

## INSIDE

Guest Editorial  
1

Interviews with  
Physics Leaders  
1

MGM Award Winner  
3

Minority Serving  
Institutions & Teacher  
Preparation  
7

Book Review  
8

Gender Bias in  
the Classroom  
9

Women Named to  
Fellowships, Prizes,  
Awards  
10

Events at March/April  
Meetings  
14

Forms  
13-15

## A Call to the Department of Energy:

Programs to Increase the Representation, Retention and Advancement of Women in the Stem Careers at National Labs are Needed

*Kawtar Hafidi, Argonne National Laboratory, Chair of CSWP*



*Kawtar Hafidi*

When the question “Why so few women leaders in STEM careers?” is raised, we often hear “... because they are so few to begin with.” While this may well explain the situation in academic physics, it is not a sufficient explanation in all fields.

The overall percentage of women earning undergraduate, graduate and doctoral degrees in STEM have steadily increased over the last 20 years. Yet, as the pipeline fills, there has not been a commensurate increase in the number of females in Science and Engineering (S&E) and at the senior level in national laboratories, who hire scientists from a variety of disciplines. The situation is the same for

the number of STEM tenured faculty and academic leaders. Several studies and workshops have been organized to understand the issues and provide recommendations to improve the status and leadership of women in academic environments.

Since 2001, the National Science Foundation has created the ADVANCE programs with the goal to develop systemic approaches to increase the representation and advancement of women in academic STEM careers. In addition, the program allocated funds to support innovative systemic organizational approaches to transform institutions of higher education in ways that will increase the participation and advancement of women in STEM academic careers.

Women at the Department of Energy (DOE) national laboratories have received less attention in national studies than have women in academia, with the exception of two Government Accountability Office

*continued on page 2*

## Transitions to Leadership: Interviews with Leaders in Physics

*Introduction by Senta V. Greene (CSWP Member, Vanderbilt Univ.); Interviews by Bushraa Khatib*

The model for educating a scientist usually resembles an apprenticeship, with the necessary skills being learned implicitly as the student works alongside more senior members of the profession. This works reasonably well for learning to do scientific tasks such as conducting experiments, analyzing data, and writing papers and proposals. For supporting transitions to leadership roles, the model is not so effective and only partly because such skills are often not required until well past school. We may pick up some skills by observing the head of a research group or a senior post-doctoral fellow, but good leadership is not necessarily part of the selection process for scientists and so we may not actually have worked closely with a talented leader before we are expected to assume such a role ourselves. The situation is further complicated when the leadership position in question is in management or administration, since frequently there is a disrespectful or adversarial attitude towards such positions.

Women can face additional obstacles as colleagues who tolerated equality fairly well react badly to women being promoted past them to positions of authority. To pass these barriers, a woman must learn a great deal to become a good leader.

Since I began working in university administration, I have been surprised at how many new skills I have needed to learn. These were not anything I had been exposed to in my training and development as a physicist, but came from a combination of making mistakes, observing others, and having the good fortune to work for a dean who is as capable an administrator as I have known. Some skills are more straightforward, such as learning to delegate to an assistant or developing better time-management skills (especially important when concurrently maintaining a research program or teaching). Others require patience: working against unfairness in the system while immersed in it and extracting good

*continued on page 4*

The Editor for this issue:  
Kawtar Hafidi

**Managing Editors**  
Arlene Modeste Knowles  
Deanna Ratnikova

*Members of CSWP*

Kawtar Hafidi, Chair  
Susan Blessing  
Patricia Burchat  
Premala Chandra  
Charles R. Doering  
Elizabeth Foley  
Senta Victoria Greene  
Amanda Peet  
Saega Vrtilick

*Members of COM*

William J. Evans, Chair  
Theda Daniels-Race  
Yesim N. Darici  
Peter J. Delfyett  
Mary James  
Rene Lopez  
Mel Sabella  
Louis-Gregory Strolger  
Mani Tripathi

*APS Liaisons*

**Theodore Hodapp**  
Director, Education &  
Diversity

**Deanna Ratnikova**  
Women & Education  
Programs Administrator

**Leanne Poteet**  
Graphic Designer

**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**

(GAO) reports (GAO 2004<sup>1</sup>, GAO 2005<sup>2</sup>) that confirm what the National Academy of Sciences<sup>3</sup> (NAS) found for academia: progress is being made, but the goals have not yet been achieved. Clearly, national laboratories must seek to cultivate an expanded, more diverse workforce to attract, develop, and retain top talent.

At a time when scientific and engineering talent is predicted to be in high demand by competing employers<sup>4</sup>, laboratories also need to ensure and communicate that a career at a national laboratory is at least as attractive as a better-known career in the private sector or academia. Additionally, laboratories need to convey their willingness to provide greater schedule flexibility to allow for increased sharing of family responsibilities. Furthermore, an increasingly international STEM workforce is making the case for proactive attention to diversity even more compelling.

The NAS 2009 report<sup>3</sup> suggested that some of the actions implemented in academia (increasing the number of women in hiring and search committees, enhancement of mentoring programs, broader dissemination of “stop (more accurately pause) the tenure

clock” policies, and attention to climate) are improving the representation of women in STEM, albeit with large differences among disciplines. Department-level climate, networking, and increasing the pool of applicants for tenure were deemed still in need of improvement for retention and advancement. These findings are important for the development of workforce diversification strategies beyond academia and at national laboratories specifically.


Now, it is the time for DOE to create and allocate funds for new and dedicated programs to support and encourage national laboratories to increase the representation, retention and advancement of women in S&E careers. National Laboratories who are ready and willing to undergo institutional transformation should develop clear strategies and initiatives to retain, advance more women scientific staff and create new programs to attract and recruit more diverse workforce would then compete for these funds. Statistics from these studies and outcomes should then be made available for other institutions to learn from and adapt to their specific needs.

<sup>1</sup> GAO. *Gender Issues – Women’s participation in the science has increased, but agencies need to do more to ensure compliance with Title IX: Report to Congressional Requesters.* GAO-04-639, July 2004

<sup>2</sup> GAO. *Equal Employment opportunity – Information on personal actions, employee concerns, and oversight at six DOE laboratories. Report to the chair, Subcommittee on Energy, Committee on Science, House of Representatives.* GAO-05-190, February 2005

<sup>3</sup> *Gender differences at critical transitions in the careers of science, engineering, and mathematics faculty, National Academies Press, National Academy of Sciences (2009)*

<sup>4</sup> Lowell, B. L., Salzman, H., Bernstein, H. & Hendersen, E. “Steady as she goes? Three generations of students through the science and engineering pipeline.” *Rutgers University and Institute for Study of International Migration, Georgetown University. Paper presented at the annual meeting of the association of public policy analysis and management, Washington DC, November 7, 2009*



Receive regular announcements about:

**Opportunities for Women in Physics**

Sign up for the

**Women in Physics Email List!**

[www.aps.org/programs/women/email-lists/](http://www.aps.org/programs/women/email-lists/)

Find us on LinkedIn! Search: **APS Physics–Women in Physics**

**Reka Albert is 2011 MGM Award Winner**

By Mike Lucibella, APS Science Staff Writer

Each year APS awards the Maria Goeppert Mayer Award to recognize the work and achievements of a woman physicist early in her career. This year’s recipient of the award is Reka Albert of Penn State University. 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.

Albert works with network theory. Her research group at Penn State University focuses on the network dynamics of complex biological systems. Her recent papers have run the gamut, looking at how a disease can spread through a city, to how the body’s immune system responds to invading pathogens and how individual proteins behave in cells. Her papers have been published in physics journals as well as journals devoted to molecular biology, genetics and network theory.

“I try to understand complex systems by hypothesizing what their most salient features are, then building models based on these features, and then using the models to predict the system’s future behavior,” Albert said. “[I]n most of the systems I study much can be gained by mapping who can interact with whom.”

Throughout her career she’s applied this research to a wide variety of fields beyond biology, ranging from general theory of networks to possible cascade failures in the United States power grid.

Albert first started getting interested in math and science during middle school in Tirgu Mures in Romania. She was drawn to mathematics and particularly loved solving algebra equations.

“In high school my interests gradually shifted toward physics, which I viewed as the ideal incarnation of applied mathematics,” Albert said.

After graduating from high school she attended Babes-Bolyai University in Cluj, Romania for her bachelors and masters degrees where she was introduced to modeling and computational physics by her advisor Zoltan Neda. It was while studying there she first met her future husband Istvan.

After finishing her masters, her advisor recommended she apply to the University of Notre-Dame for her PhD. There, Albert joined the research team led by Albert-Laszlo Barabasi, and initially modeled granular materials in a project that also involved her husband and his advisor Prof. Peter Schiffer. It was Prof. Barabasi who first introduced her to working with networks. Her doctoral work focused on analysis and modeling of network structures ranging from technological networks to social and biological networks.

