Past Meets Present in Futuristic Digital Partnership

Visitors to Chicago’s Field Museum have the history of an ancient world at their fingertips.

With nearly 40 touchscreens, the Cyrus Tang Hall of China exhibition features a digital platform that, thanks to a Northwestern partnership, could shape the future of museum-based learning.

“We’re interested in how visitors will use the displays to connect with cultural artifacts in more meaningful ways,” says Michael Horn, computer science and learning sciences. Horn and Steven McGee, learning sciences, were recently awarded a National Science Foundation (NSF) grant to study the screens’ impact.

The collaborative project is the latest in an ongoing partnership involving Northwestern and Field Museum researchers. In 2001, the anthropology programs at each institution formalized their relationship. Today, five Field Museum curators have adjunct professor status at Northwestern, where they share their extensive knowledge with students. Likewise, several

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Northwestern Now Home to National Center for Top-Down Proteomics

Northwestern’s pioneering top-down proteomics program has been awarded a multimillion grant to expand the study of intact proteins.

The National Resource for Translational and Developmental Proteomics — funded with a $5.6 million award from the National Institute of General Medical Sciences (NIGMS) — establishes a hub for biomedical projects taking place at Harvard, UCLA, Cornell, Northwestern, and elsewhere. The effort also includes a formal program through which investigators from other institutions can visit Northwestern to learn top-down proteomics and begin applying the technique within their own laboratories.

“The center is not only charged with developing new technology, but also in

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Northwestern anthropologists have adjunct curator status at the museum, bringing the University’s research strengths into a cultural institution focused on public engagement and education.

“Our zoology, geology, and botany curators have also collaborated with Northwestern,” says Deborah Bekken, director of government affairs and sponsored programs at the Field. “The most recent NSF-funded project will explore the role that curiosity plays as visitors engage with new digital media. Ultimately, the study will help us determine if the effort made to provide additional information is being accessed easily by the public.”

Previous research on visitor interactions with a tabletop exhibit that Horn and collaborators designed has helped illustrate some of the benefits of technology-aided learning. The project, a display known as DeepTree, combined several large scientific datasets and innovative visualizations to create an extensive tree of life with more than 70,000 species.

Researchers concluded that successful free-choice learning experiences should include multiple entry points to challenge learners in different ways. That’s why flatscreens within the Hall of China will feature an immersive experience that combines the power of text with the ability to explore 360-degree digital photos.

“Museums are trying to figure out what today’s technological advances mean for them and their visitors. As academic researchers, we have an ability to take a step back and conduct these longer-term studies,” says Horn. “The Field Museum has been really supportive in giving us the space to do our work, while also allowing us to recruit visitors into our studies.”

The museum partnership was also the genesis of what has become the Master of Science in Education Teacher Leadership program within the School of Education and Social Policy.

“Working with the Field has truly provided a forum for me to study the development of teacher leadership,” says McGee.

In 2012, he directed a multi-year project targeting kindergarten through third grade Chicago Public Schools teachers. The Early Elementary Science Partnership program provided a range of resources to improve science teaching and science leadership development. Having enrolled a second cohort — this time from area Catholic schools — the collaborative effort involves the Field Museum and the Chicago Academy of Sciences.

Several Northwestern community members — including David Uttal, psychology, who has conducted research on parent-child interaction and how children transfer knowledge — have also benefited from research partnerships with the Field. Krystal Villanosa, a fourth-year student in the Learning Sciences PhD program, has maintained a relationship with the museum since working in its Education Department for almost six years.

“At the Field, my team developed educational programming that provided middle school and high school students with the mentorship, tools, and resources necessary to produce games, videos, and other digital media projects based on the content of the museum’s exhibitions and the work of the museum’s scientists,” she says. “Ultimately, it was this work that made me want to pursue my PhD.”

As a 2014-15 Segal Design Cluster Fellow, Villanosa conducted research at the Field to investigate the interactions that occur during parent-child gaming. Her current work explores how museums might be redesigned to better appeal to populations that do not typically visit.
Research Note: Connecting Research, Teaching, and Society

In his novel *Cat’s Cradle*, Kurt Vonnegut emphasizes the value of communicating about research in an accessible way, declaring, “any scientist who couldn’t explain to an eight-year-old what he was doing was a charlatan.”

The statement is deliberately provocative. Even gifted teachers know that not everything complex can be “translated” to the level of a first-year college lecture, much less the third grade. But Vonnegut, and others who have echoed the sentiments, remind us that the inability to perform this translation can mean that we don’t fully understand the scope, implications, or details of what we’re studying. “Translational difficulties” may also result in missed opportunities to connect with non-academic stakeholders, people whose partnership could enhance the impact of our research.

Discovery at Northwestern is distinguished by our researchers’ engagement with one another across disciplinary lines. This is one way we share our research story within the University even as we advance the horizons of our exploration to have social benefits far beyond campus.

In fact, our mission embraces public outreach, including through partnerships with cultural institutions, such as the Adler Planetarium or Field Museum (see cover story). In these settings, Northwestern is also shaping and extending pedagogical models, bringing immediate gains that enhance general scientific discourse — and inspiring the next generation of young investigators.

