BIOLOGY

Summer Sequences

FLASH LIGHTS: A group from the biology department traveled to the Allegheny National Forest in northwest Pennsylvania this summer to view and collect fireflies as part of a project to study the insect's genomics. The group observed several species, including Father Mac's firefly (*Photinus macdermotti*), the Big Dipper firefly (*Photinus pyralis*), and the Chinese Lantern firefly (*Photuris versicolor*-complex)—all shown here in a composite image. Amanda Larracuente, an assistant professor of biology and the Stephen Biggar '92 and Elisabeth Asaro '92 Fellow in Data Science, is working to sequence the genome of the Big Dipper firefly, including studying the genes involved in the chemical reaction that produces the characteristic flashes of light that the insects use to communicate.

COMPOSITE PHOTOGRAPH BY J. ADAM FENSTER

CELESTIAL EVENTS

The Skies Have It

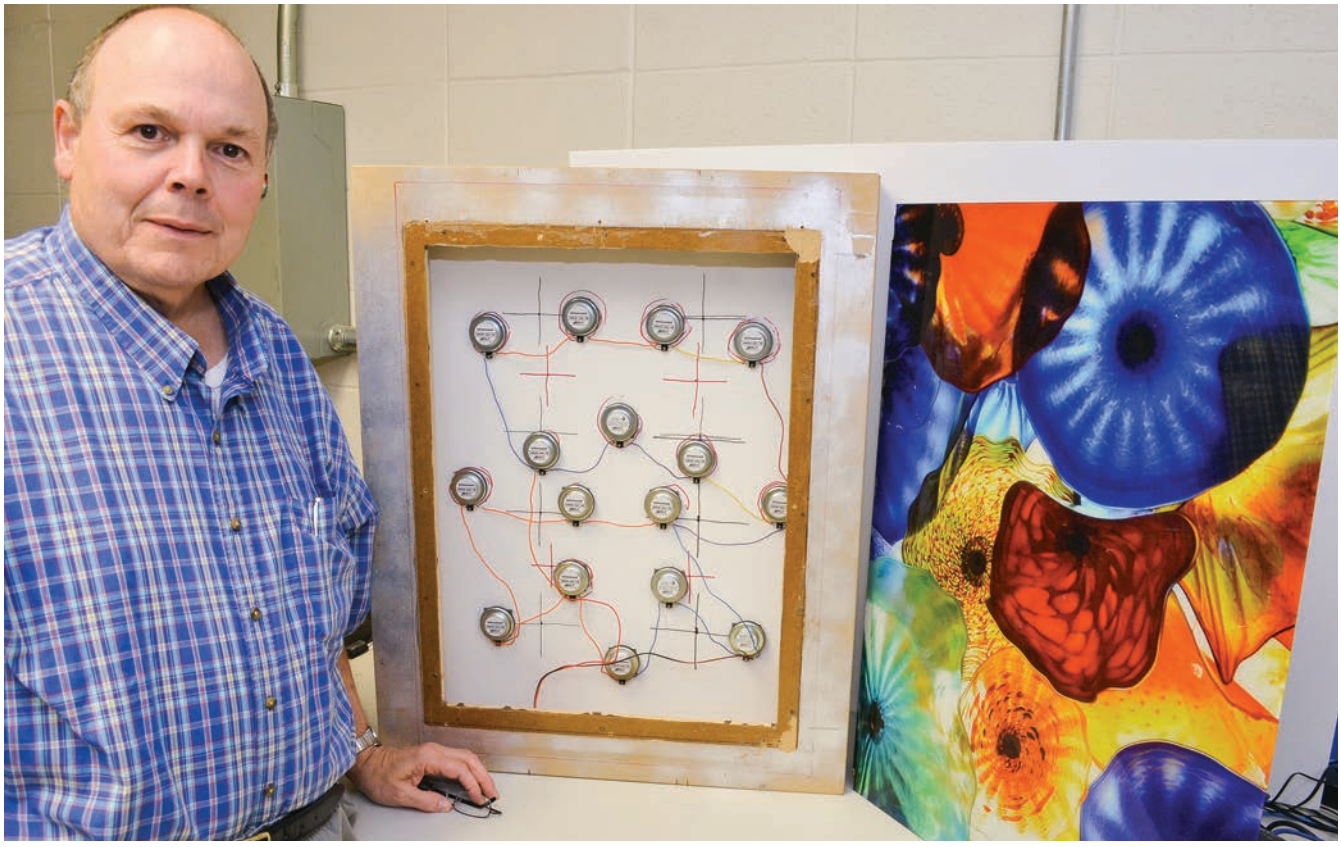
SUN SEEKERS: Warner School graduate student Blake Harriman, Emily Ivey '18, and Nick Potter '17 were among the many students, faculty, and staff on campus who watched the solar eclipse as it made its way across the United States on August 21. While Rochester was not in the "zone of totality" this summer, make reservations for April 8, 2024, when the path of the next total eclipse in the United States aligns with Rochester. **PHOTOGRAPH BY J. ADAM FENSTER**

CLASS PORTRAIT

Start of the Semester Selfie

CLASS CAMARADERIE: The members of the Class of 2021 gathered on the Wilson Quadrangle to kick off Wilson Day, the annual day of community service that helps mark the start of the semester for first-year students. Before heading out into the Rochester community to take part in projects, the roughly 1,400 members of the class lined up to form "UR 21." For more from the start of the new academic year, see pages 42 to 45.

PHOTOGRAPH BY J. ADAM FENSTER



AUDIO ENGINEERING: As an engineer, Mark Bocko has developed ways to improve audio technology for applications like flat-screen displays.

SHOWCASING ROCHESTER

Light, Sound . . . Interactivity. Action!

Drawing on deep expertise in light, music, and optics, a new initiative aims to showcase Rochester's leadership in the growing fields of imaging and audio technologies.

By Bob Marcotte

Rochester has the ingredients to create its own Silicon Valley in emerging imaging and audio technologies.

The pieces are in place to establish Rochester as a leader—and the next step is to make sure the community realizes that and then to let the world know it, too.

That's the vision of the organizers of Light and Sound Interactive. The new conference and expo, which takes place September 12 to 14, will feature three days of presentations, panel discussions, demonstrations, trade show exhibits, and networking opportunities to showcase how Rochester can play a leading role in such growing fields as augmented and virtual reality (AR/VR), and interactive games and media.

"We want to help Rochester move up the value chain," says Mark Bocko, director of the Center for Emerging and Innovative Sciences (CEIS) and one of the conference organizers. "Historically, companies like Kodak had a direct connection to consumers. Everyone knew the Kodak brand, and everyone knew the enterprise. We want to spur the growth of high-value enterprises in our region with direct connections to consumers."

What Rochester offers

- The largest cluster of optics, imaging and photonics companies in the nation.
- Two major universities (University of Rochester and RIT) with world-class expertise and innovative programs in vision science, optics, music, audio engineering, cinema, animation, and many other related fields.
- A rich heritage of innovation and entrepreneurship.

