicists as the main and sole purpose of the association. Thus it was interesting to note that a lunch panel discussion on "Women in Sciences" was scheduled on the second day of the meeting. Could this be related to the fact that the current OCPA chair is Haiyan Gao at Duke University, the first woman President in OCPA's 20-year history?

The session was chaired by Mei Bai from the Brookhaven National Laboratory. Halfway through the meeting, I counted 36 people attending the session with 17 male colleagues. The nearly 50% male ratio was certainly the highest I have seen in such type of meetings. So much so that some late-coming women participants peeked in and moved on thinking that it was the wrong session. In the beginning, I thought the men came only to eat their boxed lunch in the air-conditioned room. However, they were as active in voicing their opinions as their women counterparts during the discussions.

The opening remarks and initial comments by Mei Bai and Haiyan Gao reflected the US situation from well known studies on gender gap in physical sciences [1]. In the following, I mainly focus on remarks from the audience on gender issues "with Chinese characteristics".

The audience, especially those from mainland China, became indignant when they heard that some US middle school teachers would make comments that "there is no future in science for girls". It is unthinkable to them that such teachers could exist. This really reflects the differences in the teachers' expectation of their students in the two countries. It could also be that by middle school, the students in China already chose their field of study, Literature, Science or Business. Nearly all the Chinese scientists (male and female) reported that they had supportive parents who encouraged them to pursue advanced studies in science and that "good science teachers" had been one catalyst in their choice to become scientists.

As in all gender issue discussions, how to achieve a balanced life for a woman elucidated a lot of comments. The intents of some of our male participants became clear. A lot of them have "precious" daughters under China's one child policy. They lamented that a successful woman scientist who does not have a balanced life would scare off young girls from pursuing science.

This provoked suggestions to make pamphlets highlighting successful women scientists as role models. One Taiwan scientist reported that a 10 minute movie made for such purpose has been successful in recruiting young girls to science study. In this day and age of multi-media, short videos posted in social media may be the way to go.

The fathers were also very active in giving out advice that girls should plan their timing in attracting supporting spouses in marriage. (To the conventional Chinese thinking, being single is not balanced! That thought also applies to men.) One father volunteered that he and his wife gave their daughter advice about her career and marriage early and that his daughter adjusted her choice of graduate school to follow the "boy". These concerns led to a frank suggestion that women should plan their personal life including marriage and childbirth, the way they plan their career. Do not leave it to chance!

There were also fatherly suggestions that physicists should learn from Mathematicians, Astronomers and Chemists where there seem to be more successful women scientists. (US statistics does not support such a notion [2].) Nonetheless, most sentiments converge on the opinion that it is more difficult for women experimentalists to have balanced family lives as they need to go to the laboratories 24/7.

Most women scientists from the US complained about their childcare situation as they were brought up in a society where childcare in or near the work place was automatically provided under the communist government in China. Even in the absence of the childcare arrangements by the "big brother", some women scientists in China can rely on their extended families. At OCPA7, not only did the conference provide financial support for childcare, but a list of local babysitters was also made available to participants with children!

When it comes to gender inequalities, most of our Chinese colleagues from mainland do not believe that a gap or discrimination exists. It does not seem to matter that among the participants and speakers in OCPA7, the fairer sex represents much less than 20%. One apparently senior male scientist from an institute in Beijing commented that he noticed more and more women faces in his institute in recent years. On the other hand, a woman scientist complained that the Chinese science sky is being held up by fewer and fewer women than in the previous era under Mao when "women hold up half of the sky" was the politically correct slogan.

There was no time to discuss the glass ceiling. It might not have been fruitful to do so if the mainland Chinese physicists were not convinced that there is gender inequity. Before closing the session which lasted nearly one and a half hours, the organizers agreed to compile some statistics about women representation in China for OCPA8 [3]. From the session, we can take to heart that the sincerity of the male physicists in China especially regarding the welfare of their daughters' careers, may be one of the keys to remedy inequity problems. ■

Betty Tsang

References

[1] An example is Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering, http://darwin.nap.edu/books/0309100429/html/R7.html.

[2] Gender Equity, APS report, May 6-8, 2007, available online in http://www.aps.org/programs/women/index.cfm.

[3] After the meeting, the author found some statistics about women scientists in China in a talk posted online, http://www.aps.org/units/fip/meetings/upload/wu.pdf.