Northwestern research centers also play an active role in creating and communicating about our scholarship.

For example, our newest University center, Science in Society (SiS), is dedicated to science education and public engagement. Its Science Club Summer Camp (see page 6) is a practicum-based professional development program for Chicago Public School teachers, helping “train the trainers” and ensure they are equipped to deliver the Next Generation Science Standards. In partnership with Medill and the Graduate School, SiS also helps Northwestern PhD trainees gain the skills to communicate clearly and effectively about their research, thereby broadening the potential impact of that work within the University and outside of it.

Many of our centers also have a strong focus on undergraduate research, including through internships that offer hands-on learning. These efforts play an important part in advancing discovery and cultivating the talent that will make future breakthroughs.

Such engagement lets our discoveries come alive in a new way, blazing the trail for enduring progress across Northwestern and everywhere our knowledge transforms.

Vice President for Research

NU-Q Students Examine Race, Media in Ferguson

In a rare study abroad opportunity, Northwestern University in Qatar students examined race, class, and media ethics in Ferguson, Missouri, the epicenter of the renewed national civil rights debate.

Created and taught by Amy Kristin Sanders, NU-Q journalism and a native of the St. Louis area, the intense four-week course focused on media coverage of the civil strife in Ferguson following the story of Michael Brown, an 18-year-old black man who was fatally shot by a white police officer in August 2014.

“It was a creative idea to use the Ferguson incident to expose some of our Middle Eastern students to a pervasive American social problem in a thoughtful context,” says NU-Q Dean Everette Dennis. “It’s rare for them to see a smaller community, let alone one embroiled in a national crisis. They often think America is perfect or terrible; they don’t have much depth of knowledge about problems like race in the US.”

Read more.
applying it to timely biomedical projects,” says principal investigator Neil Kelleher, molecular biosciences, chemistry, and medicine. “In testing and proving the value of top-down proteomics in clinical and basic research, we must also create a setting where early- and late-adopting labs can learn to be successful when conducting these high-value experiments.”

Until the turn of the century, proteomics relied on the ability to break a protein into small pieces, analyzing it using mass spectrometry, and piecing the information back together to learn about their look and function. As an alternative to that traditional, or bottom-up, approach, Cornell’s Fred McLafferty developed the field of top-down proteomics. The two major advantages of the top-down strategy are the potential access to the complete protein sequence and the ability to locate and characterize post-translational modifications. Kelleher, who has established one of the leading groups in the world studying intact proteins, was a graduate student in McLafferty’s lab.

The NIGMS grant includes eight core biomedical projects, four of which involve Northwestern principal investigators: Michael Abecassis, Shuo Ma, John Wilkins, and Teresa Woodruff. Their investigations range from trying to identify proteins involved in transplant rejection before an organ fails, to reproductive health.

“Proteomics is similar to genomics in that it can be applied to many different fields,” says Paul Thomas, molecular biosciences. “Where proteomics gains a handle is that while the genome of a liver, heart, or skin cell are all pretty much the same, the proteins within each act as the primary regulators of both the fate and function of cells.”

While Thomas oversees the biological components of the National Resource for Translational and Developmental Proteomics, Philip Compton, chemistry, will oversee technology development.

“It’s a great partnership and mirrors what our research center was set up to do,” Compton says. “Our core group of researchers — including Ioanna Ntai, chemistry — will bring our mission of technological advancements and biological study to a national stage.”

Northwestern’s Proteomics Center of Excellence is supported by the University, Office for Research, Feinberg School of Medicine, and Chemistry of Life Processes Institute.

Morrison Named OSR-Evanston Director

Northwestern has named Kelly Morrison the new director of the Office for Sponsored Research (OSR) in Evanston.

Morrison has been with OSR since joining the office as a cost share officer in 2012. She most recently held positions as associate and then interim director.

“T’ll be excited to have the opportunity to lead OSR-Evanston during a time when Northwestern’s research enterprise is experiencing significant and continuous growth,” Morrison says. “OSR is dedicated to providing the infrastructure to enable outstanding support for sponsored research.”

Morrison joined the University in 2007, working in the Weinberg College of Arts and Sciences’ Department of Molecular Biosciences from 2007-09 and as a research administrator in the dean’s office at the McCormick School of Engineering and Applied Science from 2009-11.

“I feel that my experiences at the department and school levels have significantly influenced my work in central administration; it’s one of the reasons I am focused on developing strong partnerships with faculty and staff,” she says. “Customer service and compliance are two responsibilities of a central research administration unit like OSR and collaborating with departments and schools is crucial to ensure we provide the highest level of support within the institution.”

