

SPIE.
Women in
OPTICS 2025





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Avantier offers custom optical design, engineering, lens assembly, prototyping, high-volume manufacturing, and image processing services.

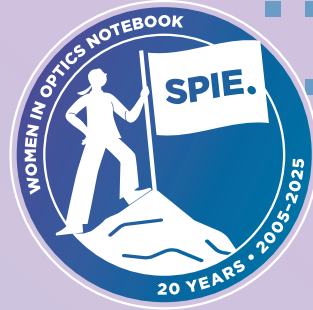
We specialize in designing and manufacturing high-precision lenses, including diffraction-limited microscope objectives, large F-theta lenses, high-performance imaging lenses, and LWIR imaging lenses for various applications such as scientific research, machine vision, surveillance, aerospace and defense, medical and life science industries, and more.



Joanna Lee, President of Americas and Europe

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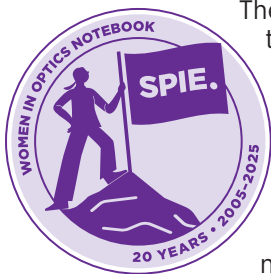
SPIE. Women in OPTICS 2025

Produced by:

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The first Women in Optics planner was produced in 2005 and highlighted the achievements, expertise, and contributions of women in the field of optics and photonics, raising their visibility within our community.

Our goal was to bring these leaders out of the shadows and into the light. We hoped to increase the representation of women by sharing their stories with others.

Twenty years later, the Women in Optics planner has had a far greater impact than we could have imagined. It's not only brought needed exposure to women in science and engineering, but it's also provided apt role models for people around the world. It has instilled confidence and ambition in readers, showing them, through stories, that there is a place in the field for them. And it has showcased the diverse pathways and opportunities available in optics and photonics while illustrating how women have played a pivotal role in shaping the landscape of our field.

The momentum continues to build. A lot has changed over the past two decades (like the use of printed planners!), but the value of the Women in Optics notebook remains the same.

As we commemorate the 20th anniversary of this publication, let us draw inspiration from the accomplishments of the past 20 years. Let us channel our collective energy toward building a future where all innovators, including women and underrepresented people, stand together on the same, brightly lit stage of scientific discovery.

Allison Romanyshyn

SPIE Senior Director of Community Engagement, Chief Inclusion Officer
 Producer of the original Women in Optics Planner





Prior to 2005, my visibility had been limited to places such as laboratories, classrooms, scientific publications, and scientific conferences. I had showcased my physics discoveries in many ways — and to varied audiences — but being profiled in the inaugural Women in Optics planner was the first time that my work and my story had been presented on such a platform. I was proud and honored to be featured in the planner, surrounded by other women who had made indelible contributions to optics and photonics.

Women have continued to have a tremendous impact on our field. Over the past 20 years, women have been instrumental in developing advanced imaging techniques, improving laser technology, making breakthroughs in photonic materials and devices, innovating optical communications, promoting progress in biophotonics and biomedical optics, advancing quantum optics and quantum information science, and much more.

Women continue to play a vital role in shaping the future of our field through their research, leadership, and innovation. I am in awe of both the early trailblazers as well as the rising generations that pave the future of optics and photonics.

I still have that same sense of honor and pride that I had 20 years ago as I look at our 2025 cohort highlighted in the Women in Optics notebook. May we continue championing diversity, equity, and inclusion in all aspects of our work, and may we continue ensuring that the contributions of women — and all underrepresented groups — are recognized, valued, and celebrated. Happy 20th anniversary!

María Yzuel

Professor Emeritus at the Autonomous University of Barcelona
 Featured in the 2005 Women in Optics Planner
 2009 SPIE President



SPIE.2025

JANUARY

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SPIE. PHOTONICS WEST

25-30 January 2025
San Francisco,
California, USA

PHOTONICS WEST EXHIBITION:

28-30 January 2025

BIOS EXPO:

25-26 January 2025

QUANTUM WEST EXPO:

28-29 January 2025

SPIE. AR|VR|MR

27-29 January 2025
San Francisco,
California, USA

EXHIBITION:

28-30 January 2025

SPIE. GLOBAL BUSINESS FORUM

27 January 2025
San Francisco,
California, USA

11 February:
INTERNATIONAL DAY OF WOMEN
AND GIRLS IN SCIENCE

SPIE. MEDICAL IMAGING

16-20 February 2025
San Diego,
California, USA

SPIE. ADVANCED LITHOGRAPHY+ PATTERNING

23-27 February 2025
San Jose,
California, USA

EXHIBITION:

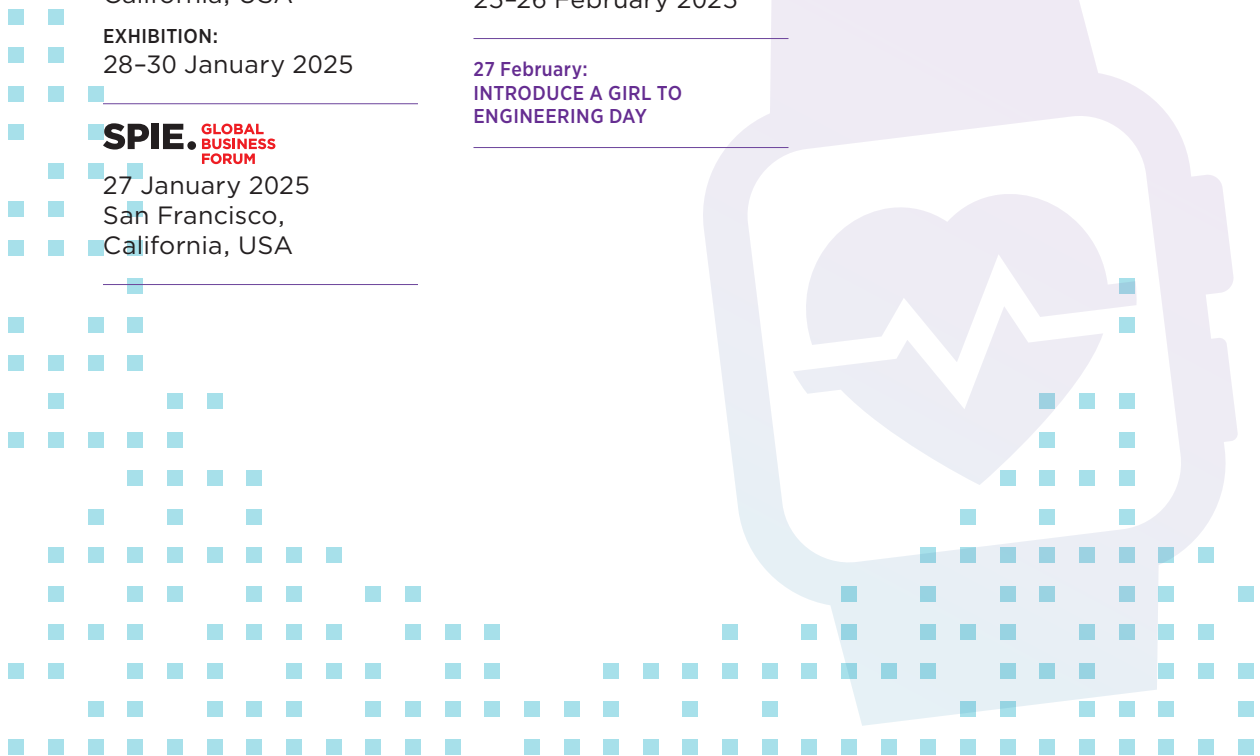
25-26 February 2025

27 February:
INTRODUCE A GIRL TO
ENGINEERING DAY

8 March:
INTERNATIONAL WOMEN'S DAY

SPIE. SMART STRUCTURES+ NONDESTRUCTIVE EVALUATION

17-20 March 2025
Vancouver, BC, Canada



APRIL						
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SPIE. OPTICS+
OPTOELECTRONICS
7-10 April 2025
Prague, Czech Republic

EXHIBITION:
8-10 April 2025

SPIE. DEFENSE+
COMMERCIAL
SENSING
13-17 April 2025
Orlando, Florida, USA

EXHIBITION:
15-17 April 2025

OPIC 2025
OPTICS & PHOTONICS
International Congress
21-25 April 2025
Yokohama, Japan

