Hajim School, Kearns Center work hand in hand

Student societies enrich the Hajim School

‘Real Readers’ give students an edge

Donna Strickland ’89 PhD receives the 2018 Nobel Prize in Physics. See page 2.
The 2018 Nobel Prize in Physics, shared with optics alumna Donna Strickland ’89 PhD (above) and Gérard Mourou (at left), former scientist at the Laboratory for Laser Energetics and engineering faculty member, was a source of pride for the Hajim School. The prize recognized the work they did developing chirped pulse amplification at LLE while Strickland was a PhD student at the Institute of Optics. The technology harnessed the power of lasers as precision tools and helped pave the way for laser-eye surgery, the machining of key parts for cell phones and other devices, tools for cancer treatment, and other clinical and commercial applications.

In the photo above, Strickland poses with guests she invited to Stockholm for the presentation ceremony. From left, institute director Scott Carney, University president Richard Feldman, and LLE director Mike Campbell. Not shown: Wayne Knox, professor of optics, who was invited by Mourou.
The appointment of Sarah Mangelsdorf, our University’s first woman president, signals a strong commitment by our institution to educational access, diversity, and inclusion. I’m impressed by Mangelsdorf’s strong track record as an administrative leader who listens, collaborates, and can make tough decisions when she needs to. And by her obvious excitement to be coming here.

As part of the search process, optics PhD student Sarah Walters cochaired the Student Advisory Committee and was also a member of the University Advisory Committee that helped evaluate prospective candidates.

I heartily concur with her assessment of our new president as “a genuine person of high integrity . . . she’ll be all in and 100 percent invested. She’ll pour her heart and soul into this University.”

The appointment of Sarah Mangelsdorf, our University’s first woman president, signals a strong commitment by our institution to educational access, diversity, and inclusion. I’m impressed by Mangelsdorf’s strong track record as an administrative leader who listens, collaborates, and can make tough decisions when she needs to. And by her obvious excitement to be coming here.

As part of the search process, optics PhD student Sarah Walters cochaired the Student Advisory Committee and was also a member of the University Advisory Committee that helped evaluate prospective candidates.

I heartily concur with her assessment of our new president as “a genuine person of high integrity . . . she’ll be all in and 100 percent invested. She’ll pour her heart and soul into this University.”

The awarding of three Nobel Prizes to recipients with University ties reinforces our reputation as a top tier research institution. The Hajim School, in particular, can take pride that the Nobel Prize in Physics was shared with optics alumna Donna Strickland ’89 PhD and Gerard Mourou, former LLE scientist and optics faculty member, for their work developing chirped pulse amplification.

We can also take pride in the 10 Hajim faculty members and LLE scientists who have been recognized as fellows by their respective professional societies in recent months (see page 13). At least three more such honors are in the pipeline. This is an impressive number indeed; this kind of recognition from peers is one of the strongest indicators of a researcher’s success in his or her field.

The Center for Freeform Optics is a good example of the cutting-edge research being done in the Hajim School. As you will read in this edition, it has adopted an interesting approach to sharing its intellectual property with member companies.

It also is providing a unique opportunity for a new generation of young scientists to become acquainted with an exciting new technology.

Not surprisingly, many of the undergraduates who come to our University do so in hopes of gaining research experience. The Kearns Center has emerged as a major partner in helping us extend research opportunities to as many of our undergraduates as possible—especially during the summer when students can most benefit from a full-time immersion in a lab. Read more about our plans to provide a stellar summer research experience to even more of our students.

The undergraduate experience is further enriched by the contributions of 20 student societies on campus. We pay tribute to them. And also to our Real Readers. These are the alumni and friends who help our students prepare the résumés and other materials they’ll use in seeking internships and careers. Their “real world” feedback is invaluable.

Last but not least we recognize Jim Zavislan, who is completing a six-year term as our associate dean. I can’t say enough about the many efforts Zavislan has undertaken to ensure our students have multiple tracks and entry points to complete required courses in physics and math, and in helping to introduce hands-on introductory courses in Arduino programming, machine shop, CAD, and other subjects. Paul Funkenbusch, professor of mechanical engineering, will bring a wealth of experience with him when he becomes our new associate dean on July 1.

