STATUS

A REPORT ON WOMEN IN ASTRONOMY

JUNE/JULY 2011

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Katy Garmany, Editor

Building Respect and Inclusion in Astronomy: Strategies for Addressing and Overcoming Harassment

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The American Astronomical Society (AAS) has an anti-harassment policy[1], and has stated its commitment to leadership in developing "people" skills and its desire to identify and disseminate best practices and tools. This talk was proposed and developed to further the AAS membership's knowledge of what constitutes harassment and how individuals and institutions should respond to it. It was presented at the Seattle Annual Meeting of the American Astronomical Society January 10, 2011.

Why should we care?

Great science and discovery are enabled by an open climate where individuals are free to share knowledge, opinions, beliefs and ideas. This cannot and will not happen if a segment(s) of the practitioners are disenfranchised and disrespected. We see ongoing efforts to broaden participation in astronomy, particularly for women and under-represented minorities. In astronomy, there is an established, though fragile, trend in these directions. Full engagement of these constituencies hinges on creating a climate of inclusion, respect and openness.

Harassment is pervasive

Since harassment was first recognized as an issue on college campuses in the early 1980s, the frequency of complaints has increased. While all members of the academic community are potential victims of unwelcome sexual behavior, a majority of the complainants are female students, faculty and staff.

Over 60% of undergraduate women and men report they have experienced sexual harassment, and 20-30% of undergraduate female students report that they have been victims of some form of sexual harassment by at least one of their professors. When this was expanded to include sexist remarks, the number rose to 75%.[2]

What is harassment?[3]

This is a simple question with a complex answer. An example of inappropriate and poor human behavior, harassment has been described carefully in laws and rules. There

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For more information on subscribing to STATUS, submitting articles or obtaining back issues, please visit the STATUS website:
aas.org/cswa/STATUS.html

AAS members may receive hard copy by sending their postal address to
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Editor's Comments

STATUS has appeared in print since 1987, usually biannually. With this issue, STATUS becomes an all electronic publication, following the trend of many other publications. I'd like to thank Pat Knezek for all her help in transitioning the editorship of STATUS to me, and also congratulate her on her new position as the Director of the WIYN Observatory. As a fitting start to this new electronic form, we are delighted to publish here a very comprehensive article on Respect and Inclusion in Astronomy: Strategies for Addressing and Overcoming Harassment which details the subject in a way that will be of great practical use to many of us. There are several other very exciting articles, which I'm delighted to be able to include, including two by graduate students.

Please note that STATUS is posted, along with past issues, on the CSWA website. (aas.org/cswa/STATUS.html) When the issue is posted, all members of CSWA and readers of AASWomen are notified.

We continue to welcome submission of relevant articles, and suggestions of individuals who we might approach to write articles. What do you, the reader, find most interesting? Suggestions for reprints of articles from other sources, interviews, summary of meetings, etc. are also welcome. We prefer to receive your article as either tex or word docs. Figures and images are welcome. We do not have a formal style guide, but will edit gently for continuity. Deadlines for the January issue include all articles received by the end of November; for the June issue, all articles received by the end of April.

Please send all communications about STATUS to the Editor, Katy Garmany.

Building Respect and Inclusion in Astronomy *continued*

are various permutations of the statements in the next six paragraphs; these carefully chosen words have been debated, selected, and tested in court.

Harassment is *a pattern of abusive and/or degrading conduct, or a single incident of extreme behavior, directed against an individual(s) on the basis of his or her sexuality or membership in a protected class.*

Harassment can also be *unwelcome verbal, visual or physical conduct of a nature that is severe and/or pervasive and adversely affects working conditions or creates a hostile work environment.*

Harassment is a form of discrimination. It is a form of bullying. It is persistent, unwelcome and intolerable. It can be severe or pervasive or both.

Generally an isolated comment or action will not rise to being harassment unless significantly egregious. However, a number of relatively minor incidents may add up to harassment. The perceived power of one individual over another can "set the stage."

The different forms of harassment require different vocabulary. One is referred to as *tangible action, which includes quid pro quo ("this for that"), in which decisions and/or actions affecting status are based on a person's response to unwelcome conduct (verbal, sexual, etc.).*

The other is referred to as *hostile environment, in which sufficiently severe and pervasive unwelcome verbal, non-verbal, and/or physical conduct based on sex, gender, race, etc., interferes with a person's work or learning or program performance or creates a hostile, intimidating, or offensive environment.*

A prerequisite for the victim!

For behavior to be categorized as harassment requires that *the victim hold membership in a protected class,* which may be based on *sex, gender (membership in class rather than sexual in nature), race, age, national origin, religion, disability, or marital status.*

Note: protected classes often vary by state and local jurisdiction. They may be based on physical qualities, sexual orientation and/or identification, health, etc.

Verbal or written, visual, or physical harassment
The following are examples of three forms of harassment.

Verbal or written: jokes about sex, race, religion, etc.; disparaging comments about membership in a protected class, etc.; comments about clothing, personal behavior or a person's body; rumors; threats; emails, blogs, etc.; poor interpersonal skills; and more.

Visual: posters, drawings, pictures, screensavers, emails, looks or gestures; and more.

Physical: assault; impeding or blocking movement; inappropriate touching of a person or person's clothing; kissing; hugging; patting; stroking; oblivion to personal space preferences and/or customs; and more.

Bullying vs. harassment

There is growing interest in the effects of bullying, a behavior similar to harassment that generally has not been dealt with by lawmakers and courts, but could still have exposure in tort law. Organizations should develop expectations, policies, processes, etc. to address bullying.

Impacts of harassment, both individually and organizationally

Harassment limits open discussion, ideas, creativity, research and discovery. Two frequent results of being a victim of harassment are loss of productivity and poor work performance. Harassment, or any similar behavior applied to individuals because of gender, race, etc., often leads to adverse physical and mental impacts on the individual, loss of opportunity (when poor performance is not understood as a symptom of harassment), and potentially, exit from the position or even the profession.