OPIC EXHIBITION:
23-25 April 2025



International
Day of Light
16 May

23 June:
INTERNATIONAL WOMEN
IN ENGINEERING DAY

SPIE. DIGITAL OPTICAL
TECHNOLOGIES
23-26 June 2025
Munich, Germany

SPIE. OPTICAL
METROLOGY
23-26 June 2025
Munich, Germany

EUROPEAN CONFERENCES ON
**BIOMEDICAL
OPTICS**
OPTICA | SPIE.
25-29 June 2025
Munich, Germany

SPIE. PHOTONICS
FOR QUANTUM
June 2025

*Looking back,
moving forward*



JULY						
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SPIE. OPTICS+
PHOTONICS
3-7 August 2025
San Diego,
California, USA
EXHIBITION:
5-7 August 2025

SPIE. SENSORS+
IMAGING
8-11 September 2025
Madrid, Spain
EXHIBITION:
9-10 September 2025

SPIE. PHOTOMASK
TECHNOLOGY +
EUV LITHOGRAPHY
21-25 September 2025
Monterey,
California, USA
EXHIBITION:
23-24 September 2025

SPIE. PHOTONICS
INDUSTRY SUMMIT
24 September 2025
Washington, DC

*Celebrating our
collective impact: past,
present, and future*



SPIE.2025

OCTOBER

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SPIE. LASER DAMAGE

20-22 October 2025
Rochester, New York, USA

SPIE.OPTIFAB

20-23 October 2025
Rochester, New York, USA

EXHIBITION:
21-23 October 2025

SPIE. PHOTONICS ASIA

October 2025
Beijing, China

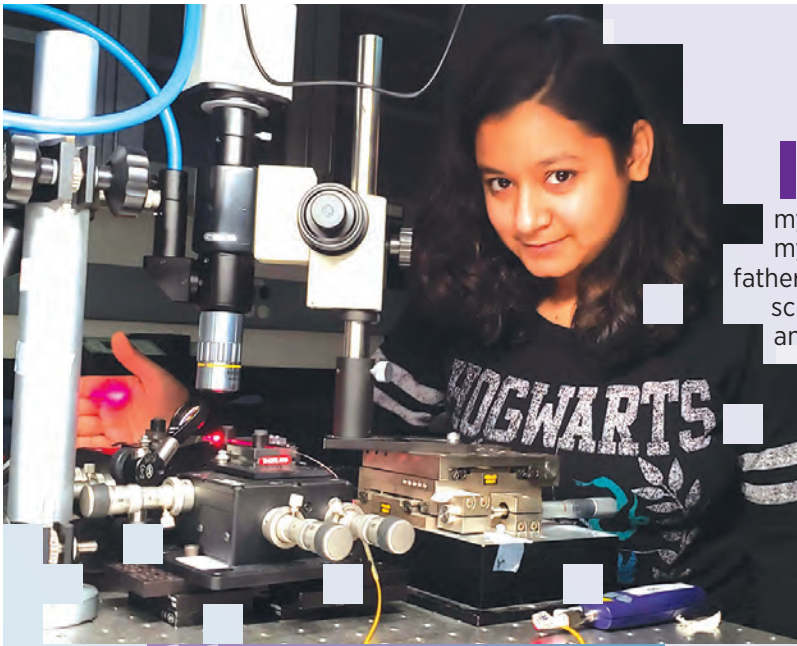
SPIE.PHOTONEX

October 2025

SPIE. FUTURE SENSING TECHNOLOGIES

11-13 November 2025
Yokohama, Japan





I always loved science, but some incidents helped me in cementing my path to photonics. During my high school years in India, my father used to take me to a monthly science gathering called “Chai and Why,” where the scientists explained physics in common terms and demonstrated it via experiments. This led me to adore physics and the laws of nature. In my undergraduate studies, we had a class called “Analytical Instrumentation” where we studied various sources of light and associated detectors.

“Don't be afraid and take risks; you will always be rewarded.”

My interest was spiked in optics while we were studying the workings of an MRI machine, where a large magnetic wave helped in orienting the spin of the protons. After joining the master's program in optics

at the University of Rochester, I learned about the possibility of doing large-scale optics on a tiny chip. I read a paper on integrated photonics by Richard A. Soref, and decided to do my PhD in photonics.

At the moment, I am bringing my PhD research into a commercial venture. I started the company while doing my PhD and have now been working full-time as the CEO. We are developing next-generation fiber-to-chip packaging equipment that is 10 times faster than current versions.

My greatest accomplishment so far has been to work in a technology that can create a global impact in the world by reducing power consumption of a data center.

Navigating how to start a company as an international student while doing research has been very challenging. I used all available resources around the university, as well as the support of colleagues and mentors. I was not afraid to ask for help when I got into this, and that has been very helpful.

Science is a field where only your mental strength matters; gender does not define how smart and innovative you are. Don't be afraid and take risks; you will always be rewarded.

I hope by reducing the power loss in photonic chips, I can have a global environmental impact by reducing the amount of electricity used by data centers.

Juniyali Nauriyal

CEO, Photonect

Born in India / Resides in United States

Educational Background: MS in Optics, University of Rochester; PhD in Electrical and Computer Engineering, University of Rochester, United States

My journey into photonics began with a childhood love for science. I've always been fascinated by learning the nature of things and how science shapes our everyday lives. As I pursued my studies in physics and later specialized in photonics during my master's and PhD, my passion for understanding light and its applications grew.

During my PhD, I faced an obstacle while searching for a specific optical component which was crucial for my research. The frustration of spending eight weeks searching for it and not finding it opened my eyes to a larger issue affecting many other engineers and researchers in similar situations. Seeing the frustration among my colleagues in the lab inspired me to co-found MEETOPTICS, a platform to help engineers access the components they need, fostering innovation and progress.

As the CEO of MEETOPTICS, my primary responsibility is to lead the team towards our shared vision for the company, providing direction and guidance to each department, including product development, sales, marketing, finance, human resources, and design. I also represent MEETOPTICS at conferences, engage with clients, and cultivate relationships with investors.

My greatest accomplishment in my career to date is founding a company and experiencing its growth while seeing the positive impact it has on so many people. Transitioning from a research-focused background to entrepreneurship has been a significant achievement for me. Initially lacking in business knowledge, I dedicated myself to learning through various courses, talks, seminars, and mentorship.

Seeing the company flourish and knowing that our efforts are making a difference in the lives of others and my team keeps me moving forward.

My advice to young girls or women considering a career in STEM is to dream big but also be practical in testing out your ideas as you move forward. It's essential to seek out mentors and advisors who can provide guidance and support along the way. Building a great team is also necessary for achieving your goals and overcoming obstacles along the way.

Finally, it's important to follow your passion. Don't be discouraged if others don't immediately believe in your idea. Instead, keep moving forward with a clear vision and surround yourself with people who are positive and will support you.

Barbara Buades

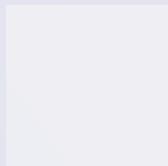
CEO and Co-Founder, MEETOPTICS LABS, S.L.

Born in Spain / Resides in Spain

Educational Background: BSc in Physics, University of Barcelona, Spain; MSc in Photonics, Imperial College London, United Kingdom; PhD in Photonics in Quantum and Non-linear Optics, ICFO (Institute of Photonic Sciences), Spain



Dream big but also be practical in testing out your ideas as you move forward.





Curiosity, the love of helping people, and, of course, the cutting-edge technologies in photonics and optics were the greatest drivers directing me to my field.

My work is varied, involving strategic leadership of my research group and research projects; project management and business development; stakeholder relations; securing funding; reviewing for international journals; serving as an external moderator/examiner for MSc dissertations and PhD theses; teaching biophotonics; being member of postgraduate committees; chairing grant reviews; delivering keynote addresses at international and local conferences; organizing conferences; and science advocacy, policy development, and outreach.

My proudest accomplishment is my PhD: I switched disciplines from medical biochemistry to physics, which was extremely challenging, so obtaining my PhD in record time was a massive success.

Being a Black woman in STEM has not been easy. Staying focused on my goals, being the best scientist, supervisor, and researcher I can be, and cancelling out the noise such as criticism, inequality in the workplace, or being deprived of opportunities, has allowed me to have a rewarding career. I celebrate being an

More than anything, love what you do with STEM.

award-winning, strong, successful Black woman in photonics.

