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## We Are GWIS, all of us

#### Hello STEM Community!

 $oldsymbol{\mathsf{W}}$ e are the UMass Amherst Graduate Women in STEM (GWIS): a volunteer organization run by graduate students with a solution-minded approach to the problem of gender equality in the academic and professional environment. Our organization was founded in response to a university-wide call-to-arms put forth by the College of Natural Sciences' Women in Science initiative, and we are proud to have nearly quadrupled in both leadership and membership since this time last year. The collective expertise of our executive board and five organizing committees spans a majority of disciplines in the colleges of natural sciences and engineering. We aspire to soon have all disciplines represented, as the talents and challenges experienced by women pursuing these disciplines are as many and as varied as they are. In addition to being jointly funded by the Graduate School, College of Engineering, College of Natural Sciences and Women for UMass Fund, we also enjoy productive partnerships with the Graduate School's Office of Professional Development and organizations like Girls Inc. and the Massachusetts Academy of Sciences, which both support and inspire us. Together, we will continue working towards the goals in our mission statement, and endeavor to be as valuable a resource to the STEM community as our sponsors and collaborators are to us.

We are moved by the emphatically positive response of the graduate community to the efforts we've put forward; however, you may be surprised to discover that the most influential efforts regarding the establishment and success of our organization have occurred outside of your awareness. You may have noticed that while most of us agree philosophically on the benefits of increasing diversity, not many people often comment on the considerable effort required to successfully create

"Nature creates diversity because it is necessary for survival; it is essential to science, as science is the study of nature..."

and maintain healthy and productive relationships within groups of diverse people. Nature creates diversity because it is necessary for survival; it is essential to science, as science is the study of nature. Diversity is necessary for the change that GWIS is trying to incite. Interactions with diverse groups of people offer us access to the many different versions of academic and social success that exist all around us, thereby illuminating new possibilities for all of us. We have at our disposal a network full of experience and examples and all the talents we could hope to learn; we simply must make an effort to wander out of our comfort zones and find space in our own world-views for new ways of thinking.

The benefits for everyone are clear, but herein lies the rub: it is up to us—the entire STEM community—to create an environment in which diversity can persist. Given that we're creatures of habit, we cannot expect the necessary change in our mindset to occur spontaneously. To effect this cultural change, we must deliberately un-plant our feet from our deep-set philosophies and decide it is time to move forward. Many endeavors are focused on introducing diversity into our community, but if we continue to meet them with closed minds we will surely undermine them. We also cannot

"We also cannot expect to be passive bystanders in this process; injustice only thrives in the presence of apathy..."

expect to be passive bystanders in this process; injustice only thrives in the presence of apathy. The things we are asking of ourselves and of you are not easy things to do, but we assure you that they are necessary and that they are our responsibility. The efforts made within the GWIS executive board to embrace our diversity have meant the difference between success and failure: the ability to adapt to changing circumstances, view situations from

multiple angles, understand things more deeply, and expand our influence to help many different types of people. The paths to success are many, and it will be our privilege to share our newfound respect and admiration for the potential contained in a collection of diverse perspectives with you.

 $oldsymbol{W}$ e are so proud to have come this far in just one year. We can now look back at the last year and say that we have learned some very important lessons. The first is that inequality is a cultural phenomenon: one that we must fight within in our communities. The second is that we are not immune to the culture in which we are immersed. We have learned, however, the importance of trusting each other and ourselves, and recognizing our achievements while we're striving for improvement. We now understand that even with the impressive and focused force of determination put forth by our leaders, fundamentally realigning the system is no easy task. These lessons confront our social understanding and are therefore met with resistance because they are uncomfortable for us, but we have come to recognize this discomfort as an indication that we are growing, and to appreciate it. We're officially asking you to do the same. Balancing the aspirations of the organization with the demands of classes, research, and life are challenges each of us faces, but the urgent nature of this organization's purpose compels us to meet these challenges.

You've seen us around, but we thought it time to properly introduce ourselves. We are GWIS, all of us, and we plan on being here for each other and for you for as long as there is room for improvement in the academic and professional atmosphere. Whoever you are, and

It's nice to meet you!