Sex Differences in Types of Jobs and Skills Used by Physics Bachelors

By Rachel Ivie, Patrick Mulvey, and Casey Langer Tesfaye, AIP Statistical Research Center

At some point, almost everyone has had to answer, or at least think about, why they do what they do. At the Statistical Research Center of the American Institute of Physics, we try to find out what draws people to physics. When we ask people why they majored in physics, many are quick to reply "because I love it!" And almost everyone, when asked in our surveys, says they would major in physics again. But when it comes right down to it, loving physics doesn't pay the bills. However, things that people learn as physics majors can pay the bills, with some money to spare [1]. So what do people with physics bachelor's degrees do in the workplace? What skills are employers paying for when they hire a physics bachelor?

To answer these questions, we survey physics bachelor's degree recipients within a year of their receiving degrees [2]. We can use these survey data to describe the types of jobs physics bachelors have initially. We also ask about a variety of skills people use on the job, ranging from people and management skills to research and computer skills. In this article, we'll also look at differences between men and women in the types of jobs they hold and the skills they use at work.

FIGURE 1. **Employment sector for physics bachelors, classes of 2009-10**

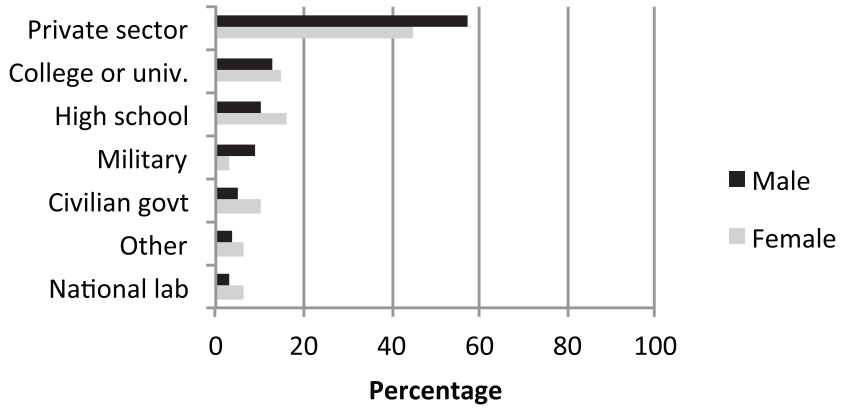


FIGURE 2. **Percentage of physics bachelors employed in private sector STEM and non-STEM jobs, classes of 2009-10**

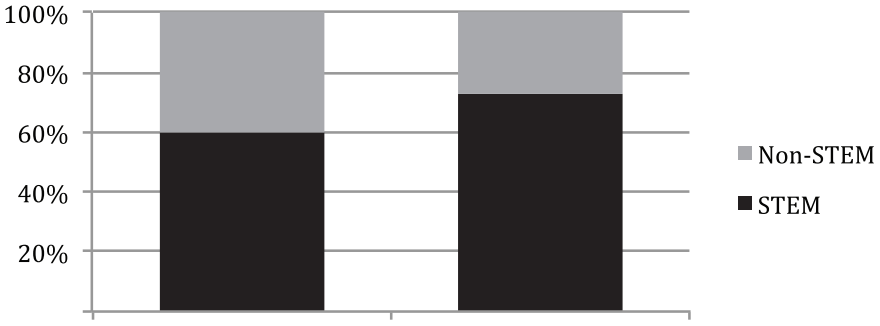
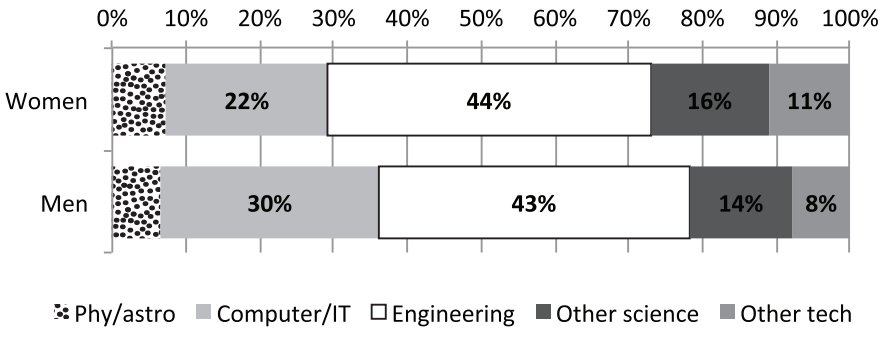


FIGURE 3. **Field of employment for physics bachelors in private-sector STEM jobs , classes of 2009-10**



