

awis

association
for women
in science

03

fall 2022
volume 54

Also in this issue:
**Calculating a
Path to NetZero**

**Four Entrepreneurs,
Four Journeys**

**Research Integrity
and Ethics**

**Dr. Tejal Desai is Going
“Home” Again**

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7 in 10 people experience imposter syndrome throughout their careers. Someone is going to figure you out you don't belong here soon. You look good on paper, but passing that exam was a fluke. I don't have what it takes to [do these experiments, write a thesis, succeed in academia]. These are all classic signs of imposter syndrome. **Tip: reframe your thinking. Aim for progress, not perfection.**

FIRST TIME FAILING
You've always been the best student at school, and you did pretty well at university too. Now your science isn't working and everyone around you seems to be getting on just fine. These feelings can come about as at undergraduate level, experiments (believe it or not) are assigned to work. **Tip: remember, you are at the forefront of scientific research - if it was easy it would already have been done!**

COMPETITIVE LANDSCAPE
Unfortunately, academia often fosters competition over collaboration, when it should be the other way around. This is made worse by the fact that often the only way to gauge

NO MORE
You got pretty good were all short te out what questio have an open en sight. You no lon doing a good job. mentality can be pe research

ISOLATION
Writing your thesis can be a isolating task. This can also be o of guilt when going about you should be writing". Tips to man attending research group meet seminars whilst writing. This can "writer's block". **Tip: when writ figures - it is far easier to write ab**

THE WORK I
There is an academics 55% of PhD students are concerned about. This is a fault with world-life balance? took abroa



from the
cover



In addition to her confidence, her drive to build and to innovate propels her forward professionally. True to her engineering mindset, she loves to take a nascent effort, envision how it can grow, and then implement well-thought-out changes.

Dr. Tejal Desai is Going “Home” Again

By Patricia Soochan

AWIS member since 2003

“You can’t go home again,” wrote novelist Thomas Wolfe, famously. Dr. Tejal Desai, the newly appointed Sorensen Family Dean of Brown University’s School of Engineering (SoE), is not returning home per se, but she is returning to her alma mater, and by means of the kind of unconventional move that she has previously employed successfully in her career – as when she joined the faculty at the University of California San Francisco (UCSF), where she earned her PhD through its joint bioengineering program with University of California Berkeley.

Dr. Desai’s deep experiences with the School’s emphasis on the societal impact of engineering, in addition to her impressive track record as both a researcher and program innovator, were key to her recent appointment. Brown’s SoE is the oldest engineering program in the Ivy League and the third oldest in the United States, yet the school to which she is returning is in some ways dramatically different from the one at which she earned her bachelor’s degree in biomedical engineering in 1994. In the last two decades, SoE has had unprecedented growth in its research funding, its faculty, and its state-of-the-art facilities.

The dean’s accomplishments as a leader in academic STEM are admirable in and of themselves and are even more impressive because of longstanding barriers to success for women in engineering education and in the workforce. In 1998, the same year that she earned her PhD in biomedical engineering, she was the one of the first two faculty members hired by the University of Illinois

at Chicago to establish its own bioengineering department. Two years later she was one of only three women among over a hundred engineering faculty at UIC.

From 2001 to 2005, she held a faculty position at Boston University, lured by the opportunity to help establish a new cellular nanotechnology center. In 2005, as a faculty member at UCSF, she helped establish and then chaired the new Department of Bioengineering and Therapeutic Sciences, was the inaugural director of the multidisciplinary Health Innovations Via Engineering initiative and led an NIH training grant. The accolades she accrued in those early years included MIT Technology Review’s Top 100 Young Innovators and Popular Science’s Brilliant 10.

Dr. Desai has also been a prominent advocate for social justice since her freshman year at Brown, when she, as a U.S.-born child of immigrant parents from India, became more conscious of her cultural identity and of inequities in the developing world and at Brown. Her strong advocacy for equity almost derailed her first year as she turned her attention away from academics and focused on social activism, pursuing such efforts as coauthoring a 100-page critique of structural inequities at Brown. As the former president of the American Institute for Medical and Biological Engineering, she launched programs on antiracism and health-care disparities.

Embracing New Opportunities and Broadening Access to Engineering

This engineering leader seems to embrace new professional opportunities fearlessly. She credits

***Dr. Desai is proud of all of her life's roles—
as a mentor, a builder of innovative
programs, a spouse, a mother, and a
daughter—all of which have helped her
think of work and life as integrated rather
than as a precarious balancing act.***

her “trial by fire” learning experiences, such as the transition from being a newly minted PhD recipient to becoming a young faculty member at UIC, for giving her the confidence to take on new roles. As she describes it, “A month after packing my bags in grad school, I became an assistant professor at UIC.” There, she quickly learned how to concurrently establish her research lab, develop a new curriculum, and hire faculty, an important lesson in integrating the three facets of faculty life—research, service, and teaching—which has served her well.

In addition to her confidence, her drive to build and to innovate propels her forward professionally. True to her engineering mindset, she loves to take a nascent effort, envision how it can grow, and then implement well-thought-out changes.

Dr. Desai also credits several mentors and sponsors who have recognized her readiness for growth, even before she has seen it in herself, and who have supported her as she has explored new opportunities. With surprising humility, she admits that such encouragement has been critical to her advancement, because on her own, she has not always been sure of what her next step should be.

As she transitions to Brown, she is excited about the opportunity to progress from establishing programs to influencing the trajectory of the engineering school, all while nurturing its entire community by bringing to bear her value of empowering all stakeholders. She observes that Brown has given her the resources and flexibility to put into place an emergent agenda for SoE that will allow it to grow its research and educational programs to new heights.

Within the larger agenda, the dean’s top strategic priorities are to nurture a community of faculty, staff, and students that is diverse and inclusive and to promote a new generation of engineers by giving students the tools to make a greater societal impact in areas such as health care, energy, and climate change. All of these priorities reflect her overriding focus on “people, research, ideas, and innovation.”

As she thinks about launching her own lab at Brown, Dr. Desai is excited to continue to explore how the characteristics of materials at the nanoscale level influence tissue healing and regeneration. Her ultimate goal is to develop therapies for chronic diseases including diabetes, heart disease, and autoimmune conditions.

Its recent, dramatic growth notwithstanding, Brown’s SoE was established only a decade ago as a stand-alone school, which emerged from a division of engineering at Brown University. As such, it is relatively small and new compared with other engineering schools, which Dr. Desai thinks makes it the right-size proving ground to achieve her goals. She remains aware, however, of the risk of SoE becoming siloed as it sits apart from the College, and she wants to ensure that as it grows, it does so within the larger Brown community.

She would like SoE not only to broaden its research scope but also to reimagine its curriculum. She observes that SoE’s curriculum is similar to when she attended Brown and worked on her engineering degree 30 years ago, but she acknowledges that hard choices lie ahead, such as building a consensus among the faculty about





what engineering knowledge is essential for the next generation of engineers to achieve technical depth.

Asked what concerns her about the transition, the dean responds that she is keenly aware of the intentional balancing act and constant adjusting of priorities that will be required for her to remain an active researcher and an effective administrator. Brown itself is on a major journey to expand research in all academic sectors, which aligns well with her vision for SoE.

Collaborative Leadership

As is true of many women leaders, Dr. Desai is intentional about how she leads. She calls her approach “collaborative leadership,” saying, “I think it’s important to foster everyone’s goals within a community.” It feels critical to her to empower and hear different voices from multiple stakeholders, even though she acknowledges that as a leader, she must make the final decision. She avoids the

“build it and they will come” mentality, preferring to invite stakeholders to share their perspectives and to combine their expertise and resources in order to build something together. This will, she believes, create a program that is bigger and better than if each change agent aims for a separate piece of the pie.

Dr. Desai is proud of all of her life’s roles—as a mentor, a builder of innovative programs, a spouse, a mother, and a daughter—all of which have helped her think of work and life as integrated rather than as a precarious balancing act. Asked about some of the challenges she has experienced as a woman of color leading in engineering, she observes that there are certain cultural and gender expectations that others have when they meet her. She is also reflective, preferring to listen to all voices first, before contributing her own ideas. She is keenly aware that as she rises in academic engineering, she sees fewer and fewer women at the table. She works hard to ensure that even the few who are there have a voice in the discussion.

The dean’s general advice for women scientists is that they should surround themselves with mentors and sponsors who recognize their strengths and who support them. It is also important to embrace opportunities, rather than shutting them out, and to consider what may be possible before deciding whether or not to take the next step. She observes, “I would not have mapped out my own career in the way that it has unfolded.” 🌱



Patricia Soochan is a Program Officer and member of the multidisciplinary team at Howard Hughes Medical Institute (HHMI), with primary responsibility for the development and execution of the Inclusive Excellence (IE1&2) initiative.

Previously she had lead responsibility for science education grants to primarily undergraduate institutions, a precursor of IE. She has served as a councilor for the Council on Undergraduate Research and is a contributing writer for AWIS Magazine and the Nucleus. Prior to joining HHMI, she was a science assistant at the National Science Foundation, a science writer for a consultant to the National Cancer Institute, and a research and development scientist at Life Technologies. She received her BS and MS degrees in biology from George Washington University.

Editor’s Note: The contents of this article are not affiliated with HHMI.

Picture a Leader

Our theme for this issue of *AWIS Magazine* is Leadership and Innovation. When I think about what defines a good leader, several important qualities come to mind.

First, a successful leader must have a strategic vision. They can envision a future state that does not yet exist and the pathway to get there. They have brilliant ideas or accurately predict important trends. They ask the right questions and are able to anticipate and mitigate risks. In this issue, we highlight several AWIS members who are [entrepreneurs](#) with these qualities.

Second, good leaders need to be able to motivate their team to execute on their vision. They inspire others with their passion, as is true of the [climate scientists](#) we interviewed. More importantly, they lead by example, consistently demonstrating [integrity](#).

Compassionate, skillful leaders also [embrace diversity](#), equity, inclusion, and accessibility because they know that companies with an inclusive culture achieve greater results. They care about the [mental health](#) of their employees. They create and enforce policies to prevent discrimination and take action when power abuse occurs.

Finally, talented leaders must also be flexible and resilient—especially if they are women in a male-dominated profession or part of another underestimated community. Women must often persevere past a variety of obstacles, such as harassment, caregiving responsibilities, and imposter syndrome, that men do not have to deal with.

In this issue, we also highlight several members' career journeys, including that of [Dr. Tejal Desai](#), who just joined her alma mater Brown University as the Dean of the School of Engineering.

AWIS is lucky to have a CEO with these leadership characteristics and more. I was so proud when Meredith Gibson was recently invited to the White House to witness the [signing of the CHIPS and Science Act](#). She is dedicated to carrying out AWIS's mission, to increasing the reach of the organization, and to supporting each of you on your own career journey.

Speaking of journeys, in this issue we also share advice for anyone moving [from academia into industry](#) and provide a webinar recap on [leveraging social media](#) for professional opportunities. Regardless of your career sector, stage, or field, I hope that AWIS has been able to assist you along the way.

Yours in innovation,

Isabel Escobar, PhD

Professor of Chemical and Materials Engineering,
University of Kentucky, and Chair of the Board,
Association for Women in Science



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on society with story ideas that
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and government offices around
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our AWIS members across all

disciplines and employment sectors
to tell us where they need support
in their work or in their lives and
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MAGAZINE LAYOUT

Hung Nguyen,
nuendesign

Leading and Listening

Over the past several years, AWIS staff and volunteers have worked hard to deliver valuable programs and benefits to our members, to listen to your feedback, and to be responsive to your needs. We want AWIS to be your go-to source for career planning, for professional development, and for growing your network. But more importantly, we want you to feel that you belong at AWIS and in science.

To measure how we are doing, we ask members every six months, "How likely are you to recommend AWIS to a colleague?" When we began reaching out in this way, we earned a [Net Promoter Score](#) (NPS) of 34. This is not a bad score, but I knew we could do better.

In case you aren't familiar with the NPS, let me give a quick description. Members who answer 9 or 10 are considered "promoters." Those who answer 7 or 8 are considered passive. Those who answer 6 or below are considered "detractors." The NPS is calculated by subtracting the percentage of detractors from the percentage of promoters. Therefore, the lowest possible score is -100 and the highest is 100.

Since we first started calculating our NPS, our score has improved to 49. Thank you for choosing AWIS and for allowing us to be part of your personal and career journey. We appreciate your feedback, your support, and your continued involvement with the organization.

This month we are pleased to celebrate our [Annual AWIS Award recipients](#). Thank you to all who applied, and congratulations to the recipients.

We have also launched a new [online community](#). In addition to starting or participating in discussion threads, you can now search the directory and send private messages other members. You can access all of this through the member portal. We hope this capability will expand your access to and engagement with the AWIS community.

I hope you all take advantage of this new resource. We welcome your participation and ideas. I'll see you online!

With all best wishes,

Meredith Gibson
CEO, AWIS

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The State of Women in Engineering

By Patricia Soochan

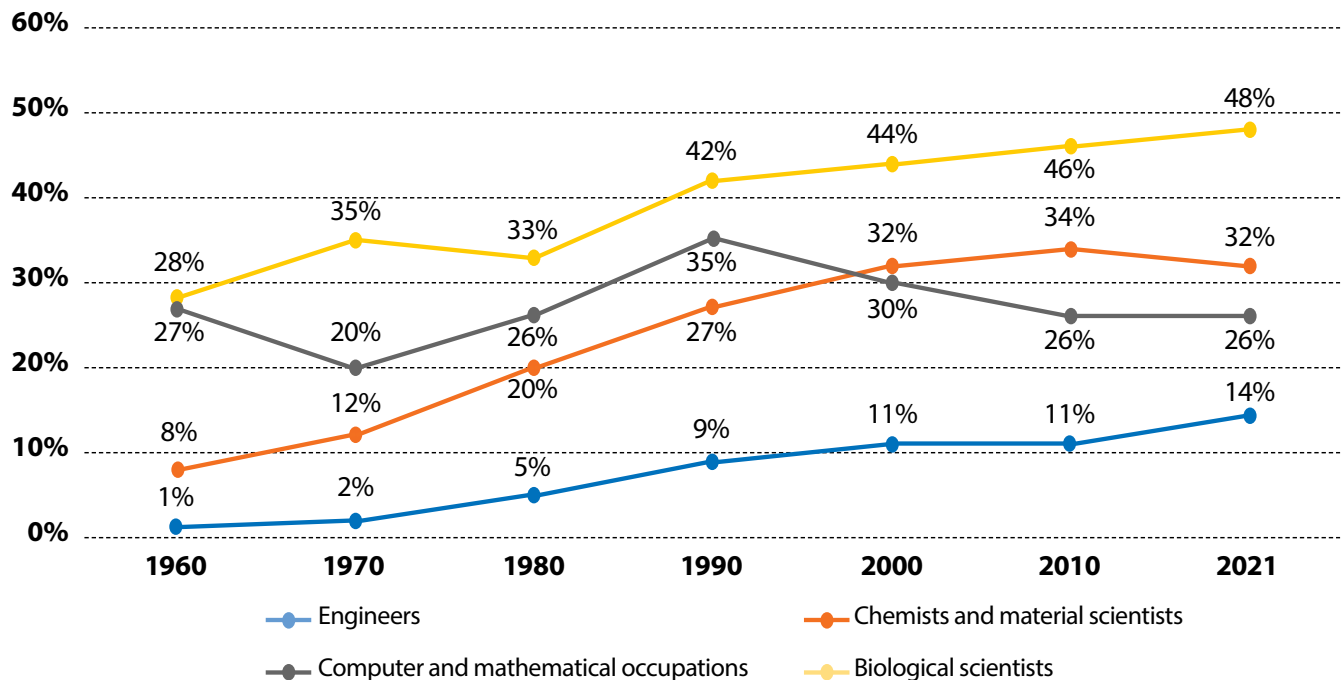
AWIS member since 2003

Data from the Society of Women Engineers website show the representation of women engineers in the workplace trailing both the rate of growth and percentages of women among other STEM occupations. Although the representation of women is better in bioengineering than in some other engineering sub-disciplines, the absolute number represents less than one quarter of all genders employed in bioengineering, with the percentage of Black women engineers being the lowest among women of all other races/ethnicities.

