Rochester Review

UNIVERSITY OF ROCHESTER/MARCH–APRIL 2017

MARATHON FINISH
Laura Lockard '17 faces an unexpected obstacle

BETTER BLAKE
A Romantic-era icon still burns bright

DOING MORE WITH DATA
A new building, new initiatives, and new ideas for data science

Lighting up History

English professor Gregory Heyworth brings new technology to the study of manuscripts.

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Features

MARCH–APRIL 2017

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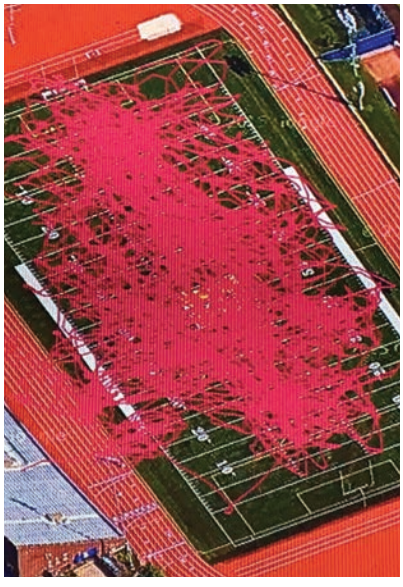
A Sprinter's Marathon

Yellowjacket athlete Laura Lockard '17 (above, left, with teammate Michaela Burrell '20) returned this spring for her final season as a key member of the track and field team. A fateful discovery brought to light during a voluntary study nearly knocked her off stride, but Lockard, a microbiology major from Sayre, Pennsylvania, was determined to "make the best of everything" in her life. *By Scott Sabocheck*



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The Future of the Past

Gregory Heyworth combines the close reading of an English professor with the imaging science of an engineer to bring new light to many of the first drafts of history. He calls the approach textual science, and he's one of the world's first practitioners. *By Kathleen McGarvey*

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Doing More with Data

Data science is changing the way researchers, scholars, doctors, teachers, musicians, business people, and others think about what they do. As the University prepares to open the first campus building devoted to a centerpiece of the institution's strategic plans, we offer some examples of how the approach is influencing many fields.

ON THE COVER: A 12th-century manuscript of the Gospels, written in Old Georgian Nuskhuri script; Svaneti Ethnographic Museum, Mestia, Georgia.

ADAM FENSTER

Departments

March–April 2017

In Review

Alumni Gazette

Class Notes

SCALA/ART RESOURCE (LISZT); ADAM FENSTER (LESLIE); DAVID COWLES FOR *ROCHESTER REVIEW* (QUINN)

An Important Milestone for Data Science

By Joel Seligman

Soon the University of Rochester will achieve an important milestone. In the coming months we will open Wegmans Hall, home of the Goergen Institute for Data Science and hub of interdisciplinary data science research. In 2013, we characterized data science as a core priority in our University strategic plan, and in 2015 we termed data science as one of the four primary goals that will help our University ascend to The Next Level. Wegmans Hall will unite many of our wide-ranging competencies in data science under one roof.

Data science is a critical discipline of the 21st century, focused on extracting meaning from massive amounts of complex information that are difficult to manipulate and understand with traditional processing methods. Our capacity to have the right technology, outstanding faculty and students, and sophisticated programs not only in computer science but in specific applications of data science will be consequential to our University's efforts to continue to be a leader in sponsored research, education, and scholarship. Rochester researchers already are using data science to advance the fields of health analytics; artificial intelligence and cognitive science; and developing new methods, tools, and infrastructure.

To galvanize this effort, we have raised $31 million in private philanthropy, added to $13 million in contributions from New York State. Our Center of Excellence in Data Science is housed in the Goergen Institute and funded by the New York State Department of Economic Development. Our researchers are committed to applying data science methods and tools to solve some of the world's greatest challenges in medicine and health; imaging and optics; energy and the environment; food and agriculture; defense and national security; economics and finance.

Business, science, health care and politics increasingly process massive amounts of data, and use those data to make forecasts and predictions that will influence decisions. Our faculty and students today are applying data science to real-world challenges.

Huaxia Rui, assistant professor of computers and information systems at Simon Business School, for example, is developing a system for recognizing trends on social media to help retailers make important decisions about products and services. Recently he began working with Wegmans to monitor food consumption trends on Twitter and Facebook, detecting signals that reflect new food consumption patterns. If there is a spike, for example, in conversations on social media among shoppers relating to a new superfood full of antioxidants, the retailer could leverage the apparent increased interest to drive new product choices. Professor Rui says in the next several decades, data will be "driving everything." The challenge will be streamlining methods to use it effectively and intelligently.

Our faculty members also seek to harness the power of data to improve patient outcomes. Orthopaedic surgeon David Mitten directs the Health Lab, a collaboration between the University of Rochester Medical Center and Arts, Sciences & Engineering that leverages computing and analytics, sensors, 3-D imaging and modeling, and virtual and augmented reality technologies to address current and emerging challenges in medicine. By collecting numerous points of data and identifying patterns from electronic health records and devices, physicians will be able to make precise and direct improvements in patient care and outcomes.

Mitchell Lovett, associate professor of marketing at Simon, is creating methodologies to help guide companies with making product-pricing decisions, optimizing store-space allocation, and assessing the impact of competitive stores to the region. Retailers and manufacturers will have new ways to understand customer decision-making patterns, which will allow them to make constant informed adjustments in marketing strategy.

Zhishan Pan '17, a double major in data science and financial economics, since September has worked as an intern in the Wegmans Customer Insights Group. Last semester, he began working on a predictive model that uses customer shopping data. When fully developed, the model will help Wegmans identify patterns and buying trends, which they may use to make important customer retention decisions.

Our capacity to have the right technology, outstanding faculty and students, and sophisticated programs … in specific applications of data science will be consequential to our University's efforts to continue to be a leader in sponsored research, education, and scholarship.

The University is not alone among leading research universities and colleges in seeking to develop outstanding programs in data science. We are moving with the same focus and energy that we have brought to fields such as optics and photonics, and to programs such as the Eastman School of Music, and the Laboratory for Laser Energetics to create a platform in specific applications of this ubiquitous field where we can be best in class or among those best in class.

In a very real sense the opening of Wegmans Hall is not an end, but a major step forward in progress we anticipate making in data science throughout this century. R

JOHN MYERS

Letters

Wild about Harry

I was thrilled to see my mentor and friend Harry Reis featured in *Review* ("How Do We Relate," January-February). And while I loved the article, I wish you had had the space to describe Harry's formidable skills as a teacher. I can still remember my first psychology class at Rochester, an introductory social psychology course taught by Harry. The class was nothing short of transformative. I clearly remember dragging myself out of bed when I was really too sick to come to class, simply because I couldn't bear the thought of missing a lecture. Every one of Harry's lectures was incredibly interesting, simultaneously answering my questions and upon reflection, generating new ones.

One thing I have never forgotten was Harry's lecture on the last day of class. He looked at those of us who always sat in the front row, mesmerized by his lectures. He thanked us for always nodding, always laughing at his jokes (they really were pretty good!) and generally making the lecture experience a two-way street. As one who has been teaching for years now, both at the University of Pittsburgh and UNC Chapel Hill, I have never forgotten that moment in Harry's class. Once you've been a teacher, you realize just how gratifying those "front-row" students really are. How kind of him to thank us for something that he made so easy.

You quoted Peggy Clark of Yale University at the end of your piece (she also became a mentor after I finished my PhD), rightly praising Harry's ever-increasing contributions to research. All true. I'd just like to add that we should honor Harry the teacher as well. As a teacher and a scholar, he is in Dr. Clark's words "amazing."

Betsy Sementilli Bennett '85
Raleigh, North Carolina

Dance Partners

Robert Druckenmiller '51 writes that he "received quite a 'bolt out of the blue'" when he was reading the January-February issue and came to page 54, where there was an archival photo of the 1950 NROTC Ball.

"Yes, I do recognize several persons on page 54. I'm the second midshipman from the right. My dance partner is Priscilla Bartlett '52. Arthur Rosen '51 is the midshipman on the right."

He adds that he and Sarah Luitwieler '52 were married in June 1952 and are currently living in Seaford, Delaware. Three of their sons also graduated from Rochester: David '77, Robert '81, and Daniel '91, who was in NROTC. "He is currently a captain in the US Navy Reserves, balancing his Navy work with Michelin," his father writes.

We also heard from Marcy Elizabeth Shapiro, a member of the Class of 1972, who also identified the midshipman on the far right as Arthur Rosen '51, her father's first cousin.

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Thomas LeBlanc

WHERE ARE THEY NOW?

Former Dean Named President of George Washington

Thomas LeBlanc, a former member of the University's computer science faculty who served as the Robert L. and Mary L. Sproull Dean of the College Faculty from 1996 to 2005, will become the president of George Washington University in August.

For the past decade, LeBlanc has served as executive vice president, provost, and professor of computer science and electrical and computer engineering at the University of Miami, where he also served as interim president in 2015.

LeBlanc joined the faculty of Rochester's Department of Computer Science in 1983, and served as chair from 1990 to 1996, when he was first named dean.

George Washington's board of trustees announced LeBlanc's appointment as president in January.

Review *welcomes letters and will print them as space permits. Letters may be edited for brevity and clarity. Unsigned letters cannot be used. Send letters to* Rochester Review, *22 Wallis Hall, P.O. Box 270044, University of Rochester, Rochester, NY 14627-0044; rochrev@rochester.edu.*

Celebrating Dentistry

Your feature article "A Higher Grade of Dentistry" (January-February), highlighting the 100th anniversary of the Eastman Institute for Oral Health, remarkably coincides with the University of Alberta's celebration of its centennial this year. As a graduate of Rochester, I was privileged to work with its renowned dental researcher, Michael Bunocore, who invented the now widely used "acid etch technique" for dental adhesion of fillings and orthodontic banding.

As an alumnus, I am honored to have been invited to deliver a lecture to the Eastman Institute for Oral Health in April, 58 years after graduating from the University.

I send Centennial Greetings from the University of Alberta to the University of Rochester's Eastman Institute for Oral Health.

Geoffrey Sperber '58D (MS)
Edmonton, Alberta

The writer is a member of the medicine and dentistry faculty at the University of Alberta.

Remembering WRUR

The letter from George Landau '55 about his experience at radio station WRUR brought back fond memories of the U of R and WRUR (Letters, January-February).

I grew up in Manhattan in the 1950s. I used to listen to AM radio and my favorite program was *The Make Believe Ballroom,* with disc jockey Martin Block. He played all the songs popular in those days—Perry Como, Eddie Fisher, Frank Sinatra, Patti Paige, Tony Bennett, and others. When in 1954 , the Penguins group recorded "Earth Angel," arguably the first rock and roll song, Block refused to play that song or any other rock and roll songs. So he became obsolete.

When I went to WRUR to see how the station operated, I was offered a one-hour program, to play whatever music I chose, on Friday evenings, at eight or nine o'clock. I called the show *The Cool Show.*

My opening and closing theme was from the late, great Chet Baker, "Little Man, You've Had a Busy Day." During the program I played Baker, Stan Getz, Chris Connor, the Australian Jazz Quartet, Miles Davis, and others. Although the program was on Friday evening, I did get some positive feedback from a few people on campus.

One anecdote: the late, great jazz pianist Oscar Peterson gave a sold-out concert one time at Strong Auditorium. His jazz playing was phenomenal, but what impressed me, aside from his musical talent, was his vocal improvisation—his "scat"—while he played. For my program that week, I dedicated all the music to Oscar Peterson and between the records, I talked about how much Peterson's scat abilities impressed me. I received a lot of feedback. People appreciated that I emphasized it during the program.

Although I enjoyed my time as a DJ on WRUR, I pursued another career. Thinking about my time at WRUR brings fond memories.

Howard Silbersher '60
Princeton, New Jersey

In Review

TECHNOLOGY TRANSFER

Patented Perspective

ROCHESTER CLOAK: A research project that uses inexpensive, readily available lenses to cloak objects from view has received a patent. Physics professor John Howell and then graduate student Joseph Choi '16 (PhD) first demonstrated the array of lenses in 2014 and have since worked to refine it. Known as the "Rochester Cloak," the system is formally known as the "Paraxial Cloak Design and Device"—at least that's what the U.S. Patent Office called it when issuing Patent No. 9,557,547.

PHOTOGRAPH BY ADAM FENSTER

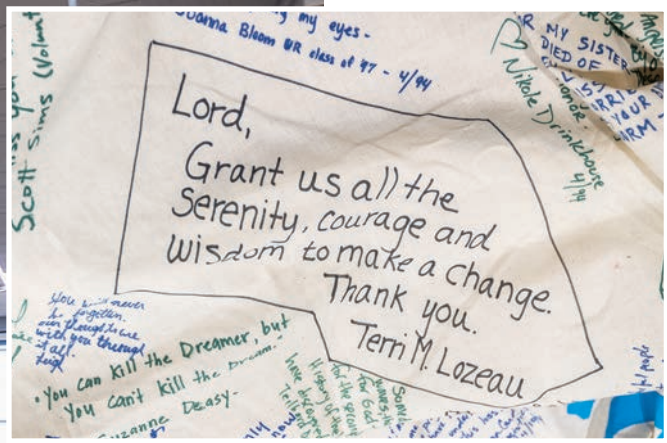
SOLAR TECHNOLOGY

Rockin' the Boat

SOLAR SYSTEM: A team of students—(clockwise from lower left) Ariane Hasbrouck '19, Andrew Gutierrez '19, Edward Ruppel '17, Ben Martell '19, Chris Dalke '19, and Matt Dombroski '17—work on the hull of their entry for this spring's Solar Splash competition. Participants in the competition, held this June in Dayton, Ohio, are challenged to design a boat that can propel itself through water using only solar power. **PHOTOGRAPH BY ADAM FENSTER**


URSS


EXIT
UNIVERSITY OF ROCHESTER
THE
NAMES
PROJECT
APRIL 8, 9, & 10
FIELD HOUSE



PRESERVING HISTORY

Fabric of Time

MEMORIAL MOMENT: A 12-foot square panel bearing signatures and comments from members of the University and the Greater Rochester communities—many of whom had family members and friends who died of AIDS—went on display in Rush Rhees Library this winter. With messages ranging from political calls for bureaucracies to "wake up" to deeply personal tributes —"Jim, You will never be forgotten. I was more because of you."—the panel was originally signed in 1994 as part of the national Names Project AIDS Quilt, which was then on display in the Goergen Athletic Center. The panel was saved by Linda Dudman, associate director of health promotion at University Health Service. After a week on exhibit in Lam Square in the library, the panel was deposited in the Department of Rare Books, Special Collections, and Preservation.

PHOTOGRAPHS BY ADAM FENSTER

VISIONARY: William Blake's work has inspired musicians, authors, and even television advertisers.

ART & LITERATURE

An 'Immortal Hand'

Romantic-era poet William Blake has left fingerprints all over contemporary pop culture.

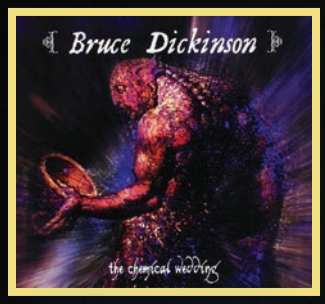
By Jeanette Colby

Poet and artist William Blake created some of the most indelible work of the Romantic era. But for more than two centuries, his works posed a technical challenge. Literary critics claimed Blake's writing, and art historians, his illustrations—with neither camp able to do justice to the full body of his work.

Two decades ago, the William Blake Archive—sponsored by the University with the Library of Congress and the University of North Carolina at Chapel Hill—set out to take advantage of the possibilities of digital media. For the first time, the archive fully brought together Blake's writings and illustrations, as he had originally produced them. The archive—coedited by Morris Eaves, a professor of English and the Richard L. Turner Professor of Humanities at Rochester—now holds almost 7,000 images from 45 of the world's research libraries and museums, and a transformative redesign, launched in December, makes the site more accessible than ever before. The redesigned archive was recently nominated for an international Digital Humanities Award, in the category of Best Digital Humanities Tool. It complements the leading academic journal for Blake studies, *Blake/An Illustrated Quarterly*, which is also coedited by Eaves and marks the 50th anniversary of its founding this year.

But you don't need to consult the archive or the journal to feel Blake's influence, which pervades popular culture through music, literature, film, and television. ®

Visit the William Blake Archive at Blakearchive.org.



English heavy metal singer Bruce Dickinson, lead singer of Iron Maiden, released a solo album, *The Chemical Wedding*, in 1998. Inspired by Blake, the recording features songs such as "The Book of Thel" and "The Gates of Urizen."

Nick Cave and the Bad Seeds recorded "A Weeping Song," in response to Blake's poem "Laughing Song," for their 1990 album, *The Good Son*.

"My Blakean Year" was written and recorded by Patti Smith in tribute to the poet, part of her 2004 album, *Trampin'*.

The 1981 movie *Chariots of Fire* took its name from a line in Blake's "Jerusalem," and Sir Hubert Parry's musical setting of the poem played in its final scene. Parry's work has been featured in many other films, too, including *Four Weddings and a Funeral* (1994), *The Loneliness of the Long Distance Runner* (1962), and *The Man Who Fell to Earth* (1976).

Film & Television

In the 1982 science fiction movie *Blade Runner*, protagonist Roy Batty recites a variation of a verse from Blake's *America a Prophecy*.

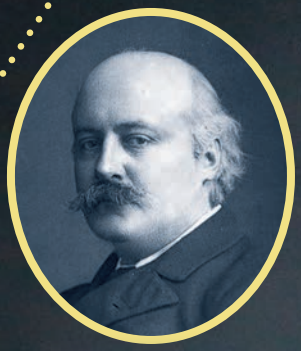
Actor Kit Harrington recites Blake's most famous poem, "The Tyger," in a recent television ad for a car made by the auto company Infiniti.

IAN DAGNALL/ALAMY (BLAKE); IANNI DIMITROV/ALAMY (CAVE); MARKA/ALAMY (SMITH); PICTORIAL PRESS LTD/ALAMY (*CHARIOTS OF FIRE*); SCREENPROD/PHOTONONSTOP/ALAMY (*BLADE RUNNER*); INFINITI (HARRINGTON)

Music

The band the Doors took its name from a phrase in Blake's 1970 illuminated book, *The Marriage of Heaven and Hell*: "If the doors of perception were cleansed every thing would appear to man as it is, infinite." Their debut album includes the song "End of the Night," inspired by Blake's poem "Auguries of Innocence": "Some are Born to sweet delight / Some are Born to Endless Night."

The band U2 released the album *Songs of Innocence* in 2014. The group is expected to release a follow-up album, *Songs of Experience*, this year.



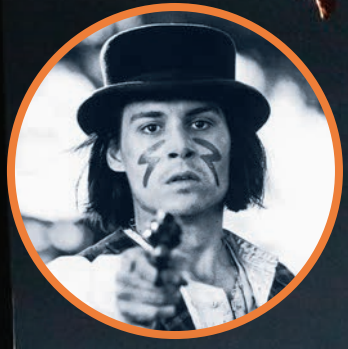
In 1916, Sir Hubert Parry set to music Blake's short poem "Jerusalem"—from the preface to his epic poem "Milton," composed between 1804 and 1811—and the piece was quickly embraced by a war-weary England. On the centenary of Blake's death in 1927, some called for its adoption as the country's national anthem.

Blake's painting *The Great Red Dragon* and the *Woman Clothed in Sun* and his poem "Auguries of Innocence" both play a prominent role in the 1981 novel *Red Dragon* by Thomas Harris, which introduced the character Hannibal Lecter, best known from Harris's sequel, *The Silence of the Lambs*.

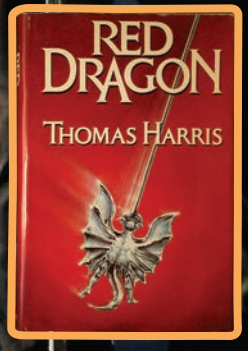
Bob Dylan collaborated with Allen Ginsberg in 1971 to record two Blake poems as songs: "Nurse's Song" and "A Dream."

Allen Ginsberg also recorded the album *Songs of Innocence and Experience* "by William Blake, tuned by Allen Ginsberg," released in 1970.

In Salman Rushdie's 1988 novel, *The Satanic Verses*, characters discuss *The Marriage of Heaven and Hell*.



Johnny Depp plays a character named William Blake in the 1995 movie *Dead Man*, which features lines from "Auguries of Innocence," *The Marriage of Heaven and Hell*, and his unfinished poem, "The Everlasting Gospel," as well as Blakean themes and symbols.



Literature

Like the Doors, Aldous Huxley borrowed Blake's phrase for his 1954 book, *The Doors of Perception*, a collection of essays about his experiences with the drug mescaline.

Children's author Maurice Sendak, most famous for his 1963 picture book, *Where the Wild Things Are*, frequently acknowledged Blake's influence on his work. He was also a significant Blake collector.

MARKA/ALAMY (DYLAN); EVERETT COLLECTION HISTORICAL/ALAMY (GINSBERG); GRANAMOUR WEEMS COLLECTION/ALAMY (DOORS); THE PRINT COLLECTOR/ALAMY (PARRY); DPA PICTURE ALLIANCE/ALAMY (U2, HUXLEY); PA IMAGES/ALAMY (RUSHDIE); KEYSTONE PICTURES USA/ALAMY (SENDAK); AF ARCHIVE/ALAMY (*DEAD MAN*)

HUMANITIES CENTER

Whither Democracy?

Finding the meaning in human events, at a teach-in.

The presidential election of 2016 raised some difficult questions about democracy and citizenship. Depending on whom you asked, the election of Donald Trump as president signaled the fragility of American democracy, the beginning of a frightening descent into racial and ethnic nationalism, and a rejection of science and reason; or a populist revival spearheaded by newly energized rural and small-town voters who rightly believed that they and their communities had been maligned, as well as written-off or harmed outright by the policies of self-satisfied coastal elites.

Parsing the meanings and implications of watershed human events—through open debate—is a big part of the mission of universities. In February, with that mission in mind, the Humanities Center held Knowledge and Citizenship: A Teach-In. As co-organizer Joan Saab, chair of the Department of Art and Art History, noted, contemporary American (and global) politics teaches, if nothing else, that "history matters, and culture matters."

The event was inspired by, but not explicitly about, the 2016 elections. Faculty in disciplines such as English, history, anthropology, and art and art history spoke about their research in response to a call from organizers for work that broadly relates "to the current sociopolitical climate." Faculty members discussed with attendees the relationship between art and propaganda; the challenge of a free press; the role of intellectuals in a democracy; and whether events such as Trump's election and the success of the Brexit movement were part of a global backlash against "neoliberal elitism."

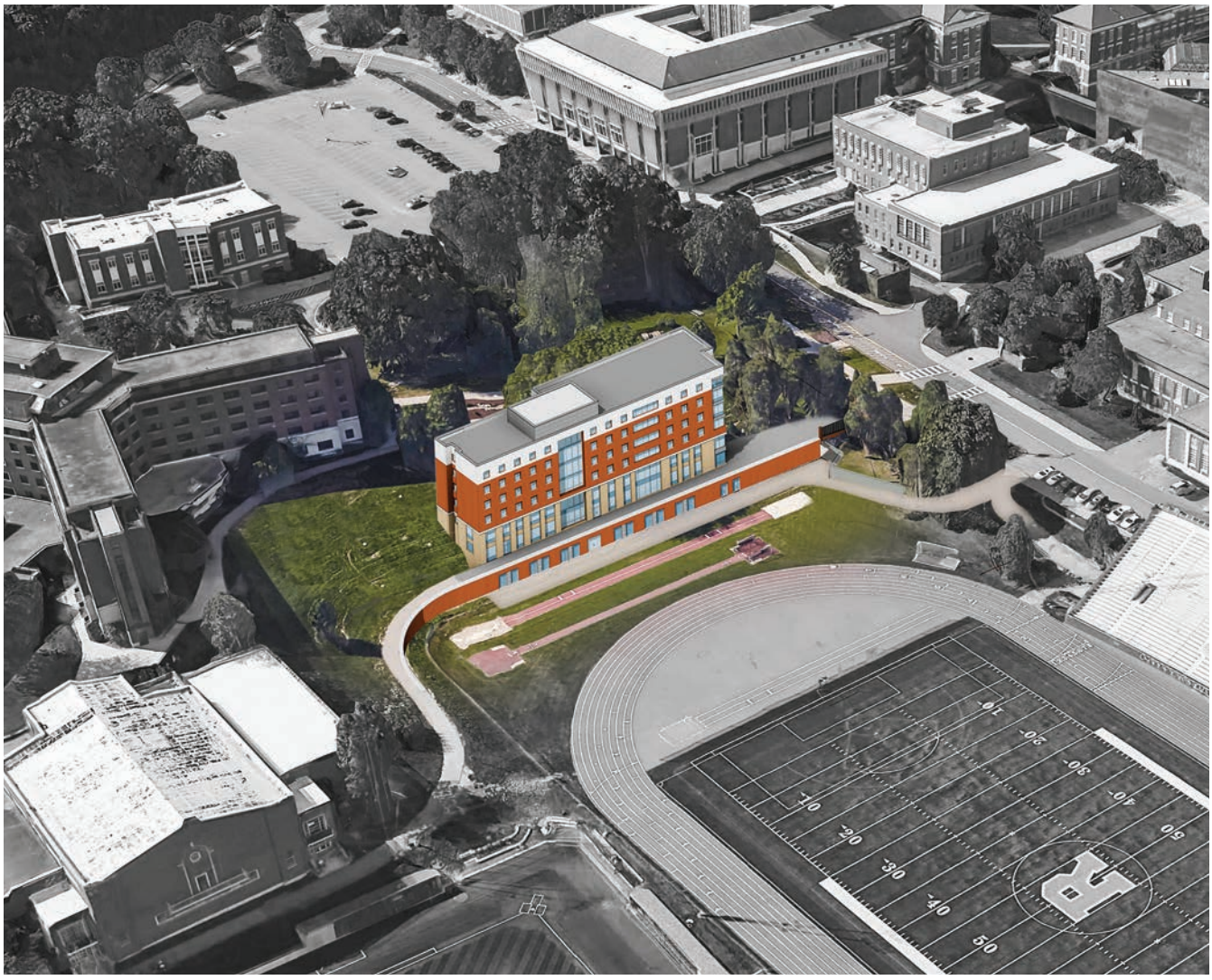
It's no secret that universities are designed to further science and foster reason, and that they tend to embrace pluralism—which, in the 21st century, also means globalism. But within those parameters, there's plenty of room for disagreement, discussion, and soul-searching. Said Joan Rubin, the Dexter Perkins Professor in History and director of the Humanities Center: "The humanities teach us the value of critical thinking, of inclusion, of empathy. The humanities teach us also about our connections to other people across time and geography, and we learn as well about our differences." R

—KAREN MCCALLY '02 (PHD)

For more about the Humanities Center and its programs, visit Rochester.edu/humanities.