-Joelle A. Labastide

Communications Chair

GWIS**Quarterly** Editor

however you think, there is room for you here.

Stop by and talk to us, or #SoundOFF and see your anonymous reply in next quarter's newsletter.

#### The GWIS Mission Statement

The UMass Amherst Graduate Women In STEM organization is committed to the professional and personal advancement of women pursuing careers in STEM and related fields. By encouraging successful scientific research strategies and practices, developing professional networking skills and supporting the integration of career with personal goals, we seek to empower women to achieve academic and professional excellence. We embrace an inclusive and diverse membership in order to enhance the participation and recognition of women in STEM, catalyze change in the professional climate, and inspire the success of future generations of STEM professionals.

The UMass GWIS organization will fulfill this mission by sponsoring 1) professional development events, 2) networking workshops, 3) seminars, and by 4) engaging the community in science, and 5) acting as mentors to current and future scientists and engineers.

# GWIS: getting it done. an organizational overview

GWIS is committed to the professional and personal advancement of women pursuing careers in STEM and related fields. We empower women to achieve academic and professional excellence by encouraging successful scientific research strategies and practices, developing professional networking skills, and supporting the integration of career with personal goals. We embrace an inclusive and diverse membership to enhance the participation and recognition of women in STEM, catalyze change in the professional climate, and inspire future generations of STEM professionals.

 $oldsymbol{\mathsf{W}}$ e attain our goals through initiatives across outreach, mentoring, professional development, communications, and finance, taking full advantage of the wide range of expertise on our executive board. The GWIS committees have been designed to tackle various facets of our mission, each supporting the others. Each committee is led by a chair and sometimes several deputy chairs; each has its permanent members, and will call for volunteers to help with specific efforts and events. The five committee chairs and two executive co-chairs constitute our member-elected executive board. You can read their bios on the leadership page of our website (www.blogs.umass.edu/gwis).

inside the organization...

The Outreach Committee strives to engage the greater Pioneer Valley community in our efforts to change the face and future of STEM.

We work to meet this goal through a series of initiatives that involve young women in the surrounding towns and cities, with a focus on communities in which high school students have lower college matriculation rates. Currently, these initiatives include developing relationships with local non-profit student education organizations, going into the classroom and teaching hands-on STEM workshops, and developing our own portfolio of STEM inquiry-based workshops that we can bring into the classroom. We have active collaborations with Girls, Inc. in Holyoke and the Massachusetts Academy of Sciences, and we are currently exploring new collaborations with additional organizations. We are working to improve the visibility of, and access to, female STEM academics and professionals who can become diverse and relatable role models for the next generation of potential STEM students.

To read more about the current state and promising future of GWIS Outreach, check out the spotlight piece on page five.

The focus of our Professional Development Committee is to provide graduate students with opportunities to develop and practice important skills for academic and professional advancement.

GWIS Professional Development is responsible for initiating, planning, and executing networking events and professional development workshops for our members and the graduate community. We collaborate frequently with the Graduate School's Office of Professional Development to design and co-sponsor programming. This past semester, we collaborated on career path seminars aimed at giving STEM students a view of careers in a wide variety of fields. A new and exciting initiative is the GWIS Situation Room. Situation Rooms are interactive workshops designed specifically to help hone public speaking, interview and scientific conversation skills that many graduate students find daunting. We create a situation that you describe - complete with characters - and provide the unique opportunity to practice navigating it with no adverse consequences. At the end, the workshop speakers receive valuable feedback from faculty and peers about their performance in these difficult situations. We believe that the time to find out how you handle your worst-case situation is long before it really happens!

mentoring

Many studies have shown mentoring from experienced professionals or among peers to be an effective technique for retaining women in STEM fields.