These are exciting times indeed. As the University embarks on this new chapter in its history, I am confident the Hajim School will help make it a memorable one.

Your dean,
Wendi Heinzelman
Some of Jim Zavislan’s best experiences have occurred when he encountered subjects he initially knew nothing about. Far from shying away from those opportunities, he fully embraced them, mastering new skills and gaining knowledge.

This happened at the machine shop, where he worked as a teen in Colorado . . . at a nearby telescope company, where he was inspired to grind his own lenses and build his own telescopes from scratch . . . at the Laboratory for Laser Energetics and the Institute of Optics, where he worked and studied as an undergraduate . . . and at Lucid Technologies, the start-up he cofounded, where he helped design and develop a highly accurate paper ballot scanner.

So, it is not surprising that for the last 16 years, as associate professor of optics and most recently as Hajim’s associate dean of education and new initiatives, Zavislan has enjoyed helping students find and embrace their own paths of discovery.

“I’ve especially enjoyed working with students who are struggling or trying to discern what their path is, because the University, as Steve Fantone ’79 PhD (optics) once said, has a head but it’s also got a heart.”

Zavislan, who received his PhD from the Institute of Optics in 1988, will complete a six-year term as the Hajim School’s “fix it” guy at the end of June. As associate dean, one of Zavislan’s primary responsibilities has been ensuring that the school’s academic programs satisfy the requirements of ABET—the Accreditation Board for Engineering and Technology. Zavislan successfully guided the school through its latest accreditation review in 2015.

Among his other responsibilities and accomplishments Zavislan has

• organized the annual Hajim School Design Day celebration.
• worked closely with the Departments of Mathematics and of Physics and Astronomy to ensure our engineering students have multiple “tracks and entry points” to complete required classes those departments offer that are “foundational” to success in engineering.
• promoted a Hajim Consultants program, so that carefully screened students from one engineering department can lend their expertise to senior design teams in another.

And he is particularly proud of the hands-on, introductory courses he has helped introduce in such subjects as Arduino programming, machine shop, CAD, and—starting this spring—introductory product design.

In recognition of these and other initiatives, Zavislan last summer was named a recipient of the University’s Mercer Brugler Distinguished Teaching Professorship, which recognizes excellence in teaching and encourages the development of cross disciplinary instructional programs. In recognition of the considerable portfolio of patents he has accumulated throughout his career, Zavislan was named a fellow of the National Academy of Inventors last fall.

So, what’s next for Zavislan after he steps down as associate dean in June? He will restart his research lab by recruiting new students, and he will manage the undergraduate labs at the Institute of Optics, in addition to his regular teaching load.

And away from campus, he and his wife Jeanette, a technical writer, will be busy renovating the early 19th-century house that they recently bought in Bloomfield, New York, and now occupy with Sadie, their “some kind of doodle” rescue dog.

With their three children now grown and on their own, Zavislan says, “this is our life: we are dominated by old home renovation.”
The chemical engineering senior design team of Tiwalade Dairo, Bradley Porceng, Charles (C. J.) Ruff, and Benjamin Walker spent last semester designing a bubble machine for children being treated at Golisano Children’s Hospital, to lift the young patients’ spirits and aid in healing. Their prototype was a big hit with five-year-old Gracyn Chappell, who tried it out in a Golisano play area. “We’re trying to normalize the experiences of the children who come here as much as possible,” said Geri Sehnert, a child life specialist in Golisano’s pediatric surgical center. “I’m really impressed at how the students took all the information we gave them and were able to create a device that will work for us.” Rachel Monfredo, lecturer and technical associate in chemical engineering, is hoping the Toys for All Tots student group she founded can make additional bubble machines for Golisano and local Rochester agencies that serve children with disabilities.

Every Gift Makes a Difference
Your gift to the Hajim School provides support for scholarships and fellowships, professorships, student and faculty research funds, experiential learning funds (for study abroad, internships, and more), and capital improvement funds (for equipment and classroom/lab space). Contact: derek.swanson@rochester.edu
Kharimat Alatise ’19 arrived at the University of Rochester as a first-generation college student, passionate about science, but not sure she really belonged.

The biomedical engineering major was excited to be at a university where undergraduates have ample opportunities to do research—but was intimidated by the mere thought of approaching a professor about doing so.