"KNOWLEDGE AND CITIZENSHIP": During a teach-in at the Humanities Center this winter, faculty members presented and discussed research related to the sociopolitical climate in the United States and abroad. The daylong session was titled "Knowledge and Citizenship."

ADAM FENSTER



STUDENT LIFE

New Residence Hall Set to Open This Fall

Genesee Hall features living spaces for freshmen, new locker rooms, and other facilities.

By Sara Miller

A new residence hall that's rising near Fauver Stadium is scheduled to open in time for this fall's arrival of the Class of 2021.

The 72,000-square-foot building, named Genesee Hall, overlooks the University's Brian F. Prince Athletic Complex. Featuring four residential floors for about 150 freshman students, the building will also include meeting rooms for study groups and workshops, a new locker room facility, and training rooms for athletics programs.

STADIUM SITE: Located between Fauver Stadium and Susan B. Anthony Halls, a new residence hall will feature living space for about 150 freshmen and new locker rooms for men's and women's outdoor athletics programs.

The new building follows O'Brien Hall, completed in 2012, as the newest undergraduate residence to be built on the River Campus since 1968.

The facility's top four floors of residential space will feature single and double bedrooms; the main level will be dedicated to academic and student life services with meeting rooms and offices.

In the residential space, architects designed a bathroom area in the center of each floor with six individual, fully equipped bathrooms—each pod containing a private shower, sink, and toilet.

Additionally, the building will include three single bedrooms with attached handicapped-accessible bathrooms in compliance with standards set by the Americans with Disabilities Act.

The lower, field level of the building, called the Varsity House, will feature new locker rooms for men's and women's outdoor athletics teams as well as sports medicine and team equipment rooms.

The project is targeting LEED Silver (Leadership in Energy and Environmental Design) designation.

Among the sustainable features of the building are water-efficient fixtures in key areas, designed to reduce water usage by 45 percent, and the implementation of an energy model to address the challenge of providing an abundance of fresh air to a variety of spaces, such as the locker rooms.

The concept for the project is by Ayers Saint Gross, Architects and Planners. The design build team is the Pike Company in association with SWBR Architects.

COURTESY OF AYERS SAINT GROSS, ARCHITECTS AND PLANNERS

HUMANITIES

Longing for Liszt

Pianist and composer Franz Liszt brought star power to 19th-century music.

By Kathleen McGarvey

More than a hundred years before Beatlemania, audiences went wild for pianist and composer Franz Liszt, in thrall to his charisma and dramatic musicianship. Women vied to garner scraps of his hair or clothes or broken piano strings. German poet Heinrich Heine, his contemporary, invented a term for the sensation he created: "Lisztomania."

"It was a very similar phenomenon" to the Beatles craze, says Robert Doran, an associate professor of French and comparative literature. "His sex appeal, his looks, his magnetism—all those things became important, as they'd never been important for a musician before."

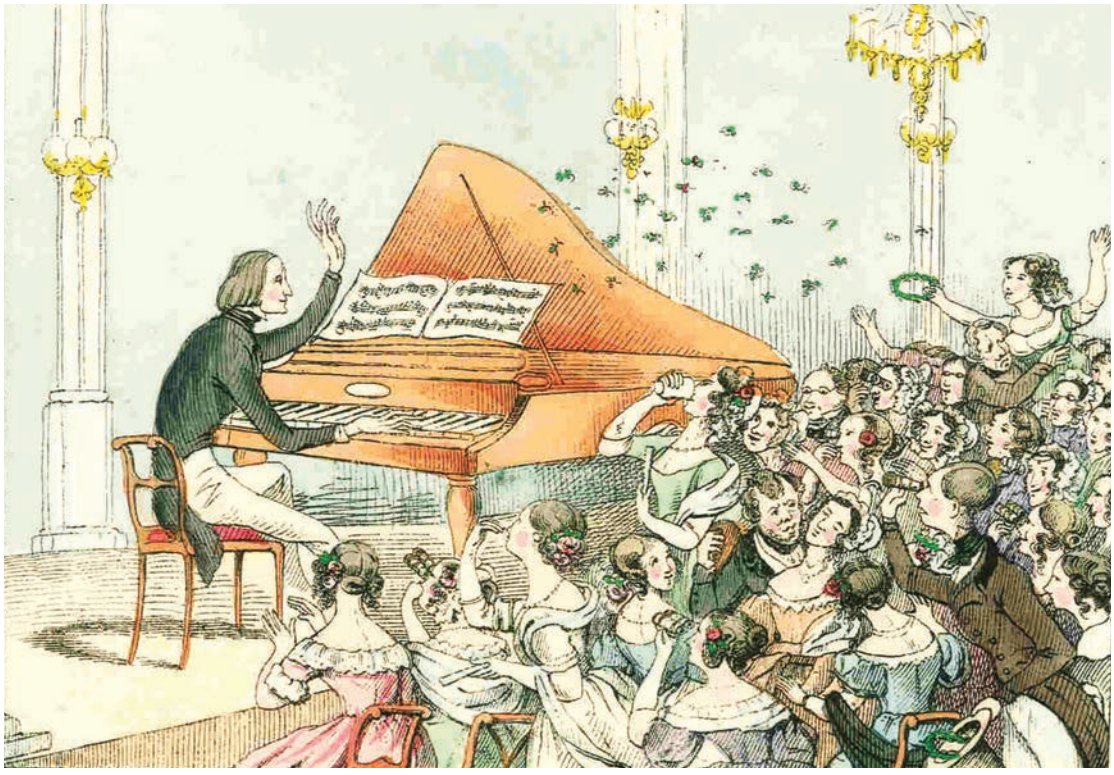
But by no means was Liszt all flash and flamboyance. "Some commentators consider him to be the greatest musician of the 19th century—greater even than Beethoven in terms of all-around musicianship, and in terms of his impact on performance," Doran says.

When he died in 1886, at age 74, Liszt left behind some 1,400 works. He created the symphonic poem and wrote instrumental music, piano works, and sacred choral music. He produced new sounds and effects that relied on extreme technical prowess at the keyboard. He was an unrivaled musical transcriber who, by arranging others' symphonic works for the piano, made music more accessible to a general public. And his influence reverberates in the works of composers such as Bartok, Grieg, Saint-Saens, Tchaikovsky, and Rachmaninoff.

In collaboration with Eastman School of Music faculty Jonathan Dunsby, a professor of music theory, and Ralph Locke, a professor emeritus of musicology, Doran was the principal organizer of a three-day international symposium on Liszt and virtuosity that was held at the University in

CAPTIVATING: Franz Liszt (left, in a portrait by Henri Charles Lehmann) played in ways intended to excite audiences—and succeeded, as shown (top right) in a caricature by Theodor Hosema of an 1842 concert in Berlin.

SCALA/ART RESOURCE



early March. It brought together some of the world's leading Liszt scholars and scholar-performers—including Alan Walker, author of a monumental three-volume biography—to consider the ways in which Liszt transformed virtuosity. The conference was among this year's Humanities Projects, a program that champions work by Rochester faculty in all humanistic fields.

A child prodigy who studied piano with Beethoven's former student Carl Czerny and with composer Antonio Salieri—best known to modern audiences as the protagonist of *Amadeus*—Liszt took over the financial support of his family at age 15, after the death of his father. But grief drove him from the stage, and he considered a clerical life. Among the influences that called him back was hearing violinist Niccolò Paganini perform. The young man determined to achieve the same level of virtuosity on the piano that Paganini had on the violin.

He set forth on his career at a time when music was taking on a much more expansive social role. Formal musical performances had been the territory of the aristocracy; in the 19th century, with the rise of bourgeois culture, a concert-going public emerged. "People were learning, appreciating, and enjoying music—and supporting it monetarily, so that you could start to make a lot of money from it," says Doran. Liszt launched one of the first concert tours, the forerunner of today's "worldwide tours." Because the apparatus of touring didn't yet exist, Liszt did everything, from booking the venue to advertising the concert, before he took the stage.

His deft management of the business side of performing didn't detract from popular adulation of his artistry. "He basically incarnated what we now call the modern virtuoso," Doran says. And audiences claimed for music a newly lofty status. "It was the exaltation of genius, musical genius, that gave the musician a new social status," he says.

Appealing to the public meant that virtuosity and public spectacle took on new significance, too. Liszt created the conventions of the modern classical music performance, repositioning the piano in profile to the audience, so that his playing could be better seen—before Liszt, pianists performed with their backs to the audience. It was said that to really hear Liszt, you had to see him. "His performances were also a visual experience," Doran says.

Liszt invented the practice of performing from memory. Playing without sheet music had been considered less than serious, because it looked like improvisation.

And Liszt excelled at improvisation, too. Concerts—which, before he remade them, were more like variety shows—involved a musician playing others' works, original works, and improvisations. "Often the audience would provide a theme, and then the virtuoso would be called upon to play on it, to make sure that you hadn't written on it before. It was very important to show that you were able to improvise in the moment," Doran says.

But in Liszt's day, virtuosity was in tension with so-called "serious music," he adds. Liszt was criticized for being too much of a showman, and using virtuosity to bring music down to public tastes. It "often unjustly marred his reputation as a composer," Doran says. But ultimately, Liszt redefined virtuosity as something artistically potent and not mere showmanship.

"It's difficult to understand his innovations because we take them all for granted now," says Doran.

With reporting by Helene Snihur.

TRENDSETTER

Liszt List

Franz Liszt—who once famously declared *"Le concert, c'est moi"*—changed classical music in a dizzying number of ways:

First "star" of the musical world

Inventor of the public concert tour

Coiner of the term "solo recital"

Inventor of the master class

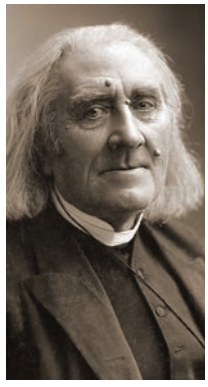
Creator of many of the conventions of modern piano performance, including the pianist entering from the wings, playing in profile to the audience, and performing from memory

Performer and composer who pushed the boundaries of piano technique to their limits

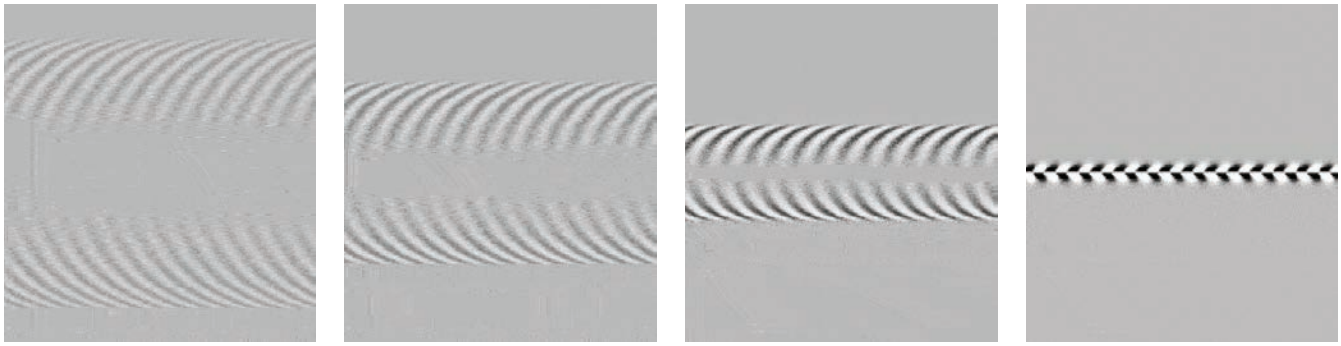
Most important **musical transcriber,** who made music newly accessible to the public

Champion of the musical avant garde of his day

—Kathleen McGarvey



MAESTRO: Liszt's innovations are taken for granted today.



NEEDLES KNOW: A new beam pattern, known as a "needle pulse," may have applications in imaging as well as manufacturing.

New 'Needle Pulse' Beam Pattern Packs a Punch

A new beam pattern devised by Rochester researchers could bring unprecedented sharpness to ultrasound and radar images, burn precise holes in manufactured materials at a nano scale—and even etch new properties onto their surfaces.

These are just a few of the items on the "Christmas tree" of possible applications for the beam pattern that Miguel Alonso, professor of optics, and Kevin Parker, the William F. May Professor of Engineering, describe in a recent paper in *Optics Express*.

The pattern results from what Parker calls "an analytically beautiful mathematical solution" that Alonso devised. It causes a light or sound wave to collapse inward, forming—during a mere nanosecond or less—an incredibly thin, intense beam before the wave expands outward again.

"All the energy fits together in time and space so it comes together—*bam!*—like a crescendo," says Parker, explosively clapping his hands for emphasis. "It can be done with an optical light wave, with ultrasound, radar, sonar—it will work for all of them."

Most traditional beam patterns maintain a persistent shape as long as the source is operating.

However, such patterns are not as intense as the beam created by Parker and Alonso, which the researchers call a "needle pulse beam."

"It is very localized, with no extensions or side lobes that would carry energy away from the main beam," says Alonso.

Side lobes, radiating off a beam like the halos sometimes seen around a car headlight, are especially problematic in ultrasound. "Side lobes are the enemy," Alonso says. "You want to direct all of your ultrasound wave to the one thing you want to image, so then, whatever is reflected back will tell you about that one thing. If you're also getting a diffusion of waves elsewhere, it blurs the image."

In addition to ultrasound, microscopy, radar, and sonar. Alonso says industrial applications might include any form of laser materials processing.

—Bob Marcotte

Rochester Drug Extends Effectiveness of HIV Therapy

A drug developed at the Medical Center extends the effectiveness of multiple HIV therapies by unleashing a cell's own protective machinery on the virus. The finding, published in the *Journal of Clinical Investigation*, is an important step toward the creation of long-acting HIV drugs that could be administered once or twice per year, in contrast to current HIV treatments that must be taken daily, according to Medical Center researchers.

The drug, called URMC-099, was developed in the laboratory of neurology professor Harris (Handy) Gelbard, the director of the Center for Neural Development and Disease, who has studied HIV/AIDS for the past 25 years.

When combined with "nanoformulated" versions of two commonly used anti-HIV drugs (also called antiretroviral drugs), the Rochester drug acts by interrupting a process called autophagy, which normally allows cells to get rid of intracellular "trash," including invading viruses. In an HIV infection, the virus prevents cells from turning on autophagy. But when the new drug lifts the brakes on autophagy, cells are able to digest any virus that remains after treatment with antiretroviral therapy, leaving cells free of virus for extended periods of time.

The finding builds on previous research that Gelbard conducted with Howard Gendelman, a professor and chair of the Department of Pharmacology/Experimental Neuroscience at the University of Nebraska Medical Center.

—Emily Boynton

VIRUS VILLAIN: By helping cells unleash their ability to fight viruses, a Medical Center–developed drug may boost HIV-fighting therapies.

Knowing Numbers: A Primate Ability?

Several primate species may be able to use numbers to estimate amounts, according to the latest work of a Rochester lab that's long been exploring how humans develop concepts such as simple counting and complex mathematical reasoning.

In a study published in the journal *Nature Communications*, the team of Jessica Cantlon, associate professor of brain and cognitive sciences, PhD candidate Steve Ferrigno, Steven Piantadosi, an assistant professor of brain and cognitive sciences, and Julian Jara-Ettinger, a postdoctoral researcher in brain and cognitive sciences at MIT, compared number perception for a single task that was performed across a diverse testing population. The results suggest that primates have the ability to distinguish large and small quantities of objects, irrespective of the surface area they appear to occupy.

The new work follows earlier studies led by Cantlon who, early in her career at Rochester, began studying primates in a search for the origins of numeric understanding. In 2013, she, Ferrigno, and colleagues at Rochester and Rochester's Seneca Park Zoo made a surprising discovery: in an experiment using varying quantities of peanuts, baboons (even as young as one year of age) clearly showed an ability to distinguish between large and small quantities of objects.

But the finding raised another question. To what extent might that ability be influenced by other dimensions of those objects—such as their relative surface area—in addition to their number?

HOW MANY MONKEYS? New Rochester research indicates that rhesus monkeys and other primates can use numbers to estimate amounts.

For the new study, the group looked at both humans and primates: adults and children in the United States; adults of the Tsimane', a predominately "low numeracy" cultural group that inhabits an area of remote rain forest in Bolivia, and that has been long studied by Piantadosi and Jara-Ettinger; and rhesus monkeys, a species with strong neural and cognitive similarities to humans.

The researchers found that all groups showed a bias toward numbers over surface area in their estimations.

"This shows that the spontaneous aspect of extracting numerical information likely has an evolutionary basis, because this has been seen across all humans and also with other primate species," says Ferrigno.

The study also showed that the bias toward the numerical dimension was strongest in humans compared to primates, and was correlated with increasing age and math education in humans.

—Bob Marcotte

'Chemo-brain' Is Pervasive, Study Shows

The largest study of a condition known as "chemo-brain" shows that women with breast cancer report it's a substantial problem after chemotherapy for as long as six months after treatment, according to investigators at the Wilmot Cancer Institute.

Scientists have known that cancer-related cognitive impairment, which includes problems with memory, attention, and processing information, is an important issue for patients. Yet previous studies have left questions about when and why it occurs and who is most likely to develop the condition.

Led by Michelle Janelsins, an assistant professor of surgery in Wilmot's Cancer Control and Survivorship Program, and published in the *Journal of Clinical Oncology*, the new study compared 581 breast cancer patients treated at clinical sites across the United States and 364 healthy people, with a mean age of 53 years in both groups. Using a well-validated measurement of impairment, investigators found that compared to healthy people, the scores of women with breast cancer exhibited 45 percent more impairment. Over a period of nearly a year, 36.5 percent of women reported a decline in scores compared to 13.6 percent of the healthy women.

—Leslie Orr

Building a Better Microbial Fuel Cell—with Paper

Researchers at the University have made significant progress toward using bacteria to generate an electrical current, a century-old concept known as a microbial fuel cell.

In work published in *ACS Energy Letters*, Kara Bren, a professor of chemistry, and Peter Lamberg, a postdoctoral fellow, report that they have developed an efficient electrode for a fuel cell that relies on bacteria found in wastewater by using a new preparation of a common household material: paper.

The breakthrough is important because the new electrode is less prone to corrosion and clogging than previous methods.

Until now, most electrodes used in wastewater have consisted of metal, which rapidly corrodes, or carbon felt. While the latter is the less expensive alternative, carbon felt is porous and prone to clogging.

Bren and Lamberg's solution was to replace the carbon felt with paper coated with carbon paste, which is a simple mixture of graphite and mineral oil. The carbon paste-paper electrode is not only cost-effective and easy to prepare, but also outperforms carbon felt.

In making their electrode, Bren and Lamberg created a layered sandwich of paper, carbon paste, a conducting polymer, and a film of the bacteria. The paper electrode had an average output of 2.24 amps per unit area, compared to 0.94 with the felt anode.

"We've come up with an electrode that's simple, inexpensive, and more efficient," says Lamberg. "As a result, it will be easy to modify it for further study and applications in the future."

—Peter Iglinski

FRANK AND JOYCE BUREK/NATIONAL GEOGRAPHIC CREATIVE

Federal Judge Jimmie Reyna '75 to Address Commencement

Jimmie Reyna '75, a circuit judge for the United States Court of Appeals for the Federal Circuit and the first Latino to serve on the court, will deliver the commencement address to the Class of 2017 at this spring's ceremony.

During the ceremony on May 21, Reyna will also receive the Charles Force Hutchison and Marjorie Smith Hutchison Medal. It's the University's highest alumni award, presented for career achievements and notable service.

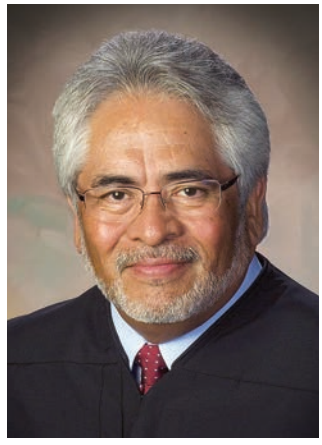
"It is an honor to welcome back to Rochester the Honorable Judge Reyna," said Joel Seligman, University president, CEO, and G. Robert Witmer, Jr. University Professor. "He is an outstanding judge, esteemed for his integrity and judiciary achievements, as well as his strong commitment to community."

Appointed to the U.S. Court of Appeals by President Barack Obama in 2011 and unanimously confirmed by the U.S. Senate, Reyna is widely recognized as an international trade lawyer respected for his skill in trade policy, business regulation, and compliance law, and has a distinguished track record of leadership in the Hispanic legal community.

He graduated from the University with a bachelor's degree in history in 1975, at the same time as his wife, Dolores, who earned a bachelor's degree in psychology.

He received a law degree from the University of New Mexico School of Law in 1978. The Reynas' youngest son, Justin, is also a Rochester alumnus, graduating in 1999 with a degree in religion.

Additional information about University commencement ceremonies and related activities is available at Rochester.edu/commencement. The May 21 ceremony will be live-streamed on the web.



HONOREE: In addition to speaking at this spring's commencement ceremony, Reyna will receive the University's highest alumni award.

SCIENCE LEADER: An internationally recognized biochemist, Maquat also is being honored for her work to mentor students, particularly women.

International RNA Society Recognizes Biochemist

Lynne Maquat has been chosen to receive the 2017 Lifetime Achievement Award in Science from the RNA Society.

The international group of 1,000 members is organized to promote research in developmental biology, evolutionary biology, biochemistry, biomedical sciences, chemistry, genetics, and virology as they relate to questions of RNA structure and function.

Maquat was selected in recognition of her biochemical work to unravel what happens in cells during disease and for her work to mentor new generations of researchers and to advocate for young women in the sciences.

Maquat, who holds the title of J. Lowell Orbison Endowed Chair and Professor in the Department of Biochemistry and Biophysics at the School of Medicine and Dentistry, began her professional career studying inherited anemias.

She discovered a quality control process that blocks the creation of toxic proteins that cause disease, a process that plays a part in one-third of all inherited diseases, such as cystic fibrosis and muscular dystrophy, and one-third of all acquired diseases, including a number of cancers.

She is the founding director of the University's Center for RNA Biology: From Genome to Therapeutics.

The National Institutes of Health has continuously funded Maquat's research for the past 34 years.

She's published more than 150 papers and reviews and one of her projects recently received an NIH MERIT award, a highly coveted type of grant that provides long-term, stable support to investigators whose research skills and productivity are distinctly superior, as judged by their peers and leaders at the NIH. Maquat joined the Medical Center's faculty in 2000 and has been a member of the RNA Society since its formation in 1993.

She will accept the award at the society's 22nd annual meeting this June in Prague.

COURTESY OF JIMMIE REYNA '75; ADAM FENSTER (MAQUAT)

Medical Center to Study Infectious Threats

The Medical Center will receive up to $9 million from the Centers for Disease Control and Prevention to conduct surveillance and research on infectious diseases over the next five years.

The award renews the University's role as a member of the CDC's Emerging Infections Program, a national network that keeps watch on the activity of several infectious threats and conducts studies that guide policy related to prevention and treatment.

The New York State Emerging Infections Program, based at the Center for Community Health, partners with the New York State Department of Health to track a wide range of diseases that have an impact on the public. The program also evaluates new therapies and prevention methods, such as the use of the HPV vaccine to curtail human papillomavirus infection, to determine effectiveness across the population.