“My advisor taught me that research can consist of exactly what drew me to physics in the first place: identify a question, build a model, write the equations, solve the equations, test the model,” Albert said.

She worked with Barabasi to identify a near-universal characteristic of network structures, now known as the scale-free property. They also worked on

research that would prove to be quite influential in the field, developing a model where the network evolves as more nodes and links are added to the system. Towards the end of her research while she was putting together a review of networks, she found herself particularly drawn to the dynamics of biological networks, a field she has stuck with to this day.

She defended her PhD in 2001 a day after her husband. From there, they went to do two years of post-doctoral work at the University of Minnesota. There she worked with Hans Othmer, a mathematical biologist, on modeling the networks inside of a cell that govern bacterial chemotaxis and fruit fly embryo development. Since moving to Penn State she has published dozens of papers on the networks of a wide variety of biological systems.

“In my recent research I am proud of the fact that many of the predictions of our dynamic models have been validated experimentally. On a personal level, I feel that my biggest accomplishment is nurturing the network interests of my research group, my students and my collaborators,” Albert said.

Because of her work, her department chair Jayanth Banavar, nominated her to receive the Maria Goppert Mayer award.

“I have a tremendous respect for Maria Goeppert-Mayer. We unfortunately did not overlap in space or time (she passed away the same day I was born),” Albert said, “As I read about her, I try to imagine her life, but it’s difficult, it’s hard to understand why she had to work as an unpaid volunteer for so many years. Her perseverance is an inspiration for me. It is a great honor to receive this award.”

Albert said that she’s looking forward to giving the lectures associated with the award. She plans on continuing her research into biological networks, all the while looking for ways to better reach across disciplines and out to the general public as well. She said that the physics community has so far been very receptive of her work with networks and she is currently working to get the theories spread more throughout the biological sciences community.

When not researching, she has also written numerous review articles and book chapters on networks. In 2010 she was elected a fellow of APS for “pioneering work in understanding the organization and dynamics of biological networks.”

In addition she spends much of her free time with her husband and two children, seventeen-year-old Pindi and three-year-old Agnes. Whenever she does have a free moment, Albert says she likes to relax with a good novel.

The Maria Goeppert Mayer award was first established in 1985 with help from General Electric. The award is presented to women less than ten years after receiving their PhD, “for scientific achievements that demonstrate her potential as an outstanding physicist.” ■



Reka Albert

**“I have a tremendous respect for Maria Goeppert-Mayer. We unfortunately did not overlap in space or time (she passed away the same day I was born). Her perseverance is an inspiration for me. It is a great honor to receive this award.”**

## Interviews with Physics Leaders, *continued from page 1*

performance from others while recognizing their limitations. The most important and also the hardest thing I learned was to move past narrow concerns for my research program or my department, and to develop a broader outlook that allows me to appreciate and respect the other disciplines in my school. Finally, the two characteristics of the best leaders I have known are a sense of fairness and clarity of purpose; these attributes can make others follow most willingly.

### Cynthia Nitta

*After earning her bachelor's degree from Princeton University, Cynthia Nitta went on to complete her MS and ScD from MIT in 1986. Immediately after graduate school, Nitta began working at Lawrence Livermore National Laboratory (LLNL), a division of the Department of Energy that deals with nuclear, environmental and energy security issues.*



#### Moving up

Nitta steadily moved up the ranks, from recently-graduated staff physicist to project physicist, to group leader, and finally to program leader. She succinctly describes her transition to successive leadership positions as being thrown into the deep end and learning how to swim. "At LLNL, when you demonstrate your abilities, and they are recognized, you are given more responsibility," she says.

#### Balancing work, life, time

Regardless of the position that she held, Nitta always took stock of her position and evaluated what she got out of it. Although a central consideration was her position's importance to the program mission, she says she often struggled to balance the program's

need with her own interests and capabilities. "My criteria for being in a particular position was whether it was important for the program mission, whether I was doing the job well, helping others, and whether I was enjoying myself," she says.

Given her increasing responsibilities, Nitta frequently finds herself short on time: "I miss having enough time during the working day to think," she says, admitting that sometimes she doesn't have the time to do as thorough a job on some things as she would prefer. But Nitta compensates by working overtime: "Some of my best thinking and problem solving I do while I'm asleep!" she says.

Despite the constant time crunch her leadership position entails, Nitta enjoys the advantages of her position, one of which is seeing the big picture. "The most rewarding aspect of leadership is the ability to see a broader cross section of how the program works and being able to move things in a direction so that people are fulfilled and the technical goals are met," she says.

#### The importance of collaboration

One of the biggest lessons that Nitta has learned through her leadership role with LLNL is the importance of good working relationships. Most people—herself included—mistakenly believe that leadership in a technical program is all about the science. She quickly realized that "it's almost more important to set the working relationships in place optimally to get the best results," she says.

Learning how to set working relationships and work effectively in a group applies to Nitta and her coworkers. "My basic personality drives me to want to solve problems on my own," she says, but in a lab environment, the most effective way to work is in collaborative groups and teams that communicate continuously. Although it might surprise some of her colleagues, "It's taken effort and many years to force myself out of my preferred 'cave,'" she says. It's important to learn to rely on others to get things done, and most people are willing to help. "So when in doubt about something or in need of assistance, go ask for that help," she says.

#### Advice

Although Nitta says you don't necessarily need a conscious, detailed plan to transition to a leadership role, she does advise preparing yourself to take advantage of chances at leadership when they come up. "Talk with leaders in your organization to find out what skills they value in leadership roles. Then volunteer for activities that develop those skills so you can be ready when opportunities present themselves," she says. But in the meantime, enjoy doing a good job and prepare for the possibilities!

### Olgica Bakajin

*Olgica Bakajin was recently a team leader at Lawrence Livermore National Laboratory (LLNL), a division of the Department of Energy that deals with nuclear, environmental and energy security issues. There, she led a group that experimentally demonstrated that carbon nanotubes act as extremely efficient nano-pipes for both water and gases.*

#### A career-changing move

Olgica had the chance to take her work on carbon nanotubes and turn it into a leadership position as Chief Technology Officer of Porifera, Inc., a San Francisco Bay area R&D company founded in 2008. The phenomenon that Olgica discovered at LLNL is the basis of Porifera's technology. "As one of the technology inventors, I was uniquely positioned to lead the technology developments at Porifera and the opportunity was very exciting," she explains.

The technology has the potential to "enable energy efficient membranes for water purification, desalination, and carbon sequestration," she says. Porifera's website explains that their vision is to "use carbon nanotubes to improve membrane performance, enabling affordable and plentiful fresh drinking water worldwide."



#### The trade-offs

Olgica admits that moving on to a leadership position has changed her career in many ways. "As you can imagine, the pace is a bit faster at a small startup company than at a government lab," she says. She's also responsible for considerably more diverse tasks than before. Unfortunately her move up to lead Porifera has moved her away from sciences: "I don't have time to think about the fundamentals of the science/technology as much as I would like," she says.

Olgica says that another sacrifice she's had to make for her career is her free time. This includes seeing her kids every night, though she still manages to keep her weekends completely work-free and reserves them for family. She also doesn't have the leisure to travel whenever she likes. "If someone in graduate school told me that I would decline an invitation to a conference in an exotic country because I am too busy, I would have said—not me. But it happened last year," she says.

#### A balancing act

Despite the minor drawbacks of success, Olgica finds her leadership position rewarding. "It's exciting, you can make changes. I love the fast pace," she says. She's also learned a lot through her experiences transitioning from LLNL to Porifera. In addition to brushing up on her accounting, regulations, and "legalese" skills—ones that she never expected to need as a physicist—Olgica has picked up valuable skills in effectively working with others, and even managing herself.

Attaining her current leadership position has taught Olgica to "consciously dampen oscillations" in her emotions, she says. She compares working for a small company to a roller coaster ride: "When things are good, be happy but don't get too excited...same when things are looking bad," she says.

Olgica says that the ability to get the most out of different people is a vital skill that she is still learning on the job. She has found that people tend to like and respect people who are similar to themselves, but recognizing the strengths and skills that others might

have is invaluable. "It is also important to be able to get people with different skills, abilities, and cultural backgrounds to work effectively with each other, especially when everyone is under stress," she says.

Her best advice for people aiming to lead? Be persistent! Never take no for an answer, but don't forget to be courteous and enthusiastic in the process.

### Peter Delfyett

*Peter Delfyett used to work in private industry as a Member of the Technical staff at Bell Communications Research before taking an academic position at the University of Central Florida (UCF). Now, he is a professor at the Center for Research and Education in Optics and Lasers (CREOL) within UCF's College of Optics & Photonics.*

#### The good, the bad, the bigger picture

This was a career-changing move for Peter. "The main difference between working in academia versus private industry is that you have the opportunity to do more in academic," he says. Being a professor means he has the freedom to participate in a wide range of activities. This includes more opportunities to serve on committees within the university, the local community, and in the national and international professional committees.

