

CORNELL'S QUARTERLY MAGAZINE WINTER 2011

EZRA

SÉAMUS DAVIS AND HIS FANTASTIC MACHINE

RESEARCH GIVES
EDGE TO FINDING
NEXT GENERATION
OF FACULTY



EZRA

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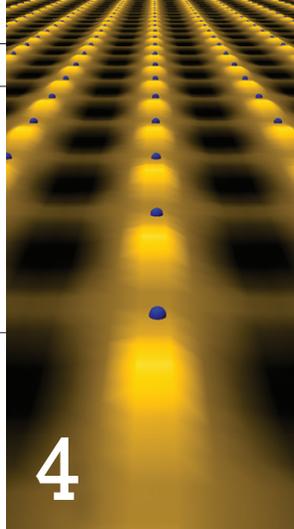
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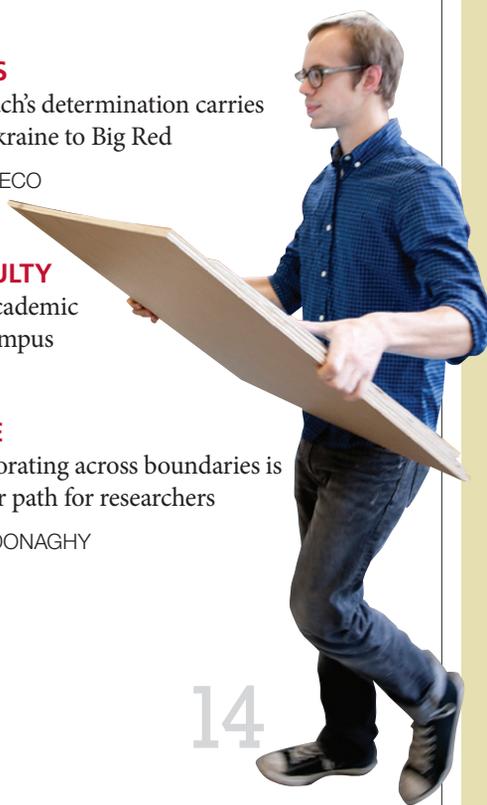
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From the publisher

Cornell's Ithaca campus is about to experience a tectonic shift. In the coming decade, as the baby boom generation hit their 60s and 70s, the university will need to hire as many as 1,000 new faculty members, including 100 in the humanities, due to the retirement of more than half of our most distinguished teachers, scholars and scientists.

This and the next three issues of Ezra will focus on this impending renewal of Cornell's faculty – perhaps the most dramatic change in the face of the academic staff in our university's history. Nearly half of our faculty members are over age 55. The College of Arts and Sciences has the oldest faculty in its history, with about 20 percent of faculty members over age 65. "We are hiring our future reputation," G. Peter Lepage, the Harold Tanner Dean of the College of Arts and Sciences, observed recently.

You may have read that Cornell has established a \$100 million Cornell Faculty Renewal Fund to begin hiring immediately, following a period of financial downturn that forced us to implement a universitywide hiring pause. In our Viewpoint article, Provost Kent Fuchs discusses the unprecedented rate of hiring that lies before us, and the opportunity it brings "to refocus, reprioritize and create new initiatives that will define Cornell's future."

In coming issues you will read about what makes Cornell such an academic magnet: The vision and dedication brought to the campus by faculty researchers and teachers in the life sciences, arts and humanities, and engineering. In this issue the discipline is the physical sciences, and the enormous energy – and, dare I say it, genius – brought to scientific investigation by one individual, and how this in turn brings the best minds – whether researchers or graduate students – to the Ithaca campus.

We also are planning other stories on how this unprecedented hiring will improve diversity in the faculty as a whole. And central to our stories is the research and teaching by current faculty members that future leadership will want to emulate. Another quote from Dean Lepage that succinctly sums up not only the challenges facing the university but also the themes that Ezra will portray: "It's scary to have your most famous people leave. But it's also a tremendous opportunity."

Thomas W. Bruce
Vice President, University Communications

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ON THE COVER

Physicist J.C. Séamus Davis peers out from behind a part of the cryogenic assembly of the scanning tunneling microscope located in a sound- and vibration-insulated room in the basement of Clark Hall.

Cover photo: Photo by Lindsay France/ University Photography; digital post-production by Matthew Fondeur/ University Photography

AROUND CAMPUS

Ezra lived here, too



PROVIDED

An Essentials item in the winter 2010 issue mentioned a new plaque put up at the restored Sigma Phi house on West Campus (1 Forest Park Lane) – a plaque that paid formal tribute to the fact that the house

sits on what was a portion of university founder Ezra Cornell's original homestead (in fact, a wall and blocker tie rings in the basement were likely part of Cornell's original barn).

The story indicated that the plaque, along with the Ezra Cornell statue and the crypt at Sage Chapel, are the only obvious places on campus that pay formal tribute to Ezra Cornell.

However, the nearby Delta Tau Delta house at 104 Mary Ann Wood Drive was built in 1965 on the site of Forest Park, Ezra Cornell's farm home, and for many years a plaque in front of that house (see photo) paid tribute to the location.

The plaque stated: "On this site stood Forest Park, the farm home of Ezra Cornell. The university's founder lived here from 1857 to 1869 while the university received its charter and began to build on portions of the farm. Here also lived four generations of the Cornell family as well as generations of students. No other site has more extended or more meaningful links with the early days of Cornell."

Forest Park was torn down in 1965 for construction of Delta Tau Delta house, which was dedicated in November of that year.

The plaque stood on a pedestal in front of the Delta Tau Delta house for many years and was moved to a spot in the sidewalk pavement in front of the house more than a decade ago. According to Young Hur, Delta Tau Delta president, the plaque was removed last semester due to damage from weathering. A replacement plaque has been ordered.



PROVIDED



MILESTONES

Cornell campaign surpasses \$3 billion mark

Cornell has reached the \$3 billion mark in its university fundraising campaign. Campaign co-chairs Jan Rock Zubrow '77 and Stephen Ashley '62, MBA '64, announced the milestone Nov. 18 at "Cornell on the Charles," an event attended by hundreds of Boston-area Cornellians. The record-breaking amount has been raised by only a handful of other universities.

Celebrating with Zubrow and Ashley (foreground) are, from left, President David Skorton, Cornell Board of Trustees Chairman Peter Meinig '62 and Vice President for Alumni Affairs and Development Charles Phlegar. Bob Appel '53, campaign co-chair for the Weill Cornell campaign, was not present at the event.

Since launching the \$4 billion campaign in 2006, Cornell has significantly increased its financial aid program for students as part of its commitment to need-blind admissions, established new professorships, created funds to assist the graduate and professional schools, and raised support for new medical institutes and professorships at Weill Cornell Medical College.

CORNELLCAST/PROVIDED



DOWNLOAD THIS

'CU in the Kitchen'

Check out the debut episode of "CU in the Kitchen" on CornellCast, www.cornell.edu/video?videoID=903, with host Dan Gabel and Senior Executive Chef Steven Miller, as they showcase preparations for the Fall Harvest Dinner, featuring local, regional and New York state produce, dairy products, beef and more.

With four certified executive chefs and two graduates from the Culinary Institute of America, eating at Cornell means enjoying some of the best campus food in the country. Cornell Dining maintains a commitment to sustainability seen in initiatives such as trayless dining, composting/recycling, and locally sourced food products.

Enablers of the app economy

Ben Roberts '10 (below, left) and Alexander Veach '09, M.Eng. '10, (right) are the founders of Terran Exchange, which was the August monthly winner at discoveringstartups.com – and represents that site's most popular startup of all time. Roberts reached out to a network of Cornellians for the competition and credited the Cornell community with amassing the 1,986 votes TerranExchange.com collected.

The site, which launched in early December, gives commercial software developers an open free market system in which to present their products; users can rate, review and purchase limited licenses and, through social media, freelancers and companies can interact with a community of buyers.

Roberts says he wants Terran Exchange to be able to give smaller application software companies the ability to compete with the much larger companies that dominate the market.

"We call Terran Exchange 'The Marketplace for Ideas' because the best products rise in a merit-based free market system," Veach says, noting that he and Roberts anticipate tremendous growth in apps and software.



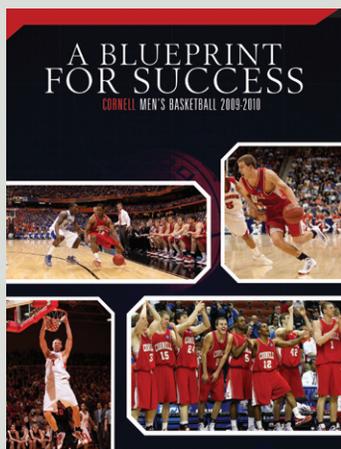
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OFF THE PRESS

Two books highlight Cornell's historic 2010 sports year

Two commemorative books on Cornell's historic 2010 year in sports are now available; proceeds from the sale of the books will benefit Cornell athletics.

"A Blueprint For Success: Cornell Men's Basketball 2009-10," commemorates the year the Cornell men's basketball team won its third straight Ivy League Championship and set a record for most wins in one season by an Ivy League team. It was the first Cornell team to win a game in the NCAA Tournament and to make it to the Sweet 16.



PROVIDED

"Making History, March 18-21, 2010: The Greatest Cornell Sports Weekend Ever!" highlights the record-setting performances and game-changing moments for four Cornell winter sports teams – wrestling, men's basketball and men's and women's hockey. Both books are published by Ithaca-based MomentumMedia and myTEAMBOOK.net, in conjunction with the Cornell Department of Athletics, and are available online and at the Cornell Store.

ALL MOOSEWOOD IMAGES PROVIDED BY THE MOOSEWOOD COLLECTIVE AND CORNELL UNIVERSITY LIBRARY



Growing up Moosewood

The Moosewood Restaurant – which Bon Appetit magazine named one of the 13 most influential eateries of the 20th century – recently donated its earliest menus, cookbook drafts, drawings, ads and other documents to Cornell University Library. Known by Cornellians as an Ithaca favorite since 1973, Moosewood has become an icon of vegetarian cooking and cuisine.



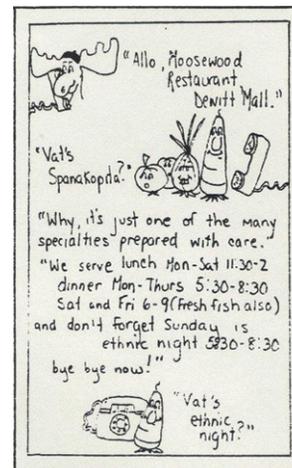
Members of the Moosewood Collective – who called themselves "Moosers" – may have appeared to be veggie-loving free spirits, but underneath the hippie exterior, they were smart and savvy businesspeople. A typewritten mid-'80s policy manual, "The Moosers' Book of Harmonious Functions," shows how organized the collective really was, with serious policies on business matters like corporate officers, ownership percentages and joint responsibility for loans.