The Rochester region and several counties surrounding Albany comprise the New York State program, one of just 10 sites selected by the CDC. Data from New York are combined with data from sites in California, New Mexico, Minnesota, Tennessee, and other locations. Together, the communities are roughly representative of the U.S. population on the basis of age, gender, race, and health indicators such as population density and poverty level.

GUEST: During her visit, author and educator DeGruy met with students and delivered the annual MLK address.

MLK Speaker Joy DeGruy: 'We Need to Heal'

Nationally renowned author, educator, and activist Joy DeGruy urged students and other members of the University community to recognize the cognitive dissonance that's inherent in a nation whose principles are based on freedom and democracy but that's still living with the legacy of slavery.

DeGruy, an assistant professor at Portland State University and the author of *Post Traumatic Slave Syndrome: America's Legacy of Enduring Injury* and *Healing* and *Post Traumatic Slave Syndrome: The Study Guide*, said the trauma wrought by slavery and the slave trade continues to have psychological and biological as well as social consequences for African Americans.

"Trauma is trapped in the DNA, so when I say we need to heal, if we do not heal, we doom future generations," she said during the annual Martin Luther King Jr. Commemorative Address.

A self-described ambassador for healing, DeGruy is an academician in social work with more than 20 years of experience in the field.

She has spent her career amassing evidence of the trauma experienced by slaves, and how decades of subjugation under Jim Crow resulted in psychic injuries that have persisted in African-American communities across generations.

As this year's speaker, she spent a day on campus meeting with students and faculty to discuss issues of race and civil rights and the responsibility of citizens to speak out against injustice.

She answered questions and talked about her background, her experiences as a teacher, and about fighting injustice.

"Choose your battles," she told students. "But always be who you are."

Financial Times Gives Simon High Marks

The Simon Business School was listed among the world's best business schools in an annual ranking published by the *Financial Times* of London.

In specialty rankings, Simon was second in the world for finance and fifth in the world for economics.

Simon is also ranked 38th among U.S. business schools (from 41st last year).

The annual survey was based this year on information collected from global business schools and their Class of 2013 graduates.

Business schools are ranked by the *Financial Times* annually based on several criteria: the career progression accrued from the MBA, diversity, and research. Other factors include placement statistics (such as salary percentage increase and weighted salaries); measures of the diversity of schools' students, faculty, and board members; and statistics of each school's faculty and their research in 45 internationally refereed journals.

ADAM FENSTER (DEGRUY); NEWSCAST ONLINE LIMITED/ALAMY (NEWSPAPER)

GLOBAL VIEW

A Tale of Two Indias

An anthropologist explores the changing landscape of rural India.

By Peter Iglinski

In the early 1990s, Gurgaon was a small city in northern India that blended with the nearby farm fields and villages.

But much has changed since then, as Gurgaon and its environs have been transformed into a financial hub with modern office buildings, condominiums, and luxury malls towering over the former agricultural landscape.

Gurgaon has become one of the premier success stories in the developing nation. But Llerena Searle, an assistant professor of anthropology, says there's more–or less–than meets the eye.

Searle spent 16 months in India interviewing more than a hundred investors, bankers, developers, contractors, architects, marketers, planners, consultants, and others. Her findings, presented in a new book, *Landscapes of Accumulation: Real Estate and the Neoliberal Imagination in Contemporary India* (Chicago), detail the factors and the relationships behind the sudden, even spectacular, growth of India's cities, while providing insights into how urban areas are developed around the world.

"While Gurgaon's new buildings look like signs that Indian society has changed and become more global," says Searle, "they are actually speculative gambles, based on stories that predict those social changes."

A Sikh man who invests in the capital region repeated a story that Searle heard often about growing demand for housing and increasing prosperity rates, driven primarily by the IT industry. But Searle's research indicated that the tale is one that real estate developers tell in order to attract investors.

In 2008, only one-half of 1 percent of India's working population actually worked in IT. Ninety-five per cent of the population earned less than $4,400 per year—far less than the income needed to buy the luxury apartments developers were building.

"Speculation isn't just the madness of crowds," Searle says. "It's a widespread business practice." The practice, as described in the book, has led to fancy golf courses, high-end malls, and ornate corporate headquarters that cater to a shrinking minority of the population.

The practice became more commonplace after 2005, when foreign companies were given the right to invest in real estate, as long as they partnered with local developers.

Of course, a major step in attracting that foreign money was convincing international corporations that India—with a population exceeding one billion—was, indeed, the next big thing.

"The media and the real estate industry both hype a reality that only a fraction of the population could possibly experience," says Searle. "Unfortunately, the end result is construction that exacerbates the dispossession of the poor."

While foreign companies have been eager to profit from construction projects in India, they did not see eye-to-eye with the Indian developers on critical issues, such as construction practices and accounting methods. That has led to uneasy partnerships and tense negotiations.

Examining those partnerships in detail, Searle shows that foreign investment is not just a matter of reducing government regulation. Rather, it relies on attempts to control and standardize building practices, as well as on stories about growth and prosperity. R

CITYSCAPES: While some Indian cities like Gurgaon (above) have experienced impressive growth, the changes have exacerbated challenges faced by the poor, a Rochester anthropologist argues in a new book.

IN PICTURES LTD./CORBIS VIA GETTY IMAGES

Ask the Archivist:
Does the de Kiewiet Refugee Scholarship Continue?

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

In 1985–87 there was an active divestment movement around South Africa on campus. As part of that, students (in collaboration with a program started by Bishop Desmond Tutu) created the Cornelis de Kiewiet Southern African Refugee Student Scholarship Fund. This was funded in part by his widow, who donated $20,000 as a result of a letter from the student organizing group and a vote by the student body to support some of the costs through student activity fees. The rest was covered by the University. There were some students who arrived when I was a senior, but I never heard much about their time at Rochester and how long the program lasted. Obviously with the changes in South Africa in the 1990s the needs and circumstances changed. I was part of this work as a student and am curious. Any idea? —Andrew Fisk '87, Amherst, Massachusetts

In her 2014 history, *Our Work Is But Begun: A History of the University of Rochester 1850–2005*, Janice Bullard Pieterse describes the University's investment and subsequent divestment of South Africa holdings in the 1980s: "The endowment portfolio underwent significant diversification credited with improving its performance. The changes included purchases in large corporations [containing] a handful doing business in South Africa. . . . Three hundred faculty members petitioned for an end to South African investments. Within weeks, the administration's committee on investing and ethical considerations recommended divestiture. . . ."

Students were vocal, vital, and constructive in effecting the change in policy. They formed the South African Action Coalition (SoAAC), and throughout your junior year, there were rallies and petitions, culminating in April 1986, when a Shantytown was erected on the Eastman Quadrangle while a teach-in at the Interfaith Chapel presented lectures, workshops, and a panel discussion.

The SoAAC, along with the Social Concerns Committee of the Interfaith Chapel's Protestant Chapel Community, proposed the establishment of a scholarship fund—named for Rochester's fifth president, Cornelis de Kiewiet—to support students who were affected by the apartheid system.

Under the proposal, the University agreed to waive tuition for two students, whose room and board would be supported by the de Kiewiet scholarship endowment; additional funds were to be provided by the Bishop Tutu Southern Africa Refugee Scholarship Fund, and the Phelps-Stokes Fund.

UNIFIER: An outspoken critic of the apartheid system of racial segregation, Cornelis de Kiewiet grew up in South Africa. At Rochester, he led the merger of the men's and women's colleges.

Cornelis de Kiewiet was born in the Netherlands and grew up in South Africa; throughout his life, he spoke out against apartheid, lecturing widely and writing *The Anatomy of South African Misery*. During his tenure at Rochester (1951–61), de Kiewiet led the unification of the colleges for men and women and the establishment of the graduate schools of engineering, business, and education. Concurrent with these efforts, he also served as chair of the board of directors of the American Council of Learned Societies, president of the Association of American Universities, and conducted studies for both the Carnegie and Ford foundations on aspects of educational, political, and social conditions in South Africa. He died on February 15, 1986.

His wife, Lucea Hejinian de Kiewiet, generously (and unexpectedly) contributed toward the scholarship endowment; the balance was funded by the allocation of $1 of the student activities fee paid by all undergraduates for four years—an unusual and somewhat controversial move, but one which was approved by a student body referendum.

The *Campus-Times* indicates there were two students who started in the fall of 1987; others have followed, but not more than two at a time so that the scholarship outlay would not outpace the endowment income.

After the dismantling of apartheid in 1994, the wording of the original scholarship was revised, and it is now available to "students of African national origin or descent, with a preference for students of African national origin or descent whose families have experienced dislocation, resettlement, or other economic or political constraints due to conflict in Africa."

Need History?

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

BASKETBALL

Best in Class

Two Yellowjackets named finalists for one of the top awards in college basketball.

Women's basketball forward Al Leslie '18 and men's guard Sam Borst-Smith '17 have helped lead the Yellowjackets since they first stepped onto the floor at the Palestra. Off the court, though, each of them has demonstrated a level of achievement and service that has impressed not only their teammates, but also those across the country who pay close attention to college basketball.

Leslie, a business major from Lancaster, Pennsylvania, and Borst-Smith, an English major from San Pedro, California, were each named this spring as finalists for the Jostens Trophy, considered one of college basketball's top individual awards, recognizing athletic skill, academic achievement, and community service.

Leslie is the first Rochester women's basketball player selected as one of 10 finalists. Borst-Smith is the third Rochester men's finalist.

One of the leading scorers in Rochester women's basketball history (with her senior season remaining), Leslie has earned league and district academic honors. She volunteers with the Lancaster County (Pennsylvania) Project for the Needy, delivering more than 1,500 Christmas dinners to low-income families. A member of the University's St. Sebastian Society, a service organization, she also tutors elementary students at Rochester city schools.

As the Yellowjackets advanced to postseason play, Borst-Smith was leading the Yellowjackets in several categories for 2016–17, including points per game (16.1) and rebounding per game (5.6), and he set a single-season record for steals, with 74. As of early March, he ranked seventh all time in scoring, with 1,460 points.

He's an athletics volunteer for the Go4theGoal Foundation, a group that raises awareness and funds for children with pediatric cancer. He's also a member of the campus chapter of the Fellowship of Christian Athletes and has been active in promoting a campuswide project to raise awareness about racial and gender diversity.

The winners of the trophy will be named March 16 and 17, during the Division III Final Four in Salem, Virginia.

Postseason Play

Rochester's men advanced to the Sweet 16 round of the NCAA Division III tournament in March, winning their regional match-ups at the Palestra on March 3 and 4. The Yellowjackets, ranked No. 13 in the country, were set to play their sectional matches at Marietta College in Ohio, beginning March 10.

The women's team also earned an NCAA berth. After winning their first round game, the Yellowjackets fell to SUNY-Geneseo to end their season.

Stay up-to-date with Yellowjackets scores and highlights at the website of the Department of Athletics and Recreation: UofRathletics.com.

ADAM FENSTER

Alexandra Leslie '18

Forward
Lancaster, Pennsylvania
Business major

Career points: 1,421 (third all-time)

Season leader: scoring (21.9 points per game); rebounding (9.7 per game); blocked shots (44)

First Team All-UAA (three consecutive seasons)

Two-time All-America

Preseason All-America for 2016-17

First Team Academic All-District III

Two-time UAA All-Academic Team

Sam Borst-Smith '17

Guard
San Pedro, California
English major

Career points: 1,460 (seventh all time, as of March 6)

Career leader: steals (210) (first all-time)

Season leader: scoring (16.1 points per game); rebounding (5.6 per game); steals (74)

First Team All-UAA

UAA Player of the Year

Player to watch: one of six from Division III listed for the Clarence (Bevo) Francis Award for the top Small College Player of the Year

SQUASH SKILLS: Winner of the Skillman Award, Ryosei Kobayashi '17 finishes his squash career as one of Rochester's most decorated players.

HIGHLIGHTS

Tops in Squash

A senior earns collegiate squash's top honor as the team hits the No. 1 spot during the season.

Ryosei Kobayashi '17 was already one of the best to ever play squash at Rochester.

This winter, he took his place among the most decorated in Yellowjackets history after capturing the 2017 College Squash Association Skillman Award.

Intercollegiate squash's highest honor, the award is given annually to a senior men's squash player who has demonstrated outstanding sportsmanship during his entire college career. The award is named for former Yale coach John Skillman, who led the Bulldogs to multiple national titles in more than 40 years of leading the team.

Kobayashi, a business major from Yokohama, Japan, is the second Yellowjacket to win the honor. Benjamin Fischer '12 was named the Skillman winner after the 2012 season.

The award was a capstone to a season in which the Yellowjackets were ranked No. 1 in the country for the first time in the program's history.

Rochester was named to the top spot in late January, after defeating then top-ranked Trinity College.

The Yellowjackets' previous best ranking was second in the country, which came after a loss to Yale in the 2015–16 national championship. That game marked the first appearance by Rochester in the title match in school history.

After a loss to Harvard that knocked the team out of the top spot, Rochester ended the 2016–17 season at No. 5 in the nation, recording 13 wins for the season—the second most wins in a single season in team history.

ADAM FENSTER (BORST-SMITH); ATHLETICS AND RECREATION (KOBAYASHI)

The Future of the Past

Textual scientist Gregory Heyworth lights up the first drafts of history.

By Kathleen McGarvey

Pack lightly, seasoned travelers advise. Take only what you need.

And Gregory Heyworth, an associate professor of English, does. A scant collection of clothes makes it into his bags when he flies to Italy, or the former Soviet republic of Georgia, or Wales. He pares his wardrobe to make room for the camera, panels of LEDs, computers, and other pieces of equipment that fill his luggage instead.

Trained as a scholar of medieval literature, Heyworth has become—in a term he coined—a "textual scientist." He recovers the words and images of cultural heritage objects that have been lost, through damage and erasure, to time.

He calls it "forensic science applied to literature and to history." And while he paints the effort in swashbuckling terms—he has described himself as "an adventurer in an undiscovered country, searching for the hidden text"—a somber urgency drives him. At a bare minimum, he estimates, there are 60,000 manuscripts from before 1500 in Europe alone that are damaged to the point of illegibility.

Some of the objects are faded; some, charred; some, moldy and crumbling. Some surely hold secrets that could change our sense of history. And time is not their friend.

To rescue them, Heyworth and his collaborators on the aptly named Lazarus Project created the contents of his airline baggage: a transportable multispectral imaging lab—the only one in the world—that uses different wavelengths of light to photograph cultural artifacts. The team analyzes the images, digitally salvaging ancient manuscripts, maps, and other texts too delicate and precious to transport. They make the undecipherable, and even the invisible, legible again.

To do so requires a broad amalgamation of expertise—and much of that breadth is represented by Heyworth himself.

Michael Phelps, director of the California-based Early Manuscripts Electronic Library (EMEL) and a frequent collaborator, calls him an "engine of innovation." Textual science, he says, couldn't exist

COURTESY OF THE LAZARUS PROJECT

ILLUMINATING: Textual scientist and English professor Gregory Heyworth uses multispectral imaging to digitally restore ancient manuscripts, like this 12th-century manuscript of the Gospels, now held in the Svaneti Ethnographic Museum in Mestia, Georgia.

without someone like Heyworth. "It needs someone who is a humanities person, who knows the manuscripts and the collections. And someone who has some chops in hard science, too—someone who brings both sides of the equation together."

The work requires expertise in paleography—the study of old handwriting—and codicology, the study of books and manuscripts as material objects and cultural artifacts. It demands proficiency in imaging science and computer science. It calls for knowledge of chemistry, to understand the makeup of inks and their interactions with the surfaces on which they were used.

The cadre of people able to carry out the projects is vanishingly small—which is why Heyworth sees one of his most important tasks as developing a textual science curriculum to train students.

"There are only about 20 people in the world now who do this," he says. "And that has to change."

Heyworth joined the University in July, from the University of Mississippi. Henry Kautz, the Robin and Tim Wentworth Director of the Goergen Institute for Data Science and a professor of computer science, spotted him when he led a search committee seeking to hire faculty whose nontraditional research could bridge different disciplines. "It's state-of-the-art work," says Kautz.

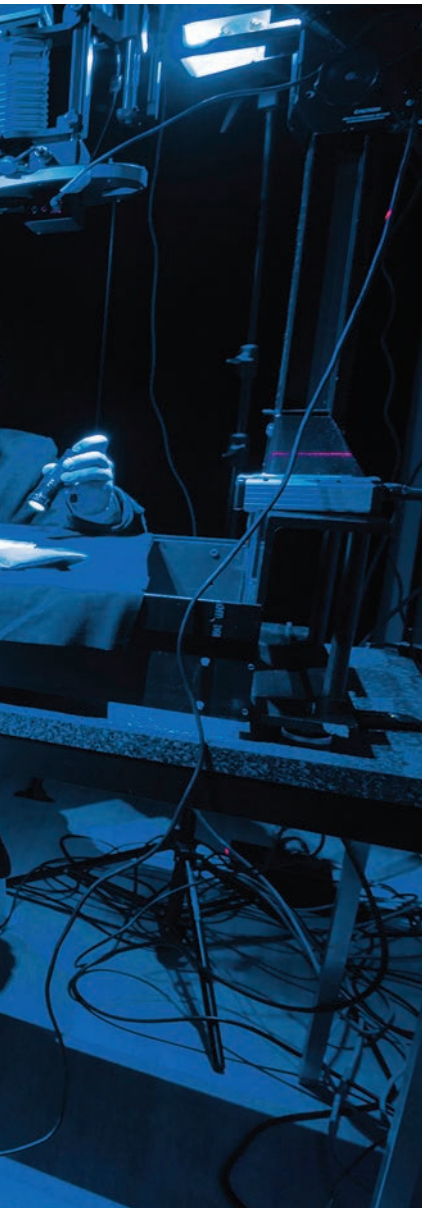
Heyworth arrived at his specialty "by necessity," he says. After earning a doctorate in comparative literature at Princeton, he spent five summers in Dresden, Germany, scrutinizing "Les Eschéz d'Amours," ("The Chess of Love"), an anonymous, 14th-century poem that's one of the longest verse works in French. Only a handful of manuscript copies ever existed, and just two survived: a fragmentary copy in Venice and a nearly complete copy, lacking only the ending, in Dresden. But that manuscript was virtually destroyed by water during Allied bombing in 1945, "leaving the manuscript's once pristine parchment a faded and murky Rorschach of figures on blotting paper," Heyworth has written.

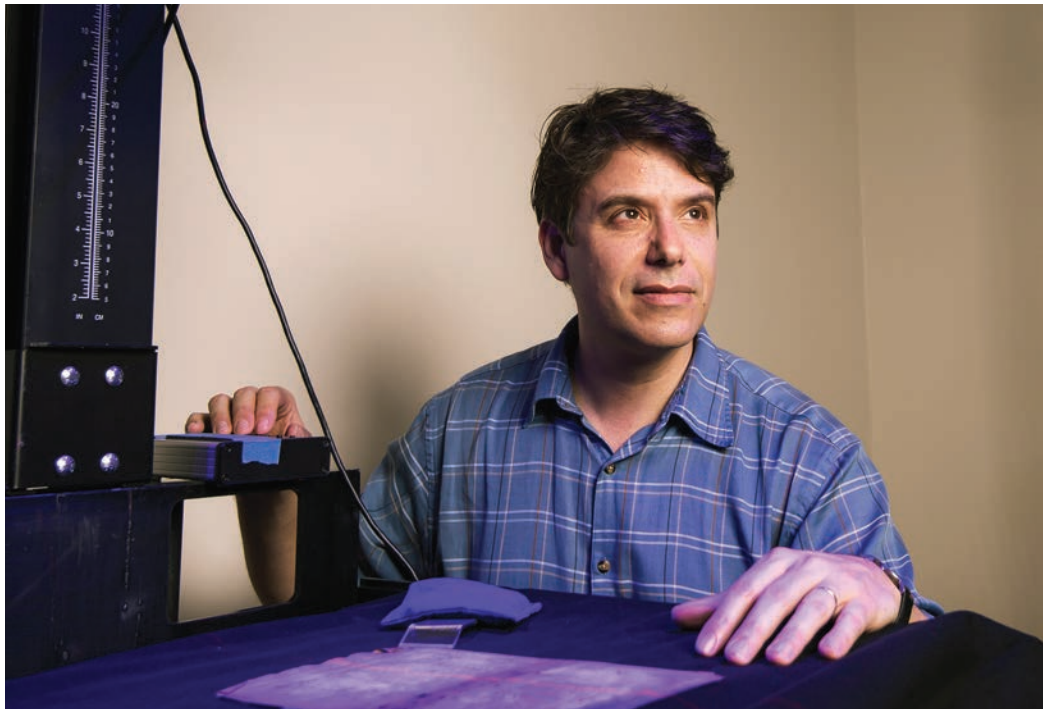
Though scholars considered the poem to be effectively lost, Heyworth refused to give up. For those five years, he used ultraviolet lamps to try to recover traces of the writing, a long-established salvage technique first developed by a German monk in 1914. He followed the method as far as it would take him—but it wasn't far enough.

Determined to find a way forward, he began to look online for ideas. And that's how he discovered the work of Rochester Institute of Technology (RIT) imaging science professor Roger Easton, who had led a team in using multispectral imaging to recover works by Greek mathematician Archimedes from a 12th-century palimpsest.

Palimpsests are essentially recycled pieces of treated animal hide, better known as parchment. Parchment was a precious commodity,

ADAM FENSTER





TEAMWORK: English graduate students Helen Davies and Alex Zawacki (left) examine a 15th-century manuscript binding fragment under the multispectral imaging equipment in the lab of Gregory Heyworth (above), an associate professor of English. Training new experts in his techniques is a vital task for Heyworth.

and so ancient and medieval scribes would reuse it, literally scraping away old writing to create a blank surface for new text.

In the case of the Archimedes palimpsest, seven of his treatises—10th-century transcriptions of his work from the 3rd century BCE—had been erased and the pages rebound and written over as a prayer book by monks. An anonymous buyer purchased the piece—called a codex, an ancient manuscript assembled in book form—at auction at Christie's New York in 1998. He entrusted it to what is now the Walters Art Museum in Baltimore for conservation, an effort that spanned a decade. Imaging and analysis by Easton, physicist and imaging specialist William Christens-Barry, and Keith Knox '70, '75 (PhD), formerly an imaging scientist at Xerox, was fundamental to an effort that yielded about 80 percent of the original text and revealed a previously unknown work by Aristotle.

"The flash of a camera and a clever algorithm . . . can transform a page," wrote Walters curator William Noel of the process, in a book he coauthored with Reviel Netz, *The Archimedes Codex: How a Medieval Prayer Book Is Revealing the True Genius of Antiquity's Greatest Scientist* (Da Capo Press, 2007).

Here, Heyworth realized, was the key that might open the "Eschéz" manuscript.

He contacted Easton in the summer of 2009 with a plan. Heyworth applied for—and received—a grant from the National Center for Preservation Technology and Training to build a transportable version of the multispectral imaging lab that Easton's team had used in Baltimore. Easton, imaging entrepreneur Ken Boydston—whose company, Megavision, created the camera Easton used—and Michael Phelps worked with Heyworth to create the system.

What the naked eye can detect is only a fraction of what manuscripts—or maps, or globes, or inscribed stones—contain. But multispectral imaging can expose what otherwise lies hidden.

The method developed by the Archimedes group relied on remote sensing technology invented by military and environmental scientists to photograph terrain using 12 light frequencies between ultraviolet and infrared light. The innovation of Easton's team was using light-emitting diodes, or LEDs, as the light source. Cool LEDs don't subject manuscripts to the damaging heat that broadband light does, and they bring greater efficiency, exposing pages only to the desired form of energy. The method "produces much better results and does no damage to the object," says Heyworth.

He met Easton for the first time in 2010, when Easton and Boydston delivered the system to him at the airport in Dresden. Their efforts in deciphering the damaged "Eschéz" manuscript were successful. About 96 percent of the original text was recovered; Heyworth and coeditor Daniel O'Sullivan have published the first volume of a two-volume critical edition of the poem, with the second soon forthcoming. "Les Eschéz d'Amours" is now the last known major medieval allegory to have found its way into print for modern readers.

The project was the start of an enduring collaboration between Heyworth and Easton, both through the Lazarus Project and now through the freshly formed group RCHIVE, which takes advantage of their new physical proximity and draws together faculty and students at the University and at RIT. Under the auspices of the Lazarus Project, Heyworth, Easton, and a team of colleagues and students have already worked with such important manuscripts as the Vercelli Book, the oldest book of English; the Black Book of Carmarthen, the oldest book in Welsh; and some of the earliest Gospels, now held in Tbilisi, Georgia.

"Greg has much better blue-sky vision than I do," says Easton of Heyworth, "to the point where I have to say, 'no, we have to focus on what we do well, and get somebody else to do that. We have enough of our own work to do.' But it doesn't affect him. He wants to do it anyway."

ADAM FENSTER

ON SITE: Heyworth (above, second from left) and colleagues Michael Phelps (left) and Roger Easton examine materials at the Archive and Capitulary Library of Vercelli, Italy, as head curator Timothy Leonardi (right) looks on during a 2014 visit. The team often sets up in spaces that date to the Renaissance and Middle Ages (opposite).