Our two major mentoring initiatives are peer mentoring groups and faculty-student luncheons. Both are very popular among GWIS members. The peer mentoring program pre-dates the creation of GWIS, but was adopted as a GWIS initiative when the program's founder served on the GWIS executive board. Our peer mentoring groups were inspired by the book Every Other Thursday: Stories and Strategies from Successful Women Scientists by Ellen Daniell. The book highlights the importance of having formal or informal peer mentors who can help us process common yet difficult moments in our professional lives, such as giving an important presentation, coping with demanding workloads, or finding a healthy worklife balance. Our faculty-student luncheon initiative launched in the fall of 2013. These luncheons provide an informal way for members to converse and cultivate relationships with some of UMass's own female STEM faculty. We are excited to be hosting two luncheons during the spring of 2014.

Read more about the importance and complexity of the mentoring relationship in our spotlight piece on page seven.

communications

Communications is an important yet underemphasized aspect of graduate education in STEM disciplines.

Today's world of team-based projects and media interfacing calls for STEM students to be expert at communicating with colleagues and community members who have varied skill sets and levels of understanding. The Communications Committee affords valuable opportunities for the development and practice of important skills in visual, written and verbal communications. It provides a medium for artistic or design work and a chance to develop new technological and software skills. The Communications Committee is responsible for informing GWIS members and the larger UMass community about the mission of GWIS, our programs and special events. We support the organization by designing and maintaining the GWIS website and Facebook page. We encourage graduate students to participate in GWIS workshops and become active in the GWIS organization. You have probably seen our event announcements and reminders, and occasional broadcast emails to all graduate students. We prepare GQM, the GWIS Quarterly Magazine, including the choice of theme, writing, editing, and layout.

The GWIS Finance Committee is responsible for writing grants, managing GWIS accounts, establishing a budget, and appropriately allocating funds for committees and organization-wide events.

The Finance Committee helps negotiate funding from three UMass sponsors: the College of Natural Sciences, the College of Engineering, and the Graduate School. Their generous support provides most of GWIS's budget. We also write proposals for grants from organizations outside the University. GWIS recently won support for professional development programming from the Women for UMass Amherst fund. Many graduate students in STEM are able to complete their degree program without ever needing to submit a grant proposal or a fellowship application. However, this good fortune becomes a handicap for a junior faculty member who has to organize a lab, manage resources, and pay students and staff. Most graduate degree programs offer no formal training in these indispensable skills. The GWIS Finance Committee gives its members experience with preparing budgets, researching grant opportunities, and presenting proposals to both internal and external funding sources.

GWIS has many initiatives and offers many avenues and levels of commitment. Since the main focus of our organization is development and advancement, you do not need to have any specific skills before you join a committee. We welcome all people looking to practice and gain new skills and expertise, so look out for your opportunity to get involved!

# GraduateWomen Reaching out

based on an interview with outgoing Outreach Committee Chair, Katie Maher, Ph.D.

#### Edited by Rachel Striker Koh

The mission of the Outreach Committee is to share our enthusiasm for science by encouraging civic science education within the community and especially among K-12 students. Through our community- and classroom-based initiatives, we hope not only to inspire a new generation of scientists, engineers, and mathematicians, but also to present ourselves as strong female leaders in STEM, encouraging equality and diversity in STEM professions.

GWIS Outreach today

Pursuing our mission, we have developed relationships with local non-profit student education organizations and have gone into the classroom to teach hands-on STEM workshops. We are currently developing our own portfolio of STEM inquiry-based workshops that we can bring into K-12 classrooms in the near future. In the past six months, we have brought our workshops to students enrolled in programs with both the Massachusetts Academy of Sciences and Girls Inc. of Holyoke.

Our work with Girls Inc. is part of the larger collaboration between the UMass College of Natural Sciences and the Girls Inc. Eureka! program. Eureka! is a 4-week program that brings several groups of rising 8th grade girls to the UMass campus for a full day of activities. This past summer, their curriculum included STEM workshops taught by UMass faculty, staff, and students, fitness at the campus fitness center, health and nutrition education, and life skills. GWIS taught a STEM workshop with the girls where we used chemistry to make our own solar cells to generate electrical energy from sunlight, and then fabricated our own electrical circuit board games from cardboard christmas lights and a battery. This May, we will be hosting another workshop in one of the UMass biochemistry labs





where we will test the quality of the town drinking water, employing chemical assays often used by professionals to continuously monitor the potability of our water.