In addition to the serious stuff, the manual includes this poem about the dress code:

summer dress vogue

The cooks well-hidden in the kitchen may wear whatever does bewitch 'em, but omnis, busettes and all waitrons should dress with reverence for our patrons.

Excessive rear and pit exposure will often cause a lost composure, so be aware of shorts and skirts as well as paints and smells and dirt. For though no rules we are devising to stop creative improvising, we must take part in realizing a mien that's clean and appetizing.



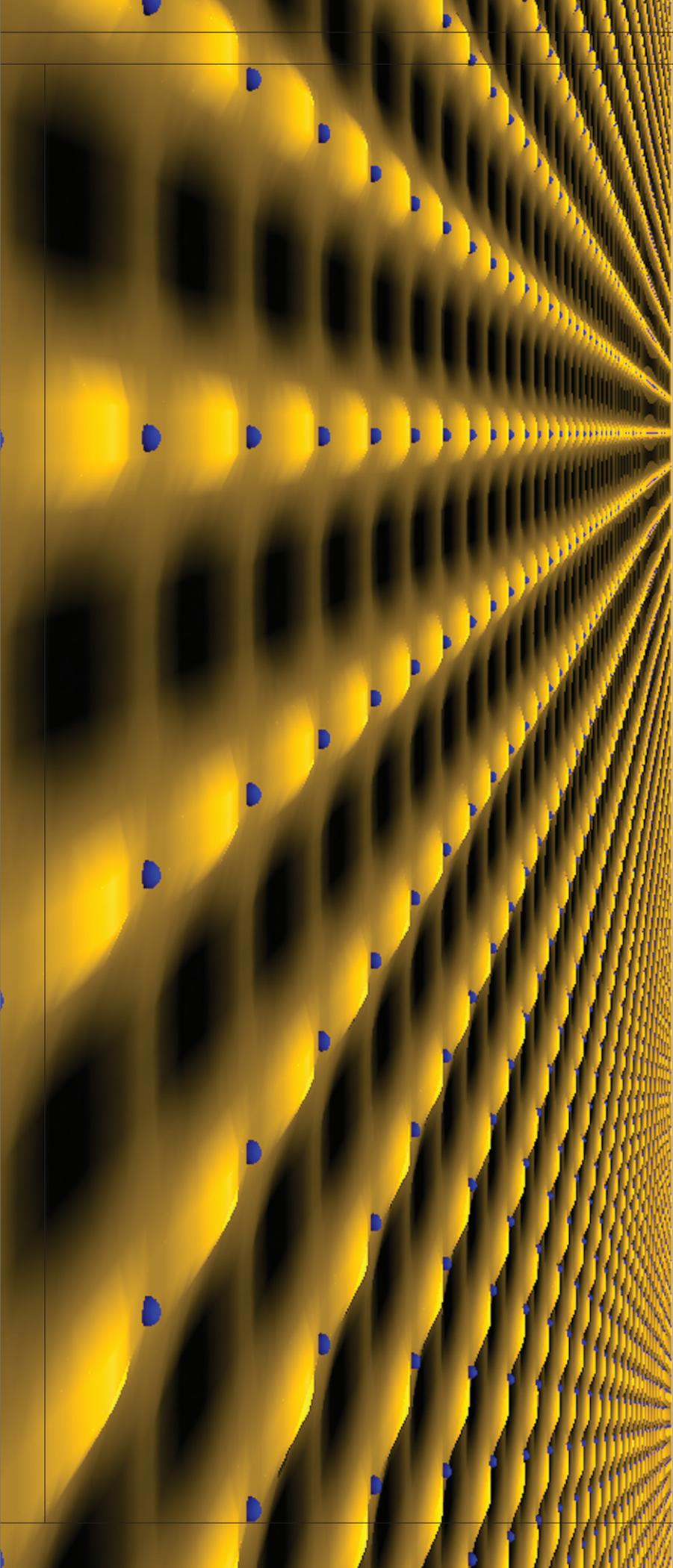


Séamus Davis builds a fantastic machine

Why his research embodies campus drive to attract next generation of faculty

It took a confluence of factors to bring physicist J.C. Séamus Davis, his family and his potentially world-changing research to Cornell: a welcoming academic environment, a good community for raising kids, generous financial support and a lot of great Irish music.

Davis had spent almost two decades at the University of California-Berkeley, working up from graduate student to professor of physics. His wife, Kathy Selby, was a physicist at the University of California-San Francisco. "As young adults living in San Francisco we had a fantastic time," Davis recalls.



DIGITAL POST-PRODUCTION BY MATTHEW FONDEUR/UNIVERSITY PHOTOGRAPHY



Left: This computer graphic simulation of the electron clouds in a layer of copper oxide in a superconductor shows how the density of electrons is different “north” and “east” of the copper atoms (marked by blue dots), a condition discovered using a scanning tunneling microscope in the low-vibration, low-temperature lab of physicist Séamus Davis (on facing page), one of three such microscope labs he has at Cornell (the third is being completed in the new Physical Sciences Building). This discovery may lead to a better understanding of high-temperature superconductors that could revolutionize electric power generation and transmission. Above: One of the controls that form parts of the cooling assembly for the lab.

HELIUM IN



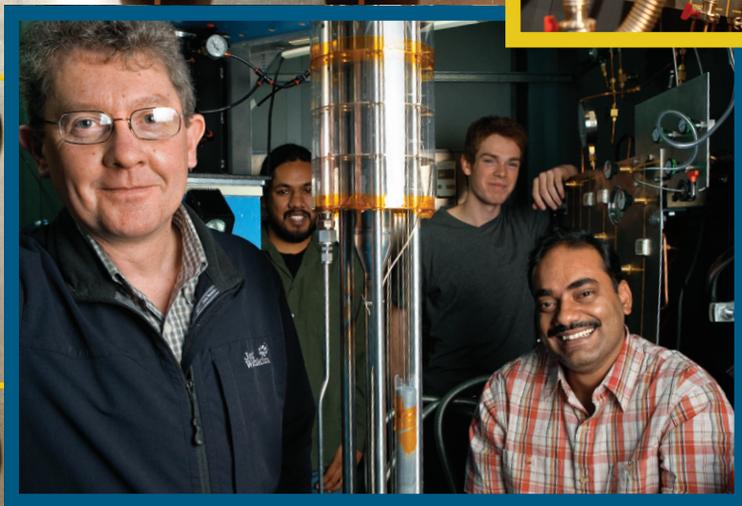
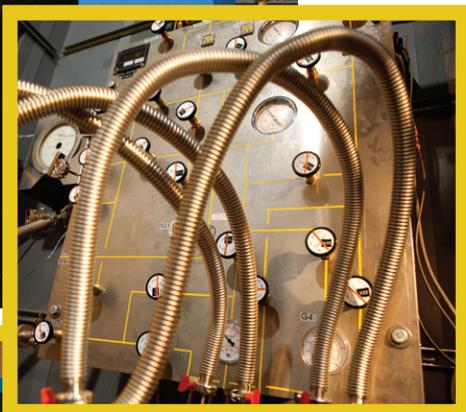
Until they had two young sons. “My wife and I were both born and bred in the country [he in Ireland, she in England],” Davis explains, “and we had to think about bringing up boys in the city, whether that was the right environment.”

“You would think he’s a lab rat and doesn’t think of anything else,” says Selby, “but in a choice between research and family, he’ll put family first.”

Serendipitously, both fell together. Cornell wanted Davis, who works in low-temperature physics and was already in professional contact with such Cornell researchers as David Lee (now at Texas A&M) and Robert Richardson, the Floyd R. Newman Professor of Physics emeritus, who shared in the Nobel Prize in physics for the discovery of the superfluid state of liquid helium at temperatures approaching absolute zero (-273.15 degrees Celsius, or -459.67 Fahrenheit).

“They hired me as a helium physicist,” Davis recalls, and he still does research on superfluid helium as well as on a new state of matter that might turn out to be what’s called a “supersolid.” But his work on high-temperature superconductivity has drawn the most attention. Superconductivity was first discovered in metals cooled to within a few degrees of absolute zero, through which electricity would move with no resistance. Recently discovered copper oxides called cuprates and some compounds of iron and arsenic become superconductors at temperatures up to 135 degrees above absolute zero. The holy grail is to find materials that will superconduct at or near room temperature, which could revolutionize electric power generation and delivery.

The attention that Davis’



Top image: Physicist Séamus Davis, right, Sourin Mukhopadhyay, visiting scientist from the Tata Institute in Mumbai, India, and undergraduate researcher Neal Harrington, in front, work with a scanning tunneling microscope (STM) in a sound- and vibration-insulated room in the basement of Clark Hall. The STM itself is in the stainless steel vacuum chamber in the center, suspended from an overhead lead table weighing about one ton. The table rests on air springs mounted on three lead-filled pillars, standing on a concrete floor eight feet deep, weighing about 35 tons and in turn resting on more air springs. All this isolation makes it possible to measure distances smaller than the diameter of an atom. During experiments the vacuum chamber is cooled to within a few degrees of absolute zero by liquid helium. Above right and background: Tubes and valves that form parts of the cooling assembly for the STM. Bottom: From left, Davis, graduate student Vikram Gadagkar, Harrington and Mukhopadhyay.

When a faculty hire depends on two jobs, not just one

Sometimes the key to enlisting a new faculty member is the offer of a position to a partner. The decision by Séamus Davis to accept a faculty position at Cornell was greatly influenced by a teaching opportunity for his physicist wife, Kathy Selby.

Early in her career Selby decided to have “balance” in her life, combining academics and music. “It runs in my father’s family. We like to do a bunch of things,” she explains. “A lot of women talk about the glass ceiling. I decided to turn it around and make the life I wanted.”

Her mother was a musician, and Selby studied classical violin as a child. Visiting Ireland with Davis she met his uncle – the Séamus for whom he was named – a renowned musician and storyteller. She brought home a book of Irish tunes and started playing them alongside the Vivaldi, and soon found more Celtic music at a San Francisco street fair. To make more time for music, she switched from an adjunct professorship at the University of California-San Francisco to a half-time research position.

Coming into Ithaca’s vibrant folk music community, she opted for a similar arrangement, devoting what she calls “50 percent time” to physics, and the rest to teaching fiddle and playing in local bands that play for contra dances (a New England descendant of English country dancing done to traditional fiddle tunes, very popular in academic communities).

Cornell’s physics department was already offering a course called The Physics of Musical Sound, and they handed it to Selby – a perfect fit. In alternate semesters she teaches physics for bioscience majors.

“Nowadays it often seems that both people in a couple are looking for a job, so you have to recruit families, not just individuals,” says Betsy Hillman, dual career consultant in the Division of Human Resources. The Dual Career Program was created in 2001 by then-Provost Biddy Martin.