For an organization, issues of harassment place a drain on resources (economic and personnel) needed to investigate claims, as well as lead to lawsuits, loss of reputation and even loss of federal funds for violating the law.

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Building Respect and Inclusion in Astronomy *continued*

What if it happens to you?

Do not remain silent. Speak up! Object to the harasser, if possible, either verbally or in writing. Keep documentation and records. Identify and try to gather information from those who witness and/or also have been affected by this behavior.

You might fear that asking someone for advice will involve you in a procedural process that will make matters worse. In fact, unless you are yourself an expert on the nuances and legalities of addressing harassment, you will need help. Find out whom to contact by asking someone you trust, such as a supervisor, mentor, adviser, or counselor, or by consulting your organization's website for a contact name. If these suggestions don't help, report the behavior to an appropriate Human Resources (HR) representative, or if you're a student, to the Dean of Students. Many organizations allow multiple avenues for reporting.

Although it can appear overwhelming or intimidating, speaking up and reporting are the only way that these situations will diminish. If people don't know about the problem, they can't take appropriate action to stop these kinds of behaviors. There are many guidelines built into the process to protect you.

A way to remember this is, "consultation is not escalation."

"Conditional confidentiality"

Off-putting though it may sound, absolute confidentiality cannot always be guaranteed when you tell someone about being harassed. The nature of the offense may mandate action, and everyone who witnesses or knows about harassment has a legal obligation to report it to someone who can address it. However, the situation will be managed to the highest level of confidentiality possible.[4]

What to expect from your institution

The most important element for any institution hoping to address sexual harassment (SH) is *leadership from the top*. There should be a highly positioned *SH response officer*; there can also be a network of knowledgeable contact people throughout the organization.

Another important element is *well-crafted and well-advertised policies*, such as posters on sexual harassment in all workplace and classroom buildings, and a good web site.

A critical element for attempts to reduce harassment, and at the same time increase reporting of incidents, is to *hold Sexual Harassment Information Sessions (SHIS) for employees, students, etc*. This is in the interest of the institution, which has a legal liability for allowing harassment to take place.

Examples

The following organizational examples are provided to illustrate the kinds of programs and resources that may be available where you work or study. They illustrate the kinds of practices and policies that many organizations put in place. Check with your own organization/institution to determine what resources are available and how to access them.

Institutional action - STScI

The STScI Director initiates some, and backs all, policies on fair treatment as well as family- and female-friendly policies.

The STScI HR Branch Chief (Sheryl Bruff, one co-author of this article) is in charge of trainings, investigations, and discipline (which is backed up by the Director). People know to call or drop in on Sheryl and that she will guide and support them.

There are harassment awareness posters and a website with policies and procedures. All employees were given anti-harassment training, and new employees, including post docs, graduate students and interns, must complete training as part of their orientation.

Institutional action - UW-Madison

The UW-Madison provost mandates Sexual Harassment Information Sessions (SHIS) for all "limited" appointees (administrative appointees have limited terms). Some, but not all, deans and directors mandate this training for many other university employees, including Teaching Assistants and Project Assistants. It would be ideal but

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daunting to have training for all 60,000 citizens of campus.

The training is led by the Provost's Office and Office for Equity and Diversity (OED). The other co-author of this article (Bernice Durand) jointly oversaw the training when she was Vice Provost for Diversity and Climate for five recent years[5]. A small group of dedicated volunteers lead the information sessions.

The Director of OED, currently Luis Piñero[6], is the top "go-to" person in cases of harassment. Sexual harassment information sessions always include to "call Luis" if you need to know what to do about harassment. He is responsible for the advice that "consultation is not escalation."

There once was a broad campus network of contact people, about one to two per unit (**departmental, administrative, research center, student services, etc.**). However, we found that on a large campus a shorter list of contact people improved consistency and still met the need. The most recent list includes several of the deans of students, as well as persons trained to assist employees.

A link to one of the Non-Discrimination Posters is on the UW-Madison Office for Equity and Diversity (http://oed.wisc.edu/) home page, as well as a link to Sexual Harassment Information and Resources (http://oed.wisc.edu/sexualharassment/).[7] The second link has more information on harassment than would fit in this whole edition of STATUS, including definitions, what to do, case studies, consequences, policies, the brochure handed out in information sessions, and information on safety and sexual assault.

...In the eye of the beholder

Harassment is a complex subject. One of the most difficult aspects about it is that there are no concrete guidelines, no "black and white." We have found in discussing case studies that the phrase, "it depends" pops up a lot.

"Hostile Work Environment" is often in the eye of the beholder, thus hard to define. We need to work on being sure everyone "gets it." Here are examples of the kinds of statements or thinking that have made progress difficult.

1. *"But s/he should understand how I am...my culture ...my style..."*
It is important to understand that harassment is about the audience, not the actor. It is about the impact, not the intent.

2. *That's the way things are."*

Privilege and power are often based on unconscious schemas/ biases of the dominant group, which create a "blind spot."

3. *"That's not what I meant!"*

It doesn't matter what was meant. It matters what was heard/experienced/perceived. "Unintentional" defense in hostile work environment claims often is the result of unknown, unquestioned or unevaluated schemas and biases.

4. "She's a trouble maker." "It can't be true or she wouldn't have put up with it." "He's playing the _____ card to avoid responsibility."

People who bring claims are often disbelieved; the motives of the complainant are mistrusted. The default belief should be that the person bringing a complaint has had a "real" experience and that s/he is bringing the claim for good reason.

What will it take?

Here is our list of what it will take to decrease harassment. How does your institution stack up?

- Develop, distribute, conduct briefings on, and enforce, your policies.
- Train **everyone** on what constitutes prohibited behavior and what gives rise to harassment.
- Apply a "Reasonable Woman" test: "Would a reasonable woman find that offensive?" (This can be varied for any protected class.)
- Create a shared understanding of what is or isn't acceptable.
- Encourage examination and discussion of attitudes and behaviors towards others.
- Question biases and schemas. This other, related topic is worth pursuing.[9]
- Open communication - speak up.
- Organizations must act! Ensure consistent response, action and consequences.