The David T. Kearns Center for Leadership and Diversity helped Alatise overcome her shyness and doubts. As a McNair Scholar at the center, she gained confidence and learned critical skills for networking and grad school preparation. She seized upon two summer research opportunities.

And now she is applying to graduate schools, determined to become a professor herself and improve the underrepresentation of minorities among the ranks of engineering faculty. “Representation is important,” she says. “I have had women professors, but I haven’t had a woman professor in my discipline who looks like me.”

The Kearns Center’s mission to expand the educational pipeline for low-income, first-generation, and underrepresented minority college students dovetails with the Hajim School’s own efforts to attract and retain increased numbers of these students.

So, it is not surprising that the Kearns Center and the Hajim School increasingly find themselves working hand in hand.

For example, since 2009, the Xerox Engineering Research Fellows Program, funded by Xerox and administered by the Kearns Center in collaboration with the Hajim School, has enabled more than 240 rising juniors and seniors to spend a summer doing hands-on, mentored research in a faculty member’s lab. As with McNair Scholars, the experience is combined with professional development and GRE exam preparation. As of 2016, more than a third of the Xerox Fellows were female and nearly a quarter were underrepresented minority students. About 60 percent of Xerox Fellows have subsequently enrolled in graduate school.

The summer research program further blossomed the last two years when three new NSF-funded REUs (research experiences for undergraduates) brought students here from other universities. The Kearns Center was instrumental in securing one of the REU programs and helped manage the other two.

Kharimat Alatise is grateful for the help she has received as a McNair Scholar in applying to graduate school. “I know that a lot of people who do it by themselves can get overwhelmed. So, I appreciate McNair for keeping me focused and grounded and making sure I stay on top of my deadlines.” The Kearns Center has helped her in other ways. “At the highest of my high points and the lowest of the low, the Kearns Center was always there for me.”
Dominique James ’19, a first-generation college student from Dallas, Texas, and a Gates Millenium Scholarship recipient, received tutoring help from the Kearns Center during her freshman year, then became a McNair Scholar. This helped the biomedical engineering major participate in an ultrasound-related research project with Diane Dalecki, chair of biomedical engineering at the Hajim School, and in another project at the University of Nebraska this past summer. The McNair program, she says, helped her engage in research sooner than she would have otherwise. “And the research I got into has influenced me to continue that path in graduate school,” she says. Eventually, she would like to teach at a university but may work in industry first after getting her PhD.

The Kearns Center even came up with a unique approach to building a sense of community among the growing number of undergraduates doing summer research on campus. REU participants, Xerox Fellows, and McNair Scholars were all intermixed, sharing dorm rooms, participating in Kearns Center seminars, and participating in social events hosted by the center. “The students have a great experience,” says Hajim dean Wendi Heinzelman. “They have access to a GRE prep class, a lot of professional development, social activities, and mentoring.”

Last summer, 42 Hajim School students were on campus doing research as Xerox Fellows or McNair Scholars.

This summer the Kearns Center “umbrella” will be extended to even more Hajim students who stay on campus, doing individual summer REUs supported by faculty members’ supplemental grant funding.

“These students haven’t been plugged in to the professional development opportunities and social functions that students in the REU, Xerox, and McNair programs are getting,” says Heinzelman. “Now they too will have the option to participate.”

She’s excited at this opportunity to create an all-inclusive Kearns summer research scholars program—and appreciates the Kearns Center’s support in helping to make it happen.

Students are not the only beneficiaries. Starting in 2013, Beth Olivares, executive director of the Kearns Center and dean for diversity initiatives, began to formally involve the University’s STEM faculty with the center’s Upward Bound program, which encourages Rochester City School District students to attend college. The center has received NSF INCLUDES funding to explore how this model might be replicated nationwide in academic settings ranging from major research universities to community colleges.

Several Hajim School faculty now lead summer courses for Upward Bound students or individually mentor them on research projects.

Faculty members have been able to leverage their participation in Upward Bound to help demonstrate—and document—the broader impact the National Science Foundation weighs in deciding which grants to fund. For example, an incredible 96 percent of the city school students that the Kearns Center mentors go on to college. Doug Kelley’s willingness to teach hands-on engineering to city school students one week each summer helped the mechanical engineering assistant professor secure an NSF CAREER award on his first try.