Female physicists tend to marry physicists, says newly arrived assistant professor Eun-Ah Kim, because the ratio of men to women among physics grad students is about 25 to one. (Selby had the same experience.) Kim’s husband, Michael Lawler, found a job as professor of physics at Binghamton University and has



Kathy Selby and Séamus Davis during a quiet moment together at a local café.

an adjunct professorship at Cornell that allows him to collaborate with Kim and other researchers.

When the partner is an academic, employment arrangements are often made through contacts within or between departments, sometimes coordinated through the provost’s office. Candidates also can make use of the Upstate New York Higher Education Recruitment Consortium (UNY HERC), which maintains a database of faculty and staff jobs at member institutions in central New York. For nonacademics Hillman maintains contacts throughout the community. “I urge departments to include information about UNY HERC and the Dual Career Program in their recruitment materials,” Hillman says.

The Division of Human Resources also helps make Cornell attractive for arriving faculty families with an on-campus child care center, a program to help defray child care expenses, a lactation time-away-from-work policy and an adoption assistance program. Kim, who gave birth to a baby boy in September, benefits from a Cornell policy that stops the tenure clock for one year for new parents and exempted her from teaching for the fall semester.



Kathy Selby plays the fiddle (with a few fellow musicians) during an English country dance party at her home this fall.



'It's absolutely critical that the funding private universities can get be preserved and amplified, because it plays a critical role in how frontier science works.'

– J.C. Séamus Davis

research is getting has enhanced the reputation of the Cornell physics department and brought in millions in government research funding, talented graduate students and, most notably, a wave of new, young faculty interested in related research. Their numbers, a judicious mix of newly minted Ph.D.s, young professors and established performers, are going to grow in all disciplines across the campus thanks to the university's historic \$100 million fund to accelerate the hiring of new faculty over the next five years (see Viewpoint, page 13). Over the next decade they will be taking over from the more than half of current faculty members who are approaching retirement age.

Davis, now the James Gilbert White Distinguished Professor in the Physical Sciences, is a leading example of Cornell's capacity to attract research stars. In recent years some of the nation's leading scientists have been attracted by the campus's commitment to excellence in diverse and collaborative research. There are professors like Serena DeBeer George, an assistant professor of chemistry who is developing new tools to understand biological and chemical catalysts; and Darrell Schlom, a professor of materials science and engineering who is leading collaborative research to create low-power, high-efficiency electronic memory and other new materials for microelectronics. The researchers have come to Ithaca from a diverse number of institutions, including Stanford University, Pennsylvania State University and the Massachusetts Institute of Technology.

The secret of high-temperature superconductors seems to be the addition of impurities whose atoms distort the normally orderly crystal lattice of copper and iron compounds, rearranging the electrons around atoms in a way that allows some of them to move without resistance. As a young professor at U.C.-Berkeley, Davis had the idea that he could observe the electrons in these materials directly with a scanning tunneling microscope (STM). An STM uses a probe so small that its tip is a single atom, scanning across a surface in steps smaller than the width of an atom. With a voltage applied between tip and surface, electrons jump the gap to create a "tunneling current." By varying the voltage and measuring the tunneling current, Davis found he could determine how much energy it takes to pull an electron loose from an atom, and more importantly, he says, he showed how to visualize the arrangement of electrons around and between atoms. Building a machine that could do this would require cryogenic cooling and serious isolation from the outside world, with massive supports to insulate against vibration. Many scientists thought the idea was unlikely to pay off in proportion to its costs. Berkeley wasn't ready to finance it.

"His work is actually quite different from the

The new Physical Sciences Building, a joint project of the College of Arts and Sciences and the College of Engineering, was officially completed Nov. 19. While the building will not be fully occupied until the end of January, some of the labs and classrooms were already in use during the fall semester.

The building includes more than 80 research and teaching laboratories, a 120-seat auditorium, and new meeting, dining and gathering spaces. It is designed to enhance interdisciplinary research, and will accommodate 15-20 research groups in the Departments of Physics and of Chemistry and Chemical Biology, and the School of Applied and Engineering Physics.

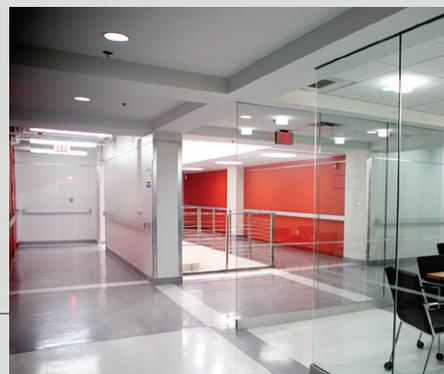
New home for the physical sciences



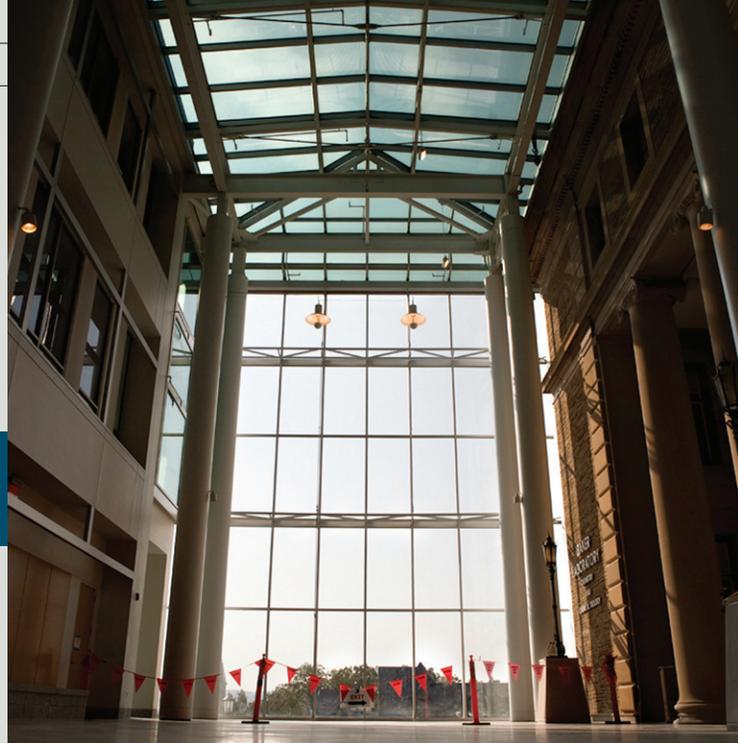
A 120-seat auditorium offers state-of-the-art videoconferencing, motorized chalkboards and flexibility for scientific demonstrations.



Left: One of nine state-of-the-art teaching laboratories on the first floor, windowed so that passers-by can share the excitement of interesting projects. Right: One of the more than 80 laboratories in the building, many engaged in interdisciplinary research in such areas as nanoscale science, X-ray and accelerator physics, chemical biology and biological physics.



Glass walls offer writing surfaces for brainstorming, and the open design encourages the kinds of chance encounters that often lead to important new insights and partnerships.



The spacious seven-story, 6,700-square-foot atrium has a skylight and a floor-to-ceiling wall of glass, providing year-round natural lighting.



The open architecture of the staircases lends a sense of energy and movement to the building.



The architectural design firm for the building is Boston-based Koetter, Kim & Associates, whose founders are both Cornell alumni.

‘Because this is kind of a Mecca for this style of research, you get people already prepared – intellectually prepared and morally prepared, because it’s very difficult work.’

– Séamus Davis

Assistant professors Eun-Ah Kim, left, and Kyle Shen are typical of the recent faculty hires who have been drawn to Cornell because of the physics work in condensed matter being done by Séamus Davis.

classical physics we do here at Cornell,” says Al Sievers, the Edward L. Nichols Professor of Physics, who was then director of the Laboratory of Atomic and Solid State Physics. “He had these ideas for a new kind of measurement, and they couldn’t build the kind of facility he needed in Berkeley. We saw the opportunity that we could modify the basement of Clark Hall and put in his instrument.”

After “informal discussions” with Cornell colleagues, Davis and Selby came to Cornell in 2002 on sabbatical. They liked the small town and its good schools. “I had offers from many of the major physics departments in the country,” Davis recalls. “My wife vetoed most of them. [At Cornell] we found a place that was one of the world’s leading physics departments and was not in an urban environment.” As a bonus, Ithaca also offered a vibrant local community of people playing Celtic music. Selby, a world-class Celtic fiddler, spent some of the initial sabbatical playing gigs and going to jam sessions.

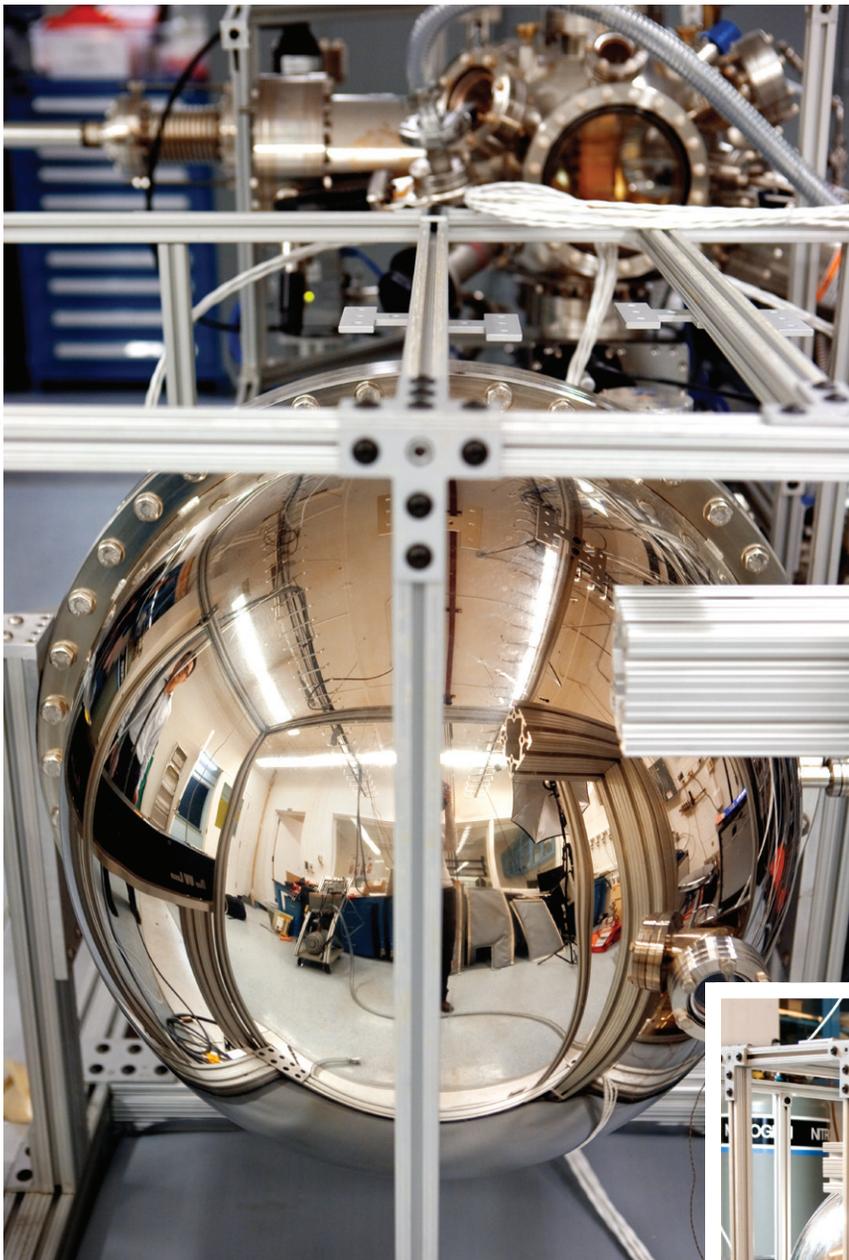
Cornell offered Davis a tenured professorship and a state-of-the-art laboratory. And it offered Selby a permanent, full-time position as lecturer in physics – an important part of the package that cemented the couple’s decision to come to Ithaca (see story, page 7).