As director, Morrison will manage OSR-Evanston, serve as the institutional representative for all sponsored programs on the Evanston campus, and oversee the sponsored programs portfolio of Evanston-campus based schools, centers, and academic units, as well as NU-Qatar.
Origins: Exploring the Journey of Discovery ‘Chasing the Impossible’ with Vicky Kalogera

Vicky Kalogera, physics and astronomy, probes the mysteries of the universe, including black holes and binary neutron stars. These exotic objects are sources of gravitational waves — the theoretical “ripples” that distort the interwoven cosmic fabric known as spacetime posited by relativity theory. Einstein predicted that massive objects, like stars, planets, or black holes, should bend this fabric and propagate a wave-like disturbance across the celestial void when moving and accelerating. Yet gravitational waves have never been directly detected, and it is this tantalizing quest that’s at the heart of Kalogera’s research.

A celebrated scientist and the author of more than 200 publications, Kalogera is the E.O. Haven Professor of Physics and Astronomy and the co-founder and director of the Center for Interdisciplinary Research in Astrophysics (CIERA). There, she is leading Northwestern’s collaboration with LIGO (the Laser Interferometer Gravitational-Wave Observatory), a project sponsored by the National Science Foundation (NSF) that Kalogera says “will mark one of the biggest discoveries in physics and astronomy.”

Kalogera has earned numerous distinctions, including the Simons Fellowship in Theoretical Physics, the Packard Fellowship in Science and Engineering, and the NSF CAREER Award. Recently, she was nominated to the prestigious Committee on Astronomy and Astrophysics (CAA).

As a child in her native Greece, Kalogera was first attracted not to interstellar expanses, but to the “invisible world of tiny particles.” Her mathematical ability helped her advance academically and garnered her a spot in the national “Math Olympiad” in Athens. She earned her PhD in astronomy at the University of Illinois and joined the Harvard-Smithsonian Center for Astrophysics as a Clay Postdoctoral Fellow before coming to Northwestern in 2001. Research News interviewed Kalogera about her professional journey.

What were some early experiences that attracted you to science?

My first influence was toward math and that was because of my father’s passion for the subject. He showed me the structure and logic of math and instilled in me his admiration for math’s beauty. I became obsessed with the process and satisfaction of problem solving. This obsession also drew me to computer programming in high school. I used my allowance to buy my first computer — a Sinclair ZX Spectrum — and spent hours programming, solving advanced math puzzles, and listening to loud music, locked up in my room like a classic teenager.

The most exciting day of my month was when the new issue of Scientific American arrived in my small town of Serres, Greece. I studied the magazine and learned the material by translating the articles into Greek. That translation gave me great pleasure and enabled me to really think about what I was reading and writing.

Do you recall one of your first important discoveries?

It was not a science-related discovery but a personal one: I learned to pursue things that I once thought unreachable and to pursue them even though they caused me fear. As a high school senior, I was encouraged by a math tutor to compete in the regional Math Olympiad. I was terrified. I was certain his assessment of me was wrong. But I didn’t want to disappoint him, so despite having zero belief that there was any reason for me to participate, I took the exams. A month later I found out that I was one of only two students from among thousands in my area who progressed to the national Olympiad.

I learned that if something excites my curiosity, I should pursue it, even if it terrifies me.

In addition to math, what other subjects piqued your interest in science?

My first love was physics. I was fascinated by the invisible world of tiny particles, the forces that bring them together or tear them apart. I was reading everything I could find in Greek or English from the library or in science magazines — including biographies of scientists. I discovered astronomy later in college and was drawn to the mysterious and recently discovered black holes and neutron stars. Against the advice of ‘reasonable’ people, I attended a research conference on black holes and was hooked.

What most excites you about your work?

I love reading others’ research and participating in conferences, which help spur new research ideas. I enjoy the process of how a split-second spark in my brain can become an entire project that touches many people’s lives, eventually reaching completion and triggering the next project.

I also love the expression on my students’ faces when they understand a new scientific concept while also gaining insight into the process and pleasure of problem solving. For me, too, I remain excited by chasing the impossible and experiencing that profound sense of wonder every time a puzzle is solved.
Science in Society Receives NIH Award

A rolling group of 16 third-grade Chicago Public Schools (CPS) elementary teachers will be enrolled in a new professional development program thanks to a $1.2 million Science Education Partnership Award from the National Institutes of Health.

The Science Club Summer Camp builds on the success of Science in Society’s (SiS) student-based Science Club launched in 2009. SiS recently became a University research center and will continue to advance its mission of science education and public engagement, including through partnerships with Chicago-area schools and community groups. SiS also helps train Northwestern researchers to better communicate about their work with diverse audiences.

The Summer Camp for teachers will focus on the Next Generation Science Standards (NGSS). Completed in 2013, the NGSS is a multi-state effort to create new education standards that are rich in content and practice and arranged in a coherent manner across disciplines and grades to provide all students with an internationally benchmarked science education.

Teachers enrolled in Science Club Summer Camp will spend one week on the Northwestern campus learning about the nature of science and the new science standards. They will then spend two weeks implementing NGSS teaching approaches with youth in a Boys & Girls Clubs of Chicago summer camp. As part of this “practicum” approach, teachers will be implementing authentic CPS curricula with the support of Northwestern scientists and CPS master teachers. The program will serve 16 teachers and 100 youth per summer. All youth will receive full scholarships to attend the camp.