A partnership between the University and the Rochester Institute of Technology, along with area businesses, trade, and civic organizations, and other groups, the conference is designed to highlight the range and depth of the expertise and talent in the Rochester region. The conference also serves as a segue to the KeyBank Rochester Fringe Festival, an arts and cultural showcase that employs many of the technologies featured in Light and Sound Interactive.

Scheduled keynote speakers include Academy Award–winning director Ang Lee and Oscar-winning cinematographer Rob Legato. Jeff Lieberman, a scientist, artist, and host of the Discovery Channel series *Time Warp*, and Ainissa Ramirez, a science evangelist who is widely recognized for her campaigns to attract the next generation of scientists and technologists, are also special guests.

But the real "chemistry" of the event—the interactive part, says conference producer Paul Ballentine of CEIS—will occur at 67 panel discussions and workshops featuring researchers and entrepreneurs from the Rochester area and across the country. They will discuss work in seven key areas: virtual and augmented reality, games and interactive media, cinema, music

BOB MARCOTTE

and audio, imaging, displays and lighting, health care, and optics and photonics.

"The presentations are designed to be accessible to students, technologists, scientists, entrepreneurs, and artists. And they are meant to be thought provoking," says Bocko, who holds the title of Distinguished University Professor and is chair of the Department of Electrical and Computer Engineering.

"We want people to appreciate the vastness of the resources that we have in this community, and to get them excited about the potential this holds to build new businesses and enterprises in this area."

Bocko and Ballentine say the inspiration for LSI came from South by Southwest Interactive in Austin, Texas, an offshoot of the renowned music and film festival. The interactive technology showcase there has helped drive the tech sector in that city.

"You go to Austin and the city is full of confidence, with major companies moving in and people of all descriptions starting companies," Bocko says. "You go to Silicon Valley, and it's the same 'anything is possible' kind of attitude.

"We want Rochester to be just as enthusiastic about its own future."

For example, Rochester is uniquely positioned to take a leading role in AR/VR, and especially in applications such as health care, Bocko says.

- Many of Rochester's 100-plus optics companies already provide components for major VR companies located around the country and the world.
- University scientists are world leaders in vision science, which is key to creating convincing VR experiences.
- The University's Center for Freeform Optics is pioneering ways to design and make compact and efficient lenses and mirrors for applications like AR/VR glasses.
- Researchers at the Medical Center are exploring virtual reality as a way to enhance physical exams, for example, and to treat patients with dementia and vestibular disorders that cause vertigo and dizziness.

"When you look at the AR/VR universe," Bocko says, "people have poured a lot of money into games and interactive media, but the field is looking for other high-value applications, and health care is clearly an area of tremendous interest."

Bocko and Ballentine share the goal of helping Rochester build on its many capabilities and world-class industry base to grow high-value enterprises and brands with direct links to consumers.

"That's the key to building lasting regional prosperity." says Bocko.

FILM AND TV STARS: Director Ang Lee (top), who won Oscars for *Life of Pi* and *Brokeback Mountain*, is scheduled to show excerpts from his newest film and to discuss his work. Jeff Lieberman (above), a roboticist who starred in the Discovery Channel's *Time Warp* series, will present a keynote address

KEYNOTES: Science evangelist Ainissa Ramirez (left) and Academy Award–winning cinematographer Rob Legato are among the keynote speakers for the inaugural conference.

ALAMY (LEE, LEGATO); ERIC GALLER/DISCOVERY CHANNEL (LIEBERMAN)

The Art of Preserving Opportunity

Philosopher Randall Curren considers what sustainability really means.

By Kathleen McGarvey

Sustainability is a well-worn term—but a hard one to define.

It's a "messy, murky concept," says philosopher Randall Curren, chair of the philosophy department. But he aims to bring some clarity with his latest book, *Living Well Now and in the Future: Why Sustainability Matters* (MIT Press, 2017).

"What philosophers do is try to understand concepts that we're accustomed to using without really thinking about what they signify," Curren says.

The book in some ways mirrors a project from the 1970s. Acting in response to ethical failures in medical research, the federal government brought together ethicists with different theoretical perspectives. Their charge was to identify basic ethical principles on which they could all agree, which were issued in the 1979 Belmont Report.

"And it turned out to be remarkably easy," says Curren. "If you're actually serious about trying to come up with guidance for the ethical practice of medicine, there are things to which one would easily agree: you should be doing no harm, you should be honest, you should get informed consent, and so on. Not that hard."

> "The problem is the way our social systems are functioning, our interlocked social, economic, and political systems. … We need a radical makeover of those human systems. And that's enormously challenging."

With his coauthor, Ellen Metzger—a professor of geology and director of science education at San Jose State University—Curren tries to bring a similar lucidity to the world of sustainability. The core of sustainability, they argue, is the "long-term preservation of opportunities to live well." It's a matter of intergenerational justice.

Curren is an international authority on educational philosophy and ethics, and his work addresses both education and sustainability. He holds a secondary appointment in the Warner School's educational leadership program and held the first professorship established in the Royal Institute of Philosophy in London. He also recently held a research chair in moral and virtue education in the Jubilee Centre for Character and Virtues at England's University of Birmingham. A premise of this research center is that institutions in a society should support the potential for people to live well.

Curren and Metzger contend that sustainability is best understood as the art of living well together without diminishing the opportunity to live well in the future. In those terms, sustainability isn't solely or even mainly the domain of science. Rather, they write, unsustainable practices are primarily a problem of social coordination.

Curren calls discussions of sustainability that turn on expenses or job losses shortsighted. "If we delay in doing things like keeping the climate stable, then everything will be enormously more expensive in the future," he says. "Because we're being provided an incredible bounty of free services by functional climate systems and functional ecosystems. What would it cost us to replace the work that bees do? Or to replace the work that thriving fisheries do?"

Narratives of postindustrial prosperity tend to dominate the historical perspective people bring to the issue of sustainability. "They're talking about roughly 150 years," says Curren. But history is filled with the collapse of civilizations—and environmental problems, especially deforestation, played a role in a significant number of those breakdowns.

Regional collapses are already beginning, he says, pointing to Syria as one example. "Look at the parts of the world that are producing the largest flows of refugees. They're typically areas with severe drought. People move from inland regions, where they can no longer farm, to coasts to fish—where the ocean is increasingly fished out, and they can't make a living fishing, either."

And technological innovation will take humanity only so far. "We absolutely need the right kind of inventing going on, but inventing will not suffice on its own," he says.

By the start of the 19th century, the whaling industry was near collapse, and it endured until the 1850s only through new energy-intensive technologies, such as steam-powered ships and explosive harpoons. The energy yielded by whaling was greatly diminished by the time petroleum became a usable source of energy, and the ensuing history of energy yield on petroleum has followed a similar pattern.

Energy transitions today will only be more complicated, Curren and Metzger argue, with a global population six times what it was when petroleum displaced whale oil—"and a way of life that is six or seven times more energy intensive," they write.