In collaboration with the Massachusetts Academy of Sciences, we recently taught a workshop at a Holyoke public school as part of their ongoing after-school program called E-STEM. We guided the students through the process of extracting DNA from several different sources, while they tested their own hypotheses about the quantity, color, and similarity of the various DNA samples. The students were highly engaged, and we were very excited to watch them as they discovered the scientific process.

These workshops have been the most collaborative, energizing, and fun part of the Outreach Committee's accomplishments so far. The workshop topics span all of STEM, including environmental engineering, biology, behavioral sciences, forensic science, electrical engineering, and chemistry. As we develop relationships with more schools and students, we are expanding our repertoire of workshops and exploring new ideas.

#### What's next for Outreach

 ${\sf T}$ hrough collaborations with Girls Inc. and the Massachusetts Academy of Sciences, we are well connected to the schools and students in Holyoke. This spring, we plan to expand our work to the Springfield area! With the help of Graduate Dean John McCarthy and Shana Passonno of the Graduate School's Office of Professional Development, we have been able to establish a collaboration with the Baystate Academy, a new charter school focused on STEM education in Springfield. We expect to begin our work with them in the We have also initiated a virtual mentoring program with Girls Inc. This program will use web and mobile-based media to connect young Eureka! participants with GWIS members who can project their interest in cool scientific concepts, share science-related media, encourage academic success and creativity, and cultivate long-term relationships with the girls.





Many of GWIS's other efforts are focused inward on encouraging our members to be stronger and more successful STEM professionals. The Outreach Committee focuses its efforts on the community beyond our own GWIS members. In order to future-proof the changes we're trying to effect within our graduate STEM community, we are working to make changes outside the University. Changing the face and future of STEM requires a concerted effort on our part. We need to empower the next generation of STEM students, both boys and girls, to pursue these challenging fields. We want everyone to be comfortable with the idea of diversity in STEM from a young age, so that they implicitly understand that such diversity will only strengthen and never detract from our academic and professional potential.

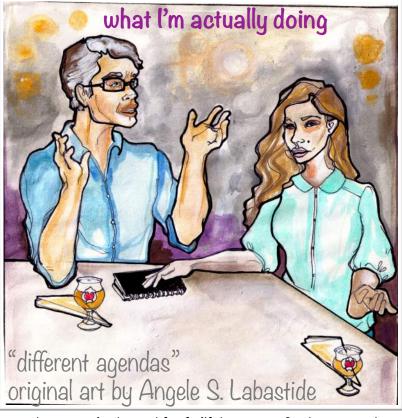
# Mentoring: it's not what you think! SEVEN

Written by the Communications Editorial Board

With input from Jessica McIver, Executive Co-chair and Lily Jeznach, Mentoring Chair

A lady grad student walks into a bar. It's the end of a scientific conference and the attendees are making the most of the last night before heading home in the morning. This particular lady grad has just received important, confidential news regarding her research and needs to make a decision about the next stage in her career. She finds an older mentor figure from whom she has been asking advice for more than a year, and suggests they find a quiet corner to talk. He gives her a dubious look, asks "A quiet corner? What would your boyfriend think?" and insists they speak within earshot of the crowd or not at all. Shocked and a little angry, she leaves the bar without advice.





 ${f S}$ ound familiar? This true story about a female STEM graduate student is just one example of the damaging consequences of the assumed sexual nature of crossgender relationships. There is a recognized cultural tendency to suppose that when two people of the opposite gender (particularly male authority figures and female juniors) are having a private conversation in an unstructured setting that something inappropriate or scandalous is in progress. Given that this stigma is strong enough to disrupt even well established mentor-mentee relationships, it's natural to wonder how many female scientists avoid cultivating such relationships with potential advisors for this reason.