Types of jobs held by physics bachelors

Physics bachelors are employed throughout all sectors of the economy, but the largest percentage is employed in the private sector (Figure 1). However, women are less likely than men to be employed in the private sector, and more likely to be employed in high school and civilian government than men with physics bachelor's degrees. Fifty-seven percent of men and 45% of women with physics bachelor's degrees are employed in the private sector, where the jobs are potentially very lucrative. The percentages of physics bachelors employed in other sectors are much lower than in the private sector. Sixteen percent of women and 10% of men with physics bachelor's degree work in high schools. Civilian governments employ 10% of women and 5% of men with physics bachelor's degrees. About 14% of both sexes are employed by colleges and universities, usually in jobs like "lab technician." The remaining physics bachelors are employed in the military, national labs, or other sectors.

Not only is there a difference in the percentage of women employed in the private sector, but there is also a difference in the percentage of women employed in STEM (science, technology, engineering, and math) jobs within the private sector. About three-fourths of men employed in the private sector are in STEM jobs, compared to 60% of women with physics bachelor's degrees (Figure 2). Non-STEM jobs are very diverse, with "finance" and "marketing and sales" being the most frequently cited.

Within private-sector STEM jobs, the most common are engineering and computer science. Male and female physics bachelors are equally likely to work in engineering. About 43% of physics bachelors in private-sector STEM jobs are working in engineering (Figure 3). However, men are more likely than women to work in computer science or IT jobs (30% of men compared to 22% of women). Women are more likely than men to work in jobs we classified as "other science and technology jobs." Some of this difference is because women are more likely to work in science education jobs outside of high schools than men are.

Skills used by physics bachelors in the private sector

We ask all physics bachelors about skills they use on the job. But in this article, we will focus on people employed in computer science and engineering because these are the two most common fields within the private sector. One of the skills most frequently used by physics bachelors in computer science and engineering is teamwork, with virtually all respondents reporting that they work in teams at least some of the time (Figure 4). It is also fairly common for physics bachelors to manage projects and work with customers or clients. With a few exceptions, about the same percentage of respondents use the people and management skills shown in Figure 4 whether they work in computer science or in engineering jobs in the private sector.

Most respondents in private-sector computer and engineering jobs also solve technical problems (Figure 5). In fact, a physics major can provide excellent training for solving technical problems in the workplace. Many respondents also do quality control and technical writing. In Figure 5, which shows computer and other technical skills, we see the first large differences between respondents employed in computer science and in engineering in the private sector. Not surprisingly, physics bachelors in engineering are more likely than computer science respondents to do simulation or modeling. Of course, those employed in computer science are much more likely to do tech support or computer administration. Likewise, almost all physics bachelors working in computer science do programming or systems software. Even for physics bachelors working in engineering, programming is a very commonly used skill, with 75% of these respondents reporting that they do some sort of programming.

Figure 6 shows just how frequently physics bachelors, especially those employed in private-sector engineering jobs, use research and science-related skills. Physics bachelors employed in engineering frequently use specialized equipment and knowledge of physics or astronomy at work. Not surprisingly, many physics bachelors in engineering also use statistics or advanced math and do some type of research. All of the skills in Figure 6, except design and development, are used more frequently by respondents employed in engineering than by respondents employed in computer science in the private sector.

Is there any difference between men and women in how often they use these skills on the job? Most of the skills had no difference by sex, meaning that male and female respondents were equally likely to use them. However, we found two important differences by sex for physics bachelors working in STEM jobs in the private sector.

- Women are less likely to report that they solve technical problems than men. In our previous studies, solving technical problems has been one of the most frequently used skills for working physicists at all degree levels. However, it now appears that this finding is heavily influenced by the large proportion of men in the field.
- Women are less likely to report that they do tech support or computer administration than men. This is true in private-sector STEM jobs as a whole, and it is true even when looking only at physics bachelors in computer science jobs. Men and women are equally likely to report doing programming, but there is a sex difference in technical support.

Implications for women in physics

Physics bachelors work in a variety of sectors, but most frequently in the private sector. Within the private sector, computer and engineering jobs are very common for physics bachelors. We have seen that women are less likely to hold private-sector STEM jobs than men are. Because of the earning potential that private-sector STEM jobs have, this could be a real disadvantage for women.

continued on page 12

Percentages represent the proportion of physics bachelors who chose "daily", "weekly," or "monthly" on a four-point scale that also included "never or rarely."