"And we've never had to cooperate on a global scale, which we must do to stabilize Earth's climate and stay within other critical planetary boundaries," says Curren. "The orders of difficulty are staggering."

Matt Ferkany, an environmental philosopher at Michigan State University, calls the book "clarifying and instructive." It's a wide-ranging work, he says, and "covers certain important matters hardly discussed elsewhere," such as societal collapses through unmanageable complexity. A Chinese translation of *Living Well Now and in the Future* is already underway by Beijing Normal University Press, a rapid pace for such a book to attain a broad reach.

The authors don't try to resolve the nitty-gritty of sustainability issues. Instead, they use the book to define the concept of sustainability and to frame the scope of the problem and the nature of solutions needed, with the illustrative help of three case studies: the Gulf of Mexico oil spill in 2010, the National Water Management System in Australia, and food production patterns in Southeast Asia's Mekong region.

"The problem is the way our social systems are functioning, our interlocked social, economic, and political systems," says Curren. Those systems have been stable—but they won't stay that way as they undercut the functioning of natural systems.

"We need a radical makeover of those human systems," he says. "And that's enormously challenging."

Such a makeover requires the broad, voluntary participation of ordinary people. That's why Curren and Metzger build a case for systematic education in sustainability. "Students have a right to know these things," says Curren. "We need to understand the world in which we're trying to live, to be able to live well in it."

Teaching courses in environmental justice, he has found that for some of his students—who have been known to email him fretfully in the wee hours—he needs to point them toward practical ways to respond to the disturbing information they learn. "You need to provide people with ways to feel like they're constructively engaging the problems, to feel somewhat in control, and competent within their own lives to do something constructive," he says.

Curren's book carries a similar pragmatic value, albeit on a larger and more abstract scale. Like the members of the Belmont Commission, he and Metzger try to lead readers to imagine a fair social contract, grounded in common morality, addressing sustainability.

"Doing one's part to preserve opportunity is a basic moral duty that no one has any good grounds for disputing," he says. R

SERGEY NIVENS/ADOBE STOCK

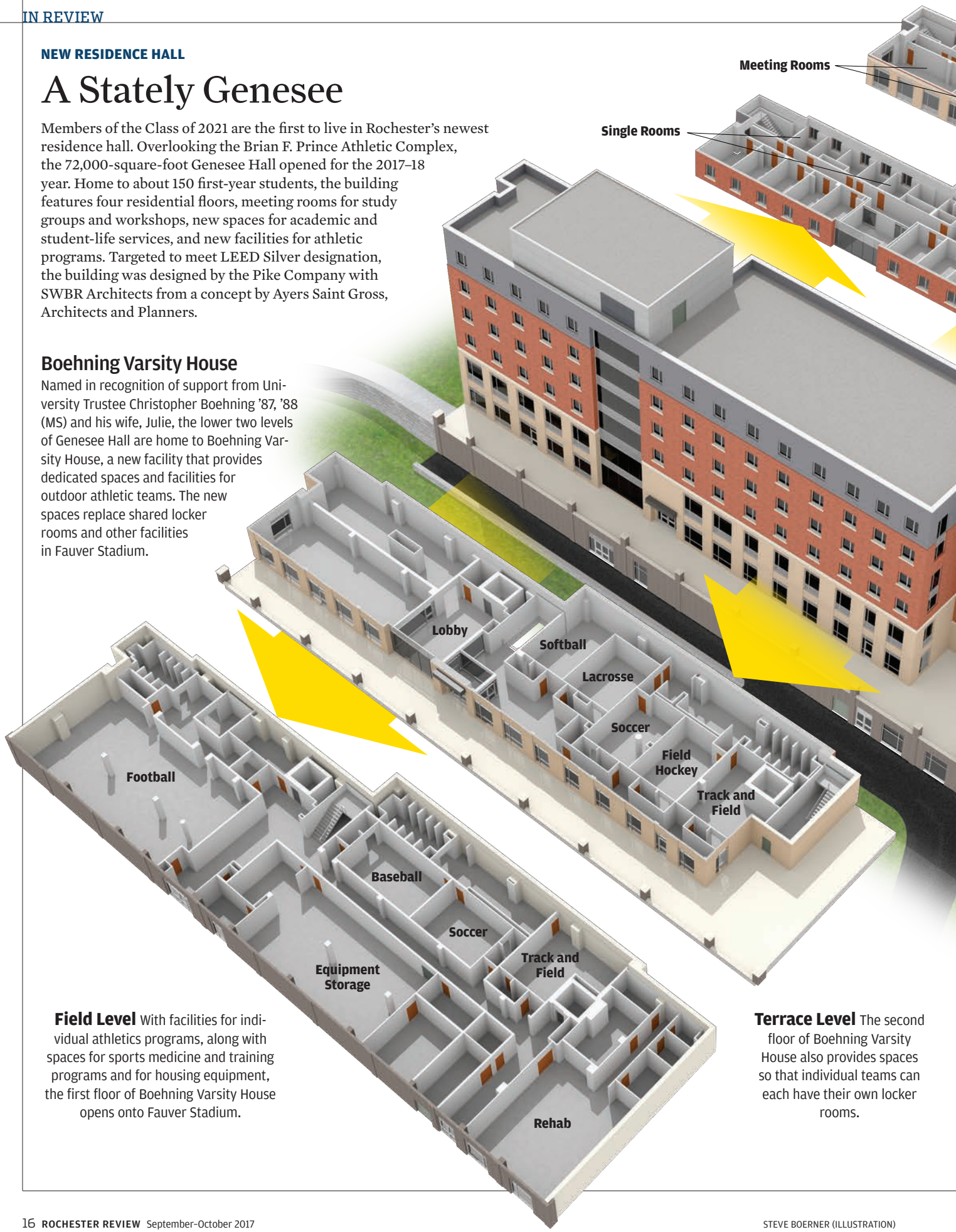
NEW RESIDENCE HALL

A Stately Genesee

Members of the Class of 2021 are the first to live in Rochester's newest residence hall. Overlooking the Brian F. Prince Athletic Complex, the 72,000-square-foot Genesee Hall opened for the 2017–18 year. Home to about 150 first-year students, the building features four residential floors, meeting rooms for study groups and workshops, new spaces for academic and student-life services, and new facilities for athletic programs. Targeted to meet LEED Silver designation, the building was designed by the Pike Company with SWBR Architects from a concept by Ayers Saint Gross, Architects and Planners.