A 2016 article in Harvard Business Review might be considered outdated, but the 13% representation of women in the engineering workforce cited in the article is only 1% lower than the 14% recorded for 2021. The article points out that there has been an uptick in the percentage (20%) of women who graduate with a degree in engineering as schools have reformed their curricula, but that almost 40% of women engineering baccalaureates leave or never enter the profession. The cause? Engineering schools and workplaces are still steeped in a culture in which women feel that they don't belong and that their contributions to collaborative work are devalued.

Professional societies that advocate for women, like AWIS, IEEE Women in Engineering, the Society of Women Engineers, and Women in Engineering Proactive Network provide a powerful, collective voice and space for the women engineers like Dr. Desai, who beat the odds. 🙌

Women in Selected STEM Occupations, 1960 to 2021

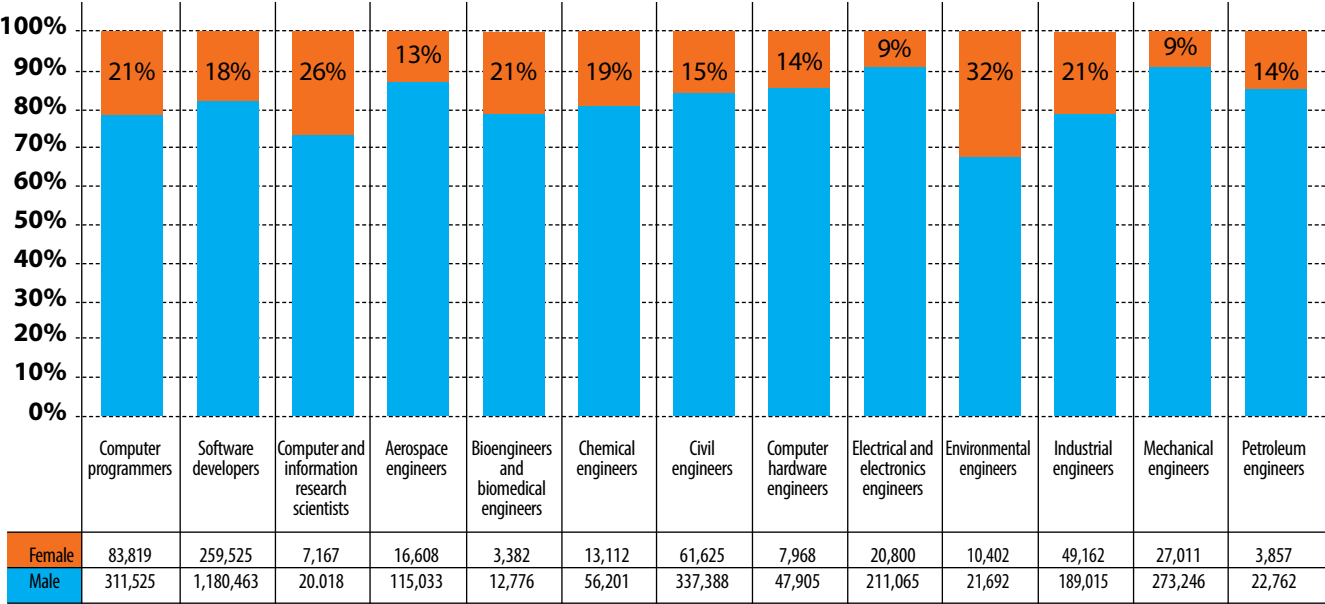


Sources:

1. Corbett, C., & Hill, C. (2015). Solving the Equation: The Variables for Women's Success in Engineering and Computing. Washington, DC: American Association of University Women.
2. U.S. Dept of Labor, BLS: 11. Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity (Data for 2021; updated on January 20, 2022) <https://www.bls.gov/cps/cpsaat11.htm>

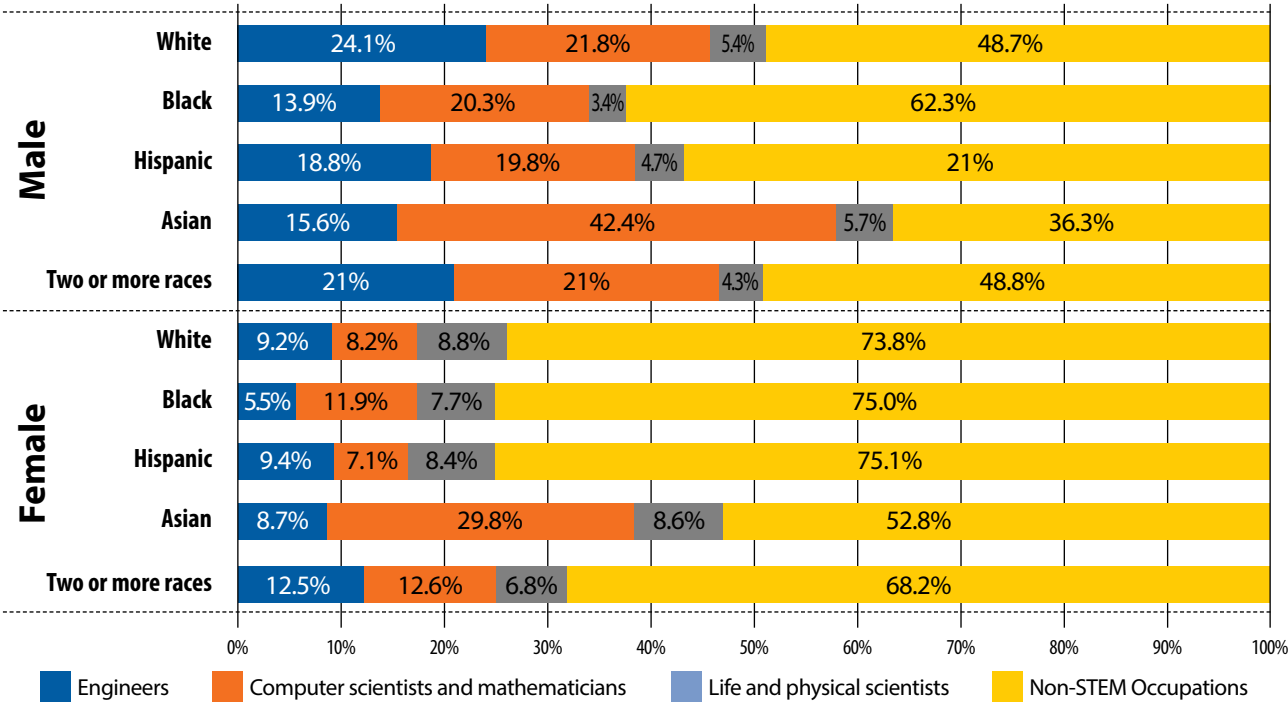
Society of Women Engineers, <https://swe.org/research/2022/employment/>

Full-Time Employed Engineers and Computer Professionals, by Gender, 2020



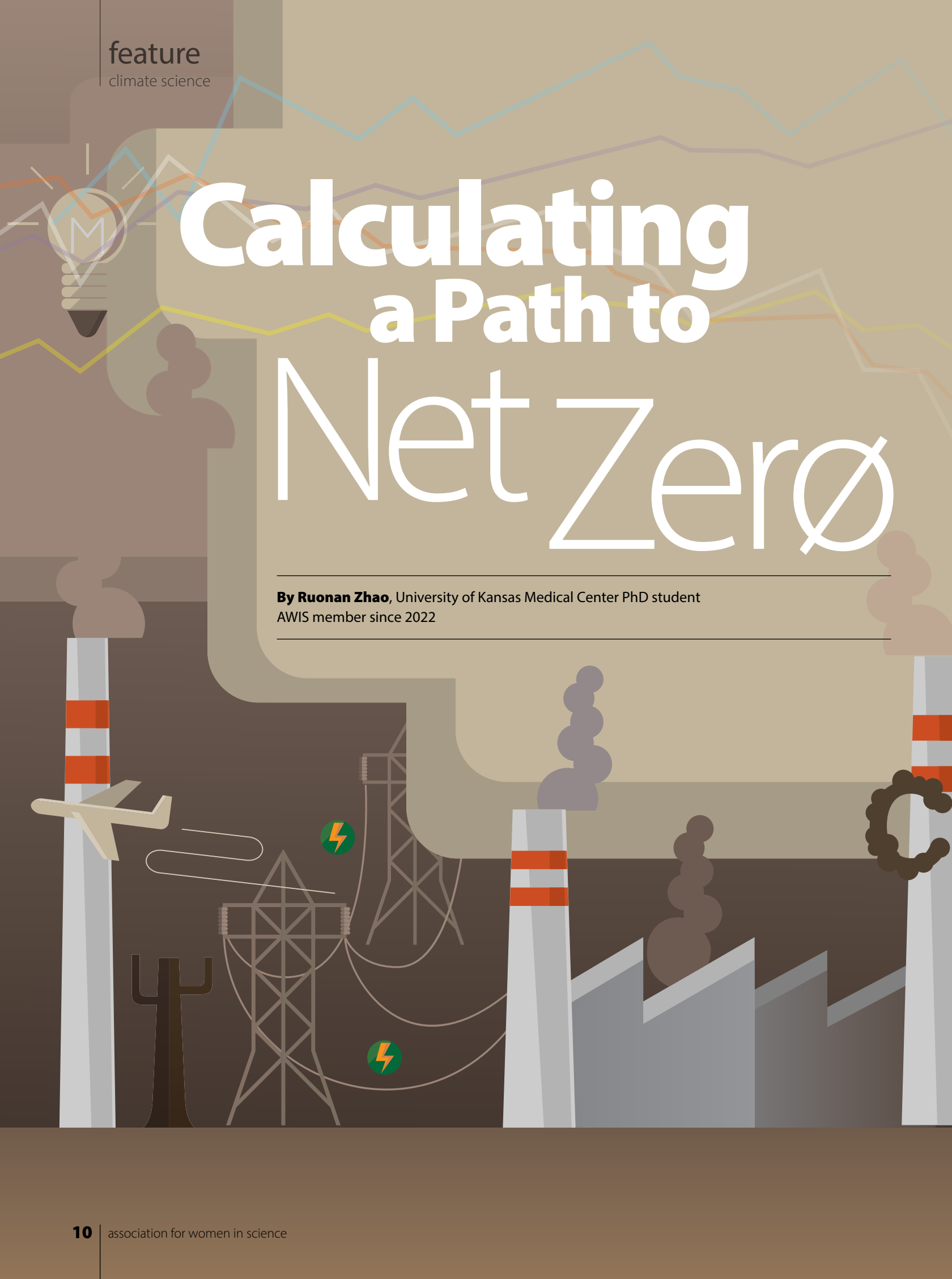
Source: 15. Census Bureau. Detailed Occupation for the Civilian Employed Female/Male Population 16 Years and Over, Tables 824115 and 824116. Data retrieved from <https://data.census.gov/cedsci/> Society of Women Engineers, <https://swe.org/research/2022/employment/>

Proportion of 25to 34-year-old Men and Women Employed with a Bachelor's Degree in STEM, by Race/Ethnicity and Occupation, 2019



Source: Digest of Education Statistics, 2020, Table 505.30 (updated in October 2021)

Society of Women Engineers,
<https://swe.org/research/2022/employment/>



Calculating a Path to Net Zero

By Ruonan Zhao, University of Kansas Medical Center PhD student
AWIS member since 2022

In the past several months, devastating and deadly heat waves have swept across the globe. The dangerous heat has not only led to a high number of heat-related deaths, but it has also put extra pressure on the environment and infrastructure. In Spain and Portugal alone, there were over 1000 heat-related deaths during a single week in July. In the past two months, nearly 80 square miles of forests have been destroyed by devastating wildfires in France, and 37,000 people have been forced to evacuate. And in the United Kingdom, transportation infrastructure has been affected by the high temperatures: railroad tracks have begun to warp and buckle; aircraft tires have sunk into the pavement of melting runways, due to the abnormal heat.

Since the 18th century, the average global temperature has increased 1.1–1.2° Celsius, due to greenhouse gas pollution, particularly CO₂ emissions from the energy and industry sectors that have increased by 60% in the last 30 years. To help solve this global emergency, 196 countries adopted the Paris Agreement in 2015, with the goal of limiting global warming to below 2° Celsius, preferably to 1.5° Celsius, compared to preindustrial levels. In order to reach this target, the agreement stipulated that global energy-related carbon dioxide emissions must reach net zero by 2050. Unfortunately, due to an insufficient reduction of greenhouse gas emissions in the past decade, we likely cannot meet the 2050 target date without also proactively removing carbon from the atmosphere.





We want to engage and create responsive and creative learning experiences for professionals, to meet them where they are in realistic time components that match their professional needs.



— *Dr. Lauren Cooper*

[Carbon dioxide removal](#) (CDR) solutions can be divided into natural and technological approaches. Natural mitigation strategies are relatively low cost, easier to deploy, and beneficial to the ecosystem, compared with technological approaches. A major type of natural CDR strategy is terrestrial carbon removal and sequestration, which involves using land and management practices within forests and agricultural lands to enhance the total storage of carbon in trees and soil.

Forests have historically been considered great resources for absorbing carbon from the atmosphere and for helping with climate mitigation. However, setting aside land for carbon removal and sequestration via trees and soil is not that simple because of competition from the expansion of food production; food producers also require land, which they need for agriculture and pasturage. In this article, we will discuss some critical challenges in terrestrial carbon practices and what scientists are working on to solve them.

Education Is Fundamental

One major obstacle to implementing science-based forest and soil carbon practices is a gap between the scientific knowledge that already exists and the dissemination of that knowledge to practitioners, such as policymakers, landowners, and forest managers. Michigan State University's Department of Forestry has established the Forest Carbon and Climate Program (FCCP) to help close this gap. The program's Director, Dr. Lauren Cooper, recognizes the need for systematic learning in this field and believes that FCCP provides many more opportunities and more potential outcomes than the chance to earn a graduate certificate and to take three graduate courses.



Dr. Lauren Cooper, Program
Director of MSU Forestry Department
Forest Carbon and Climate Program

"We want to engage and create responsive and creative learning experiences for professionals, to meet them where they are in realistic time components that match their professional needs," Cooper said.

Since 2014, Cooper has been expanding the program to include more educational resources. As the first program of its kind, the FCCP now offers three tiers of learning experiences that range from graduate-level courses to shorter professional courses suitable for natural-resource professionals, extension agents, and landowners. The FCCP also collaborates with governments and private companies, which either sponsor employees to participate in the program or create sponsorships for external applicants interested in taking part. The goal is to allow more professionals to become comfortable with engaging in conversations and advocating for actions and decision-making in their own spheres of influence.

In addition to fostering educational opportunities, Cooper also focuses on creating a variety of partnerships between the diverse team of the FCCP and other universities, nonprofit organizations, and the forest industry. "We all are bringing something unique to the table, and we are able to do way more when we are working together," Cooper said. "We try to be strategic about where we can jump in and enhance each other's work."

Forest Carbon Modeling

Policy making that relates to nature-based solutions relies heavily on anticipated outcomes of forest and land-management practices. However, scientists can find it challenging to accurately characterize a system as complex as a forest or similar ecosystem. Fortunately, researchers have taken detailed forest measurements over time and have gradually developed a variety of forest carbon models that enable them to reliably connect forest-associated climate-mitigation strategies with carbon-cycle dynamics on different scales.

One such tool, the Carbon Budget Model of the Canadian Forest Sector, is a forest carbon model used by American Forests (AF), a nonprofit conservation organization, to examine the carbon impact of forest management practices at a landscape scale. AF's current study consists





Kendall DeLyser, Director
of Climate Science at
American Forests.

of four projects spanning seven states in the United States and is led by Kendall DeLyser, Director of Climate Science.