Africa is such a rich continent: I want my name to be documented as one of the history-makers in Africa; I want to take Africa to international platforms. I want to be remembered as an educator, to be known for using photonics and optics in the improvement of the quality of life for people in Africa. I want to be the reason Africa is not left behind in enjoying the evolving innovations and benefits offered by conducting research in photonics and optics.

If you aspire to be in STEM, just do it! Ask lots of questions, surround yourself with those who have experience in the field, do not doubt yourself, throw your feelers in different directions, and do not box yourself in. If something doesn't work out, it's not the end of the world. And more than anything, love what you do with STEM.

Patience Mthunzi-Kufa

Professor and Biophotonics Research Head, Photonics Centre, Council for Scientific and Industrial Research (CSIR)

Born in South Africa / Resides in South Africa

Educational Background: BSc in Zoology, BSc Honours Degree in Biochemistry, and MSc in Medical Biochemistry, University of Johannesburg (formerly Rand Afrikaans University), South Africa; PhD in Laser Physics (Biophotonics), University of St. Andrews, Scotland

When I was a little girl, my parents gave me a mini-microscope, and I started to study the plants in my garden. Growing up, I always had a strong passion for math and science and by the end of high school, I realized that I wanted to explore this passion as a physicist. I am amazed every time I learn how to describe a phenomenon using such an elegant language.

My current field of study is experimental quantum optics, and I hold three jobs. I work in a quantum telecommunication startup, QTI, where my main responsibilities include the design and development of new hardware components and the testing of the devices I have envisioned. I also work as a PhD student in the physics department. Here I study new cryptographic protocols through which I can use the unique properties of quantum light to enhance the security of the telecommunication system. Finally, I work as a scientific

creator for a divulgation [science communication] startup, STEMA. Here I dive into all sorts of new engineering discoveries, and I transform them into social-media content for all to enjoy.

One of the toughest times was during the pandemic. I was struggling to keep myself motivated and committed to my master's degree. So, I decided to roll up my sleeves and arrange an internship in the UK, where for the first time I could work with integrated devices for quantum telecommunications systems in a young and innovative startup, KETS. This decision is one of my greatest accomplishments as I was able to push myself out of a very tough and demotivating time, turning it into a precious learning experience.

Being a woman in physics isn't always easy. It's a male-dominated field, and I often find myself the only woman in class or during experiments. This highlights the diversity problem in STEM, where it is often difficult to find a senior female role model. In addition, experiencing Imposter Syndrome is more likely. I wish someone had told me: don't let anyone else tell you what you're worth; prove yourself, and never doubt your abilities. Besides the struggle, this pushes me to give my best every day. I hope that by promoting diversity, I can encourage other women to stick with their passion and not give up. My advice for the future generation is simple: believe in yourself; you can overcome the challenges you are facing.

Giulia Guarda

PhD Student in Atomic and Molecular Photonics, European Laboratory for Non-Linear Spectroscopy, University of Florence; Quantum Photonics Consultant; Scientific Creator, STEMA

Born in Italy / Resides in Italy

Educational Background: BSc in Physics, University of Trieste, Italy; MSc in Engineering Physics and Nanotechnologies, Quantum Engineering, Technical University of Denmark (DTU), Denmark



**Believe in yourself;
you can overcome the
challenges you are facing.**



When I came to the University of Rochester, I was a biology/pre-med major, and had never heard about optics. Unfortunately, becoming a medical doctor was not in my future because I couldn't stand the sight of blood. A friend told me about optics: she was the coolest woman I had met on campus and was good in math and science like me, so figured that optics must be awesome because it was her major, so I changed to optics and never looked back.

I found that I had a talent for designing and developing optical interference coatings. There were not a lot of women in my first optics job; the lead technician [older white male] thought it was funny to call me "little girl." My boss heard about this nickname and gave me a very complicated design request from an important customer. I found a solution that same day and gave it to my tormentor to fabricate. He had never seen a design like that and told me it wouldn't work; I told him to humor me. He made it, and it surpassed all the customer's specifications. He never called me "little girl" again.

Never lose the excitement of learning something new.

I have never been a very good test-taker, so my grades have always been subpar. However, I excelled as an engineer in the workplace. Grades did not define me or my future success.

I was fortunate to be accepted to Rochester Institute of Technology's Color Science PhD program when I was in my 40s. Don't let anyone tell you it is too late to go back to school. About the time I earned my PhD, I also earned my fourth-degree black belt in Taekwondo. I discovered that anyone can do anything when they take small, positive steps forward.

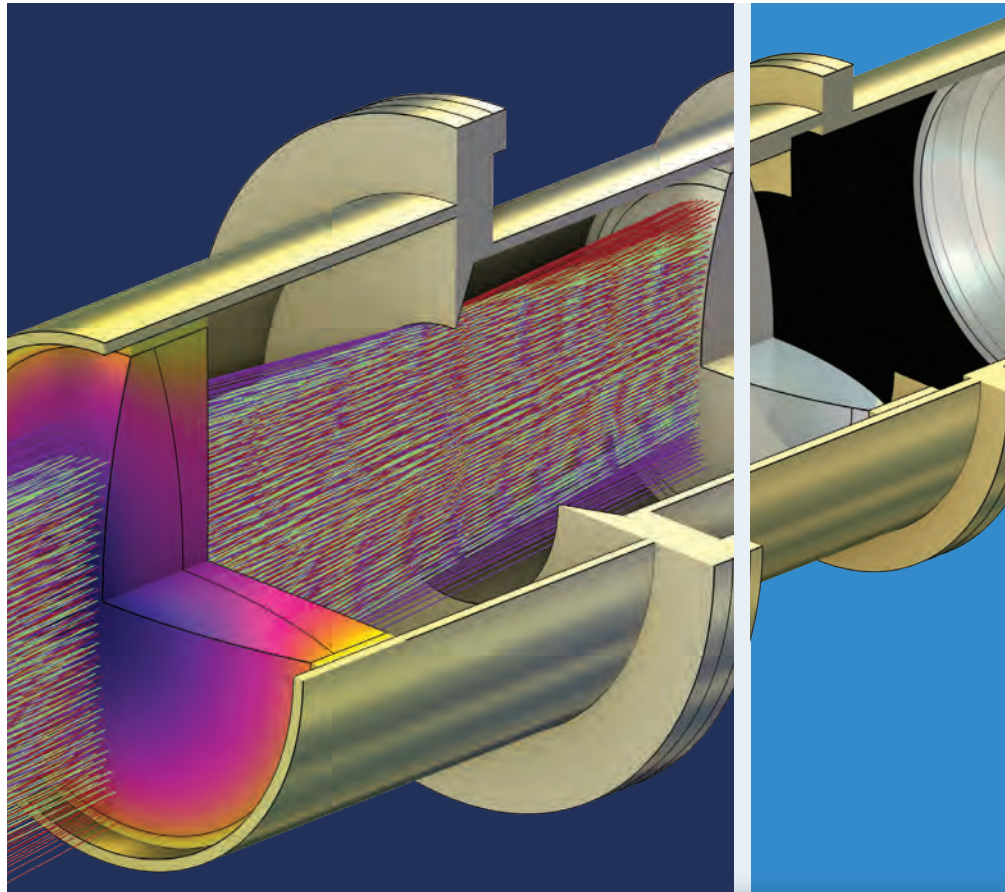
Now I am an associate professor of optics at Rochester, as well as a senior scientist at the Laboratory for Laser Energetics. I am full-time teaching faculty, as well as program director of the MS Optics program. I teach classes in beginner and advanced coating design, wave optics, color technology, and undergraduate and master's labs. I bring excitement to my classes because I love my job. I want my students to remember me being excited to meet them and educate them, to help them realize that everyone can make a positive difference in optics. Never lose the excitement of learning something new. Keep learning, keep growing, keep moving forward.

Jennifer Kruschwitz

Associate Professor of Optics, University of Rochester; Senior Scientist (LLE) and Optical Interference Coating Design Consultant, JK Consulting

Born in United States / Resides in United States

Educational Background: BS and MS in Optics, University of Rochester, United States; PhD in Color Science, Rochester Institute of Technology, United States



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» [comsol.com/feature/optics-innovation](https://www.comsol.com/feature/optics-innovation)



In my undergraduate years, a teaching assistant in my physics lab sparked my enduring passion for integrated optics, a passion which has persisted for 20 years.

