2015 WAS ANOTHER EXCEPTIONAL YEAR FOR THE HAJIM SCHOOL

The designation of Rochester as headquarters for the AIM Photonics initiative is a historic opportunity to bolster our nation’s manufacturing of integrated photonics. It will help transform the solid core of optics, photonics, and imaging companies in this region and will open up new avenues of research and innovation for our faculty and students.

Our Center for Emerging and Innovative Sciences, which laid the groundwork for AIM Photonics, was redesignated for 10 years as part of the Empire State Development Centers for Advanced Technology Program. This ensures that CEIS will continue to fund research collaborations in optics, photonics, and imaging in our region.

Our research awards showed a refreshing uptick, despite ongoing stagnation of federal funding. So far this fiscal year, we have been awarded $9.5 million compared to $5.3 million at the same point last year.

Our number of incoming freshmen stabilized, giving us an overall undergraduate enrollment of about 1,750, up from 747 in fall 2008.

Combined with a master’s enrollment of 310 and a PhD enrollment of 350, this gives us the critical mass we need to gain the attention of top recruiters. This has also enabled us to reduce our subvention revenue—the amount we draw from the University’s endowment to meet expenses—from 42 percent of our budget when I arrived to 7 percent now.

Our audio and music engineering major, certified in 2013, now numbers 76 students. Our new data science master’s program, approved earlier this year, enrolled 27 students. This fall we also enrolled 71 students in six sections of WRT273, our Communicating Your Professional Identity class. Starting with this year’s incoming freshmen, this is a required course.
We awarded our first eight Hajim School International Experience Scholarships to help cover travel and other costs for students studying abroad. Kenneth Imade ’16 of electrical and computer engineering, at right, used his award to study abroad in Hong Kong this past summer. We would like at least 25 percent of our students to participate in an overseas learning experience before they graduate.

We surpassed the $75 million goal we set as the Hajim School’s contribution to the University’s Meliora Challenge fundraising campaign.

We welcomed members of the Engineering Accreditation Commission of ABET www.abet.org/ to our campus in October as part of their accreditation review of our biomedical, chemical, electrical and computer, mechanical, and optical engineering BS degree programs. We greatly appreciated their thorough review and their feedback on those programs’ strengths and areas of improvement. We look forward to their final report next July.

We even gained a brand-new look online. Thanks to the AS&E Web Help team, our Hajim School and department websites look and feel fresh and are more interactive.

We have a lot to be proud of at the Hajim School. As I prepare to move on to new responsibilities as the University’s provost starting July 1, I am grateful to all of you for helping us accomplish so much. We have worked together for seven years building a community. As I mentioned when my appointment as provost was announced, every success has been a team success. Without each of you, I would never have had the opportunities afforded to me.

When I hand over the reigns, I will do so proudly, knowing that your next dean will inherit a winning combination: a vibrant, innovative educational program; a research portfolio at the cutting edge; and an incredibly talented team of faculty members, staff members, and students. This is a school with great momentum!
**Maintaining an upward trajectory**

In order to maintain that momentum, I have no intention of slipping into “cruise control” between now and the arrival of the next dean. At a retreat this summer, our department chairs and central office staff identified some key priorities that we must address in order to keep the Hajim School on an upward trajectory.

**Quality instruction**

We want to ensure that instruction does not suffer as result of our increased enrollments, particularly at the undergraduate level. I know we’ve had some growing pains. I know this has not been easy for our faculty members, undergraduate coordinators, lab technicians, and department administrators. Here are some of the ways we’re working to alleviate this.

This year we welcomed two new tenure-track faculty members: **Niaz Abdolrahim**, assistant professor of mechanical engineering, uses computational techniques to predict the performance of nanoscale metallic materials (NMMs), and **Catherine Kuo**, associate professor of biomedical engineering, generates new tissues from implanted stem cells and develops and implements living tissue models as independent platforms to study tissue development, homeostasis, disease, and healing.

We will fill six tenure-track positions for next school year.

We also have hired additional faculty of practice, whose main job is teaching rather than research. Their numbers have quadrupled, from three to 12 in the last five years.