Setting up a new lab for a brand-new assistant professor in almost any experimental science can run to at least \$1 million, Sievers notes. Setting up a tenured professor typically costs at least twice as much, and Davis probably pushed that well beyond the upper limit. But Davis brought with him an armload of federal research funding, and since then has brought in new grants totaling much more than Cornell’s initial setup costs.

He has also brought prestige. Since coming to Cornell, Davis has been awarded the Fritz London Memorial Prize, considered the highest award in the field of low-temperature physics, and the Heike Kamerlingh Onnes Prize for Superconductivity Experiments. In the spring of 2010 he was elected as one the youngest physicists in the National Academy of Sciences.

Davis now has two STMs in the basement of Clark Hall, and is building a third in the new Physical Sciences Building that will operate in the highest magnetic field available on any STM in the world. The instruments in Clark Hall were built with “overkill” insulation to protect against vibration from construction of the Physical Sciences Building next door. Now that construction is finished, Davis says, the instruments will be about 10 times more sensitive. He shares some of his time with Brookhaven National Laboratory on Long Island, where he is director of the Center for Emergent Superconductivity, a Department of Energy-supported collaboration among scientists at Brookhaven, Argonne National Laboratory and the University of Illinois at Urbana-Champaign.

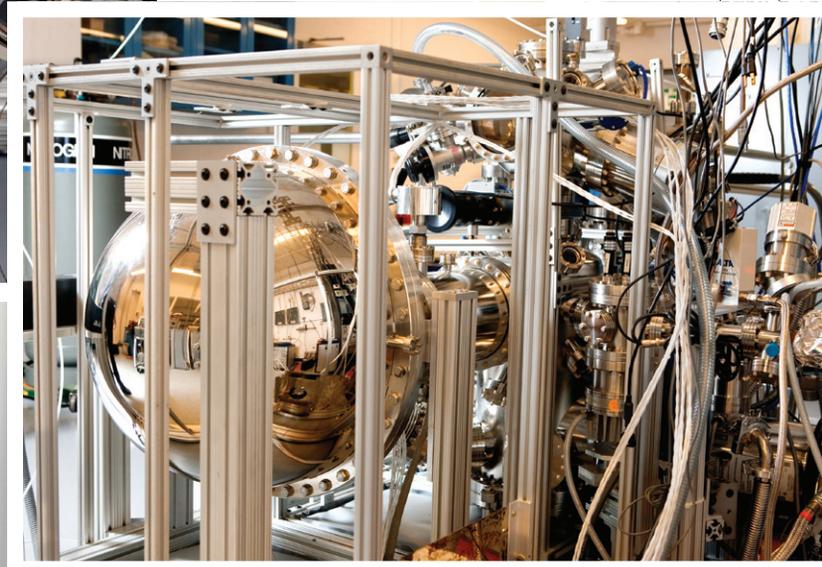




His work has enhanced Cornell's reputation as a center for research in the overall field of "condensed matter" – loosely, anything that isn't a gas, or matter in which atoms have some sort of relationship with one another. And that has attracted young physicists interested in the field, who in turn further enhance the power of the research engine and attract even more new faculty. Cornell's growing reputation in the field also attracts "fabulous graduate students," says Davis. "Because this is kind of a Mecca for this style of research, you get people already prepared – intellectually prepared and morally prepared, because it's very difficult work."

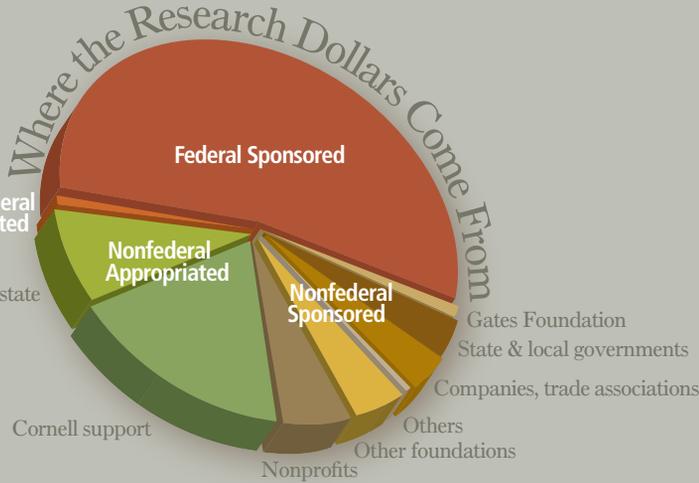
Among recent faculty hires are Kyle Shen, an experimentalist who studies the same complex materials as Davis with advanced X-ray diffraction and photo-emission spectrometry equipment, and Eun-Ah Kim, a theoretical physicist who tries to understand why these materials behave as they do and predict how their properties might be enhanced.

Davis and Shen are collaborating with materials scientist Schlom, who uses a process called molecular beam epitaxy – what he calls "atomic spray painting" – to build materials that never have and perhaps never could exist in nature, atom by atom. Schlom and Shen



Several views of a one-of-a-kind machine designed and built by Kyle Shen, assistant professor of physics (in reflection at left) and Darrell Schlom, professor of materials science and engineering, that combines molecular beam epitaxy, which builds materials by single-atom layers, with photoemission spectrometry to measure how electrons move through the material. To avoid disturbing the measurements, air is removed from the tough, inert stainless steel chamber by a vacuum pump resembling a jet engine until only one of every 100 trillion atoms of gas is left.

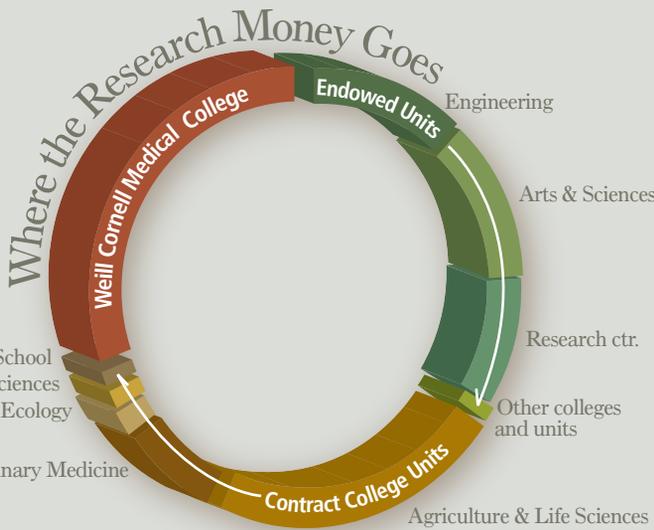
Funding Research at Cornell



\$687.4 million
(fiscal year ended June 30, 2009)

*Federal Sources (%)	
Sponsored Research	54.6
**Appropriated Research	1.2
Nonfederal Sources (%)	
Sponsored Research	6.1 4.6 4.0 3.8 0.7 0.1
Appropriated Research	17.2 7.9

*Federal Funding Sources: Department of Health, Human Services; National Science Foundation; Department of Defense; Department of Agriculture; NASA; Department of Energy; Agency for International Development; others
 **Appropriated by federal agency and not competitive (e.g., USDA Hatch Funds)



Ithaca (%)	
Contract College Units	0.9 1.4 2.1 7.4 23.8
Endowed Units	0.2 9.6 12.1 12.4
Weill Cornell Medical College (%)	
	30.2

designed and built a machine that combines molecular beam epitaxy and photo-emission spectrometry to create new materials and study them while they still have an uncontaminated “pristine atomic surface.” By bouncing radiation off that surface Shen can see how and where conduction electrons move through the material. “They definitely are the first people in the world to have such a machine,” Davis reports.

Kim was responsible for a recent breakthrough in superconductivity research, discovering a “broken symmetry” in the arrangement of electrons around oxygen atoms in cuprates, which opens another door to the design of better superconductors.

But superconductivity may be only the tip of the iceberg at the frontier of condensed matter physics, Davis says. “There’s a false perception that we understand all solids,” he explains, “because the ones we use in our engineering are things like silicon and aluminum and gold that have been understood since the 1930s.” Now researchers are able to make much more complex materials by combining many elements – but, Davis says, theory and experimental technique haven’t kept up. “If we just knew what we were doing, even vaguely, we could probably invent whole families of new materials with useful and dramatically different properties,” he says. Shen, for example, is working on materials with unusual magnetic properties that could lead to faster, higher-capacity computer data storage.

Davis collaborates with researchers in several other countries where there is often more government funding for basic research. “The traditional sources of research funding from the [U.S.] federal government for physical sciences have effectively been diminishing for 20 years,” he says. “It’s absolutely critical that the funding private universities can get be preserved and amplified, because it plays a critical role in how frontier science works.”

But his pleasure in being at Cornell is not just the search for practical applications and the advancement of knowledge. “Of course the thing the university really produces is people,” he says. “All this investment isn’t just going into bricks and mortar; it’s going into training these young people and then they go off and pursue their own ambitious careers of discovery and contribution to society.” ♦

[At Cornell] we found a place that was one of the world’s leading physics departments and was not in an urban environment.’

– Séamus Davis

ONLINE SOLUTIONS AND PUBLICATIONS AT CORNELL UNIVERSITY



A historic moment to ensure our teaching and research legacy

Our university is on the cusp of unprecedented change. In the next decade more than half of our most distinguished teachers and scholars will be moving to emeritus status. That means that Cornell will need to hire 800 new faculty members. That's a hiring rate that will never occur again in our lifetimes.