“We’re delighted to be partnering with the CPS Department of Science and Boys & Girls Clubs of Chicago to launch this innovative program,” says Michael Kennedy, SiS director. “The Next Generation Science Standards represent an exciting new direction for K-12 science education focused on student-led inquiry, conceptual understanding, and evidence-based debate. This approach requires teaching practices that are quite different. Our goal is to train and support teachers as they implement these new pedagogical strategies.”

The program begins in 2016.

Study Reconsiders Some Statin Therapy

A new study co-authored by Northwestern Medicine scientists found that discontinuing statin therapy for patients in palliative care settings was not only safe, but also benefited patients’ quality of life, increased satisfaction with care, and reduced medication costs.

“As patients approach the end of life, they usually get more medications and that increase often exacts a toll on their bodies, becomes harder to track, and increases the risk of side effects and complications,” says Adeboye Ogunseitan, medicine. “Physicians know that it is beneficial to discontinue medications that are no longer necessary, but it is unclear which medicines should be discontinued as well as timing and safety.”

Crounse Named Executive Director of The Garage

Entrepreneur Melissa Crounse has been named the first executive director of The Garage at Northwestern. She took the reins of the “innovation incubator” Sept. 1, bringing with her a decade of experience in Silicon Valley, including for Google, YouTube, and Luvocracy.

“I’m excited to work with students to build the space and programming that I wish I had as a college student,” Crounse says. “Entrepreneurship isn’t only taught in a classroom — it must also be experienced and lived. I want The Garage to be a space where the alchemy of entrepreneurship comes to life.”

Crounse’s experience helping consumer startups with business strategy, growth marketing, strategic partnerships, and business development will be invaluable as she builds a leadership team for The Garage, says Alicia Löffler, associate provost and executive director of Northwestern’s Innovation and New Ventures Office.

Housed in a real garage on the Evanston campus, the cross-disciplinary space opened in June. The signature program for The Garage will be a high-quality accelerator/mentorship offering that leverages local and global entrepreneurs and alumni volunteer mentors.

“We are thrilled to have Melissa Crounse as the founding director for The Garage,” Löffler says. “Melissa’s energy, entrepreneurial DNA and smarts make her ideal to lead this important initiative at Northwestern.”

Read more.
New $20M Grant Advances Nano-Sustainability Studies

Much remains to be learned about how nanoparticles affect the environment. Thanks to a new $20 million grant, researchers at Northwestern are helping to advance our understanding of such interactions.

“The newest Nissan Leaf battery, for instance, relies on nanometer-scale technology, and there's little information on what will happen to this material if the battery isn’t recycled properly,” says Franz M. Geiger, chemistry. “It’s reasonable to believe that when a Leaf is involved in an accident, fragments of these materials will be absorbed by the smallest of microorganisms, make their way up the food chain, and eventually wind up on the dinner table. Is that a realistic concern?”

That's one of the questions Geiger and a team of Northwestern scientists involved in the multi-institutional Center for Sustainable Nanotechnology, will attempt to answer.

Based at the University of Wisconsin-Madison, the center recently received a five-year, nearly $20 million renewable grant from the National Science Foundation to specifically study nanoparticles in emerging technologies and their effects on the environment.

Geiger will use a unique nonlinear optics laboratory to develop new imaging techniques and provide the testing grounds for nanoparticles created by other center members.

“New technologies and mass consumer products are emerging that feature nanomaterials as critical operational components,” says Geiger. “Our center, which started three years ago as a much smaller enterprise, is now well-equipped to tackle the challenge of studying engineered nanomaterials once they enter the environment — both the negative and positive aspects.”

Much of what the center does is focused on establishing causality, rather than reporting correlations.

“This is a problem rooted in being able to predict, from a set of experiments that we carry out in the laboratory, what nanomaterials shouldn’t be used because later on they will turn out to be detrimental,” says Geiger. “We can upend the existing paradigm in nanomaterial production towards one in which companies design nanomaterials to be sustainable from the beginning, as opposed to risking expensive product recalls — or worse — down the road.”

Nanotechnology involves the use of materials at the smallest scale, including the manipulation of individual atoms and molecules. Products that use nanoscale materials range from beer bottles and car wax to solar cells and electric and hybrid car batteries. If you read your books on a Kindle, quantum dots, a semiconducting material manufactured at the nanoscale, underpin the high-resolution screen.

In addition to Northwestern and UW-Madison, scientists from UW-Milwaukee, the University of Minnesota, the University of Illinois, and the Pacific Northwest National Laboratory have been involved in the center's first research phase, which began in 2012. Joining the center for the next five-year phase are Tuskegee University, the University of Maryland-Baltimore County, Johns Hopkins University, the University of Iowa, Augsburg College, and Georgia Tech.

Kabiller Prize Winner to be Announced at IIN Symposium

The inaugural winners of the $250,000 Kabiller Prize and the $10,000 Kabiller Young Investigator Award in Nanoscience and Nanomedicine will be revealed at this year’s International Institute for Nanotechnology (IIN) symposium.

The awards were established through a generous donation from Northwestern trustee and alumnus David G. Kabiller.