FIGURE 4. Physics bachelors' use of people and management skills, classes of 2009-10, employed in private-sector jobs

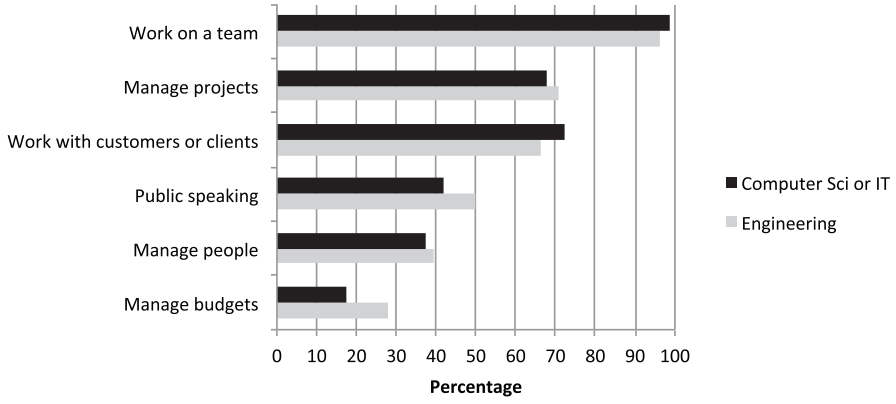


FIGURE 5. Physics bachelors' use of computer and technical skills, classes of 2009-10, employed in private-sector jobs

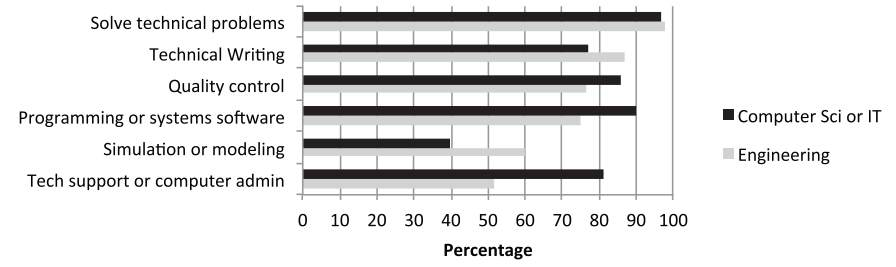
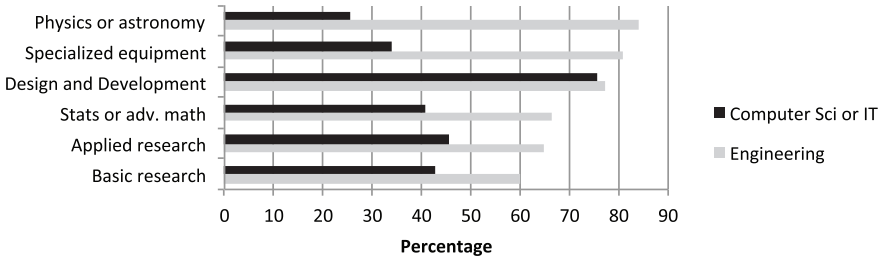


FIGURE 6. Physics bachelors' use of physics, math, research, etc., classes of 2009-10, employed in private-sector jobs



Sex Differences in Jobs and Skills *continued from page 11*

Find more studies from the AIP Statistical Research Center at www.aip.org/statistics.

For physics bachelors in private-sector STEM jobs, men and women are equally likely work in engineering, but computer science/IT jobs are less common for women than for men. Those women who are in computer science/IT jobs are less likely to report doing technical support or computer administration than men. In both computer and engineering jobs, the most frequently used job skills are working on a team and solving technical problems. However, women are less likely to say they solve technical problems than men are. We don't have information from this survey about why this difference occurs. It could be that women actually do less technical problem solving. Or, it could be that women define technical problem solving differently than men and therefore report their activities differently. The sex differences in technical support and problem solving show the need for further research into the working lives of physics bachelors.

In order to understand women's situation in physics fully, we need further investigations into the types of jobs held by physics bachelors. We are not sure why women with physics bachelors are less likely to take STEM jobs than men are. Our previous research shows that after 5-8 years, about one-quarter of physics bachelors with initial non-STEM jobs have switched to STEM jobs [3]. Will women be as likely to switch as men? Further data are needed to answer these questions. The fact that women are less likely to go into computer science jobs is consistent with research on computer science majors [4] and probably shares some of the same causes.