Boehning Varsity House

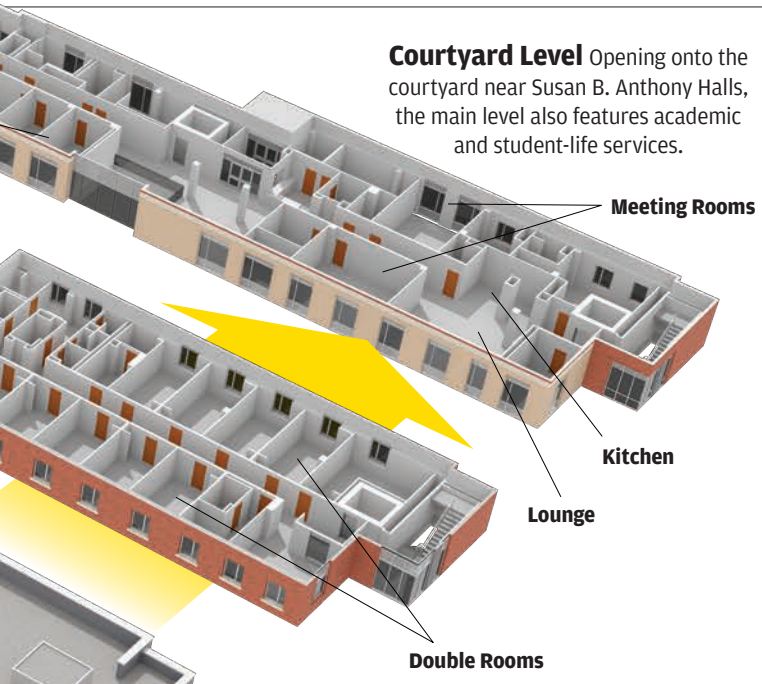
Named in recognition of support from University Trustee Christopher Boehning '87, '88 (MS) and his wife, Julie, the lower two levels of Genesee Hall are home to Boehning Varsity House, a new facility that provides dedicated spaces and facilities for outdoor athletic teams. The new spaces replace shared locker rooms and other facilities in Fauver Stadium.



Field Level With facilities for individual athletics programs, along with spaces for sports medicine and training programs and for housing equipment, the first floor of Boehning Varsity House opens onto Fauver Stadium.

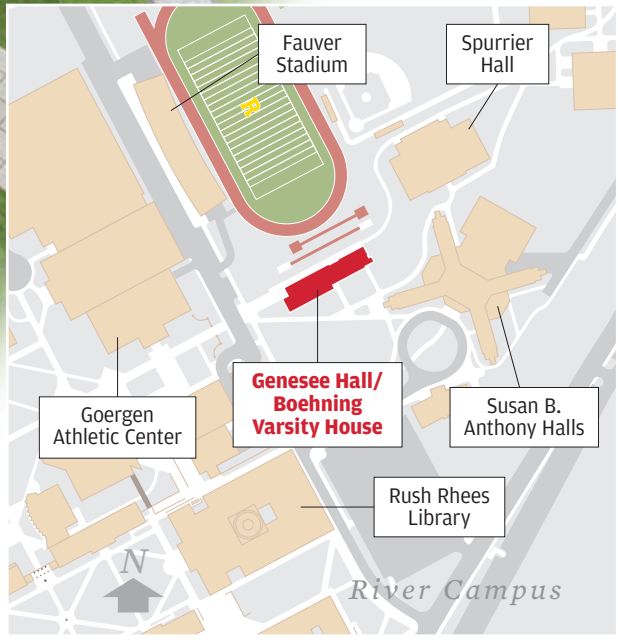
Terrace Level The second floor of Boehning Varsity House also provides spaces so that individual teams can each have their own locker rooms.

STEVE BOERNER (ILLUSTRATION)



Courtyard Level Opening onto the courtyard near Susan B. Anthony Halls, the main level also features academic and student-life services.

Residence Levels Housing single and double rooms, the residence floors feature a bathroom area with six fully equipped bathrooms, each with a private shower, sink, and toilet behind a lockable door.



Home Site Situated between the Brian F. Prince Athletic Complex and Susan B. Anthony Halls, Genesee Hall is the first residence hall built on the River Campus since 2012, when O'Brien Hall opened in Jackson Court.

DATABASE

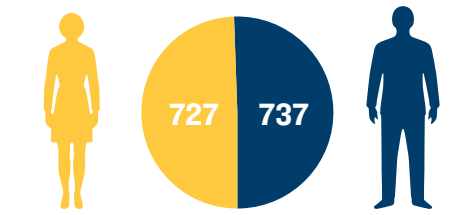
Quick Count: Class of 2021

Drawn from a record number of applications, the Class of 2021 represents one of the most academically high-achieving and diverse groups of first-year students ever to arrive at the College. The numbers will be finalized later this fall, but here's a preliminary look.