My current role includes leading a research group, writing grant proposals, and mentoring students. Additionally, I teach multiple courses, serve on the examination board, and coordinate a physics master's track.

When I started at Vrije Universiteit, I didn't have much financial support, and there was no cleanroom for my integrated optics research; I almost gave up. Then, a colleague and I developed a simple way to make our own microchips. We got \$35K in funding, turned our idea into a startup, Rapid Photonics, and raised \$450K in private investment plus a \$500K soft loan. This success taught me the power of doing more with less and remains a highlight of my career.

“ Focus on the joy of discovering something new or understanding how things work; always maintain a sense of curiosity and innocence. ”

Securing funding or getting published in top journals often seems to rely more on networking than on the quality of your work or ideas. I strongly oppose such injustices and always stand up against them: I have reached out to journal editors and filed complaints with funding organizations. Many of my friends say it's a waste of time, but if we all give up and stop questioning, nothing will change. At least, I find peace knowing I have spoken up.

As scientists, we seek to comprehend nature. Nature doesn't care about gender, religion, nationality, or age. It has no agenda. Similarly, scientists should remain unbiased and focused on discovering the truth. My advice to young girls and boys is to focus on the joy of discovering something new or understanding how things work; always maintain a sense of curiosity and innocence. True scientists are those who remain humble, quietly achieving without the need to boast about their accomplishments. Take them as your role models. Less can indeed be more. In my lab, we build setups with minimal financial investment but plenty of knowledge and passion. Success in science doesn't rely solely on costly equipment — my startup company proves this. In my group, we welcome individuals from diverse and often discriminated nationalities. We have shown that impact comes from our intellect and dedication, not our race, nationality, religion, or gender. This is the legacy I aim to leave behind.

Imran Avci

Associate Professor in Experimental Physics, Vrije Universiteit Amsterdam; Founder, Rapid Photonics

Born in Turkey / Resides in the Netherlands

Educational Background: BSc in Electrical and Electronics Engineering, MSc in Physics, Bilkent University, Turkey; PhD in Physics, University of Twente, the Netherlands

Since I was a teenager, I have been fascinated by the world around me. When I entered high school, I was eager to explore subjects that would help me better understand the world from an engineering/science perspective. I was fortunate to have great math and physics teachers who inspired and challenged me to think critically and creatively. I appreciated how math and physics could be used to design and improve daily-use systems such as buildings, cars, and computers.

This fascination for science led me to pursue a career in physics. Since then, I have always been intrigued by how emerging technologies can enhance our lives, especially in the pervasive field of semiconductors.

I have held evolving roles, from researcher to leader of R&D projects and teams, now focusing on the business value of new technologies. For over a decade, I have worked on new display technologies for augmented-reality glasses. I managed the team, exploring issues with

existing technologies and sourcing new materials and architectures to provide the needed properties. We filed patents, matured the technologies, and created two startups. Today, I manage a software portfolio that helps engineers design and develop more integrated and complex optical systems, like displays or cameras. Riding in a Waymo is already impressive; imagine how it will be when all cameras are miniaturized. As such, my responsibility is to enhance our software design and simulations portfolio to enable this transformation.

Early in my career, I thought success depended only on excellent technical skills. However, I soon realized the importance of soft skills such as communication, networking, and understanding the market and customers. Your career is a marathon, not a sprint, and you will keep learning new skills, hard and soft, throughout your journey. Don't wait to feel completely prepared for any position you will have. Trust your existing skills and your capability to learn, remain curious and open-minded about all the facets of your upcoming roles, and be resilient.

Throughout this journey, my driving force is the impact I create. I hope to benefit society by creating new technologies with my teams and influencing the people I work with by being a leader they can rely on, believe in, and follow. Science is a powerful tool for achieving this as it is universal. It's truly amazing to witness it: even if you don't share a language with your colleagues, you will have the same ideas in Taiwan, Japan, Germany, Canada, and the United States. This universality of science is truly inspiring.

Emilie Viasnoff

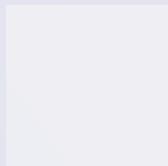
Head of Optical Solutions, System Design Group, Synopsys

Born in France / Resides in United States

Educational Background: MSc in Physics, Ecole Normale Supérieure; "Agrégation de physique" (highest teaching degree in France); PhD in Semiconductor Optics, University of Paris-Sud, France



Don't wait to feel completely prepared for any position you will have. Trust your existing skills and your capability to learn.



My interest in the natural world as a young child and developing a constantly growing interest in astronomy through my adult years led me to where I am today. Being able to work at Jenoptik shortly after graduating high school and while working my way through college, exposed me to the ubiquitous influence optics has on the entire world and outer space.



My parents immigrated from Central America and the Caribbean to offer me a life that, for many generations of my family, was never thought to be possible. They have pushed me to work harder than I thought possible while encouraging me to prioritize my interests along the way.

I work at the interface of the production floor and engineering to qualify optical systems before the end user can apply them. I work on most optical systems that flow through the building while working alongside great teammates.



Take every single one of your failures as a sign that you are on the path to success.



One of my most significant accomplishments was finishing my undergraduate degree in electrical engineering and immediately being promoted to an engineering position at Jenoptik. I am approaching the last

semester of my master's program in the fall, and I believe that will be my next "greatest accomplishment."

The biggest obstacle I have faced (and currently am still facing) lies in the time constraints that come with being a full-time worker, part-time student, mother, wife, daughter, sister, friend, and everything else, while also finding time to get adequate sleep. I overcome this by staying mentally flexible and planning for life's expected and unexpected elements. For the most part, it works out, but it is a balancing act that is possible for me because of the healthy work-life balance at Jenoptik and the support of my family.

For young girls or women considering a career in STEM, I would advise you to take every single one of your failures as a sign that you are on the path to success. Hard work will outperform "natural ability" in most situations.

I hope to have an impact by expanding the path to success and by changing the perception of what the expected mold of optics students is supposed to be.

I want my legacy to encompass treating everyone with respect and inclusivity while encouraging those around me to express their intrinsic curiosity.

Gabriela Olivo

System Test Engineer, Jenoptik

Born in United States / Resides in United States

Educational Background: BS, Florida International University, United States; MS, University of Central Florida College of Optics and Photonics (UCF CREOL), Florida

My adventure into the area of molecular imaging was sparked by various influences: my deep-seated curiosity about optical nanoscopy fueled my fascination; deciphering the complex workings of biological systems further ignited my interest; and pioneering accomplishments in molecular imaging served as a guiding light for my own research endeavors.

In my current role, my primary responsibilities revolve around developing and applying cutting-edge multimodal optical-imaging technologies including stimulated Raman scattering microscopy, multiphoton fluorescence microscopy, and second harmonic generation microscopy. I integrated these modalities into a single multimodal platform to study metabolic dynamics in aging and diseases.

One of my greatest accomplishments to date is the development of a series of metabolic-nanoscopy technologies that allow the visualization of metabolic activity of multiple new and old molecules with unprecedented molecular specificity at subcellular resolution, enabling us to observe complex molecular structures and organelles in cells and tissues with high spatial and temporal resolution.

The biggest challenges have been navigating the landscape of interdisciplinary research and overcoming technical hurdles associated with developing novel optical-imaging technologies. To overcome these challenges, I cultivated a collaborative mindset, leveraging the expertise of colleagues from diverse fields.

For young girls or women considering a career in STEM, I advise them to cultivate their curiosity, passion, and perseverance. Do not be afraid to pursue your interests; seek out role models, mentors, and allies; and never underestimate the value of your unique perspective and contributions to the field.

The impact I hope to have is twofold: firstly, to advance our understanding of complex biological processes such as aging and related diseases, and, secondly, to inspire and empower the next generation of scientists, particularly women.

Ultimately, I believe that making a difference in the world begins with a commitment to curiosity, collaboration, and compassion. By pushing the boundaries of scientific knowledge and fostering inclusivity and diversity in STEM fields, we can create a more equitable and sustainable future for generations to come.

Lingyan Shi

Associate Professor, Shu Chien-Gen Lay Department of Bioengineering, University of California San Diego

Born in China / Resides in United States

Educational Background: PhD in Biomedical Engineering, City College of New York, United States



Making a difference in the world begins with a commitment to curiosity, collaboration, and compassion.