Renovated labs in the Departments of Chemical Engineering and Mechanical Engineering and a new lecture room in Gavett Hall have provided additional flexibility. Eventually all of Gavett will be available for undergraduate classrooms and labs when Wegmans Hall is completed and our new Science and Engineering Quad becomes a reality.

In the meantime, we can be more creative in using the workshop model for our large lecture classes. This involves breaking into smaller study groups where students can continue to receive the individual attention that has been a hallmark of our school. We can make use of talented juniors and seniors to serve as TAs and mentors. And we can group two or three students, instead of one, in mentored research opportunities with our faculty.

We will continue to work with the Admissions Office to ensure that our enrollments remain steady.

**Consistent advising**

Our students, especially incoming freshmen, have a wide range of advising needs. Some need in-depth counseling from faculty members or from our undergraduate coordinators; peer advising suffices for other students. To make best use of our resources, we need to be smart in steering incoming students accordingly.
However, one thing is paramount: Whoever does the advising, the information our students receive needs to be consistent. We need to survey the best practices of our faculty who excel at advising. We can then develop a consistent protocol for training new faculty and for refreshing the advising skills of senior faculty as well.

Retention of underrepresented and first-generation students
We’ve made some very positive strides in retaining underrepresented and first-generation students from their freshman to sophomore years through the STEM-Gems program. Now we need to be sure that our departments are prepared to maintain this momentum as these students move on to become juniors and seniors.

Internships for master’s students
As we increase our master’s enrollment, we need to recognize that master’s students come here with a unique set of aspirations and needs. Many are pursuing a master’s degree because they are planning to enter the workforce and want additional education for enhanced career opportunities. We can help them achieve that by expanding their opportunities to intern with potential employers while they are still students. We can help our foreign master’s students who aspire to enter the workforce here by ensuring they are proficient in English language skills.

The Hajim School will have a valuable ally in this effort in Joe Testani, the new director of the Gwen Greene Career and Internship Center. Joe places a high priority on internships not only for graduate but also for undergraduate students. He is also bringing a new metric-based approach to evaluating where our graduates go post graduation.

Closer ties to the Laboratory for Laser Energetics
Much of our research funding flows through LLE; many of our faculty members are LLE scientists with labs and graduate students there. We need to foster an even closer relationship, especially as LLE reevaluates its mission for the next decade and beyond. There are ample opportunities for our faculty members and students to become
involved in projects that would directly benefit LLE’s operations, even as LLE provides our faculty with funded research opportunities and our students with unique learning experiences. We need to do more to encourage shared seminars and other venues for exchanging ideas.

Honing our grant writing skills

Hajim School research expenditures have been relatively flat in recent years—tracking the national trend—and we continue to be heavily reliant on funding through LLE.

On a positive note, despite the trend in expenditures in recent years, our awards this year have increased. For example: James Allen, our John H. Dessauer Professor of Computer Science, is leading an ambitious project to enable computers to communicate more like humans, using collaborative problem solving as a model. The project, in collaboration with the Florida Institute for Human and Machine Cognition, is funded with a $7.5 million grant from DARPA, the Defense Advanced Research Projects Agency, with $2.5 million coming to the University of Rochester. Ehsan Hoque, assistant professor of computer science, will be principal investigator for the Rochester part of the project.

A team of researchers led by David Williams, the William G. Allyn Professor of Medical Optics and director of the Center for Visual Science, is designing an optical system to image how large numbers of retina cells respond to light. The goal of this project, which will receive $3.8 million from the National Eye Institute, is to accelerate the next generation of cures for blindness.

Professor Hani Awad and Associate Professor Danielle Benoit of the Department of Biomedical Engineering were awarded a $2 million grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases to investigate a novel nanoparticle-mediated drug delivery approach to prevent adhesions that form in injured hand tendons, causing loss of hand function. This could have a profound impact since there are presently no pharmacologic or biologic treatments.

Jong-Hoon Nam, assistant professor of mechanical engineering and of biomedical engineering, has received a National Institutes of Health grant of up to $1.8 million to study the biomechanics of the organ of Corti in the inner ear. This could lay the groundwork for better hearing aids or more finely customizable implants.