The pre-eminence of our institution in the decades to come will be determined by the quality of the young faculty members we recruit. Thirty years from now, this talented, visionary pool of individuals will become the institution's legacy.

We must begin vigorously hiring this new faculty immediately. To do so, we have established a \$100 million Cornell Faculty Renewal Fund. We have asked the college deans and the department chairs to develop hiring plans for the next five years and to reallocate monies from their budgets to focus on faculty hiring. These reallocated monies will comprise half of the faculty renewal fund. The other half will come from philanthropy; we are asking donors to make faculty renewal their priority.

Why begin hiring now? During the economic downturn of the past two

years, Cornell reduced its hiring by 50 percent. And so did our competitors. At the same time the production of new Ph.D.s remained the same. If we wait until a faculty member retires – and although currently 47 percent of Cornell professors are over age 55 and 15 percent are over 65, the majority won't be retiring for another five years – and we have salaries available to us to fund new hires, we will have missed a vital opportunity. At that point, we won't be able to hire fast enough to replace those who are leaving; there won't be enough candidates on the market.

The \$100 million faculty fund will be designated for current use to hire as many as 100 new faculty members a year for the next five years – a rate unprecedented at Cornell. But we must proceed wisely. We can only begin this transformative process when the monies from the fund are in hand.

We expect that 85 percent of the \$50 million raised through philanthropy will go directly to the colleges and schools for their use in recruiting faculty. The remaining 15 percent we expect will be designated for the provost's discretion based on donors' wishes and cross-university faculty hiring priorities.

Each college and school is in the midst of determining strategically important academic areas of excellence in the core disciplines: humanities and arts; life sciences and agricultural sciences; physical sciences, information science and engineering; and the social sciences. Our new faculty will not necessarily be hired in those disciplines from which current faculty are expected to retire but rather in areas that are determined to be important academic disciplines now and in the years to come.

Replacing more than half the faculty provides us with an opportunity to refocus, reprioritize and create new initiatives that will define Cornell's future. The result will be a reinvigorated university. The faculty renewal fund provides the means to seize this historic moment.

Earlier this year the university published a Strategic Plan, www.cornell.edu/strategicplan, to guide us through to the 2015 Cornell sesquicentennial. Faculty renewal was the highest priority of the seven initiatives set forth in that plan. Each of us can lend a hand in shaping Cornell's future by contributing to the renewal fund to ensure that we hire the best in every field.

Kent Fuchs is Cornell's provost.

BY DANIEL ALOI

What does it take to design and mass-produce an automobile to sell for around \$2,500? And what are the inevitable environmental, social, economic and cultural impacts of having 5 million, 10 million, 50 million such cars (and first-time car owners) on the road?

The College of Architecture, Art and Planning (AAP) will explore these and other questions related to Tata Motors' revolutionary new Tata Nano in an exhibition at the Herbert F. Johnson Museum of Art.

"Unpacking the Nano," on display Jan. 18 through March 21, 2011, will feature two production Nanos – one of them taken apart to highlight 16 critical subassemblies, with parts suspended by wires in the gallery – and the original concept vehicle.

The exhibition team of AAP students, faculty and young alumni has created custom shipping crates for the Nano's parts and subassemblies. Each crate side doubles as an exhibition panel, with text, maps, charts and other graphics showing cost, weight and other statistics.

"The question we asked [in organizing the exhibition] was, 'What do all the nuts and bolts add up to?'" says project co-director Alex Mergold, B.Arch. '98, a visiting assistant professor of architecture.

"What does the Nano add up to as a car, a piece of engineering and design, a status symbol, a social construct, a financial asset, an environmental hazard, a solution to India's mobility problem? This thing brings out many debates, and that's what we are hoping to stimulate."

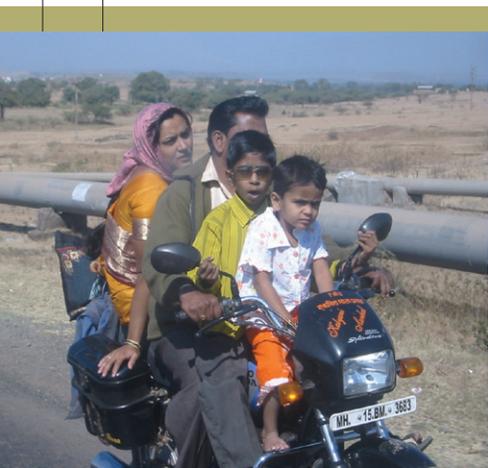
Much like Henry Ford's Model T did in North America a century ago, the Nano is poised to bring about widespread change across the Indian subcontinent and globally. The company ultimately wants to produce as many as 2 million cars a year.

Production of the Nano in India began in 2009; about 250,000 Nanos will ship in 2010 alone. Designed by a team of 70 Tata Motors engineers, the four-door car seats five, has an aluminum two-cylinder engine, weighs 600 kilograms, and gets up to 65 miles per gallon of gas.

"The design accomplishment is truly extraordinary," says Kent Kleinman, the Gale and Ira Drukier Dean of AAP, who discussed the car with Tata Group chairman Ratan Tata '59, B.Arch. '62, during Reunion 2009, and later led an AAP delegation that toured the factory in India.

The exhibition highlights "the role of design as an agent of profound social change," Kleinman says. "We're lucky to have privileged access to such an innovation of epic dimensions."

The display also addresses



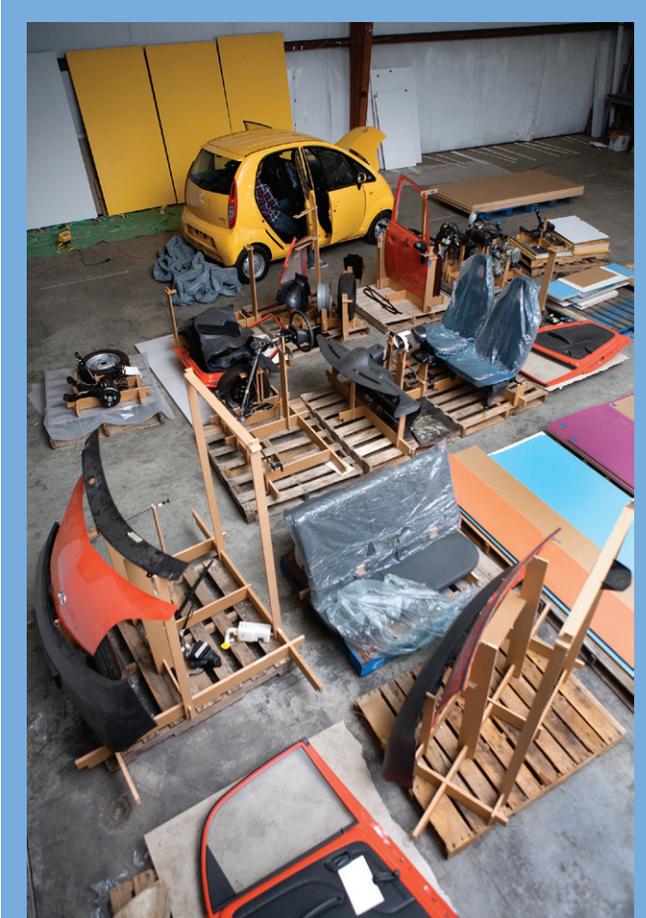
BY YANNI/WIKIMEDIA COMMONS



PROVIDED/AAP



SPENCER LAAP



A complete Nano and a car in pieces will be featured in "Unpacking the Nano."



Ratan Tata and AAP Dean Kent Kleinman discuss the Nano in 2009 on campus.

Top: The Nano could be a safer alternative to two-wheeled transport in India. Center and bottom: Then and now: A worker sleeps beside the assembly line for Ambassador automobiles in 1960s India; Nanos roll off the line in a new Tata Motors factory.

‘Unpacking the Nano’ explores a revolution in design and transportation



Spencer Lapp, B.Arch. '09. “[Tata Motors] started with the idea that this car was going to be much less than it eventually became. They tried a design with no doors, plastic curtains and a plastic body. They discovered they could design a car that people would want to drive, not a golf cart.”

Ratan Tata’s goal was to bring motoring to the masses in India, where

highway infrastructure is improving and the middle class is growing. The Nano was designed as a safe, affordable alternative to the millions of two-wheeled vehicles, motorized and not, now on the road.

Using parts and assemblies from outside manufacturers proved ineffective, so Tata engineers provided “in-house innovation,” designing parts themselves. Lapp says: “The value engineering became a very effective strategy; the car’s weight essentially drove the cost, and they got it down to 2,000 parts.” A typical car on the road today has about 3,500 parts.

“It’s a balance between what they were going to get rid of versus what they needed to keep,” says Ben Widger, M.Arch. '11. “It was going to be a two-door car before they realized that women in saris couldn’t get into the back seat.”

The project has opened up “huge” teaching possibilities, Mergold says. “During the research phase we ended up with mini-courses on design, engineering, environment, anthropology, sociology – all during only one semester.”

“For our college it’s always a question of defining a problem, and then synthesizing a solution,” Mergold says. “In our case the problem was finding the way to present many conflicting arguments as well as a wealth of technical information about the car – in an art museum. And then we had to go above and beyond ... into implementation. For the students that alone was an invaluable lesson, to see their ideas become material and understanding what that actually takes.”

For more information, go to aap.cornell.edu/events/nano.

safety and the car’s role in sustainability in India and other industrialized nations, and casts a critical eye toward American automotive culture.

A related symposium, “Unpacking the Nano: The Price of the World’s Most Affordable Car,” will be held in March.

The Nano raises specific issues for architects and planners, since expanding transportation on a large scale could cause a “suburbanization of the global south,” Kleinman says.

Tata engineers worked to meet a price of one lakh (100,000 rupees, or around \$2,200 in 2009 U.S. dollars), a symbolic price benchmark in India.

“It was started from a blank slate,” says exhibition team member

PROVIDED/AAP



Spencer Lapp, B.Arch. '09, Sarah Haubner, M.Arch. II '10, and Ben Widger, M.Arch. '11, work on color-coded Nano exhibition panels in The Foundry.

WILLIAM STAFFEL/DAAP

nman us.



PROVIDED/AAP



Patricia and David Atkinson enjoy a standing ovation for their gift.



David Atkinson



BY LAUREN GOLD

\$80 million gift to Ithaca campus aims to make world a more sustainable place

‘CORNELL IS THE BEST-POSITIONED UNIVERSITY IN AMERICA, AND ARGUABLY THE WORLD, TO DEVELOP SOLUTIONS.’

– DAVID ATKINSON '60

With a historic commitment of \$80 million, David R. Atkinson '60 and his wife, Patricia, have created a permanent center on campus that will cultivate innovative collaborations in sustainability research and education on campus and far beyond.

The gift, the single largest to the Ithaca campus by individual donors, positions Cornell to be a global leader in the effort to create a sustainable future.