My undergraduate advisor taught optics and feminism: We read and discussed biographies of Marie Curie, helping me to develop a perspective on women's progress in science over the last century. My advisor's inspiration drives me to make a difference, both in my career and by advocating for greater opportunities and representation for women in science.

I am a project manager and optical lead for astronomical instrumentation that supports international observatories, including the Thirty Meter Telescopes' (TMT) NFIRAOS and Gemini's GIRMOS imager. I lead multidisciplinary teams through various phases of design and construction, working with stakeholders to negotiate funding and schedule expectations.

Managing large, diverse teams can be challenging; I have found that fostering collaboration and accountability is key. Requiring researchers to document their work, and regularly review each other's allows them to focus on problems together.

As an optical engineer with expertise in adaptive optics and imaging, I design, build, and test optical systems. In adaptive-optics systems like NFIRAOS, we build the equivalent of corrective glasses for the telescope, which accounts for atmospheric distortion. With imaging systems, such as the Gemini GIRMOS imager, we take pictures that astronomers use to study things like galaxy formation.

When you recognize what fuels your curiosity, don't hesitate to pursue it.

A key requirement of NFIRAOS is an ability to measure the exact positions of stars in the sky which requires nearly zero image distortion. In a review of multiple designs by industry experts, I presented a novel optical configuration that used two pairs of paraboloid mirrors to cancel both aberrations and distortion. I was thrilled to have my design selected by TMT's panel of experts and incorporated into the system.

My advice to young women considering a career in STEM is to take the time to explore your passions and interests. When you recognize what fuels your curiosity, don't hesitate to pursue it. The barriers that once existed for women in STEM are gradually diminishing. Have confidence in your abilities. You belong in the field just as much as anyone else, and your contributions are valuable.

I am passionate about developing cutting-edge instrumentation that not only contributes to our understanding of the Universe but also stands the test of time. Our group has built instruments that have been productive for over 20 years; I hope the instruments I build will have a similar impact. By developing innovative instruments, we empower current and future generations of scientists to ask new questions, challenge existing theories, and uncover groundbreaking discoveries.

Jenny Atwood

Optical Sciences Team Lead, Herzberg Astronomy and Astrophysics Research Centre,
National Research Council Canada
Born in United States / Resides in Canada
Educational Background: BA in Physics, Colorado College, United States; MS in Optics,
University of Rochester, United States



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There have been inspiring people at every stage of my career: supportive chemistry and math teachers; the professor who hired me into his research lab; the teacher who welcomed chemical engineers into his semiconductor courses; mentors who taught me professional communication, advanced principles of lithography, that leadership has many forms; and an industry leader who taught me the power of connections and empowering others.

I lead Eulitha's United States office and drive strategic technology development for our lithography platforms. Additionally, I provide specialized application support and manage our global technical partnerships. Overall, my work focuses on advancing lithography solutions for augmented-reality waveguides. Publishing and presenting at conferences on our major developments has been rewarding. Opening the United States office for Eulitha was a major achievement.

The greatest legacy you can leave is the light we ignite in each other.

Another career highlight was representing the photonics industry to government representatives at the 2023 SPIE Industry Summit. I gained critical perspective on how government, academia, and industry can support each other and are working together to ensure American semiconductor competitiveness. Additionally, this year I was able to co-host the Women in Optics luncheon for SPIE AR|VR|MR and bring in a panel of incredible women leaders to speak about the power of mentoring.

I love talking to young women about careers in science and engineering. My message to them is to find segments of science that spark genuine interest. Explore the diverse and exciting fields open to them. And when doubt comes, remember: You are smart enough. You are strong enough. You can do hard things. Failure isn't permanent, and mistakes can be powerful lessons.

I'd like to leave a legacy of lithographic innovation through publications, patents, technical talks, and by building connections at industry conferences. Just as impactful as technical contributions, I strive to help others along their career paths, as so many have helped me. Some of my favorite experiences have been speaking to high school and university students about careers in science and engineering, being an inclusive recruiter and interviewer, speaking at career panels, and hosting women's activities.

I hope to leave the world a little brighter; I believe the greatest legacy you can leave is the light we ignite in each other.

Kelsey Wooley

Director of North American Operations, Eulitha

Born in United States / Resides in United States

Educational Background: BS in Chemical Engineering, Brigham Young University, United States

Since childhood, my curiosity about science, along with the encouragement of my teachers and my good performance in physics, chemistry, and mathematics classes during high school, have been influential factors inspiring me to pursue a career in the engineering field.

In my current role, I teach electronic circuits to engineering students, helping them understand how these systems work. Moreover, I guide master's and doctoral students in my research domain, which focuses on microelectronics, particularly semiconductor material synthesis, device fabrication processes, and the application of sensors and photovoltaic devices.

My greatest achievement is my journey: overcoming the challenges of being raised in a small town in northeastern Brazil, where higher education was not common. My parents lacked higher education. My journey to São Paulo and my completion of a PhD in engineering are my proudest accomplishments.

I believe my greatest challenge has been entering and pursuing a career in the field of engineering, a field traditionally dominated by men. As a woman, I continually face the need to demonstrate my capabilities, which can be exhausting. This demands determination and resilience to deal with biases and stereotypes. I have overcome this challenge by seeking out supportive networks, advocating for gender diversity in STEM fields, and focusing on my passion for engineering to drive me forward.

My advice for young girls or women considering a career in STEM is to believe in yourself and your abilities. Don't let stereotypes or societal expectations deter you from pursuing your dreams. Embrace challenges as opportunities for growth, seek out mentors and supportive networks, and don't be afraid to ask questions or seek help when needed.

In my classes and other activities, I strive to empower female students, guiding them to overcome challenges and persist in their studies. Additionally, I seize every opportunity to discuss with male students the significance of embracing diversity and fostering inclusivity within STEM fields. My goal is to leave a legacy of positive influence, motivating others to pursue their passions and create meaningful change in their communities and beyond.

Mariana Fraga

Assistant Professor/Lead of Sensors and Photovoltaic Devices Research Group, School of Engineering, Mackenzie Presbyterian University

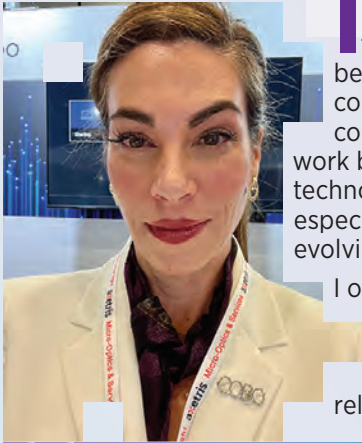
Born in Brazil / Resides in Brazil

Educational Background: BSc in Mechatronics Technology, São Paulo State Technological College, Brazil; MSc in Electrical Engineering, University of São Paulo, Brazil; PhD in Aeronautics and Mechanical Engineering, Technological Institute of Aeronautics, Brazil



Don't let stereotypes or societal expectations deter you from pursuing your dreams.





In grade school, kids would ask me to “re-explain what the teacher said” in my terms, so it was on the playground I began to recraft messages for audiences to better understand concepts. Growing up in Silicon Valley with big technology companies all around, I wanted a part of it. Beginning work before graduation, I was inspired to “re-explain what the technology officer said” for audiences to better understand, especially when it came to addressing the complexities of rapidly evolving architectures and the business community.

I oversee all corporate, business, and communication growth strategies of the Advanced Photonics Coalition standards organization. Working with approximately 100 photonics companies, I work to retain and acquire relevant technology partners to form industry standards representing the entire photonics ecosystem, from design to manufacturing.

“Show up for others.”

Resiliency is the greatest accomplishment in my career. Technology evolves quickly and you must keep the pace. Sometimes you invest in people, companies, or product

lines that don’t come to fruition, not because of your effort, but because of situations outside of your control that you must overcome quickly — and with grace.

Being subject to stereotypes has been a challenge in my career and was overcome by being the absolute best version of myself in every possible aspect until there was nothing left for anyone to say. Results speak for themselves.

My advice for someone starting out in their career is “show up for others.” This is the most productive way to interact: tuning in to the needs of others, honoring their vulnerabilities, and being completely open to whatever those may be. It’s being there for that person despite what’s going on with you. In doing so, we become part of the greater picture, we co-create the company, and it becomes a magic show.

