EOS Earth & Space Science News

A PUBLICATION OF AGU American Geophysical Union

EDUCATION Opinion

March 1, 2016

Creating Local Support Networks for Graduate Student Women

Regional groups can help advance the careers of women in science and combat the biases and policies that continue to drive them from the field.

By Katherine B. Lininger, Rosemary Records, Erika May Smull, and Christine Wehner

Graduate students Annette Patton (Colorado State University) and Claire Lukens (University of Wyoming) collect rock samples for beryllium-10 radionuclide analysis. Credit: Sara Rathburn

Women remain underrepresented in the science, technology, engineering, and math (STEM) workforce inside and outside of academia [National Science Foundation, 2015]. We are women graduate students in STEM, and we have seen our female colleagues drop out of STEM fields during and just after graduate school, creating leaks in the pipeline toward academic and nonacademic jobs.

Although gender bias exists at all levels in academia, specific biases hurt women graduate students in particular. As trainees, women graduate students are more likely to experience sexual harassment and assault in the field [Clancy et al., 2014], and women graduate students have been the targets of recently publicized sexual harassment by professors at universities across the country [Marín-Spiotta et al., 2016].

Students tend to rate male assistant instructors more highly than female assistant instructors regardless of abilities [MacNell et al., 2015], and letters of recommendation for female students may be more likely to contain inappropriate and inapplicable information, such as personality descriptors as opposed to skill and intelligence level [McNutt, 2015]. Male and female faculty members also exhibit hiring biases against female applicants for positions such as lab managers [Moss-Racusin et al., 2012].

Because we feel strongly that issues for women and other underrepresented groups in STEM should be addressed, we established the Northern Colorado chapter of Graduate Women in Science Science (GWIS) in fall 2014. Our organization's goal is to promote women of all ages and backgrounds in STEM fields through community support, professional networking, and mentoring opportunities. We wish to share what we have learned, which is particular to graduate student women but is applicable to STEM women at all levels.

In our first year, we organized panels on women in scientific careers and networking (some cosponsored by the American Geophysical Union Hydrology section),

held social events, and advocated for paid parental leave for graduate student employees at our institution. Through our activities, we learned to help one another become more confident in our career paths and more aware of the biases we currently face and may encounter in the future. Here we provide our perspective on issues facing many graduate women in STEM and describe some strategies to overcome barriers to success.

Feeling Like Impostors

Despite the successes of our group members, as we engaged in activities, it became clear that many of us lacked confidence and sometimes felt like impostors in our fields. All graduate students can experience feelings of inadequacy, but women and other underrepresented groups may feel this more strongly. Women tend to lack confidence in their abilities, at times attributing their success to luck instead of taking ownership of their successes (as summarized in Kay and Shipman [2014]).

In addition, women and underrepresented groups are disproportionately affected by negative talk in academia [Twale and De Luca, 2008], such as unnecessarily harsh criticism of a graduate student's research. We heard these perspectives and experiences from panelists—successful women well established in STEM careers—and group members.

Striking a Professional-Personal Balance

Panelists and group members also expressed concerns about professional-personal balance in graduate school and professional arenas.

Some in our group plan to move on to jobs in academia, whereas others seek careers in government, nonprofit organizations, or the private sector. For those with academic aspirations, getting tenure while starting a family is particularly concerning. However, many of our group members and panelists discussed the difficulty of balancing children and professional success regardless of which path they took, or hoped to take, in their careers.

> *"Through our activities, we learned to help one another become more confident in our career paths and more aware of the biases we currently face and may encounter in the future."*

Several of the STEM women we hosted for our panels noted that they didn't realize what their options were for professional-personal balance before they began their careers. They described successfully negotiating and asking for what they needed from an employer or department (e.g., working from home 1 day a week), resulting in a better balance between their personal and professional lives.

The lesson is clear: Let's not take ourselves out of the game too early. If we aspire to careers as field or lab scientists at competitive research institutions or at government agencies but know that we hope to have families, we shouldn't give up too early on either—we won't know what is possible unless we try. As highlighted in many recent discussions in the news and online, many people, regardless of gender, are concerned about having families or full personal lives, with or without children, while working. Although we recognize that social norms and institutional policies need to change to create work environments that promote balance and support for everyone, we can all actively advocate for positive changes from within science organizations and institutions.