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- Understand the rights and responsibilities of both those it happens to and those that see it happening.

Appendix A
General background information

American Association of University Women (AAUW) Study

In a 2005 AAUW Educational Foundation study on sexual harassment at colleges and universities titled "Drawing the Line: Sexual Harassment on Campus," http://aauw.org/learn/research/upload/DTLFinal.pdf, the claim was made that while both men and women were targets of sexual harassment, "women are disproportionately negatively affected." Some other findings follow.

- 62% of female college students and 61% of male college students report having been sexually harassed at their university.
- 66% of college students know someone personally who was harassed.
- 10% or fewer of student sexual harassment victims attempt to report their experiences to a university employee.
- 35% or more of college students who experience sexual harassment do not tell anyone about their experiences.
- 80% of students who experienced sexual harassment report being harassed by another student or former student.
- 39% of students who experienced sexual harassment say the incident or incidents occurred in the dorm.
- 51% of male college students admit to sexually harassing someone in college, with 22% admitting to harassing someone often or occasionally.
- 31% of female college students admit to harassing someone in college.

Appendix B
Some highlights of the history of harassment law (Wikipedia has a long entry on this subject)

Federal acts

Title VII of the Civil Rights Act of 1964
(http://eeoc.gov/laws/statutes/titlevii.cfm)

Title IX of the Higher Education Amendments of 1972
(http://dol.gov/oasam/regs/statutes/titleix.htm)

Age Discrimination in Employment Act (ADEA) of 1967 (http://eeoc.gov/laws/statutes/adea.cfm) and the **Age Discrimination Act (ADA) of 1975** (http://dol.gov/oasam/regs/statutes/age_act.htm)

Americans with Disabilities Act (another ADA) of 1990
(http://ada.gov/pubs/ada.htm)

Samples of influential case law

Meritor Savings Bank v. Vinson (http://scholar.google.com/scholar_case?case=14616838878214701501&q=meritor+savings+bank+v.+vinson&hl=en&as_sdt=2,6&as_vis=1), 1986, recognized certain forms of sexual harassment as a violation of the Title VII of the Civil Rights Act of 1964 and established standards for hostile working environment as distinguished from 'economic' or 'tangible' discrimination.

Faragher v. City of Boca Raton (http://law.cornell.edu/supct/html/97-282.ZO.html), 1994, established that employers are liable for harassment by their employees.

Burlington Industries, Inc. v. Ellerth (http://law.cornell.edu/supct/html/97-569.ZS.html), 1998, established that employers are vicariously liable if supervisors create a sexually hostile work environment.

Anita Hill's testimony in the Clarence Thomas Confirmation Hearings, 1991, which highlighted aspects and complexities of hostile work environment, raised national awareness of sexual harassment. We suggest the reader choose among online references on this testimony.

Some legal aspects

The following samples from the literature do not constitute legal opinions or guidance. We are not lawyers and have never even played them on TV!

Harassment generally must result in a "tangible employment action;" e.g., hiring, pay, promotion, references, work assignments, etc., or a "hostile work

environment;" e.g., unreasonable interference with an individual's work performance via an intimidating or offensive working environment. "Quid pro quo" is an aspect of "tangible action."

Those "employers" that can be considered liable include both organizations and individuals. The EEOC has jurisdiction; however, cases can go immediately to lawsuit.

Litigation can include actions in tort/personal injury law (as distinguished from criminal law). Tort injuries may be brought to court by the injured individual. Some examples are intentional infliction of emotional distress, libel, slander and defamation.

Organizations are not just liable for harassment by employees, but can be held responsible for harassment perpetrated on their employees by third parties such as vendors, customers, contractors, etc.

State and federal laws protect against retaliation, such as taking adverse action against someone for making a good faith claim or for cooperating in an investigation. Retaliation is considered more egregious than the initial act. Where harassment can sometimes be defended as "unintentional," retaliation is considered deliberate and many organizations view it as a dismissible event.

Investigation of a claim of harassment

If a claim is made—personally or organizationally—there is a legal and ethical responsibility to report, investigate and act. One is not permitted to simply "keep it off the record." This information should be disclosed to an individual making a claim. Investigations are generally discreet, but absolute confidentiality cannot always be guaranteed. (Recall the term "conditional confidentiality" in this context.) Most organizations will do their best to protect all parties' privacy during the investigatory phase.

It can be helpful for the responsible institutional officer to create a summary investigatory document containing a summary of the claim; initial expectations for the investigation, outcome, and time frame; an initial list of all interviewees and witnesses; and strong language on protections against retaliation.

The institution should identify and consistently utilize appropriate sanctions and remedies if a claim is substantiated, and be sure to provide the claimant with the outcome of the investigation—though not necessarily the details—of disciplinary actions, if taken.

Appendix C
Index of UW-Madison OED web site[10]
Sexual Harassment Home
(http://oed.wisc.edu/sexualharassment/index.html)

What is Sexual harassment?
(http://oed.wisc.edu/sexualharassment/what.html)

Tangible Action or Quid Pro Quo Harassment
(http://oed.wisc.edu/sexualharassment/what.html)

Hostile Environment
(http://oed.wisc.edu/sexualharassment/hostile.html)

What to do about sexual harassment?
(http://oed.wisc.edu/sexualharassment/table.html)
...if you feel you've been sexually harassed
...if you are accused of inappropriate conduct
...if you are in a position of authority
...if you are a colleague or peer

Expectations (if you are approached by someone who thinks he or she has been harassed)
(http://oed.wisc.edu/sexualharassment/expect.html)

Advice for conversations
(http://oed.wisc.edu/sexualharassment/guide.html)

Protection from retaliation (State and federal laws and university policy protect against retaliation.)
(http://oed.wisc.edu/sexualharassment/protect.html)

Consequences of sexual harassment and legal liability
http://oed.wisc.edu/sexualharassment/conse.html)
For the Individuals
For the University
Legal Liability

Campus policies
(http://oed.wisc.edu/sexualharassment/policy.html)

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Prohibited Harassment Policy
(http://secfac.wisc.edu/governance/legislation/Pages300-399.htm#303)

Sexual Harassment Policy for Classified Employees
(http://oed.wisc.edu/sexualharassment/sexharpol.html)
Consensual Relationship Policy
(http://oed.wisc.edu/sexualharassment/consent.html)
(distinct from harassment) Institutions should have a policy setting out the responsibilities of two individuals in a romantic and/or sexual relationship who have a reporting or evaluative relationship.