The careers of all young scientists benefit greatly from mentors; mentoring is a natural and necessary component of education. The combination of formal and informal advice, encouragement, and access to expertise has been proven to reduce attrition rates and

act as a springboard for fruitful careers. Such encounters often involve the casual exchange of information, whether it is a senior lab-member giving advice during lunch about how to supervise undergraduates, a peer recommendation over Friday night drinks about travel funding sources, or the guidance given by a professor in the mailroom about navigating the job market. These informal forms of mentoring often lead to productive, lifelong relationships, and are also the most difficult for women in particular to acquire and maintain. It is not surprising, then, that the gender ratio becomes more pronounced at high level positions in both industry and academia.

The obvious solution to the problem of unequal access to informal mentors is to de-stigmatize the underlying interactions, but the sexualized view of these relationships is a deep-set cultural problem and is not easily resolved. Don't get us wrong, this needs to happen; however, a more immediately attainable solution is to have a higher

concentration of relatable role models for women. A 1994 study investigated 30 academic departments in five STEM disciplines<sup>1</sup>, comparing departments that were relatively successful in graduating female PhDs to those that had not been. Researchers found that the minimum critical mass of female faculty per department that encouraged retention and career growth of female graduate students to be 15-30 percent.

**W**hile critical mass is, well, critical, it is not sufficient. The willingness of senior faculty members to provide support and dedicate time to their mentees is equally important. The first step towards becoming a good mentor is reaching out to students. Giving equal access to all students (even in the bar, at dinner, or other social settings) and encouraging colleagues to do the same sets an important example. A little bit of social engineering by departments and advisors goes a long way. This can mean setting up inter-departmental support networks, hosting departmental social events, and encouraging students to make use of the resources available to them, like the Graduate Women in STEM, Graduate Women's Network, Graduate Student Senate [links to all of these in e-issue], and any departmental programs.

Female graduate students need adequate mentorship in order to decrease attrition rates at crucial career transition points, but in order to truly equalize the STEM gender ratios we need to get to the point where we can have productive cross-gender mentorships of both kinds. Students look to the faculty for cues on how to act and what is 'normal' in academia. Therefore, the focus shouldn't solely be on mentoring junior women: it is equally essential for senior women to serve as role models for male students because this may positively influence the way young men view female colleagues and authority figures. Mentors and mentees of both genders should be mindful of the fact that they set the tone of the relationship, and resolve to remain relaxed while maintaining the appropriate level of formality.

"Students look to the faculty for cues on how to act and what is 'normal' in academia..."

As graduate women, we need to be more proactive about making connections and building our mentoring networks. By supporting one another and those in earlier stages of their careers through challenging career transitions, we can reduce attrition rates. We have to make time to be social with peers, senior scientists, and other colleagues. We must overcome our hesitation to ask for advice and guidance, even when we are not stuck. When we are stuck, we must understand that

asking for help doesn't detract from our competence or our independence. Everyone needs advice sometimes, whether it's on how to approach a big presentation, coping with demanding workloads, navigating the next stage in a career, or finding a healthy work-life balance. We are students, after all.

Most people have much wider mentoring networks than they realize. Mentors are just colleagues that can answer questions and discuss ideas. The classic notion of relying on 'my mentor' - one senior person - for all questions and informal guidance is impractical for both parties. We all benefit from seeking out different perspectives and types of mentoring throughout our careers, which will maximize our options to learn about organizational culture, expectations, and opportunities for advancement<sup>2</sup>.