Often the physics community's discourse on women in physics centers on women's low representation. This is certainly an area of concern. However, we must also drill deeper and look at the differences in job experiences for our graduates. Even if the representation of women in physics was suddenly brought up to parity, differences in jobs and skills used could still exist, and some of these could disadvantage women. Careful examination of data on jobs held by physicists is needed to properly design programs to recruit and retain women in physics. ■

References

[1] American Institute of Physics Statistical Research Center, 2009. "What's a Bachelor's Degree Worth?" www.aip.org/statistics/trends/reports/fall09a.pdf

[2] Patrick Mulvey and Brandon Shindel, 2010. "Physics Bachelors' Initial Employment" www.aip.org/statistics/trends/reports/emp2010.pdf

[3] Rachel Ivie and Katie Stowe, 2002. "The Early Careers of Physics Bachelors" www.aip.org/statistics/trends/reports/bachplus5.pdf

[4] Jane Margolis & Allan Fisher, 2003. Unlocking the Clubhouse: Women in Computing. Cambridge, MA: MIT Press.

Announcements

Presidential Appointment

President Obama recently announced his intent to appoint Dr. Margaret Murnane for Chairman, President's Committee on the National Medal of Science. Dr. Murnane is a Fellow of JILA and a Distinguished Professor in the Department of Physics at the University of Colorado. Dr. Murnane is also a Fellow of the American Physical Society, the Optical Society of America, and the American Association for the Advancement of Science. She was elected to the American Academy of Arts and Sciences in 2006 and the National Academy of Sciences in 2004. In recognition of her work, she has been awarded the 2011 Royal Dublin Society Irish Times Boyle Medal for Scientific Excellence, the 2010 R.W. Wood Prize of the Optical Society of America, the 2010 Schawlow Prize of the American Physical Society, the 2009 Ahmed Zewail Award of the American Chemical Society, and a John D. and Catherine T. MacArthur Fellowship in 2000. She was first appointed to the President's Committee on the National Medal of Science in 2010. Dr. Murnane received her B.S and M.S. from University College Cork, Ireland, and her Ph.D. from the University of California at Berkeley.

Blewett Fellowship

The Blewett Fellowship (formerly the Blewett Scholarship) has been established to enable women to return to physics research careers after having had to interrupt those careers. The fellowship consists of an award of up to $45,000. The applicant must be a legal resident or resident alien of the US or Canada. She must currently be in Canada or the US and must have completed substantial work toward a PhD.

The application period will open in the spring with applications due June 1, 2012. Selection will be made by a sub-committee of the APS Committee on the Status of Women in Physics. Announcement of the award is expected to be made by August 1, 2012.

Details can be found at www.WomenInPhysics.org (click on Scholarships & Awards). Contact Deanna Ratnikova in the APS office at blewett@aps.org for more information.

This unique award was established from a generous bequest from M. Hildred Blewett, a particle accelerator physicist who died in 2004. Hildred Blewett was passionate about physics and wanted to help women overcome obstacles by establishing the fellowship.

Woman Physicist of the Month

The APS Committee on the Status of Women in Physics (CSWP) recently began a program to highlight exceptional female physicists. The CSWP Woman Physicist of the Month award recognizes female physicists who have positively impacted other individuals' lives and careers. Nominations are being accepted on a rolling basis.

Each CSWP Woman Physicist of the Month will be featured on the Women in Physics website, announced in the Gazette, and recognized at a reception at an APS national meeting. CSWP will also work to identify other outlets through which awardees can be recognized for their efforts and contributions.

The CSWP Woman Physicist of the Month award is not restricted to just research physicists, but open to students, teachers or any woman doing physics-related work. The organizers intentionally kept the criteria for nominees nonspecific in order to encourage a diverse group of nominees.

To nominate someone, the name, institution/facility/company, and email of both the nominee and nominator should be emailed to women@aps.org. The nominee's CV and a nomination statement up to three paragraphs should also be included in the email as attachments. The nominee does not need to be an APS member.

Remembering Frostburg State Physics Major

On November 6, 2011, 19 year- old Kortneigh McCoy died as a result of being involved in an altercation at an off-campus party. The Baltimore native was a physics major at Frostburg State University and a resident assistant in a freshman dorm. Although she hadn't yet taken many physics courses, Kortneigh reportedly had a passion for the sciences. In addition to her studies, she loved to sing and was involved in both the university chorale and the university's gospel choir. Kortneigh's friends and family describe her as a smart, likeable young woman who loved life and loved to laugh.