TOTAL ENROLLMENT

1,464

GENDER IDENTITY



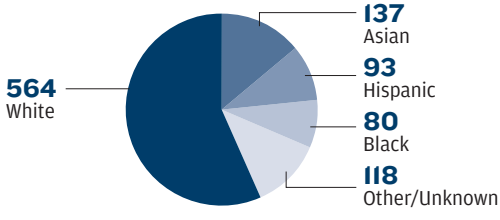
49.7% **50.3%**

NATIONAL ORIGIN

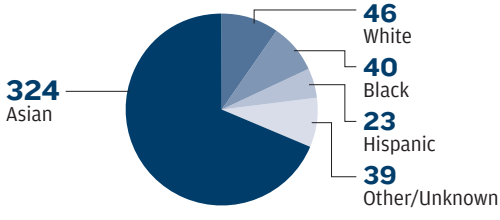
992 students from **42** states

472 students from **105** countries

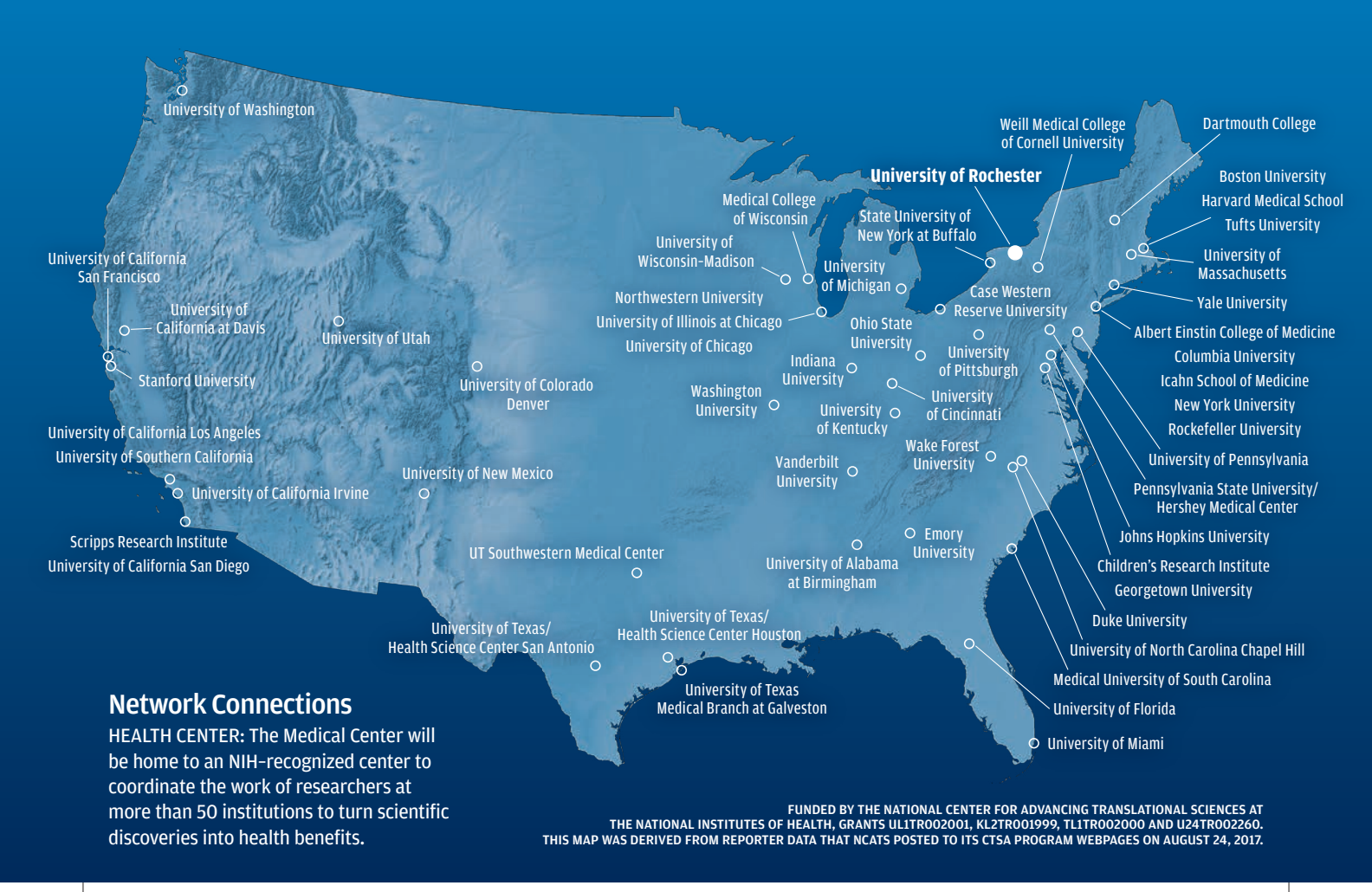
ETHNICITY



DOMESTIC



INTERNATIONAL



Network Connections

HEALTH CENTER: The Medical Center will be home to an NIH-recognized center to coordinate the work of researchers at more than 50 institutions to turn scientific discoveries into health benefits.

FUNDED BY THE NATIONAL CENTER FOR ADVANCING TRANSLATIONAL SCIENCES AT THE NATIONAL INSTITUTES OF HEALTH, GRANTS UL1TR002001, KL2TR001999, TL1TR002000 AND U24TR002260. THIS MAP WAS DERIVED FROM REPORTER DATA THAT NCATS POSTED TO ITS CTSA PROGRAM WEBPAGES ON AUGUST 24, 2017.

DISCOVERY TO HEALTH

Rochester to Lead National Translational Sciences Network

The Medical Center will coordinate NIH effort to turn discoveries to health benefits.

By Susanne Pallo

The Medical Center will coordinate the work of more than 50 institutions to help researchers turn scientific discoveries into health benefits faster as the hub of a National Institutes of Health network.

Funded with a $19 million grant from the NIH's National Center for Advancing Translational Sciences, Rochester will become home to the Center for Leading Innovation and Coordination. The center will create virtual and in-person platforms for institutions to share data and educational materials, track success, communicate with one another, and develop collaborations.

The center, led by Martin Zand, a professor of medicine and codirector of Rochester's Clinical and Translational Science Institute, and Deborah Ossip, a professor of public health sciences and director of the institute's Population Health Research Postdoctoral Program, will help member institutions benchmark their progress in comparison to the network as a whole and identify areas where improvement may be needed or where efforts could be reduced.

Announced this summer, the funding is the latest in a decade-long recognition of Rochester's national leadership in clinical and translational science. In 2006, the Medical Center received one of the first NIH grants designed to accelerate the application of discoveries in medical science. Since then, Rochester's Clinical and Translational Science Institute has received nearly $105 million in NIH funding and has supported nearly 100 trainees and funded close to 200 projects for a total of nearly $15 million at the University. Researchers and trainees supported by the center have secured $102 million in external funding.

Since 2011, the institute has been housed in the Saunders Research Building at the Medical Center.

Nancy Bennett, codirector of the institute and director of the Center for Community Health, says the goal of the NIH's translational sciences program is to speed medical and population health interventions to people who need them.

"No single institution can do this alone, and we don't want to reinvent the wheel at each institution, so we must create ways to easily access and leverage each other's resources, tools, and expertise," Bennett says.

Early in the national program's history, member institutions worked largely independently and best practices or resources developed at one institution were not easily transferred to the others as was originally intended. The National Center for Advancing Translational Sciences established funding for a coordinating center to facilitate collaboration among awarded institutions.

The center will also help communicate the importance of the program to government stakeholders and US taxpayers. R

Ask the Archivist:
'Ask Not What the Archivist Can Answer for You…'

A question for Melissa Mead, the John M. and Barbara Keil University Archivist and Rochester Collections Librarian.

On the back of Bausch & Lomb Hall, there is a balcony or observation deck off the fourth floor. Was it used to address students and staff, or for events? Do you have anything that would explain our mysterious balcony?—Shawn Casey, Churchville, New York

The balcony on the back of Bausch & Lomb Memorial Hall (facing Hoyt Hall) was intended as the scene of scientific, not theatrical events. It was requested by Professor Brian O'Brien for the purpose of "study[ing] the sun's rays from sun rise to sun set" using a spectroscope weighing 800 pounds that was connected to equipment within the building.

SUN SETTINGS: Brian O'Brien, director of the Institute of Optics from 1938 to 1953 (left), helped develop the icaroscope, a telescope designed for studying the sun. Optics faculty demonstrated a modern version of the device during August's eclipse.

Like the ivy on the Eastman Quadrangle (*Rochester Review*, July-August 2017), the balcony was an embellishment to the original campus plan that was initially opposed for aesthetic reasons. "Dr. Rhees stated that unquestionably the Bausch & Lomb Memorial Building had been built for use, and if [the] balcony as contemplated is needed, it will be built." It was completed in November 1930, at a total cost of $891. O'Brien, one of the University's most enduring figures, joined the faculty in 1930, and served as director of the Institute of Optics from 1938 to 1953. During World War II, *Review* noted that O'Brien "probably had been given more tough research assignments than any single scientist in the United States." One assignment, top secret until the October 1946 meeting of the Optical Society of America, was the icaroscope: "With the icaroscope, the human eye does not look directly at the sun itself or any object in line with the sun. Instead, the light is focused on the phosphorescent screen. The screen has an afterglow, and reproduces the image but at greatly reduced brilliance," reported the *Honolulu Star-Bulletin*, one of many newspapers to report the invention. On August 21, members of the University community had the chance to use a modern icaroscope to view the solar eclipse, courtesy of Jim Zavislan, an associate professor of optics.