"The classic notion of relying on 'my mentor'
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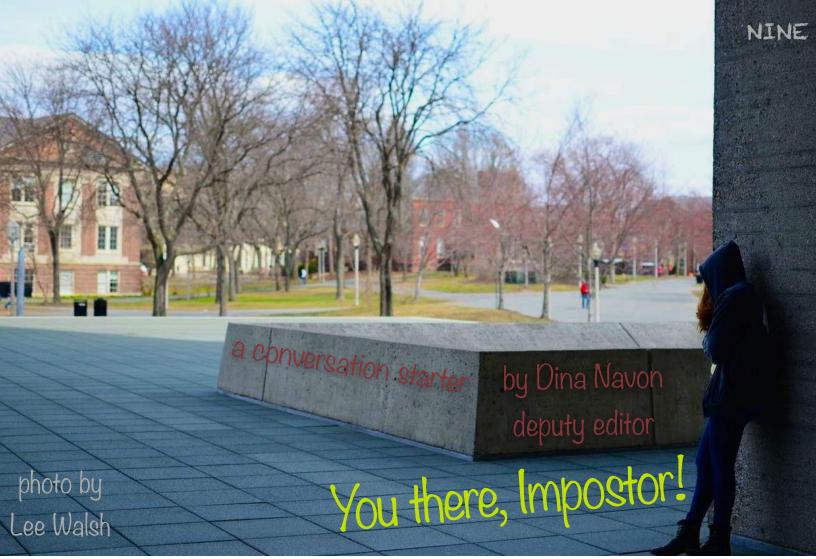
When organizing the most recent wave of peer mentoring groups, GWIS found that many female graduate students in challenging STEM programs at UMass were relieved to know that those in different disciplines have similar concerns and face the same challenges. Surrounding ourselves with diverse influences provides new and ongoing opportunities to develop our resilience and creativity. Exposure to and discussions about different approaches to science, academia, and defining personal and professional success will benefit us all.

Click here to check out GWIS mentoring initiatives or get more information about joining peer mentoring groups

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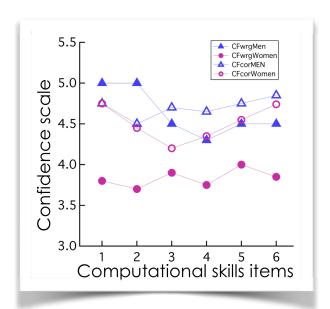
"There's no way I belong here - I must have gotten lucky. I certainly don't work as hard as Sally, because she was at the library for three hours while I was doing laundry. And I'm not as smart as Jim - everything seems so effortless for him! I just can't believe they accepted my application; I don't deserve this success."

To be honest, impostor syndrome was an unfamiliar concept before I arrived here at UMass a few months ago, but the instant I heard the term I thought to myself, "Yep, I feel like that pretty much constantly". Most of us have similarly considered ourselves inadequate or undeserving of our own success at some point or another during the course of our careers, and we are certainly not alone. Kolligian and Sternberg (1991) found that many Yale students often felt inauthentic or fraudulent in some way pertaining to their academic success.

It seems as though women, particularly those of us pursuing STEM careers, are more likely to experience this feeling of depleted confidence. In the fields of science and engineering, Dix (1986) found that women are more likely to experience "diminished self-confidence...in higher level science courses". Interestingly, Landeburg and colleagues (1991) reported that men tended to be more confident in their responses than women, regardless of whether or not they answered the questions correctly (see the figure). Women were overall more accurate in evaluating their confidence than men in that study - in other words, they were less hesitant to admit when they thought that they were wrong. Lind and colleagues (2002) showed that female medical students were regularly outperforming their male counterparts in various examinations while scoring lower on confidence-related self-assessments.

Another study also found a correlation between gender and one index of impostor syndrome (Fried-Buchalter 1997). All of these data point to the idea that women are more prone to feelings of inadequacy, fraud, or depleted self-confidence throughout our careers. Over the course of multiple decisions, these wrongful feelings of inadequacy could cause women to opt out of STEM-related fields, thus contributing to the oft-cited scarcity of women pursuing STEM.

**B**ut are women really any less capable of achieving success in those STEM fields? How closely does the stereotype match with reality? I'm skeptical of making sweeping generalizations based on perceived classifications of gender. People are people, after all; it is far more useful to assess an individual than a stereotype. However, based on the information I review above, it does



Mean confidence of women and men on various computational skills items. Skills items are questions on a test; participants were asked to answer the question and rate how confident they were in their answer. CfCor Men (open triangle), confidence when correct for men; CfWrg Men (closed triangle), confidence when wrong for men; CfCor Women (open circle), confidence when correct for women; CfWrg Women (closed circle), confidence when wrong women.

appear that neither gender objectively evaluates their own talents, and we all, man or woman, should work on developing this hugely important While confidence and self-assertion can skill. certainly be strengths, I would like to argue briefly that self-criticism can similarly become a strength. Fundamental to science is the ability to accept the idea that we may be wrong. Any theory, no matter how well supported, must be examined critically in the light of new evidence; thus, any theory can be nullified if it is later shown to be We are in the business of testing insufficient. hypotheses, not finding facts. Thus I'd argue that one component of an aptitude for science is a

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willingness to admit mistakes, and as the Landeburg study found, women are much more likely to do so than men. However, there is and must be a distinction between critically evaluating our work and criticizing ourselves.