Mitchell Anthamatten, associate professor of chemical engineering, along with co-principal investigators Alexander Shestopalov, assistant professor of chemical engineering, and John Lambropoulos, chair and professor of mechanical engineering, are collaborating on a $1.5 million grant from the National Science Foundation to develop a scalable nano-manufacturing process for the additive printing of patterned thin films, using shape-memory polymers. This would save energy and costs compared to other nanofabrication processes.

Robert Boyd, professor of optics, has received a $1.2 million grant from the Office of Naval Research to develop a free-space optical link for secure communication over marine environments, encoding simultaneously in
the transverse spatial degree of freedom of the light field and in polarization. This will maximize the amount of information that can be carried by each photon.

John Criswell, Philip Guo, and Ehsan Hoque, all assistant professors of computer science, received awards from a new National Science Foundation precareer grant category for “potentially transformative proposals” from computer science faculty who are in their first academic position after receiving their PhDs.

To ensure that this trend continues, we need to be more aggressive and more savvy about how and where we look for external funding. There are several key components to addressing this issue:

• We need to mentor young faculty as they enter the increasingly competitive fray for tight research funding—and mid-career faculty as well. For example, Laurel Carney, professor of biomedical engineering, meets weekly with junior faculty in that department to discuss research opportunities, share and critique the grant applications those faculty are working on, and address issues of balancing teaching and research responsibilities and managing a lab.
• Our young faculty should routinely visit funding agency program managers—at least twice a year, in person—to better understand federal priorities but also to let the managers know about their research.
• All of our faculty members need to seek new funding sources, be they federal, state, or private.
• And, in doing so, they need to be good ambassadors for the school as a whole. If they learn about a funding opportunity that does not fit their research but would apply to a colleague, they need to communicate that to their colleague.

AIM Photonics was a great example of the kind of large-scale, multisite application that can bring a major infusion of funding for our research efforts. But AIM also illustrates the need to be ahead of the game in identifying large grant opportunities and then find an investigator or investigators willing to carry a proposal through.

Support from alumni and friends

I am grateful to all of the donors who helped us exceed the goal we set for the Hajim School as part of the Meliora Campaign.

We have added five endowed professorships.

Our Young Leadership Council is a new initiative aimed at involving more of our recent alumni in giving and service. This is off to a good start with 13 members.

Our alumni serve us in many ways, not least in their achievements.
Edmund Hajim ’58 (chemical engineering), whose $30 million gift was instrumental to the progress we’ve made in recent years, received the Horatio Alger Award, bestowed annually by the Horatio Alger Association of Distinguished Americans to honor renowned leaders who have succeeded despite adversity and are committed to both philanthropy and higher education. Ed, who steps down as chair of our University Board of Trustees in the spring of 2016, will continue to serve as a member of that board.

Stephen D. Fantone ’79 (PhD optics), resident of Optikos Corp. and a member of our Hajim School Dean’s Advisory Committee, received our University’s Rochester Distinguished Scholar Award.

Richard Rashid ’77 (MA), ’80 (PhD), a computer science alumnus who is chief technology officer of Microsoft’s Applications and Services Division, received an honorary doctor of science degree from the University.

Stuart Elby ’82 (optics), senior vice president at Infinera, is this year’s recipient of the Hajim School Distinguished Alumnus Award.

Faculty, student, and staff awards

The strength of our faculty is reflected not only in successful grant applications, such as those mentioned above, but also in the recognition our faculty members receive from their peers. This year:

Govind Agrawal, the James C. Wyant Professor of Optics, received the Esther Hoffman Beller Medal from the Optical Society of America (OSA).

Hani Awad, professor of biomedical engineering and of orthopaedics, was inducted as a fellow of the American Institute for Medical and Biological Engineering.

Danielle Benoit, associate professor of biomedical engineering, was recognized as one of 11 CMBE Young Innovators for 2015 by the Cellular and Molecular Bioengineering journal. She also received an NSF Faculty Early Career Development (CAREER) award.

Mark Bocko, distinguished professor and chair of electrical and computer engineering, received the Hajim School Lifetime Achievement Award.