When people hear the word “impact” they think of the result a new technology will have, or the impression you or your company left on someone. While technology, company reputation, and your appearance are important, it’s the self and company image in your subconscious mind that really counts. This image that you hold — that brand projection, really — determines you or your company’s impact, its success or failure.

Thoughts become things. If you see it in your mind, you will hold it in your hand.

Melissa Kallos

Corporate Development and Strategy, Advanced Photonics Coalition

Born in United States / Resides in United States

Educational Background: BSc — dual in Public Relations and Business Administration, San Jose State University, United States



I am a Principal Research Fellow in the Optoelectronics Research Centre at the University of Southampton. My work focuses on a novel type of optical fibre, a hollow core fibre (HCF). In a conventional optical fibre, light is guided with low loss in a glass (usually silica) core region; in an HCF, light is guided in a gas (or even vacuum-pressure) core region, surrounded by a cladding region that is made up of several smaller gas-filled holes, defined by thin silica glass membranes. Transmission of light in air instead of glass can overcome many limitations of conventional fibres, leading to lower loss, ultra-low non-linearity, and ultimate low latency. HCFs are now being investigated and deployed for wide-ranging applications, including telecoms, high-power beam delivery, and advanced fibre sensors. I have been working on HCF fabrication, characterisation, and applications since my PhD. Now, more than 15 years later, I lead a research group in this area.

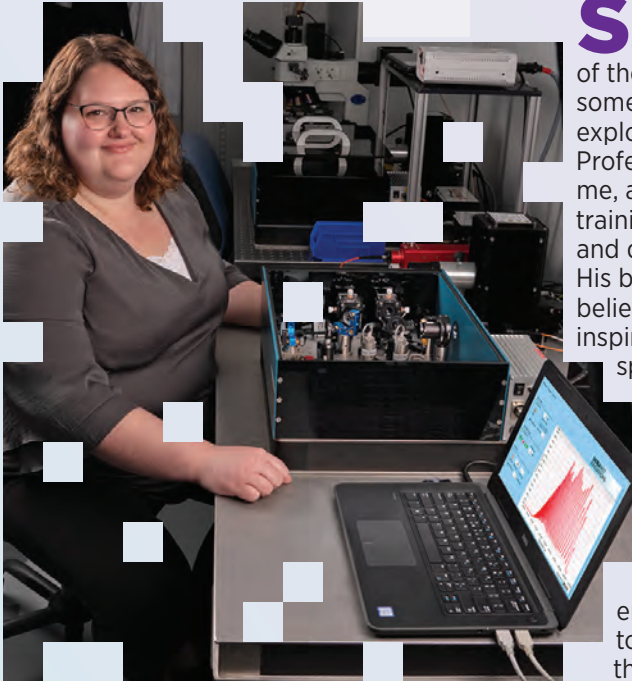
... [My] role is never boring, and I never find myself looking at the clock, waiting until it is time to go home!

I have always been motivated by learning and problem-solving. During my undergraduate degree, I was interested in a wide range of topics, being drawn to the area of HCFs after an extended research project. While my interest in this area was a key factor in pursuing a research career, other factors have also been important. I appreciate the variety of work within a research role: while the research is the primary focus, working with an extensive range of people and communicating your ideas and results — in meetings, at conferences, in papers — is a critical part of the role. This diversity means the role is never boring, and I never find myself looking at the clock, waiting until it is time to go home! I also enjoy being involved in the research “lifecycle,” from initial ideas, through fabrication, characterisation, and application, working with different industrial partners and seeing the technology being deployed.

A major challenge for me, which I think will resonate with many people, has been progressing my career alongside my family life. I have three children, so I have taken three extended career breaks, and there have been periods where juggling home and work has been difficult. I hope that one impact from my career will be demonstrating that it is possible to achieve a work-family balance. There may be people who will say differently, but please don't let this discourage you from a rewarding career in academia where you can make a valuable contribution.

Natalie Wheeler

Principal Research Fellow, Optoelectronics Research Centre, University of Southampton
Born in England / Resides in England
Educational Background: MPhys, University of Bath, United Kingdom; PhD, University of Bath, United Kingdom



“Don’t try to carry the weight of the world on your shoulders!”

Since childhood, I’ve had an incessant desire to understand how the pieces of the Universe fit together. I gained some tools and skills necessary to explore those questions during college: Professor James Demas took a chance on me, a young woman from rural Virginia, training me to ask the right questions and design experiments to answer them. His belief and trust in me helped me believe in myself; his encouragement inspired me to pursue my PhD in ultrafast spectroscopy, which jump-started my career in ultrafast optics.

I serve as a subject-matter expert in ultrafast laser applications. In addition to helping our customers select the best optics for their applications, I help develop new products. I work with R&D, engineering, and factory operations to ensure that our customers receive the latest and greatest in ultrafast laser optics technologies.

The decision to transition from academia to industry was difficult. I had dreamed of a career spent delivering university lectures and guiding researchers in my own laboratory. The further I advanced, however,

the more I realized that I had other professional and personal goals that were more important. Through a lot of research, networking, and interviews, I found the things that I loved most about academia — sharing my passion for STEM and solving tangible problems — in my current position. I found a career path that works for me, and I consider that my greatest accomplishment thus far.

Don’t try to carry the weight of the world on your shoulders! Too often, I’ve viewed my successes and failures through the lens of representing my entire gender. If I failed, I worried that I was letting down all other women in STEM. When I didn’t understand a concept or struggled to align a laser, I thought I was providing another data point for the argument of why women aren’t cut out to pursue STEM careers.

I hope my legacy empowers other women and gender minorities to pursue technical careers in male-dominated fields. I hope that someone is able to look at my career path and say, “If Olivia can do that, so can I!” Most of us are quick to assume that making an impact has to come from grand accomplishments or lofty gestures. In reality, each of us is crafting our impact every moment of every day. I hope that the moments of my life and career leave a legacy of empowerment and inclusivity.

Olivia Wheeler-Williams

Ultrafast Laser Optics Engineer, Edmund Optics

Born in United States / Resides in United States

Educational Background: BS in Chemistry, University of Virginia, United States; PhD in Physical Chemistry, University of North Carolina at Chapel Hill, United States

Empowering Perspectives: Women Leading the Way in Optics!



Mehrnoosh Taghavimehr, Ph.D.
Principal Data Scientist



Michele Wurch, Ph.D.
Sr. Microfabrication Process
Engineer

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My “Intro to Physics” professor, Dr. Juliet Brosing, was a strong inspiration. I took her course for fun as I’d always enjoyed math/physics but didn’t think I belonged in that field. Towards the end of my first semester she said, “You can do this! I’m not letting you choose otherwise.” She became an important mentor, cheerleading and challenging me throughout my university years.

I am responsible for assessing needs and identifying gaps in optical-engineering expertise across research pillars at Meta. This involves working with various teams and stakeholders to gain a deep understanding of their requirements and challenges. Another important aspect of my role is supporting the career development of my team members, providing guidance, mentorship, and opportunities for growth and advancement. I also establish strong relationships with other teams, organizations, and disciplines within the company, so that we effectively collaborate and work toward common goals.

One of my greatest achievements is learning to be courageous. Having faced various obstacles

You belong here. You deserve respect. Your opinions matter. Your work matters. You are valued.

that could have sent me down a completely different path, I chose to take the leap whenever I had the chance, whether it was choosing a degree I didn’t think I was good enough for, moving across the country for my first industry job, or leaving Microsoft to move to Germany for my master’s degree at 29. These decisions have impacted who I am as well as how I approach engineering.

One of the biggest challenges in my career was finding a job after my master’s program when the world had shut down from Covid. Happily, I had developed a great network, and that moved me forward.

The most common theme I’ve come across in women’s advocacy work and have struggled with myself is confidence: “Do I belong here?”, “Will they take me seriously?” etc. I encourage young girls and women to take up space. You belong here. You deserve respect. Your opinions matter. Your work matters. You are valued. Don’t ever stand for letting anyone make you feel otherwise.

I hope to have a positive impact on the women in my organization, changing the culture so that they feel empowered and don’t have to spend energy fighting for respect or to be seen.

Simone Carpenter

Optical Engineering Manager, Meta

Born in United States / Resides in United States

Educational Background: BS in Physics, Pacific University, United States; MS in Optics and Photonics, Karlsruher Institut für Technologie, Germany

During high school, I was deeply inspired by a fellow student, a remarkable woman who defied gender stereotypes in physics by excelling and ranking first at the 30th Chinese Physics Olympiad. Her achievements motivated me not only to pursue physics but also to challenge myself in the same male-dominated competition. This experience was instrumental in me pursuing a career in optics. Her example continues to drive my commitment to inspire other women in science.