I graduated from the River Campus in 1960. Early that year, or possibly in late 1959, John F. Kennedy visited the campus and met with a group of students. I took pictures of him at the event, which were published in the *Campus-Times*. I would like to locate those pictures, but I believe the *Campus-Times* is not available online for that year. Can you check to see if the pictures might be available either online or in hard copy?
—Richard Miller '60, Washington, D.C.

Kennedy had a whirlwind day in Rochester on October 1, 1959, which the *Campus-Times* reported using a sequence of your photographs. In addition to speaking to a standing-room-only crowd in Strong Auditorium, Kennedy was booked to address the Rochester Ad Club, for a television interview with Channel 10, had a 3 p.m. meeting with area Democratic Party chairs, held what we would today call a town hall meeting at Temple B'rith Kodesh at 7 p.m., and finished the day with an 8 p.m. speech and rally with the Democratic County Committee at the Auditorium.

The *Campus-Times*, *Tower-Times*, and their respective predecessors have recently been digitized, and will be available online soon. The University Archives holds thousands of images, but relatively few original photographs from student publications, and always welcomes the gift (or loan) of images in any format—photographs, negatives, slides, and digital.

Need History?
Do you have a question about University history? Email it to rochrev@rochester.edu. Please put "Ask the Archivist" in the subject line.

. . . Ask What You Can Answer for the Archivist
The Archives (and the Archivist) can locate the answers to many fact-based questions, but not the "what was it like" kind: did you see the Kennedy(s) in Strong Auditorium?

Many thanks to all those who responded regarding their student-soldier experiences; your memories and insights will enrich the exhibit in the short-term, and the Archives for the duration.

GLIAL GLITCHES: Childhood-onset schizophrenia may begin in faulty glial cells—brain cells that protect neurons and help them build communication networks.

Where Does Schizophrenia Begin? New Evidence Points to Glial Cells

Researchers at the Medical Center have identified a potential culprit behind the wiring problems in the brains of people with schizophrenia.

When the researchers transplanted human brain cells generated from individuals diagnosed with childhood-onset schizophrenia into mice, the animal's nerve cell networks did not mature properly, and the mice exhibited behaviors similar to those seen in people with the disease.

The findings, published in the journal *Cell*, suggest that childhood-onset schizophrenia may be due to glial cell dysfunction, according to Steve Goldman, the Dean Zutes Chair in Biology of the Aging Brain and codirector of the Center for Translational Neuromedicine, who was the lead author of the study.

"The inability of these cells to do their job, which is to help nerve cells build and maintain healthy and effective communication networks, appears to be a primary contributor to the disease," he says.

The research provides scientists with a foundation to explore new treatments for the disease. Because schizophrenia is unique to humans, scientists have been limited in their ability to study it. The researchers developed a new animal model that can be used to accelerate testing drugs and other therapies in schizophrenia.

—Mark Michaud

An Eye Test That Could Help Diagnose Autism

New research on rapid eye movements could herald a new tool to help physicians identify a sub-group of people with autism.

The rapid eye movements that humans make when shifting attention from one object to another, known as saccades, are essential to understanding and interacting with the world.

Saccades are controlled by the cerebellum, a densely packed structure of neurons that plays a role in motor control as well as emotion and cognition, due to its connections to the rest of the brain. There is growing evidence that the structure of the cerebellum is altered in some people with autism.

A series of experiments led by John Foxe, the Kilian J. and Caroline F. Schmitt Professor in Neuroscience and director of the Del Monte Institute for Neuroscience, and Edward Freedman, an associate professor in the Department of Neuroscience, suggested that the sensory motor controls in the cerebellum responsible for eye movement were impaired in subjects with autism.

Thus, saccade adaptation measures may prove useful in early detection of the disorder.

The research appears in the *European Journal of Neuroscience*.

—Mark Michaud

Bacterial or Viral? Genes May Hold the Key

Antibiotics are lifesaving drugs, but overuse is leading to one of the world's most pressing health threats: antibiotic resistance.

Antibiotics help fight bacterial infections, but are not effective against viruses. But because physicians have lacked a foolproof means to confirm bacterial infections, they often prescribe antibiotics, even though an infection may be viral.

A team led by Ann Falsey, professor and interim chief of the Infectious Diseases Division at the Medical Center, is developing a tool to help physicians identify bacterial infections.

Falsey's team conducted a battery of microbiologic tests on blood samples from participants who had been hospitalized with lower respiratory tract infections. Thomas Mariani, a professor of pediatrics and biomedical genetics, used genetic and statistical analysis to pinpoint 11 genetic markers in the blood that correctly classified the patients with bacterial infections 80 to 90 percent of the time.

"Our genes react differently to a virus than they do to bacteria," says Mariani. "Rather than trying to detect the specific organism that's making an individual sick, we're using genetic data to help us determine what's affecting the patient."

Falsey and Mariani plan to continue their research, noting that the genetic classifiers selected from the study population may not prove to be universal to all patients.

The study appears in *Scientific Reports*.

—Emily Boynton

THOMAS DEERINCK/SCIENCE PHOTO LIBRARY

Sharpen Your Image—With Freeform Optics

Researchers at the Institute of Optics have described an optical device with potential applications ranging from improved satellite and diagnostic imagery to more precisely matching the paint color on a living room wall.

The device is a type of spectrometer—an optical instrument that takes light and breaks it down into components to reveal a catalog of information about an object.

Unlike traditional spectrometers, this one is designed using freeform optics. A relatively new type of optical design, it replaces rotationally symmetrical, and often perfectly spherical, optical surfaces with "freeform" ones that rely on a more complicated geometry.

Freeform design enables a device to efficiently correct aberrations with fewer, smaller lenses and mirrors.

Described in *Light: Science & Applications*, the device—designed by Jacob Reimers, a PhD candidate in the lab of Jannick Roland, the Brian J. Thompson Professor of Optical Engineering—is five times more compact than similar spectrometer designs using more conventional mirrors.

DECENTERED: Designed with freeform optics, Reimers's prototype spectrometer is lighter, more compact, and more efficient than traditional spectrometers.

It also allows a three-fold increase in the bandwidths analyzed and is 65 times more effective at correcting aberrations that affect field of view and resolution.

"Spectrometers monitor the environment, help examine patients, and are broadly used for many other applications. What we found here can be applied to spectrometers used in all of these other applications," says Rolland.