A covered bridge in Bucks County, Pennsylvania, beckons—it holds graffiti that may be related to a visit to the area from Abraham Lincoln. The Dresden collection that holds the "Eschéz" manuscript is also a vast treasure house of baroque music—much of which has been in some way damaged. Heyworth did a pilot project there last summer, imaging music by composers such as Antonio Vivaldi, Georg Philipp Telemann, and Carl Ditters von Dittersdorf. "There are three unknown operas there, damaged, that we are recovering, and then symphonies by important composers of the time, like Johann David Heinichen." Now that he's at Rochester, Heyworth hopes to collaborate with musicians at the Eastman School of Music to take the manuscripts from recovery to performance.

"Sometimes when letters are erased, they leave a 'footprint' behind," he says. Even when the ink has only flaked away, there's still a trace. The acid in the ink eats away at the parchment, creating a channel where the parchment is thinner. Lighting the manuscript from beneath allows the team's camera to capture what was lost—the thinner channel transmits light better than the parchment that wasn't written on, and lost words can shine out more brightly than their surroundings.

"We're seeing back in time. That's really what we do," says Heyworth. "We're seeing back before the final draft. I like to say that our job is to try to recover the first draft of history, before people started changing things. And you know how revealing that can be—all the changes of mind, the attempts that are erased and started over again. That gives us huge insight into what the author or cartographer knew, understood, and aspired to." In that sense, the process can recover not only what was once on the page, but also the story behind its creation.

The transportability of the lab is crucial. Multispectral imaging systems are scattered around the world, at places like the Library of Congress, the British Library, and the Israel Antiquities Authority. But they don't travel.

And most of the manuscripts in jeopardy are held by institutions that lack financial resources and that can't, for various reasons, send their objects to establishments with digital conservation equipment.

"Transportability was fundamental," says Timothy Leonardi, the head curator of the Archive and Capitulary Library of Vercelli in Italy. "It's not possible for us to bring our manuscripts outside the library." When Heyworth and his team visited, twice, to image and analyze items from the collection, they carried out all of their work in the library, using the base of an 11th-century tower, and a suite of rooms formerly used by Pope John Paul II, as their center of operations.

Easton describes the sight of Heyworth toting the lab to the project: "I left Greg at a train station in Rome, and he had this little train of bags, tied together with a webbing, that he was pulling. He had the camera and the copy stand and the computers and the lights. And so it's still not portable in a convenient sense. But you have to take it places. The manuscripts don't leave where they are, and we wouldn't want them to leave. We don't even want to touch them."

The Lazarus Project is a not-for-profit organization that seeks to provide the team's services at little or no cost to individual scholars and smaller institutions around the globe. It claims no ownership of the images and analysis produced, and diplomacy is central to its process.

Heyworth formed the Lazarus Project as a separate charitable group that only affiliates itself with the university at which he's employed. That separation is important, he says, in addressing concerns about a university's appropriation of the collections he works with. "With the Lazarus Project, we're able to tell them, we don't own your data. Not only do we not own it, we never want to own it. It needs to be published freely, openly—and that's what we'll do. In return for doing it for free, we will open up this to everyone."

COURTESY OF THE LAZARUS PROJECT

The work is painstaking. It takes two days to set up and calibrate the system. Michael Phelps, Heyworth's collaborator, ticks through some of the preparatory questions: "Are you dealing with flat pieces of paper or parchment? Can you just set them down on a copy stand underneath the camera? Are you dealing with a codex? If you're dealing with a codex, is it intact? Is it broken? How fragile and brittle is it? How much can it be opened? Can it be opened 100 degrees? Or 90 degrees? Or 150 degrees? You have to carefully plan out how you're going to handle the object."

The room is readied, the windows darkened with black aluminum foil or black rubberized cloth. Banks of lights are put in place to illuminate the pages from above and below.

And then the imaging begins, with a camera whose lens is made of quartz. There are fewer than a dozen such cameras in existence.

When Heyworth and the team began their work in Dresden, they took 12 images of each manuscript page. Now, depending on how fragile the object is—and consequently, how efficiently it can be manipulated—they can image between 30 and 40 pages a day, with 30 to 50 images of each page.

Analysis of the images usually begins on site, so that archivists and scholars can give immediate feedback. And despite the elaborate technology involved, some parts of the process rely on startlingly simple equipment—like a pair of comfortable shoes.

"We capture data onto a very fast external hard drive," Phelps says. "And then we 'sneaker-net' it, walking down the hallway to another room where image processing is set up." Networking the computers that capture images to those that process them, by recombining photographs taken at different wavelengths, slows down the process too much. "So we capture images for a certain number of hours, and then we walk them down the hall."

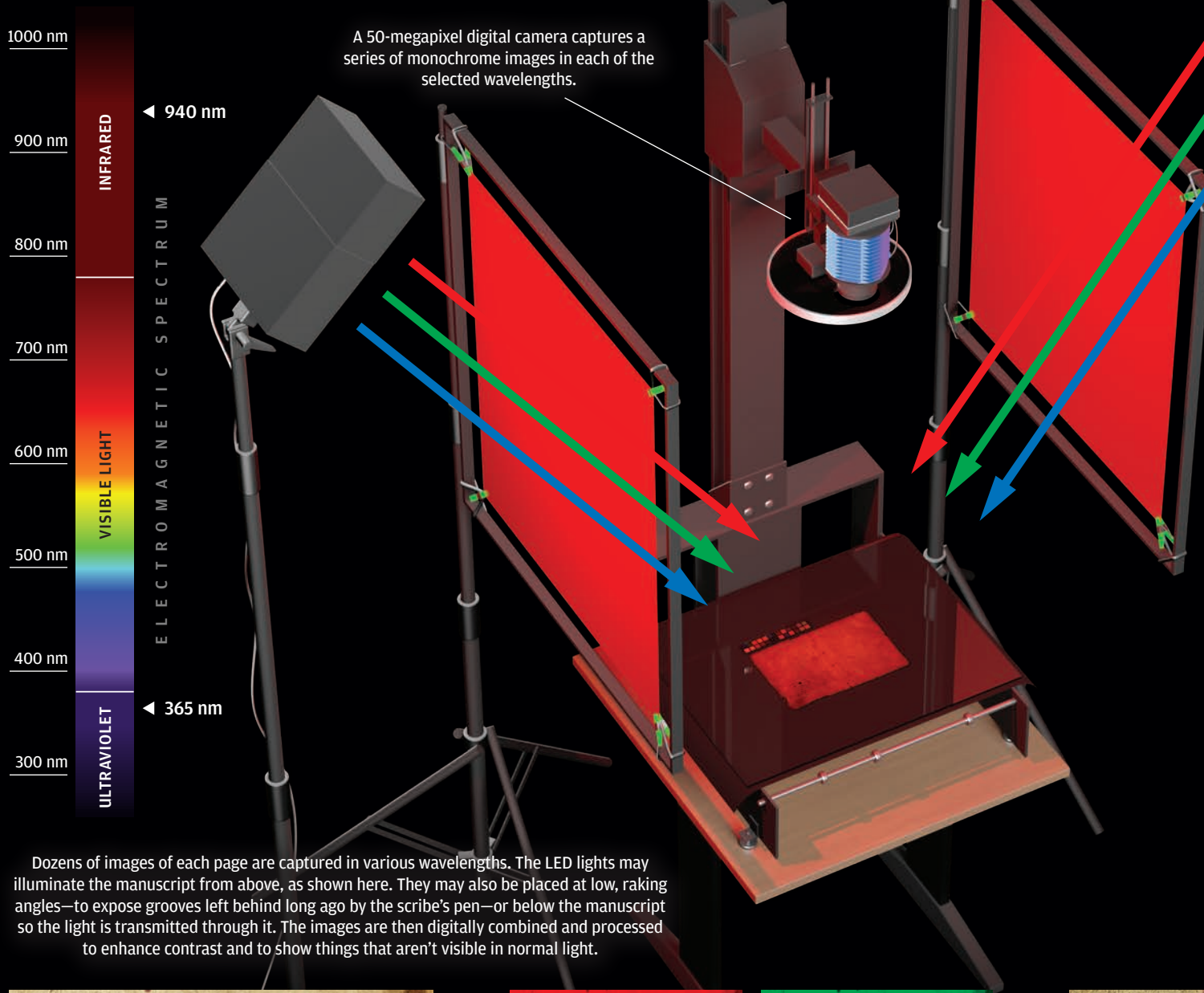
Heyworth was recruited to Rochester as part of the University's data science initiative. "In our projects, we generate an enormous amount of data, terabytes of data," he says. Data science—extracting meaningful information from large-scale data—is one of the University's top academic priorities for the next several years. The Goergen Institute for Data Science, headed by Henry Kautz, was formed in part to foster work that spans the entire University, linking—in combinations that vary by project—inquiry in science, medicine, the arts and humanities, social science, engineering, and business. To support such research and teaching, the University plans to hire new faculty in areas where data science plays a critical role.

The data on which Heyworth relies—images, optics, chemical analysis, and the algorithms to extrapolate information from the data—allow him to move beyond the parameters of traditional literary

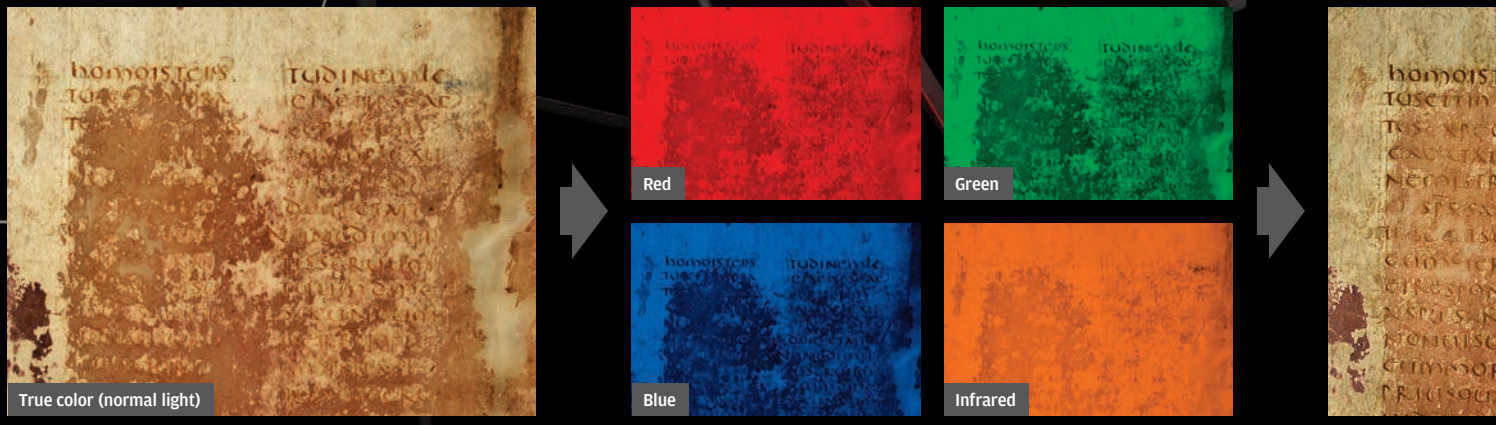
COURTESY OF THE LAZARUS PROJECT

Illuminating the Past

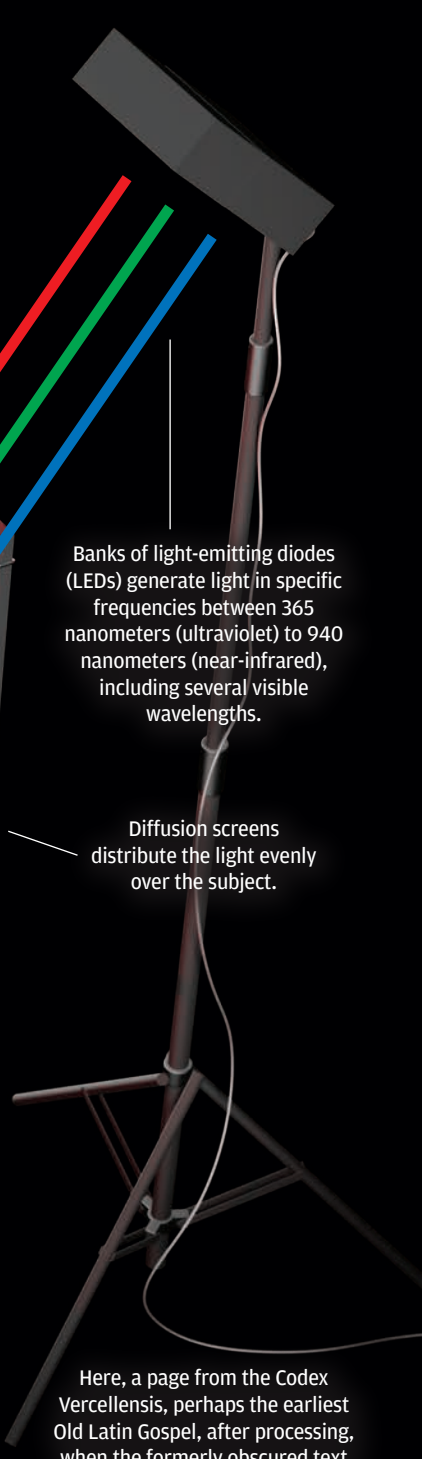
Textual scientist Gregory Heyworth and his team use multispectral imaging to recover and preserve damaged and illegible cultural heritage objects, recovering text that has been lost. They photograph the object under a controlled spectrum of light. The images, when processed, allow the researchers to see material undetectable by the naked eye.



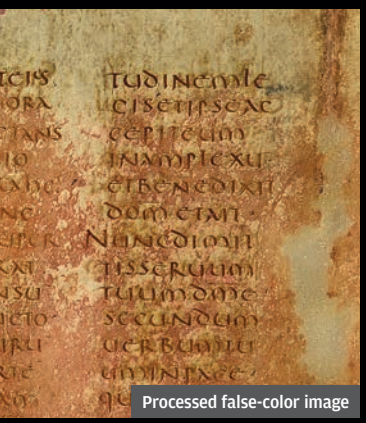
Dozens of images of each page are captured in various wavelengths. The LED lights may illuminate the manuscript from above, as shown here. They may also be placed at low, raking angles—to expose grooves left behind long ago by the scribe's pen—or below the manuscript so the light is transmitted through it. The images are then digitally combined and processed to enhance contrast and to show things that aren't visible in normal light.



SOURCES: GREGORY HEYWORTH; THE LAZARUS PROJECT



STEVE BOERNER



Here, a page from the Codex Vercellensis, perhaps the earliest Old Latin Gospel, after processing, when the formerly obscured text becomes legible.

COURTESY OF THE LAZARUS PROJECT

scholarship to a version of archival work that wouldn't be possible otherwise. At one level, that means recovering texts, like the "Eschéz," that have seemed irretrievable. At another, it means engaging with the shadowy history of a document that is revealed when it's subjected not only to the scholar's probing eye but also to the equally potent gaze of cameras and computers.

Says Phelps, of the Early Manuscripts Electronic Library: "Manuscripts are extremely complex objects. They have complex histories, where they've been damaged by fire or water, they've been degraded by mold and the mandibles of insects, and sometimes they've been intentionally effaced, either by painting over some of the text or by erasing text, in the case of a palimpsest. The chemistry of the inks is complicated and differs from manuscript to manuscript."

In the face of so many variables, the team's approach has been to "throw the kitchen sink at each manuscript," he says, trying different modes of imaging—including volumetric imaging, thermography, and X-ray fluorescence—and different wavelengths of light. And imaging contributes to material analysis, too, allowing the researchers to identify inks and pigments.

"We don't hunt and peck," Phelps says, searching through images to find the information worth processing. Instead they process massive quantities of data using statistics and mathematical algorithms. "Going from 12 images to 50 per page is a big jump, and that adds time to a project and it adds data that you have to store and manage later," says Phelps.

Now one of Heyworth's priorities is understanding why a particular technique works in a given situation, allowing the team to image and analyze objects more efficiently and effectively.

"This is where Greg's move to Rochester is important," Phelps says. "With the University of Rochester and RIT within a few miles of each other, we have the opportunity for hard scientists and humanities people at both institutions to put their heads together and create solutions. Heretofore, most of the solutions have been fairly ad hoc."

COLORFUL VIEWS: The equipment—set up here in Vercelli—exposes manuscripts to different wavelengths of light, including blue, red, and ultraviolet, in an effort to recover as much lost text as possible.

Be that as it may, the solutions have worked well enough to elicit at times what Lazarus Project board member and cartographic historian Chet Van Duzer has termed a "spectral gasp."

Van Duzer was part of the team from the Lazarus Project and EMEL who in 2014 imaged and analyzed the Martellus Map, a large—four by six-and-a-half feet—hand-painted paper map of Eurasia and Africa by German cartographer Henricus Martellus, who created it in Italy around 1491. Scholars believe that Christopher Columbus may have consulted the map before his voyage to the New World.

Acquired by Yale's Beinecke Rare Book and Manuscript Library in 1962, the map had hung, largely unnoticed, on a wall outside the library's reading room. Its inks had degraded with age, darkening the map until it became virtually undecipherable.

"It looks like a desert," Heyworth says. "It looks dull green for the ocean and Sahara Desert–brown for the rest, and there's almost nothing that's visible."

When librarians gathered to see the team's before-and-after images, they let out a gasp, astonished to see for the first time what had been cloaked. There were places names all down the coast of Africa. For the first time, Japan was represented with a north-south orientation. The margins were decorated with descriptions of lands and people. The map's darkly impenetrable legend could suddenly be read.

"Details all over this map are now fully legible," says Phelps. "It's mind-blowing."

His is a mind not easily blown. "I've gotten sort of used to this, so I've gotten cynical. I've seen [the process at work] a thousand times, and you're not going to be able to get me to gasp very often." But working in Vercelli with the Codex Vercellensis—thought to be the earliest manuscript of the Old Latin Gospels—he felt a chill. "There are some pages where, if you're holding the manuscript in your

hands, you just don't think there's anything there. It's too far deteriorated. There's no technology other than a time machine that's going to recover it. And then—pow! We see legible text."

But such recovery can only be carried out on anything approaching the needed scale if there are enough trained specialists. And that's why Heyworth is driven to enlist students, undergraduates as well as graduate students, in the effort.

He began teaching at Rochester this spring, with two courses—Image, Text, and Technology, and Digital Imaging: Transforming Real into Virtual. The second draws undergraduates and graduate students, but the first is an introductory textual science course aimed, as it was at Mississippi, at second-semester sophomores, so that they're ready by their senior year to carry out a major piece of work.

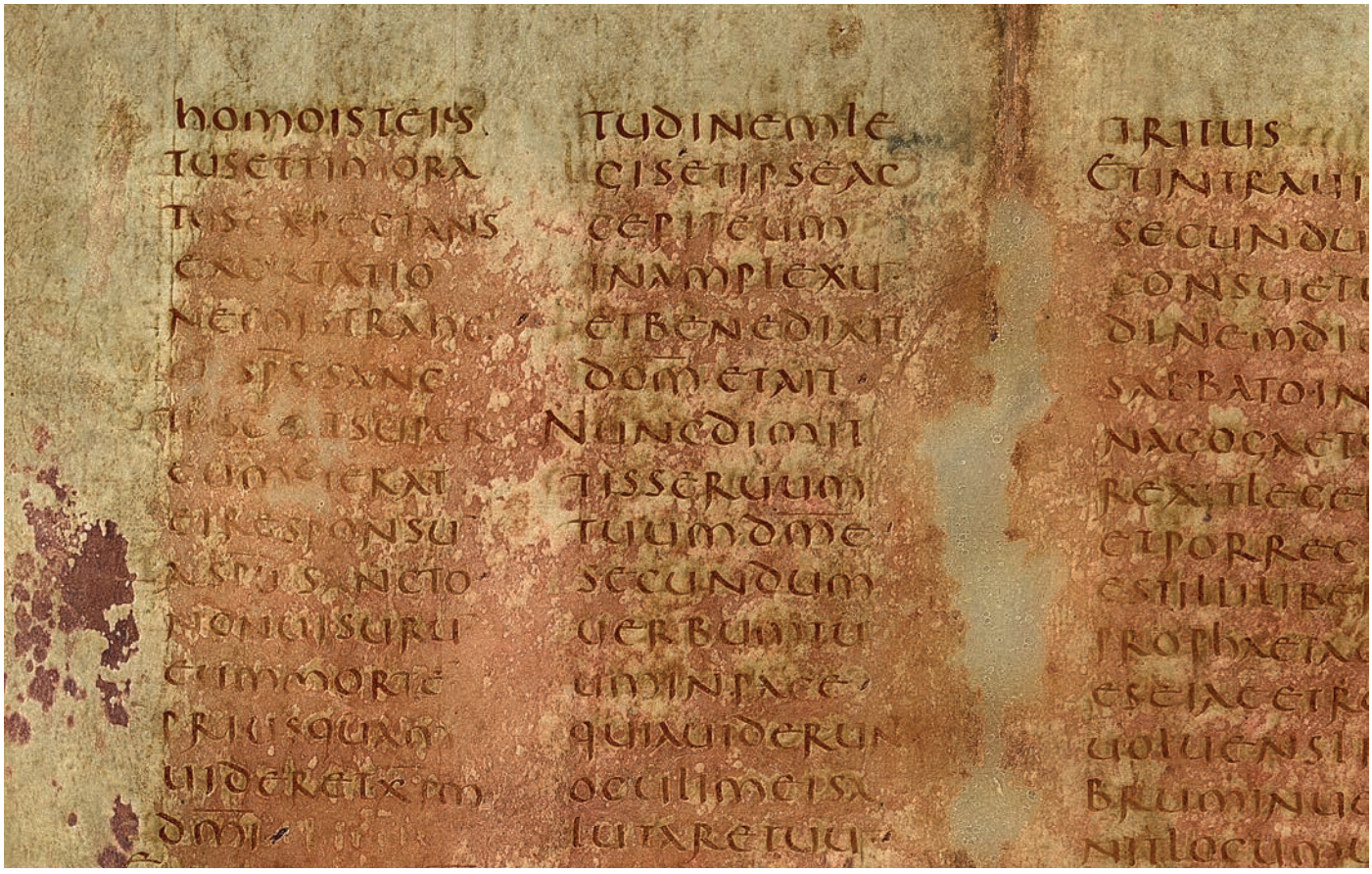
"They'll have the technical skills to be able to pull it off," he says. "And they can present on it, or even publish on it, either individually or collectively." For undergraduates, he says, the projects provide "the moment of transformation that one sees from a passive receiver of knowledge to a producer of knowledge."

WORLD TRAVELS: Heyworth's group, the Lazarus Project, crosses the globe to image imperiled cultural heritage objects. During a 2015 visit to the country of Georgia (top), Heyworth examined a charred manuscript in the Georgian National Archives (above).

He welcomes the interest of anyone whose enthusiasm for the quest might begin to match his own. He's already working with students from computer scientist Henry Kautz's lab to see how machine learning—in the form of computer-aided optical character recognition—could be used one day to read rediscovered texts, moving through manuscripts more efficiently than individual scholars can. Students of optics professor Wayne Knox may collaborate with Heyworth to determine how the University's collection of dime novels—one of the world's largest—can be accessed, given that many of the books can be opened only a few degrees.

And in a freewheeling assemblage almost unheard of in the fairly solitary world of humanities research, Heyworth spoke at Rush Rhees Library one afternoon last autumn to a room filled with students, faculty, and librarians from the University and RIT—not hand-picked people but anyone interested in attending. He explained dimensions of the projects in which they could involve themselves. For example, in the late 15th century, scholars started using chemical reagents—chemicals used to "revitalize" texts for 10 seconds or a minute, after which time the chemicals would permanently stain the pages, obscuring the text even further. "Anyone with a background in this?" Heyworth called out, on the hunt for

COURTESY OF THE LAZARUS PROJECT



BEFORE AND AFTER: A page from the Codex Vercellensis—thought to be the earliest manuscript of the Old Latin Gospels—before Heyworth and his team complete multispectral imaging and processing (above) and after (top).

chemists. "I have recipes for reagents and medieval inks and would love to do some tests in a lab, to see if we can find ways to see through reagents."

"We're going to attract people from communities that don't talk to each other," says Easton, who is still amazed that his scientific work now brings him into regular contact with some of the world's most eminent humanistic scholars. "We don't speak the same language. So that's going to be a challenge," he says of the team's plans.

But Heyworth has no doubts. "I think in this new digital world, it's absolutely necessary to integrate the sciences with the humanities," he says. "Without that we can't have true innovation. We can't move forward. I think we owe it to our students and to our next generation to train them in ways to work together, to do just this."

And Phelps is convinced that Heyworth and Easton's proximity and the chance to bring together experts at Rochester and RIT in the service of preserving world cultural heritage will bring as-yet unimagined breakthroughs.

In humanities research that relies on technology, "we're always using derivative technologies. They were made for some other purpose, and we try to use them for humanities work," he says. "Greg's move to Rochester, with the collaboration developing with RIT, brings a real opportunity for humanities people and the unique problems we face in preserving and restoring treasures of our culture. It's an opportunity to have the problems of our fields in the humanities—the problems of historical research—drive technological development."