Cornell President David Skorton announced the gift Oct. 28 in Statler Auditorium following a panel discussion on sustainability.

“David Atkinson’s historic gift provides a permanent Cornell base for stimulating and coordinating the university’s unfolding capabilities in sustainability,” Skorton said. “It represents a very significant investment in our most valued resource: people – faculty, staff and students – with the mission of achieving world impact and leadership in sustainability. Cornell aspires to be a leader in efforts to create a bright future for our world: for our children, grandchildren and generations to follow.”

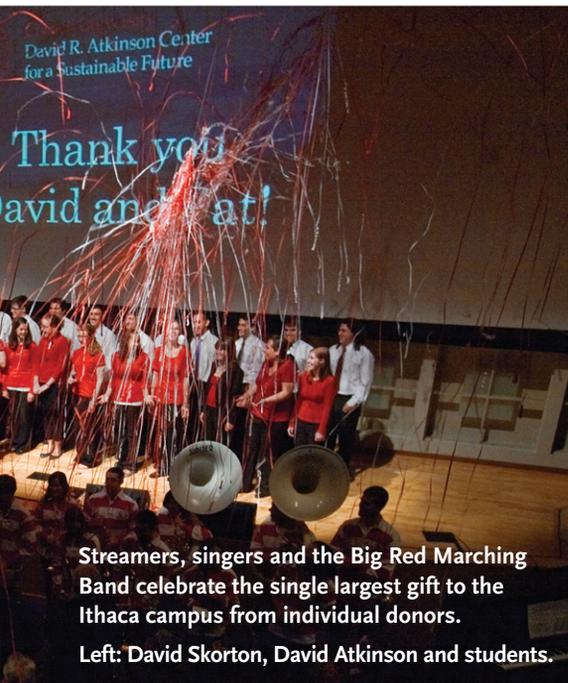
The gift builds on the success of the Cornell Center for a Sustainable Future, which was created in 2007 with initial support from the Atkinsons. The center has been renamed the David R. Atkinson Center for a Sustainable Future (ACSF).

David Atkinson said that new ideas and collaborations are vital in a time of exploding global population and dramatic economic growth. “Cornell is the best-positioned university in America, and arguably the world, to develop solutions,” Atkinson said.

The center will be “a source of unbiased information; a catalyst bringing knowledge from different



From left, Frank DiSalvo, Sheryl WuDunn, Armando Olivera, Fred Krupp and Rich Delaney during a discussion Oct. 28 in Statler Hall.



Streamers, singers and the Big Red Marching Band celebrate the single largest gift to the Ithaca campus from individual donors.

Left: David Skorton, David Atkinson and students.



Patricia Atkinson

... AND THE RESEARCH THE NEW ATKINSON CENTER WILL SUPPORT

Established in 2007 with major support from David and Patricia Atkinson, the Center for a Sustainable Future currently engages 220 faculty members from 10 colleges and involves 55 departments in interdisciplinary research related to the environment, energy and economic development.

Among its current enterprises:

Researchers are collaborating to reduce energy consumption and curb emissions, while also seeking ways of capturing and sequestering greenhouse gases in the atmosphere. Contributors include members of a new multidisciplinary program centered around the computation and modeling of sustainable energy systems; faculty and students in three colleges creating tools for sustainable architectural designs; and researchers at the Energy Materials Center at Cornell working to develop high-performance, durable and affordable materials for advanced fuel cell and battery components.

Scientists are exploring the effects of climate change, biodiversity loss, invasive species and pollution from the perspectives of population genetics, modeling, biogeochemistry, economics, environmental sociology and microbiology.

Cornell is at the forefront of research to develop index-based insurance for poor herders and farmers and for pre-financing of emergency response by humanitarian organizations. Other Cornell researchers are working on microfinance enterprises in the developing world, the effect of climate change on job growth, the link between agriculture and health, and sustainable crop and livestock management.

Center-funded research is contributing to ongoing, larger efforts to develop technology for bio-based energy and feedstock production. Researchers are exploring ways to convert sugars from perennial grasses and woody biomass into fuel and other products. The effort involves dozens of researchers in departments from applied economics and management to engineering and physics.

The center also provides seed funding, publicizes research funding opportunities, and promotes grants, employment and conference prospects. Its programs have awarded more than 40 grants totaling more than \$4 million since 2008.

The center has also so far raised an additional \$55 million in external support.

disciplines together to address sustainability; and a partner with entrepreneurs, businesses, NGOs and governments to magnify the impact of the knowledge and ingenuity at Cornell in moving society toward a more sustainable future," he said.

It will also be a focal point for sustainability-related activity on campus, including education, operations, outreach and research.

"The center provides the means and programs to build new, multidisciplinary collaborations and the external partnerships needed to tackle important and complex problems," said Frank DiSalvo, the center's director and the J.A. Newman Professor of Physical Science.

In a panel discussion moderated by DiSalvo preceding the gift announcement, Environmental Defense Fund President Fred Krupp said that Cornell has an opportunity to lead the current discussion and help shape the next generation of sustainability leaders.

"Great universities like Cornell need to speak up about global warming. There's an ethical dimension here," Krupp said. "There's also the opportunity for Cornell to be involved in a way unique in American universities – to create the examples and the constituents that make policy."

Panelist Sheryl WuDunn '81, Pulitzer Prize-winning author, business executive and a Cornell trustee, added that economic development – and the role of women in that development – is an often-overlooked but vital piece of the sustainability puzzle. Along with research in energy and the environment, the ACSF's mission includes a dedicated focus on economic development.

David and Patricia Atkinson are longtime supporters of sustainability at Cornell. Earlier this year, David Atkinson was elected a presidential councillor, the highest honor the university can bestow.

A graduate of Cornell's College of Agriculture and Life Sciences, Atkinson has held various posts in the financial industry, including as founder of Atkinson & Co., general partner of Miller, Anderson & Sherrerd LLP, vice president in the research department of Morgan Stanley, and co-founder of Franklin Capital Investors.

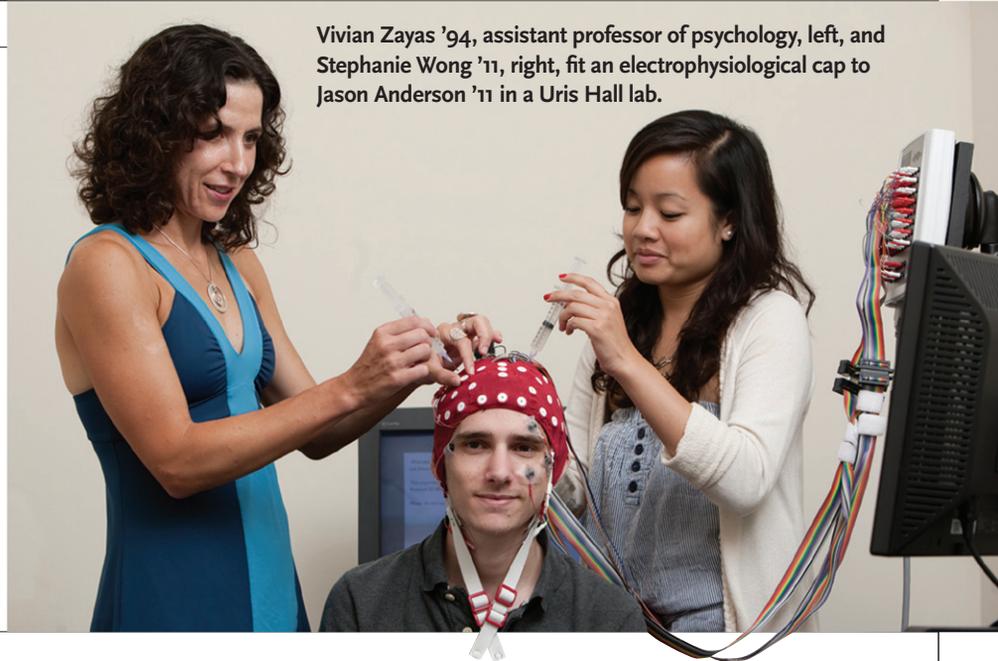
Patricia Atkinson is a graduate of the University of Southern California. She is active with the Princeton Hospital Auxiliary, for which she has served as membership chair and treasurer. She was also a longtime volunteer for the Princeton Meals on Wheels Program.

The son of a New Jersey poultry farmer and agri-businessman whose formal education ended in ninth grade, David Atkinson said he is grateful for the opportunity to strengthen Cornell's leadership role in sustainability.

"I think this center will be great for Cornell," Atkinson added, "just as Cornell was, and is, great for me."

BY SUSAN S. LANG AND CAITLIN PARKER

Attaching links between Ultimate Frisbee and regulation of behavior



Vivian Zayas '94, assistant professor of psychology, left, and Stephanie Wong '11, right, fit an electrophysiological cap to Jason Anderson '11 in a Uris Hall lab.

You could say that attachment is a major theme in the life of Vivian Zayas '94, assistant professor of psychology. She is attached to Cornell – having been an undergrad here and now a member of the faculty; to Ultimate Frisbee – traveling far and wide on weekends to compete; and professionally attached to attachment, as it's a focus of her research.

As director of the Personality, Attachment and Control Lab, Zayas studies the processes that regulate behaviors within close relationships and how these processes may affect the quality of relationships and mental health. She examines the emotional and automatic aspects of intimate relationships as well the cognitive and controlled ones.

"What's available to our consciousness is a fraction of what happens psychologically," Zayas says. "We use a number of techniques to try to get at how people respond emotionally and cognitively to socially relevant, personally significant events." To do so, she draws on theories and methods from social and personality, cognitive and developmental psychology, and, most recently, cognitive neuroscience.

Her studies explore how close relationships are mentally

represented and how those representations in adulthood are shaped by early relationships. She also looks at how people's futures are shaped by friends and partners with whom they form relationships.

For example, one recent project examined how rejection in a close relationship affects psychological and neural processes. Wearing electrophysiological caps to monitor brain activity, women listened to statements about their relationships. They were told that when they needed support or help – in both personal ("attachment-relevant") and mundane ("nonattachment") situations – their partners would be either supportive ("warm," "comforting") or rejecting ("cold," "distant").

When presented with attachment-relevant situations, the women showed more neural activity when they heard the rejecting cues. This heightened neural activity was not observed in the nonattachment situations, "indicating that the neural activity wasn't simply caused by negative words. Rather, it was specific to rejection," says Zayas.

Although she majored in psychology at Cornell, Zayas didn't focus on attachment until she was working as a paralegal in the San Francisco Bay area after graduation and decided one day to volunteer in an attachment lab at the University of California-Berkeley; her life hasn't been the same since.