Kelley strongly encourages faculty to work with the Kearns Center. “It’s super easy. The staff is great. They really know the literature about what works well with these students, and they can provide lots of manpower.”

“Once you bring your expertise to us, we bring the students to you,” says Danielle Daniels, the Kearns Center Director of Diversity in STEM.
Matthew Wallace watches approvingly, occasionally taking pictures with his smartphone, as his sixth-grade daughter Harper huddles on a floor in Wilmot Hall with two other girls. They are building a Hollywood “movie set” out of toothpicks and marshmallows.

The excitement in the room is palpable as groups of girls compete to make the tallest structure. Kate Korslund ’20, a mechanical engineering major, circulates from group to group, making suggestions and answering questions.

For two years, Wallace, a business analytics administrator and architect for Wegmans Food Markets, has brought his daughter to the biannual Girls Day hosted by the Society for Women Engineers (SWE) student chapter.

The event uses hands-on activities built around a fun theme—“Hollywood” last fall, “pirates” the previous spring—to illustrate basic concepts of science and engineering. The goal is to spark an interest in science and engineering among the girls and begin to instill in them the confidence to pursue careers in fields where women are underrepresented.

“I think it’s a fantastic program,” says Wallace. By bringing his daughter to this event, he says, she will take more interest in the science-related activities he encourages at home.

More importantly, “it leads to a dialogue,” Wallace says. “I can’t always lead her to the science, but I can answer the questions and be there when she finds a project that interests her. And this is one way of doing that.”

SWE is one of 20 student societies on campus devoted to or including engineering disciplines or projects. They enrich the Hajim School experience by

- engaging in meaningful service projects that embody the spirit of Meliora.
- competing against students from other universities. The contests and hackathons enable students to apply what they have learned in the classroom to real-world challenges.
- providing tutoring and mentoring for fellow students.
- teaching leadership and organizational skills.
- organizing industry tours, workshops, and networking opportunities and career conversations with alumni and professionals.
- orchestrating e-socials, a hackathon, and the annual pumpkin launch.
- sending members to national conferences where they pick up valuable networking and career skills, meet potential employers, and perhaps even return with an internship or job offer.

Mira Bodek ’19 of mechanical engineering was one of 12 SWE members to attend their national conference last fall. “After stepping up to the Boeing stand, I spoke briefly with a representative, handed her my résumé, and to my shock, she invited me to their speed interviews later that night,” she wrote. “I was floored that such an incredible company, one so often in the news, would be even remotely interested in me. As a woman in engineering who often questioned if she belonged in the industry, this single interaction completely changed how I viewed myself.” She also received invitations to interview with three other companies. Many of the activities contribute directly to Hajim School initiatives.
Engineers without Borders (EWB), for example, is wrapping up a five-year project to provide fresh drinking water for a school in the Dominican Republic. This included yearly trips to Don Juan to assess the problem and install the system. EWB members have applied their experiences with the project to qualify as NAE Grand Challenges Scholars.

The tutoring and support provided by NSBE, WIC, Tau Beta Pi, and other societies has helped the school retain first-generation, underrepresented minority, and women students.

The Hajim School, in turn, helps pay for society members to attend national conferences. And when engineering students declare their majors on time, the school rewards them by offering to pay for a year of membership in the appropriate national professional society.

“The idea is to make them aware of their national organization because it’s important for professional development, and it’s important to know what profession they’re getting into,” says Lisa Norwood, assistant dean of undergraduate studies.

As rising juniors, moreover, many of these students will want to do an internship the following summer. Membership in a national organization “opens up a whole bunch of resources for these students,” Norwood says. “Many of the organizations have career databases and résumé databases.”

“The hope is that, after the first year free, they will continue to renew their memberships and have a lifelong involvement with their professional organization.”

The connections and friendships that result from participation in a student society can also last a lifetime. Participation can be transformative in other ways as well. Murray Rudin ’83, an electrical engineering alumnus, now a managing director of Riordan, Lewis & Haden Equity Partners, says he was “kind of a quiet nerd coming into college.” But he eventually served as president of the Tau Beta Pi chapter, “a personal development experience that was unparalleled for me, helping me to come out of my shell.”