—Bob Marcotte

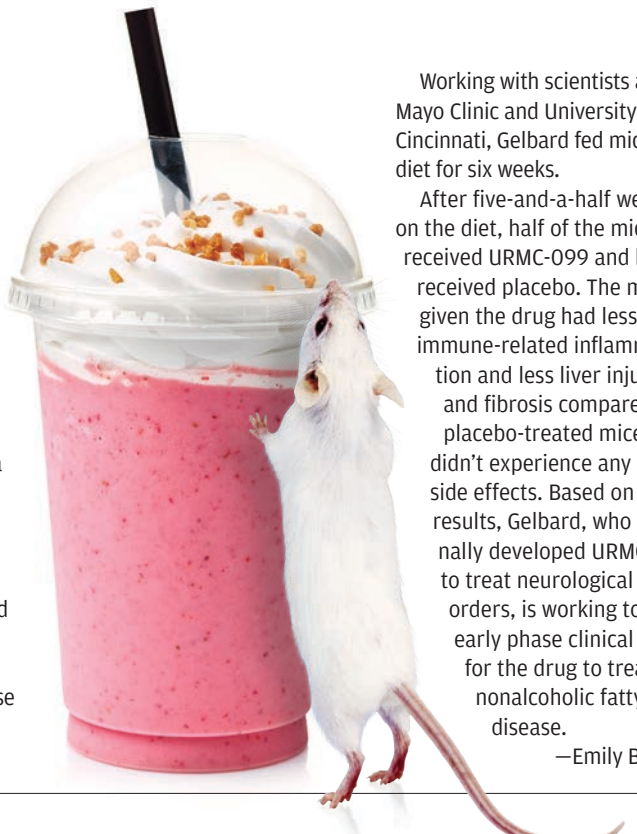
Of Mice and Milkshakes

Not surprisingly, a fast-food diet is no better for mice than for humans. But a drug developed at the Medical Center protected mice that were fed a fast-food diet from one of the diet's many potential ills: nonalcoholic fatty liver disease.

In a study published in the journal *JCI Insights*, scientists reported that the drug, dubbed "URMC-099," reversed liver inflammation, injury, and scarring in mice. The mice had developed the symptoms of fatty liver disease after consuming a diet high in fat, sugar, and cholesterol that had been designed to replicate a fast-food diet and recreate the features of the illness found in people.

Eating high volumes of fatty and sugary foods triggers inflammation in the liver, and the body responds by sending immune cells to neutralize the threat. Unfortunately, the immune response can rage out of control, creating even more inflammation and further damaging the liver. URMC-099, which was developed in the laboratory of Harris (Handy) Gelbard, a professor of neurology and the director of the Center for Neurotherapeutics Discovery, dials back the immune response to a normal level.

"URMC-099 seems to break this vicious cycle of persistent inflammation by restoring balance between immune cells and liver cells," says Gelbard. "The drug's ability to turn down the volume on the immune response allows the liver to regain its normal functions."



Working with scientists at the Mayo Clinic and University of Cincinnati, Gelbard fed mice the diet for six weeks.

After five-and-a-half weeks on the diet, half of the mice received URMC-099 and half received placebo. The mice given the drug had less immune-related inflammation and less liver injury and fibrosis compared to placebo-treated mice and didn't experience any major side effects. Based on the results, Gelbard, who originally developed URMC-099 to treat neurological disorders, is working toward early phase clinical trials for the drug to treat nonalcoholic fatty liver disease.

—Emily Boynton

J. ADAM FENSTER (OPTICS); STEVE BOERNER (PHOTO ILLUSTRATION)/ADOBE STOCK (ORIGINAL IMAGES)

MUSIC LEADER: Waddell will direct ensembles in the College.

New Conductor Named

Rachel Waddell is the new director of orchestral activities in the Department of Music.

Previously the associate conductor of the Canton Symphony Orchestra, a professional regional orchestra in northeastern Ohio, and music director of the award-winning Canton Youth Symphonies, Waddell will conduct both the Symphony and Chamber Orchestras, mentor the Chamber Ensembles, and teach the course The Symphony and the Conductor. She holds a doctor of musical arts in orchestra conducting from the University of Nevada, Las Vegas, and has served on the faculty at Kent State University, Malone University, as well as Nevada.

University Offers Gender-inclusive Housing Option

The University is making the option of gender-inclusive housing assignments available to sophomores, juniors, and seniors in the College. As of this fall, upper-class students can choose to live in a double room or a double room in a suite with someone of a different gender or gender expression.

The new policy is aimed at fostering a residential experience that's welcoming and supportive of all gender identities, as well as giving students greater flexibility to have roommates with whom they are most comfortable.

The University joins more than 200 colleges and universities in the United States that offer gender-inclusive housing, including Cornell University, Case Western Reserve University, RIT, and SUNY Geneseo.

The Office for Residential Life and Housing Services has permitted mixed-gender groups to live together in on-campus suites and apartments. The new option extends that option to double rooms and suite double rooms on coed floors. Consistent with other University housing policies, students in a romantic relationship are discouraged from being roommates through the option.

The policy does not apply to first-year students.

Eastman Jazz Sextet Makes Tokyo Festival Debut

MUSICAL TOUR: An ensemble from the Eastman School of Music represented the University for the first time at the Tokyo Jazz Festival late this summer. Under the sponsorship of the US Embassy in Japan, the Eastman Jazz Sextet—Ryder Eaton '17E (bass), Luke Norris '17E (saxophone), Christian Crawford '17E (trumpet), Sterling Cozza '18E (piano), graduate student Chase Ellison '16E (drums), and C. J. Ziarniak '17E (saxophone)—performed a series of concerts. The ensemble is led by jazz professor Jeff Campbell '92E (MM), '02E (DMA).

Golisano Children's Hospital Opens Two New Floors

The Medical Center celebrated the opening of two new floors of Golisano Children's Hospital this summer, a milestone that marked the completion of the second phase of construction on the new hospital building that opened in 2015.

The $45 million endeavor adds to the hospital's position as one of the top surgical and complex care facilities in the nation. The new areas on the fourth and sixth floors include six new pediatric operating rooms in the William and Mildred Levine Pediatric Surgical Suite; new facilities in the Clay E. and Rita M. Buzzard Pediatric Cardiac Cath Lab Suite; a gastroenterology surgical procedure suite, and 23 new private pre-op and post-op recovery rooms.

The work also included the relocation of ICU and general care pediatric beds and the addition of new pediatric ICU beds.

"For the first time, we will have operating rooms that are designed specifically for the complex needs of children," says Walter Pegoli, the Joseph M. Lobozzo II Professor and chief of pediatric surgery. "The larger, modern facilities will give us the space and resources we need to provide patients with the most advanced surgical care."

Fundraising for the construction is ongoing and has been supported by numerous gifts, including a $2 million donation from Rita Buzzard in honor of her late husband, Clay, and a $750,000 pledge from Andy McDermott and Rob Burch, creators of the Fairport Music Festival.

JEFF RICHARDS (WADDELL); MICHELLE MARTORELL (JAZZ SEXTET)

Experiment by East High School Students Orbits the Earth

A project designed by East High School students went into orbit this summer.

As part of NASA's Student Spaceflight Experiments Program, students De'aunte Johnson, Binti Mohamed, and Tailor Davis in August watched from Rochester as their project was rocketed to the International Space Station.

Working with Mary Courtney, a chemistry teacher and spaceflight experiments community project director at East, the three designed an experiment to test how quickly chlorophyll degrades in microgravity conditions.