Laurel Carney, professor of biomedical engineering, was awarded the William and Christine Hartmann Prize in Auditory Neuroscience by the Acoustical Society of America.

Christophe Dorrer, senior scientist at the Laboratory for Laser Energetics, was elected a fellow of the Optical Society of America (OSA).

Greg Gdowski, associate professor of biomedical engineering and executive director of the Center for Medical Technology and Innovation, was presented a Region 1 Technical Excellence Award from IEEE.

Henry Kautz, professor of computer science, was installed as the Robin and Tim Wentworth Director of the Goergen Institute for Data Science.

James Li, professor emeritus of mechanical engineering and of materials science, received the Gold Medal from ASM International.
James McGrath, professor of biomedical engineering, was inducted as a fellow of the American Institute for Medical and Biological Engineering.

Duncan Moore, the Rudolf and Hilda Kingslake Professor in Optical Engineering Science, received the Leadership Award from the Rochester Regional Photonics Cluster.

Chris Muir, associate professor of mechanical engineering, was named Engineering Professor of the Year by the Student Association.

Sean Regan, a senior scientist at the Laboratory for Laser Energetics, was selected as a fellow in the American Physical Society.

Roman Sobolewski, professor of electrical and computer engineering, was recognized as a distinguished fellow of the Kosciuszko Foundation Collegium of Eminent Scientists.

Nick Vamivakas, assistant professor of quantum optics and quantum physics, received the G. Graydon Curtis ’58 and Jane W. Curtis Award for Nontenured Faculty Teaching Excellence.

David Williams, the William G. Allyn Professor of Medical Optics, director of the Center for Visual Science, and dean for research in Arts, Sciences & Engineering, received the Beckman-Argyros Award in Vision Research. He also received the William Procter Prize for Scientific Achievement from the Sigma Xi scientific research society.

We congratulate these students for outstanding achievements:

Alexander Anderson ’16 of optics received a scholarship from the Rochester Engineering Society and was among 15 summer interns at NASA's Goddard Space Flight Center who were awarded John Mather Nobel Scholarships by the National Space Grant Foundation Inc. He also received a Raytheon/FIRST Robotics Scholarship and the Michael Pate Optical Sciences Memorial Scholarship and was named a Tau Beta Scholar.

Matthew Archibald ’16 of electrical and computer engineering received a scholarship from the Rochester Engineering Society.

Racquel Awuor ’15 of electrical and computer engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Lauren Bailey’s legacy as an outstanding varsity swimmer and excellent student was further cemented when the chemical engineering senior was honored by the Athletic Department as cowinner of the 2015 Merle Spurrier Award. She also was elected as a First Team Academic All-American on the Capital One Academic All-America Division III At-Large Team and was chosen a Scholar All-American by the College Swim Coaches Association of America.

Lisa Benison, a graduate student in the Center for Medical Technology and Innovation Program, received an Engineering World Health Summer Institute Scholarship.

Changchen Chen ’15 of optical engineering and physics was cowinner of the Charles L. Newton Prize, which recognizes engineering students who show a special proficiency in an engineering subject and have conducted research, given a presentation, or published a paper.

Nicholas Cirucci ’15 of optical engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

James Corsetti, a PhD student in optics, received the Optical Design and Engineering Scholarship from SPIE.
Boubacar Diallo ’16 of mechanical engineering, who competes in the triple jump in track and field, was among the recipients of this year’s Garnish Scholar-Athlete Awards, presented by the Athletic Department to students who lead teams on the field of play while also doing outstanding work in the classroom.

Jennifer Ford ’16 of chemical engineering, an outside hitter for the women’s volleyball team, was also among the recipients of this year’s Garnish Scholar-Athlete Awards.

Kyle Fuerschbach, a PhD candidate at the Institute of Optics, received the University’s 2014–15 Outstanding Dissertation Award in Engineering and Applied Sciences.

Gary Ge ’16 of electrical and computer engineering received a scholarship from the Rochester Engineering Society.

David Heid, a master’s student in audio and music engineering, was the winner of the 2015 New Venture Challenge held by the Center for Music Innovation and Engagement at the Eastman School’s Institute for Music Leadership.