Learn more about these organizations at www.hajim.rochester.edu/academics/undergraduate/index.html.

Members of Tau Beta Pi dedicate a Bent Monument on the Engineering Quad near Wegmans Hall during Meliora Weekend. The bent of a trestle is the load-bearing part of a bridge, representing Tau Beta Pi’s principles of Integrity and Excellence in Engineering.
Freeform optics is poised to permeate all precision technologies of the future, and perhaps a lot sooner than we ever anticipated.

Jannick Rolland envisions an optics future in which the patents that researchers compete to file—and that companies line up to exclusively license—will be for devices using freeform lenses and mirrors.

For now, however, the Brian J. Thompson Professor of Optical Engineering is content to nurture this emerging technology at a precompetitive stage as director of the Center for Freeform Optics (CeFO). And that means a different set of tech transfer rules apply.

The academic-industry-government collaboration, which recently received a second five years of National Science Foundation funding, unites researchers from the University of Rochester (including faculty and students in both mechanical engineering and optics) and the University of North Carolina Charlotte, working with 18 member companies and research institutions.

Their goal: advancing the use of lenses and mirrors with freeform surfaces in optical devices that are lighter, more compact, and more effective than ever before. Applications include 3-D imaging and visualization, augmented and virtual reality, infrared and military optical systems, efficient automotive and LED lighting, energy research, remote sensing, semiconductor manufacturing and inspection, and medical and assistive technologies.

"Freeform optics is poised to permeate all precision technologies of the future, and perhaps a lot sooner than we ever anticipated," Rolland says.

She cites these accomplishments to date:

• a new methodology for designing freeform optics that removes much of the guesswork, published in Nature Communications
• a full adoption and expansion of "concurrent engineering" between the theory and design experts at Rochester and the manufacturing and precision mechanical design experts at Charlotte
• hardware prototypes completed, including a compact freeform spectrometer and a freeform telescope
• total annual revenues in excess of $1 million
• a significant increase in participating companies and institutes from an initial 7 to 18

Members and faculty determine the center’s 17 ongoing projects; membership fees and supplements fund the projects.

The collaboration has produced seven patents that have either been awarded or filed. Under the CeFO membership agreement, all fee-paying members have non-exclusive, royalty-free rights to all intellectual property created by any research funded by member fees.

However, in the event that only one of the members is interested in a particular patent or other CeFO IP, there is a provision that would allow it to obtain an exclusive, fee-bearing license.
An ongoing education

One of the longest-lasting effects of CeFO is the “development of a new generation of young scientists who are trained at UNC Charlotte and Rochester,” says John Lambropoulos, professor and chair of mechanical engineering and CeFO’s associate director. “The students, ranging from undergraduates to master’s students to PhDs to postdocs, represent a broad spectrum of backgrounds.”

And the constant contact with industry as well as CeFO faculty “represents a new way of learning and teaching, where industry itself is the third partner in the student/teacher intellectual relationship,” Lambropoulos says.

Another point of pride: Greater than 40 percent of the students involved with CeFO are underrepresented with a majority of women among the 40 percent.

Goals for the next five years include advancing the metrology (measuring of freeform surfaces) to ensure quality and finding ways to mass produce freeform optics quickly. Another goal is to use a variety of materials, for large consumer markets.

One intriguing possibility: molding transparent ultraviolet-cured polymer materials so they can be applied, almost like contact lenses, to traditional glass lenses and mirrors, giving them a freeform surface.

“There’s an evolution in the education process that is still happening, as companies learn more about what freeform optics can really do,” says Thomas Suleski, professor of physics and optical science at UNC Charlotte and director of the CeFO team there. “Many companies are still only thinking of freeforms in terms of tiny changes to existing symmetrical elements . . . they aren’t thinking far enough outside the box.”

“Once you start to think away from these classical designs, it should be possible to take multiple optics and with one freeform optic turn them into one,” says Matt Davies, a professor of mechanical engineering and engineering science, who served as prior director of the CeFO team at Charlotte. “So that the price of making the device is more than overcome by the reduction in assembly steps, the reduction in the number of optics, and the compactness.”