Whether it's ancient manuscripts or 20th-century political ephemera, the world is filled with objects waiting to be read—to be rescued, before they crumble into dust, deteriorated beyond saving. And everyone has a stake in their preservation, says Phelps.

"I don't see these projects as ivory-tower scholarly projects," he says. "Of course, they have a scholarly component, but this is the heritage of us all."

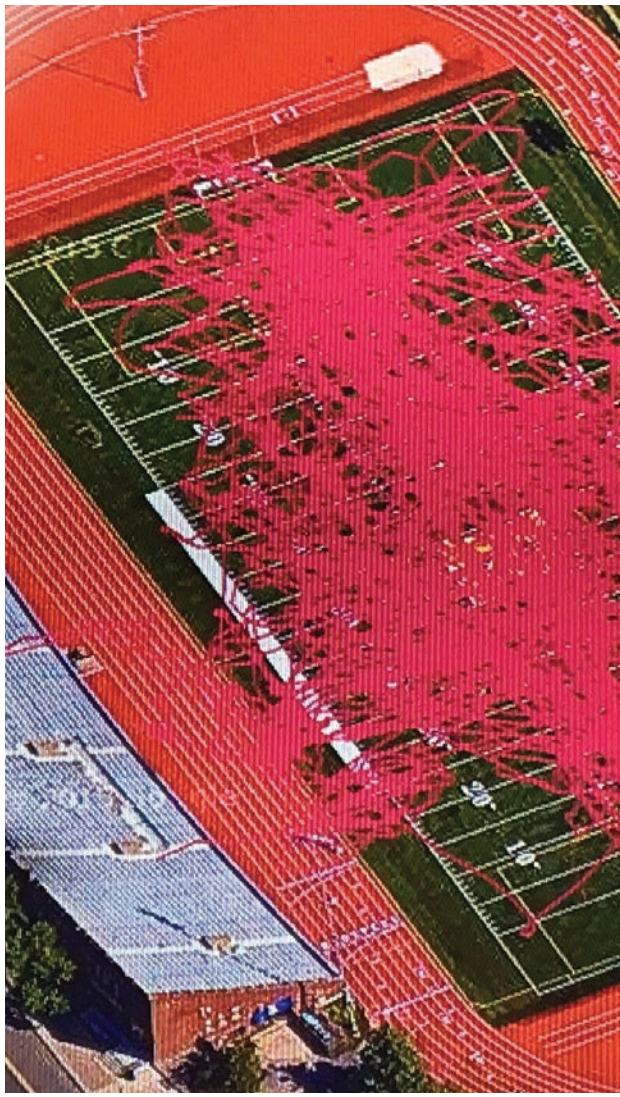
Says Heyworth: "We have an obligation not only to try to make this technology available for free or for almost no cost—but also to train students to do this, to expand our capacity."

Cultural heritage imaging is only in its infancy, and there is much to explore, he says. He calls what lies ahead "the future of the past"—a bold and unfamiliar future.

"I predict that in the next 10 years," he says, "textual science is going to revolutionize the kind of work that's been going on in the humanities." R

COURTESY OF THE LAZARUS PROJECT

DOING MORE WITH Data



A brief look at how data science is influencing research at Rochester.

What questions would you ask, if you could get the data? If you had access to the right data set—and could focus the right technology to examine it—could you articulate a new question that advances your field, your practice, or your business?

Sometimes described as the defining discipline of the early 21st century, data science is changing the way researchers, scholars, doctors, teachers, musicians, business people, and others think about what they do. The possibilities are transforming humanities scholars into imaging scientists (see page 26), giving music theorists the tools of genomics, and helping to reshape the clinical treatment of human beings through the power of machine-based algorithms.

For more data science stories, visit Rochester.edu/news/unlocking-big-data

It's purposefully interdisciplinary, and welcoming to entrepreneurial perspectives. It relies on new resources, such as Rochester's Health Science Center for Computational Innovation, and organizing initiatives such as the University's new Wegmans Hall, home to the Goergen Institute for Data Science (see page 38).

But most important, it's designed to address new questions—the kind that may not even have arisen without it. Here's a sample of some of the ways data science–oriented perspectives are influencing work at Rochester. R

AS TOLD TO

What Does a Data Science Student Do?

Ulrik Soderstrom '16, '17 (MS)

One of the first Rochester students to graduate with a BA in data science, Ulrik Soderstrom '16, '17 (MS) is combining his love of math and computers with a passion for environmental sustainability and renewables. He's finishing his coursework for a master's degree in data science, planning to graduate in May.

Along the way, he has put his education to use as a data scientist on campus, in Rochester, and other parts of the country.

NOAA

The National Oceanic and Atmospheric Administration is an agency within the United States Department of Commerce that conducts environmental research focused on the oceans and the atmosphere. As an intern, I worked in NOAA's environmental modeling center with wave propagation data. The NOAA has tens of thousands of buoys all around the oceans. Based on the effects and trajectory of waves, they can, for instance, predict hurricanes. They also have a

FIRST WAVE: Soderstrom was one of Rochester's first data science majors.

BRANDON VICK (SODERSTROM)

VISUALIZATION

Tracking Athletes

Kim Stagg '17 endured a rigorous workout in the women's soccer season finale last November.

The midfielder from Winter Springs, Florida, ran 10.05 miles, burned 2,006 calories, and completed 63 sprints in a 2–2 tie with Emory University. She ran at an average speed of 3.2 miles per hour. And she left cleat marks over 90 percent of Fauver Stadium.

"She was everywhere," Yellowjackets coach Thomas (Sike) Dardaganis says.

Dardaganis knows because he has a data visualization tool known as a heat map to prove it. His program was one of the first in the nation (and remains the only one at Rochester) to use Polar Team Pro, a GPS-based performance tracking system for team sports. Each player straps a sensor under her jersey, close to her heart. The sensor tracks movement, monitors heart rate, and acts as an accelerometer, tracking how many times an athlete runs at full speed.

BUSY DAY: Tracked by a sensor under her uniform, women's soccer player Kim Stagg '17 traveled more than 10 miles and burned more than 2,000 calories during her final home game.

The information is logged in an iPad carried by a team manager during practices and games. Once the iPad is loaded onto a docking station, the sensors start charging, and the data for each player are uploaded for review."From an analytic standpoint, it's fantastic," says Dardaganis, in his sixth year as head coach after serving 14 as an assistant coach for the team.

When Rochester signed on with Polar two years ago, Polar sent a specialist to measure Fauver Stadium's dimensions and create a GPS map tailored to that field. The rewards were immediate.

Using that information helped Dardaganis and his staff adjust the team's workouts to better match the expectations of games and to better personalize goals for each player.

The data also helped spark important conversations.

"Athletes don't always communicate with coaches when they're sick or injured," Dardaganis says. "Having the data right there? Well, that's a great conversation starter." —Jim Mandelaro

computer model that simulates this buoy data. I took the outputted model data, compared it with the real buoy data, and did statistical validation to figure out how close they were mathematically, and then suggested heuristics to improve those models. Because there was so much data—more than 30 years of buoy data with tens of thousands of points all around the ocean—we used supercomputers to process this information.

Arable

A data science agriculture company, Arable has a data-monitoring system called a Pulsepod that they offer to farmers to monitor their crops. Each pod has a solar panel on top and takes in different weather parameters like rainfall, relative humidity, and temperature. Using that data, Arable does localized weather forecasting of fields that is more accurate than the National Weather Service. I worked with Arable to test machine-learning algorithms to figure out which ones were the most optimal to forecast weather.

ROCSPOT

ROCSPOT is a cool company because they're a nonprofit organization that educates people about solar incentives and also focuses on bringing solar to low-income neighborhoods. We also want to pursue projects that redistribute energy because we could power a large portion of the country on solar energy if we could transport it and if the laws allowed for that. This is a really big data science problem because of the shear amount of information. One of ROCSPOT's goals is to have full renewable energy in Rochester by 2025. Even in cloudy Rochester, our location and angle to the sun mean we get an enormous amount of solar radiation. —AS TOLD TO LINDSEY VALICH

TWITTERSPHERE

Finding Nuggets in the Noise

To computer scientist Henry Kautz, Twitter is like a distributed sensor network. Hundreds of millions of tweets are posted to the platform each day, with each user observing and reporting on some aspect of the world.

"Each report is very noisy," says the Robin and Tim Wentworth Director of the Goergen Institute for Data Science. "But the aggregate results can be reliable."

What does the aggregate show?

Tracking sickness and disease

The Las Vegas Health Department tested an app developed by Kautz and his team that connected food-poisoning-related tweets to the restaurants that prompted them. The researchers found that the tweet-based system led to citations for health violations in 15 percent of inspections, compared to 9 percent using the traditional random system. That resulted in an estimated 9,000 fewer food poisoning incidents and 557 fewer hospitalizations during the course of the study.

Increasing transparency

Huaxia Rui, an assistant professor at the Simon Business School, uses Twitter to study the relationships between companies and their customers. Working with Simon professor Abraham Seidmann and PhD student Priyanga Gunarathne, Rui analyzed more than 450,000 Twitter messages and found that airlines were more likely to respond to tweets sent by customers with a higher number of followers. The study raises interesting questions about fairness as well as how companies handle requests for engagement.

Taking the pulse of voters

Jiebo Luo, associate professor of computer science, PhD student Yu Wang, and their colleagues tracked the Twitter followers of Donald Trump, Hillary Clinton, Bernie Sanders, and other candidates to better understand the dynamics of the 2016 campaign. Their exhaustive, 14-month study of each candidate's Twitter followers offered clues as to why the race turned out the way it did.—Bob Marcotte

INTRODUCING WEGMANS HALL

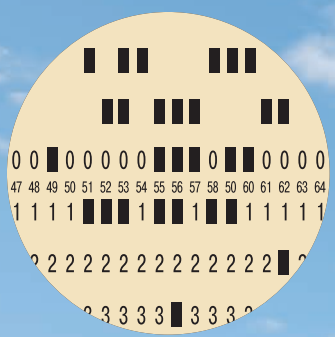
Destiny with Data

Named in recognition of the support of the Wegman Family Charitable Foundation, the 58,000-square-foot Wegmans Hall is designed as an interdisciplinary campus hub for work involving data science. Dedicated during Meliora Weekend last fall, the building will open for researchers this year. Danny Wegman, chair of the University's Board of Trustees, announced the foundation's $10 million commitment to the project in 2014.

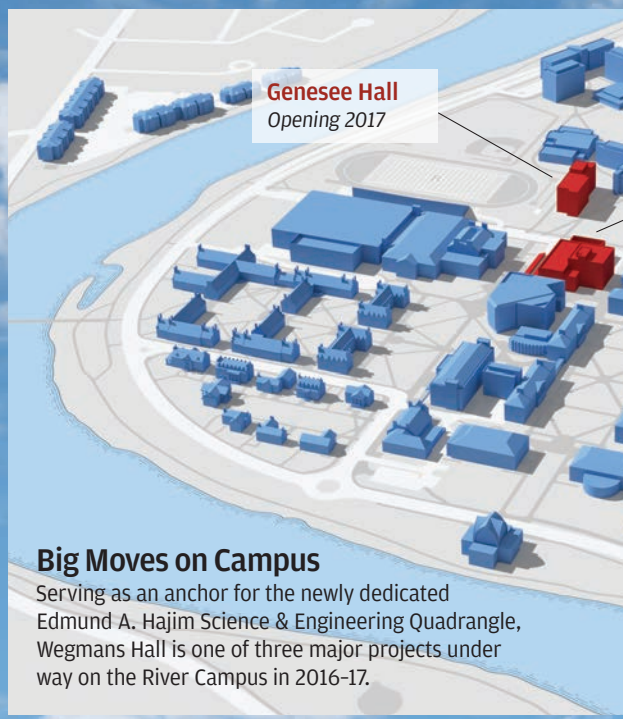
The building is home to the Goergen Institute for Data Science, a University-wide center that helps to advance the University's research strengths in machine learning, artificial intelligence, biostatistics, and biomedical research, and to foster research collaborations throughout the University and through industry partnerships.

The institute is named in recognition of the support of University Board Chair Emeritus Robert Goergen '60 and his wife, Pamela, who committed $11 million to the University's multimillion initiative in data science, a centerpiece of the University's strategic plan.

Patterned bricks on the south, east, and north sides were inspired by artwork from *The Matrix* film series.



Window arrangements are reminiscent of classic IBM computer punch cards.

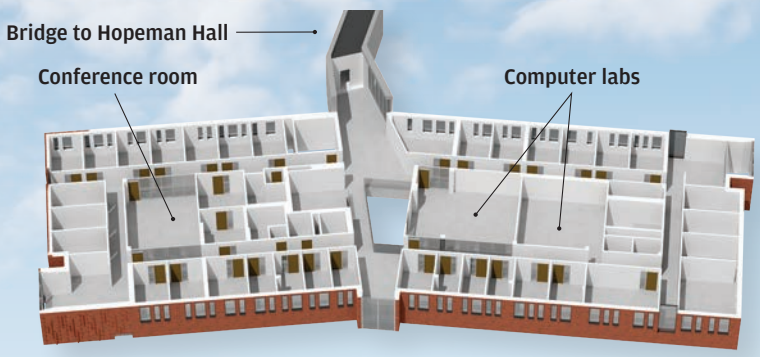


Big Moves on Campus

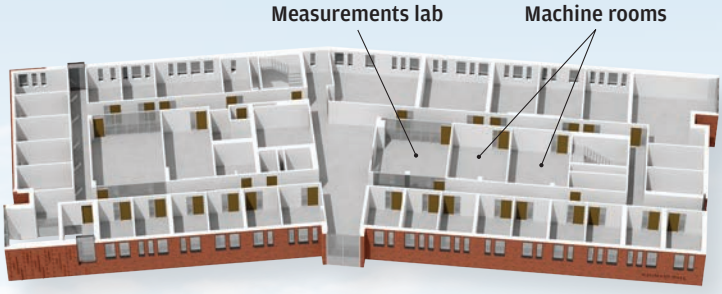
Serving as an anchor for the newly dedicated Edmund A. Hajim Science & Engineering Quadrangle, Wegmans Hall is one of three major projects under way on the River Campus in 2016–17.

Doors Opening to Data

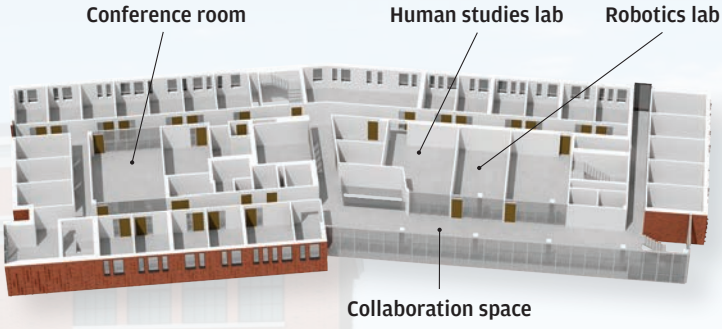
Home to the Goergen Institute for Data Science, Wegmans Hall is designed to serve as a University-wide hub for faculty, students, and staff to conduct interdisciplinary research and studies in data science.



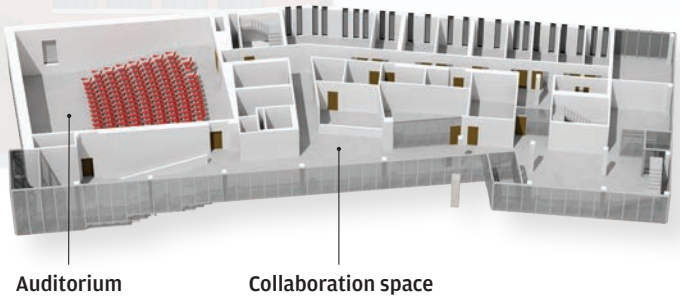
Fourth Floor A bridge connects faculty lab and office spaces on the top floor to engineering labs and spaces in Hopeman Hall.



Third Floor Devoted to computer science, the third floor will feature faculty and specialty laboratories. All together, the building will have about 30 such lab spaces.



Second Floor The second floor will be home to the Department of Computer Science and includes space for research and teaching in robotics and other areas.



First Floor Home to the Goergen Institute for Data Science, the first floor also features a 160-seat auditorium. The floor opens onto the new Hajim Science & Engineering Quadrangle.

STEVE BOERNER

ARTS, MEET SCIENCES

Music—in the Key of Data

'There is a lot you can quantify about music.'

By Lindsey Valich

There's much that's mysterious about music.

"We don't really have a good understanding of why people like music at all," says David Temperley, a professor of music theory at the Eastman School of Music. "It doesn't serve any obvious evolutionary purpose, and we don't understand why people like one song more than another or why some people like one song and other people don't. I don't think we're anywhere near uncovering all of the mysteries of music, but there are a lot of questions that people are starting to answer with data science."

Temperley and other researchers at the University are exploring the intersection of data science and music. As Temperley says, "there is a lot you can quantify about music."

Mimicking human music recognition

Mark Bocko, Distinguished Professor and chair of the Department of Electrical and Computer Engineering, combines his love of music and science to study subjects ranging from audio and acoustics to musical sound representation and data analytics applied to music.

One of his group's projects involves using computers to analyze digitally recorded music files, with the goal of better understanding and mimicking the ways in which humans are able to recognize specific singers and musical performance styles. Using data analysis tools from genomic signal processing, similar to that used to study sequences in DNA, Bocko and his team search musical data for recurrent patterns—common sequences known as motifs—in the subtle inflections of performers and performance styles.

The system would be able to illustrate, for example, that Michael Bublé has a singing style similar to Frank Sinatra's, but less similar to Nat King Cole's. The approach may ultimately enable computers to learn to recognize the subtle nuances between singers and musical performances that human beings pick up on quickly simply by listening to the music.

Transcribing music

Zhiyao Duan, an assistant professor of electrical and computer engineering, has been working with Temperley to extract data from songs to produce automatic music transcriptions—feeding audio into a computer to generate a score.

Duan uses signal processing and machine learning to help the computer identify the pitch and duration of each note and to output musical notation.

Rocking songs through Wikipedia

Darren Mueller, an assistant professor of musicology, is creating a corpus of information based on a large-scale data analyses of Wikipedia's coverage of musical performers and genres. By applying computer algorithms and machine learning to sort through entries on music, he hopes to analyze information about musical history and how that information is distributed.

"Usually musicians are a little skeptical when anyone is like, 'Oh, I want to quantify music,' because they put their hearts and souls into music," Mueller says. "It's their art and there's always this sort of tension between the arts and science, but there's no reason these two things can't work together."

FRANKLY: Mimicking a common human ability to pick out the sound and style of individual musicians (like Frank Sinatra, right), a Rochester team is working on software than can pick out telltale musical motifs.

AF ARCHIVE/ALAMY

Q&A

Learning Lessons from Data

Interview by Nick Bruno '17

For researchers who know how to extrapolate it, there's a lot of data to be found in K-12 schools. It's information that can provide an important lens for exploring questions involving student success, how resources are allocated across districts, and other administrative, curricular, and financial issues. The Warner School of Education's Karen DeAngelis, an associate professor and chair of educational leadership, and Kara Finnigan, an associate professor and director of the educational policy program, bring a data science–informed approach to such research.

"I would say access to data has become easier," says DeAngelis, who's also associate dean for academic programs. In her research, she analyzes data on how much schools spend on security measures. While at a conference, she discovered that schools in Texas are required to report that information to the state. "Suddenly we had district-level data for the state of Texas, and we didn't have to go out and collect it. We went to Texas and were able to get information about all of the spending categories for all the 1,000-plus districts in Texas and do an analysis on what proportion of district budgets they allocate to security and safety."

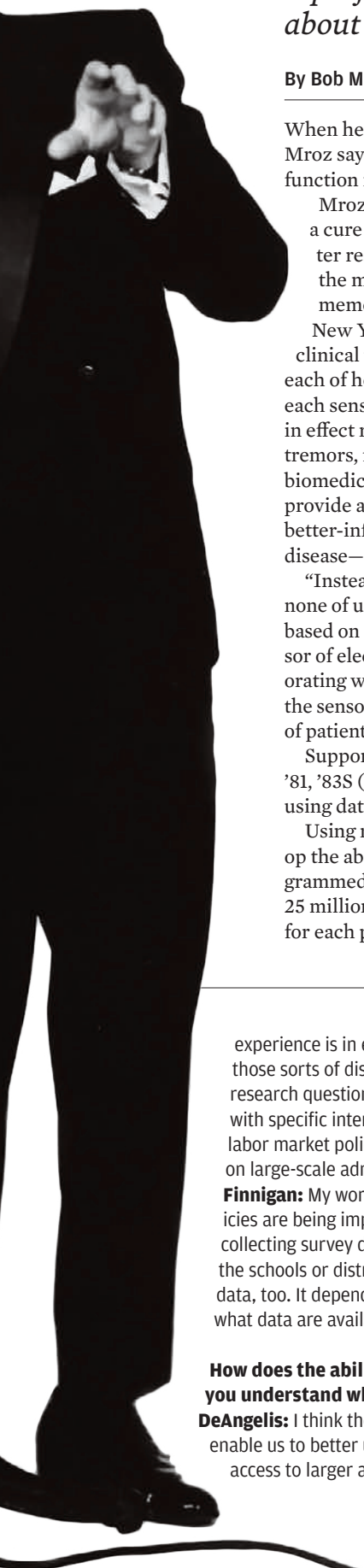
The possibilities for asking such questions and for using such analyses to make policy recommendations, she says, are becoming more common as educational researchers and their students hone their abilities with data science.

What types of data do you collect?

DeAngelis: My academic background and professional

Your Data, Your Treatment

A project aims to give physicians better information about how to treat your condition.



By Bob Marcotte

When her medications aren't working, Bernadette Mroz says, "my world goes into a spin cycle. I cannot function mentally, emotionally, or physically."

Mroz, who has Parkinson's disease, doesn't expect a cure in her lifetime. But she's hopeful that Rochester researchers will soon be able to "better tune in" the medications that help control her tremors and memory lapses. Toward that end, the Hannibal, New York, resident has participated in a Rochester clinical trial in which she wore five sensors—one on each of her limbs and her chest. Thirty times a second, each sensor recorded acceleration in three directions—in effect recording her every movement, including tremors, for 46 hours at a time. The sensors, made by a biomedical health care analytics company called MC10, provide a wealth of data that allows physicians to make better-informed decisions about the progression of her disease—even about adjusting her medications.

"Instead of treating all patients as averages, which none of us are, we will be able to customize treatment based on individual data," says Gaurav Sharma, a professor of electrical and computer engineering who's collaborating with University neurologist Ray Dorsey to use the sensors and data science to improve the treatment of patients with Parkinson's or Huntington's disease.

Supported by MC10, whose CEO is Scott Pomerantz '81, '83S (MBA), the project is one of many at Rochester using data science to advance clinical care.

Using machine learning, in which computers develop the ability to learn without being explicitly programmed, the team is developing ways to analyze some 25 million measurements generated by the sensors for each patient over a two-day period. They also are working on the challenge of translating all that information in ways that are helpful to physicians and other health care professionals.

"If you tell a physician you have to look at two gigabytes of data to figure out what's going on with your patient, you don't have a chance," Sharma says. "But if you can present the data in easily digestible plots and visualizations, the physician can comprehend it and act on it."

The goal of the research is to change how patients and physicians help each other understand disease and treatment.

Under a scenario envisioned by Sharma, Dorsey, and others, a few days before an appointment, patients would drop by a neighborhood pharmacy, pick up a pack of adhesive patches embedded with electronic sensors, and place them on their skin, providing more accurate and comprehensive measurements than are possible in a doctor's office.

For now, research participants mail their patches back to the researchers. Soon, Sharma and Dorsey say, the sensors will be as unobtrusive as temporary tattoos, transmitting data wirelessly to a patient's smart phone, then on to a secure database for analysis. Patients in even the remotest areas could be monitored from their homes.

"This will transform the way we care for patients with Parkinson's and Huntington's disease," says Dorsey, the David M. Levy Professor in Neurology.

Mroz, who was first diagnosed with Parkinson's disease in 2004, continues to volunteer as a board member at a local humane society and enthusiastically participates in clinical trials at the University.

It's part of her obligation as a Parkinson's patient to be an ambassador and advocate, she says.

"I will not let this defeat me."

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experience is in economics and finance, so I bring those sorts of disciplinary lenses to my work. My research questions involve the allocation of resources with specific interests in teacher and administrator labor market policies. To do that work, I typically rely on large-scale administrative data sets.

Finnigan: My work is focused on how education policies are being implemented in the field. I'm usually collecting survey data or interviewing participants in the schools or districts—but I also rely on some existing data, too. It depends on the question I'm asking and what data are available.

How does the ability to process large data sets help you understand what you're studying?

DeAngelis: I think there's a richness of data now that enable us to better understand context. It's really about access to larger amounts of data than we had in the past. I'd say there's been progress in statistical analyses, which has definitely influenced my work.

What's next for data science in education research?

DeAngelis: I'm excited about the advances in big data that other disciplines are making—and thinking about what methodological approaches I might bring to education work. Perhaps advances in the health sciences or other fields might be applicable to helping me better answer some of the questions I'm asking.