For each region, DeLyser and her team compile a baseline level of carbon fluctuations using historical-management and natural-disturbance information. A range of potential forest-management and wood-utilization scenarios are then applied in the model to generate outputs that reflect future carbon changes in the landscape. "With each of those different management practices and scenarios, we want to understand which ones can help us capture the most carbon," says DeLyser. "The results can then help forest managers confirm that their current practices are good or decide what they should be doing next. Policy makers can also use the results to support climate-action goals with programs to incentivize climate-smart practices."

To distribute the findings of the study broadly, DeLyser and the team work closely with direct state partnerships and the U.S. Climate Alliance. "There are a lot of other states with a lot of forest lands that either don't know we are doing this [research] or don't know that they can ask us to do this [work]. Our next step is to figure out how to expand this project to other parts of the country with forests, so we can better manage all our forests as a climate solution," DeLyser said.

Unique Carbon Dynamics in Urban Forestry

Another innovator in this field, Dr. Lucy Hutyra, is a biogeochemist and ecologist at Boston University who is specifically interested in carbon dynamics in urban areas. "Historically, cities are just viewed as the source. They are just where CO₂ comes out, and that is a problematic view," explained Dr. Hutyra. To many people's surprise, urban trees also play an important role in promoting climate mitigation and in shaping the bigger picture of climate change.

Over the last decade, Dr. Hutyra's team has discovered that urban vegetation behaves differently than vegetation in other environments. Specifically,

Dr. Lucy Hutyra,
Professor and Director of
Biogeosciences Program at
Boston University



in the northeastern United States, urban trees grow more productively and cycle carbon dioxide more rapidly than trees growing in rural areas. These findings point to a critical need for scientists to reevaluate their methods of monitoring, reporting, and verifying carbon dynamics in cities, so that they can accurately assess whether or not climate-mitigation policies are working.

While policy makers' efforts to conserve fragmented forests in cities and to implement urban afforestation can be extremely valuable, they need to carefully plan and manage this work. "We need to think very thoughtfully, in a way that we haven't been, about which trees to plant," Dr. Hutyra said. She pointed out that different trees can achieve different environmental goals, and that we also need to take climate, pest tolerance, human preferences, and other human impacts on trees into account.

Agroforestry in Africa

Another potential challenge in implementing natural-based CDR solutions lies in interactions with local communities: scientists must recognize the needs of these communities while making plans to meet climate goals. This is especially important in low-income communities and in developing countries, which are more vulnerable to climate risks and whose needs do not always align with the needs of climate-change policy makers.



Dr. Susan Chomba
Director of Vital
Landscapes for Africa
at the World Resources
Institute

In recent years, some scientists and policy makers have developed road maps for how to address this particular challenge. A perfect example of an organization working to balance communities' needs with climate-change objectives is the Regreening Africa program once led by Dr. Susan Chomba, who is now the Director of Vital Landscapes for Africa at the World Resources Institute. Speaking at a recent



When you are working with small-holder farmers, it is not just focusing on land health. What we realized is that you have to focus on the economic aspects because you are working with farmers, who are looking at what that means for their children to be able to go to school and what that means for them to feed their children in the evening.

— Dr. Susan Chomba

seminar, Dr. Chomba noted, “When you are working with small-holder farmers, it is not just focusing on land health. What we realized is that you have to focus on the economic aspects because you are working with farmers, who are looking at what that means for their children to be able to go to school and what that means for them to feed their children in the evening.”

Regreening Africa focuses on giving farmers across eight African countries access to locally appropriate knowledge and technologies to bring trees back onto farms and to sustainably manage landscapes. The major approach of the project—agroforestry—incorporates a deliberate and systematic integration of trees with crops and livestock.

The benefits of agroforestry include increasing carbon storage, enhancing crop and grass yields, and boosting income and food security. Using these strategies, the project has helped 500,000 households reverse land degradation across one million hectares in eight countries in sub-Saharan Africa. The program is also estimated to have decreased soil erosion by 5% while increasing both tree cover and average household income by 10%.



An example of agroforestry—coffee bushes in a shade-grown plantation in the Andes, Ecuador.

Morley Read/Shutterstock
Meine van Noordwijk, World Agroforestry Centre (ICRAF)

Summary

Climate change is a global emergency that requires global attention and cooperation. Even though they face many obstacles in their efforts to reach net zero by 2050, scientists, policy makers, landowners, and other stakeholders are all working together to come up with solutions to halt the crisis and to save our planet. Nature-based solutions are only the tip of the iceberg. As technology evolves, we can look forward to additional cost-effective and scalable approaches to both control carbon emissions and to remove carbon from the atmosphere. 🌱



Ruonan Zhao is a PhD student in the Anatomy and Cell Biology program at the University of Kansas Medical Center. She is a science writer who is passionate about research, human health, and medicine. After completing her degree, she would like to pursue a career in clinical research development, where she can apply her scientific skills to make advances in human health.

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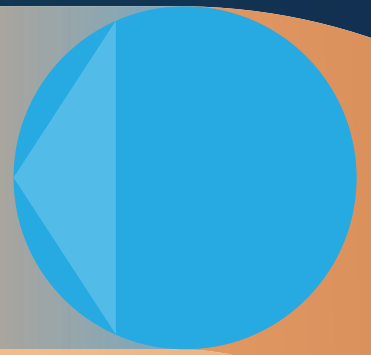
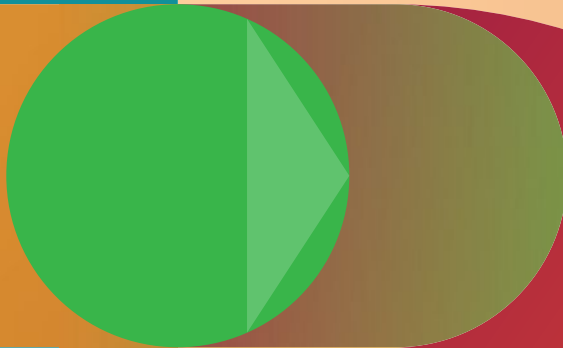
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Four Entrepreneurs, Four Journeys

By **Yanting “Raven” Luo**, PhD student, Duke University
AWIS member since 2021

Consider four companies: Switchback Systems, which improves the DNA synthesis platform; Avails Medical, which accelerates the detection of pathogens in any bodily fluid; Enzyme By Design, which reduces the toxicity of cancer chemotherapeutics; and Fit Hidden Figure, which empowers people to transform their physique in a matter of weeks by leveraging the latest in science and technology. Despite their diversity, in spanning the fields of research, diagnostics, therapeutics, and fitness, these four companies are united by their sound scientific foundations. Each of them was also founded by an AWIS member: **Dr. Mary Noe** (Switchback Systems), **Dr. Meike Herget** (Avails Medical), **Dr. Amanda Schalk** (Enzyme by Design), and **Karene Richards-Wise, CFA, IFBB Pro** (Fit Hidden Figure).

The Companies: How They Started

Mary had been obsessed with the chemistry around DNA and RNA since she was an undergrad, 20 years before the recent spike in demand for DNA synthesis in vaccine research, precision medicine, and synthetic biomaterials. She completed a highly collaborative and interdisciplinary PhD in organic chemistry at the University of California San Diego, through which she helped to create novel chemical structures in synthetic DNA and RNA and to develop biophysical assays—yet she felt that she had failed because she did not fit the conventional image of an expert chemist: someone who spends all their time honing one specific technique.

During her PhD work, **Amanda** studied at one of the prestigious Max Planck Institutes in Germany, which are known for Nobel laureates and for being the ultimate dream job for the scientists around her. However, she found herself more interested in how to apply scientific discoveries to the world, and not in three decades but immediately.



Meike Herget,
founder of Avails Medical

Meike also became curious about how to bring her discoveries out into the world, but she initially struggled to choose between starting a company and starting a lab. While growing up and training in Germany, she had thought that academia was the only option for scientists. Then her postdoctoral fellowship at Stanford University exposed her to entrepreneurship. When she received the National Institutes of Health's Pathway to Independence Award (K99/R00) to start her research group, Meike realized that she had a decision to make about her path forward.

Karene had already found success, applying her talent in mathematics to the trading desk at investment banks. When her mother lost her battle with breast cancer—and the doctors discovered a lump in Karene's breast ten years

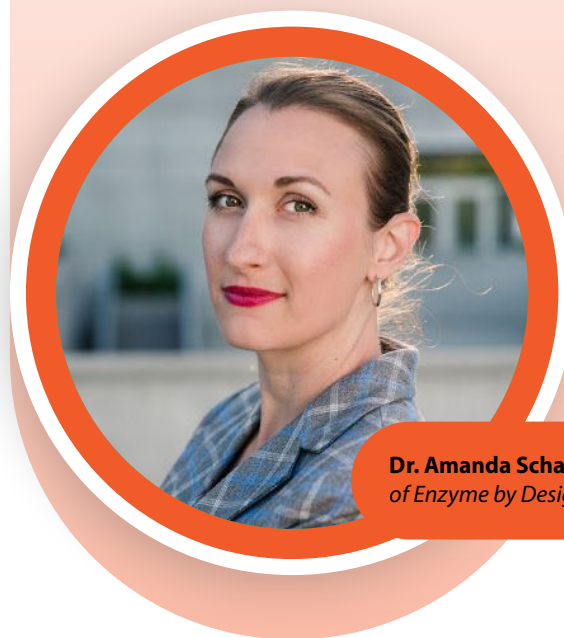


Photo by Christie Goshie, Tiny Oak Media

Dr. Amanda Schalk, founder
of Enzyme by Design

later—she had to reconsider priorities in her life. It seemed like her high-achieving personality conflicted intensely with self-care.

Their Journeys

In the face of these obstacles, and much like chemical reactions, the founders had enough energy to overcome challenges and to activate their start-ups.

Mary realized that her ability to communicate across disciplines did not make her a failure but instead would be the key to her success. She went into industry after finishing her PhD. At established companies like Agilent and Twist, she worked with diverse teams and found herself talking in depth with fellow chemists, as well as with biologists, physicists, and engineers. When access to large pools of



Karene Richards-Wise,
CFA, IFBB Pro, founder
of Fit Hidden Figure



Dr. Mary Noe, founder of
Switchback Systems

DNA became a pain point in science, medicine, and engineering, Mary launched her company—Switchback Systems. She then leveraged her expertise and interdisciplinary skills to scale up DNA synthesis.

Unlike Mary, **Amanda** chose to do a postdoc with a translational bend after her PhD. Specifically, she worked to reduce the toxicity of the L-asparaginase class of enzymes, the bacterial version of which has been used as a chemotherapeutic for acute lymphoblastic leukemia, the most common type of pediatric cancer, since the 1970s. She achieved a breakthrough by utilizing the unique structure of the guinea pig version of L-asparaginase. Although the guinea pig enzyme had been discovered serendipitously in the 1950s as the unknown substance in guinea pig blood able to regress lymphoma in mice, it was relegated to history until Amanda's team rediscovered it. Equipped with modern recombinant DNA technology, she was able to purify, characterize, and engineer the guinea pig L-asparaginase to optimize its use as a chemotherapeutic, which prompted the formation of Enzyme by Design. Freeing herself from the basic research-focused mindset that she had experienced during her graduate studies, she has turned her findings into a highly effective product with a maximized safety profile which holds the promise of treating more patients and expanding its indications for use.

At the end of her own postdoc, **Meike** decided to put her K99 grant on hold for six months to dip her toes into entrepreneurship. Together with Dr. Oren Knopfmacher, her classmate at the Stanford Ignite entrepreneurial studies program, Meike evolved several business ideas until Avails Medical eventually took shape. She and her partner began with a prototype of a home monitoring device for epilepsy patients. It could detect epileptic drugs in patients' saliva, eliminating the need for patients to check their drug levels in a blood sample drawn at the hospital. However, Meike and Oren learned quickly that their sensor technology revealed an even bigger market opportunity for infectious disease. They pivoted to using their electronic sensor technology for pathogen detection in urine and then expanded their

At the end of her own postdoc, Meike decided to put her K99 grant on hold for six months to dip her toes into entrepreneurship. Together with Dr. Oren Knopfmacher, her classmate at the Stanford Ignite entrepreneurial studies program, Meike evolved several business ideas until Avails Medical eventually took shape.

focus to antibiotic susceptibility testing for patients with life-threatening bloodstream infections, as a means of addressing the worldwide emergence of antibiotic resistance that makes treatment more and more challenging. By switching from current optical measurements of pathogen cell density to electronic sensing of metabolites released from living organisms, they created a reliable way to rapidly detect and monitor bacteria's response to different antibiotics in the presence of blood and without the need to isolate pathogens from blood in a lengthy process. Thus, they dramatically accelerated the time-to-results from multiple days to a few hours. Meike has not looked back at academia.

The way **Karene** resolved her conflict was markedly different from Meike's approach. Rather than choosing between career achievement and self-care, Karene entered a bikini competition as a way of working on her personal health and fitness. Within two years, she earned the title of Masters Bikini Overall with the National Physique Committee. Happily, the lump in her breast also disappeared, and her health improved. Unexpectedly, she also noticed that she had greater vitality, more confidence, and a stronger sense of presence, which opened up board service opportunities for her. Additionally, by incorporating a healthy and fit lifestyle into her routine as a study strategy, Karene was able to pass the Chartered Financial Analyst (CFA) exam. She became passionate about creating similar outcomes for others, especially for women and people of color, who suffer from pay inequities. She has named her personal training and health coaching business "Fit Hidden Figure," and she has leveraged her mathematical skills to develop a robust scientific system to help people transform their physiques.

Their Vision

Like nuclear chain reactions, the founders have sustained their businesses and painted new visions for the future.

Mary's Switchback Systems is developing a benchtop DNA synthesis platform that is more environmentally friendly than factory pipelines. By virtue of its

Karene has shaken up an industry with her innovation. Rather than stopping where most trainers have, with existing methods to transform the physique, she has researched how to streamline such technologies as dexa scans, heart rate monitors, and precise meal plans.

compactness, the benchtop machine will drastically reduce the volume of flammable organic reagents and the amount of plastic waste. Its synthesis technology will be faster, cheaper and customizable to researchers who want to make their own DNA in the lab. Mary hopes that the platform will make her skill set obsolete and will democratize DNA synthesis for everyone, even for people who do not have a chemistry background.

The safer, mammalian L-asparaginase at **Amanda's** Enzyme by Design has passed lab tests and is now ready to be manufactured at a large scale in preparation for studies that grant approval for first-in-human clinical trials. Meanwhile, based on consultations with physicians and nurses, Amanda is working on extending the half-life of the enzyme to create more convenient dosing schedules for patients, many of whom are children.

Meike and Oren's Avails Medical is conducting clinical trials that will be used to support a submission for FDA clearance for use in hospitals, with the goal of reducing sepsis deaths by up to 80%. Their scalable platform technology will enable them to address more unmet needs in the infectious disease space, such as urinary tract infections, or even to use the approach in other cell diagnostic applications.

Karene has transformed over 250 lives with Fit Hidden Figure's unique methodology. She empowers people, especially women of color, to build not just their own bodies and lifestyles, but also generational health and wealth. She is automating her coaching with videos and machine learning to scale the business and, ultimately, touch more lives.

The Founders

Throughout their start-up journeys, these women have shined with their entrepreneurial qualities:

Mary embodies versatility. She has not limited herself to being an expert in DNA synthesis chemistry. Instead, she has communicated with biologists, physicists, engineers, as well as with colleagues, investors, and clients, across

disciplines. Mary's ability to collaborate has made her uniquely suited to creating a DNA synthesis platform that will democratize her chemical expertise.

Amanda exemplifies insight. Not only has she compared the past and present states of science to take advantage of historical accidents and to fix mistakes, but she has also looked beyond current scientific discoveries to ponder whether they might address unmet needs in people's lives in the future.

Meike is a risk-taker. She has taken a leap from academia into the unfamiliar waters of entrepreneurship. Unafraid of failure, she quickly tried many disease spaces before landing in sepsis research and launching Avails Medical.