“The IIN at Northwestern University is a hub of excellence in the field of nanotechnology,” says Kabiller. “As such, it is the ideal organization from which to launch an award to recognize outstanding achievements that have the potential to substantially benefit society.”

The symposium takes place October 1 at the Hilton Orrington Hotel in Evanston. The event’s anticipated record attendance has necessitated the move to an off-campus venue.

There is no charge to attend the event due to the generous support from sponsors, but space is limited and reservations are required.

The following global leaders in the nanotechnology field are scheduled to present at the symposium:

- Warren Chan, University of Toronto
- Joseph M. DeSimone, University of North Carolina at Chapel Hill
- William E. Moerner, Stanford University
- Christopher B. Murray, University of Pennsylvania
- Hanadi F. Sleiman, McGill University
- Peidong Yang, University of California, Berkeley

Read more
Bioelectronics Pioneer John Rogers ‘Extremely Excited’ to Join Collaborative Research Culture at Northwestern

John A. Rogers, a materials scientist noted for his pathbreaking contributions to applied physics, particularly his leadership in developing flexible electronic devices, will become the inaugural Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering and Medicine when he arrives at Northwestern next fall.

“I’m extremely excited by this opportunity to join the science, engineering, and medical communities at Northwestern,” says Rogers. “Our research blends expertise from many different fields, with an increasing focus on biomedical technologies that have potential for clinical translation.” Rogers, currently at the University of Illinois Urbana-Champaign, cited Northwestern’s diverse thought leadership and culture of innovation as key elements informing his decision to join the University.

“The environment at Northwestern, where we already have productive collaborations with faculty in chemistry, materials science, mechanical engineering, bioengineering, dermatology, prosthetics, and neurological surgery, is exceptionally well matched to our interdisciplinary style of work,” he says.

Rogers is internationally renowned for designing and developing classes of electronic devices that can bend, stretch and twist, be integrated with the human body, and have diverse diagnostic and therapeutic function. His research spans disciplines and exploits novel approaches to problems with the potential to change the fields of industrial, consumer, and biocompatible electronics.

At Northwestern, Rogers will lead the new Center for Bio-Integrated Electronics, housed in the Simpson Querrey Institute for BioNanotechnology on Northwestern’s Chicago campus.

“John will expand greatly the scope of research at the Simpson Querrey Institute and create many synergistic opportunities with the institute’s scientific and clinical partners worldwide,” says Samuel I. Stupp, institute director and Board of Trustees Professor of Materials Science and Engineering, Chemistry, Medicine and Biomedical Engineering.

Neurobiologist Receives Beckman Young Investigator Award

Yevgenia Kozorovitskiy, neurobiology, has been named a 2015 Beckman Young Investigator by the Arnold and Mabel Beckman Foundation. The prestigious award includes a $750,000 grant, which Kozorovitskiy will use to research how neuromodulatory systems interact to support complex behaviors in vertebrates.

“The key to overcoming the long-standing challenges in neuromodulation is the creation of tools and approaches that combine the strengths of biological, engineering, and computational disciplines,” says Kozorovitskiy. “Thanks to the support of the Arnold and Mabel Beckman Foundation, my team and I will be able to do just that.”

To answer fundamental questions in neuromodulation, Kozorovitskiy will bring together multiple new optical microscopy techniques and classical technologies in neuroscience, such as electrophysiology and anatomical and computational approaches.

Discrimination Has Lasting Effect on the Body

In both blacks and whites, everyday feelings of discrimination can disrupt the body’s levels of the primary stress hormone, cortisol, new research suggests.

In African-Americans, however, perceived discrimination exerts stronger negative effects on cortisol than in whites, according to the study, one of the first to look at the biological response to the cumulative impact of prejudicial treatment.

The team of researchers, led by Emma Adam, a developmental psychologist at the School of Education and Social Policy, also found that the teenage years are a particularly sensitive time to be experiencing discrimination, in terms of the future impact on adult cortisol levels.

Read more.

Read more.
Most chemistry students don’t find Swahili listed as part of their course prerequisites.

But Aislinn McMillan, a junior majoring in chemistry and minoring in global health, found her yearlong study of the African language invaluable.

“My research was done to better understand how hospital staff and people in the surrounding communities view a private pharmacy,” says McMillan. “From our interviews and participant observation at other pharmacies, we learned that the prices at this pharmacy are higher than others in the area and this is what keeps many from seeing the pharmacy as beneficial to the community.”

During the eight-week study abroad experience — the first two weeks were spent learning Swahili — students were challenged to navigate the inherent complexity of conducting research in a foreign land.

“One theme that became apparent while working with the Dar es Salaam students was the difference in what had been emphasized to us in our educational backgrounds,” says McMillan. “Their training put a larger focus on structural components and theories, while ours had a larger focus on elements such as consent, confidentiality, and writing. These differences made writing the proposals more challenging than anticipated.”

After weeks of research, students compiled their results into reports presented in both English and Swahili to various community and health leaders.

“All of the students, whether American or Tanzanian, were put into situations that were inherently unfamiliar and sometimes uncomfortable,” says Noelle Sullivan, global health studies, anthropology, and director of the field research program in Tanzania. “By the end of the experience, they learned a lot about conducting collaborative health research, and also about themselves and their assumptions about the world. Discomfort is an incredible teacher.”