Campus resources
(http://oed.wisc.edu/sexualharassment/resource.html)

Information sessions[11]
(http://oed.wisc.edu/sexualharassment/info.html)
Goals & Outcomes
(http://oed.wisc.edu/sexualharassment/goals.html)
Brochure (a pdf file)
(http://oed.wisc.edu/sexualharassment/SexHarrBroV2.pdf)

Case Studies
(http://oed.wisc.edu/sexualharassment/case.html)
(a good way to learn about the complexity of harassment)
Vignettes (What's a Person to do?)
(http://oed.wisc.edu/sexualharassment/whats.html)
(This contains many more "cases.")

Safety and Sexual Assault
(http://oed.wisc.edu/sexualharassment/assault.html)

Appendix D
Two Case Studies and some vignettes[12]
Case One

Two students who work part-time in an office on campus are having trouble getting along in the office. Their supervisor interviews each of them. Both report that they used to be great friends and often went out for beer together after work. The male student asserts that the tension resulted from his rejection of the female student's sexual advances. He claims that ever since he rejected her, she has said nasty personal things to him and about him to other members of the office staff, creating a hostile work environment. The female student says that the tension resulted from the male student's condescending attitude and disrespect for her work. She claims that the other student belittles her and denigrates everything she does in the office.

Case One discussion questions: Put yourself in the position of the supervisor. Watch for "it depends," when analyzing these examples!
1. What might happen if you do nothing?
2. What could happen if you leave it to the two students to work out?
3. What should you do next?

Case Two

A professor and a research associate employed by the professor attend a professional meeting out of town and have a one-night sexual encounter. Both are in long-term relationships and agree that the affair will not continue when they return to campus.

Case Two discussion questions: Imagine you are the professor.

1. What should you do next? Why?
2. What if word of the event spreads throughout the lab and other members of the group complain that the research associate is getting preferential treatment?
3. What if, six months later, you decide to terminate the research associate's position?

We suggest you download the document of vignettes called "WHAT'S A PERSON TO DO?" from the UW-Madison website on Information Sessions. As you think about or discuss these, ask yourself: Is this harassment?; Who, if anyone, is in the wrong?; What should the recipient of the behavior, or the person consulted, do?

About the authors

Sheryl Bruff is the Branch Chief of Human Resources at Space Telescope Science Institute. Her email is bruff@stsci.edu. Bernice Durand is Emerita Professor of Physics and Emerita Vice Provost for Diversity and Climate at the University of Wisconsin-Madison. Her email is bdurand@wisc.edu. If you wish to send her anything, please email for her address, as she has left the university.

We wish to thank Dr. Dara Norman, NOAO, the AAS session organizer, and the CSWA and CSMA for co-sponsorship of the anti-harassment session; and Dr. Katy Garmany, editor of STATUS, for inviting us to turn our talks into prose.

Footnotes

[1]Anti-Harassment Policy for Meetings and Activities of the American Astronomical Society and Divisions

[2]From the AAUW report, Drawing the Line: Sexual Harassment on Campus © 2005; click on the title of the report in this footnote to upload it. See more in Appendix A.

[3]See Appendix B for more details about the history and legal aspects of harassment.

[4]For more on this see "Investigation of a claim of harassment" in Appendix B.

[5]Maureen "Mo" Bischof is the current contact person in the provost's office.

[6]Both Luis Piñero and Mo Bischof are willing to answer any questions we can't.

[7]In Appendix C we give the Index for the UW OED Sexual Harassment web site.

[8]See Appendix D for brief case studies.

[9]See the 2009 talk by Professor Abigail Stewart of the University of Michigan in Women in Astronomy and Space Science: Meeting the challenges of an increasingly diverse workforce (pp 51-61). The talk is also at Addressing Unconscious Bias .

[10]All UW-Madison material is used with permission from the administrators responsible for the policy development, dissemination, and enforcement.

[11]We suggest you download the case studies (see Appendix D) and vignettes.

[12]These were crafted from real-life cases, changed beyond recognition yet no doubt literally true somewhere!

'Women in Science' Groups as Instruments of Change

Meredith Danowski, Ph.D. Student
Department of Astronomy, Boston University

There are grants that need to be written, data that need to be analyzed, and courses that need to be taught. Juggling the every day work of science can be difficult, but it is often the tasks that fall outside the job description that cause the most stress. Maybe you're searching for childcare, eldercare, or healthcare. Maybe you watch laundry pile up next to the remnants of a long-lost hobby. Maybe you are experiencing a harassing work environment. It is in those moments of frustration and difficulty that we realize that we need friends, we need mentors, and we need a supportive community.

Organizations that support women in science often spring from such seeds—founded to ease the struggles of many by providing a support network. While diversity in departments has improved, unconscious bias is pervasive, leave policies are inconsistent or lacking, and the pipeline is still leaking. Women in Science, Technology, Engineering, and Mathematics (STEM) groups play a critical role in the scientific community, using mentoring, networking, and personal and professional development to bring about a new culture. They serve to change the system from the ground up, demonstrating that diversity breeds excellence and paving the way for even larger initiatives. There is still work to be done, so why not band together to build a community that strives to change the climate for modern day science?

Having had the fortune of being involved in the earliest stages of such organizations, I have blogged about my experiences at the Women in Astronomy blog (womeninastronomy.blogspot.com, http://womeninastronomy.blogspot.com/2011/01/women-in-stem-organizations-getting.html, http://womeninastronomy.blogspot.com/2011/02/getting-connected-engaging-your.html) and I hope to convince you to find some allies, get started, get involved, and to build your community.