She eventually earned a Ph.D. (2003) in psychology at the University of Washington-Seattle, and after working as a postdoctoral fellow on a UW-Columbia National Institutes of Health-funded collaboration, Zayas found herself returning to a familiar place of steep hills and gray days in 2007.

"I had very positive memories and experiences as an undergraduate here, and coming back felt really good," Zayas says.

It also has allowed her to join one of the most elite women's teams in Ultimate, a sport she's been playing passionately since her sophomore year at Cornell. For four years, she's been a member of Boston's Brute Squad, which ranked second in club nationals in 2009 and this past July came in fourth at the World Flying Disc Federation Championships in Prague.

"[Ultimate] pushes me every day, physically and mentally, and it challenges my beliefs about what I can and can't do," says Zayas. "It's an amazing experience to do something that you didn't think was possible, and it's even more amazing when your team, as a group, breaks those barriers."

Her most recent attachment: She competed at the club championships Oct. 28-31 in Sarasota, Fla., where some 1,600 athletes on 64 teams converged. The Boston Brutes were semifinalists and tied for third at the competition.

Caitlin Parker '13 is a writer intern at the Cornell Chronicle.

Zayas has been playing Ultimate since her sophomore year at Cornell. She travels each weekend to compete with the Boston Brutes.



PROVIDED

A tree grows in Brooklyn – but with help from volunteer urban foresters

Trees not only can help improve mood, concentration and the ability to recover from illness but also can help reduce stress, promote a sense of community and perhaps even help deter crime, report various studies. They also benefit communities by helping to reduce energy costs, decelerate climate change, manage storm water and increase property values.

Trees are so important for the health and well-being of New York City residents, their communities and environment that Cornell University Cooperative Extension-NYC (CUCE-NYC) and Cornell's Department of Natural Resources have joined forces in a pilot program to provide urban forest education workshops in Jamaica, Queens, and Canarsie, Brooklyn.

The goal is to enlist residents and organizations to become stewards of their community's trees and, ultimately, to develop resources to help groups around the country do the same, says CUCE-NYC senior extension associate Gretchen Ferenz, who co-leads the project.

Although such cities as Los Angeles, Salt Lake City, Houston and New York have large-scale tree-planting programs, their "capital project funds will support planting and immediate care of trees for a couple of years, but costs for longer term care to ensure a young tree's growth often are not included in municipal budgets," says Ferenz. "As a result, many urban trees do not survive into maturity."

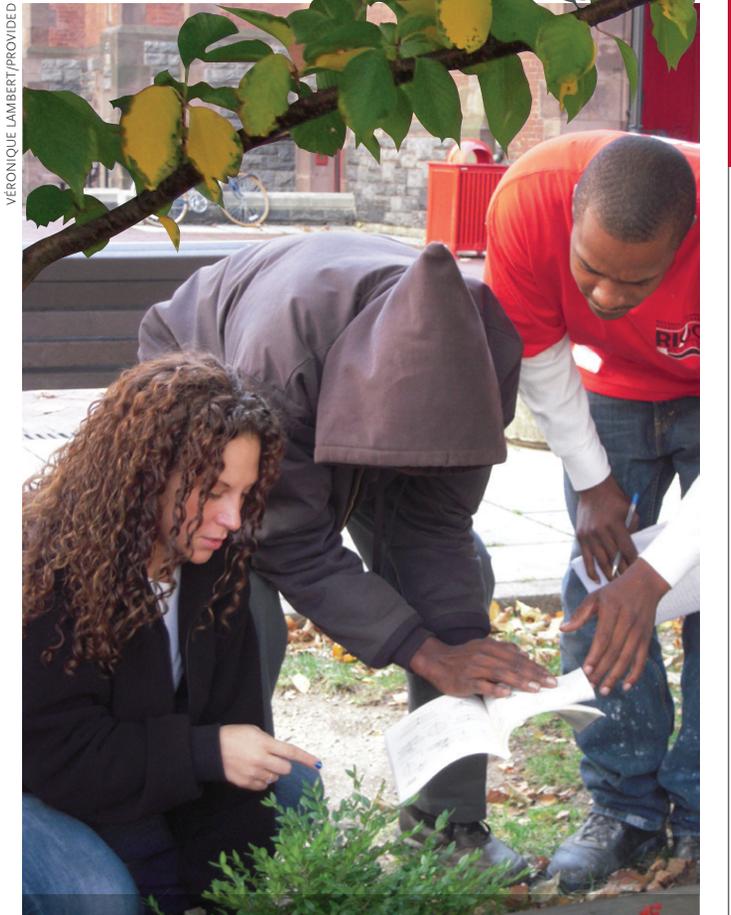
The Urban Forestry Community Engagement project aims to change this.

First, the project team surveyed more than 800 residents "on the street" and in focus groups in Jamaica and Canarsie – where young trees were recently planted and resident involvement in tree care is needed – to learn about people's motivations, values and interests regarding urban trees and tree care.

"We learned that many residents surveyed did not feel that they should be responsible for taking care of trees; they viewed that as the responsibility of the parks department," says Shorna Broussard Allred, Cornell associate professor of natural resources and project co-leader. "However, we also found that nearly 60 percent were interested in learning more about trees – especially about the health benefits of trees along with tree planting, tree identification and tree care."

This fall, project staff began teaching free sessions in Jamaica and Canarsie about the role of trees in the urban environment. One activity being tested, for example, is "Neighborhood Tree Exploration," which allows residents to see their neighborhoods from a "green assets" perspective. Other topics included soils, selecting species, identifying plants, understanding species and age diversity, invasive species and wildlife.

As a result of the workshop, participant Mike Steffens, a volunteer forest steward, organized a volunteer tree care



Participants of CUCE-NYC's urban environment program learn about the importance of vegetation to a healthy ecosystem. Here they learn how to identify a plant using an ID key.

project to introduce residents to the natural areas of Canarsie Park that are being reforested. This kind of networking between local groups and residents, which helps ensure that community education programs have lasting impact, are being studied as part of the project.

"Cornell's urban forestry project is a useful and important community project that engages people and local residents in creating green spaces in areas that otherwise would simply be 'concrete jungles,'" says N.Y. Sen. John Sampson, who has helped support and promote the project. "Projects like these will help to reduce our carbon footprint."

Partners include the New York City Department of Parks and Recreation, U.S. Forest Service, Alliance for Community Trees, MillionTreesNYC and Trees New York; funding was provided in part by the Ittleson Foundation.

BY AMANDA GARRIS

Any wine from any grape: scenes at Cornell's teaching

On a Wednesday evening in late September, students clad in rubber boots are pouring fresh wine samples into glasses for comparative tasting, pipetting juice to measure sugars and acids, and hoisting bins of fresh grapes up a ladder into the destemmer. Cornell's teaching winery is simultaneously a classroom, a lab, a wine cellar, a tasting room and a workshop.

The ingredients for wine are few – grapes, yeast and time – but what does it take to make a winemaker? This fall, more than 40 aspiring student winemakers are finding out, with guidance from associate professor of enology Ramón Mira de Orduña and enology lecturer Kathy Arnink.

"Many of the things we teach in the winery are not written in books – the students have to learn by doing," says Mira de Orduña. "One of our goals is for students to feel as if the winery is a natural environment for them. That means actually understanding the winemaking process, from theories about yeast metabolism to the wrench used to tighten valves on the fermentation tanks."

The 1,800-square-foot facility, officially called the College of Agriculture and Life Sciences Teaching Winery, is the only university facility of its kind in the eastern United States. Located at the Cornell Orchards, the facility was established in 2009 with a \$900,000 investment from Cornell and continues to grow with generous gifts of supplies and equipment from the wine industry.

For many students, Arnink's class *Grapes to Wine* is their first hands-on experience with winemaking. "My students learn how much work goes into producing high-quality grapes in the vineyard," she explains. "But winemaking can turn those fantastic grapes into a mediocre wine or a fantastic wine, depending on how it's made."

To explore these possibilities, her 27 students work in groups to perform structured experiments that test the impact of specific winemaking decisions on wine flavor. One group makes wine from early and late harvests of Cayuga white, a white wine grape whose aroma intensifies from neutral to bold the longer it stays on the vine. Other students tackle technical processes, such as evaluating different methods for reducing the acidity in wines produced from cabernet franc. This year all her students are undergraduate enology and viticulture majors or minors, but she hopes an additional lab section next year will allow non-majors the opportunity to try their hand at winemaking, too.

Eric Misiewicz '12 uses an impeller pump to aerate his fermenting chardonnay, which helps improve its aroma and flavor by eliminating hydrogen sulfide.

Graduate student Céline Coquard Lenerz and Johnston Moore '12 seal a fermentation barrel.

Classware dries in the lab.

Behind the winery

explore their own winemaking style by making all the decisions from grape to bottle. They select the grape variety, harvest date, yeast strain, blending and even packaging and label design.

In the early stages of winemaking, the students are essentially farmers of yeast, the single-celled organisms that convert sugar in the fresh grape juice into alcohol – the true winemakers in the winery. Mira de Orduña teaches the students to treat the living wine carefully, like a child, meeting its needs and guarding it from potential dangers from spoilage organisms or contamination with off flavors.

Because of this delicate relationship, the teaching lab is rarely quiet. In the first weeks of fermentation, students from both classes report daily – and some students three times a day, seven days a week – to monitor and tend the yeast. And, as with any interesting journey, winemaking can take some unexpected detours.

During class, Mira de Orduña circulates like a resident doctor on rounds. “I try to be everywhere,” he admits. With a sniff, swirl, swish and a squeeze of the fermented pulp, he and the students diagnose yeast in distress. His recommendation: revive them by pumping oxygen through and adding supplemental nutrient. A few minutes later the odor of socks and cheese is gone, and a fruity aroma is abruptly revealed.

Mira de Orduña welcomes these detours. “It’s a good thing. If students make mistakes, they’ll remember it. If I try to make everything go flawlessly, it sets them up for problems in the future because they won’t know how to respond when things don’t go as planned.”

At another pair of fermentation tanks, he detects the aroma of bonbons but also some bitterness, and senior Nathan Littlejohn sets up a bladder press to gently separate the juice from the skins and seeds. Minutes later, garnet juice is pumped into a fresh tank.

“It tastes like wine,” Littlejohn announces with pride and just a hint of surprise.

Months from now, when the fermentations are complete and the wines have been clarified, blended and bottled, students from both classes will evaluate their wines and the winemaking choices that shaped them.

They’ll leave the teaching winery behind, a step closer to being winemakers and ready to intern in wine cellars around the world.

Left: Some of the first wines produced at the teaching winery last spring.