Tech Development Fund helps hone innovations

Frequently, research yields scientific breakthroughs that are not yet ready to be translated to real-world situations. The University’s Technology Development Fund (TDF) supports University of Rochester researchers as they develop and hone their innovations for the marketplace.

An example is the recent TDF award to Jaime Cardenas, assistant professor of optics. Cardenas has developed a novel way to connect an optical fiber to a photonic chip that avoids the high costs, delays, and unreliability of current methods. This could revolutionize the manufacturing of photonic devices for data communications, telecommunications, and lidar in self-driving cars, and enable high volume commercial manufacturing of such devices.

How? Cardenas’s lab first connects the optical fiber to an optical taper at the edge of the chip. The taper, which acts as a mode converter, in turn connects with a nanotaper waveguide inside the chip. A laser is used to fuse the fiber and taper firmly in place with an adhesive.

Not only can this be done quickly and at less expense, but “we have also found that this leads to very good optical efficiencies,” Cardenas says. “And very recently, we have demonstrated state-of-the-art efficiency.”

Corning and the Tyndall National Institute in Ireland—a leading European research center in integrated information and communications technology—have expressed interest in this innovation. But they want to connect multiple fibers to a chip, not just one, Cardenas says.

“And so, we figured this was a perfect match for the Technology Development Fund,” he says.

The $100,000 award from UR Ventures—the University’s tech transfer office—will pay for equipment and microfabrication costs to adapt Cardenas’s fusion process so it can connect an array of fibers to a chip. The funding will also help support Junyiali Nauriyal, the PhD student who is working with Cardenas on the project.

“For a one-year award, this is a very good amount of money to work with,” says Cardenas, who joined the Institute of Optics faculty in July 2016. “UR Ventures has been very helpful. They’ve been interested in the project since day one. I had barely joined the University, and right away we submitted a provisional patent.”

Learn more about the Technology Development Fund at www.rochester.edu/tdf/.

---

CeFO members

- Air Force Research Laboratory
- Aperture Optical Sciences
- Ball Aerospace and Technologies
- Collins Aerospace
- Corning
- Facebook Reality Labs
- Google
- Jabil Optics Germany GmbH
- LightPath
- Nikon
- OptiPro
- Opto-Alignment Technology
- PerkinElmer
- PocoGraphite
- PolymerPlus
- Synopsys
- Thales
- Zeiss

---

Photos courtesy of University of Rochester (J. Adam Fenster) and University of North Carolina at Charlotte.
Robert L. Wells ’39, a mechanical engineering alumnus who became a top executive at Westinghouse, felt strongly that students need the balance of the humanities to become competent engineers. The Hajim School is proud each year to present the Wells Award to seniors in engineering and computer science who are also pursuing a major or minor in one of the humanities. Winners are chosen based on highest GPAs at the end of their junior year. There are three recipients this year.

Oliver Xu ’20 is majoring in both applied music (percussion) and computer science through the dual degree program at Eastman. The two fields “complement each other in some interesting ways,” Xu says. “The creativity and open-mindedness that I have cultivated through music has been very helpful in my experience solving problems in coursework and in the professional world as a software engineering intern. The logical thinking and detail-oriented attitude that is essential for success in computer science has also been invaluable in my experience as a musician.”

Andrew Howard ’19 is an optics major who is also completing a minor in Italian, which he has studied since high school and “just seemed to scratch an itch in a completely different part of the brain.” Howard’s “pipe-dream” when he came to Rochester was to do research at the Laboratory for Laser Energetics. He has been immersed in projects there since his second semester. He is interested in pursuing a PhD in physics or optics. “I’m convinced that grad school was always my ultimate destination; I’m always trying to get at the more conceptual ‘why’ questions when I arrive upon an answer doing various homework sets.”

Yiting Zhang ’19 is majoring in audio and music engineering (AME), while also pursuing minors in math and music. Zhang says the AME major, offered through the Department of Electrical and Computer Engineering, was a “perfect fit” for her because of her interests in both music—she’s played piano since age 7 and enjoys singing—and applied science. She plans to continue studying electrical and computer engineering, with an emphasis on audio, in graduate school. “I want to do more research about the interdisciplinary area between audio/music, signal processing, and machine learning,” Zhang says.
Robert Boyd, professor of optics, was elected a member of Germany’s Heidelberg Academy of Sciences and Humanities. He was also named a fellow of the American Association for the Advancement of Science.