Our group has tried to practice support for professional-personal balance in informal ways through conversations with each other. We are also formally advocating for paid parental leave for all graduate student employees at Colorado State University, where most of our members are graduate students. Similar university-wide policies providing 6–8 weeks of paid parental leave have been implemented at many institutions across the country, including some of our university's peer institutions (Michigan State University, North Carolina State University, University of California, Davis, and others). We have started a necessary conversation about this issue on our campus, and we hope that a policy will be implemented within the coming year.

Taking Ownership of Our Successes

We are learning to help each other take ownership of our successes and identify ways to internally challenge feelings of inadequacy. This can take the form of recognizing and questioning situations in which we are irrationally undercutting ourselves or others. These feelings are common when considering our prospects for a particular job interview or prior doctoral qualifying exams, class tests, and conference presentations.

We find it helpful to remind our colleagues and peers that when they experience these unjustified feelings, they should challenge the feelings internally. Strategies include pointing out to these peers when they are attributing their success solely to luck as opposed to luck and abilities.

We also find that we can facilitate taking ownership of our successes by shifting focus from "How can I be enough?" to "What do I need in order to succeed, and how can I create the outcomes that I believe in?" Seeking out the resources we need for success —a new and supportive committee member, a new or altered component to a dissertation, or perhaps even a change in career—redirects the energy from critiquing ourselves into getting the necessary support to engage fully in our communities and disciplines.

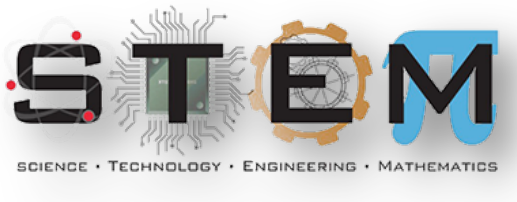
Strong Mentorship to Advance Our Careers

In our discussions, we also focus on the benefits of strong and positive mentorship. Our panelists have pointed out that sometimes the best mentors are those who is only a year or two ahead of us in graduate school because they remember clearly what it is like to be in our position. Studies and initiatives on mentoring for women in STEM fields are gaining momentum—such as Colorado State University's recently launched recruitment and retention research [Rolston, 2014] and the organization Million Women Mentors.

Regardless of where our mentors are in their careers, we shouldn't be afraid to seek out additional mentors, even in different departments or professions. We can have mentors for different aspects of our work such as seeking professional-personal balance or for obtaining proposal funding. We should learn to take our mentoring needs seriously rather than telling ourselves that we need to "toughen up" or learn to live with our situation.

Addressing Underrepresentation in STEM

Women graduate students in STEM are at a unique and decisive point in their careers. Our Northern Colorado GWIS chapter has become a support network for helping each other in times of need, regardless of what that need might be. We help each other learn new professional skills, advance our research, get through stressful or uncomfortable fieldwork situations, and manage difficult professional relationships.



Many of us are members of online networks that aim to support women in science, such as the excellent Earth Science Women's Network (ESWN). ESWN and the Association for Women Geoscientists hosted a town hall meeting at AGU's 2015 Fall Meeting to discuss the role of scientific societies in addressing sexual harassment [Marín-Spiotta et al., 2016]. However, having a local support network with face-to-face events and interactions is extremely beneficial. Our local group can also forge face-to-face connections in our region and elsewhere, for example, by cohosting events with the AGU Hydrology section at the AGU Fall Meeting.

Diversity in science is important for the sake of social justice and equal opportunity, and we also recognize the value that diversity in race, gender, ethnicity, and other aspects can bring to the advancement of science. Without this diversity of perspective, science is missing out on the unique contributions that different groups can provide. For example, the presence of women in a group greatly improves group collaboration, which is increasingly important to scientific innovation [Bear and Woolley, 2011]. Women scientists perform more interdisciplinary collaborations compared to male scientists [van Rijnsoever and Hessels, 2011].

Furthermore, women in leadership positions can act as mentors for students who are interested in pursuing STEM careers, thus increasing the diversity of future research. The support, mentorship, and collaboration provided by groups such as ours can improve the campus environment for STEM women. We believe that if others also start conversations about supportive environments in the workplace, we can move one step closer to a time when gender does not influence career success.

In March of 2016, ESWN Board Member Erika Marin-Spiotta co-authored an Opinion Piece in EOS about the role of scientific societies in addressing sexual harassment following a town hall at the AGU Fall Meeting, which ESWN helped organize.