Peter's current position also gives him the opportunity to work on a larger scope of research topics, which he cites as one of the most rewarding aspects of being in a leadership position. "Now I have the ability to develop a broad vision of what I believe are important research topics within my area of expertise," he says. He assigns graduate students to work on specific projects within these topics.

The biggest sacrifice of this setup is that Peter doesn't get to work in the lab, setting up experiments and taking data, as much as he could while in industry. "Now, I must let my graduate students do the work," he says. But he admits the advantages are worth it: "By doing this, I have the pleasure of seeing my vision become a reality in a shorter time span, since each student is working on one aspect of a much broader perspective."

#### Listening well

"The most important skill one must develop is to be a very good listener, and to be open to all possible ideas," Peter says. It's a basic but vital part of succeeding in a leadership role. Being a good listener helps stimulate new ideas and build strong morale in collaborative groups. He urges others to listen well to all ideas and concerns, not just your own. This lets team members know that they are an integral part of the team and that their input matters.

*continued on page 6*



**Be persistent!  
Never take no for  
an answer, but  
don't forget to  
be courteous and  
enthusiastic in the  
process.**

**The most important  
skill one must  
develop is to be a  
very good listener,  
and to be open to all  
possible ideas. Being  
a good listener  
helps stimulate  
new ideas and build  
strong morale in  
collaborative groups.**

**Talk with leaders in  
your organization  
to find out what  
skills they value in  
leadership roles.  
Then volunteer  
for activities that  
develop those skills  
so you can be ready  
when opportunities  
present themselves.**

**The importance of being humble**

In addition to guiding his students to soar academically, Peter likes to ground them a little. He believes that while it's important for someone to feel good about what they can do, it's also important to be humble. He's not afraid to remind his students that "while I'm sure they believe they are outstanding, intelligent students (which they are)...there are many outstanding, intelligent people out there that they will encounter." His philosophy is simple: "When you are humble, it is easier for people to work with you."

**Keep on going**

As a scientist, one of the most useful lessons to learn early on is to never give up, "especially if you truly believe you can be successful at what you're doing," Peter says. This is especially important when dealing with experiments that "fail." He suggests that "an experiment that doesn't work in the manner that you expected is not a failed experiment." Rather, this experience just tells you how not to do the experiment if you want the results you're hoping for. "Do not be afraid to fail," he says.

**Gay Stewart**

*Gay Stewart is a professor at the University of Arkansas and incoming vice president for the American Association of Physics Teachers (AAPT). She has been committed to physics education since she was a graduate student and has since turned her passion into a series of successful leadership positions.*

**Evolving into a leader**

"I am not sure there was ever a transition to leadership for me," Gay says. And it does indeed appear that her status as a leader evolved as opposed to undergoing a definable transition. Her leadership position gradually developed through her work on various committees.

When she started her faculty position at University of Arkansas, Gay also joined the undergraduate affairs committee as part of her service commitment. Turnaround time was fast and within a year, she and her colleagues were submitting plans for significantly revised undergraduate programs and even new courses. Soon she became chair of the undergraduate affairs and the departmental chair's advisory committee.

"We had some pretty spectacular changes in the undergraduate program and the university was looking to improve graduation rates, and noticed that the physics department was doing a great job, so I ended up on some university-level committees," she says. She was elated by the results of her involvement.

Gay became more involved with the APS after one of her mentors nominated her for the APS Forum on Education Executive Committee. When a colleague

suggested Arkansas for one of the first Physics Teacher Education Coalition (PhysTEC) sites, she found her niche: "Once we got involved with that it was easy to become a part of the leadership, since so few people at that time were focused on physics teacher preparation," she says.

Gay also entered the world of Advanced Placement (AP) physics, accepting an invitation to join the development committee. "I found something I liked pretty well, but that could use some changes, and decided the best way to enact change was to be thoroughly involved," she says. She went on to become chair of not only the AP development committee, but also the College Board Science Academic Advisory Committee and co-chair of the College Board/NSF physics redesign committee. She also earned tenure by this point, which she admits took longer than usual "since leading a lot of things, unless they are groups of research students, cuts into the publication numbers!" she says.

Her successful efforts redesigning undergraduate and AP courses led to further opportunities with other initiatives, like the Science and Mathematics Teacher Imperative (SMTI) and The Leadership Collaborative (TLC). She worked with a variety of teachers with a wide range of preparation and gained perspective on the kinds of changes that needed to be made.

Gay was excited to be able to make marked changes in her chosen field. "With funding from NSF, we were able to try a lot of things, and our progress there made me willing to spend some more time on various committees and boards. If we could make a difference, other places can too!" she says.

Now she's honored to have the chance to serve on the APS Executive Board and as vice president of AAPT, using these leadership positions to further enhance physics education.

**Advice**

"The single most important skill is wrapped up in remembering that you are still part of a group, even if you are the leader," she says. This includes listening to what others have to say, finding commonalities, building on strengths and finding compromises to move forward around potential weaknesses. "The group must feel ownership of anything that moves forward. Careful communication is key," she says.

Gay says that the most rewarding aspect of being in a leadership position is looking at something really good and realizing you had a hand in getting it done. But like most leaders, she realizes that assuming a real leadership role is a major time commitment and means having less time for other things. "It is best if the leadership role is in something that enables you to accomplish something you are passionate about," she says.

"There are times when I feel like I do not spend enough time with my students, that I am not being as good a teacher and mentor as I can be," she says. Fortunately, her students are pretty understanding. "I tell them not to let me scare them off of an academic career. Not everyone is as crazy as me!" she says. ■



**I tell my students not to let me scare them off of an academic career. Not everyone is as crazy as me!**

**Minority Serving Institutions Take on Teacher Preparation**

*By Gabe Popkin, APS Education Program Manager*

Since 2001, the Physics Teacher Education Coalition (PhysTEC) project has funded universities to implement a range of activities and programs designed to increase the number of physics majors pursuing teaching careers. The project has been motivated primarily by the fact that two-thirds of the nation's high school physics teachers do not have a degree in the subject—a fact that has grave implications for the preparedness of our nation's students to compete in the 21st-century workplace, and for the public's understanding of science.

A statistic that gets less attention is the tiny fraction of high school physics teachers who are members of minority groups. According to the American Institute of Physics' Statistical Research Center, only about 1.5% of US physics teachers are African-American, and another 1.5% are Hispanic. These figures are even lower than the already low fraction of physics majors belonging to these groups, which hovers around 3% in each case. Our nation's schools are missing out on a large pool of talent by failing to recruit minority physics teachers, and our nation's minority students—over one third of all high school students today—are very unlikely to have access to minority role models in their physics classes.

PhysTEC has, from its inception, reached out to minority-serving institutions, which educate nearly 60% of the nation's minority undergraduates, according to the National Center of Education Statistics. One of the original supported sites was Xavier University of Louisiana, a historically black institution in New Orleans that graduates the largest number of African-American physics majors in the country. Xavier made significant strides under the project; unfortunately, the university was hit hard by Hurricane Katrina, and project leaders asked for permission to suspend activity for the 2005-2006 funding year.

**Collaborative Learning Engages Students**

In 2007, the project began funding Florida International University (FIU), a Hispanic-serving institution in Miami that is among the institutions graduating the largest number of Hispanic physics majors in the US. Prior to joining PhysTEC, FIU's physics department had already implemented a highly interactive introductory physics curriculum that encourages collaborative learning. Physics professor and project leader Laird Kramer says, "We implemented a cooperative learning environment partly because of research showing that underrepresented students are often disproportionately affected by the competitive atmosphere of lecture courses. However, we also believe it has improved the learning environment for all students."

In order to provide a pathway into a teaching program, project leaders added a Learning Assistant program based on the one at the University of Colorado, where high-achieving undergraduates mentor their peers in introductory science courses while receiving pedagogy instruction and encouragement to consider

teaching careers. "Our future teachers are immersed in a participation model of learning both as students and as Learning Assistants. Thus, we fully expect them to use this model in their classrooms, and further change the learning paradigm." While it is too early to tell the ultimate impact of PhysTEC reforms on the number of physics teachers who graduate from the program, the Learning Assistant program has attracted increasing numbers of students every semester, and project leaders are seeing a significant fraction of these students progress toward teaching certification.