Karene has shaken up an industry with her innovation. Rather than stopping where most trainers have, with existing methods to transform the physique, she has researched how to streamline such technologies as dexa scans, heart rate monitors, and precise meal plans. Through controlled scientific experiments and mathematical analysis, Karene has personalized the best bodybuilding approach for each client.

Their Communities

Entrepreneurship may still be considered an unconventional career path, and the fields of science, technology, medicine, and fitness may still be dominated by men. But these women have overcome these challenges by building supportive communities around them. When their own resourcefulness met the support of family, friends, colleagues, and advisors, these women's networks propelled them forward.

Mary is grateful for her classmates in grad school, who happen to be predominantly women. Although she is the only founder among the diverse professionals in her cohort—from PIs to venture capitalists—she has gained confidence from them, as well as a starting point for gaining the external knowledge necessary for her business.

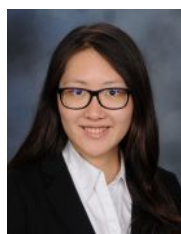
Amanda was surprised by the number of highly experienced Chicago entrepreneurs who guided her when she came on the scene. Once an AWIS mentee, she now pays it forward by mentoring other young women founders and by participating in professional organizations like Women In Bio and HerCsuite™.

When **Meike** moved to Silicon Valley from Germany for her postdoc, she did not know anyone, but she has found a home in the entrepreneurial ecosystem there and has served as the president of the Palo Alto chapter of AWIS.

Karene came to the United States for college with a scholarship to Howard University, but also with help from a group of pharmacists back home in Jamaica, who pooled the required funds for the U.S. government to approve her visa. Named one of the “100 Most Influential People of African Descent Under 40” by the United Nations in 2019, Karene continues to surround herself with supportive women, from her business coach to her hair stylist. Having served as interim CEO of AWIS from August 2018 to February 2019, Karene is now the AWIS national governing board’s chair of finance and investments. She

has been asked to become a health coach for women who are CFA charter holders.

These founders’ paths demonstrate that the distance between entrepreneurship and other careers is smaller than we might realize. Mary was inspired to revolutionize DNA synthesis after working in industry for companies like Agilent and Twist. Amanda’s marketable, novel chemotherapeutic was discovered in an academic research lab. Meike and Karene both had other careers in mind when new opportunities in life made them pivot to entrepreneurship. As society changes to become more open to founders—especially women founders—we can both learn from and support the entrepreneurial members of our own communities. 🌱



Yanting “Raven” Luo is a PhD student in the University Program in Genetics and Genomics (UPGG) at Duke University. She does research in evolutionary genomics and is passionate about science communication.

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Research Integrity and Ethics

By **Laura Szkolar-Sienkiewicz**, Microsoft's Principal Privacy and Compliance Manager for Healthcare
AWIS member 2017

Data forms the basis of all scientific research. Our ability to trust published data has a monumental impact on what research can be funded and, in turn, on how new technologies, treatments, or products may be developed. However, with advances in technology and increasing competition for scientific positions, scientific misconduct is on the rise.

What Is Scientific Misconduct?

Examples of misconduct include publishing data or conclusions that were not generated by experiments or observations, but instead were invented or were the result of data manipulation. In research and scientific publishing, there are two typical kinds of misconduct:

- **Fabrication:** Making up research data or results and recording or reporting them.
- **Falsification:** Manipulating research materials, images, data, equipment, or processes. Falsification includes changing or omitting data or results in such a way that the research is not accurately represented.

Fraud Is the Exception, Not the Rule, in Science... But It Does Happen

Misconduct by fraud now accounts for more than 60% of publishing retractions. As early as 1992, a survey conducted by the American Association for Advancement of Science reported that 27% of scientists had encountered a suspected fraud during the past 10 years.

One PNAS study showed a significant upswing in scientific misconduct. It reported only three retractions for misconduct out of 309,000 papers (0.00097%) in 1975, compared to as many as 83 retractions for misconduct out of 867,700 in 2007 (0.0096%). A ten-fold increase in two decades.

The recent events of the COVID-19 pandemic have also highlighted the consequences of such misreporting.

Fraudulent data poses very real risks to both science and the public, such as the misinformation about dangerous health practices that has misled consumers and patients during this global health crisis.

To address this increase in misreported data, scientists are starting to develop new tools like Retraction Watch, a searchable database



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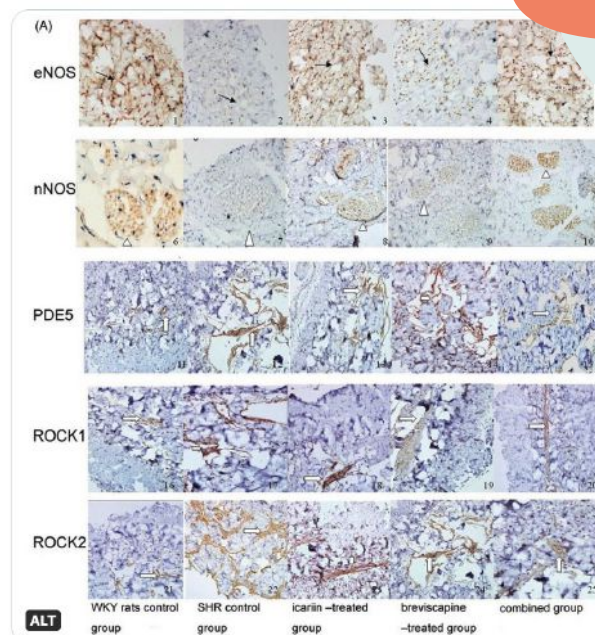


Image Credit: @Elisabeth Bik - Twitter

An example of image misrepresentation from a high-impact publication. Shared by Scientific Integrity Consultant and popular research ethics advocate Dr. Elisabeth Bik, this image shows panels with duplication and overlap reported to represent separate samples.



of over 18,000 retracted papers and conference abstracts. Along with providing such tools, some individual scientists have dedicated themselves to improving the integrity of science. One such crusader is Dr. Elisabeth Bik. Dr. Bik is a Dutch microbiologist and scientific integrity consultant, known for her work detecting photo manipulation in scientific publications. She is responsible for identifying over 4,000 potential cases of improper research conduct and hosts the Science Integrity Digest blog. In 2021, Dr. Bik was awarded the John Maddox Prize for outstanding work exposing widespread threats to research integrity in scientific papers.

Proactively Addressing Misconduct

While these advocates work to address research fraud reactively, after it has been communicated or publicized,

their efforts must go hand in hand with those of our research journals, which are on the front lines in proactively improving ethics in scientific publishing.

It was my pleasure to speak recently with Dr. Amy Kullas, Director for Ethics and IDEAA (inclusive diversity with equity, access, and accountability) at the American Society of Microbiology (ASM) about her career and to get her thoughts on how to improve research integrity and ethical conduct. Dr. Kullas has worked for ASM for over five years and is responsible for oversight and management of its organizational ethics policies and procedures program. In her role, she oversees and facilitates the reporting process, discussions, and resolution of allegations relating to science ethics, misconduct, and harassment.

LSS: Can you tell me a little about your role at ASM, and how you got there?

AK: I have been with ASM since late 2016. When I initially joined, I worked as a Publishing Ethics Manager to maintain the integrity of the scientific record within ASM's 13 scientific journals, including investigation of allegations related to research misconduct.

This included design and implementation of policies and educational modules to help authors conform to best practices in publishing ethics and to work with the editors to ensure we appropriately respond to potential allegations. Notably, I developed and implemented ASM's data citation policy and language for ASM's Instruction to Authors.

In 2019, ASM underwent a more comprehensive ethics review, which allowed us to centralize policies and procedures relating to ethics, to not solely focus on publishing. This allowed us to take a more holistic organizational approach, leading to the development of the ASM ethics department.

Now as the Ethics Director, I am responsible for oversight and management of ASM's organizational ethics policies and procedures program. I oversee and facilitate the reporting process for allegations relating to science ethics, misconduct, and harassment. Additionally, I manage and conduct investigations, discussions, and resolutions/remedies of these matters as appropriate.

LSS: What was it about the Ethics field that spoke to you?

AK: I wasn't sure what I wanted to be "when I grew up." I was going through informational interviews and learning about what opportunities existed. I knew I didn't want to go into academia but didn't necessarily know what I wanted to do.

As I did my postdoc at the NIH, one of the career information sessions was about ethics in science, which included my predecessor at ASM and a bioethicist.

When my predecessor was looking to transition to a new role, they let me know there was an opportunity becoming available and encouraged me to apply.

I feel that a lot of what I do is very important in maintaining the integrity of science, and that is really important to the broader scientific field.

“One ASM journal now has been relaunched to take an even broader approach, in that it publishes negative data studies, studies that have sound data that contradicts the norm in the field, as well as studies that confirm previous publications.”

LSS: In the media right now there are a lot of articles about falsified data and misconduct. Do you think that we are getting better at identifying false data, or do you feel like the cases of misconduct are increasing?

AK: It's probably a combination. Within ASM, it was only around 2014, from a publisher perspective, that we began analysis of figures prior to publication to ensure there is no background manipulation, unacknowledged slicing, or other forms of manipulation. But at the same time, as academia continues to be intense and competitive, there is still the publish-or-perish mindset, and people are worried about getting scooped.

ASM has been taking an approach of collaboration to combat this, and we really want to promote a culture of rigor and data sharing that highlights the importance of the underlying data being available, and in repositories, to the scientific community. One ASM journal now has been relaunched to take an even broader approach, in that it publishes negative data studies, studies that have sound data that contradicts the norm in the field, as well as studies that confirm previous publications.



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I appreciate that companies may not want to give away their proprietary secrets, but we need to instill that open access mindset, especially as taxpayers support a significant portion of science within the United States.

LSS: We have been through an unprecedented time in which trust in science is being challenged, and in parallel, this has coincided with discussions around ethics and scientific misconduct. In terms of misreported scientific data, what are your thoughts on its impact on scientists, science, and the public in general?

AK: Misrepresentation of data can have a significant impact on the public's trust in science. For example, during the COVID pandemic it allowed science to become highly politicized, which can have devastating implications for individuals and for our faith in science as a whole.

One resource that has become of interest for the scientific community is getting the information out in the form of preprints. This allows information to get into scientists' hands quickly, but there is the caveat that when so much research is coming out in preprint, the media may not understand that the research has not undergone peer review. Right now, we still have ripples from preprint and misrepresented studies from the COVID pandemic happening, such as those on hydroxychloroquine and Ivermectin. We really need to ensure that the media knows the importance of going to the right scientific source or organizations, to ensure sure that we are referencing quality science and studies.

LSS: What are your thoughts on how we can combat scientific misconduct? Are there tools and processes that can drive the culture of ethics?

AK: Having open data, open science, and transparency is really important to the integrity of the scientific and research community.

I appreciate that companies may not want to give away their proprietary secrets, but we need to instill that open access mindset, especially as taxpayers support a significant portion of science within the United States.

There is always more we should be doing, but having funders and organizations get on board is going to be crucial. For example, at the beginning of 2023 the NIH is

enhancing their data sharing and policies to ensure that NIH-funded research meets the bar for ethics. The scientific community in general is also becoming more educated, and there are now avenues such as PubPeer, where individuals can anonymously share potential concerns, and Retraction Watch, which highlights which papers have been retracted in all fields and the reasons why.

Although there is training for students, everybody needs to have continued refreshers and conversations about ethics. Even when you get tenure, you need to be mindful of these things.

As scientists, we all need to focus less on impact factor and more on the rigor of the science.

LSS: Do you have any closing thoughts you'd like to share? For example, if someone asked you what was the most important thing about research ethics, what would you tell them?

AK: I really think that transparency is really critical, but also we need to recognize that mistakes do happen. Unintentional mistakes are not the same thing as research misconduct, so we need to understand and appreciate that author correction is not the end of the world. We are all human, and we need to give grace and understanding. ✨



Dr. Laura Szkolar-Sienkiewicz earned their PhD in Biomedical Materials Science from a joint venture between Peptisyntha-Solvay and The University of Manchester, United Kingdom. After dedicating time to a biotech start-up, they moved to Lansing, MI, to research MRI theranostic agents for clinical imaging at Michigan State University. Dr. Szkolar-Sienkiewicz is currently a Principal Privacy and Compliance Manager for Healthcare at Microsoft, and since moving to Seattle in 2017, they have written for AWIS Magazine, have served on the board of Seattle AWIS, and have chaired the board of Women In Bio, Seattle.

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How to Navigate the Switch from Academia to Industry

By **Georgina To'a Salazar, PhD**, scientific writer
AWIS member since 2013

Professionals who begin their careers in the academy pursuing scientific research often wind up turning to industry, transitioning to a wide variety of work opportunities in STEM outside of universities. Academia can, of course, be a wonderful, exciting place that supports innovative research and the growth of intellectual curiosity. Still, individuals initially working at academic institutions may consider a new career path for any number of reasons.

Side hustles or consulting gigs are certainly available options for many academics who want to work outside of academia on just a part-time basis. Many mid-career faculty members seek experiences that will help them earn a promotion and take their career to the chair or dean level. Some researchers who are in earlier stages of their career may also pursue these part-time opportunities, hoping the nonacademic STEM roles will help them shine in the tenure review process. Still other scientists eventually discover that a complete switch to work outside of academia is best for their professional or personal goals.

The number of academics who consider this switch may surprise you: for instance, according to statistics



published by the [American Institute of Physics](#), 63% of those who earned a PhD in physics in 2019 and 2020 transitioned to potentially permanent employment in other fields, including engineering, business or finance, and medical services.

If you find yourself contemplating a career change to industry and need more help than your institution or local community can provide, keep the following four considerations in mind:

1) Do you know what specific path you want to pursue, and might you benefit from professional help in figuring this out?

Since academic research is very specialized, switching from it means a significant departure from what you've done in the past. A career development professional can help you consider a broad array of options. They may be aware of opportunities based on their experience assisting other people with a background similar to yours.



A key indication that you may benefit from this assistance is if you have been submitting applications for jobs in your preferred industry but have not yet landed any interviews. A professional reviewer can help you update your résumé for the current market in your target employment field. Pursuing such services can also benefit your professional development journey at later stages of your career. However, although you should be open to this type of guidance, you should not feel pressure to pay for services beyond what you can afford or are willing to pay (see additional guidance about selecting a career development professional later in this article).

2) Are you pursuing career connections through social media?

Using social media networks, you can find groups to provide guidance and share tips, such as Facebook's [The Professor is Out](#), a group for academics who are moving on from their university roles. Such communities provide mutually supportive environments for professionals who are exploring nonacademic options. They may even provide a specific connection to an employment opportunity. A personal example: I used LinkedIn to reach out to a technical writer at a target company, and she helped me get an interview. Although I didn't get an

offer then, we stayed in touch, and a year later she let me know about another open role. I've learned a lot from being a member of her team for the past nine months!

3) Have you considered participating in a professional community like AWIS?

Joining professional communities provides many advantages for those of us making career transitions. Some organizations are specific to particular fields or locations, for example, the [American Medical Writers Association](#) and the [San Diego Scientific Writers Association](#). Other organizations focus on needs particular to a demographic group, such as [the Society for Advancement of Chicanos/Hispanics and Native Americans in Science](#). Participating in alumni group activities and networking with colleagues and classmates are other ways to engage in the benefits of professional communities.

AWIS, an organization that supports women in STEM, provides many professional benefits, including access to such career development resources as webinars, newsletters, articles, member recognition opportunities, local and national events, and membership directories. Participating in professional communities like AWIS can help you overcome feelings of vulnerability and can help you reduce any hesitancy you may have about tackling career development challenges. These communities allow you to connect with people who

share common interests, and they offer you collaborative ways to address larger goals, such as promoting diversity and inclusion and driving systemic change. Additionally, they provide opportunities to volunteer to help others—another great way to overcome barriers, to build social bonds, and to increase feelings of self-worth. Wherever career growth takes you, the benefits of participating in a professional community like AWIS will help you make the transition.

4) Are you allowing emotional issues to cloud your thinking?