Finnigan: I think we have to be more attentive to the ways we train students. When you have big data, you can get very lost or you could start asking the wrong questions. It's important to make sure students are intentionally trained to understand the multitude of data that's out there without being overwhelmed.

Nick Bruno '17 is the lead editor of the Quadcast, *a University podcast, from which this interview was adapted. You can hear the full podcast at Soundcloud.com/urochester.*

BACK ON TRACK: Returning to the track and field team, Lockard accomplished one of her goals after brain surgery. When her routine participation in an imaging sciences study found a small growth in her cerebellum, Lockard had to change her plans as a student and an athlete. But "I think I've made the best of everything in my life since that point," she says.

a Sprinter's MARATHON

A FATEFUL EVENT PRESENTED SCHOLAR–ATHLETE LAURA LOCKARD '17 WITH OBSTACLES SHE'D NEVER ENVISIONED EXPERIENCING—MUCH LESS OVERCOMING.

By Scott Sabocheck
Photographs by Adam Fenster

STUDYING AT THE UNIVERSITY OF BRISTOL last fall, Laura Lockard '17, a microbiology major and an accomplished track and field athlete, found herself with no suitable track to train on. The school's athletic center required her to purchase a six-month membership that would cost her an estimated $1,000. Moreover, the small track there was nothing like the 400-meter standard tracks on which she both trained and competed.

So instead of buying a membership to the athletic center, Lockard decided to complete her workouts on a dirt path at a place called Queen's Square—a small park roughly one mile from the Bristol campus.

The square had a perimeter of about 500 meters. But she made it work, completing workouts that Sam Albert '01, '02W (MS), the director of Rochester's programs in track and field and cross country, would send her to keep her on par with the rest of the team back stateside.

Lockard had been a team leader from the very start. During her freshman year, she won her first collegiate race, indoors, at the RIT Early Season Invitational. Later in the indoor season, at the New York State Collegiate Track Conference Championships, she placed third in the 400 meters. Outdoors, she won the 400 meters in front of a home crowd at the University of Rochester Alumni Invitational. Later, she was a New York State champion on the 4-by-400-meter relay. Overall, she helped set three new school records in her first year on the River Campus.

Now, as a team captain and in her final semester at Rochester, Lockard says she hopes to match those performances. "I'd love to get around the same point, if not a little better, than I was freshman year," she says. And "to maintain my grades."

If those seem like modest goals for a student-athlete with Lockard's record, it's not for a lack of drive. Rather, Lockard has worked through two track seasons and four semesters with a steep and unusual set of challenges.

Spring 2015

It was early February when Lockard, shortly into her second track season at Rochester, decided to earn a little extra money by volunteering for a functional magnetic resonance imaging (fMRI) study in the University's Neuroimaging Center.

About 10 minutes into her scan, Frank Garcea, the graduate student running the procedure, told her there was a problem with the machine. He aborted the scan and told Lockard they would have to reschedule.

Shortly after Lockard returned to her dorm room, she received a phone call. The machine was fixed, she was told. When she returned to the center, however, she discovered the machine hadn't malfunctioned. Instead, Brad Mahon, an assistant professor of brain and cognitive sciences and neurosurgery, and the principal investigator of the study, was there to deliver to her in person some troubling news. The scan revealed a mass—approximately 2.4 cm-by-2.4 cm-by-4.8 cm in size—on the lower part of her brain, near the brain stem.

At first, she panicked. Then, after calling home, she went for a long walk in the chill of February in Rochester. "After hearing the news," she recalls, "I needed the long walk outside to finally breathe."

Within days, she met with Howard Silberstein, the chief of pediatric neurosurgery at the Medical Center.

"The tumor was in a tough location, very deep in the cerebellum and up against the brain stem," says Silberstein. "It had probably been developing slowly over Laura's childhood."

The cerebellum coordinates and regulates muscular activity, aiding in activities such as walking and running, as well as precision muscle movements and timing.

A cerebral angiogram produced no definite diagnosis. Her doctors concluded from the sum total of her tests and scans that the mass was most likely a juvenile pilocytic astrocytoma—a rare childhood brain tumor that is slow growing and can cause symptoms such as headaches, nausea, balance problems, and vision abnormalities. Juvenile pilocytic astrocytomas are usually benign. Regardless, she had a choice: it could be monitored, or it could be removed.

SHORTLY AFTER LOCKARD RETURNED TO HER DORM ROOM, SHE RECEIVED A PHONE CALL. THE MACHINE WAS FIXED, SHE WAS TOLD. WHEN SHE RETURNED TO THE CENTER, HOWEVER, SHE DISCOVERED THE MACHINE HADN'T MALFUNCTIONED. INSTEAD, BRAD MAHON, AN ASSISTANT PROFESSOR OF BRAIN AND COGNITIVE SCIENCES AND NEUROSURGERY, AND THE PRINCIPAL INVESTIGATOR OF THE STUDY, WAS THERE TO DELIVER TO HER IN PERSON SOME TROUBLING NEWS.

Lockard kept close counsel with her family, including her father, John Lockard '83, '84 (MS), a medical doctor; her mother, Susan; her older sister, Kim; and her brother, John '16.

Meanwhile, she attempted to have as normal a semester as she could. She was out for the indoor and outdoor track seasons, but participated by attending practices and supporting her teammates. In addition, Lockard says, "I focused a lot of energy towards my studies." In a sense, they were a refuge. "I kind of used my school work as a distraction from everything that was happening. It was one of the few areas of my life that still felt normal to me. I didn't even really tell my professors what was going on. I didn't want any special treatment. I just wanted to feel like a normal student."

"Plenty of people would have just shut down and checked out entirely, grades and all," says Albert. "But Laura stayed calm through it all, took it one day at a time, and did a great job balancing everything."

Summer and Fall 2015

When Lockard returned home to Pennsylvania for the summer, the family sought a second consultation with a specialist at Massachusetts General Hospital. After the consultation, they decided to have the tumor removed.

In late June, Silberstein performed the 10-hour operation at the University's Strong Memorial Hospital.

CAPTAIN: In her final semester at Rochester, Lockard is a team captain, setting her sights on matching the athletic perfomances she had when she first joined the team. "I'd love to get around the same point, if not a little better, than I was freshman year," she says. And "to maintain my grades."

FULL SPEED: Lockard was cleared for full practice just in time to start training for the 2016 indoor and outdoor seasons. "It was incredible that not even after six months following surgery, she was back to full training," says Sam Albert, director of track and field and cross country.

"This was a challenging operation as you don't know exactly how the tumor is connected to surrounding tissues," he says, adding, "Laura's surgery went as well as could be expected." A biopsy confirmed that the mass was a juvenile pilocytic astrocytoma.

Her recovery began in the hospital, with nurses gradually increasing the function of the surgically affected area of her brain. She progressed quickly with the initial rehab—with the help, she notes, of her stuffed Pembroke Welsh Corgi, a reminder of the Lockards' dog, Molly.

After returning home from the hospital, "Molly knew something was wrong," she says. "She practically never left the couch with me all summer."

Lockard's main task for the summer was to regain her strength, balance, and basic motor skills, with the goal of returning to normal college life in the fall—and possibly, if her doctors allowed it, a return to the track team.

"We are always concerned for patients after brain surgery, and this case was no different," says Silberstein. "We didn't want her to trip and fall, possibly damaging the surgical area, or run prior to the cerebellum being healed."

When fall arrived, Lockard stayed right on course, academically. Neither the tumor, nor the surgery, affected her cognitively.

She'd come to Rochester in part to take advantage of the opportunities the University provides for undergraduate research. Following her surgery, she would work as an assistant in the lab of Andrea Sant, a professor in the Medical Center's Department of Microbiology and Immunology. She would offer instruction and support to fellow undergraduates as a workshop leader in introductory microbiology. And she began to prepare for her semester in Bristol, deciding that she would not let her condition prevent her from taking advantage of the opportunity to study overseas.

Athletically, things were looking up as well. Remarkably, she was cleared for full practice just in time to start training for the 2016 indoor and outdoor seasons. "It was incredible that not even after six months following surgery, she was back to full training," says Albert.

Spring 2016

Although she hadn't been on the track for a year, she picked up right where she left off. At the Houghton Highlander Invitational in January, she ran on the second place 4-by-200-meter relay team. The following week, she and three teammates on the 4-by-400-meter relay

To follow Lockard's journey through the remainder of the spring season, visit https://www.tfrrs.org/athletes/4643893/Rochester/Laura_Lockard.html. The progress of the entire women's track team can be found at https://www.tfrrs.org/teams/NY_college_f_Rochester.html.

NORMAL STUDENT: Lockard, a microbiology major, says focusing her energy on her studies helped her recover. "It was one of the few areas of my life that still felt normal to me. I didn't even really tell my professors what was going on. . . . I just wanted to feel like a normal student."

captured first place at the Brockport Golden Eagle Multi & Invitational. She posted indoor personal best times in the 500-meter race at the Ithaca Bomber Invitational in early February and in the 200-meter dash a few weeks later at the Brockport Golden Eagle Invite.

"It was nerve-wracking given everything that happened," Lockard says. "But soon after those first few meets, I realized that I wasn't as far behind as I thought."

Soon she would face another setback that would sideline her for the remainder of the indoor season. Following the second Brockport meet, she started to feel "off." She was lightheaded and lost some sensation in her legs and face. She underwent another round of tests, and came back with normal results. Doctors attributed her symptoms to stress, or possibly a virus of the type that often spread around college campuses in the winter months.

In March, as the outdoor season began, she was back, making her debut at a home meet, the Rochester Spring Invite. She placed fifth of 29 runners in the 200-meter dash. Later in the season, at the New York State meet, Lockard and her teammates in the 4-by-100 meter relay captured the state title in the event, posting a time of 48.91 seconds, less than half a second off the school record.

By the end of the spring semester, Albert professed amazement. "The success Laura had this season given the limited amount of summer training was remarkable," he said in May. "I am really excited about what she can accomplish in her senior season."

Spring 2017

As the 2017 indoor season draws to a close, it just might be that Lockard's workouts on a dirt path in southwest England served her well. If her goal was to match her personal bests—all but one of which occurred in her freshman year, before the discovery of her tumor—she's been coming close. Moreover, in the opening weeks of the indoor season, she posted the top times on the Rochester women's team in five events.

Looking back at her ordeal, Lockard says, "The insignificant decision to participate in this volunteer study changed my whole life." At the most basic level, it means she'll take her medical school entrance exams and apply to schools in the coming year, a year later than she'd planned. The gap year, she notes dryly, "will give me a full year to experience the medical profession as something other than a patient."

More deeply, there are the life lessons. "Thinking about everything I went through and where I am now really fills me with a considerable amount of pride," she says. It was definitely a really rough thing to go through at only 19, 20 years old. But I think I've made the best of everything in my life since that point." Ⓡ

Scott Sabocheck is assistant director of communications for the Department of Athletics and Recreation.

Futurama Drama

Computer scientist David Lu ’07 (T5) uses theater to explore the evolving relationship between humans and robots.

By Sofia Tokar

David Lu ’07 (T5) has not yet seen *Westworld*, HBO’s hit television series in which android hosts populate a Wild West–themed park and cater to the whims of human guests. Lu’s omission is notable, given his billing as chief robot programmer in the spring 2015 theatrical premiere of *Sky Sky Sky* by Liza Birkenmeier.

The play, like *Westworld*, raised questions about artificial intelligence, human-robot relationships, agency, and autonomy. But unlike the TV show—which features human actors playing robots who think they are humans—one of the play’s main actors was, in fact, a robot.

Dubbed Harris T. Robot, it was a PR2 model, a common robotics research platform that runs on the open source robot operating system (ROS) and is used by countless industries, universities, and companies. About five feet tall, weighing 400 pounds, and with two arms, PR2 is not exactly Anthony Hopkins. Still, Lu believes that the performing arts, especially theater, offer a way to explore the potential to enhance human-robot interactions using current robotics technology.

“With theater, we can construct controlled scenarios and put the robots in, allowing them to participate in much the same way human actors do,” he says. The job of professional actors, after all, is to convince others that they are something they’re not. Using acting techniques, might robots convince people that they are social, or even conscious?

“If I’m in a production of *Hamlet*, I can’t actually change myself into Hamlet. But I can do everything in my power to make my actions look consistent with those of the Prince of Denmark,” says Lu. Maybe it’s the same thing with robots. “We can’t get robots to be real, human-like, emotional creatures, but within the scope of theater we can have them perform actions that make it seem to the audience as if they are.”

Sky, Sky, Sky was the result of a six-year collaboration between computer scientists

HUMAN TOUCH: Roboticist David Lu ’07 (T5) helped program Harris T. Robot—a central figure in the play *Sky, Sky, Sky* (above, in a scene with actress Nancy Harris)—as part of his PhD work on how robots interact with people.

COURTESY OF DAVID LU ’07 (T5)

and performing artists (including the play's director, Annamaria Pileggi) as part of Lu's PhD work on contextualized robot navigation at Washington University in St. Louis. Set in 2061, it centers on a character named Joan, an older woman who suffers a heart attack and needs the assistance of a robot as her medical caregiver.

Lu believes there is also something special about using real robots in live theater, as opposed to digital droids or actors playing robots on screen. "The fact that it's a chunk of plastic with whirring fans and flickering sensors—that part gets a visceral response from the audience."

Understanding that response is a key part of Lu's current work as a roboticist at Bossa Nova Robotics, a Pittsburgh-based start-up that specializes in building robots that work around people. Lu programs robots that scan the shelves of large grocery and retail stores to track what's out of stock.

"Like the theater work, it's all about how people perceive the robot," he says. "This robot is in a store with people who had no idea they were going to see a robot that day. Every move that robot makes is going to have broad implications for what people think of robots from then on."

Most robots, for example, are programmed to get from point A to point B in the most efficient manner, even if there's a person in the way. Whereas humans understand the concept of personal space, most robots are not concerned with such decorum. Lu's work entails programming robots with contextual information to improve human-robot interactions. "The idea of being able to help shape people's impressions of robots is really what drives me," he says. "I want people to not be afraid of robots. They're completely harmless."

Could Harris T. Robot be a gateway to Wall-E, Skynet, or other fictionalized versions of self-aware artificial intelligence?

Lu demurs. "There's no greater intelligence in these robots. I might personify my robots, but I'm under no false pretenses about their abilities."

Instead, when it comes to robots like PR2, Lu likens himself to a stage parent: "I'm not the one on stage, but I am making sure that [the robot] does well—and when it screws up, that reflects on me. But if it succeeds, then I can sit back proudly." ®

PENNSYLVANIA'S 50TH: Josh Shapiro '95 (right) takes the oath of office as Pennsylvania's 50th attorney general while his wife, Lori, and children, Sophia, Jonah, Max, and Reuben, look on.

Taking the Oath

Alumni are sworn into new elected offices this year.

Josh Shapiro '95

Pennsylvania Attorney General

A native of Abington, just outside Philadelphia, **Josh Shapiro** '95 has moved steadily upward to higher and higher offices since his first election, as a member of the Pennsylvania House of Representatives, in 2004. In January, he became the 50th attorney general of the state of Pennsylvania.

Shapiro served three terms in the legislature representing the district that includes his hometown. Then, in 2012, he sought and won election to the Montgomery County Board of Commissioners. A Democrat, he defeated Republican State Sen. John Rafferty, whose district includes parts of Montgomery County, in last November's race for attorney general.

A political science major at Rochester, Shapiro got his first taste of legislative politics as a participant in the political science department's Semester in Washington program. That experience led him to return to Capitol Hill after graduation, where he eventually became the chief of staff to Rep. Joe Hoeffel of Pennsylvania.

Tony Vargas '08

Nebraska State Senator

In January, about the time he was taking the oath of office as a Nebraska state senator, **Tony Vargas** '08 was also accepting an award from the Omaha Jaycees as one of Ten Outstanding Young Omahans. The award, which honors community service and professional development, underscored the growing importance of Vargas, a native of New York City, in Nebraska's largest city.

The son of Peruvian immigrants, Vargas studied psychology at Rochester and gained research experience in the lab of Jack Werren, the Nathaniel and Helen Wisch Professor in Biology. He began his professional career teaching science in a New York City public school for Teach for America. His work with the nonprofit led him to Nebraska, where he worked on teacher support and development for Teach for America, before becoming a policy analyst for an Omaha educational consulting firm and a member of the Omaha School Board. Last fall, he accepted a new position, which he retains while serving in the senate, as marketing and communications director for Omaha Healthy Kids Alliance.

A Democrat, Vargas defeated Republican challenger John Synowiecki last November. Vargas is the only Latino serving in Nebraska's unicameral legislature.

Mary Beth Walsh '87

New York Assemblywoman

Mary Beth Walsh '87 is a lawyer in private practice, where her work has been focused on advocating for children in Family Court. Before winning a seat in the New York State Assembly in November, she served on the Ballston Town Board and as assistant Saratoga County attorney. A specialist in municipal as well as family law, she's also a board member of the Saratoga County Industrial Development Agency.

Walsh, a Republican, defeated Democratic challenger Michael Godlewski, also a family attorney, in November.

CHRIS KNIGHT/AP IMAGES

Breaking News, Making News

It's a 'golden era' in broadcast news, says Tommy Evans '99, London bureau chief at CNN International.

By Sofia Tokar

As a child in Thailand and India, **Thomas (Tommy) Evans** '99 thought about working for the United Nations when he grew up. But instead of the UN, Evans found his calling at another global organization: CNN, one of the world's leading producers and distributors of news media. "I always wanted to do something international," he recalls, "but never really considered journalism."

Evans visited the River Campus in February, where he met with students, faculty, and administrators, and lectured at the Humanities Center on the global view of the 2016 American presidential election.

With an eye for photography and an interest in politics, Evans double majored in studio art and political science at Rochester, before earning a master's degree in international politics at London's School for Oriental and African Studies. He was living in New York City and working at CNN as an associate producer when the September 11 attacks took place.

"Suddenly, my master's dissertation,

OPTIMISTIC OUTLOOK: "I'm an optimist who thinks this is a golden era and an exceptionally creative time in the industry," says Tommy Evans '99, the London bureau chief at CNN International, who met with students (above) and others while on campus this winter.

ADAM FENSTER

which focused on terrorist political theory, became pertinent to what everyone was covering," he says.

"Everyone" included Evans, who covered the aftermath of the attacks, and would go on to cover other major stories, such as the "7/7" bombings in Central London and Hurricane Katrina, both in 2005. He was developing as a journalist, something he credits to good mentorship.

Among his mentors was CNN anchor Anderson Cooper, whom Evans respectfully dubs one of the "drill sergeants in my journalist's boot camp."

In 2006, Evans moved to Baghdad to cover the war in Iraq as a field producer. He spent the next five years living in the city—as opposed to the Green Zone, the center of the city's international presence—and working with correspondent Michael Ware and dozens of Iraqis. He was regularly embedded with coalition forces. "You have to be willing to take professional risks and leave your comfort zone," he says. "I think my career has benefited greatly from this mentality."

Today Evans is vice president and the London bureau chief at CNN International, which broadcasts news abroad while also supplying international content for CNN's domestic outlets. He oversees the award-winning news operations across Europe, the Middle East, and Africa.

"My newsroom is like a little United Nations. There are people from everywhere and they speak something like 40 languages," he says. "We have an amazingly diverse staff and audience."

His team has a wide variety of reporting and storytelling technologies available, too.

"There are doom-and-gloom people who say social media and digital technology are killing traditional TV news. I'm an optimist who thinks this is a golden era and an exceptionally creative time in the industry. We have the freedom to tell stories the best way, not necessarily the way it's always been done."

He's particularly proud of his team's coverage of the migrant and refugee crisis in Europe. "Telling that story wasn't just our job—it was the right thing to do." His team ended up winning an Emmy Award in recognition of their outstanding reporting.

But the network has had its critics. President Donald Trump, for example, has sometimes singled out CNN when he thinks the network has reported "very fake news."

Evans says that CNN's reporters are doing what the media are supposed to do: setting (and keeping) the factual record straight. "We'll continue to take him to task when he says things that aren't true."

WATER & LAND: As a Fulbright Scholar in India, Goodine will use photography and other media to explore the tension between modern land and water use and ancient traditions.

THE ARTS

Picturing Land and Water

Over a 30-year period, **Linda Adele Goodine** '80 has developed a national and international reputation for her performative photography—work that draws on her training not only in photography, but also in installation art, dance, video, and sound art.

Goodine has been awarded a Fulbright Scholarship to India to complete a photographic series exploring the tension between modern land and water use and ancient culture and tradition.

Over a two-year period, Goodine will record in still photography, sound, and video the transition from the dry season to the monsoon season at the junction of the Alaknanda and Bhagirathi Rivers.

Her latest project flows naturally out of previous bodies of work reflecting on the manipulation of the natural environment in the service of commerce. Works such as *The Baler* (above, right), carried out in New Zealand, explored "the remaking of the contemporary material world through the metaphor of sustainable farming." *Perigee Moon* (top) was part of a series recording environmental

change in the Florida Everglades that Goodine—invoking Henry David Thoreau—says has resulted in "an erosion of modern man's fantasy and search for an ideal nature."

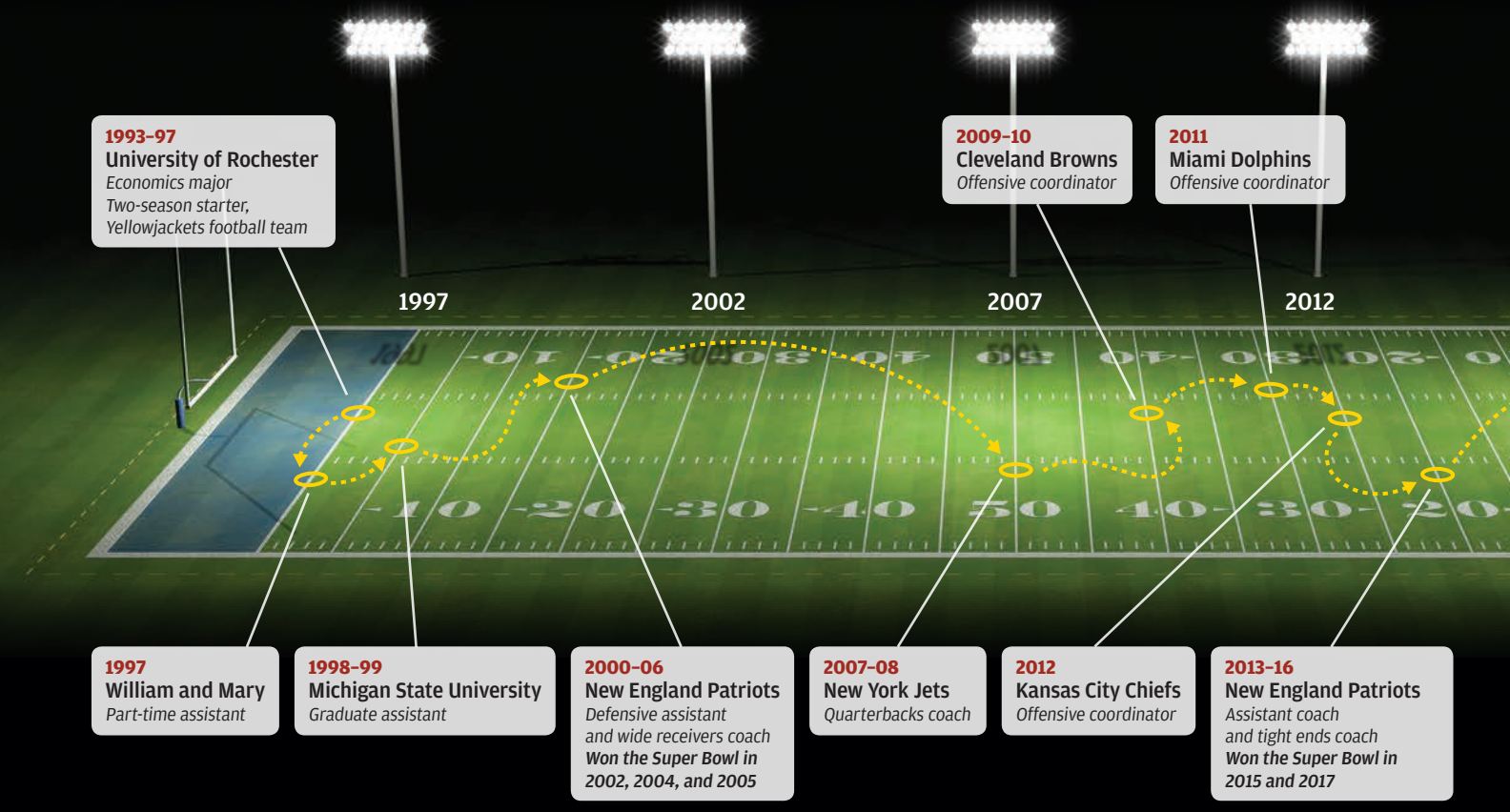
Goodine, who studied with the late photographer Roger Mertin at Rochester, spent 25 years at Indiana University/Purdue University's Herron School of Art and Design—where she last held the title Chancellor's Professor of Art—before being named the Carol Grotnes Belk Distinguished Professor at East Carolina University's School of Art and Design in 2015.