Memorial Fund

Michele Dufault, a Physics & Astronomy major (Yale class of 2011, Saybrook College), died in a tragic accident on April 12, 2011, while finalizing her senior thesis project on detectors for low-mass dark matter particles. Michele was a strong supporter of other women in science and a leader among leaders. In recognition of her passion for science and for encouraging other women to pursue science careers, her friends and teachers have established the Michele Dufault Summer Research Fellowship and Conference Fund. The fund will support a summer fellowship for a Yale undergraduate woman in the physical sciences, especially Physics, Astronomy or Geology & Geophysics, which were the areas of greatest interest to Michele. It will also be used to support conferences that encourage young women to pursue the physical sciences, such as the Conference on Undergraduate Women in Physics now held annually at Yale. If you would like to contribute to the fund, please write a check payable to Yale University, note on the check that it is for the "Michele Dufault Summer Fellowship and Conference Fund" and mail it c/o Meg Urry, Physics Department, PO Box 208120, New Haven CT 06520-8120. ■

Women Named to Fellowship, Prizes and Awards

Each year, APS members are nominated by their peers to prizes and awards and to fellowship in the society. The nomination and selection procedure, involving APS-appointed selection committees, guarantees their high standards and prestige.

Prizes and Awards

More than forty APS Prizes and Awards recognize outstanding achievements in research, education and public service. This year, six women are among the recipients.

Lillian Hoddeson

Recipient of the Abraham Pais Prize for History of Physics (2012)

For her leadership and contributions to writing the history of twentieth-century physics, her pioneering studies of American research laboratories—particularly Bell Labs, Los Alamos and Fermilab—and her perceptive scientific biography of John Bardeen.

Sylvia Torres-Peimbert

Recipient of the Hans A. Bethe Prize (2012)

For outstanding work on the primordial helium abundance as well as abundances of other elements and their implications for cosmology and for the chemical evolution of galaxies and stars. This work is fundamental as a critical test for cosmological theories and the baryonic content of the Universe.

Rachel Segalman

Recipient of the John H. Dillon Medal (2012)

For fundamental and technological contributions to the field of polymer science and engineering, especially in the area of rod-coil block copolymers.

Arian Pregenzer

Recipient of the Joseph A. Burton Forum Award (2012)

For her intellectual and managerial leadership in creating centers that allow international technical and policy experts to explore confidence building measures and other arms control regimes.

Bethany Jochim

Recipient of the LeRoy Apker Award (2011)

Strong-field dissociation dynamics of NO2+: A multiphoton electronic or vibrational excitation.

Nadya Mason

Recipient of the Maria Goeppert Mayer Award (2012)

For innovative experiments that elucidate the electronic interactions and correlations in low-dimensional systems, in particular the use of local gates and tunnel probes to control and measure the electronic states in carbon nanotubes and graphene.

Fellowships

New Fellows of APS are elected after careful and competitive review and recommendation by a fellowship committee on the unit level, additional review by the APS Fellowship Committee and final approval by the full APS Council. Only ½ of 1% of the total APS membership is selected for Fellowship in the Society each year. This year, 30 women were named to Fellowship.

Claudia Ambrosch-Draxl

For her seminal contributions to the development and applications of first principle theoretical techniques to the study of spectroscopic properties of condensed systems, and her pioneering work on the ab-initio theory of organic semiconductors. *Nominated by DCOMP*

Alice Bean

For her unique contribution in the design and construction of silicon detectors and other instrumentation. Her expert work of heavy quark decays in B decays. She created a novel outreach physics project *Quarked!*$_{TM}$ and also led unique undergraduate research opportunities. *Nominated by DPF*

April Brown

For outstanding contributions to development and application of molecular beam epitaxy to the formation advanced device structures, with particular contributions to the advancement of the strained heterostructures forming modern microwave devices. *Nominated by FIAP*

Cathryn Carson

For her contributions to the history and philosophy of physics, especially regarding Heisenberg in postwar West Germany, and for her professional leadership as program director, book and journal editor, and conference organizer. *Nominated by FHP*

Regina Demina

For significant contributions to hadron collider physics, especially measurements of the mass and properties of the top quark, and for leading the construction of silicon trackers for the CMS detector. *Nominated by DPF*

Judith Driscoll

For pioneering contributions in design and understanding of nanostructured functional oxides, including superconductors, magnetic materials, ferroelectrics, multiferroics and semiconductors. *Nominated by DMP*

Aida El-Khadra

For contributions to lattice QCD and flavor physics including pioneering studies of heavy quarks on the lattice, semileptonic and leptonic heavy-light meson decays, the strong coupling constant, and quark masses. *Nominated by DPF*

Marie Farge

For pioneering research applying wavelets to the analysis and computation of turbulent flows in two and three dimensions. *Nominated by DFD*

Do you know a female physicist worthy of recognition?