*Teachers at a Chicago State summer physics workshop collaborate on an activity.*

**Professional Nature of Teaching**

In 2010, Chicago State University joined the PhysTEC project. Chicago State is a public minority-serving institution on the south side of Chicago, with a population of around 7,000 students, of whom 85% identify as Black and another 7% identify as Hispanic. Most of the students at Chicago State grew up within five miles of the university, and have a strong desire to positively impact their home communities, says Mel Sabella, a Chicago State physics professor and PhysTEC project co-leader. However, project leaders have found that many do not consider science teaching because they see it as a career with less professionalism than options such as medicine and engineering. "African-American non-education majors can view teaching as a career that is underpaid and undervalued, and often believe that it is only viable for students with altruistic tendencies seeking intrinsic rewards," says Sabella. "We place the professional nature of teaching front and center, by involving students in education research projects and internships at local museums, and by having them attend conferences, a seminar series, and a weekly journal reading club."

Ultimately, Sabella hopes PhysTEC can help address the underrepresentation of minority teachers and role models in Chicago's schools. "While about 50% of the teachers in the Chicago Public School system are teachers of color, over 80% of the students are students of color," he says. "By recruiting more minority students into the teaching profession, there is a great opportunity to reduce this racial disparity in our urban school district, and provide minority students with teachers who can explicitly function as role models of academic achievement."

California State University, Long Beach, a Hispanic-serving institution in the Los Angeles area, also

*continued on page 8*

**Our nation's schools are missing out on a large pool of talent by failing to recruit minority physics teachers, and our nation's minority students—over one third of all high school students today—are very unlikely to have access to minority role models in their physics classes.**

## Minority Serving Institutions, *continued from page 7*

joined the project in 2010. Cal State, Long Beach prepares six percent of California's secondary science teachers, and is hoping to draw on its large student population to increase the number of physics majors and teachers it graduates.

### Looking Ahead

Theodore Hodapp, Director of Education and Diversity at APS and the PhysTEC project, says that increasing the participation of minorities and minority-serving in-

stitutions will continue to be a priority for the project going forward. The project is in the process of selecting the next cohort of supported sites, and plans to solicit another round of proposals in Fall 2011. "Many departments are finding new and innovative ways to engage minority populations in physics and physics education," says Hodapp. "Involving these departments in PhysTEC is critical to making sure all students have access to a high quality physics education." ■

## BOOK REVIEW

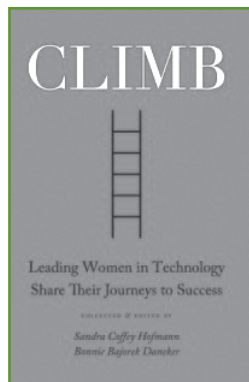
### CLIMB: Leading Women In Technology Share Their Journeys To Success

CLIMB, published by Women in Technology (WIT), features more than 60 profiles of leaders influencing Atlanta's business, academic and technology landscapes, including Women of the Year in Technology Award recipients, WIT presidents, and key WIT supporters and volunteers.


With great warmth and wisdom, Climb delivers compelling stories of women at different career stages succeeding in the technology business community. Personal essays depict the varied roads traveled and challenges met by these insightful leaders from a field where few women venture. Learn why they are passionate about their careers. Share in their rich experi-

ences. Garner valuable advice to incorporate in your own leadership efforts. From young girls building robots, to a software engineer, to a high-tech lawyer, to a CEO, these stories of women will appeal to readers at various points in their professional lives. They convey the heart and soul of leadership for the next generation.

"These powerful and poignant contributions illustrate challenging and often humorous leadership lessons that can impact readers of all ages and gender," said Sandy Hofmann, president of WIT, Inc. and co-editor of CLIMB. "These extraordinary women have generously shared their invaluable experience, advice, and journeys to inspire leaders in this generation and the next." ■



**Jump START** Your Search for a great science job or hire!

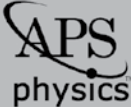


The American Physical Society (APS) Job Center is the best niche employment site for physics and engineering jobs, with hundreds of jobs viewed by thousands of the finest scientists each month.

- Physics Faculty
- High School Physics Teacher
- Postdoctoral Fellowship
- Biomedical Engineering
- National Lab Research
- Computational Astrophysics
- Science Program Administration
- Accelerator Physics

The APS Job Center is part of the *Physics Today* Career Network, a niche job board network operated for the physical science, engineering, and computing disciplines. PTCN is comprised of the *Physics Today* print magazine classifieds and online job board, as well as the online job sites of the American Association of Physics Teachers (AAPT), American Physical Society (APS), AVS: Science and Technology of Materials, Interfaces, and Processing, IEEE Computer Society, and the Society of Physics Students and Sigma Pi Sigma (SPS).

<http://careers.aps.org>



## Unconscious Gender Bias in the Classroom

By Amy Bug, Etsuko Hoshino-Browne and Kris Lui

Why should gender be an issue in physics? Philosopher of science Fox Keller asked this more than 25 years ago in her groundbreaking book *Reflections on Gender and Science*. Astrophysicist Urry made a similar point in her 2008 contribution to the volume *Gendered Innovations in Science and Engineering*, writing "photons have no gender." Of course, while photons have no gender, physicists do. Happily, when even the oldest of us (AB) was in graduate school, the days of legally-sanctioned discrimination and harassment recalled by several eminent women physicists on the 20th anniversary of the CSWP (Gazette Vol. 12, no. 2, 1992) were over. By 2005 the infamous "pipeline" had even stopped leaking women at almost all career junctures (Feder, Ivie). NSF and AIP figures show that fraction of women in physics has continued to rise; between 2000 and 2008 Ph.D.s awarded to women went from around 13% to almost 19%.

On the other hand, the "pipeline" has already delivered an excellent gender balance in professions like medicine and in life and social sciences. Using U.S. physics Ph.D. numbers as a metric, Murnane estimates that we will achieve equity by gender almost a century from now. Prospects for racial balance are even more dire (Ivie, Horton). Data reveal that women have poorer job quality: less satisfaction, lower pay, later promotions, ... and that children have a negative impact on their mother's success, but not their father's.

Are today's inequities due solely to past discrimination — and will they resolve without any further action on our parts? This was certainly AB's belief when she was a student. Attending a girl's school, then Williams College with great professors like Stuart Crampton and David Park, then M.I.T. insulated her from any thought that being a woman could harm her career. The difficulties that arose only when she became an assistant professor align with the concept of "stereotype activation," and can be exacerbated for people in so-called gender or race "stereotype-incongruent" fields (e.g. female physicist or male nurse). An understanding of the effects of subtle, or unconscious bias has arisen thanks to decades of research in social psychology and gender studies. Unconscious gender bias when evaluating people — the topic of the research which we describe below — is well understood and accepted by social scientists. Our concern, though, is that it is not only foreign to most physicists, but that it is tough to accept as well. Acknowledging that we are biased is at odds with the way we physicists conduct business as usual in the lab or at the blackboard. Faith in the ability to be wholly objective in our judgments is the *sine qua non* of physics.

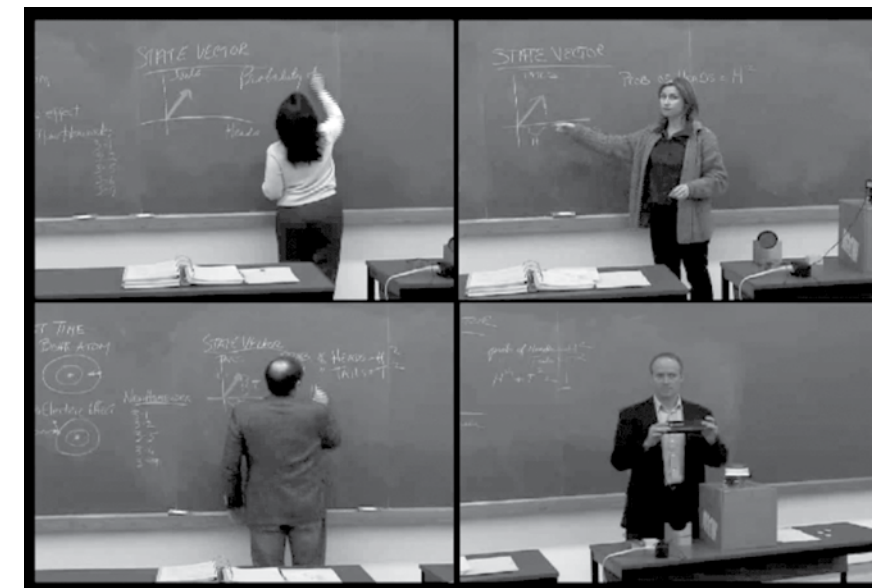
Our research probed a double standard of evaluation — effects similar to ours are well documented in the social science literature. More than one study has shown that teaching evaluations can be quantifiably different according to the gender of the candidate, and that the name (e.g. John, Jane, or J.) on otherwise

identical CVs or preprints resulted in different ratings of the document. In grant competitions women can be less successful or receive lesser awards. In 2003 Trix and Psenka analyzed adjectives which appear in the letters of recommendation of male and female candidates for medical fellowships. In 2010 Hebl et al. documented a similar effect in letters in tenure dossiers — and claimed that negative ratings result from female-identified adjectives like "nurturing" and "kind" appearing. (However, it is known that people find it tough to judge competent women as nice, nice women as competent — and to hire women who aren't both. So we might assume that women's letters were downgraded not because they indicated candidates were nice, but because they lacked additional adjectives that signaled agency and competence.)