James Fan, a senior majoring in biology and minoring in global health, found the experience of walking through local neighborhoods exhilarating.

“Because our research was about community health needs, we spent all of our time in various villages,” he says. “People were so friendly and everyone we asked took 10-20 minutes out of their day to talk to us.”

Fan’s results seem to show that many of the community’s healthcare issues stem from a lack of trust between residents and public health facilities.

“I hope that the district uses our list of community suggestions to prioritize health improvements,” Fan says. “I’m hopeful because the district medical officer is new and told us that he would follow up and communicate with us about the outcomes.”
Science Café Returns With Look at ‘Next-Gen’ Scientists

What do blocks, stickers, and jigsaw puzzles have to do with science?

“Knowing how things fit together, particularly with regard to computers will be a necessary attribute for future researchers,” says Michael Horn, computer science and learning sciences.

Building computational literacy skills is the next topic of Northwestern's Science Café, taking place from 6:30 to 8 p.m. on September 16 at the Firehouse Grill in Evanston.

The nature of science is changing. More than ever, scientists use sophisticated computational tools and massive amounts of data to pursue research that was unimaginable a generation ago. From genome sequencing to searching for planets beyond our solar system, computation has become an indispensable tool. But these profound changes in how science is conducted also raise important questions about preparing the next generation of researchers, engineers, teachers, and policymakers.

Horn will address how educational institutions might do a better job reflecting the computational nature of modern science; how science can become more satisfying for youths; and ways to engage broad and diverse audiences in a computational future.

Horn's research largely focuses on human-computer interaction. A tabletop exhibit on evolution and common ancestry that he helped design has been installed in numerous museums throughout the country. His research findings regarding how students learn from the interactive exhibit, combined with an upcoming National Science Foundation-funded project at the Field Museum, could influence the design of future museum displays.

Good Clinical Practice Compliance Challenges Topic of next IRB Brown Bag

Institutional Review Board (IRB) Office brown bag sessions are held each month to address human research-related topics.

The September 23 brown bag discussion will explore some of the most prevalent challenges to Good Clinical Practice (GCP) and provide practical solutions for maintaining adherence to regulations for research involving human subjects.

Pamela Mason, School of Professional Studies and quality and compliance consultant for Northwestern's Global Health Foundation, will be presenting. The session begins at noon in Rubloff 750 on the Chicago campus. RSVP via email or the IRB events page.

Mirkin Receives Sackler Prize

Chad A. Mirkin, chemistry, one of the world’s leaders in nanotechnology research and its application, has been awarded the inaugural $400,000 Raymond and Beverly Sackler Prize in Convergence Research from the National Academy of Sciences (NAS).

A researcher whose work cuts across disciplines, Mirkin is being recognized “for impressively integrating chemistry, materials science, molecular biology, and biomedicine in the development of spherical nucleic acids that are widely used in the rapid and automated diagnosis of infectious diseases and many other human diseases — including cancers and cardiac disease — and in the detection of drug-resistant bacteria.”

These nanostructures, called SNAs, are able to access and interact in unique ways with biological systems and structures, including cancer cells and tumors.

Mirkin will receive the award October 13 during a ceremony in Washington, DC.

“I am absolutely delighted to be recognized by the academy with this inaugural award,” Mirkin says. “It is a remarkable tribute to the many students and postdoctoral associates who have contributed to my group’s research over the last two decades.”

The annual prize was established through a generous gift from Raymond and Beverly Sackler and their foundation. It recognizes significant advances in convergence research — the integration of two or more of the following disciplines: mathematics, physics, chemistry, biomedicine, biology, astronomy, Earth sciences, engineering, and computational science — and achievements possible only through such integration.

“By successfully combining the power of many scientific disciplines, Chad Mirkin created an entirely new kind of nucleic acid that is fueling critical advances in the diagnosis and treatment of devastating illnesses,” says Ralph J. Cicerone, president of the NAS.
‘ORD Presents DARPA 101’ on October 2

The Office of Research Development (ORD) is hosting a workshop regarding the intricacies of the Defense Advanced Research Projects Agency (DARPA).

Prem Kumar, electrical engineering and computer science, currently a program manager in the Defense Sciences Office at DARPA, will deliver an overview of the US Department of Defense agency responsible for the development of emerging technologies of benefit to multiple governmental and nongovernmental entities. DARPA-funded faculty will share their experiences during an afternoon Q&A panel discussion on October 2.

The workshop will take place from 11 a.m. to 1 p.m. at Chambers Hall, and is designed for researchers interested in learning how to collaborate with DARPA, present ideas to program managers, and develop a competitive proposal.

“DARPA’s portfolio spans the spectrum from basic research to applied research to operational applications, a range of activity that offers numerous opportunities for Northwestern investigators,” says Fruma Yehiely, associate vice president for research.

“The hallmarks of productive engagement with DARPA are ‘game-changing’ ideas that generate deliverables within a tight timeline of milestones.”