In that case, we should focus on guiding the discussion of the impostor syndrome such that women move away from the latter and towards the former, and feel encouraged to tackle the challenges of STEM within a supportive network of like-minded individuals. Both men and women clearly have a place in the future of STEM, and working towards a more harmonious diversity and collaboration between these two, often disparate groups will certainly fortify that future by leveraging the strengths of each.

"... there is and must be a distinction between critically evaluating our work and criticizing ourselves..."

 $oldsymbol{\mathsf{W}}$  hat are your thoughts? The GWIS Communications Committee would love to foster a healthy, respectful discussion on the topic of how the impostor syndrome relates to gender, so we encourage you to express your own opinions and join the conversation. As Sandberg (2013) points out, "multiple studies in multiple industries show that women often judge their own performance as worse than it actually is, while men judge their own performance as better than it actually is." What do you think is responsible for the tendency of women to be under-confident and men to be overconfident? How might you encourage more women to step into STEM-related careers or to be more accurately confident in themselves? We are very excited to hear from you, and answers may be posted either on our blog or in the next issue of GQM! Participants will be eligible to win prizes like notebooks, t-shirts, and pencils.



# GWISsincerelythanks Our Sponsors The Graduate School

The College of Engineering

The College of Natural Sciences The Women for UMass Fund

## Our Collaborators

The Office of Professional Development Girls Inc. and Eureka! **UMass Center for Teaching** The Massachusetts Academy of Sciences

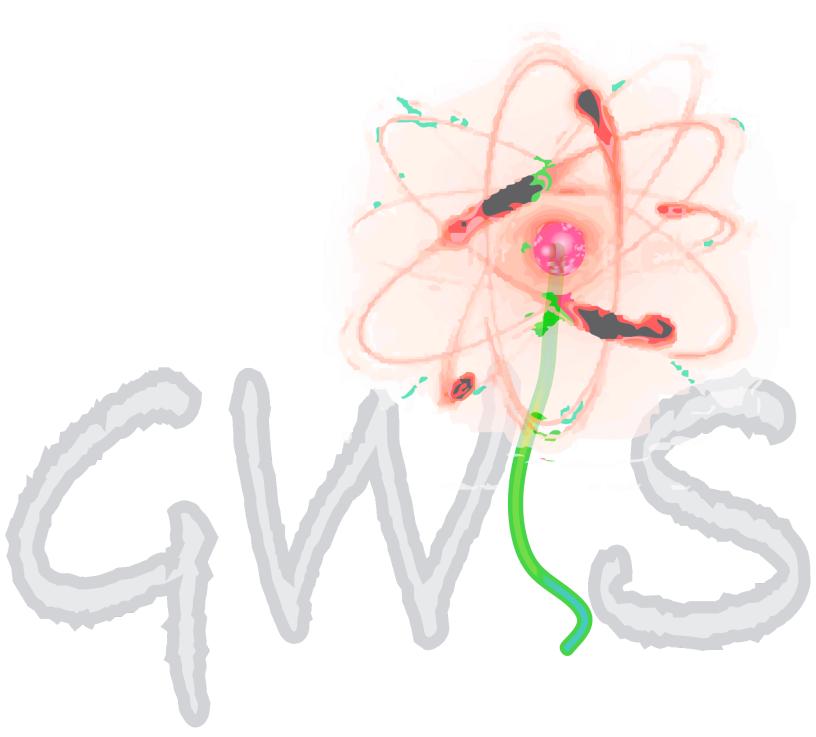
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