Tess Jacobs ’15 of optical engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Catherine Knox ’16 of mechanical engineering, a member of the women’s cross country team, was named to the Capital One Academic All-District Three First Team and also was a recipient this year’s Garnish Scholar-Athlete Awards, presented by the University’s Athletic Department to students who lead teams on the field of play while also doing outstanding work in the classroom.

Tianyi (Linda) Liu ’16 of mechanical engineering won a scholarship from the Rochester Engineering Society.

Marlen Mahendraratnam ’16 of biomedical engineering received the Joseph W. Campbell Memorial Scholarship from the Rochester Engineering Society and, with Allison Stiller, received the President’s Choice award at the Undergraduate Research Exposition.

Garrett Meier ’15 of chemical engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Matt Mender ’16 of biomedical engineering, a defensive tackle for the football team, was a recipient of this year’s Garnish Scholar-Athlete Awards, presented by the University’s Athletic Department to students who lead teams on the field of play while also doing outstanding work in the classroom.

Julia Morris ’15 of chemical engineering was cowinner of the Tau Beta Pi Prize for Tau Beta Pi seniors who, through academic achievement, proven leadership, and sterling character, have excelled and inspired fellow students.

Mark Mullock ’15 of computer science was cowinner of the Robert L. Wells Prize, presented to senior engineering students for demonstrated competence in both engineering and the humanities, based on the highest-ranking seniors in the Hajim School as of the fall of their senior year.

Koji Muto ’15 of mechanical engineering was cowinner of the Tau Beta Pi Prize for Tau Beta Pi seniors who, through academic achievement, proven leadership, and sterling character, have excelled and inspired fellow students.
Danielle Neu ’17 of chemical engineering, a member of the women’s swimming team, was selected as a First Team Scholar All-American.

Daniel Nikolov, a PhD student in optics, received a Donald M. and Janet C. Barnard Fellowship from Arts, Sciences & Engineering in recognition of his research record and his exceptional commitment to mentoring, outreach, and service.

Ethan Pacheco ’15 of chemical engineering, a member of the men’s cross country team, was elected to the Capital One Academic All-America Division III Team and received the Athletic Department’s Peter DiPasquale Award as the top male scholar-athlete of the senior class.

Samuel Perakis ’16 of biomedical engineering was corecipient of the Richard Eisenberg Engineering Award, which recognizes hard-working undergraduates with an interest in metallurgy.

Jacob Reimers, a PhD student in optics, placed first in the 2015 Robert S. Hilbert Memorial Optical Design Competition run by Synopsys, for his Compact Offner-Chrisp Imaging Spectrometer using Freeform Surfaces.

Stephanie Rigot ’15 of biomedical engineering was corecipient of the Richard Eisenberg Engineering Award, which recognizes hard-working undergraduates with an interest in metallurgy.

Namita Sarraf ’15 of biomedical engineering received a predoctoral fellowship from the Whitaker International Program to do research at University Hospital Basel in Switzerland.

Eric Schiesser, a PhD student in optics, was awarded the 2015 Michael Kidger Memorial Scholarship from SPIE.

Michael Silverstein ’15 of biomedical engineering received a predoctoral fellowship from the Whitaker International Program to work with researchers at Switzerland’s École Polytechnique Fédérale de Lausanne.

Stephen Sloan ’15 of biomedical engineering was cowinner of the Charles L. Newton Prize, which recognizes engineering students who show a special proficiency in an engineering subject and have conducted research, given a presentation, or published a paper.

Allison Stiller ’16 biomedical engineering, received, with Marlen Mahendraratnam, the President’s Choice award at the Undergraduate Research Exposition.

Ryan Trombetta, a PhD student in biomedical engineering, was the winner of the University’s first Falling Walls competition, earning him an expenses-paid trip to the Falling Walls Conference in Berlin this fall.

Pedro Vallejo-Ramirez ’16 of optical engineering received the G. Harold Hook Prize for a student who has demonstrated outstanding interest in engineering. He also was selected as a 2015 Laureate of the Tau Beta Pi Association, was elected to the Keidaeans honor society, and was named a Tau Beta Pi Scholar.