The upcoming workshop is free, although participants must register by September 18. Lunch will be provided.

For more information, contact Fruma Yehiely.

Mokyr Awarded 2015 Balzan Prize

Joel Mokyr, economics and history, has been awarded the 2015 International Balzan Prize for his groundbreaking work on the economic history of Europe and roots of technological change.

Winners of the Balzan Prize are awarded approximately $770,000. Half of the prize money must be allocated for research purposes.

The subject areas of the Balzan prizes are either specific or interdisciplinary fields, in the humanities (literature, the moral sciences, and the arts) and in the sciences (medicine and the physical, mathematical, and natural sciences). To recognize emerging fields and give priority to innovative research, the subject areas vary each year.

Mokyr will be honored during an award ceremony on November 13 in Bern, Switzerland.

“I feel a deep gratitude to two of Northwestern’s finest research departments, who in their different ways are both wholly committed to scholarship and learning,” says Mokyr.

“Without my outstanding colleagues and graduate students in economics and history, I would have never been able to do the work that is now being recognized.”

Mokyr works on the economic history of Europe, specializing in the period 1750 to 1914. He is the author of The Lever of Riches, The Gifts of Athena, The Enlightened Economy, and most recently A Culture of Growth — all books that focus on changes in technology and economic growth.

His scholarship aims to understand the economic and intellectual roots of technological progress and the growth of useful knowledge in European societies.

Read more.

Researchers Showcase Prosthetic Socket Design

NU-FlexSIV Socket developer Ryan Caldwell, left, a visiting fellow at the Northwestern University Prosthetics-Orthotics Center (NUPOC), demonstrates for Iraq military veteran Kim Cundiff how to fit the device. Caldwell recently presented at several NUPOC technology transfer/continuing education workshops. He was joined by course developer and principal investigator Stefania Fatone, physical medicine and rehabilitation, seated center.
Spotlight: Research in the News

Andrea Dunaif, medicine: endocrinology, brought a crew from Good Morning America into her lab to talk about new research on polycystic ovary syndrome.

Craig Garfield, pediatrics and medical social sciences, discussed his research on weight gain and new fathers in US News and World Report.

Ruchi Gupta, pediatrics and medicine-allergy-immunology, was quoted in US News and World Report regarding a finding that many teens with chronic illnesses have used alcohol or marijuana.

“Marriage today is, in some senses, better, and in other senses worse than it’s ever been,” says Eli Finkel, psychology, on The Today Show. Finkel’s relationships and motivation lab studies initial romantic attraction, interpersonal conflict, and self-control.

Reuters, US News and World Report, Fox News, and other national media outlets featured work by Brian Mustanski, medical social sciences. The research findings showed that only about one in five teenage gay and bisexual males said they had ever been tested for HIV, despite their increased risk of infection. Almost half the teens didn’t know where they could go to be tested for HIV, the virus that causes AIDS, researchers found.

Northwestern President Morton Schapiro co-wrote an article that appeared in Los Angeles Times expressing the view that Baby Boomers should not be so quick to mock colleges about “trigger warnings” and “micro-aggressions” among the student body.

Lonnie Shea, obstetrics and gynecology, was featured in Discovery News for research that demonstrates how a tiny implant can capture cancer cells spreading through the body.

Zachary Wright, religious studies at NU-Q, was quoted in Guardian, Washington Post, and Newsweek stories about a pilgrim that rode around on a motorized “hoverboard” in Islam’s most sacred shrine.

Discoveries

A study by Robert Hanlon, psychiatry and behavioral sciences, found that men who murder their wives or girlfriends are a distinctly different group than those who kill strangers. Chief among those differences: they are less likely to have a serious criminal record. Read more.

Yonggang Huang, mechanical engineering, and his team worked with the research group of John A. Rogers, materials science and engineering at the University of Illinois, to design a new assembly method based on an ancient Japanese paper art that quickly transforms 2-D structures into complex 3-D shapes. Read more.

A research team led by Neelesh A. Patankar, mechanical engineering, is the first to identify the ideal “roughness” needed in a surface’s texture to keep it dry for a long period of time when submerged in water. Read more.

James Rondinelli, materials science and engineering, and his research team have developed a design strategy that could open up new possibilities for electronics, including logic processing and new types of memory storage. Read more.

Marc Walton, materials science and engineering, has discovered that ancient artists used the pigment Egyptian blue as material for underdrawings and for modulating color — a finding never before documented. Because blue has to be manufactured, it typically is reserved for very prominent uses, not hidden under other colors. Read more.

At 12 months old, an infant’s ability to group objects according to the names associated with them — as opposed to their appearance alone — offers a glimpse into how his or her vocabulary will develop by 18 months, Sandra Waxman, psychology, has discovered. Read more.

Jane Wu, neurology, was lead author of a study that found that a nuclear protein called FUS is toxic to neurons, a finding that may lead to better diagnostic tools for amyotrophic lateral sclerosis (ALS) and other neurodegenerative diseases. Read more.