Margaret Mead said, "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." It all starts with a few people in a room and a conversation. So invite some like-minded colleagues out for coffee to discuss institutional policies and issues you've encountered along your way. Determine if you have a critical mass of people who can devote the time necessary to getting things off the ground. Don't just look within your field. Broaden your vision to include women in other branches of science and engineering.

Once together, make a list of goals, priorities, and guiding principles—perhaps you want to tackle leave policies or hiring practices, start a mentoring group, or get people together for social outings. Write down your ideas, strategize, compile information, and organize a document. Do your research; find past examples of success and demonstrate how your organization supports the goals of the institution. Define the scope of your activities and outline the progress you expect to make. Meet with department chairs, deans, or directors to try to obtain start-up funding and to get them invested in your cause. Beyond asking for the financial support, invite these individuals to play an advisory role, providing ideas, contacts, and sharing administrative resources.

Regardless of the group's size or breadth of audience, fostering relationships with the broader community is crucial to ensure success and longevity. Work with other organizations and capitalize on existing programs to extend your resources. Reach beyond your institution and collaborate with wider networks. By sharing opportunities, you ease the workload, increase your membership, and broaden your impact.

Take time out to evaluate progress and seek feedback from your membership and any persons in advisory roles. Ask yourselves how well you are fulfilling your mission, and be prepared to change as the group grows. By measuring impact, it's easier to demonstrate success and keep people invested. Also, by building these partnerships and harnessing available resources, you can grow your research program as well, gaining

collaborators and honing the skills that promote effective research.

So while an initial, additional time commitment may seem daunting, being involved in a 'women in science' group presents unique opportunities for personal growth, professional advancement, and cultural change. Through these grassroots movements, we can demonstrate the benefits of diversity and begin to build a community truly invested in supporting science and scientists.

Leaders in Science and Engineering: The Women of MIT

Edmund Bertschinger, Department of Physics, MIT

This spring, as part of its 150th anniversary festivities, MIT hosted a major symposium on women in science and engineering. The conference, and an accompanying report on the status of women faculty in science and engineering, was conceived about 18 months earlier. I was fortunate to chair the organizing committee and to work with a remarkable group of colleagues to put together this celebration.

Why would one want to organize or attend a symposium on women in science and engineering? After all, women spoke at—and led—other symposia in the same series. One reason was to highlight the research accomplishments of a group of our star female faculty members en masse. Many people incorrectly assumed that this was another "women's conference" dealing with issues of narrow interest; consequently, the attendance was less than the speakers deserved. However, by the end of the conference the speakers and audience realized that we had accomplished something historic: we assembled a dream team of scientists and engineers who inspired everyone with the power their accomplishments *and every single research presentation was by a woman*. It was a treat to hear leaders of their fields give beautiful presentations in molecular biology, neuroscience, materials science, computer science, fluid dynamics, global ecology, gravitational physics, and more. The conference included the finest collection of talks spanning science and engineering – delivered by the greatest set of speakers—that I have ever witnessed at any conference, at MIT or elsewhere. Needless to say, there is no gender qualification in this statement. My reaction was not unique—many people told me afterwards how moved they were—especially the speakers themselves, who had never before had the experience of sharing the stage with such a star-studded group of female researchers. In short, although I didn't fully realize it when we began planning in 2009, a good reason to organize and attend such a symposium is that it vividly illustrates why women should enter science and engineering as a career.

A Celebration, With Caveats

Another reason to hold a symposium about women in science and engineering is to recall the historic impact of the 1999 publication of "A Study on the Status of Women Faculty in Science at MIT" and the later publication of similar reports in Engineering and other schools at MIT. Although women have been faculty members since the 1960s and 1970s, they have been discriminated against—even if unconsciously—during the following decades. In the mid-1990s, a courageous biologist, Nancy Hopkins, uncovered this subtle discrimination. An equally courageous Dean (Robert Birgeneau) and President (Charles Vest) recognized and took steps to correct this discrimination.

Their roles, and the impacts following their actions, were highlighted in speeches by Professor Hopkins, Dr. Vest, and Rensselaer Polytechnic Institute President Shirley Ann Jackson. Even broader historical perspectives were given by MIT historian Professor David Mindell and by the current MIT President, Susan Hockfield. These talks are a clarion call on why gender equity matters. As a male scientist and faculty leader, I was

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Leaders in Science and Engineering: The Women of MIT *continued*

especially moved by Dr. Vest's personal account of his transformation "from being part of the problem to being part of the solution." There are important lessons here for all academic leaders.

In preparation for the symposium, two committees of women faculty in science and engineering at MIT conducted interviews of women faculty members and prepared a new report on the status of women faculty in the schools of science and engineering. They chose to hear the stories of women—rather than analyzing surveys and other numerical data—because it was the compelling stories told by the women a decade ago that first revealed the problems of subtle discrimination and inspired efforts to solve them.

What were the problems, then and now? Professor Nancy Hopkins summarized the main ones in her opening keynote address: sexual harassment, the lack of mentoring, work-life balance, unconscious bias, and marginalization of women and their contributions. These are well-known to readers of Status. Professor Hopkins vividly illustrated these problems with her own experiences and those of her colleagues. I found her presentation compelling. It surprises me that some people are still unable to see the inequity in what she and other women scientists and engineers experience routinely. Would watching her presentation change some minds? I hope so, because my institution, and perhaps yours, includes members who insist that women face no inequity, they are less capable at the top ranks of achievement, and that they make the better choice to leave academia. An example of such marginalization was given in the new MIT report by faculty who report of women undergraduates being told by male peers that "you're here because of affirmative action." Leaders throughout our institutions must refute these claims and work to create an environment where respect for all members prevails.