Sarah Walters, a PhD student in optics, received a Grant-in-Aid of Research from Sigma Xi, the Scientific Research Society.

Jeremy Warner ’15 of electrical and computer engineering and computer science was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Jungeun (Jenny) Won ’16 of biomedical engineering received the 2015 Walt and Bobbi Makous Prize for Undergraduate Vision Research from the Center for Visual Science.
Xing Yan ’15 of computer science was cowinner of the Robert L. Wells Prize, presented to senior engineering students for demonstrated competence in both engineering and the humanities, based on the highest-ranking seniors in the Hajim School as of the fall of their senior year.

Ling Yang ’15 of biomedical engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Andrew Zeccola ’15 of biomedical engineering was cowinner of the Donald M. Barnard Prize, awarded to junior or senior engineering students on the basis of personal qualification and achievement.

Stacie Zwolski ’15 of biomedical engineering was cowinner of the Robert L. Wells Prize, presented to senior engineering students for demonstrated competence in both engineering and the humanities, based on the highest-ranking seniors in the Hajim School as of the fall of their senior year.

Several of our student teams performed well in various design and business plan competitions this year.

Nullspace developed wearable technology that allows the user to feel the surface and impacts of a virtual environment. Team members included Morgan Sinko ’16 of computer science, Lucian Copeland ’15 of electrical and computer engineering, Jordan Brooks ’15 of mechanical engineering, Kian Jones ’17 of computer science, Alexander Matthers ’15 of biomedical engineering, Casey Waldren ’17 of computer science, Christian Freitas ’16 of biomedical engineering, and Minsoo Lee ’16 of electrical and computer engineering.

Nullspace

• made it to the U.S. finals of the Microsoft Imagine Cup competition and the finals for the Cornell Cup;
• won the Student Achievement Award at Digital Rochester’s fifth annual Greater Rochester Excellence and Achievements in Technology (GREAT) Awards ceremony;
• placed first in the Charles and Janet Forbes Competition, a technical business idea contest for undergrads; and
• took second place and a $2,500 cash prize in the Mark Ain Business Model competition.

The Hajim School was well represented at the New York Business Plan Competition in Albany.

• A Wireless Moisture Alarm Technology developed by Stephen McAljeavey, associate professor of biomedical engineering, and Daniel Mruzek, associate professor of pediatrics, was used by a team from SUNY Geneseo that won first place and $10,000.
• Team Cataract Innovations—including Eryn Fennig, a PhD student in optics, and Sarah Walters ’15 (MS in technical entrepreneurship and management) and a PhD student in optics—won third place and $1,500 in the Social Entrepreneurship/Non-Profit category.

• Team Cλ—Anthony Yee ’15 (MS in TEAM) and a PhD student in optics; Xiangzhi Yu, a PhD student in mechanical engineering; Yang Zhao, a PhD student in optics; and Seth Reining ’15 (MS in TEAM)—won the People’s Choice Award and $500 in the Nanotechnology/Advanced Technology category.

No school could achieve what we have the last few years without a dedicated staff. This year we honored Tony Green, our director of finance and administration, with the Hajim School Outstanding Staff Award. Tony is a great young leader who has transformed our budgeting and administrative processes. He played a key role in getting our books in order and introduced effective financial forecasting and operating efficiencies that have benefited both our central office and departmental administrators. A growing school like this needs solid metrics to assess its performance and establish goals, and Tony has played a major part in that effort.

Jennifer Condit, the undergraduate administrative assistant for the Department of Chemical Engineering, received the Dottie Welch Award for her superb work in supporting the undergraduates in her department—even scheduling her vacations for times when students are not on campus.

They are deserving recipients. But as I look back at what we’ve achieved these last seven years, it is clear that another award is in order for the entire school: best ensemble performance.

When President Seligman announced that I would serve as the University’s 10th provost, I replied that it would be an honor and a privilege to do so. I hope all of you realize what an honor and privilege it has been to serve you as dean of the Hajim School of Engineering & Applied Sciences. These have been seven of the most enjoyable years I’ve spent—anywhere.

It will be my privilege to continue to serve you as dean for the next six months, working hand in hand with you to make the Hajim School ever better.

Meliora!

Rob Clark