Students ultimately hope to learn how organisms, in this case phytoplankton, are able to survive in space without sunlight or gravity. East was one of only 21 schools across the United States and Canada selected to have their science experiments aboard the space station.

EXPERIMENTAL SPACE: An experiment designed by East High School students was selected to go aboard the International Space Station.

As part of an Educational Partnership Organization established in July 2015, the University has assumed management responsibilities for East, a Rochester city school that includes grades 6 through 12.

"Everything that we're trying to do here at East under the University of Rochester partnership, in terms of turning the school around, is all research based," says Courtney, "I think when you take a science project like this and show kids how it can have real-world applications and involve them and really immerse them, it really builds on everything that we're trying to do and it reinforces the whole U of R research philosophy."

GLOBAL GATHERING: For the second time in two years, International Baccalaureate students from around the world convened at Rochester.

University Hosts International Baccalaureate Conference

More than 200 high school students from around the globe gathered on the River Campus this summer for the sixth annual International Baccalaureate World Student Conference.

The University has long had a special relationship to the International Baccalaureate program, a rigorous precollege educational system emphasizing critical thinking. Rochester was the first university in the Northeast to offer scholarships to students with International Baccalaureate, or IB, diplomas, and about 10 percent of incoming students each year come from IB schools.

"Like Rochester on the college level, the International Baccalaureate program has for 50 years led students in an innovative approach to curriculum," says Jonathan Burdick, the University's vice provost for enrollment initiatives and dean of admissions and financial aid. "It's one that requires them to choose a few subjects they love most and immerse themselves in them to high levels of mastery."

International Baccalaureate started with one school in Geneva, Switzerland, in 1968 and today is offered in more than 3,400 schools in 150 nations.

The University also hosted the world conference in 2015. This summer, students came from nations such as Cambodia, China, Egypt, Mozambique, and New Zealand, and states as far away as Oregon, Texas, and Idaho.

Through a broad spectrum of speakers and classes, the students explored the theme "Defining and Defying Boundaries."

NASA (SPACE STATION); J. ADAM FENSTER (IB)

SCOUTING REPORT

What's the Outlook for the Yellowjackets?

Rochester's fall varsity sports teams are looking forward to successful campaigns in 2017.

By Dennis O'Donnell

Men's Cross Country: The team returns a good nucleus of Yellowjackets who ran in the UAA and NCAA regional championships in 2016: Ivan Frantz '20, Benjamin Martell '19, Hunter Phinney '19, and Nate Conroy '18. Frantz was the team's top runner at the 2016 regionals, finishing 66th overall, and Martell finished in the No. 2 spot both at UAA and regionals.

LOOKING FOR A FOURTH? Rachel Bargabos will help lead the women's cross country team this fall. The squad is looking to make a fourth straight appearance at the NCAA championship meet.

Women's Cross Country: Rochester has appeared in the NCAA championship meet for three straight years—finishing 14th as a team in 2015 and qualifying individual competitors in 2014 and 2016. Will it be four straight in 2017? The team is led by four returnees from last year's regional squad: Rachel Bargabos '19, Ayumi Yuasa '18, Ariane Hasbrouck '19, and Clara Wolfe '18.

Field Hockey: With back-to-back 18-win seasons, Rochester has established itself as a contender. Aiming for a third straight NCAA playoff bid, the Yellowjackets return with top scorers Claire Dickerson '18 and Maya Haigis '20, goaltenders Gabrielle Cantley '18 and Kiran Sundaram '18, and backfielders Courtney Dunham '19, Samantha Dow '18, and Colleen Maillie '20. In midfield, look for Olivia Denny '18 and Miranda Lakis '19.

Football: As the 2016 quarterback, Dan Bronson '18 led an offense that generated almost 380 yards per game. He's a wideout in 2017. Emanuel Calmar '19 ran for five touchdowns. Bronson and punter Paul Mokrzycki '20 made the All–Liberty League team. Ricky Sparks '18 and Josh Churchin '18 were among the tackle leaders.

Golf: Rochester won the Liberty League title and advanced to the NCAAs last year. All-Region golfers Jack Mulligan '20 and Jason Paek '18 lead the way this year. Both were first team All–Liberty League, and

SQUAD SUCCESS: All-UAA honorees Sydney Melton and Clara Martinez return to help anchor soccer and volleyball.

Mulligan was the league's Rookie of the Year. Corey Mitchener eyes a return to the lineup, and five first-year students look to make an immediate impact.

Rowing: At the state championships last spring, Rochester produced solid performances in the varsity 4+, open 4+, and novice 8+. That may bode well for 2017–18. In the fall, Rochester will compete in the Challenge on the Canal, the Head of the Genesee, and either the Head of the Schuylkill (Philadelphia) or Head of the Fish (Saratoga Springs).

Men's Soccer: With plenty of experience in the soccer ranks, defense remains a strength. Last year, Rochester posted six shutouts and held five teams to one goal in a season that included the team's 17th NCAA playoff appearance, its 10th in the last 12 years. Lasha Alkhazishvili '19, Zach Lawlor '20, and Lucas Loecher '19 return to anchor a seasoned group at the back. On attack, the goals will come by committee with Bryce Ikeda '19, Aleks Dombrowski '18, Alex Di Perna '18, Geoffrey Rouin '18, and Mitch Volis '20 all returning.

Women's Soccer: Rochester beat two Final Four teams last year, including the eventual NCAA champion. Eight starters are back for a team that held 12 of 18 foes to a goal or less. The veterans include All–UAA honorees McKenzie Runyan '19, Megan Runyan '19, and defender Sydney Melton '18. Three vets return in goal: Madilynne Lee '18, Samantha Hlavac '19, and Gwen Haffenden '20.

Men's Tennis: The Yellowjackets were ranked No. 18 regionally in the spring. Masaru Fujimaki '19, Aaron Mevorach '18, Jun Yuminaga '18, and Andrew Nunno '18 head up the returnees. Rochester will play at the St. Lawrence Fall Classic and at the ITA Regionals at Skidmore this fall.

Women's Tennis: Rochester has two All-UAA honorees returning to a lineup that was ranked 33rd nationally. Leaders include Sravya Gudipudi '20 and Camila Garcia '19, who was ranked No. 24 in the Northeast regional singles rankings. Rochester will play in three fall tournaments, highlighted by the ITA Regionals at Skidmore in late September.

Women's Volleyball: Rochester looks to build on last year's success behind Clara Martinez '20, an All-Region and a first team All–UAA honoree. Courtney Vidovich '19 led the UAA in aces per set. Rochester's balance will help in the offense: Alara Kocak '19, Beth Ghyzel '20, and Alexandra Nelligan '18 all return. R

FACTOR IN FOOTBALL: Dan Bronson takes his skills to wide receiver this year. At quarterback in 2016, he passed for 1,523 yards and 12 TDs plus ran for 668 yards and five touchdowns.

Dennis O'Donnell is director of athletic communications.