Further examples of these problems and their impact on the pipeline of women in academia were given in the evening performance of *Truth Values*, a solo play performed by Gioia de Cari, who, after her experiences of discrimination and harassment as an MIT math graduate student in the 1980s became a successful actress and playwright. She gave two performances on the MIT campus, the second one being co-hosted by the Math department itself. The play is moving and educational, and the after-performance discussion between the audience and panelists illustrated the need for continuing efforts to eliminate gender bias and discrimination.

Despite the ongoing challenges, MIT women faculty are pleased with the progress that has been made in the past decade. This is made clear in the recently published report. Interviews were conducted in three groups: senior women who were interviewed for the previous reports, tenured women who were not interviewed a decade ago, and currently untenured women faculty. What do the women say? Typical remarks from each group are:

- "Who would have thought it possible in our lifetime?" – senior women
- "MIT is not warm and fuzzy, but enabling." – tenured women
- "This is a place full of energy and a great place to be junior." – junior women

The earlier problems of sexual harassment, a lack of mentoring, the difficulty of being a mother and a faculty member, and unconscious bias have been reduced by steps taken by the university in response to the previous reports. Formal mentoring of junior faculty is mandated; campus child care centers, tenure clock extension for childbirth, and faculty parental leave have been established; and implicit bias training of faculty search chairs and serious affirmative action reviews of all searches have been institutionalized. Moreover, the informal climate for women and minorities has improved significantly due, in part, to increasing numbers but also due to proactive, distributed leadership. In short, the efforts inspired by the heroic efforts of women faculty in the 1990s have transformed MIT into a much better place for women scientists and engineers. It is for all these reasons that one of the senior women gave the following subtitle to the recent symposium: "A Celebration—with Caveats".

The Need for Institutional Persistence

Two panels discussed ways in which universities can further advance the climate for and success of women in science and engineering. As Professor Hopkins noted and illustrated with historical data, it takes about the professional lifetime of a tenured faculty member—more than 30 years—to transform institutional culture. The panels provided valuable advice on how to extend recent gains.

First, an all-star panel, chaired by MIT Institute Professor Barbara Liskov, discussed "Effective Practices for Recruiting, Mentoring, Retention, and Leadership." Abigail Stewart (Distinguished University Professor, University of Michigan) discussed recruiting. Her work is well known through her leadership of the Michigan ADVANCE program and its STRIDE committee model (Strategies and Tactics for Recruiting to Improve Diversity and Excellence). Unfortunately, her MIT talk is not available on video. However, the slides of her plenary address on unconscious bias at the January, 2011 AAS Meeting are available at the CSWA website. Mildred Dresselhaus (MIT Institute Professor Emerita) is a famous mentor who shared not only her methods and observations, but also her own experience being mentored by several famous scientists. Lotte Bailyn (Professor of Management Emerita, MIT Sloan School) discussed retention of women and minorities, a topic she has studied professionally and in which she contributed to the National Academies report *Beyond Bias and Barriers*. She gave important advice to any department wanting to improve its climate and success in retaining faculty and highlighted the challenge of accommodating dual career couples. Cherry Murray (Dean of Engineering and Applied Science, Harvard) discussed leadership, which she has exemplified at Bell Laboratories, Lawrence Livermore National Laboratory, and now at Harvard. She stressed that leadership is a learned trait for which universities can and should do more to prepare students, postdocs, and faculty. The perspectives of all these speakers inspire great hope for the future of science and engineering, if we take their lessons to heart.

A second panel, chaired by MIT Dean of Science Marc Kastner, discussed "Shaping Policy in Academia and Across the Nation." Robert Birgeneau (Chancellor, UC Berkeley) showed how Berkeley has dramatically improved its family friendly policies to the great benefit of junior faculty, and he described a new academic program studying the social science of equity, inclusion, and diversity—the Haas Diversity Research Center. Heidi Hammel (Executive Vice President, AURA) illustrated the serious challenges of balancing family and career that affect research staff and others, not just faculty. The family-friendly policies adopted by universities need to be extended beyond faculty if they are to be fully effective in advancing women in science and engineering. Lisa Maatz (Director of Public Policy and Government Relations, American Association of University Women) described the role of AAUW in encouraging more girls to enter science and engineering and to improve the conditions for university women in these fields. The need for more accessible and affordable child care was a major theme throughout this session.

Conclusion

I took away two main lessons from this remarkably successful symposium and its associated report of women faculty. The first was the need to transform institutional cultures to eliminate the marginalization of any group. This cannot be done through policy changes alone but requires sustained leadership from deans and department heads. The second lesson was that the inspirational power of women scientists and engineers is amazing and exceeded all of our expectations. Buoyed by this symposium, we plan to create several short videos based on the presentations, including one aimed at middle-school girls encouraging them to pursue science and engineering careers.

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Introduction to Unconscious Bias

Joan T. Schmelz (University of Memphis) & Patricia Knezek (National Optical Astronomy Observatory)

We all have biases, and we are (for the most part) unaware of them. In general, men and women BOTH unconsciously devalue the contributions of women. This can have a detrimental effect on grant proposals, job applications, performance reviews, and ultimately opportunities for advancement.

It is important to note that unconscious bias is not discrimination. Discrimination is a conscious, unfair treatment of a person or group based on prejudice. Unconscious bias, on the other hand, is due to the fact that much of our social behavior is driven by learned stereotypes that operate automatically—and therefore unconsciously—when we interact with other people. The term stereotype often has a negative connotation, but in fact a stereotype is simply a mechanism for our minds to sort out and categorize the different types of people we meet into groups in order to help us determine how to interact with them. These groupings are known as schemas.

Schemas are non-conscious hypotheses. They are expectations or stereotypes that influence our judgments of others (*regardless of our own group*). For example, with regard to gender, we're not just talking about men judging women; we're also talking about women judging women. Men and women both downplay the contributions of women. With regard to race/ethnicity, we're not just talking about whites judging minorities; we're also talking about minorities judging minorities. Whites and minorities both downplay the contributions of minorities.