—Karen McCally '02 (PhD)

COURTESY OF LINDA ADELE GOODINE '80

A Successful Drive

In two decades of coaching, Brian Daboll '97 has played important roles for several college and professional football teams.



On the Offense

Brian Daboll '97 is going from one football powerhouse to another.

Coming off the 2016 NFL season as an assistant coach for the Super Bowl champion New England Patriots, Daboll will begin the 2017 season as the offensive coordinator and quarterbacks coach for the University of Alabama Crimson Tide, winner of four national championships since 2009.

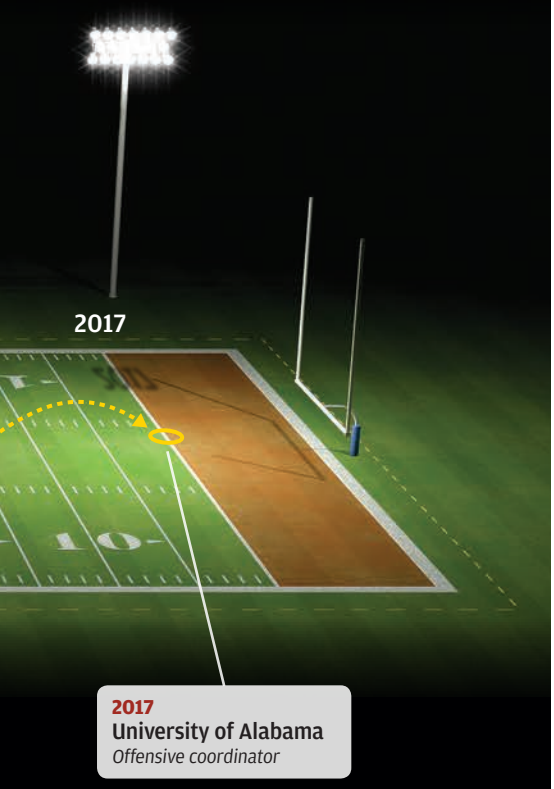
With nearly two decades of college and professional coaching experience, including 10 seasons and 5 Super Bowl titles with the Patriots, Daboll is rejoining a staff led by Alabama head coach Nick Saban. The two first met in 1998 at Michigan State, where Saban was head coach and Daboll was a graduate assistant.

An economics major at Rochester, Daboll played two seasons for the Yellowjackets as a starter at safety. His playing career ended in the 1995 season finale with a helmet-to-helmet collision. Doctors advised him to quit to prevent possible damage to nerves in his shoulders and spine. He spent his senior season as a student assistant before embarking on a coaching career.

Daboll "brings a tremendous work ethic to the job and has a wealth of football knowledge," Saban said in a statement. "Brian is a great teacher of the game, and someone who can relate well to our players."

—JIM MANDELARO

STEVE BOERNER (GRAPHIC); ISTOCK (FOOTBALL FIELD)



2017
University of Alabama
Offensive coordinator

TOP TEAMS: While he was a member of the coaching staff for the New England Patriots, the team won five Super Bowl titles.

ELISE AMENDOLA/AP IMAGES

GRAMMY GROUP: Double bassist Geoff Saunders '09E (far right) was recognized for his work as a member of the Grammy Award–winning O'Connor Band (from left), Maggie O'Connor, Mark O'Connor, Forrest O'Connor, Kate Lee, and Joe Smart.

2017 Grammy Round Up

Three Eastman School alumni and one faculty member won Grammy awards in 2017.

Sean Connors '04E, a member and technical director of Third Coast Percussion, won the award for Best Chamber Music/ Small Ensemble Performance for the album *Steve Reich*. **Oliver Hagen** '08E, '10E (MM) appears on the album as a guest pianist.

Charles Pillow, assistant professor of saxophone at Eastman and a member of the Ted Nash Big Band, won Best Large Jazz Ensemble Album for *Presidential Suite: Eight Variations on Freedom*.

Geoff Saunders '09E, double bassist with the O'Connor Band with Marc O'Connor, won Best Bluegrass Album for the group's debut recording, *Coming Home*.

Shane Shanahan '95E, a percussionist with the Silk Road Ensemble, won Best World Music Album for *Sing Me Home*.

In addition, **Jared Schonig** '05E (MM), drum chair for the Broadway musical *The Color Purple*, performed on the soundtrack, which won Best Musical Theater Album.

How are the Winners Chosen, Anyway?

There were 84 categories recognized by the National Academy of Recording Arts and Sciences for this year's Grammy Awards. Who makes the decisions about the most noteworthy contributions to this vast and wildly diverse array of musical output? **Nick Bruno** '17, an audio and music engineering major from Rochester, discussed the selection process with Stephen Roessner, an instructor in audio and music engineering and a doctoral candidate in electrical engineering at Rochester, and **Dan Kannen** '17, an audio and music engineering major from Baltimore, Maryland.

Roessner won a Grammy in 2010 as the recording engineer/mixer on *Messiaen: Livre Du Saint-Sacrement*, which won for Best Instrumental Soloist Performance (without Orchestra).

The conversation was recorded as part of the *Quadcast*, a University podcast. To listen, visit Soundcloud.com/urochester.

CHRIS PIZZELLO/INVISION/AP IMAGES

Class Notes

GREEN AND CAREFREE: Spring arrived early in 1969. Recognize anyone? Write to us at rochrev@rochester.edu.

College

ARTS, SCIENCES & ENGINEERING

1955 **Ed Russell** has published a book of poetry, *The Rhymes of My Life* (Outskirts Press), exploring "the highs and lows from his own life and the follies of others."

1957 **Roberta Allbert Dayer** writes that she's published *Gene & Dorothy: A 70-Year Love Story* (CreateSpace), tracing the history of her parents' marriage, in their own words, beginning with their childhood in Raton, New Mexico, through East Pittsburgh and Buffalo to Silicon Valley in the 1990s. Roberta is the former executive director of the Western New York International Trade Council and the author of two previous books, *Bankers and Diplomats in China, 1917-1925* and *Finance and Empire: Sir Charles Addis, 1861-1945*. She adds, "I look forward to celebrating my 60th reunion with classmates in October."

1959 In the January-February issue, we printed a note and a photo from **Marilyn Johnson Burday**, who gathered with eight other classmates in Port Clyde, Maine, last August. We mistakenly included only a partial listing of the classmates appearing in the photo. With apologies, we reprint the photo of the nine friends who were, as Marilyn wrote, "ready to embark on a Puffin tour in the rain." From left to right are **Steve Barnes** '66, Marilyn, **Abby Barnes Anderson**, **Bob Geyer**, **Liz Allen Symonds**, **Barbara Thomas Geyer**, **Marcia Sheehe Zornow** '65W (Mas), **Stu Symonds** '60, and **Ted Zornow**. . . . **David Sutliff** writes that he and **David Linderman** traveled to Bloomington, Illinois, last summer to visit their Alpha Delta Phi brother **Robert Baker** '60W (MA). "This gathering was a repeat of a similar get-together two years ago," David Sutliff writes. He adds that discussion of the 2016 presidential election "was given short shrift in favor of catching up on everyone's grandchildren and retelling stories of yesteryear, which have gotten better over the years."

1960 **Alan Hilfiker** has published a collection of short stories, *Journeys off the Road* (CreateSpace). Alan is a University trustee and an estates and trust director in the Naples, Florida, office of the business law firm Cohen & Grigsby. . . . **Stu Symonds** (see '59).

1959 Burday

1963 We apologize to **Jeanne Torre** for misspelling her name in the January-February issue, in which she reported on the role of **Kirk Dougherty** '03E (DMA) as a resident artist with Opera San Jose. Jeanne adds that the opera performed *Silent Night*, by composer **Kevin Puts** '94E, '99E (DMA), in February. Dougherty, a tenor, performed the role of Nikolaus Sprink.

1964 **Judith Lehman Ruderman** '66W (MA) sends a photo of (left

to right) **Naomi Schwartzman Silvergleid**, **Barbara Bauling Reeback**, and herself "at the south rim of the Grand Canyon in May 2016, part of a hiking trip to Sedona, both rims of the Grand Canyon, Bryce, and Zion." She adds: "The trip arose from our 50th reunion in October 2014. What a wonderful follow-up to a fantastic reunion!"

1965 **Tim Londergan** has been named a fellow of the American Physical Society in the nuclear physics division. A professor emeritus at Indiana University, Tim has conducted groundbreaking research on quarks. Fellows, who make up about one-half-of-one percent of the membership, according to the society, are nominated by their peers based on original research, innovative applications, teaching, leadership, and service. While a student at Rochester, Tim won a Rhodes Scholarship to study at Oxford University.

1966 **Steve Barnes** (see '59). . . . **Judith Littman Ellison** (see '83).

1968 **David Freese** has published *East Coast: Arctic to Tropic* (George F. Thompson Publishing), a photographic portrait of "the threat of climate change along the Atlantic Seaboard from the Arctic Circle all the way south to the Tropic of Cancer." The book is a companion to David's *West Coast: Bering to Baja*, released in 2012 by the same publisher.

1970 **John Bloom** has published a book, *Inhabiting Interdependence: Being in the Next Economy* (Steiner Books). John is a vice president at RSF Social Finance, a San Francisco-based nonprofit helping clients make socially minded decisions regarding investments, lending, and philanthropy.

1972 **John Kessel**, a professor and director of creative writing at North Carolina State University, has published *The Moon and the Other* (Simon and Schuster), a novel depicting a matriarchal utopia on the brink of civil war.

1973 **Steven Hahn** has published *A Nation Without Borders: The United States and Its World in an Age of Civil Wars, 1830–1910* (Viking). Formerly a professor of history at the University of Pennsylvania, Steven now teaches at New York University.

1975 **Dave Russo** sends an update about **Val Torrens**. Dave and Val are married and living near Seattle. Dave writes: "Val was elected to the US Lacrosse/Washington Hall of Fame Class of 2016. She founded the North Kitsap (high school) girls team, and has helped organize and grow the sport in Washington state."

1977 Science fiction author and film critic **Daniel Kimmel** writes that his newly released novel, *Time on My Hands: My Misadventures in Time Travel* (Fantastic Books), is set in and around the U of R campus, and is a satire that "skewer[s] all the clichés of the time-travel genre."

1979 **Sandra Gustafson Long** is the owner and manager of Post Road Consulting, with offices in Stamford and Westport, Connecticut. She's published a book, *LinkedIn for Personal Branding: The Ultimate Guide* (Hybrid Global Publishers).

1981 **Scott** '82 (MS) and **Barbara Barasky Birnbaum** write that several classmates gathered in Livingston, New Jersey, last November for the wedding of their son, Eric, to Meredith Turtletaub. Pictured from left to right are **Daniel Cohen**, Katia Segré Cohen, **Sam Narotsky** '80, '86S (MBA), **Irene Feldman Narotsky**, **Jo-Ann Daniels Suna**, **Jean Mack-Fogg** '82N, '88N (MS), **Thom Fogg** '90 (MS), '09M (MPH), Scott, Barbara, **Nanette Weingarten Strenger**, **Sandy Strenger** '80, '81 (MS), **Corine Slawin Milgram** '81N, Madelyn Givant, and **Steve Givant**.

1983 **Hope Shapiro Lilian** '84W (MS) sends a photo of herself with **Judith Littman Ellison** '66. She writes: "Upon Judy's retirement, I became her successor as the family engagement coordinator for HeadStart Programming in Westchester County, New York. We

1964 Ruderman

1981 Birnbaum

1983 Lilian

1984 Pinkham

Abbreviations

E	Eastman School of Music
M	School of Medicine and Dentistry
N	School of Nursing
S	Simon Business School
W	Warner School of Education
Mas	Master's degree
RC	River Campus
Res	Medical Center residency
Flw	Postdoctoral fellowship
Pdc	Postdoctoral certificate

DAY OF GIVING

5.3.17

Join the entire Rochester community of alumni, students, faculty, staff, parents, and friends as we celebrate our third annual Day of Giving. Please support any school, program, or area across the University and its Medical Center that means the most to you.

A gift of any amount counts. **Get ready to make a difference!**

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Don't want to wait? You can make a gift today and have an immediate impact by giving online or mailing your contribution in the enclosed envelope. Thank you!

UNIVERSITY *of* ROCHESTER

#URMakingADifference

were delighted to learn we were both U of R grads."

1984 **Robert Friedberg** has been named CEO of Health Quest Systems, where he'll oversee facilities in Dutchess, Ulster, Putnam, Orange, Columbia, and northern Westchester counties in New York. . . . **Wendy Hauler Pinkham** (see photo, page 55) writes: "Greetings from Djibouti! I'm the physical therapist for our military personnel deployed to the Horn of Africa and have been deployed here since June. I was promoted to my current rank of captain in October by the Navy's surgeon general, and was happy that Rocky could be present to help me celebrate!"

1985 **Margaret Blank Birth** writes that she's published *Romeo and Juliana* (Boroughs Publishing) under the name Maggie Adams. The book is "a modern-day multicultural retelling of *Romeo and Juliet*, but with a happily-ever-after plot twist." . . . **Jennifer Donnelly** has published *Lost in a Book* (Disney Books), "an original addition to the beloved *Beauty and the Beast* fairy tale."

1986 **Randy Abate** is the editor of *Climate Justice: Case Studies in Global and Regional Governance Challenges* (ELI Press). Randy is a professor of law at Florida Agricultural and Mechanical University.

1987 **Mary Beth Bain Hynes Walsh** was elected to the New York State Assembly for the 112th District, north of Albany. Her district office is in Ballston Spa. Prior to her election to the assembly, she was Saratoga assistant county attorney and the Town of Edinburg attorney.

1988 **Mara Shapiro James** writes that she founded the Extraordinary Lives (EL) Foundation for mental health awareness after receiving a diagnosis of bipolar disorder in 2014. "One of my visions is to host National Mental Health Awareness events at Major League Baseball stadiums, and we have our first event in May at Petco Park, where the San Diego Padres play the L.A. Dodgers." Mara invites classmates to find more information about the foundation, and the May event, at the website EL.foundation. Before establishing her own organization, Mara worked for Drexel Burnham Lambert, Swiss Bank Corp., and Credit Suisse First Boston, where she was vice president of foreign exchange operations. She and her husband, **Kenneth James** '89, an OB/GYN, moved to California with their three children in 2007.

1989 **Kenneth James** (see '88).

1990 **Jeffrey Barkstrom** writes: "After being foster parents for a number of years, my wife, Una, and I adopted our first child, Ariel, last June."

1992 **Joseph Santandrea** writes that he was a winner of the 2016 Austin (Texas) Art Boards contest. "My art will be seen on a billboard that moves around Austin for the year. Look for it if you pass through!" Joseph, who works in marketing for Dell, has been creating art with words for more than 20 years. He has shown his work around Austin, and maintains a gallery of his work at Travelzealot.com.

1993 **Rob Aaron** writes that he started a new position last December at Northwestern University as executive director of student affairs assessment and planning. "This is an exciting professional opportunity, and personally it puts me and my family back in my hometown after living elsewhere (including Rochester!) for 25 years. My wife, **Suzanne Stevens Aaron** '99E (MM), will continue teaching private voice lessons and singing in the Chicagoland area. Our son, Thomas, is now in his freshman year of high school."

1990 Barkstrom

1999 Duga

1996 **Gregg Roberts** has joined the New York City office of the law firm Reed Smith as a partner in the state tax group. Gregg specializes in the resolution of state and local tax controversies across the country.

1997 **Julie Reisler** writes that after graduating with a double major in psychology and health and society, she earned a master's degree in health and wellness coaching and developed her own coaching and personal development training company. She has written a book, *Get a PhD in You: A Course in Miraculous Self-Discovery* (Empowered Living Books). Julie adds that Professors Ed Deci and Ted Brown, and Dean Paul Burgett, "were each a huge inspiration."

1998 **Dave Handler** writes that he was promoted to partner in the law firm of Hawkins Delafield & Wood in January. The firm, based in New York City, specializes in public finance. He works in the Newark, New Jersey, office.

Send Your News!

If you have an announcement you'd like to share with your fellow alumni, please send or e-mail your personal and professional news to *Rochester Review*.

E-mail your news and digital photos to rochrev@rochester.edu. Mail news and photos to *Rochester Review*, 22 Wallis Hall, University of Rochester, P.O. Box 270044, Rochester, NY 14627-0044.

Please do not edit, crop, or resize your digital images; send the original, full-size file downloaded from your camera or smartphone.

To ensure timely publication of your information, keep in mind the following deadlines:

Issue	Deadline
July 2017	April 1, 2017
September 2017	June 1, 2017

2002 Albright

2006 Relyea and Roosa

2007 Korsak

2008 Carrier and Fersh

2010 Bogue

2010 Weissmann

2011 Benincasa

2011 Fridley and Cooper

1999 **Jason** and **Emily Aronstam Duga** '00, '06S (MBA) welcomed a third child, Olivia Violet, in April 2016 (see photo, page 57). Olivia joins big sisters Sienna, 6, and Julia, 3. They live in Webster, New York, just outside Rochester.

2000 **Emily Aronstam Duga** '06S (MBA) (see '99).

2002 Shane and **Ingrid Brill Albright** welcomed their second child, Tyler, last December. Ingrid writes: "Mom, Dad, and big sister Anneliese are all excited and smitten."

2003 **Matt Davison** was recognized as one of Buffalo Business First's 2016 "40 Under 40." Matt is senior vice president of the Martin Group and managing partner of its affiliate, Martin Davison Public Relations, which is a large and fast-growing western New York firm. Matt is also publisher of *Western New York Craft Beer Magazine*, co-owner of Consumer's Craft Cruiser, and former board chair of Explore & More Children's Museum.

2006 **Deste Relyea** and **Nicholas Roosa** '07 were married last September in East Burke, Vermont. Pictured from left to right are **Lindsay Wech Nabozny** '05, **Dan Lane** '12, **Jason Ludwig** '09, **Sarah Van Cor-Hosmer** '13M (PhD), **Christopher Nolan**, **Tyle Stelzig** '11, **Pete Nabozny** '05, Nicholas, Deste, **Joe Lust** '08, **Erika Winkler**, **Jenna Hoeler Lust** '07, **Lindsay Kryzak** '09, **Dan Duett** '05, **Iskra Miralem** '07, **Neil Janowitz** '04, **Laura Suchy-Dicey**, **Alex Voetsch** '04, **Basil Sitaras** '02, **Brian MacIlvain** '07, and **Dan Chebot** '09.

2007 **Amanda Michaud** and **Juan Carlos Hatchondo** '05 (PhD) were married last November in Bloomington, Indiana. Amanda writes: "Although we overlapped for two years at U of R (2003–05), we didn't meet until 2012." . . . **Ryan** and **Lulu Tsai Korsak** write that they welcomed a daughter, Ani, in October. . . . **Nicholas Roosa** (see '06).

2008 **Christopher Bell** '10M (MS), '15S (MBA) has been named executive director of the Monroe County Medical Society. . . . **Lynn Carrier** and **David Fersh** were married last September at the Massachusetts Museum of Contemporary Art (MASS MoCA) in North Adams. Lynn writes: "David and I were thrilled to share our wedding day with so many Rochester friends. Our mutual friend, **Tamar Mintz**, introduced us at an alumni happy hour in D.C. in 2012, and our wedding was officiated by our dear friend **Caitlin Powalski** '11M (MPH). In attendance were **Todd Rotkis**, **Joanna Reynolds**, **Adam Williamson**, **Hannah Geswein Williamson**, **Allen Bediako** '17S (MBA), **Jonathan DeRight**, **Jaimie Shapiro DeRight**, Tamar, **Avi Sommer**, **Kyley McClain Sommer** '06E, **Abbe Cohen Minor** '09, **William Chesebro** '10W (MS), and Caitlin. . . . **Tony Vargas** was elected to the Nebraska state legislature in November and has been named one of 10 "Outstanding Young Omahans" by the Omaha Jaycees (see page 49).

2013 Bellis

2010 **Jarrod Bogue** '15M (MD) sent a photo from a minireunion in New York City. From left to right are Jarrod, **Eric Mason**, **Matt Golder**, **Mike Fortier**, **Tom Madden**, and **Joni Mici**. . . . **Eric Weissmann** writes that he and Colleen Fauerbach were married last September in Washington, D.C. Eric is a member of the Young Alumni Council, and notes that the Office of Alumni Relations sent him and Colleen "a nice box of U of R gear before our wedding," which they put to use in a photo. Pictured from left to right are **Bradley Halpern** '12, **Brittany Crowley**, **Riley Robinson** '09, **Wyatt Anderson**, **Andrew Flack** '09, **Nikki Socash Robinson** '11N, **Hannah Baker**, **Dan Mendelson** '11 (MS), **David Axe**, **Matthew Neal**, **Jessica Marino**, **David Fersh** '08, **Lynn Carrier Fersh** '08, **Zachary Kimball**, **Megan Jones**, and **Kirstin Barry**. In attendance, but not pictured, was Eric's brother, **Matthew Eisenstein** '18.

2011 **Joseph** and **Elizabeth Del Mastro Benincasa** write, "We are thrilled to announce the arrival of our first child, Joseph Kieran." Joseph was born in June 2016. . . . **Leo Fridley** '12S (MBA) and **Katie Cooper** '12, '16M (MD) were married in Ithaca, New York, in May 2016. Leo and Katie met as freshmen in Susan B. Anthony Hall. Pictured from left to right are **Steve Paluszek** '79, **Aditya Jain** '12S (MBA), **Dhruv Kulkarni** '12S (MBA), **Neal Miller** '78, **Ellen McCormack** '17M (MD), **Claire Lyons** '16M (MD), **Bridget Hughes** '16M (MD), **Erin Lauer** '16M (MD), **Emily Redman** '12, '16M (MD), Katie, Leo, **Adriana Polisano**, **Andrew Fisher** '12 (MS), **Michael Weissman**, **Eric Auslander**, **Erin Finn** '16M (MD), **Andrew Allbee** (MD/PhD candidate), **Hannah Smith** '16M (MD), **Rachel Sitts**, and **Bill Forman** '82, '83S (MBA).

2012 **Katie Cooper** '16M (MD) (see '11).

2013 **Kylie Bellis** '14N writes that she married Brendan Ewing in June 2016 at the Adirondack League Club in Old Forge, New York. Kylie was a member of Alpha Phi at Rochester and sends a photo of herself and many of her sorority sisters from the Theta Kappa chapter who attended her wedding. From left to right are **Joelle Mamon**, **Sara Speilman**, **Carla Graff** '14, Kylie, **Lindsay Shor** '15, '16N, **Clare Kreckel** '14, **Nicole Podoloff** '15, and **Michelle Eglovitch**.

Graduate

ARTS, SCIENCES & ENGINEERING

1964 **Rochelle Goldberg Ruthchild** (MA), '76 (PhD) is executive producer of the documentary film *Left on Pearl: Women Take Over 888 Memorial Drive, Cambridge*. The film won the Director's Choice Award from the Black Maria Film Festival, and was shown at High Falls Film Festival in Rochester, as well as at Dallas VideoFest. Rochelle adds that she's an associate at Harvard's Davis Center for Russian and Eurasian Studies and a resident scholar at Brandeis's Women's Studies Research Center. She'll be speaking at a number of events in 2017 to mark the 100th anniversary of the Russian Revolution.

1976 **Ed Folsom** (PhD), a scholar of American poet Walt Whitman, is coeditor of *Song of Myself: With a Complete Commentary* (University of Iowa Press). Ed is the Roy J. Carver Professor of English at the University of Iowa, the editor of the Whitman Series at the University of Iowa Press, and codirector of the online Walt Whitman Archive, published by the Center for Digital Research in the Humanities at the University of Nebraska. . . . **Rochelle Goldberg Ruthchild** (PhD) (see '64).

1982 **Scott Birnbaum** (MS) (see '81 College). . . . **Jonathan Wolf** (MA) is an adjunct professor of physics at Fairleigh Dickinson University. In 2013, he published *Easy Physics: Step-by-Step* (McGraw-Hill Education).

1991 **Jeffrey Powers** (MS), a patent attorney, has been named senior counsel at the Syracuse, New York, law firm Bond Schoeneck & King. He works in the Rochester office.

2000 **Peter Stone** (PhD) is coeditor of *Bertrand Russell, Public Intellectual* (Tiger Bark Press). Peter holds the title of Ussher Assistant Professor of Political Science at Trinity College Dublin.

2005 **Juan Carlos Hatchondo** (PhD) (see '07 College).

2010 **Craig Nakashian** (PhD) has published *Warrior Churchmen of Medieval England, 1000–1250* (Boydell & Brewer). Craig is an asso-

ciate professor of history at Texas A&M University-Texarkana.

Eastman School of Music

1955 *Elegy*, by the late **Richard Lane** '56 (MM), has been published posthumously by Editions BIM. The 1989 composition for piano and violin has also been selected as a required piece by the Associated Board of the Royal Schools of Music in the UK. Editions BIM has also recently published Richard's *Fourteen Easy Pieces for Piano*.