Nominate her to be the CSWP Woman Physicist of the Month!

Find more info on page 16.

CSWP congratulates Dr. Mildred S. Dresselhaus on receiving the Enrico Fermi Award.

Deadline to apply for the Blewett Fellowship is June 1, 2012.

Are you looking for a graduate school that is "female friendly"?

Check out the results of an informal survey and read what departments say about themselves at:

www.aps.org/programs/women/female-friendly/index.cfm

Brenna Flaugher
For her important contributions to experimental particle astrophysics, particularly her leadership of and seminal contributions to the design and construction of the Dark Energy Camera. *Nominated by DAP*

Wendy Freedman
For fundamental contributions in observational cosmology, including the determination of the Hubble constant. *Nominated by DAP*

Mette Gaarde
For important contributions to the macroscopic theory of high harmonic generation and attosecond light formation. *Nominated by DAMOP*

Marina Guenza
For significant contributions to the field of polymer physics through the development of theoretical methods to study macromolecular structure and dynamics. *Nominated by DPOLY*

Fiona Harrison
For fundamental contributions in gamma-ray, X-ray, and optical observations of gamma-ray bursts, active galaxies, and black hole systems. *Nominated by DAP*

Sarah Keller
For her pioneering, fundamental contributions to the understanding of miscibility phase transitions in model surfactant and membrane systems. *Nominated by DBP*

Svetlana Kotochigova
For insightful theoretical description of the formation and control of ultracold molecules in optical trapping potentials. *Nominated by DAMOP*

Anna Krylov
For developing and implementing robust theoretical models and accurate computational tools for treating complicated open-shell electronic structure problems ranging from small radicals to the complex environment of solution and proteins. *Nominated by DCP*

Naomi C. Makins
For her contributions to our understanding of the transverse quark structure of the nucleon through the study of polarized semi-inclusive deep-inelastic lepton scattering. *Nominated by DNP*

Julie McEnery
For her fundamental contributions to the understanding of the gamma-ray sky through her leadership of the Fermi mission as Project Scientist and her discoveries of gamma-ray burst high energy properties. *Nominated by DAP*

Beatriz Noheda
For fundamental structural studies of new phases in perovskite-type ferroelectric materials and of domain nanostructures in epitaxial films of multiferroics. *Nominated by DMP*

Dvora Perahia
For her outstanding contributions to the understanding of complex fluids formed by assemblies of strongly interacting polymers, through the use of elastic and inelastic neutron scattering. *Nominated by DPOLY*

Cynthia Reichhardt
For characterization of collective phenomena in driven systems with long-range interactions, and including non-equilibrium phase diagrams, avalanches, noise and fractal flow. *Nominated by DCMP*

Marianna Safronova
For innovative development of high-accuracy first-principles methods of computational atomic structure and dynamics, and their application to optical atomic clocks, quantum computing with neutral atoms, and tests of fundamental symmetries. *Nominated by DAMOP*

Joan Shea
For fundamental contributions in the field of theoretical and computational biophysics and the study of protein folding and aggregation. *Nominated by DBP*

Chandralekha Singh
For pioneering research extending the impact of physics education research to advanced topics, especially quantum mechanics, and for leadership in organizing physics education activities at the national level. *Nominated by FED*

Yuri Suzuki
For innovative work in epitaxial oxide thin films, nanostructures and devices, with tailored magnetic and electronic properties, and the development of platforms for photonic structures. *Nominated by DMP*

Jennifer Thomas
In recognition of her crucial contributions to the worldwide efforts aimed at understanding the elusive neutrinos, especially her seminal role played in the design, construction and physics analyses of the MINOS experiment and her leadership in the double beta decay NEMO and SuperNEMO programs. *Nominated by DPF*

Nandini Trivedi
For contributions to strongly correlated Fermi and Bose systems and disorder-driven quantum phase transitions. *Nominated by DCMP*

Ophelia Tsui
For outstanding contributions on the dynamics of thin polymer films. *Nominated by DPOLY*

Cristina Volpe
For her work on neutrino-nucleus interactions and understanding the role of neutrinos in astrophysical sites, and for her suggestion of building a source of low-energy beta beams using the beta decay of radioactive nuclei. *Nominated by DNP*

Syun-Ru Yeh
For fundamental contributions to the understanding of protein structure, function and folding and for technological advances that opened new windows of opportunity for the study of rapid biological reactions. *Nominated by DBP*

Special Events Focusing on Women and Minorities in Physics

APS MARCH MEETING • BOSTON

Sunday, February 26

8:00am – 5:00pm **Professional Skills Development Workshop for Women Physicists** *(Westin Boston Waterfront)*
Workshop for developing communication, negotiation and leadership skills; for post docs and senior-level women physicists (participants must be pre-registered). Reception for participants to follow.