Schemas influence group members' expectations about how they will be judged. They allow efficient, if sometimes inaccurate, processing of information. They often conflict with consciously held or "explicit" attitudes. The good news is that they can change based on experience/exposure. See, e.g., Nosek, Banaji & Greenwald (2002); Fiske et al. (2002).

Schemas are applied more often under circumstances of: lack of critical mass; time pressure; stress from competing tasks; and ambiguity (Fiske 2002). Consider your typical Astronomy Department. Rarely is there a critical mass of women (30%), and everyone is under time pressure and has too much to do. And no one is likely to spend a lot of their time contemplating gender issues. We're not supposed to. We're scientists—we think about astronomy.

When do schemas affect evaluation outcomes? The short answer is all the time: resumes, job credentials, fellowship applications, hiring, award nominations, and promotions.

Steinpreis, Anders & Ritzke (1999) published a pioneering study on unconscious bias and gender. Panels composed of male and female university psychology professors were asked to evaluate application packages for either "Brian" or "Karen" and determine the candidate's suitability as an assistant professor. The panels preferred 2:1 to hire "Brian" over "Karen," even though the application packages were identical except for the name. When evaluating a more experienced record (at the point of promotion to tenure), the panel members expressed reservations four times more often when the name was female. So not only was unconscious bias operating, it got stronger with seniority. The study determined that unconscious bias would have a repeated negative effect on "Karen's" career.

Correll, Benard & Paik (2007) extended the study to mothers. Panels were asked to evaluate application packages that were identical except for one line in the CV: "Active in the PTA." Evaluators rated mothers as less competent and committed to paid work than non-mothers. Prospective employers called mothers back about half as often. Mothers were less likely to be recommended for hire, promotion, and management. Mothers were offered lower starting salaries. When a

similar study was done for fathers, however, the results were quite different. Fathers were not disadvantaged in the hiring process. They were seen as more committed to paid work and were offered higher starting salaries.

Critical mass affects the use of schemas. When there are many individuals, we differentiate among them and cannot rely on group-based schemas. In both experimental and field settings, increasing the female share of those being rated increased ratings of female applicants and employees. See, e.g., Heilman (1980); Sackettet et al. (1991); Valian (1998).

Any one slight may seem minor, but since small imbalances and disadvantages accrue, they can have major consequences in salary, promotion, prestige, and advancement to leadership positions (Merton 1948; 1968). According to Valian (1998), "Mountains are molehills piled one on top of the other."

What can we do about unconscious bias? First, we have to be aware it exists. Then we need to establish policies and put them into practice. Finally, there needs to be accountability. We can illustrate this process with an example: A Faculty Search Committee. How do we typically start a job search for a new faculty member? There are several standard steps: (1) the department chair forms a search committee; (2) the committee writes an ad targeting a specific sub-discipline; (3) the position is advertized; and (4) the committee members go about their business until the applications begin to pour in.

If you follow this standard practice, odds are that the racial and gender diversity of your applicant pool will look a lot like your current dept. If you want the pool to be more diverse, you have to work a bit harder. Your job will start even before the formation of the committee with a step zero: (0) recruitment of the applicant pool. Here are some pointers to consider during this all-important step zero: recruit proactively year-round; recruit from a wider range of institutions; recruit specifically for underrepresented groups; use "open searches" (broad vs. narrow job definitions); and if possible, advertize for multiple positions at once (cluster hiring).

When you begin your venture into active recruiting, make a conscious effort to widen the range of institutions from which you recruit. Consider candidates, including women and minorities, who may currently be thriving at less well-ranked institutions. They may be there because of factors that have nothing to do with scientific talent. Some examples might be early career decisions based on factors other than ranking of institution; past discrimination by top tier institutions; and the candidate's own internalization of schemas.

The composition of the search committee is extremely important. Since jury deliberations can be analogous to faculty search deliberations, we may want to take a lesson from studies of racial diversity in jury deliberations. Studies find that, compared with all-white juries, diverse juries deliberating about an African American defendant: took longer to discuss the case; mentioned more facts; made fewer inaccurate statements; left fewer inaccurate statements uncorrected, and discussed more race-related issues (Sommers 2006). The lesson here is that even though a critical mass might not be available, one woman or one person of color on the search committee can make a difference.

How do we typically continue a job search? (1) the search committee picks 'best' candidates; (2) applications sit in a file drawer in chair's office; (3) faculty are invited to browse through the files; (4) 'best' candidates are then invited to campus. This is the easiest, least painful way to go through this process. Efforts may be made to avoid conscious bias and prejudice, but opportunities abound for *unconscious bias* to dominate the selection.

The University of Michigan ADVANCE program has come up with a "Candidate Evaluation Tool," which is available on their web site:

http://umich.edu/%7Eadvproj/CandidateEvaluationTool.doc

Their advice is to focus on multiple specific criteria during the evaluation process. This includes decreasing the ambiguity of the criteria for the job. Specify in as much detail as possible how the committee will evaluate scholarly productivity, research funding, teaching ability, fit with the department's priorities, etc. before any applications are examined. When discussing candidates, the committee should weigh judgments that reflect examination of all materials. The committee must also weigh evidence consistently and avoid global judgments (see Bauer & Baltes 2002).

The committee must also be aware that the letters of recommendation will suffer from unconscious bias. Trix

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Introduction to Unconscious Bias *continued*

& Psenka (2003) examined letters of recommendation for successful medical school faculty applicants. They found that the letters for men were longer and contained more references to the CV, publications, patients, and colleagues. The letters for women were shorter and contained more references to personal life. There were also more "doubt raisers" (hedges, faint praise, and irrelevancies). Some examples:

"It's amazing how much she's accomplished."
"It appears her health is stable."
"She is close to my wife."

How should the committee evaluate candidates? (1) Set criteria before looking at applications; (2) evaluate all applications based on the same criteria; (3) all candidates that meet the criteria become part of the "long short list;" (4) all long short list candidates get phone interviews.

Overcoming unconscious bias in the job search takes work and dedication, but the results are well worth the effort. Every department wants the most talented, accomplished, and successful faculty possible. We do not want to erect barriers that discourage or eliminate gifted and capable candidates. After all, excellence has no gender or race or sexual orientation.