It is surely not the case that gender bias is active in all hirings, grant competitions, job niches, and so on. One of us (KL) teaches at a community college, with many women physical science professors. Freshmen are surprised to hear that there is gender inequality in the physical sciences. It is only in sophomore classes that they start noticing the lack of women — one which occurs among their classmates. Gender studies is a field guaranteed to annoy a physicist — where the devil is forever in the details, and where unifying principles, when they exist at all, offer much less in the way of accurate predictive power than do the laws of physics.

One such unifying principle is that negative stereotypes are activated when there is some motivation — as in the 2000 study of Sinclair and Kunda.

*continued on page 12*



*In this Mellon Foundation-funded study, we used videotaped lectures in which professional actors, two male and two female, played the role of physics professors. None of the actors were trained in physics. Each of 126 physics students was randomly assigned to view a single videotape featuring only one of the four "professors." They were not informed that the study was related to gender, or that there was more than one version of the lecture being shown. Students then rated various aspects of the lecture.*

**Our study was designed to determine whether male and female physicists giving equivalent classroom lectures would be evaluated differently by students who heard them.**

## 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, five women are among the recipients.*

### Reka Albert

**Recipient of the Maria Goeppert Mayer Award (2011)**  
For her imaginative and pioneering studies of networks.

### Noemie Benczer Koller

**Recipient of the Nicholson Medal for Human Outreach (2010)**

For unselfish commitment to advocating the freedom of scientists around the world and for leadership in fostering equal opportunities for women in science.

### Kang-Kuen Ni

**Recipient of the Outstanding Doctoral Thesis Research in AMO Physics (2010)**

“A Quantum Gas of Polar Molecules.”

### Janet Seger

**Recipient of the Prize for a Faculty Member for Research in an Undergraduate Institution (2011)**

For significant contributions to the understanding of ultra-peripheral relativistic heavy ion interactions, skill in involving undergraduates in a large experimental research collaboration, and successful mentoring of undergraduates at her institution.

### Xiaowei Zhuang

**Recipient of the Max Delbruck Prize in Biological Physics (2010)**

For contributions to the field of single molecule biophysics and super-resolution imaging.

**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, 25 women were named to Fellowship.*

### Olgica Bakajin

For contributions to the development of new instrumentation for studies of protein folding and for fundamental understanding of transport and selectivity at nano-scale, with implications to understanding of membrane channels.

*Nominated by Division of Biological Physics*

### Pushpalatha Bhat

For her demonstration of the effectiveness of advanced statistical methods in extracting the most information from small signals in hadron collider physics and especially for pioneering the use of these techniques to improve the measurement of the top-quark mass in the D0 experiment at the Fermilab Tevatron.

*Nominated by Division of Particles & Fields*

### Doerte Blume

For contributions to physics of weakly-bound quantum clusters and strongly-interacting degenerate Fermi gases in one dimension.

*Nominated by Division of Atomic, Molecular and Optical Physics*

### Cynthia Cattell

For measurements of solitary waves and electric fields in the Earth's radiation belts and for observation and interpretation of the very large amplitude whistler mode waves that provide a new mechanism for accelerating trapped electrons to relativistic energies in a fraction of a second.

*Nominated by Topical Group in Plasma Astrophysics*

### Genevieve Comte-Bellot

For seminal contributions to the understanding and measurement of turbulent and aeroacoustic phenomena.

*Nominated by Division of Fluid Dynamics*

### Arati Dasgupta

For contributions to the theory of electron collisions with atoms and ions, and their applications to gaseous electronics, short laser pulses, inertial confinement fusion, and astrophysical plasmas.

*Nominated by Division of Atomic, Molecular and Optical Physics*

### Latifa Elouadrhiri

For pioneering work on experiments in deeply virtual Compton scattering (DVCS), a powerful means of accessing the non-perturbative structure of the nucleon, and insuring the maximum fulfillment of their potential by playing a major role in the 12 GeV Jefferson upgrade.

*Nominated by Division of Nuclear Physics*

### Kristen Fichthorn

For simulations that revealed new phenomena in the kinetics of reaction systems, self-assembly of nanostructures, and diffusion in mesoporous systems.

*Nominated by Division of Condensed Matter Physics*

### Cecilia Gerber

For her numerous contributions to the D0 experiment, especially the implementation of the D0 muon and silicon trackers and the elucidation of the characteristics of top quarks in the strong production of top-antitop pairs and the electroweak production of single top quarks.

*Nominated by Division of Particles & Fields*

### Pupa Gilbert

For contributions to synchrotron spectromicroscopy and its application to cancer therapy, tribology, and biomineralization.

*Nominated by Division of Condensed Matter Physics*

### Sharon Hammes-Schiffer

For the development and application of a theory for proton-coupled electron transfer; clarifying the roles of hydrogen tunneling and protein motion in enzymes; and fundamental insight into electron-proton correlation in nuclear-electronic orbital methods and multi-component density functional theory.

*Nominated by Division of Chemical Physics*

### Rongying Jin

For her significant contributions to materials physics, including science-driven materials development and pioneering studies of their underlying physics.

*Nominated by Division of Material Physics*

### Maki Kawai

For pioneering work on single-molecule spectroscopy on surfaces.

*Nominated by Division of Chemical Physics*

### Ching-Hwa Kiang

For her work in experimental biological physics, especially for studying molecular interactions of nucleic acids and proteins using nanoscale probes, and for the discovery of single-walled carbon nanotubes.

*Nominated by Division of Biological Physics*

### Amy Liu

For her innovative and influential computational studies of the electronic, structural, and vibrational properties of solids, and of electron-phonon interactions, with applications to ultra-hard materials; high-pressure phases; fullerenes, nanotubes, and related compounds; and novel superconductors.

*Nominated by Division of Computational Physics*

### Nergis Mavalvala

For her contributions to the design and commissioning of LIGO, and for experimental exploration of the fundamental quantum limits of interferometric gravitational wave interferometers.

*Nominated by Topical Group in Gravitation*

### Priyamvada Natarajan

For key contributions to two of the most challenging problems in cosmology: mapping dark matter and tracing the accretion history of black holes. Her work using gravitational lensing techniques has provided a deeper understanding of the granularity of dark matter in clusters of galaxies. She has developed theoretical models to describe the assembly and accretion history of black holes.

*Nominated by Division of Astrophysics*

### Hye-Sook Park

For the development of seminal experimental techniques to create and probe plasmas with extreme density and temperature.

*Nominated by Division of Plasma Physics*

### Mary Hall Reno

For important contributions to the physics of neutrino interactions and detection, especially at high energies.

*Nominated by Division of Particles & Fields*

### Petra Rudolf

For explorations of fullerenes, nanotubes, graphite, and graphene, and light-driven synthetic molecular motors.

*Nominated by Division of Condensed Matter Physics*

### Eun-Suk Seo

For leading the development and utilization of particle detectors for balloon and space-based experiments to understand cosmic ray origin, acceleration and propagation, especially as Principal Investigator of the Cosmic Ray Energetics And Mass balloon-borne experiment over Antarctica.

*Nominated by Division of Astrophysics*

### Sindee Simon

For pioneering contributions to the understanding of the thermal and mechanical properties of bulk and nanostructured polymeric glasses.

*Nominated by Division of Polymer Physics*

### Kathleen Stebe

For lasting contributions to the physics of fluid-fluid interfaces, and in particular the discovery of surface re-mobilization and other surfactant phenomena, to the dynamics of drops and bubbles and to nano-particle self-assembly.

*Nominated by Division of Fluid Dynamics*

### Carolyn Van Vliet

For seminal contributions to the foundations of Linear Response Theory and to Quantum Transport involving extended or localized states, with applications to Condensed Matter problems.

*Nominated by Topical Group on Statistical and Nonlinear Physics*

### Ramona Vogt

For contributions to our understanding of the dynamics of heavy quark and charmonium production in collisions with nuclei and providing guidance for using these probes in the current and planned experimental investigations of hard dynamics in collisions with nuclei.

*Nominated by Division of Nuclear Physics*

## Gender Bias in the Classroom, *continued from page 9*

Another is that ambiguity acts as a trigger, as when a candidate is neither a superstar nor a failure, but somewhere in the middle. A higher standard of proof is required for a middling candidate if they are gender- or race-incongruent. In a 2010 study by Brescoll et al, when mistakes in job performance were included in a fictive resume, women/men in typically male/female jobs received lower competency ratings. As a young professor, AB used to worry about what students would think if she made any mistakes at the blackboard, despite reassurance of her male colleagues that this happens to everyone, and it would not matter. Unfortunately, research now suggests otherwise.