Under certain circumstances, consulting a mental health therapist may be an important component of your professional development strategy. Perhaps you experience intrusive thoughts, nightmares, emotional numbness, jumpiness, or agitation. Or you may be concerned about your ability to come up with an accurate assessment of your current skills and responsibilities. You might have a persistently low mood, a feeling of helplessness about changing your situation, a feeling of hopelessness about things getting any better, or a disturbance in your eating or sleeping patterns. If these experiences are so intense and distracting that they interfere with your basic ability to function in your personal or professional life, seek out a therapist who can help you address your challenges. Attending to your emotional and mental health will greatly enhance your career development. We all need help maintaining and improving our mental health sometimes; attending to these needs is nothing more than another step to achieving the best for ourselves, our families, and our communities.

Choosing the Coach Who Is Right for You

Now that you have started to shape your plan for making a switch to industry, you may need additional guidance in how to select the career educator, consultant, counselor, or coach who is right for you. I have communicated with several such professionals: Gertrude Nonterah, also known as [The Bold PhD](#); Alaina Levine of [Create Your Unicorn Career](#); Jennifer Polk of [From PhD to Life](#); and Cátia Moutinho and Ossama Khalaf of [Advice For Life Scientists Academy](#) (AFLS). Here are some lessons they shared with me about the benefits of a coach, what to look for in a coach, and how to pay for these services.

Benefits of a Coach

The coaching programs I have explored include both small classes and individual consultations, different models that can be tailored to a job seeker's individual goals, strengths, and needs. Commenting on what they often observe when working with new clients, AFLS representatives said,

"We (scientists) often learn how to be meticulous when we are conducting experiments, analyzing the results, and publishing our work. Yet, we spend no time at all promoting our skills and marketing them properly." So, they often help clients work to emphasize their skills so that they stand out in an application, and they also help clients learn how to interview confidently for an industry position.

Alaina Levine, author of a series of articles in *Science Magazine* called "Your Unicorn Career," said, "It's part of my mission to make sure people understand the extent of their value and the extent of the power and choice that they have in terms of career development, so that they don't have to be fleeing from something negative. They can be looking toward something positive."

What to Look for

The International Coaching Federation—the leading organization advancing life coaching as a profession—does award credentials. However, in my research, I could not find any accreditation process for organizations providing services to support the switch from academia to industry. So, you need to be careful in personally assessing the caliber of a potential career coach. I advise following these three steps when looking for a career coach to help you to navigate the transition from a university job to an industry role:

1) Make some preliminary decisions about your ultimate goal and the tasks you believe are necessary to achieve that goal. The goal and the tasks may change as you explore potential coaching resources. However, making these preliminary decisions will give you an initial framework for assessing how well a particular coach might help you.

2) Begin your assessment process by interacting with a career coach's free content. For example, The Bold PhD [YouTube channel](#) features dozens of videos, including a playlist of interviews of people who have successfully made the switch from academia to industry. Jennifer Polk of From PhD to Life said, "We [career coaches] all put out free resources and content on various platforms. I'm on Twitter and have a presence on LinkedIn. Other folks might be big on Instagram, newsletters, or they might speak in person." Reading a coach's free articles or watching their free videos is a good way to get a better idea of the coach's personality. It will also help you understand what is included and excluded from the coach's services. You might even find that the help provided in the free content is enough guidance for you to achieve your goals.

3) Further evaluate a potential coach with an introductory session. For those cautious about making a big commitment, take advantage of the free or low-cost introductory sessions or 30-day trial that some coaches provide. For instance, Alaina Levine offers a free [15-minute introductory consultation](#). This will provide a better idea of how well you might work together with a potential coach.

Other points to consider:

- Once you have a better sense of the coach's personality, goals for sessions, and services, do you believe that they are likely to work well with you?
- Is the coach focused on a particular outcome, or is their work more focused on the holistic growth of clients?
- What are some examples that demonstrate the coach's track record of success?
- How is this coaching a better fit than other coaching you are considering?
- How well does the coach appear to understand your unique situation as they describe their services and how they can add value to your career development?
- Does the coach have training, certifications, experience, or background in your field? Does their specific skill set seem well suited to meeting your unique needs?
- If you and the coach decide that you're not a good match, can they refer you to another coach who might be a better fit?

How to Fund Career Coaching

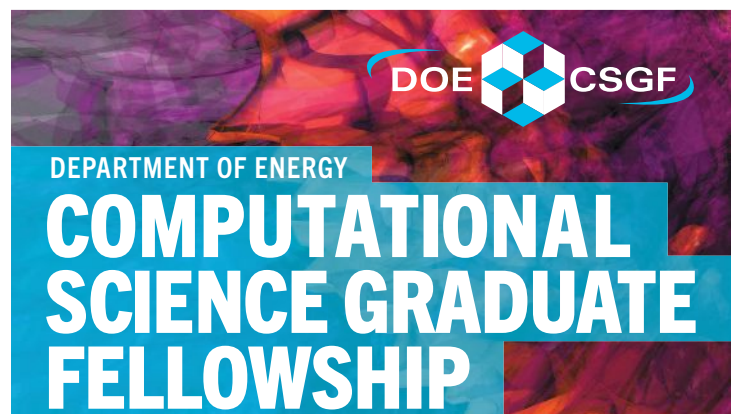
Since this field is unregulated, prices for services offered by different coaches vary widely. Sometimes discounts may be offered to students or researchers who may benefit from services but for whom the full cost of these services is prohibitive. There are also opportunities for trainees or faculty members to get financial support for career coaching through their universities or other organizations. AFLS representatives said that a few of their clients have managed to access continuing-education funds through their institutions. They added, "We do offer coaching programs for entire labs, where a PI (principal investigator) asks for our help coaching their team, and it is covered by the lab or institution." Coaches' websites may even feature information for organizations seeking to fund support for their members, for example, the following link on the From PhD to Life site: "[For Institutions and Organizations](#)." The Beyond the Professoriate site has a [similar page describing their platforms and resources](#).

Ready, Set, Go

The broader point is that many resources are available to people ready to make the switch to industry. Keep all of these considerations in mind, and work to develop a step-by-step plan that fits your specific goals. Regardless of your plan, don't hesitate to take the plunge, now that you have decided to explore a new career path, and don't be reluctant to reach out for the help that awaits. ✱



Georgina To'a Salazar, PhD, works to create innovative solutions in science communication, research, and policy. With a BS in chemical engineering from Stanford University and a PhD in biomedical engineering from the University of California, Irvine, Dr. Salazar has fulfilled her dream of exploring the world, having taken research positions in Singapore and Japan before returning to the United States to focus on science communication at Takara Bio USA, Inc.

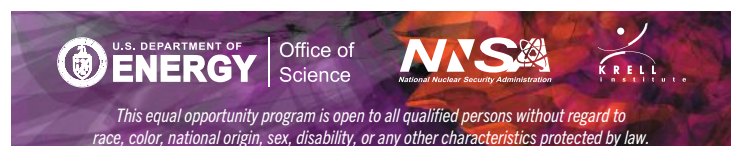


The Department of Energy Computational Science Graduate Fellowship (DOE CSGF) provides up to four years of financial support for students pursuing doctoral degrees in fields that use high-performance computing to solve complex problems in science and engineering.

The program also funds doctoral candidates in applied mathematics, statistics, computer science or computational science – in one of those departments or their academic equivalent – who undertake research in enabling technologies for emerging high-performance systems.

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APPLICATIONS DUE
1.18.2023



Meet Mental Health Advocate Dr. Zoë Ayres

By Cynthia Hurlbert, Assistant Technical Writer, NCI
AWIS member since 2022

There is a growing mental-illness epidemic in higher education. Academics face high levels of stress and low mental-health support. Surveys indicate that academic staff also face stress levels at or above those of health care workers. Graduate students have eight-times-higher rates of severe depression and anxiety than corresponding peers in the general population, far too often resulting in suicide. The main factors associated with PhD students' mental-health challenges are high levels of work demands and work-life conflict, low job control, poor support from the supervisor, and exclusion from decision-making.

Not only are academics grappling with these challenges, but they also appear reluctant to share that they are suffering. While the percentage of workers in academic settings disclosing mental health concerns to their employer appears to be in the single digits, the actual percentage is likely much higher; academics have been found to be among the occupational groups with the highest levels of common mental disorders, with a prevalence of nearly one third of respondents admitting to having problems in surveys.

Right now, the biggest questions facing the academy are: What is causing this reporting discrepancy? What are the possible causes of these challenges and concerns? How can universities better

support their students and staff?

Dr. Zoë Ayres is one of the voices speaking out publicly about the issue of mental health in academia. She is an analytical scientist by background, with an undergraduate degree in forensic science from Nottingham Trent University, a master's degree in analytical chemistry, and a doctorate in electrochemical sensor development, both from University of Warwick. After spending several years in academia post-PhD, she moved to industry and is now Head of Research and Development at Figura Analytics, the President-Elect of the Royal Society of Chemistry's Analytical Science Community, and a trustee of the Analytical Chemistry Trust Fund. Dr. Ayres is also an advocate working toward improving mental health in research settings, with a primary focus on the mental health of graduate students. She raises awareness of the common issues grad students face through various campaigns and initiatives and is the author of the #mentalhealth poster series on Twitter (you can find her @zjayres).

Dr. Ayres says, "For us to truly solve the biggest challenges of today, we must have diverse teams of talented



individuals working toward one common goal. I also strongly believe that well-being and productivity go hand in hand, and I am interested in utilizing this intersection, enabling researchers to be at prolonged peak performance, and have better quality of life. For these reasons I advocate for improved mental health awareness and support in academia and beyond, as well as greater representation and inclusivity within STEM, alongside my day job as a research scientist."

CH: Congratulations on your book *Managing Your Mental Health During Your PhD: A Survival Guide*. What drove you to write a book focusing on mental health?

ZA: I wrote the guide I wish I'd had during my PhD. I struggled heavily at times with my mental health during my PhD and finally had the strength to put my experiences and things

MENTAL HEALTH DURING YOUR PhD

AN OPINION PIECE BASED ON SOME RESEARCH I DID IN MY LUNCH HOURS AND MY ENTIRELY UNQUALIFIED EXPERIENCE*

47%

A study by the University of California, Berkeley, found nearly half of postgraduate students met criteria to classify them as depressed.¹

WHAT YOU MAY BE EXPERIENCING/FEELING (YOU ARE NOT ALONE, I PROMISE)

IMPOSTER SYNDROME



Someone is going to figure out you don't belong here soon. You look good on paper, but passing that exam was a fluke. I don't have what it takes to [do these experiments, write a thesis, succeed in academia]. These are all classic signs of imposter syndrome. **Tip: reframe your thinking. Aim for progress not perfection.**

NO MORE TICK BOXES



You got pretty good at doing essay and lab reports - they were all short term tasks. You also got good at figuring out what questions might be asked in exams. Now you have an open ended project, with the end no where in sight. You no longer have grades to tell you if you are doing a good job. Transitioning from this undergraduate mentality can be particularly tough. **Tip: break down your research into small, manageable goals.**

FIRST TIME FAILING

You've always been the best student at school, and you did pretty well at university too. Now your science isn't working and everyone around you seems to be getting on just fine. These feelings can come about as at undergraduate level, experiments (believe it or not) are designed to work. **Tip: remember, you are at the forefront of scientific research - if it was easy it would already have been done!**



ISOLATION / GUILT

Writing your thesis can be a particularly lonely, isolating task. This can also be coupled with feelings of guilt when going about your daily life as "you should be writing". Tips to manage this include still attending research group meetings/departamental seminars whilst writing. This can also be coupled with 'writer's block'. **Tip: when writing, start by making figures - it is far easier to write about what a figure means.**



COMPETITIVE LANDSCAPE



Unfortunately, academia often fosters competition over collaboration, when it should be the other way around. This is made worse by the fact that often the only way to gauge how well you are doing is to compare yourself against others. **Tip: no two PhD projects are the same. so avoid comparing them.**

THE WORK | LIFE STRUGGLE



There is an inherent culture of acceptance in academia of long work hours. In fact, 40% of academics report working more than 50 hours a week.⁴ This is a fault with the system. Presenteeism is a common trait observed in academia, where people work long hours due to anxiety/stress, but are not being efficient in these long hours. **Tip: aim to be efficient inside normal working hours then focus on "you" time.**

A hard truth is only 7 in 200 PhD graduates become full professors.⁵ During your PhD, make sure to work on other "soft skills" as well as doing your research. Like making a poster for an online Twitter competition for example...

ARE THOSE AROUND YOU STRUGGLING? HERE ARE SOME POSSIBLE WARNING SIGNS



INCREASED DRINKING



INCREASED EATING



DECREASED EATING



WORKING LONG HOURS



BEING ABSENT



JOKING ABOUT SUICIDE



LOOKING DISHEVELLED

SELF-HARMING? SUICIDAL THOUGHTS?

CALL SAMARITANS NOW

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SOME WAYS TO HELP MANAGE YOUR MENTAL HEALTH AND WELLBEING



SEEK MEDICAL ADVICE

Speak to a medical professional about how you are feeling. This may lead to intervention such as medication or counselling to help you manage your mental health.



TAKE SOME TIME OUT

Taking a break can actually improve efficiency when you return to work. If you cannot justify taking a couple of weeks off, take a series of long weekends to get some time away.



FOCUS ON YOU

It is a proven fact that lack of sleep can add to feelings of stress. Exercise can also work to alleviate stress. It may feel like you don't have time, but going for a walk at lunchtime (for example) may be a positive change you can make.



REQUEST COUNSELLING

Universities have counselling services that are available for you to use. This can be useful to help talk through your problems and also make sure appropriate coping strategies are in place.



TALK TO YOUR SUPERVISOR

It is not always possible, but if you feel you can approach your supervisor, discuss your mental health concerns with them. Other options include discussions to reduce workload temporarily or take time out.



TALK TO YOUR PEERS / POSTDOCS

It is highly likely that people around you have also experienced the stressful nature of a PhD. Reach out, if you feel able. Remember, postdocs have survived their PhD so may have some useful tips / coping strategies.



CREATE MANAGEABLE CHUNKS

If everything is overwhelming, try to break down your research into manageable tasks. It may help to do this in consultation with your supervisor. A good tip is to aim to get into the lab first thing in your day, before looking at other tasks like emails.



READ LITERATURE

There are a large amount of online resources available to help manage mental health and wellbeing. For example, the charity Mind, have a range of booklets available, from how to manage stress, to how to support others with mental health problems.

As a final note, if your PhD is heavily affecting your mental health and wellbeing, there is absolutely no shame in quitting and starting a new chapter in your life. There are plenty of successful people that quit their PhD! Put it this way - you might put up with an ill-fitting t-shirt for a while, but you wouldn't wear it for 4 years!!

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A poster by Dr Zoe Ayres (not a medical professional). Free to distribute.



#TIMETOTALK
#RSCPOSTER

*ALTHOUGH I DID SURVIVE A PhD

Z. Ayres (2020) Mental Health During your PhD. (figshare)

This poster explores common mental health concerns PhD students face during their studies, as well as practical advice to help manage mental health and wellbeing. Originally produced for the #RSCPoster competition in March 2019 by @zjayres.

that I've learned down on paper. Few books like this currently exist for PhD researchers, written from a lived-experience perspective, and so I hope it will be a valuable resource. I wanted to show it's possible to have mental illness and navigate a PhD journey, but also not shy away from talking about some of the challenges that people might face to better prepare them to ensure they thrive in the academy.

CH: In 2020, you launched the #100voices campaign to capture individual stories over 100 days to reduce the stigma of mental health issues. Tell us more about the project, your goals, and outcomes.

ZA: When I started this project, I wasn't sure what the uptake would be, and now I have over 300 people that have shared their mental health journeys with me. The aim of the project was to show the amazing

research that people do in academia, alongside them talking openly about their mental health, to normalize these sorts of conversations. We are not robots, but human beings! Long term my goal is to get to 500 experiences captured, and perhaps compile the accounts into a book.

CH: I see that you have collaborated with Heidi Gardner for Science On A Postcard's (now Little Science Co) mental health collection with proceeds going to Dragonfly Mental Health. How important are collaborations for mental health advocacy?