Thomas Brown, professor of optics, was named a fellow of SPIE, the international society for optics and photonics.

Mujdat Cetin, associate professor of electrical and computer engineering, was named a fellow of the Institute of Electrical and Electronics Engineers.

Sandhya Dwarkadas, the Albert Arendt Hopeman Professor and chair of computer science, was named a fellow of the Association for Computing Machinery.

Wendi Heinzelman, dean of the Hajim School and professor of electrical and computer engineering, was named a fellow of the Association for Computing Machinery.

Ehsan Hoque, assistant professor of computer science, Asaro Biggar Family Fellow in Data Science, and interim director of the Goergen Institute for Data Science, received an Early Career Award for Scientists and Engineers from the Army Research Office.

Qiang Lin, associate professor of electrical and computer engineering, was elected a fellow of the Optical Society.

Jiebo Luo, professor of computer science, was named a fellow of the Association for Computing Machinery, and of the Association for the Advancement of Artificial Intelligence. He also received the Region 1 Technological Innovation (Academic) Award from the Institute of Electrical and Electronics Engineers.

Sean Regan, senior scientist at the Laboratory for Laser Energetics, received the Fusion Power Associates 2018 Leadership Award.

Michael Scott, the Arthur Gould Yates Professor of Engineering and professor of computer science, received the Hajim School Lifetime Achievement Award.

Ching Tang, emeritus professor of chemical engineering, received the 2018 C&C Prize from the NEC Corporation’s nonprofit C&C Foundation.

Michael Pomerantz, a technical associate with the Department of Mechanical Engineering and the Institute of Optics, received the Rochester Regional Photonics Cluster Education Award.

Jim Zavislan, associate dean of the Hajim School and associate professor of optics, was named a fellow of the National Academy of Inventors.

Mingsheng Wei, manager of the National Laser Users Facility at the Laboratory for Laser Energetics, was elected a fellow of the American Physical Society.

There are many ways to support the Hajim School, including:

• making a gift of any size to the Hajim School Annual Fund
• joining the George Eastman Circle by making Annual Fund gifts of $1,500 or more per year for five years
• including the Hajim School of Engineering & Applied Sciences in your estate planning

Learn More about Giving
Derek Swanson, Associate Director for Advancement, Hajim School
(585) 273-1341
derek.swanson@rochester.edu
Bloch Alumni and Advancement Center
300 East River Road
Box 278701
Rochester, NY 14627
Aaron Swerdlow-Freed ’15 says the insights he received as a student from a Real Reader were critical to his subsequent career. Lisa Bobich ’04 wishes she could have benefited from a similar experience.

Both are now Real Readers themselves.

They are among 105 professional engineering alumni who volunteered their time last semester to give Hajim School students “real-world” feedback on the résumés, cover letters, LinkedIn profiles, and other items they prepare for their portfolios as part of WRT 273: Communicating Your Professional Identity.

The 2-credit course is required of all engineering undergraduates in ABET-accredited departments—and highly recommended for computer science. Feedback from Real Readers is factored in as 10 percent of the grade students receive.

“There’s no better way to help students see how effectively they are presenting their professional identities than to have a Real Reader evaluate their work and give feedback,” says Laura Jones, lead instructor for the courses, which are offered through the Writing, Speaking, and Argument Program.

Former Hajim School dean Rob Clark, the University’s current provost, provided the impetus that led to the launch of WRT 273 classes for engineering students in 2013. He had heard repeated comments from CEOs—many of them University alumni—that college graduates across the board, accustomed to communicating by text and other digital formats, often struggle to present themselves professionally when applying for internships and jobs.

The WRT 273 requirement, he reasoned, would give Hajim students an advantage, especially if it included feedback from Real Readers.

Swerdlow-Freed, now an enterprise account executive at Macedon Technologies in Herndon, Virginia, says his Real Reader—a solutions engineer—made a “very positive impression” on him. Swerdlow-Freed had become interested in not only the technical skills involved in computer science, but in learning how to communicate his work to a general audience. His Real Reader, he discovered, was doing exactly that in his job—working directly with prospective clients to help them understand the software they were buying, and how it worked.