Motivated both by previous studies and by real-world anecdotes, our study (APS March Meeting 2010, *Physics World* August 2010, preprint in progress) was designed to

determine whether male and female physicists giving equivalent classroom lectures could be evaluated differently by students who heard them. In this Mellon Foundation-funded study, we used videotaped lectures in which professional actors, two male and two female, played the role of physics professors. None of the actors were trained in physics. Each of 126 physics students was randomly assigned to view a single videotape featuring only one of the four “professors,” so student responses were independent. They were not informed that the study was related to gender, or that there was more than one version of the lecture being shown. Students then completed a survey in which they rated various aspects of the lecture using a 5-point scale. They were also invited to write additional comments. They were asked for some personal information, but not their own gender, which was recorded covertly.

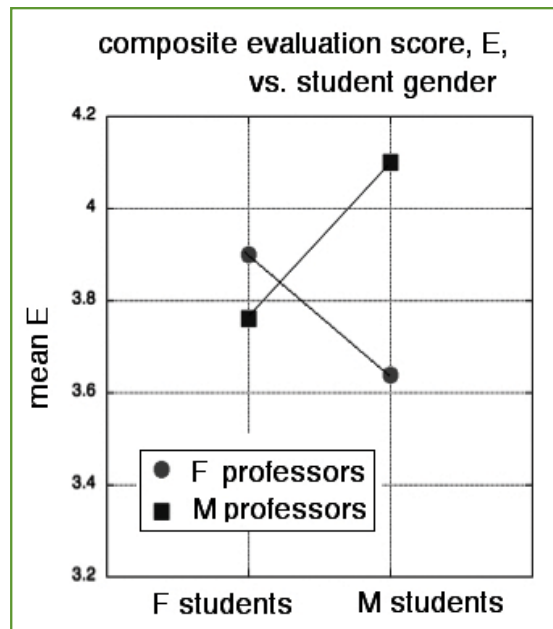
Our experimental design precluded any difference in the knowledge of physics exhibited by the “physics professors,” the scripted words spoken or symbols chalked on the board. Though clearly the four individuals were different in myriad ways, our study eliminated the variability in the intellectual content of the lecture — making it an interesting compliment to studies that look at surveys of actual physics teachers who author their own lectures and speak with genuine authority. For those outside of this field of research, it is natural to wonder if using only two actors of each gender is statis-

tically suspect. This type of social science experiment characteristically uses only one actor — at the very most two — of each “type.” (If two, one can statistically test for effects that depend on identity a lecturer, rather than his/her gender.) For example, the 2010 study on customer service representatives of Hekman et al. used one white man, one white woman and one black man — all actors performing the same script. We used actors of the same race, matched for attractiveness and quality of acting resume, and rehearsed in a group setting. In this way, we tried our best to standardize performative aspects of their lectures.

One null hypothesis for the experiment was that student responses would be statistically indistinguishable between the two genders. Responses on fifteen survey questions were combined to create a “composite evaluation score” for a professor. There were three “overall quality” questions at the end (rating of lecture, of lecturer, and whether they should be hired if a job candidate). There was strong correlation between the overall quality and our composite evaluation score. Our statistical tools were common ones in the social sciences: the t-test and analysis of variance (ANOVA). These predict how likely it is for the group means to differ quantitatively by the amount seen if a null hypothesis is true. Further, ANOVA reveals the degree to which independent variables “interact.” In other words, the value of one variable, say professor gender, might meaningfully influence what transpires when another, say student gender, is varied. The null hypothesis was upheld for the three questions of overall quality — but only for the female students. According to them, not only was quality independent of gender, but independent of identity ... that all four actors were of indistinguishable quality. The male students disagreed, preferring the male actors. The fact that these results divided sharply along gender lines supports the idea that our attempts to standardize teaching/acting ability were successful, that a distribution of acting abilities among the four actors was not a compelling explanation for our results.

We found several independent variables which were predictive of the mean. These were of institution, professor identity and (marginal effect) professor gender. ANOVAs indicated that there was only one significant interaction - between the independent variables of professor gender and student gender, as mentioned to above. While female students rated female professors slightly better, male students rated male professors vastly better. This result is reminiscent of numerous studies real course evaluations, both for college and high school science teaching.

We also looked at subgroups of questions that one might argue relate to gender-stereotypical attributes. Questions related to having a “solid grasp of the material”, being knowledgeable, and being good with equipment yielded a distinct gender bias, in that both male and female students rated male professors as better. Female students were more equivocal; the difference in scores failed to achieve significance for them, but did



Mean “composite evaluation score” for female and male professors (dot female, square male) segregated according to gender of student doing the evaluation. Data shown correspond to  $N=55$  students at one of two institutions studied. Data from second institution is omitted here for visual clarity, but it also has “scissors” form showing interaction between professor and student gender, and will appear in a future publication.

**While female students rated female professors slightly better, male students rated male professors vastly better. This result is reminiscent of numerous studies of real course evaluations, both for college and high school science teaching.**

for male students. On the other hand, questions asking whether the professor “teaches in a way that really helps students learn”, was well organized, and interacts well with students produced an own-gender bias. Female/male students rated the female/male professor better.

We believe our results show that in the physics classroom, the gender of the professor can, on average, make a difference in how the class is received, and what sorts of strengths and weaknesses students attribute to the professor. Further, the gender of the student has a role. Clearly, no single study like ours can guarantee that gender is the causative factor rather than, say, the sparse hair or lower voices of our male actors versus the abundant hair or higher voices of our female actors. On the other hand, we would argue that “gender” embraces a multitude of specific features like these, and it would be beside the point to costume the actors identically, graphically equalize their voices, etc. Depicting naturalistic people as physicists was our goal.

What prevents physicists from applying our analytical skills and “throwing away the unimportant terms” related to gender as we teach, recruit, mentor, evaluate, or reward colleagues? We can try, but “gender schemas” — the set of associations suggesting what a person is like based on their gender - are deeply embedded, and tend to govern virtually every interaction we have with others (and even with inanimate objects). (See <https://implicit.harvard.edu/implicit/demo/> for the online test of these biases.) Schemas were naturally beneficial to humans in the wild. However, schemas about gender, race, disability, ... create a societal problem by seeping into professional interactions and judgments. The tiny, unconscious biases that infiltrate evaluations can be amplified, say at in the final stage of a hiring decision, when an all-or-nothing decision is made between candidates.

Further, Valian argues that the accumulation of tiny disadvantages will, over time, have dramatic career consequences. This model suggests to us a Monte Carlo simulation. Our careers are like random walks, biased by both gender-independent and gender-dependent terms in the Hamiltonian. To extend the physics analogy a bit further, each walker (person) has a Hamiltonian which has a unique spectrum of such terms (Is the walker a white man? Black woman? Mother? Father?) In each interaction with a teacher, an advisor, a grant committee, ... a Boltzmann factor determines in

which direction the walk is likely to proceed. This leads in the usual way, to a steady-state flux. The walk can be projected onto a subspace like professional achievement or personal fulfillment. The walker-averaged flux of men in the positive directions (career success, fulfillment) is higher than that of women, all thanks to gender-biased terms, small though they may be.

In closing, we assert that we do not believe in a single cause for the “Why so few; why less successful?” issue of women in physics. Quite unlike physicists, feminists tend to resist monocausal explanations. Philosophers of science have discussed highly theoretical causes like feminist epistemologies, and symbolic linkages between masculinity and power, logic, and mathematical thinking. Educational psychologists have pointed to loss-of-confidence issues among girls at critical stages in their math and science education. Sociologists and practicing physicists alike have described institutional policy failings, and effects of a “chilly climate” for women. An interesting distinction regarding barriers to women in math-intensive fields is drawn by Ceci and Williams. In 2010 they implicate the choices that women themselves make, but assert that there are two kinds: some free and some constrained by society. We feel that all of these factors and more are part of the complicated pastiche that represents causes and suggests cures for issues of women in physics today.