ZA: Collaboration is a huge part of mental health advocacy, as it helps build connections as well as share the load. It's great meeting others that have a shared purpose with me and work together. It's also hugely valuable if I'm ever struggling (sometimes advocacy takes its toll) and having people to speak to

that "get it" is fantastic. One of the biggest collaborations for me has been founding Voices of Academia with Dr. Marissa Edwards (<https://voicesofacademia.com/about>), a blog and podcast, where people contribute their academic mental health stories.

CH: Can you tell us more about your work in ED&I? What are your goals as you pick which projects to support? What has been successful? What still needs work?

ZA: ED&I work is constant vigilance, and there is always more work to be done. As I'm moving into leadership positions, I'm trying my best to advocate for change where I can and to make sure others get to contribute and that I'm not the only voice. One of my favorite projects to date was the [Warwick Diversity Book Club](#), funded by the Royal Society of Chemistry. A team of us ran the book club for a yearlong pilot,

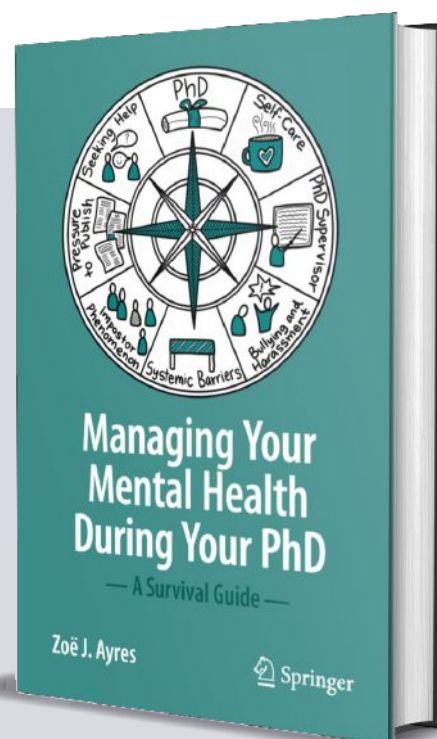
To learn more:

Visit her website: www.zjayres.com

Follow Dr. Ayres on Twitter @ZJAYres

Read her book [Managing Your Mental Health During Your PhD](#)

Visit [Dragonfly Mental Health](#)



having engagement from all levels in academia, allowing us to talk openly about diversity and inclusion in STEM. The whole project is open source and can be used by any institution.

CH: You are very active on Twitter (60K+ followers!), have a growing newsletter, and also have amazing resources on your website. What can you tell us about how you got to this point? How do you find and elevate others and grow your community? What advice do you have for other scientists who are interested in scicomm?

ZA: I still can't quite believe the follower numbers I've gotten, and I wish I could share some plan for how I've done it. I (think) I'm genuine and perceived this way, and I think people respond better to this than to highly curated social media. I try

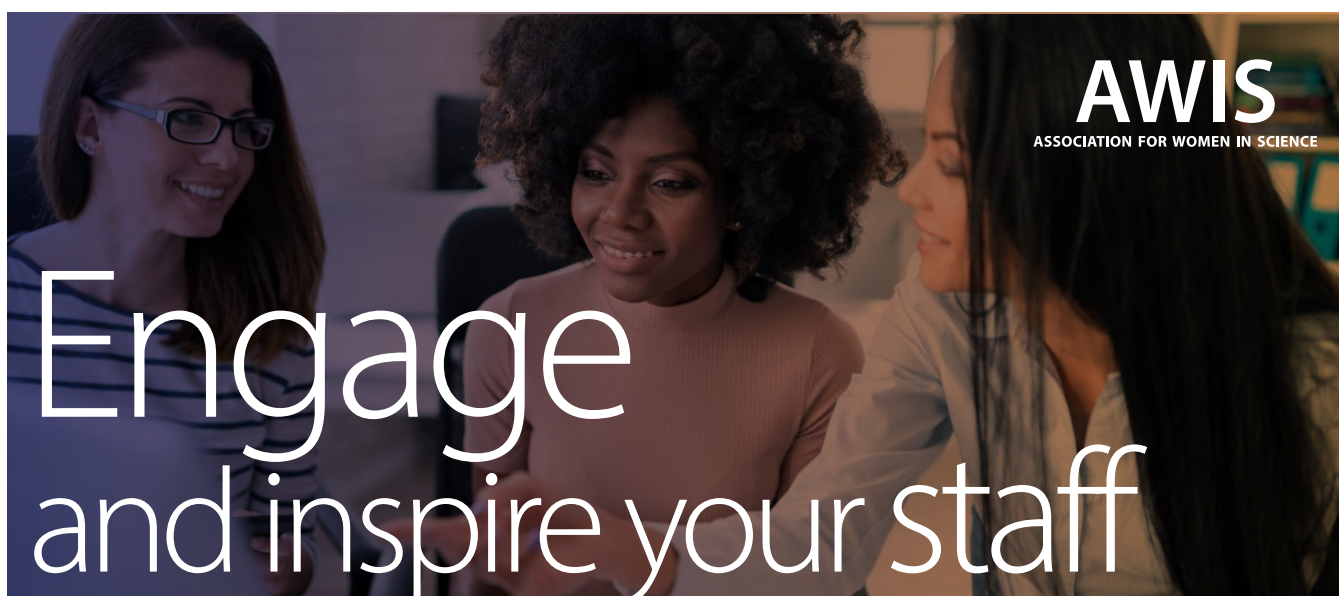
to ensure that I engage in dialogue, not generate a one-way information stream, and I run campaigns like #100Voices to elevate others. I also started the #AcademicMentalHealth hashtag to form a sense of community. I'd say to people who are trying to use social media to get their content out there: don't change yourself for others. Quality engagements are far more important than quantity. 🧠

Sources:

<https://www.rand.org/randeurope/research/projects/researcher-mental-health.html>

Cynthia Hurlbert is an Assistant Technical Writer with the Laboratory of Molecular Biology at the National Cancer Institute. There she assists with the publication process, as well as with

*coordinating laboratory events, large and small. She has previously worked as a private tutor in the Washington, D.C., area. She holds two bachelor's degrees in neuroscience and microbiology from Furman University and Clemson University, respectively. She continued her educational opportunities at Uniformed Services University, studying *Schistosoma* spp. Hurlbert is involved in science communication and education and has pursued her passion for these fields both formally and informally.*



AWIS
ASSOCIATION FOR WOMEN IN SCIENCE

Engage and inspire your staff

Dive into AWIS webinar recordings using our new webinar discussion guides. Quality speakers bring diverse experiences and lead conversations curated for women in STEM and their allies.

Browse our library and contact awis@awis.org to arrange a private screening for groups that include non-AWIS members.

How My Journey in Science Led Me to Diversity, Equity, and Inclusion Work

By Rachel Roper, PhD, Professor of Microbiology and Immunology, Brody School of Medicine at East Carolina University
AWIS member since 2008

Over the years, I attended numerous equity and diversity trainings at several universities and at the National Institutes of Health. I always believed in the existence of racial and ethnic bias, but I remained puzzled for a long time about whether there was still significant gender bias affecting women's careers. As a scientist, I needed to see convincing, hard data to believe that the problem was real.

As Nobel Laureate Gertrude Elion said, "I hadn't been aware that there were doors closed to me until I started knocking on them." I became more aware of these issues when I became a professor. A [Pew Research study](#) confirmed that gender bias becomes more apparent if you're in a male dominated field and reach the upper levels.

When I was hired, I was the only woman in the microbiology and immunology department with 16 men. A previous woman faculty member who had not received tenure had just left. While I was used to working in heavily male-dominated environments – the ratio in the department was below the national average of approximately 25% women. In fact, there were only a few tenured women in the entire medical school.

In addition, when I told friends and neighbors that I was a professor in the medical school, I kept getting asked if I was a nurse. They assumed that because I was a woman that I was a nurse. I had to explain that I was a professor in the medical school and taught future physicians.

However, I received wonderful support and mentoring from the medical school's women faculty committee, and after I received tenure, I paid this support forward. I organized annual promotion and tenure mentoring workshops for the women faculty, and later for associate professors interested in going up for full professor. These group meetings were very successful and popular.

Gender Bias in Science

I eventually became chair of the women's faculty committee in the medical school and then chair of the Chancellor's Committee on the Status of Women. When I sent out a campus-wide announcement about our plans for International Women's Day, I received an email from a man who was a faculty member,



The Brody Women's Faculty Committee (Drs. Anagha Malur, Tracey Woodlief, Karen Litwa, and Rachel Roper) at a recent on-campus diversity and inclusion event showcasing their library, activities, and planned events.

asking me about when to expect an "international men's day." I realized that there was a serious question behind this comment: why do we still pay attention to women in this way at universities?

I wrote back a response with some references to well-designed experiments published in respected, peer-reviewed journals that showed statistically significant bias against women in science and academia. Many such studies showed that simply changing a man's first name on a CV or article to that of a woman's name decreases the perceived quality of identical materials. I also shared statistics on sexual assault, which was (and still is) rampant on college campuses.

I continued collecting published studies on bias against women in science and medicine and searching for a review article on this subject. I realized that many of my colleagues did not know about these studies or their results, so in 2014 I gave my first seminar on campus about bias against women and was invited by the provost to give the seminar to the deans and directors in 2015. Eventually this led to me write a 2019 review article on bias against women in STEM and in academia entitled "[Does Gender Bias Still Affect Women in Science?](#)" I published it in a peer reviewed scientific journal so that it would reach scientists who ordinarily would not know about these data.

I have now been invited to give over 45 talks on gender and racial/ethnic bias, and I have shared this research in presentations to undergraduates, to faculty at department meetings, and to participants at national and international conferences. Audiences are amazed by the data. Fortunately, awareness of the bias makes a tremendous impact, and seeing where bias exists helps us to devise strategies to lessen it. [A 2018 report](#) from the National Academies of Sciences, Engineering, and Medicine stated, “Training to reduce personal bias can cause larger-scale changes in departmental behaviors in an academic setting.”

Since bias is most often unconscious, simply discussing it can raise awareness and make a difference. As they say, “If you see something, say something!” It really can open eyes and change lives.

More Work Must Be Done

The studies captured in my review article, as well as research published since then, document bias in grading, hiring, evaluations, promotions, tenure, pay, citations, grant reviews, and letters of recommendation, and they also document persistent sexual harassment. These biases accumulate over time to affect the overall career success of women, including their chances for tenure and promotion. One measure often used in evaluating faculty productivity and prestige is the H-index which is based on the quantity of an individual's published papers and on how many times they have been cited in other publications. Anyone looking at a candidate for promotion, should realize that a woman's H-index is likely lower than it should be due to gender bias, as I described in my 2021 paper, [“The H-Index in Medicine and Science: Does It Favor H-im or H-er? Successes and Hurdles for Women Faculty.”](#)

Another challenge for women and historically underrepresented groups, is that they bear an extra burden of service work, both formally and informally. We are asked to serve on committees where diversity is needed, and students who are like us reach out for help and advice even when we're not their advisors or official mentors. Often our male colleagues don't know about this extra work that we do. This unrecognized service is sometimes called the “woman tax” or the “minority tax.” Department chairs can help by recognizing and rewarding this important work.

While these gender issues can hold women back, there is some good news. Over the years, we've seen a tremendous increase in women faculty in microbiology disciplines, with women assistant professors increasing from about 25% in 2006 to over 55% in 2018, but women still make up only about 25% of full professors. [Editor's note: The author's pre-print manuscript with this data is pending publication.]

Continuing Advocacy

To help younger women see professional women scientists as role models, I decided that any time a reporter requested a microbiologist or immunologist for an interview, I would do it. I've now done over 200 interviews, many for national platforms. I hope this public role helps people to see and accept women as scientists.

I have worked on many committees and initiatives focused on racial and ethnic diversity and on supporting women in STEM. I was a co-PI on an NSF ADVANCE grant for women in STEM. Over the past five years, I've worked on implementing equity and diversity initiatives at East Carolina University to build diversity into school and department policies and procedures—and, importantly, into promotion and tenure guidelines. We've had great success, and I'm preparing a manuscript on how to help others do this.

In 2022, I was selected to be on the American Society for Microbiology's Inclusive Diversity with Equity, Access, and Accountability Committee of the Board, and I will work to promote diversity, equity, and inclusion (DEI) nationally and internationally. I will continue to give seminars and lead workshops on bias and intervention strategies and for improving diversity throughout the university structure.

I hope that faculty and scientists across the country will work to improve DEI at their universities and companies. My advice for them: Get the data, form committees to support each other, and actively advocate to include DEI in all policies and procedures. 🌱



Rachel Roper, PhD, is a professor of microbiology and immunology at East Carolina University in the Brody School of Medicine. She received her BS from Texas A&M University and her MS and PhD from the University of Rochester's School of Medicine and Dentistry, where she received the M.A.

Hare Research Excellence Award. During her postdoctoral training at the National Institutes of Health Lab of Viral Disease, she was awarded the NIH Fellows Award for Research Excellence. Dr. Roper has studied poxvirus virulence genes, genomics, and vaccines, including oncolytic viruses, and her publications have been cited over 7,000 times. She has been funded by NIH, the National Science Foundation, and a variety of other foundations, and she is a member of the National Academy of Inventors, as well as co-chair of the Global Virus Network Monkeypox Task Force. She serves on the American Society for Microbiology's Inclusive Diversity with Equity, Access, and Accountability Committee of the Board and is an ECU Woman of Distinction. She has served on numerous national and international grant panels and editorial boards.

Persistence Pays Off

A Computer Scientist's Journey

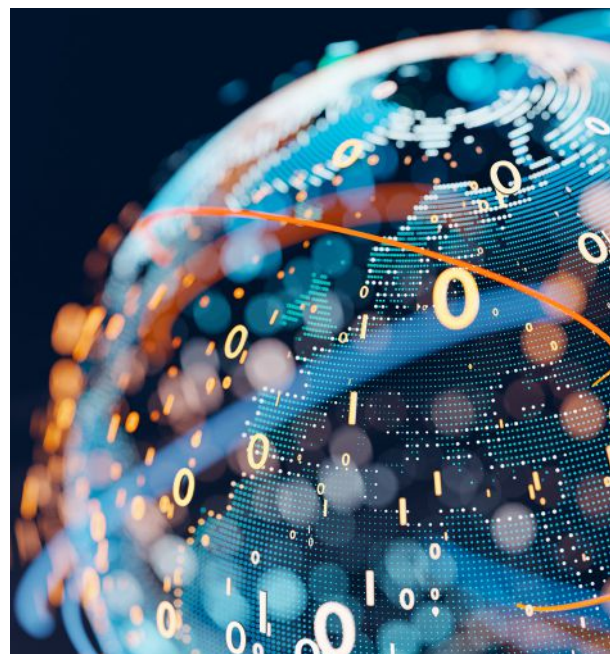
By Obianuju Okafor, PhD, Software Engineer, Microsoft
AWIS member since 2022

My tech journey is quite an unconventional one. For my bachelor's degree, I originally applied to study medicine at Eastern Mediterranean University but was admitted into the pharmacy program. I was told that if I performed well in my first year, I could transfer to the medical program. As the time to register for classes drew closer, I realized that I wasn't passionate about pharmaceutical work. I wasn't passionate about studying medicine either! I spoke to my dad about this, and he encouraged me to pursue a degree in software engineering because, according to him, "that is the direction the world is going." I decided to take his advice and enrolled in that program on registration day.

My first semester was a bit tough. I did well in all my classes except for the introductory programming class. With no prior software experience, I struggled. A lot of the concepts I was being introduced to seemed quite confusing and abstract. This discouraged me, and I thought about changing my course yet again.

When I went home for the summer, my dad introduced me to a software engineer who allowed me to shadow him for a couple of weeks. By the end of the summer, I was able to create a simple website using HTML and CSS, which I found really interesting. Seeing the fun and practical side of software development steadily increased my interest in the field.