My primary responsibility is working in the nanofab and our optical lab. My research focuses on the design, fabrication, and characterization of optical devices on a silicon carbide platform. I make these optical devices in a cleanroom, and after building them, I optically characterize the samples by shining lasers on them and detecting the corresponding transmission.

One of my greatest accomplishments has been the development of a low-loss 4H-silicon-carbide-on-insulator integrated photonics platform. Our work in silicon carbide nanofabrication is state-of-the-art, achieving optical quality factors in the 5-10 million range. This work represents a major step forward in the field of photonics, enabling more efficient and powerful optical devices that can be used in both classical and quantum domains.

The world of STEM turns curiosity into innovation that can greatly benefit our society. My advice for young girls and women considering STEM is to hold on to your passion strongly and consistently. Never let stereotypes or doubts about your abilities control your choices. The journey in fields like optics and engineering can be challenging but is also immensely rewarding. Never underestimate the power of curiosity. Ask questions, explore different areas of interest, and let your curiosity guide you to new and exciting findings.

I wish someone had told me earlier about the importance of resilience and adaptability. In research and development, setbacks are not just barriers — they provide chances to learn and grow. Every experiment that doesn't go as planned teaches you something valuable. Learn from these experiences; use them to move forward.

Recently, I spoke with a woman who works in hardware technology. She was very supportive and gave me a lot of advice; it was refreshing and inspiring to connect with someone who is navigating a similar path. She mentioned how glad she was to discuss these topics with a female student in tech. This experience made me even more eager to support young girls and women in the field of optics.

Ruixuan Wang

PhD Candidate, Carnegie Mellon University
Born in China / Resides in China

Educational Background: BS in Physics, Nanjing University, China; MS in Electrical and Computer Engineering, Carnegie Mellon University, United States



Hold on to your passion strongly and consistently.



Growing up in a family that highly valued education, I was exposed to science early on. My mother, an elementary school teacher, would plan experiments for her students at home, and my father, an engineer, would share his enthusiasm for the latest technology with the family. After discovering Isaac Asimov's books and having a remarkable physics teacher, I was drawn towards physics. During my studies in Munich, I developed a passion for optics and photonics as I learned more about the unique properties of light and its potential to detect and manipulate structures, ultimately facilitating our understanding of the world.

Inspiring and motivating the next generation might be a scientist's most significant accomplishment.

Now, I work as an optical scientist and project lead in corporate research

at Carl Zeiss AG. Our team works with other researchers, engineers, and scientists to develop and test new ideas for innovative optical tools, identify potential applications, and share our findings. Our goal is to develop novel solutions that improve Carl Zeiss AG's optical products and technologies, enabling our customers to tackle their most pressing challenges.

As a scientist, I believe it is also crucial to devote time to mentoring, teaching, and engaging in science outreach activities. These efforts may seem small compared to big scientific findings, but their long-term impacts can be substantial. Inspiring and motivating the next generation might be a scientist's most significant accomplishment.

During my PhD studies, I developed an advanced microscope that could resolve features smaller than the diffraction limit of light, which I consider my first scientific accomplishment. The project was more challenging than anticipated, but it taught me the importance of resilience and perseverance. Whenever I think back to the moment when I first saw the data in the optics laboratory, I still get chills. It was at that moment I realized that I had found my true calling.

To young girls and women considering a career in STEM, my advice is to follow your passion and never give up. Pursue opportunities to learn and gain experience in STEM, seek out mentors and role models, and don't be afraid to take risks and try new things. Diversity is essential in the STEM field, and your unique perspective and experiences can bring value to any team or project.

Ulrike Boehm

Optical Scientist and Project Lead, Carl Zeiss AG

Born in Germany / Resides in Germany

Educational Background: Diploma in Physics, Technical University of Munich and Max Planck Institute of Biochemistry, Germany; PhD in Physics, Max Planck Institute for Biophysical Chemistry and Heidelberg University, Germany

My great mentor was my doctoral-thesis supervisor. She inspired me with her passion for optics and her communication skills, and she instilled in me confidence and motivation to achieve my goals.

As a teacher, I particularly enjoy the constant interaction with students. As a researcher, I currently work on applications related to diffractive optics, to measure light polarization and to manipulate it, while also exploring new applications in plasma diagnostics.

I am particularly proud of the leadership skills I've developed: At the beginning of my PhD, I co-founded the non-profit association "Physics League," dedicated to the dissemination of physics to everyone from primary-school children to the general public. For this work, I was awarded two "Ciencia en Acción" [Science in Action] prizes as part of an Iberoamerican contest.

I've been involved in the Women in Optics and Photonics Committee of the Spanish Optical Society since its 2018 formation, and I am its current president. This committee showcases work carried out by women researchers in optics and photonics in Spain, creating a network of contacts and mutual support.

One of my greatest challenges was having to emigrate to another country to continue my scientific career, without knowing if there would be a possibility of returning. Experiences such as this one led me to become the proactive and fighting person I consider myself to be today.

To a young woman starting her career, I would tell her to be ambitious, both in her work and in her motivations. You need to pursue what you are passionate about, but don't let it control you. And above all, enjoy what you do. The moment it doesn't make you happy, it's time to change.

The best advice I've received is to believe in yourself, in your abilities and in your achievements. Others will want you to believe that it is a matter of luck, and it is not like that. Your success is the result of your work, and the first person who has to value it is yourself.

I think that one of the strongest parts of my career has been mentoring younger people; I would like my legacy to include my actions for a more inclusive and egalitarian scientific world.

We need to show women scientists that they are right where they belong, developing their work and inspiring the world.

Verónica González-Fernández

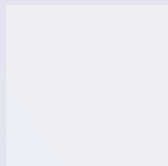
Assistant Professor, Department of Optics, Universidad Complutense de Madrid

Born in Spain / Resides in Spain

Educational Background: BS in Physics, Universidad de Valladolid, Spain; MS in Optical and Imaging Technologies at Universidad Complutense de Madrid, Spain; PhD in Physics, Universidad de Valladolid, Spain



Your success is the result of your work, and the first person who has to value it is yourself.



From a young age, I've been curious about how things work. Inspired by my late father's love for STEM and my mother's dedication for teaching, I pursued a path in STEM education, and I feel blessed that I had female leaders in the community who inspired me. I was introduced to the fascinating world of magneto-optics by Dr. Muhammad Sabieh Anwar, who instilled in me that learning is not just the science, but also the importance of community engagement and educational outreach.

I work in quantum optics with a particular focus on using quantum weak values to study ultra-small magneto-optic and spintronic effects. This work includes synthesis of nanostructures and developing novel optical detection techniques to reach ultra-high accuracies in order to observe light-matter interactions that are smaller than the scope of current optical equipment. I also serve as a safety officer, supervise undergraduate theses, and train new research assistants and interns.

An integral part of my journey involves organizing laser and optics outreach activities for underprivileged communities through various platforms. As the first female president of the SPIE Student Chapter at Lahore University of Management Sciences under the mentorship of chapter advisor Dr. Muhammad Faryad, I organized seminars, promoted women's inclusion, and facilitated equipment-building workshops.

The biggest obstacle has been finding the right balance. Being a woman in STEM can be overwhelming; unlike our peers, we at times feel added pressure to repetitively prove our position and commitment. Finding a work-life balance is achievable with discipline, consistency, and choosing a wise spouse, though it all may take time.

Join professional bodies — like SPIE — at early stages and participate in their programs; that brings inspiration and opens doors to opportunities. Embrace your unique perspective and lift others as you climb. Remember to push and pull! Surround yourself with supportive friends, family, and peers who push your aspirations forward, while seeking out mentors who are eager to pull you to new heights.

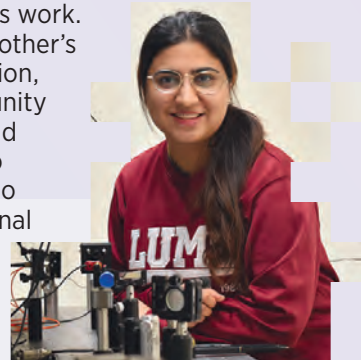
As the first woman in my immediate and extended families to soon achieve a doctorate in sciences, I aspire to inspire others to break barriers in their communities.