Tuesday, February 28

11:00am – 2:00pm **CSWP/FIAP Networking Luncheon** *(Westin Boston Waterfront)*
Enjoy lunch while networking with colleagues! Cost: $15; free for physics students thanks to FIAP's generosity (registration is still required for students, however, as space is limited). All are welcome, both men and women. Pre-registration is strongly advised by February 14. Pre-register at www.aps.org/meetings/march/events/receptions/

11:15am – 2:15pm **Sexual and Gender Diversity Issues in Physics**
Sponsored by the Committee on the Status of Women in Physics and the Committee on Minorities

2:30pm – 5:30pm **STEM Outreach to Underrepresented Minorities**
Sponsored by the Committee on the Status of Women in Physics and the Committee on Minorities

7:00pm – 9:00pm **COM/CSWP Diversity Networking Reception** *(Westin Boston Waterfront)*
Learn about the work of the Committee on Minorities in Physics and the Committee on the Status of Women in Physics, network with colleagues, and unwind after a long day of sessions. All are welcome.
This year's reception will also feature information about the Lesbian, Gay, Bisexual, and Transgender (LGBT) Physicists group.

APS APRIL MEETING • ATLANTA

Friday, March 30

8:00am – 5:00pm **Professional Skills Development Workshop for Women Physicists** *(Hyatt Regency Atlanta)*
Workshop for developing communication, negotiation and leadership skills; for post docs and early-career women physicists (participants must be pre-registered). Reception for participants to follow.

Sunday, April 1

8:30am – 10:15am **Joint Invited Session of COM and FEd**
Sponsored by the Committee on Minorities and the Forum on Education

1:30pm – 3:15pm **Invited Session of COM**
Sponsored by the Committee on Minorities

6:00pm – 8:00pm **COM/CSWP Networking Reception** *(Hyatt Regency Atlanta)*
Learn about the work of the Committee on Minorities in Physics and the Committee on the Status of Women in Physics, network with colleagues, and unwind after a long day of sessions. All are welcome.

Monday, April 2

12:00pm – 3:00pm **CSWP/DPF Networking Luncheon** *(Hyatt Regency Atlanta)*
Enjoy lunch while networking with colleagues! Cost: $15; $5 for physics students thanks to DPF's generosity. All are welcome, both men and women. Pre-registration is strongly advised by March 20, as only limited walk-ins are accepted. Pre-register at www.aps.org/meetings/april/events/receptions/index.cfm.

1:30pm – 3:15pm **Women in Physics: Status and Interventions**
Sponsored by the Committee on the Status of Women in Physics

Please check dates and times of all events on the Meetings and hotel calendars, as they may change nearer the time!

American Physical Society
One Physics Ellipse
College Park, MD 20740-3844

The *Gazette* is printed with soy ink on recycled paper. When you are finished with this newsletter, please recycle it or pass it on to a friend.

American Physical Society Travel Grant Programs

Travel Grants are available for Physics Departments at U.S. institutions to host Women and Minority Speakers!

The Women and Minorities Speakers Programs are intended to expand the opportunity for physics departments to invite women and minority colloquium/seminar speakers who can serve as role models for undergraduates, graduate students and faculty. The program also recognizes the scientific accomplishments and contributions of these physicists.

For more information and to complete an online application, please visit:

Women Speakers Program Travel Grants:
www.aps.org/programs/women/speakers/travel-grants.cfm

Minority Speakers Program Travel Grants:
www.aps.org/programs/minorities/speakers/travel-grants.cfm

Women & Minority Speakers List

Need a speaker? Consider consulting the American Physical Society's Speakers List, an online list of physicists who are willing to give colloquium or seminar talks to various audiences. This list serves as a wonderful resource for colleges, universities, and general audiences. It has been especially useful for colloquium chairs and for those taking advantage of the Travel Grant Program for Women and Minority Speakers. The online list is searchable by state, field of physics, or speakers' last names.

To search the list to find a woman speaker, go to:
www.aps.org/programs/women/speakers/

To search the list to find a minority speaker, go to:
www.aps.org/programs/minorities/speakers/