Much wonderful progress has been made with remedies that take their cues from of these different root causes, to foster equity in the scientific community. Though Wenneras and Wold created a stir with their work on nepotism and sexism in 1994 Swedish Medical Institute fellowships, a study from 2004 could find no such gender bias (but still some nepotism). Along with research on stereotype activation and threat, there is research on reducing it. Moody’s 2007 paper is a rich resource in which she both identifies and shows how to avoid the “cognitive shortcuts” that produce biases in hiring and promotion. The AAUW 2010 booklet, *Why So Few?* is another exemplary resource that documents problems and proposes remedies. In conclusion, we hope that our data on gender stereotypes in the physics classroom will not discourage our community, but will encourage action that faces up to this challenge, and contributes to a climate of gender equity in physics. ■

**We hope that our data on gender stereotypes in the physics classroom will encourage action that faces up to the challenge, and contributes to a climate of gender equity in physics.**

### 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](http://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](mailto:roster@aps.org). Keep reading the Gazette!*

## Special Events Focusing on Women and Minorities in Physics

### APS MARCH MEETING • DALLAS, TX

#### Sunday, March 20

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

#### Tuesday, March 22

**11:15am – 2:15pm ... Hildred Blewett Scholars and their Research followed by Panel Discussion** (*Dallas Convention Center - Ballroom C1*)  
Sponsored by the Committee on the Status of Women in Physics

**2:30pm – 5:30pm ..... Topics in Alternative Energy** (*Dallas Convention Center - Ballroom C1*)  
Sponsored by the Committee on Minorities

**7:00pm – 8:30pm ..... COM/CSWP Reception** (*Hyatt Regency - Bryan Beeman B*)  
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.

#### Thursday, March 24

**7:30am – 9:30am ..... CSWP/FIAP Networking Breakfast** (*Hyatt Regency - Bryan Beeman B*)  
Enjoy a full breakfast and network with colleagues! Cost: \$15; \$5 for physics students thanks to FIAP's generosity. All are welcome, both men and women. Pre-registration is strongly advised by March 4, as only limited walk-ins are accepted. Pre-register at [www.aps.org/meetings/march/events/receptions/index.cfm](http://www.aps.org/meetings/march/events/receptions/index.cfm).

### APS APRIL MEETING • ANAHEIM, CALIFORNIA

#### Friday, April 29

**8:00am – 5:00pm ..... Professional Skills Development Workshop for Women Physicists** (*Hyatt Hotel Orange County*)  
Workshop for developing communication, negotiation and leadership skills; for post docs and tenure-track/newly-tenured women physicists (participants must be pre-registered). Reception for participants to follow.

#### Sunday, May 1

**3:30pm – 5:15pm ..... Initiatives for Broadening Participation of Minorities in Graduate Level Physics** (*Royal AB*)  
Sponsored by the Committee on Minorities

**6:00pm – 7:30pm ..... COM/CSWP Reception** (*Hyatt Hotel Orange County*)  
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.

#### Tuesday, May 3

**7:30am – 9:30am ..... CSWP/DPF Networking Breakfast** (*Hyatt Hotel Orange County*)  
Enjoy a full breakfast and network 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 April 8, as only limited walk-ins are accepted. Pre-register at [www.aps.org/meetings/april/events/receptions/index.cfm](http://www.aps.org/meetings/april/events/receptions/index.cfm).

**10:45am – 12:30pm . Enhancing Performance and Retention of Under-Represented Students in Undergraduate Physics** (*Grand A*)  
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!

## APS Offers Blewett Scholarship for Women Physicists

The Blewett Scholarship has been established to enable women to return to physics research careers after having had to interrupt those careers. The scholarship consists of an award of up to \$45,000. The applicant must currently 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 3, 2011. 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, 2011.

Details can be found at [www.aps.org/programs/women/](http://www.aps.org/programs/women/) (click on Scholarships and Awards). Contact Deanna Ratnikova in the APS office at [blewett@aps.org](mailto: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 scholarship.

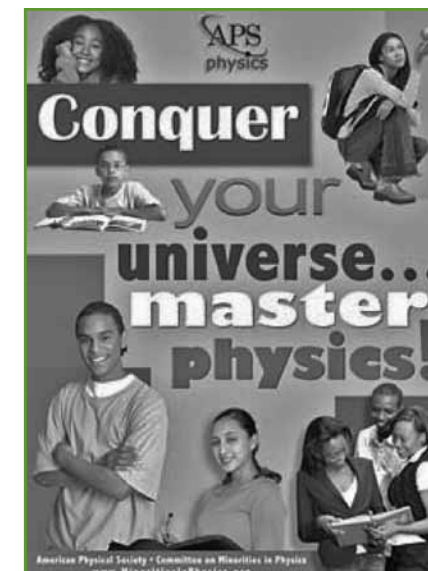
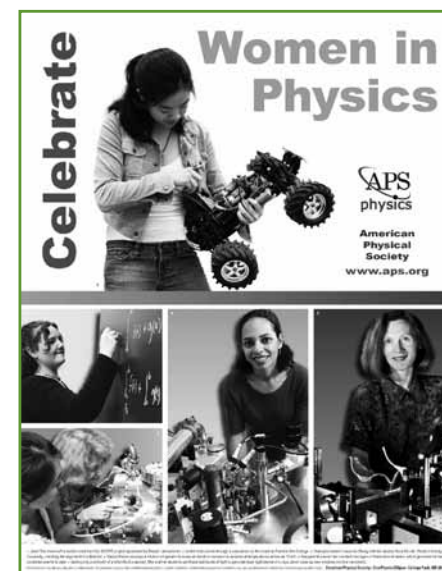
## Celebrate Women and Minorities in Physics!

Decorate your office or department with posters promoting the participation of women and minorities in physics.

Order a free Celebrate Women in Physics poster at [www.aps.org/programs/women/reports/poster.cfm](http://www.aps.org/programs/women/reports/poster.cfm).

Order a Conquer Your Universe, Master Physics poster at [www.aps.org/programs/minorities/poster.cfm](http://www.aps.org/programs/minorities/poster.cfm).

Physics InSight has also produced a Women in Physics Slide Show designed to inform and excite undergraduates about physics. Download the slide show at [www.aps.org/careers/insight/2010women.cfm](http://www.aps.org/careers/insight/2010women.cfm).



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](http://www.aps.org/programs/women/female-friendly/index.cfm)



# 2011 Katherine Weimer Award



The Weimer award is open to any female plasma scientist who received her Ph.D. within the ten-year period prior to April 1, 2011. Nominations are active for one selection cycle (three years).

The award consists of \$2,000 and funds for travel to the annual meeting where the award is to be presented. The recipient will be invited to give a talk at the Division's annual meeting.

To nominate a candidate, send the following to [women@aps](mailto:women@aps).

- A letter evaluating the nominee's qualifications identifying the specific work to be recognized
- A biographical sketch
- A list of the most important publications
- At least two, but no more than four, seconding letters

**Deadline is April 1, 2011.**

[www.apsdpp.org/prizes\\_awards/katherine\\_weimer.php](http://www.apsdpp.org/prizes_awards/katherine_weimer.php)



**NEW!** Career Development Speaker Travel Grant Program to provide assistance to physics departments that are trying to increase their career development activities and to raise the career awareness of students seeking undergraduate and graduate physics degrees.

The Committee on Careers and Professional Development will reimburse up to \$600 for one of two speakers invited to give presentations at colleges or universities on topics concerning careers in physics. Act quickly as there are a very limited number of Travel Grants available!

For more information and to fill out the online application, please visit:

[www.aps.org/careers/educator/travelgrant/](http://www.aps.org/careers/educator/travelgrant/)

## AMERICAN PHYSICAL SOCIETY 2010-2011 TRAVEL GRANTS FOR WOMEN SPEAKERS PROGRAM

Limited funding is available for the 2010-2011 academic year! Apply online at [www.aps.org/programs/women/speakers/travel-grants.cfm](http://www.aps.org/programs/women/speakers/travel-grants.cfm)

- Purpose** *The program is intended to expand the opportunity for physics departments to invite women colloquium/seminar speakers who can serve as role models for women undergraduates, graduate students and faculty. The program also recognizes the scientific accomplishments and contributions of these women physicists.*
- Grant** *The program will reimburse U.S. colleges and universities for up to \$500 for travel expenses for one of two women colloquium/seminar speakers invited during the 2010-2011 academic year.*
- Qualifications** *All physics and/or science departments in the United States are encouraged to apply. Canadian and Mexican colleges and universities are also eligible, provided that the speakers they invite are currently employed by U.S. institutions. Invited women speakers should be physicists or in a closely related field, such as astronomy. Speakers should be currently in the U.S. The APS maintains the Women Speakers List which is available online at [www.aps.org/programs/women/speakers/enroll.cfm](http://www.aps.org/programs/women/speakers/enroll.cfm). However, selection of the speaker need not be limited to this list. Neither of the two speakers may be a faculty member of the host institution.*
- Guidelines** *Reimbursement is for travel and lodging expenses only. Honoraria or extraneous expenses at the colloquium itself, such as refreshments, will not be reimbursed.*
- Application** *The Travel Grants for Women Speakers Application Form ([www.aps.org/programs/women/speakers/travelgrants-app.cfm](http://www.aps.org/programs/women/speakers/travelgrants-app.cfm)) should be submitted to APS identifying the institution, the names of the two speakers to be invited and the possible dates of their talks. Please note that funds for the program are limited. The Travel Grants for Women Speakers Application Form should be submitted as early as possible, even if speakers and dates are tentative, or if the speakers are scheduled for the spring semester. The application form will be reviewed by APS, and the institutions will be notified of approval or rejection of their application within two weeks. Institutions whose applications have been approved will receive a Travel and Expense Report Form to submit for reimbursement.*

SEE FOLLOWING PAGE FOR APPLICATION FORM

## WOMEN SPEAKERS LIST

Need a speaker? Consider consulting the American Physical Society Women Speakers List (WSL), an online list of over 300 women 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 Speakers. To make the WSL easy to use, we have made the online version searchable by state, field of physics, or speakers' last names.