Wardah Mahmood

PhD Student, Syed Babar Ali School of Science and Engineering at Lahore University of Management Science

Born in Pakistan / Resides in Pakistan

Educational Background: BS Honor (Campus Gold Medalist) in Physics from COMSATS University Islamabad, Pakistan; M.Phil in Physics from Quaid-i-Azam University, Pakistan



Push and pull! Surround yourself with supportive friends, family, and peers who push your aspirations forward, while seeking out mentors who are eager to pull you to new heights.



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Marie Curie or Ada Lovelace are great role models for me, but I was also inspired by the non-science women around me: they motivated and pushed me, making me see that I would be the one who would someday inspire new generations.

I study characteristics of materials through light. I can determine how much a material stretches or how much it deforms with light-leveraging techniques. I also teach mathematics and physics and develop activities to bring science closer to underrepresented communities, such as low-income people, the LGBTQI+ community, and people with blindness or visual disabilities.

For a woman from a family with limited resources, obtaining a doctorate and working in research required an enormous effort. Studying physics was a great achievement because at home no one knew what that meant, and they questioned me constantly.

Accessing scholarships for my master's and doctorate degrees was a momentous achievement.

During my doctorate, I published an article about optical tweezers, the first article in this field published by the A.C. Optical Research Center. But the social responsibility that I acquired during my training is the greatest success of my career. The passion I have for transmitting my knowledge is what I value most from my time in science.

To overcome obstacles, I created a support network: Anytime I doubt my abilities, my colleagues are there to help me. In this sense, SPIE has been invaluable, because it allowed me to meet brilliant people who are my role models, my support network, and my friends.

There are still too few of us in STEM areas, so try to hold on tightly to your colleagues and let them hold onto you: individually, we are strong, but collectively, we are powerful; we are invincible.

The only way to make a difference is to look back and help others get to where you are. Do not forget how difficult the beginning was and convey to others that they are not alone — that we must learn to ask for help because there is always a woman willing to help another. My way of making an impact is like this: I try to give my students the opportunities that I would have liked to have, and I strive to prepare them for current challenges.

Individually strong, collectively powerful: let's illuminate the path for future generations, fostering inclusivity and empowerment in the field of science.

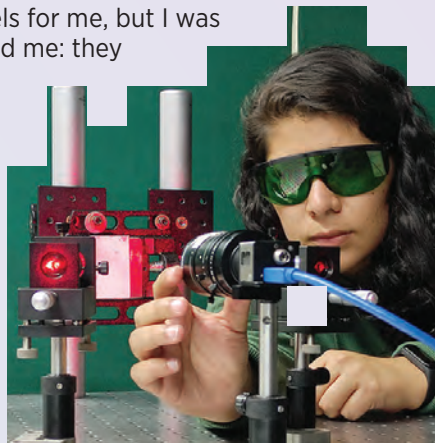
Ana Karen Reyes

Postdoctoral Researcher, Universidad Tecnológica de Tulancingo

Born in Mexico / Resides in Mexico

Educational Background: BS in Physical-Mathematical Sciences and MS in Physics

Engineering, Universidad Michoacana de San Nicolás de Hidalgo, Mexico; PhD in Sciences with a specialty in Optics, Centro de Investigaciones en Óptica A.C., Mexico



**Individually, we are strong,
but collectively, we are
powerful; we are invincible.**





I am a self-proclaimed product of the “Scully Effect.” I loved watching *The X-Files*, and Dr. Dana Scully seemed so cool asking the tough questions. It was inspiring to see a woman in that role, and that had a huge impact on me. In fact, I initially went into chemistry to do forensics just like Scully, but that later morphed into a fascination with lasers and optics.

As an engineering manager in the Advanced Technology Group of Lasers R&D (Spectra-Physics) at MKS Instruments, I help manage the development of laser technologies and engineering solutions as precursors to product development. I get to interface with various functional engineering teams, as well as product marketing and operations to understand the roadmap for lasers in different markets.

“ Impact is when young women see more women in rooms where decisions are being made! ”

One of my greatest accomplishments was completing my PhD despite many practical and emotional challenges. I wanted to give up several times and pivot to something easier, but I wanted to prove to myself that persistence matters. I also had a tough advisor who ended up being one of the best teachers I have ever had — he taught me how to build grit and instilled a “just do it” attitude in me. Another accomplishment was getting selected to be a part of the emerging-leaders program at my current company, which has given me confidence that my skills are being recognized and valued.

Feeling like you don’t fit into the stereotype in your field can be exhausting at times and feel like a constant upward battle; the only way to change this is to normalize our existence in under-represented divisions. I grew up in a culture where a woman’s role is culturally prescribed — it is almost expected that women will not take up “serious” careers. There are tons of such limiting narratives; be stubborn about not letting those become your story. There is no formula for making an impact — lean on your unique strengths, be a good student, and focus on developing skills rather than outcomes. Find mentors and allies who can champion your development.

To the women in STEM fields, know that you are making a valuable impact by simply being your authentic self in a space that is male dominated. Focus on making the world slightly better for the next woman to come by.

Impact is when young women see more women in rooms where decisions are being made!

Shalaka Dewan

Engineering Manager, Lasers R&D, MKS Instruments

Born in India / Resides in United States

Educational Background: MSc in Chemistry, University of Mumbai, India; PhD in Physical Chemistry, Temple University, United States



I was born and raised in Ethiopia. Growing up, I witnessed the devastation caused by illness — particularly infectious diseases. As a medical student, I experienced firsthand the limitations of healthcare facilities in resource-constrained settings. The doctors had fantastic education, but equipment and supplies were either non-existent or malfunctioning. I was convinced that I had to do something about it and moved to the United States to extend my education in biomedical engineering.

During the first year of my PhD, I assessed which physical measurement principle would serve as the most clinically translatable for global dissemination and landed on optics. My interest grew when I learned about light-matter interactions at the atomistic level in my senior physical-chemistry classes. When I realized optics was the best path for building translatable tools, I couldn't have been more excited.

“ Finding joy in the little victories one achieves along the way to a bigger goal is key to progress. ”

As a professor at MIT, I lead a team of students and postdocs on our research, teach courses, and perform departmental services. I also serve my scientific community, travel to conferences, and present our research findings.

My greatest accomplishment has been demonstrating Raman spectroscopy's capability to detect and identify bacterium types and their antibiotic responses, including in native liquid environments. This is achieved in a few seconds of measurement compared to days-long culturing steps required in gold-standard diagnostic methods.

I aim to transform healthcare globally through accessible technologies. My interdisciplinary path enabled me to learn from the best of medicine, chemistry, physics, and engineering. I would like to see the transformative power of Raman spectroscopy realized in clinical settings and in biomedical research spaces, illuminating fundamental biology that leads to discovery and cure. There are many problems in the world bigger than an individual's lifetime; finding joy in the little victories one achieves along the way to a bigger goal is key to progress.

My advice to others is that you don't have to have the details of your journey figured out from the get-go; you just need to walk toward what you're passionate about and clarify the details as you explore opportunities.

Loza Tadesse

Assistant Professor, Department of Mechanical Engineering, the Massachusetts Institute of Technology (MIT)

Born in Ethiopia / Resides in United States

Educational Background: MD (unconferred), St. Paul Hospital Millennium Medical College, Ethiopia; BA in Chemistry, Minnesota State University Moorhead, United States; MSc and PhD in Bioengineering Stanford University, Stanford University, United States

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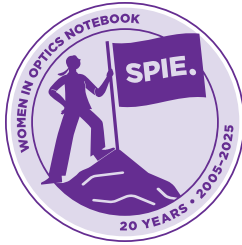
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SPIE Women in Optics promotes personal and professional growth for women through community building, networking opportunities, and encouraging young women to choose optics as a career. For information visit spie.org/wio.

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SPIE has produced the annual Women in Optics notebook and provided it free of charge since 2005.

Know someone who should be featured next year? Nominate inspiring women in STEM for the 2026 Women in Optics notebook – and find out more about the SPIE Women in Optics program – at spie.org/wio.



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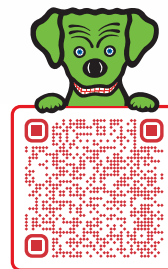


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