1969 **Max Stern**, a professor of music at Ariel University in Israel, writes that his symphony *Beyond the Sambatyon* premiered at the 19th Israel Music Days in Be'er Sheba last October. He adds: "An unusual feature of the work is its integration of the folk instrument doira, from Bukhara in Central Asia, into the orchestra texture." This spring, he's an honorable research fellow of the Institute of Musical Research at the University of London.

1972 **Ted Piltzecker**, a vibraphonist, composer, and associate professor of music at SUNY Purchase College, spent last fall on sabbatical. He writes: "I presented concerts, performed in clubs, and taught master classes at conservatories in Iceland, Norway, Estonia, Turkey, India, and Nepal, and then went on to study gamelan music in Bali."

1981 **Bill Picher** (MM), organist and music director of the Basilica of the National Shrine of Mary, Queen of the Universe, in Orlando, Florida, writes that the Basilica Choir has released a CD, *Ave Maria* (Stemik Music). "This is our fourth full-length album release, and I'm pretty proud of it," Bill writes. "The music is by such diverse composers as Palestrina, Mozart, and Bach, and six of the tracks are written especially for us by living composers." . . . **Paul Schwendener** is the executive director of the All-Star Orchestra, an ensemble of 95 top musicians from orchestras around the country. He developed a partnership between the orchestra and the online educational organization Khan Academy. In recognition of that project, the publication *Musical America* named Paul one of the top 30 innovators in the performing arts industry in 2016.

1969E Stern

1972E Piltzecker

1994 **Kevin Puts** '99 (DMA) (see '63 College).

1999 **Suzanne Stevens Aaron** (MM) (see '93 College).

2002 Pianist **Mirna Lekić** has released her solo debut album, *Masks* (Centaur Records). She writes that the recording "features Claude Debussy's final ballet, *La Boîte à joujoux*, and includes shorter pieces by Muczynski, Debussy, Martinu, and Villa-Lobos." Mirna is an assistant professor of music at Queensborough Community College, City University of New York.

2009 Trombonist and composer **Nick Finzer** has released *Hear & Now* (Outside In Music), and began a two-month, 23-city tour in February. His third album, it includes eight originals and a Duke Ellington classic, and is "an artistic interpretation of the current social and political scene in the United States."

School of Medicine and Dentistry

1971 **Armando Filomeno** (Res), founding neurologist of the Peruvian Association for Attention Deficit (APDA) and the Tourette Syndrome Association of Peru, writes that his guide for Spanish-speaking parents of children with Attention Deficit Hyperactivity Disorder, *El niño con deficit de atención o hiperactividad: Cómo pasar del fracas al éxito* (APDA), is now in its third edition.

1999 **Salvatore Pacella** (MD) is the head of the plastic surgery division at Scripps Health in San Diego and La Jolla, California. He is coauthor of *Aesthetic Facial Reconstruction After Mohs Surgery* (JP Medical).

2010 **Christopher Bell** (MS) (see '08 College).

2015 **Jarrod Bogue** (MD) (see '10 College).

2016 **Katie Cooper** (MD) (see '11 College).

School of Nursing

2011 **Susan Lowey** (PhD) has published a book, *Nursing Beyond the Bedside: 60 Non-Hospital Careers in Nursing* (Sigma Theta Tau International Publishing). Susan is an assistant professor at the College at Brockport.

2014 **Kylie Bellis** (see '13 College).

Simon Business School

1990 **Nick Lantuh** (MBA) has been named executive chairman of the board for the cyber security company eSentire. Nick founded NetWitness Corp. in 2006.

2006 **Emily Aronstam Duga** (MBA) (see '99 College).

2012 **Leo Fridley** (MBA) (see '11 College).

2015 **Christopher Bell** (MBA) (see '08 College).

Warner School of Education

1960 **Robert Baker** (MA) (see '59 College).

1965 **Marcia Sheehe Zornow** (Mas) (See '59 College).

1966 **Judith Lehman Ruderman** (MA) (see '64 College).

1984 **Hope Shapiro Lilian** (MS) (see '83 College).

In Memoriam

ALUMNI

Jane Gordon Wilson '33, January 2017

Donald D. McCowan '39, January 2017

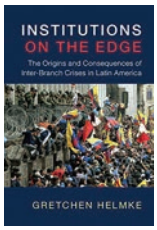
Ivar A. Lundgaard '41, December 2016
Barbara Carpenter Grace '42, January 2017
Elizabeth Fetter Mear '43E, December 2016
Ruth Tillotson Sandgren '43E, November 2016
Marian Maher Vaeth '44, December 2016
Elizabeth Bird Druckenmiller '45E, December 2016
Wallace L. Pensgen '45, '50 (MS), December 2016
Robert D. Neubecker '46, '49M (MD), December 2016
Catherine Bentley Browning '47, '48N, December 2016
Roger F. Milnes '47M (MD), October 2016
Donald J. Aldinger '48 (MS), December 2016
Vance B. Van Alstyne '48, January 2017
Pierce B. Day '48, '53 (MS), December 2016
Carol Pfleeger McKeehan '48, '49N, January 2017
Mary Baird DeSantis '49E, January 2017
Robert Gomer '49 (PhD), December 2016
Beatrice Caro Roxin '49E, January 2017
Vergil Singer Scott '49E, November 2016
Vincent Armand '50, June 2015
Stuart W. Ferguson '50, January 2017
Walter V. Isaac '50, January 2017
William P. McCarrick '50, December 2016
Carl F. Montione '50, January 2017
Marvin L. Smith '50, '52 (MS), December 2016
Ruth Clapp Van Buren '50, December 2016
Betty Jane Johnson Warner '50N, December 2016
Ann Hasker Barnes '51 (MA), November 2016
Joseph P. Coonan '51, December 2016
Sarah Horwitz Lewis '51, January 2017
Wesley P. Sauter '51, December 2016
Peter S. Shearer '51, June 2016
Stanley S. Dunkelman '52, '56M (Res), December 2016
Donald H. Painting '52, January 2017
Donald B. Wright '52E, '58E (MM), November 2016
Esther Christensen '53N, December 2016
William T. Allen '54E (PhD), December 2016
Thaddeus M. Bonus '54, November 2016
Dorothy Schambacher Cuthbert '54 (Mas), January 2017
Dan Neuberger '54 (PhD), January 2017
Anthony F. Saturno '54, December 2016
Jane Baldwin Shumway '54M (Res), November 2016
Dirk J. Spruyt '54M (MD), October 2016
Eva Miller Brauninger '55E (MM), December 2016
Robert J. Fogelin '55, October 2016
Joseph T. Lewis '55, December 2016
P. Jean Kershaw-Cantor '56E (MM), October 2016
Norman P. Leenhouts '56, January 2017
R. Neil McKay '56E (PhD), December 2016
Sylvia Shaffer Blankenship '57E, '59W (Mas), December 2016
Robert J. Francis '57, June 2016
G. Michael Howard '57, December 2016
Paul A. McEnderfer '57E (MM), December 2016
Barry Robinson '57, December 2016
Donald F. Spieler '57, January 2017
Alan McCanne '58, January 2017
Nancy Taskett Munzert '58, January 2017
Jocelyn Bull Notz '58, December 2016
Willliam G. Peck '59, '70 (MS), January 2017
Kenneth D. Watjen '59, December 2016
Peter H. Zachmann '59, November 2016
Patti Oday Blow '60, January 2017
Philip Browne '60E (MM), October 2016
Malcolm Gorin '60M (MD), November 2016
Donald R. Grinols '61M (Res), January 2017
Betty Stoller Saunders '61E, '63E (MM), October 2016
Charles A. Bablo '62, May 2016
David P. Beardsley '62S (MS), December 2016
Catherine Swift Doughty '62E, March 2015
Dawn White Hood '62, December 2016
William E. Smith '62E, January 2017
Robert C. Blackmun '63 (MS), December 2016
Laurel Jensen Humphreys '63, January 2017
Robert J. Rohr '63, October 2016
Dorothy Snell Howald '64N, December 2016
Raymond L. Bleier '65, December 2016
Katherine Heinrich Clark '67W, '71W (MA), December 2016
Frederick T. Cross '67M (PhD), December 2016
Donald J. Haycock '67W (Mas), December 2016
Jeffrey A. Stone '67, November 2016
Henrietta Irgang Harrison '68, October 2016
Mary Bramlett Retchless '68N (MS), January 2017
Daniel F. Cahill '70M (PhD), December 2016
John M. Clarey '70, December 2016
Nancy Arseneau Cummings '70W (MA), August 2015
Roy L. Wood '70S (MBA), January 2017
Yves Z. Salama '72, December 2016
Wayne S. Pittenger '72 (MA), December 2016
Keith M. Dewey '73W (MA), October 2016
J. Evelyn Osborne '78N (Flw), December 2016
Daniel E. Hedberg '80 (MS), December 2016
Marc A. Rozner '80M (PhD), January 2017
Richard J. Wesolowski '80S (MBA), January 2017
Arlene Davidson '82 (MS), January 2017
Raymond J. McQuade '83 (MS), December 2016
Keith Mersereau '84, '86 (MS), January 2017
Timothy C. Miller '84 (PhD), January 2017
Richard G. Fowler '85S (MBA), '93W (MS), December 2016
Michael B. Cosentino '87, January 2017
Paul D. Mahoney '88M (Res), August 2016
Cristy Knapp '90W (MS), December 2016
Lawrence P. Tarnacki '92M (MS), December 2016
Gordon G. Wingard '93, January 2017

Books & Recordings

Books

Institutions on the Edge: The Origins and Consequences of Inter-Branch Crises in Latin America

By Gretchen Helmke
Cambridge University Press, 2017



Through the lens of Latin America, Helmke addresses the questions, Why is institutional instability pervasive in the developing world? And why do institutional crises emerge repeatedly in some countries and not in others? Helmke is a professor of political science and chair of the department at Rochester.

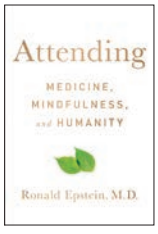
Downed by Friendly Fire: Black Girls, White Girls, and Suburban Schooling

By Signithia Fordham
University of Minnesota Press, 2016

Fordham, an associate professor of anthropology at Rochester, presents an ethnography of white and black girls at a high school in upstate New York. Among the issues she explores are academic achievement, social competition, and aggression in the form of female-centered bullying.

Attending: Medicine, Mindfulness, and Humanity

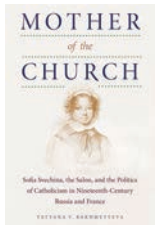
By Ronald Epstein '87M (Res)
Scribner, 2017



Epstein, a professor of family medicine, psychiatry, and oncology at the Medical Center, offers insights on bringing humanity to the practice of medicine in an increasingly commodified health care environment.

Mother of the Church: Sofia Svechina, the Salon, and the Politics of Catholicism in 19th-Century Russia and France

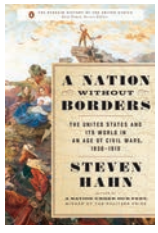
By Tatyana Bakhmetyeva '06 (PhD)
Northern Illinois University Press, 2017



Bakhmetyeva explores the life of Parisian salonnière Svechina—a Russian émigré who converted to Catholicism and made her salon a meeting place of the Liberal Catholic movement and the French intellectual Catholic elite. Bakhmetyeva is a lecturer at Rochester's Susan B. Anthony Institute for Gender, Sexuality, and Women's Studies.

A Nation Without Borders: The United States and Its World in an Age of Civil Wars, 1830–1910

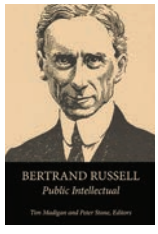
By Steven Hahn '73
Viking, 2016



Hahn, a Pulitzer Prize–winning historian and professor of history at New York University, offers a synthesis of the decades surrounding the Civil War that places the conflict in the context of many domestic rebellions against state authority. The book is the third volume in the edited series the Penguin History of the United States.

Bertrand Russell, Public Intellectual

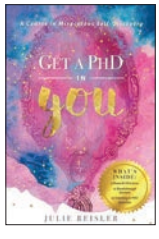
Edited by Peter Stone '00 (PhD) and Tim Madigan
Tiger Bark Press, 2016



Stone and Madigan coedit a collection of essays from Russell scholars across disciplines, lending insight to Russell's work as a political activist and progressive educator, and to his role as a cultural icon. Stone holds the title of Ussher Assistant Professor of Political Science at Trinity College Dublin and Madigan is an associate professor of philosophy at St. John Fisher College.

Get a PhD in You: A Course in Miraculous Self-Discovery

By Julie Reisler '97
Empowered Living Books, 2017



Life coach Reisler offers advice and strategies designed to help you achieve your personal potential.

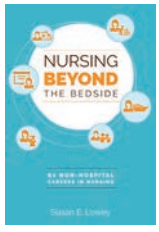
Aesthetic Facial Reconstruction after Mohs Surgery

By Salvatore Pacella '99M (MD)
JP Medical, 2016

Pacella, division head of plastic surgery at Scripps Health in San Diego and La Jolla, California, coauthors a guide to improving cosmetic outcomes in the surgical treatment of skin cancer.

Nursing Beyond the Bedside: 60 Non-Hospital Careers in Nursing

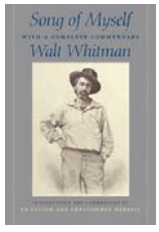
By Susan Lowey '11N (PhD)
Sigma Theta Tau, 2017



Lowey, an assistant professor and advisement coordinator at SUNY's College at Brockport, offers a guide to nursing careers in an increasingly community-based care environment.

Song of Myself: With a Complete Commentary

Edited by Ed Folsom '76 (PhD) and Christopher Merrill
University of Iowa Press, 2016



Folsom, the Roy J. Carver Professor of English at the University of Iowa and a distinguished Whitman scholar, joins the poet Merrill in offering critical commentary and perspective on the 19th-century American poet's most famous work.

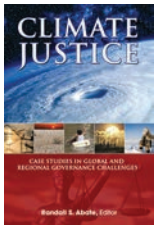
El niño con deficit de atención o hiperactividad: Cómo pasar del fracas al éxito

By Armando Filomeno '71M (Res)
Peruvian Association for Attention Deficit, 2016

Neurologist Filomeno offers a third edition of his guide for Spanish-speaking parents of children with attention deficit hyperactivity disorder.

Climate Justice: Case Studies in Global and Regional Governance Challenges

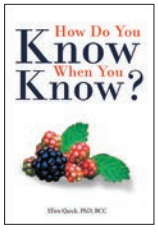
Edited by Randall Abate '86
ELI Press, 2016



Abate, associate dean for academic affairs and professor of law at Florida A&M University's law school, examines climate justice from the perspectives of U.S., international, and foreign domestic law and proposes solutions to regulatory obstacles to climate justice on a global scale.

How Do You Know When You Know?

By Ellen Quick '00M (Pdc)
Lulu, 2016



Quick, a clinical psychologist and life coach, presents "a solution-focused approach to personal decision making" drawing on insights from behavioral economics, philosophy, and multiple areas of psychology.

Lost in a Book

By Jennifer Donnelly '85
Disney Books, 2017

Donnelly offers an original twist to the Beauty and the Beast fairy tale in which a bookish Belle finds an enchanted book in the Beast's library. Just as "good stories take hold of us and never let us go," when Belle "becomes lost in this book, she may never find her way out again."

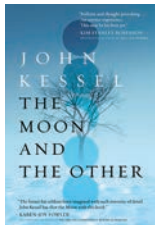
A Last Chapter of the Greatest Generation: The Life and Family of Colonel Frederic A. Stone, MD

By Judson Stone
Aviva Publishing, 2017

Stone tells the life story of his father, Frederic Stone '52M (MD), who served as a pilot during World War II, completed a medical degree at Rochester, practiced medicine around the world as an Air Force doctor, served as a missionary, and found "that dreams can be fulfilled in the most unexpected ways, through a career, marriage and fatherhood, and ambitions."

The Moon and the Other

By John Kessel '72
Simon and Schuster, 2017



Kessel, a novelist who teaches creative writing and American literature at North Carolina State University, presents a dystopia in which a matriarchal utopia disintegrates into civil war.

Romeo and Juliana

By Maggie Adams
Boroughs Publishing, 2016

Margaret Blank Birth '85, writing under the name Maggie Adams, presents a modern and multicultural retelling of the Shakespearean tragedy "with a happily-ever-after plot twist."

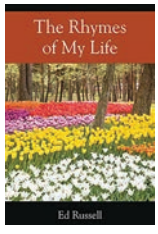
East Coast: Arctic to Tropic

By David Freese '68
George F. Thompson Publishing, 2017

In a companion book to his 2012 *West Coast: Bering to Baja*, Freese offers a photographic exploration of the effects of climate change along the Atlantic seaboard. Freese teaches in the film and media arts department at Temple University.

The Rhymes of My Life

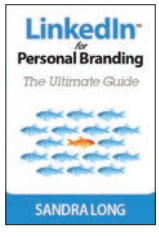
By Ed Russell '55
Outskirts Press, 2016



Russell presents a collection of poems reflecting on "the highs and lows of his own life and the follies of others."

LinkedIn for Personal Branding: The Ultimate Guide

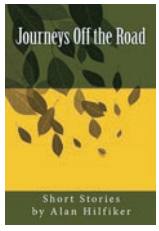
By Sandra Long '79
Hybrid Global Publishers, 2016



Long, an author, trainer, and consultant at Connecticut-based Post Road Consulting, shares her formula for demonstrating a personal brand effectively using the networking tool LinkedIn.

Journeys Off the Road: Short Stories

By Alan Hilfiker '60
CreateSpace, 2015



Hilfiker offers a collection of stories in which characters attempt "to find some measure of grace, or power, in a morally complex world." An attorney and a University trustee, Hilfiker has published multiple works of fiction and poetry.

Recordings

Masks

By Mirna Lekić '02E
Centaur Records, 2017

Pianist Lekić presents her solo debut, featuring Claude Debussy's *La Boîte à joujoux*. Lekić is an assistant professor of music at Queensborough Community College.

Hear & Now

By Nick Finzer '09E
Outside In Music, 2017

Trombonist and composer Finzer's third recording is "an artistic interpretation of the current social and political scene in the United States," delivered through eight original tracks and a Duke Ellington classic.

Ave Maria

By the Basilica Choir,
Mary, Queen of the Universe Shrine
Stemik Music, 2016

The Basilica's choir performs works by Palestrina, Mozart, Bach, and several living composers. William Picher '81E (MM) is the director of music and organist.

Books & Recordings is a compilation of recent work by University alumni, faculty, and staff. For inclusion in an upcoming issue, send the work's title, publisher, author or performer, a brief description, and a high-resolution cover image, to Books & Recordings, Rochester Review, *22 Wallis Hall, P. O. Box 270044, University of Rochester, Rochester, NY 14627-0044; or by e-mail to rochrev@rochester.edu.*

What's Your Script?

Through 'compassionate creativity,' theater artist Kali Quinn '03 finds her own script, and helps others find theirs.

Interview by Karen McCally '02 (PhD)

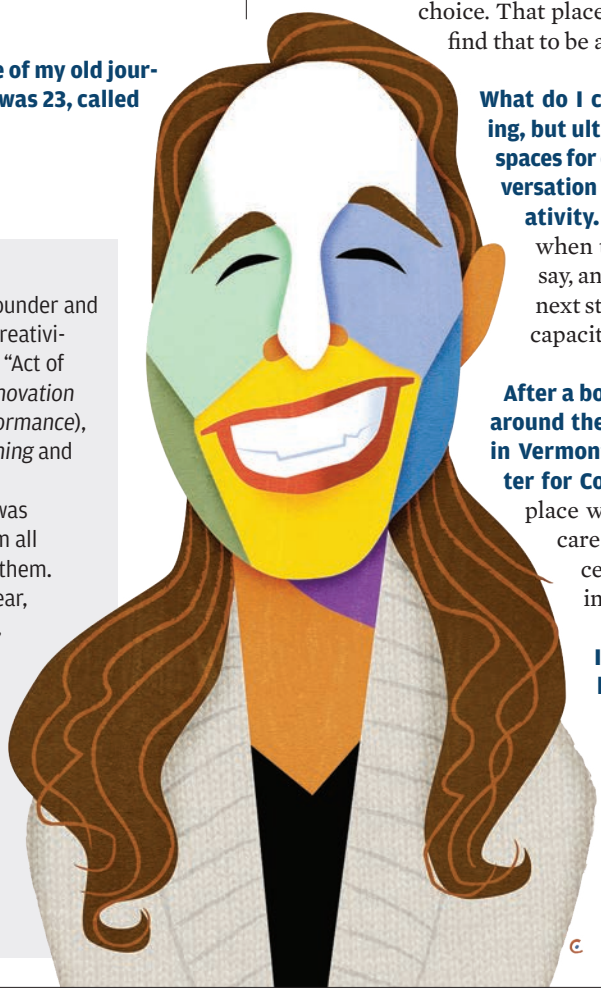
After graduation, I went to study at the Dell'Arte International School of Physical Theatre, in this tiny town in Northern California. Every week we were placed with a different group, and given an assignment to make something together. We would show it on Friday, and everybody from the community would come. It was constant collaboration, and constant honing in on basic questions. What is your point of view? What do you believe in? What do you want to say? All of a sudden I was going from playing other characters from script, to saying, what is my script? Who am I, and what am I going to create?

Over a decade later, after performing and directing around the country, I was teaching a course at Brown called Applied Creativity and Activism when a student said, "What's your question? You do so many different things, but what is the question that you're asking the world?" It was such an interesting moment, because I had always thought, "What is the world asking of me? What am I supposed to be doing? What kinds of work am I supposed to be doing?"

I went back home and went through some of my old journals. I found a list that I'd written when I was 23, called "Advice to a Young Artist Like Myself." I read the list of what I now call values. I didn't remember writing it, but I said, "Wait a second. I need to listen to this person, this part of me." That list really showed me my value system.

I realized that I've been looking at the relationship between compassion and creativity throughout my lifetime. Compassion and creativity are two qualities that both invoke a sense of connection and a need for presence. My question became, very quickly, how do we cultivate compassionate creativity in ourselves and our communities?

In my classes and workshops, the first exercise that I do is usually to have people walk around in a space and invite them to make eye contact with one another or not. Given that choice, what happens? There's a moment, always, of hesitation—like, "Uh-oh. What's going to happen? What am I going to have to do? I don't know what to do." And then, inevitably, within minutes, the room is just erupting with laughter. It's the unleashing of that permission to connect, to create, and to realize that you have a choice. That place of not knowing what to do—I find that to be a really exciting place.



What do I call what I do? It's ever evolving, but ultimately, I create and facilitate spaces for empathy, storytelling, and conversation that elicit compassion and creativity. I encourage people to admit when they don't know what to do or say, and then I help them discover the next steps by reminding them of their capacity to play and connect and love.

After a book tour, which I held in homes around the country last spring, I settled in Vermont and began to create a Center for Compassionate Creativity. It's a place where people can come to take care of their unique gifts and process what questions they're asking of the world.

I held a retreat for recent college graduates that offered a space to come and to not know. We tend to want to shut down that space. We end it by responding quickly, or shutting things off. My goal instead is to open up that space, to allow people to see all the possibilities within that moment.

Kali Quinn '03

Home: Guilford, Vermont
Theater artist, educator, workshop leader; founder and artistic director, Center for Compassionate Creativity; author of *I Am Compassionate Creativity*, "Act of Introducing Something New" (included in *Innovation in Five Acts: Strategies for Theatre and Performance*), and solo shows *Overture to a Thursday Morning* and *Vamping*.
On theater at Rochester: "My connection was instantaneous. I started meeting people from all over the world and then making things with them. It felt so natural. Then, after my freshman year, when I decided I really wanted to do theater, I transferred to NYU. And then, after one semester, I transferred back to Rochester. NYU was more of a conservatory setting. People were doing theater to do theater. And I didn't see it that way. Theater is not an end. It's a means to discover and learn about the world. Having had a more community-based experience at Rochester, I just kind of knew in my gut that I had to continue in that way."

DAVID COWLES FOR *ROCHESTER REVIEW*

A Legacy of Support

WHEN NORMA ANDZER AND HER late husband, Arnold, updated their estate plan, they asked themselves three key questions: What do we value? Where can we have an impact philanthropically? How do we ensure we will have enough income in retirement? Supporting the Golisano Children's Hospital was an answer to all their questions. It was important for the Andzers to give back to the community they love and to help the youngest and most vulnerable patients and their families. The Andzers made this happen through a provision in their will, naming the University as beneficiary of retirement assets, and funding charitable gift annuities which pay six percent income for life. Through the combination of these gifts, they will provide generous support including the establishment of the Norma and Arnold Andzer Endowed Fellowship in Pediatrics.

"We want all children to have healthy and productive lives," said Norma.

Norma Andzer in the Ganatra Family Atrium of the new Golisano Children's Hospital. She and Arnold are members of The Wilson Society. They also provide for the Memorial Art Gallery and the Eastman School of Music in their estate.

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CAMPUS SCENE

Warming to the Weather

HAMMOCK HANGOUT: Pegga Mosavi ’18 (left), an environmental studies major from College Station, Texas, and Julie Adams ’18, a cell and developmental biology major from Williamsville, New York, take advantage of a February warm spell to hang out in a hammock on the Eastman Quadrangle. PHOTOGRAPH BY ADAM FENSTER

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