Returning to school the next semester, I noticed a shift in my outlook. I understood the programming concepts better than I had before. I no longer felt like programming was difficult, and I started to enjoy it, so much so that I lost track of time while doing it. The constant practice made my skills increase significantly. Lab work, assignments, and exams became easy for me. I became so good at programming that my professors began to commend me, and the people who I would go to for help in the past started coming to me for help. I eventually graduated at the top of my class.



My dad encouraged me to pursue a degree in software engineering because, according to him, "that is the direction the world is going."

I next decided to apply for a computer science master's degree at the University of North Texas. After my application was accepted, a professor reached out to me and told me that my undergraduate cGPA, GPA and my test scores made me a good candidate for the PhD program. They asked if I would like to switch to the PhD program instead. Encouraging me with incentives, they told me that the degree would be fully funded and that I

I became so good at programming that my professors began to commend me, and the people who I would go to for help in the past started coming to me for help. I eventually graduated at the top of my class.

would also be given a monthly stipend, and so I agreed to switch, as I had already planned to work on a PhD down the line, after getting my master's. After two years in the doctoral program, I was awarded a master's degree, and two and a half years after that, I graduated with my PhD in computer science.

I am so glad that I didn't give up after facing difficulties in the first semester of my undergraduate degree. If I had, I wouldn't be where I am today. That degree in software engineering has opened so many doors for me. My entire graduate school experience was fully funded. I was able to secure internships during graduate school at reputable companies like IBM and Salesforce. I have also been able to travel to different conferences and to network with different people, who have inspired and helped me. Lastly, I was able to secure a full-time job at Microsoft after graduating with my PhD.

This whole educational experience has taught me so many things. I have learned the importance of perseverance, of not giving up when things are hard. I have discovered that you can achieve anything that you put your mind to through consistent hard work and determination. Additionally, I have absorbed the lesson that everything happens for a reason, and exactly as it is supposed to. I also have grown to understand the importance of having mentors and a good support system, how crucial it is to reach out to people who can give you good advice and help guide you in your journey.

I'm grateful to have had people who have encouraged me and who have given me good counsel. Not everyone is fortunate enough to have had that. In particular, I have noticed that there are too few technology role models in underrepresented communities. This can be discouraging and may prevent young people from venturing into a technology career. This is why I actively and visibly promote computing careers. I want to create awareness of all the benefits that this exciting field offers and how achievable it is. It is also the reason why I'm passionate about mentoring and encouraging underrepresented minorities. 🌟



Dr. Obianuju Okafor earned her PhD and master's in computer science at the University of North Texas under the supervision of Dr. Stephanie Ludi. She also holds a bachelor's degree in Software Engineer from Eastern Mediterranean University. She is currently a Software Engineer at Microsoft. She is passionate about increasing access to computing for all – in particular, people with disabilities and young girls of color. Her research focus has been on the ways to increase the accessibility of programming environments. For her dissertation, she created an application that helps people with upper-limb motor impairments to write code using their voice. She also volunteers as a mentor, board member, and instructor in several organizations aimed at promoting underrepresented minority women in STEM.

Leaning into Career Twists and Turns

How a Nerdy Academic Became a Leader in the Cannabis Industry

By **Tess Eidem, PhD**, Rogue Micro LLC
AWIS Member since 2015

Before I outline my path from nerdy kid to scientist, and from project manager to professor, as well as describe my current role as a scientific leader in the cannabis industry, I want to say this to all of you looking for a little career inspiration: be curious, care, and don't be afraid to take your shot. You never know what could happen.

As a kid, I didn't have dreams about becoming a scientist, I never met a scientist in real life, and I had no idea what they did—except for being supervillains in cartoons. Although I grew up in a single-parent, low-income family without this career-relevant understanding, my first nerd “phenotypes” started revealing themselves around age ten. My twin sister, Megan, and I would stay up late in anticipation of *Star Trek: The Next Generation*. I loved the show, the discoveries, and the science-based problem-solving. Now, THAT was a future I could get into! Unfortunately, I was born about 400 years too early, but that didn't stop a spark from igniting something deep within me: a passion to understand life in all its forms. Here on Earth, it started with my love of animals and a fascination with nature. It manifested at home, which was always full of pets, creatures (some hidden from our landlord), and specimens collected from the nearby creek. With this drive and focus, I started excelling in school and graduated high school as valedictorian.



Dr. Eidem with her colleagues at Columbia Care New York.

Thanks to some great teachers and to a super supportive mom, I was able to go to college at the University of Nebraska at Omaha on a full-ride scholarship to pursue a degree in biology. As an undergrad, I got my first experience with the trials and tribulations of research, and I'm not going to lie, it was hard! There were no answers at the back of the book, professors who were experts in the field shrugged at my results, and I wondered if the questions would ever end! Even though it could be discouraging, the little tastes of discovery fueled and propelled me into graduate school at the University of Nebraska Medical Center.

(source Columbia Care New York)

In my second year of graduate school, I had to switch labs unexpectedly after being warned by senior graduate students of unethical scientific conduct encouraged by our advisor. Later I found out that my first graduate advisor's house had been raided by the FBI, and to this day it is [unclear](#) why he is under investigation. Needless to say, he is no longer a professor. Thankfully, I transferred into Dr. Paul Dunman's lab studying pathogenic bacteria, and within a year, our entire lab moved 1,000 miles away from Nebraska—my home and my entire support system—to the University of Rochester in upstate New York.

Graduate school is already full of ups and downs normally, under the best of circumstances, but these early perturbations in my scientific journey knocked me well out of my comfort zone and made me doubt myself and my ability to continue. In hindsight, these challenges gave me the opportunity to explore different labs and perspectives, to find my support groups in these new spaces, and to help me build grit and determination. As I progressed in graduate school, these experiences and connections with others built a foundation that became the core to my success.

Along the way, I continued to develop my research skills and peer into the scientific unknown. In the lab, I investigated a potential new class of antibiotics and had the opportunity to collaborate with pharmaceutical companies. I also expanded my interests to music and science communication, helping to round out my technical "hard" skills by synergizing these "soft" skills.

After graduate school, I took a research position at the University of Colorado Boulder and became involved in several advocacy groups on campus to promote the advancement of women, postdocs, science outreach, and inclusion. I focused on new ways to grow and complement my skills in the lab, classroom, and kitchen. I sought out training in leadership, management, and crucial conversations. I could run a beautiful Northern Blot, and I could also teach RNA transcription to a 12-year-old through an interactive board game that I built for outreach. I founded the Science Communication Symposium through the Women in Science and Engineering (WiSE) Group (an AWIS affiliate), bringing



Plated Cannabis Leaf

Photo by Tess Eidem

diverse scientists and the general public together for inspirational science and career talks that got participants thinking outside of the box. I also started a fermented foods company with my husband, Derek, who was a brewer at the time. We combined our microbe-wrangling skills to promote beneficial microbiomes through delicious foods, meaning that most Friday evenings were sauerkraut-shredding date nights.

My advocacy work, entrepreneurial spirit, and passion to make science fun and approachable led to my next position as the Associate Director of Education at an NSF Science and Technology Center. It was there where I finally put my diverse skills and talents to use, based on a strong mission and good leadership, to build programs that promoted diversity, science education, and skill development for kids, undergraduates, and postdoctoral researchers.

Program building is also what led me to my next role as an associate professor. I was recruited to expand the Human Health and the Environment Program, and I loved teaching, building new interactive learning tools, and getting to know my students. Unfortunately, I also saw flaws at the college, including sexism and racism in the highest ranks, and my time there ended abruptly after being retaliated against for challenging toxic behaviors.

Up until this point, I'd thrived in an academic environment for close to 30 years. Being in the academy was part of my

identity and self-worth. I just took a giant leap and was in free fall, waiting to touch down, overwhelmed with the question, “What do I do now?”

My advice to anyone in this situation: take time for self-evaluation and self-care if you can. Reach out to your friends, your counselor, and your family. Look back at the stepping stones that have led to where you are now and appreciate how far you’ve come. What has motivated you? What environments have made you feel fulfilled and energized? Look at the possibilities with curiosity instead of with the anxiety that can come with the unknown. You will find a place to land, and you will be all right. After all, you’ve come this far already!

Well, I did land: right into the cannabis industry. It has been nothing short of the Wild West, but I’ve found that I thrive in this space, where overlapping fields, backgrounds, and experiences collide. For example, I have used my chemistry and drug-discovery background to extract and purify cannabinoids and terpenes, and my project management skills to bring new products to market, improve processes, and build systems to monitor efficiency while manufacturing cannabis products. My communication skills have come in handy while liaising with state health departments, third-party testing labs, and cultivators to help everyone understand the patchwork of state compliance requirements and scientific methods. My microbiology skills have been paramount to establish quality control methods, enabling cannabis manufacturers to “seek and destroy” microbial contaminants before they get a foothold on plant-derived flower products, protecting consumers from pathogens and the manufacturer’s brand from recalls.

Currently, I run my own consulting company, Rogue Micro LLC, where I work with cannabis and fungi cultivators to help them overcome microbial challenges that can put their consumers and company at risk. I travel to visit

**My advice to
anyone in this
situation: take
time for
self-evaluation
and self-care
if you can.**

their facilities, get to know their pain points, and build action plans. I also work with scientific organizations, state regulators, quality companies, and testing labs to help set standards, validate methods, and bridge the gap between these stakeholders.

It’s rare to draw a straight line to success. Our journeys are unique and take us down winding roads. There are many things you can learn in a classroom or a laboratory, but innovation doesn’t happen until diverse experiences and technical skills crash into the “real world,” pushing you to address challenges and meet needs. My experience with innovation is that you keep putting one foot in front of the other, surround yourself with people who

share your values, keep trying stuff, and care: care about the big picture and the outcome, care about the people involved, and care about how you achieve your goals. When those secret ingredients have combined in my life, that’s when I have really felt that I’ve found success. So, if you haven’t lately, dare yourself to try something new to get out of your comfort zone. You won’t regret it! ★



Dr. Tess Eidem earned her PhD discovering potential new antibiotics against bacterial pathogens, owned and operated a fermented foods company with her husband, Derek Staebell, and got her start in the cannabis industry by working in manufacturing and quality management. At her company Rogue Micro LLC, she is motivated to help cultivators overcome microbial challenges by sharing her knowledge and experience in science, food, agriculture, advocacy, and entrepreneurship.

Fighting Power Abuse in Academia and Industry

Do you enjoy your work environment? Do you feel heard on your research team? Are you free to express your ideas and to grow with the organization? Does your supervisor have high expectations and yet reasonable demands for your work?

Unfortunately, not every work environment is so supportive. People from marginalized groups can sometimes feel intense pressure to succeed and then overextend themselves, while they simultaneously endure discrimination. Members of these groups often experience abuse from people who wield power over them at work, a common problem in both academic and professional environments. Dr. Wendy Ingram explored this challenge in a recent AWIS webinar, “What to Do When Power Abuse Occurs in Academia (or Elsewhere).”

Dr. Ingram is the Co-Founder and CEO of Dragonfly Mental Health, “a nonprofit dedicated to cultivating excellent mental health among academics worldwide.” She is committed to researching the underlying biology of mental illness and to dismantling the stigma against it through advocacy, education, and systemic change.

Just what is power abuse? According to Dr. Ingram, it is “the misuse of a position of power to take advantage of a person in an inferior position for personal gain or to harm said person,” a definition she attributed to the United Nations Educational, Scientific, and Cultural Organization. This inappropriate dominance affects the victim's confidence and work motivation.

Those who misuse their power in this way typically discriminate against or harass their workers. Dr. Ingram explained that harassment can emerge in a highly competitive, performance-driven environment or work culture; in an environment consisting of distinct hierarchies, in which employees are heavily dependent on their mentors or teams; or in workplaces where the people in power have a substantial effect on their subordinates' next promotions.

Dr. Ingram asserted that no matter how common such harassment is, it should never be allowed to occur. She provided the following tips for anyone dealing with this abuse:

- Trust your instincts when a situation does not feel safe.
- Prioritize your health. Some ways to take care of yourself are



by removing yourself from danger, asking for help, using sick leave, or seeking therapy.

- Document everything. Be specific with the details, including how you felt in the moment, so that even if you do not report the harassment immediately, you have created a record that you can use later.
- Report the harassment when you feel ready to do so. Keep in mind that investigations can go on longer than expected. During this time, lean on your support system.

Finally, Dr. Ingram offered tips for early researchers, group leaders, and allies who find themselves handling situations of harassment. She encouraged them to be active listeners; to state what their own boundaries are; and to check that their actions, and those of their colleagues, are truly helpful. She also reminded us that it is not the victim's responsibility to prevent discrimination, harassment, or power abuse. Instead, the institution or organization must be held accountable.

For a list of helpful resources from Dragonfly and AWIS, watch the [webinar recording](#), and get access to the presentation (AWIS members have FREE access). 📌

Advocacy Update

By Meredith Gibson, AWIS CEO

Advocacy is at the heart of our mission, which reads: *AWIS champions the interests of women in science across all disciplines and employment sectors. Working for positive system transformation, AWIS strives to ensure that all women in these fields can achieve their full potential.*

We believe that in order for women scientists to achieve their full potential, they must be treated fairly, must be able to work in a safe environment, and must be properly credited for their achievements. We use a number of strategies to monitor trends, raise awareness of inequities, and recommend changes.

Advocacy Activities

Part of our work involves collecting the voices of AWIS members through conversations and surveys. Your

firsthand experiences demonstrate the current challenges that women scientists face and inform us about which areas to focus on. As we monitor research and legislative efforts directed at these challenges, we also share updates in our newsletters, on our website, and through social media.

On our website, we have curated data points and resources for AWIS members that focus on how to fight gender bias, racism, harassment, Title IX violations, and caregiving discrimination. These web pages outline the issues and their impact on individuals, organizations, or society. We also recommend action steps for individuals and for leaders of organizations, so that they can address these issues.

On key problems that affect women's careers, AWIS may choose to issue a specific statement stipulating our stance,

President Joe Biden speaking on the White House South Lawn on August 9, 2022 at the signing of the Chips and Science Act of 2022.



AWIS CEO, Meredith Gibson was in attendance at the ceremony.

Photo by Chip Somodevilla Getty Images

Last summer, AWIS signed a letter asking Congress to support the United States Innovation and Competition bill and the American COMPETES bill, which called for boosting science innovation and the economy. Through the federal legislative process, these bills evolved into the CHIPS and Science Act of 2022.

such as recent statements on racism, harassment, and women's reproductive rights.

AWIS also participates in a variety of science coalitions, and this participation gives us the opportunity to see larger trends, to leverage our combined resources, and to exert greater pressure on governmental leaders to advance critical issues. For example, rather than having each organization write a statement or letter to policy makers, one organization will take the lead and give the others the opportunity to co-sign. (Review the [recent advocacy actions](#) that AWIS has taken, as well as the [coalitions and committees](#) that AWIS supports.)

Last summer, AWIS [signed a letter](#) asking Congress to support the United States Innovation and Competition bill and the American COMPETES bill, which called for boosting science innovation and the economy. Through the federal legislative process, these bills evolved into the CHIPS and Science Act of 2022. When the act passed, the White House invited us to attend the ceremony and witness President Biden signing the legislation, and I was thrilled to participate on behalf of AWIS. This incredible honor was due to the strength of our mission and to our collective voices. Throughout our history, AWIS has been invited to speak at the United Nations, before Congress, and at other national and international conferences and organizations.

New Advocacy Focus Areas

On a related note, thank you to everyone who participated in our recent advocacy survey. We asked you to rank several topics that relate to gender issues and a person's career.