If you'd like to search the list to find a woman speaker, go to: [www.aps.org/programs/women/speakers/](http://www.aps.org/programs/women/speakers/)

Women physicists who would like to be listed on the Women Speakers List or those who would like to modify their existing entries can do so at: [www.aps.org/programs/women/speakers/enroll.cfm](http://www.aps.org/programs/women/speakers/enroll.cfm) or see page 19.

APS has a companion program for minority speakers. Information on the Minority Speakers List and the Travel Grant Program for Minority Speakers can be found at: [www.aps.org/programs/minorities/speakers](http://www.aps.org/programs/minorities/speakers)

## 2010-2011 TRAVEL GRANTS FOR WOMEN SPEAKERS APPLICATION FORM

This form is also available on the Internet at [www.aps.org/programs/women/speakers/travel-grants-app.cfm](http://www.aps.org/programs/women/speakers/travel-grants-app.cfm)  
 This form must be filled out and approval received from the APS in order to be eligible for up to \$500 travel reimbursement.  
 Please note that submitting this application form does not guarantee reimbursement.  
 You will be notified within two weeks of receipt of this application whether or not it has been approved.

Date \_\_\_\_\_  
 Institution \_\_\_\_\_  
 Department \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
*Application Prepared by (required):*  
 Name \_\_\_\_\_ Title \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_

Please list information on the speakers below and indicate if speakers' dates or talk titles are tentative.

Date \_\_\_\_\_  
 Institution \_\_\_\_\_  
 Department \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
*Application Prepared by (required):*  
 Name \_\_\_\_\_ Title \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_

Date \_\_\_\_\_  
 Institution \_\_\_\_\_  
 Department \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
*Application Prepared by (required):*  
 Name \_\_\_\_\_ Title \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_

Please return this form to: Pahola Elder, Travel Grants for Women Speakers Program • APS • One Physics Ellipse • College Park, MD 20740-3844 •  
 Tel: (301) 209-3262 • Fax: (301) 209-0865 • [travelgrant@aps.org](mailto:travelgrant@aps.org)

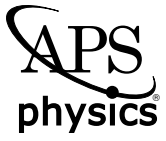
## WOMEN SPEAKERS LIST (WSL) ENROLLMENT/MODIFICATION FORM

Additions/Modifications may also be made on the Internet at [www.aps.org/programs/women/speakers/enroll.cfm](http://www.aps.org/programs/women/speakers/enroll.cfm)  
 An online copy of the WSL is also available. The *Women Speakers List* is compiled by the American Physical Society Committee on the Status of Women in Physics (CSWP). The list is updated continuously online. Comments, questions and entries should be addressed to:  
**Women Speakers List • APS • One Physics Ellipse • College Park, MD 20740-3844 • (301) 209-3232**

To enroll or update your current entry, please complete this form and return it to the address above. Please print clearly or type.  
 Title/Name  Dr.  Prof.  Mrs.  Ms. \_\_\_\_\_ Date \_\_\_\_\_  
 Institution \_\_\_\_\_ Telephone \_\_\_\_\_  
 Address \_\_\_\_\_ Fax \_\_\_\_\_  
 \_\_\_\_\_ Email \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
 If you have moved out of state, list previous state: \_\_\_\_\_  New Entry  Modification  
 For which audiences are you willing to speak? (Check all that apply)  Middle school  High school  General  Colloquium

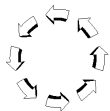
To register a new title, give the title as you want it to appear in the left column below. Then check the section(s) where it is to be inserted. To delete a title, indicate the title and check the appropriate box below. A limit of four total entries will be imposed. You may use additional pages if you are submitting more than four modifications. Please type or print legibly paying particular attention to formulas. We regret that we are unable to include illegible entries.

TALK TITLE	PHYSICS SUBFIELD (LIMIT 4)		
1 . <input type="checkbox"/> Add this title <input type="checkbox"/> Delete this title	<input type="checkbox"/> Accelerators <input type="checkbox"/> Astrophysics <input type="checkbox"/> Atomic/Molecular <input type="checkbox"/> Biological/Medical <input type="checkbox"/> Chemical <input type="checkbox"/> Computational <input type="checkbox"/> Condensed Matter <input type="checkbox"/> Diversity	<input type="checkbox"/> Education <input type="checkbox"/> Fluid Dynamics <input type="checkbox"/> General <input type="checkbox"/> Geophysics/ Environmental/Energy <input type="checkbox"/> History <input type="checkbox"/> Interface/Device <input type="checkbox"/> Materials	<input type="checkbox"/> Nuclear <input type="checkbox"/> Optics/Optical <input type="checkbox"/> Particle <input type="checkbox"/> Physics & Society <input type="checkbox"/> Plasma <input type="checkbox"/> Polymer <input type="checkbox"/> Statistical/Nonlinear <input type="checkbox"/> Other
2 . <input type="checkbox"/> Add this title <input type="checkbox"/> Delete this title	<input type="checkbox"/> Accelerators <input type="checkbox"/> Astrophysics <input type="checkbox"/> Atomic/Molecular <input type="checkbox"/> Biological/Medical <input type="checkbox"/> Chemical <input type="checkbox"/> Computational <input type="checkbox"/> Condensed Matter <input type="checkbox"/> Diversity	<input type="checkbox"/> Education <input type="checkbox"/> Fluid Dynamics <input type="checkbox"/> General <input type="checkbox"/> Geophysics/ Environmental/Energy <input type="checkbox"/> History <input type="checkbox"/> Interface/Device <input type="checkbox"/> Materials	<input type="checkbox"/> Nuclear <input type="checkbox"/> Optics/Optical <input type="checkbox"/> Particle <input type="checkbox"/> Physics & Society <input type="checkbox"/> Plasma <input type="checkbox"/> Polymer <input type="checkbox"/> Statistical/Nonlinear <input type="checkbox"/> Other
3 . <input type="checkbox"/> Add this title <input type="checkbox"/> Delete this title	<input type="checkbox"/> Accelerators <input type="checkbox"/> Astrophysics <input type="checkbox"/> Atomic/Molecular <input type="checkbox"/> Biological/Medical <input type="checkbox"/> Chemical <input type="checkbox"/> Computational <input type="checkbox"/> Condensed Matter <input type="checkbox"/> Diversity	<input type="checkbox"/> Education <input type="checkbox"/> Fluid Dynamics <input type="checkbox"/> General <input type="checkbox"/> Geophysics/ Environmental/Energy <input type="checkbox"/> History <input type="checkbox"/> Interface/Device <input type="checkbox"/> Materials	<input type="checkbox"/> Nuclear <input type="checkbox"/> Optics/Optical <input type="checkbox"/> Particle <input type="checkbox"/> Physics & Society <input type="checkbox"/> Plasma <input type="checkbox"/> Polymer <input type="checkbox"/> Statistical/Nonlinear <input type="checkbox"/> Other
4 . <input type="checkbox"/> Add this title <input type="checkbox"/> Delete this title	<input type="checkbox"/> Accelerators <input type="checkbox"/> Astrophysics <input type="checkbox"/> Atomic/Molecular <input type="checkbox"/> Biological/Medical <input type="checkbox"/> Chemical <input type="checkbox"/> Computational <input type="checkbox"/> Condensed Matter <input type="checkbox"/> Diversity	<input type="checkbox"/> Education <input type="checkbox"/> Fluid Dynamics <input type="checkbox"/> General <input type="checkbox"/> Geophysics/ Environmental/Energy <input type="checkbox"/> History <input type="checkbox"/> Interface/Device <input type="checkbox"/> Materials	<input type="checkbox"/> Nuclear <input type="checkbox"/> Optics/Optical <input type="checkbox"/> Particle <input type="checkbox"/> Physics & Society <input type="checkbox"/> Plasma <input type="checkbox"/> Polymer <input type="checkbox"/> Statistical/Nonlinear <input type="checkbox"/> Other



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

Non-Profit Org.  
U.S. Postage  
PAID  
College Park, MD  
Permit No. 1233



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.