“So that was something I looked into very deeply because it really appealed to me,” Swerdlow-Freed says. And when his current position opened up, requiring both technical knowledge and an ability to communicate with clients, “I was able to make a pretty strong business case to let me take it over rather than hiring someone new.”

He’s been a Real Reader for three semesters. “I make it a policy to push on the students lightly,” he says, “I’m never going to tell them, ‘hey, you should come to me and ask if I will be a reference,’ or ‘you should come to me and ask about your résumé.’ But I’m always looking for the students who are willing to reach out and get everything that they can out of this program. And when they do that, I’m really able to help them.”

Bobich went on to earn master’s and PhD degrees in bioengineering at Arizona State University after completing her BS in biomedical engineering at Rochester. She’s now a principal product engineer and sourcing engineering process coordinator for Medtronic in Tempe, Arizona.

Talking with WRT273 students, Bobich says, helps her “keep track of what’s going on at the University, and if all the students enjoy the University as much as I did.”

She rarely limits the initial informational interview to the recommended 30 minutes.

“This is about more than just résumés and cover letters,” she says. “A lot of the students ask me should they apply to grad school or apply for a job? What’s the benefit of getting a higher degree? Should I try to work while I’m at school or just focus on my coursework? What kind of internship should I get? Does it matter if it’s an internship or a research position? These are important discussions to have.”

In addition to Hajim School alumni, parents of University students and friends of the University have also served as Real Readers. At least two years of work experience is preferred.

For more information, contact
michelle.marks-hook@rochester.edu
Last summer, mechanical engineering students were able to survey the entire exterior of a historic coastal fort in Ghana thanks to a top-of-the-line Total Station transit.

Optics students in Professor Andrew Berger’s classes now learn about the polarization of light, not just from lectures but by actually manipulating polarization with a hands-on exploration kit.

These are just two examples of how the Wadsworth C. Sykes Engineering Award has benefited Hajim students.

Sykes, a 1920 mechanical engineering alumnus, was an engineer for RG&E before he founded a pipeline construction company. He also served as a Brighton town councilman. Sykes remained actively engaged with his alma mater. He died in 1995.

Each year, the fund created in his honor provides modest but greatly appreciated funding that enables faculty members to improve their classes, labs, and other learning experiences for students in significant ways.

“The Sykes funding has been extremely, extremely helpful,” says Renato Perucchio, a professor of mechanical engineering and program director of the Archaeology, Technology, and Historic Structures Program.

He has received several Sykes awards, including the one that helped pay for the Total Station transit.

The transit was a “big plus” for the Ghana field school, Perucchio says, because it can record both angle and distance measurements, which can then be downloaded to software that creates 3-D models. As a result, “the surveying proceeded much faster” than it did the previous year.

This enabled students to not only survey the exterior of Elmina Castle but take measurements at Fort Amsterdam as well, then use the data to do structural analyses. Why, for example, have so many of the vaults at Fort Amsterdam collapsed?

“That’s real engineering. It goes beyond exercises in the textbook,” Perucchio says.

For Berger, the Sykes award was the difference between having one polarization kit to demonstrate in front of a class or having 30 kits so students could use them individually or in small teams to learn firsthand how to manipulate the polarization of light.

The award paid for polarizing filter sheets, light-emitting diodes and other materials, and for Katherine Donnelly, an undergraduate, to spend a summer helping Berger design the kit, then assembling 30 of them.

“I was totally thrilled being able to use these things in class,” Berger says. “I would never have been able to build all these myself.”

Sykes memorial award creates learning opportunities
Each fall, seniors in mechanical engineering take ME 204 to prepare for the culminating design project they do the following spring. In ME 204, they do four projects, learning how to use tools in the machine shop to actually fabricate the parts they've designed in CAD, learning to define a problem and then come up with a device to address it, learning the importance of teamwork, and, finally, walking the plank, as seen here, to see which team's balsa wood structure can withstand the greatest pressure before shattering into pieces. Shira Katz '19, who took a year off from school last year to do internships at Battelle and Honda, says "It was cool to see how much of what we did in this class was important and applicable to the future work we'd be doing."