Our survey reflected the following issues in order of importance to our members:

1. Pay equity for women in science
2. Equal recognition and advancement for women (promotions, awards, publishing, patents, etc.)
3. Diversity, inclusion, equity, and accessibility for BIPOC, LGBTQ+, and/or disabled scientists
4. Anti-harassment and anti-bullying
5. Equal representation of women scientists (panels, media, ads, movies, images, etc.)
6. Support for women's reproductive rights or other health issues that impact careers
7. Outreach to support/inspire girls in STEM
8. Work-life integration policies, including paid parental leave and flexible schedules for caregivers
9. Postdoctoral employment improvements
10. Immigration and visas for women in science
11. Support for women entrepreneurs

Your rankings will allow us to focus our efforts and energy in the upcoming year on the issues that are most important to you. Thank you for participating and for helping us set our goals for the days ahead. 🌟

AWIS Recognizes University of Denver Physics and Mathematics Student Kate Pletcher

2022 AWIS Kirsten R. Lorentzen Awardee

Mmeet Kate Pletcher, the 2022 recipient of the AWIS Kirsten R. Lorentzen Award and a senior physics and mathematics double major at University of Denver (DU).

1. What inspired you to study physics?

I actually remember the day I realized I wanted to study physics. I was in northern Minnesota during the Perseid meteor shower and was completely fascinated by it. From then on, I always held onto a curiosity about the universe. Once I took more math and science classes and realized how much I enjoyed them, physics felt like the perfect path for me — a great way to combine my fascination with the universe and my love for STEM.

2. What challenges have you had to overcome in pursuing this path?

Physics is a field where impostor syndrome is all too common, and being a woman in physics can really amplify those feelings. It's easy to become discouraged or have self-doubt at times, particularly when there is pressure to perform well and to prove yourself as a woman in a STEM field. I have had to learn



to trust myself and know that I belong in these spaces just as much as anyone else. This is something that gets easier over the years and I have gained more confidence throughout my time in this major.



Part of Kate's optical table in the Siemens Research Lab.

3. What has been one of the proudest moments so far in your STEM journey?

The proudest moment in my STEM journey happened very recently. I spent this past summer doing research in Dr. Siemens' lab at DU; it was my first full summer of research. After weeks of hard work and quite a few setbacks, I recently achieved some exciting results. While I am proud of the results themselves, I am more proud of the hard work I put in, as well as the problem-solving skills I developed along the way. I learned a lot about the payoff of putting in quality time and effort to achieve quality results.

4. What's one lesson you've learned from your non-academic involvements?

The most important lesson I've learned from my non-academic clubs is how important it is for me to have a good work-life balance. I have a tendency to get really wrapped up in academic responsibilities, but when I am regularly participating in things like finger painting club and club curling, I notice



Kate (left) teaching new team members how to curl at a club curling practice.



Teaching a young boy about the Van de Graaff generator at a Society of Physics Students outreach event at Elitch Gardens amusement park.

I have had to learn to trust myself and know that I belong in these spaces just as much as anyone else.

how much happier and more relaxed I am. It is a great reminder for me to prioritize these things in life and make sure I maintain a healthy balance between all of my involvements.

5. What impact do you hope to make on the field of physics?

After a Society of Physics Students outreach event at a local elementary school, we had a third grader come up to us and tell us how much he wanted to be a physicist after seeing our demos. That, in a nutshell, is the impact I want to make on the field of physics. I love teaching and sharing the joys of physics, and the biggest impact I could hope to make is creating welcoming and safe environments for anyone to learn physics, particularly underrepresented groups. ✨

About the awardee: Kate Pletcher is a senior at the University of Denver (DU), where she's pursuing a double major in physics and mathematics with a minor in computer science. She has been a Society of Physics Students (SPS) member since her freshman year at DU and loved building a tight-knit physics community as well as participating in outreach with the local schools. She has happily held the position as social media manager of our SPS chapter for over a year and was recently elected president. For the past three years, she's worked with the Siemens Research Lab, researching stability of tilted optical vortices in laser beams. Her next step is to attend graduate school with the goal of becoming a physics professor. Pletcher is passionate about teaching and accessibility in the sciences, therefore, she hopes to someday foster classroom environments that welcome and empower all students to learn physics. Outside of physics, she is the president of the club curling team at DU and a member of the Tactile Art Community, which is lovingly referred to as "finger painting club." In her free time, she's learning to crochet and enjoys exploring the beauty of Colorado.

About the award: The Kirsten R. Lorentzen Award is an AWIS Educational Foundation program for women who are college sophomores and juniors studying physics, including space physics and geophysics, or geoscience. The award is given annually to an exceptionally well-rounded student who excels in her studies as well as outdoor activities, service, sports, music, or other non-academic pursuits or who has overcome significant obstacles. The award is administered by Society for Physics Students and may be used for any aspect of education. Applications for the 2023 AWIS Kirsten R. Lorentzen Award will open in early 2023.

Leveraging Social Media for Professional Opportunities

When was the last time you googled yourself? What will others find when they search for your name? Will you be proud of what they discover? As we manage our professional lives, we need to remember that how we see ourselves is not always synonymous with how others see us.

You can, however, create a solid online presence to advance your professional life, taking advantage of social media's emergence and continued growth. Jazmine Benjamin, a brand strategist and PhD candidate in the Division of Nephrology at the University of Alabama at Birmingham, recently provided strategies on just how to do this, leading a presentation for AWIS on August 2022 called "Leveraging Social Media for Professional Opportunities."

Benjamin notes that social media is a great place to network quickly and share information. Whether you are starting to create or redesign your social media accounts, you should begin with your goals, always keeping in mind that your online presence is your brand and is a manifestation of who you are as an individual. Here are some questions that Benjamin wants you to consider to identify those goals:

- Why are you creating this account?
- Who is your intended audience?
- When and where will you communicate?
- What do you plan to share?

Once you know your goals, you can find your niche and establish a presence on your chosen platforms. Your brand will always be unique to you because no one else can replicate your delivery, presentation, and authenticity. Engaging with others, sharing content, following relevant accounts, and creating original content will help you to grow your accounts.

Benjamin points out that keeping your social media presence fresh will be an ongoing challenge. Life events can take you away from your day-to-day responsibilities, so it might be tempting to let your accounts grow stale, but keeping them current will help you stay relevant



and meet your goals. Producing content can be as easy as sharing your accomplishments, showing support to a friend, and keeping your profile photo current.

As much content as you push out, you must also be receptive to comments and questions. Benjamin advises you to check your direct messages and notifications as often as possible. There's no deadline to respond to others, but you should try to acknowledge the message quickly and provide a timeline for your more complete response.

Each social platform offers different features, so don't be afraid to explore them! If you have a story to tell, go to LinkedIn. If you have a concise thought, share it on Twitter. Post videos, reels, and stories on Instagram and TikTok. The technology has been created, so make it work for you.

Benjamin offers branding tips for each social media platform and ways that you can get started. AWIS members can find out more through their unlimited access to the [webinar recording and brand guide](#). 📺

Allyship

The Importance of Taking Action

In times of social justice demands and political unrest, it's important to know where you stand and how you can help others. One such period came in parallel with the discovery of COVID-19 in China, America, and across the globe, which marked a "new normal" for the entire world. Whether you lost your job, switched to working from home, or lost loved ones to the virus, life was never the same after the pandemic was declared.

The pandemic, however, did not stop the waves of protests, demonstrations, and strikes over police brutality and racial injustice. The need for organizations and resources as allies became more important than ever. This period, indeed, may have led you to think, "How can I be an ally at this moment?" Two years later, this is still a relevant question that needs answers.

In July 2022, AWIS invited Grace Pai, executive director of [Asian Americans Advancing Justice | Chicago](#), to lead a discussion on how to become a better ally. Pai's nonprofit organization builds power through advocating collectively and organizing to achieve racial equity for Asian Americans, Pacific Islanders, and other underserved communities.

Pai provided a history of racism toward Asian Americans, debunked myths about race and allyship, reflected on what allyship means in action, acknowledged how allyship is different for everyone and suggested ways to take action as an ally.

How can you tackle racism in any way that it shows up in your life? Here's how Pai suggests that you enter the ally continuum:

- You may start out in a place that is apathetic. That is okay!
- Next, you'll become more aware by learning about some different, basic concepts. For example, your choice to participate in a webinar could be the first step on your educational journey.



- Then, you'll become active in areas where you are not only well informed but are also sharing and seeking diverse perspectives when asked and prompted.
- Lastly, as an actual advocate, you will consider diversity and inclusion in everything that you do, whether or not you are asked. It will become second nature to you.

Becoming an ally looks different for everyone. Allyship is not about proving to other people that you are an ally, and it's more than gestures and statements on social media. You don't need to hold a high title to make a difference, and you may not get it right every time.

Pai states, "Allyship is about really being on a continual learning journey where you are open to feedback and have the humility to be able to admit that there are things that you don't know."

If you missed this webinar and want to learn more, AWIS members have unlimited access to watch the replay [here](#).

Check out [Asian Americans Advancing Justice | Chicago](#) for more training information, including their FREE Bystander Intervention Training. 🌟

Sexism in Science: A Book Club Visit with Dr. Rita Colwell

By **Miriam S. Erickson**, Senior Counsel, Advocacy and Government Relations, AWIS

On July 30, AWIS members from the Washington, DC, chapter met up for an in-person and virtual book club chat with Dr. Rita R. Colwell, author of [*Lab of One's Own: One Woman's Personal Journey Through Sexism in Science*](#), published in 2020. Six participants drove to the University of Maryland to meet up for this event, and 14 chapter members opted to attend online. We were honored to visit with Dr. Colwell and to discuss her book, her life and career, and her advocacy for gender equity.

Dr. Colwell is a distinguished professor at both the University of Maryland, College Park, and the Bloomberg School of Public Health at Johns Hopkins University. She is also Senior Advisor and Chairman Emeritus for Canon U.S. Life Sciences, Inc., and is President and Chairman of CosmosID, Inc. She served as the first woman and 11th director of the National Science Foundation (NSF), from 1998–2004, and she cochaired the National Science and Technology Council's Committee on Science during this time. She is the President of the Rosalind Franklin Society and has held many advisory positions in the U.S. government, nonprofit science policy organizations, private foundations, and the international scientific research community. Dr. Colwell is a nationally-respected scientist and educator who has authored or co-authored 17 books and more than 800 scientific publications.

Born in the 1930s into a family of Sicilian immigrants, she encountered bias early on because of her ethnic group, her socioeconomic class, her gender, and her interest in



Dr. Rita Colwell (middle) joined members of the AWIS DC Chapter in person and virtually to discuss her book.

pursuing science as a woman. However, her parents, who had a limited education themselves, were determined that their children be well educated and undeterred by the world's assumptions. Dr. Colwell did not disappoint. She earned a BS in bacteriology from Purdue University and a PhD in oceanography from the University of Washington. Through the years, she has focused her research on global infectious diseases, water, and health.

She acknowledged that situations that were once commonplace for women scientists sometimes presented almost insurmountable obstacles to a forward career path. For example, at one time Dr. Colwell asked her department for a fellowship while she deferred starting medical school, so that she could work on a master's degree. She was told, "We don't waste fellowships on women." She hopes that such backward thinking is no longer tolerated, and she credits organizations like AWIS for working to dismantle such roadblocks.

Dr. Colwell had to find alternative methods for achieving her educational goals. She did not have the legal system on her side or any institutional support. Despite these challenges, she remained positive, instead of staying angry. She considers herself incredibly stubborn. She focused on anticipating negative responses and devising strategies to get around them.

To support gender equity today, Dr. Colwell said she believes that we need to continue to advocate for funded parental leave and childcare. The pandemic has reinforced the reality that affordable childcare is a fundamental issue that needs strong solutions to keep women active in STEM. She is encouraged by the new Chips and Science Act, but she emphasized that women won't be able to take full advantage of the opportunities it provides if they don't receive this additional support. She also asserted that the work of multidisciplinary science teams and research funding for such teams will be crucial in preparing for a complex future.

Our meeting with Dr. Colwell, and the opportunity to learn about the obstacles she faced, reinforced the fact that AWIS's work to advance women in science is absolutely crucial. AWIS actively supports nondiscriminatory structures to ensure that women scientists and other

underrepresented groups in STEM can take full advantage of the kinds of funding opportunities provided by the CHIPS and Science Act. AWIS is also working to guarantee that Title IX regulations continue to protect women in academia. ✨

Miriam S. Erickson is president of Swydan Erickson Group, LLC, where she advises firms and organizations about government relations and business development strategies, with a special emphasis in the energy sector. Erickson supports AWIS as Senior Counsel for Advocacy and Government Relations. She earned a BA from the University of California, Berkeley, studied urban planning at the University of Pennsylvania, and received her law degree from Georgetown University, where she served on The Georgetown Law Journal. She has a Women's Leadership Programme certificate from Oxford University's Said Business School. She is a member and active participant in the National Academy of Science committees on climate change and women in STEM and STEM education. Erickson has been active in advancing Women and Girls' success in STEM for over 15 years and lectures on women and STEM at MIT, the Johns Hopkins University, New York University, Georgetown University, the US Department of State, Georgetown University, and other venues.

To support gender equity today, Dr. Colwell said she believes that we need to continue to advocate for funded parental leave and childcare. The pandemic has reinforced the reality that affordable childcare is a fundamental issue that needs strong solutions to keep women active in STEM.

bī-lēf'

Lamiaa El Fassi, PhD

Associate Professor,
Mississippi State University
AWIS member since 2011



What is your favorite word?

Belief

How has this word influenced your career?

I strongly believe that without God (Allah in Arabic) supporting me, I would not have reached where I am now. I also believe that if you are passionate about something and you work hard toward it, it will be realized. It may not happen as fast as you would like, but when it is time for something to happen, it will happen.

What challenges have you encountered throughout your career?

Growing up in Morocco, my family lived very modestly. I lost my Dad, the main support of the family, in my second year of college. The family struggled a lot afterward thus my older sister, who quit her education during middle school to take care of my sick mother, had to look for a job to support my studies. I always loved science and chose to study nuclear physics. What could I do as a nuclear physicist in Morocco? Nothing. Still, I moved to the capital, Rabat, to pursue a master's degree and hoped for something miraculous to happen and it did.

Describe an amazing opportunity in your STEM career.

During my first year of my master's, Dr. Kawtar Hafidi visited Mohammad V University, from Argonne National Laboratory (ANL) in the U.S. She is originally from Morocco and did her undergraduate studies at the same university. She was looking for a student to fill a fellowship position at ANL. She met with all students in my class and end up choosing me! It was a surprise, if not a "miracle!" I wasn't even looking for opportunities because I couldn't financially afford to travel somewhere for training. That was part of her criteria. She wanted to help someone in need that showed passion. I came to the U.S. on September 6, 2003. I will never forget this date. It was a life-changing experience. I strived to succeed, no matter what it takes, because my belief that a great opportunity is worth sacrificing for!

What do you consider to be your most important career achievement?

I got my PhD in Experimental Nuclear/Hadronic Physics in 2008 and was lucky to have several postdoctoral offers before I even graduated. I chose to go to Rutgers University and work with Dr.

Ronald Gilman for 4.5 years. Then, I moved to

Old Dominion University in Norfolk, VA before getting the prestigious Bridged-appointment Assistant Professor Position at Mississippi State University (MSU) in August of 2014. When I joined MSU, another new chapter of my life started. I had to balance my time between research and teaching, which was a completely new skill to adopt. After the completion of my Bridged-appointment, I was promoted and tenured in August 2020. I am now an Associate Professor.

How do you inspire your students?

In the first session of my course each semester, I tell students about my background and career path. I also participate in career development sessions for juniors in the STEM field organized by the university or national labs. I want them to know that doesn't matter where you come from, you can be successful as long as you are educated, enthusiastic, and passionate. It is not necessary to be passionate about the same field as me, just be passionate about something. That is the most important thing!

What advice do you give them?

Look for mentors to help you. I was lucky to have a few very good mentors, but not everyone is this lucky. Make sure to observe and understand the environment surrounding you, analyze facts properly, then act based on what suits your belief and findings, not just what you heard from others. Do not underestimate yourself. It is okay to fail to grow stronger if lessons are aptly learned. As you broaden your knowledge and gain confidence, your study and research, will become easier and easier due to the work ethics and time management skill you acquired. Choose the job that you are passionate about and keep working on your time management and life-work balance. You may find yourself many times over-committed, thus prioritizing your tasks will help you remain productive and advancing instead of sinking! ✨