Chicago Expo Highlights Evanston Cores, Centers

Rama Mishra, a cheminformatics specialist with the Center for Molecular Innovation and Drug Discovery, talks about the center’s Medicinal and Synthetic Chemistry Core (ChemCore). Mishra was one of nine Chemistry of Life Processes (CLP) core facility presenters at the CLP Core Expo held September 10 on the Chicago campus. More than 200 expo participants learned how CLP services and instrumentation in proteomics, drug discovery, preclinical testing, biologics production, quantitative analysis, and imaging advance potential therapeutics and diagnostics from the early stages of discovery through pre-clinical testing.
Honors

Antonio Facchetti, chemistry, has received the American Chemical Society’s Award for Creative Invention. The honor recognizes a single inventor for the successful application of research in chemistry or chemical engineering that contributes to material prosperity and happiness.

Mercouri Kanatzidis, chemistry, has received the American Chemical Society’s Award in Inorganic Chemistry, an honor recognizing outstanding research in the preparation, properties, reactions, or structures of inorganic substances. Kanatzidis is a pioneering scholar in the field of renewable energy.

Frederick D. Lewis, chemistry, has received the inaugural Josef Michl American Chemical Society Award in Photochemistry. The honor recognizes excellence in fundamental research in organic or inorganic photochemistry and photophysics. Lewis’ research studies the relationship between the unique structure of DNA and its interaction with light.

Vicky Kalogera, physics and astronomy, has been selected to serve on the National Research Council’s Committee on Astronomy and Astrophysics (CAA). The overarching purpose of the committee is to support scientific progress in astronomy and astrophysics and assist the federal government in integrating and planning programs in these fields.

US News & World Report has ranked Northwestern University 12th in its annual college rankings. The University is up one spot from last year and sits tied with Dartmouth College.

The American Chemical Society has bestowed its Peter Debye Award in Physical Chemistry on Mark Ratner, chemistry. The award honors outstanding theoretical or experimental research in physical chemistry. Ratner has gained international acclaim as a scholar in several major areas, including environmental chemistry, energy science, and nanoscience.

George C. Schatz, chemistry, has received the American Chemical Society’s Irving Langmuir Award in Chemical Physics, a biennial award given to those who have made an outstanding contribution to chemical physics or physical chemistry within the past decade. Schatz researches theory and modeling in plasmonic materials, single molecule mechanical properties, and DNA photophysics and mechanical properties.

The American Association of Family Physicians has recognized Alisha Thomas, family and community medicine, for her exemplary teaching.

MANDELA WASHINGTON FELLOWS RECEIVE GRANTS TO CONTINUE WORK IN AFRICA

The United States Africa Development Foundation (USADF) has awarded six of Northwestern’s Mandela Washington Fellows with $25,000 grants and Northwestern alumni Bob and Charlene Shaw have supported seven others with gifts of $3,400. The elite fellowship program is part of President Obama’s Young African Leaders Initiative. This year, 25 Fellows spent six weeks at Northwestern where they participated in an intensive leadership curriculum through the Program of African Studies. The grantees include:

Patience Chisanga, who will use her gift to continue filming documentaries showcasing local culture around Zambia, exposing the country to their cultural heritage.

Edith Massa Greene from Liberia, who received a USADF grant for her fashion line Turquois House of Style, where she employs local women in her community and helps to empower them through economic freedom.

Felix Dela Klutse, the founder of Ghana’s leading business newspaper, Business Day, who will use his $25,000 grant to digitize his newspaper by creating a mobile app, thereby advancing economic and financial literacy across the country.

David Morfaw from Cameroon, who will use his USADF grant for his company, Poult Vault, to create more accessible finance and improve cooperation among poultry farmers.

Angèle Traoret from Gabon, who will use her $3,400 grant to continue strengthening cultural identity in her country by teaching children their local languages through picture books.
Proposal and Award Report: Through July 2015

The total amount of award funding that Northwestern received this fiscal year, through July, is $473.2 million, a 4 percent decrease ($21.1 million) compared with July 2014. The number of awards to date (2,450) is slightly less than last year.

The dollar volume of awards from federal agencies declined 7 percent ($23.8 million). Awards from industrial sponsors are up about 1 percent. Foundation funding has increased 10 percent ($2.3 million), while voluntary health organization funding is up 11 percent ($1.5 million).

The dollar volume of proposals submitted through July is $2.389 billion, an increase of 8 percent compared to last year. The number of proposals submitted (3,103) is up 1 percent.

The dollar volume of proposals submitted to federal agencies rose 7 percent ($130.7 million), while proposals to industrial sponsors increased 15 percent ($12.7 million). Proposal activity to voluntary health organizations is up 22 percent ($11.8 million).

Click here to access the full report.

Rep. Bob Dold Visits Feinberg School of Medicine

US Rep. Bob Dold (R-IL) discusses new legislation to improve the funding of biomedical research with Teresa Woodruff, medicine: obstetrics and gynecology-fertility preservation and director of the Women’s Health Research Institute, during a roundtable discussion at the Feinberg School of Medicine. While in Chicago, Dold also toured the laboratory of Elizabeth McNally, medicine: cardiology, and director of the Center for Genetic Medicine.