The authors wish to thank Abigail Stewart from the University of Michigan for sharing her powerpoint slides, references, and expertise on this subject.

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Book Review

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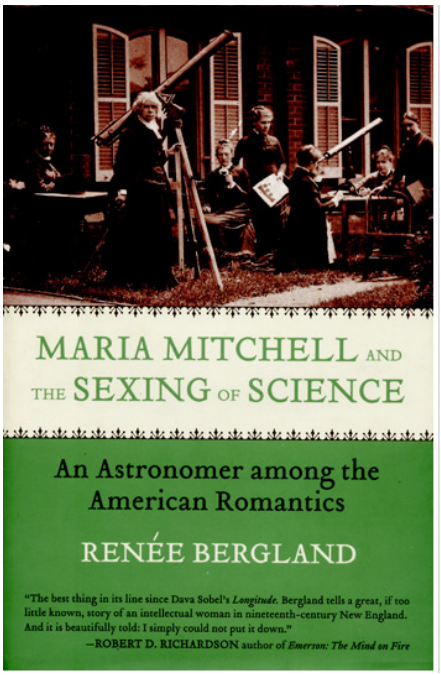
Maria Mitchell and the Sexing of Science: An Astronomer among the American Romantics by Renée Bergland Boston: Beacon Press 2008

Set against the backdrop of the rapid advancement of 19th century science, the Civil War, industrialization of the US economy, and the rise of American intellectualism, Maria Mitchell and the Sexing of Science was a fascinating read for me as woman, scientist and educator.

Much was in flux in the early to mid-nineteenth century, and Mitchell struggled continuously with her exceptionally public role as the premier woman scientist of her age. At the same time, she was one of the last generation of women who came of age between the American Revolution and the late 19th century, when science was considered a fitting pursuit for women, even more so than for men. Tragically, she lived to see the beginnings



of the "scientific antifeminist" movement that prevailed into the mid 20th century, and the last part of the book is sobering. Her struggles with internal and external conflicts, including religion and science, domesticity and occupation, research and teaching and public and private life, are central themes of the book. Maria Mitchell and the Sexing of Science chronicles the myriad public and private struggles Mitchell encountered in her lifetime, chief among them trying to find her place as a professional scientist in an era with very few exemplars of either gender.

During this time, America was still considered a colonial backwater, and American science was virtually unknown to the international scientific community. Mitchell became the first internationally recognized American scientist when she received a medal from the Danish king following her discovery of what was later known as "Miss Mitchell's comet" in 1847. Mitchell is remembered both as a pioneer of American science and as a forerunner of the women's education movement.

The book was clearly meticulously researched, and I found the historical backdrop and the portrait of an early American intellectual almost as interesting as the revelations about the place of women in scientific history. From Mitchell's summer in Florence with Nathaniel and Sophia Hawthorne to her close personal friendships with many of the early crusaders for women's rights, Mitchell's life was fascinating as much for its well-roundedness as for its place in the history of science. The book is full of quotations from literature and poetry (even some composed by Mitchell herself), snippets from personal correspondence and asides about the intellectual, social, political and scientific climate of the time. It tells the refreshing tale of an era when science and the humanities were not so separate as they are now.

Maria Mitchell and the Sexing of Science is, however, fundamentally a book about the "sexing of science" and how it came to be. The contributions of Darwin, Joule, Maxwell and others to 19th century science, and even to some extent the earlier contributions of Galileo, Kepler and Newton, transformed science from a fundamentally amateur, purely observational, and completely orderly scholarly pursuit into an increasingly theoretical, wholly revolutionary and necessarily professional one. As scholars in Europe and America crusaded for the professionalization of science, their rhetoric, perhaps unwittingly, also resulted in the masculinization of science.

Timing was also of particular issue for the downfall of American women's science. In a generation in which the male population had been decimated by the Civil War, the nascent women's education movement was embraced as a source of skilled workers, and Mitchell got in on the ground floor as one of the first female professors and perhaps the first professor of any gender to develop a truly mathematically and scientifically rigorous astrophysics curriculum. At the time, science was taught primarily at women's schools and seminaries, while men's colleges focused on the humanities. However, the transition to nearly a century of scientific anti-feminism, beginning with the graduation of the first generation of boys too young to fight in the war, was rapid and devastating. Despite consciously devoting the latter half of her life to educating and training true women scientists, she lived to see the day when women were demoted from "scientists" (which, ironically, was a word coined to describe Mary Sommerville in the first place) to "technicians", "assistants" and "computers". In fact, one of Mitchell's students went on to become one of Edward Charles Pickering's woman "computers" at the Harvard College Observatory, putting "kilo girl hours" into the cataloging of variable stars while reminiscing in her personal writings about her days at the Vassar College Observatory completing true scientific inquiry under Maria Mitchell's guidance.

Mitchell is touted with many firsts, chief among them becoming the first president of the American Association for the Advancement of Women and the first woman elected to the American Academy of Arts and Sciences. However, a rapid reversal of attitudes towards women's roles in general and their place in science in particular, meant that half a century passed before women were granted the right to vote and nearly a century before the next woman was elected to the American Academy of Arts and Sciences. She witnessed the beginnings of this reversal in the last decade of her life and was deeply saddened by it.

Mitchell's memory suffered the further indignity of posthumous domestication - done benevolently, with the intention of preserving her reputation in an era when the lady scientist was considered unnatural and even dangerous, but objectionable nonetheless. It would undoubtedly have been upsetting to Mitchell, who had a well-documented aversion to sewing, to be pictured as a pillar of womanly domesticity, crocheting in her telescope dome while carrying on a conversation with students.

Every woman astronomer should read this book if for no other reason than because women scientists encounter many of the same struggles today as Maria Mitchell did 150 years ago. Although she didn't serve as the role model she would have liked for many of her students, who were discouraged from becoming professional scientists, she certainly can be one to today's astronomers.