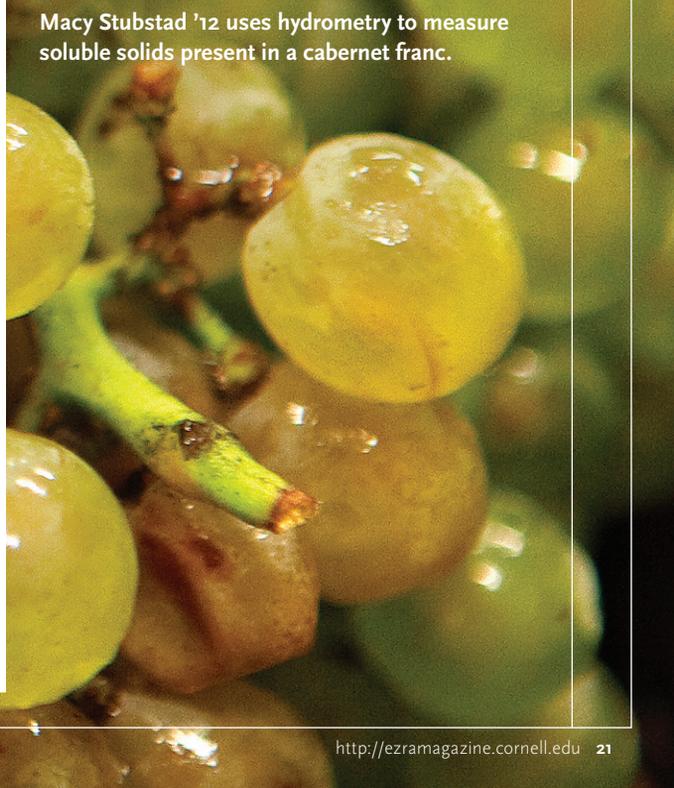
Associate professor Ramón Mira de Orduña samples a glass of a student's wine.



Amanda Vondras '11 dilutes samples of her wines in curvettes to measure wine color (amount of pigment). The samples will be analyzed by a spectrophotometer.



Macy Stubstad '12 uses hydrometry to measure soluble solids present in a cabernet franc.



Sleep evangelist Maas and Kogan of 'Barney Miller' are now self-publishers

James Maas, Cornell professor of psychology, and actor/physician Milt Kogan '07 have a lot in common: They're both Cornellians in their early 70s, have been on TV many times and have each just self-published a nonfiction book with AuthorHouse that relates to Cornell in various ways.

Maas' book, "Sleep for Success! Everything You Must Know About Sleep but Are Too Tired to Ask," written with Cornell graduate student Rebecca S. Robbins '09 while she was an undergraduate (and with significant help from Sharon Driscoll '12 while she was a sophomore; Hannah Appelbaum '06, now in social work school at Emory University; and Samantha Platt '10, now in physician assistant school). It presents the latest scientific research on sleep, much of it conducted in Maas' Cornell sleep lab, where he recently studied the sleeping patterns of 450 students.

Kogan's "Second Act: Returning to College at Age 71" is a "diary" of the 2007 semester the physician spent at Cornell to complete his bachelor's degree. Kogan had been practicing medicine for more than 40 years and performed in some 200 TV shows (he was Officer Kogan on the sitcom "Barney Miller") and various movies when he took his wife's challenge to complete the Cornell degree he never finished, because he entered medical school in 1956 right after his junior year.

Why self-publish?

Maas' previous book, "Power Sleep: The Revolutionary Program That Prepares Your Mind for Peak Performance" (HarperCollins, 1998), was a New York Times best-seller translated into 10 languages. When HarperCollins said it would only consider publishing the new book as a revised edition of "Power Sleep," Maas balked: "This is a major new look at the field 12 years later."

It was May 2010, and to hunt for another publisher and get the book published would take up to year. "I wanted the public and my students to have access to the latest information" by the fall, says Maas. He also wanted a new book for myriad how-to-sleep-better presentations he and his writing assistants give as part of Maas and Robbins' consulting firm, Sleep for Success, to Fortune 500 companies and such groups as the New York Jets and Orlando Magic. "They ask for my book, and with 'Power Sleep' being so old, I just decided to bite the bullet."

Maas got the manuscript to AuthorHouse in June. By Sept. 5, the book was on store shelves.

"It was expensive, but I didn't publish this to make money. I am preaching that we have to learn the value of sleep; it's a necessity, not a luxury – that's how I am spending the rest of my life," says Maas, who's been called a "sleep evangelist" in the media.

The book notes that 65 percent of Americans are sleep deprived. But just one extra hour of sleep per night can greatly improve a person's mood, alertness, health and productivity.

The book reports on such findings as:

- The best predictor of longevity is not exercise or nutrition, but quality and quantity of sleep;



James Mass with "Sleep for Success!"

- Most people overestimate the amount they sleep each night by nearly one hour;
- If you fall asleep within five minutes, you are sleep deprived, since the fully rested person takes 20 minutes to fall asleep;
- Women sleep less soundly with a partner than men do; perhaps that's why 23 percent of American couples sleep apart;
- Every additional hour of sleep reduces a child's risk of obesity by 9 percent;
- One drink of alcohol on six hours of sleep has the same effect on one's ability to drive a car as three to four martinis on eight hours of sleep;
- The best time to exercise is between 5 and 7 p.m. to enhance the depth of nighttime sleep.

Maas' recent studies on high school and college students support the idea that the teenage brain is set to fall asleep at 3 a.m. and wake up at 11 a.m., yet most high school and college students get 2.5 hours less sleep per night than recommended. Grades in high school and college are directly related to sleep length as evidenced by the increase in students' grades and other measures, Maas has found.

The book also includes tests to help readers determine how well they sleep, the financial and health costs of sleep loss, strategies for getting a healthy night's rest, sleep tips for different populations and for managing jetlag, and guidelines on sleep medications.

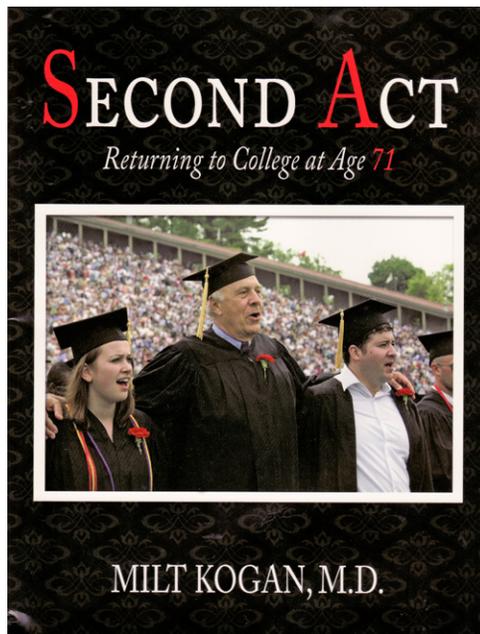
Maas, Ph.D. '66, has been teaching Psychology 101 at Cornell for 47 years, with an enrollment of 1,600 students some years, giving him the record for having taught more than 65,000 students in his Cornell career.

Kogan, on the other hand, self-published "Second Act" as a "memory to treasure" about his "exciting experience at Cornell at age 71" for friends, fellow students and perhaps even "grandchildren of the future to know the voice of their grandpa ... and even possibly as a stimulus for other senior citizens," Kogan says. He knew writer friends and "their struggles with agents, publishing, rejection" and their lack of opportunity "to write down the experiences of their lives and to ponder them. ... Anyway, who, in reality, would be interested in sponsoring a 71-year-old writer who remains only interested in writing about his own life?"

Kogan's book is a candid look at his academic insecurities, competing with students a half-century younger; his fears of a heart attack on Libe Slope; coping with blizzards and bitter cold; and the sheep and pig labs for his animal science course. It ends with his 50th Cornell Reunion (which he attended just one week after his graduation) and some advice.

As for his third act: Catch him in "Mulligan" on the Hallmark Channel in December and in "The Descendants," starring George Clooney, in 2011.

Images from Milt Kogan's book "Second Act" include, from top: Kogan with classmates at Slope Day 2007; during an Ithaca snowstorm; measuring a horse during an equine lab; enology class supply case; and a Kogan family photo at Commencement.



BY EMILY SANDERS HOPKINS

Pillsbury entrepreneurs tell of failure and success

Milkshake mogul Jim Farrell, CALS '78, is a tall, slender man with boyish good looks and a presentation style that is unpretentious and even intimate.

Using PowerPoint slides, he told his story to a dozen students in Statler Hall this September, detailing a longish list of his professional failures: starting a greenhouse insulation business that was brought down by falling oil prices in the '80s, being let go from McKinsey Consulting, unsuccessfully trying to launch a waste management company after graduating from Harvard Business School, and then being asked to resign from two subsequent corporate management jobs. His wife, Catherine, sat in the audience smiling serenely.

"It was harder on my wife," Farrell

said at one point, "than it was on me." It was difficult for Catherine, he explained, to face eight years of sympathetic looks and subtle questioning from friends about her husband's progress on the launch of his mysterious milkshake company. For several years, Farrell admitted, the family was forced to live off his wife's income while he poured his efforts into trying to make his dream a reality.

Farrell was one of six guests invited to speak on campus this semester as part of the Conversations with Entrepreneurs

Series sponsored by the Leland C. and Mary M. Pillsbury Institute for Hospitality Entrepreneurship at the School of Hotel Administration.

While the famous Dean's Distinguished Lecture Series, founded by Dean H.B. Meek in 1963, exposes Hotel school students to some of the most powerful hospitality business leaders in the world, it is the Pillsbury Institute that allows students to hear the life stories of successful entrepreneurs up close and personal and then to dine with them in a private dining room in Banfi's.

Tom Ward, the institute's managing director, works with students to identify and invite a dozen or more hospitality-industry entrepreneurs to campus each year.

"Every business relies on the efforts of individuals, but none more so than the entrepreneurial enterprise," he says. "Close, first-hand involvement with successful entrepreneurs – people who create something from nothing through vision and drive – is what the Pillsbury conversation series is all about."

"Things I wish someone had told me about entrepreneurship when I was at Cornell," Farrell said cheerfully, reading from a projected slide. The bits of wisdom that followed included the admonition to always look calm, even if you aren't; to foster a "relentless desire to move forward"; and to both metaphorically and literally "drive to the front door."

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Eli Zabar of New York City's Zabar's delicatessen and founder of the larger Zabar enterprise (E.A.T., Eli's Bread, TASTE), speaks to hotel students in October.



Jim Farrell, CALS '78, founder of F'real, chats with students after his talk in September as part of the Conversations with Entrepreneurs Series.



“If I write a book, this will be the title,” Farrell said. Driving to the front door, according to Farrell, means aiming exactly where you want to you go, not to a parking space three blocks away. “Your life will go where you aim it, so aim it toward where you most want to be.”

Today, Farrell’s private company, F’real, employs 60 people and sells nearly a million creamy milkshakes every week, freshly made to order on F’real’s patented in-store blenders at thousands of convenience store locations across the country. After years of struggle to get it up and running, Farrell’s milkshake company is worth tens of millions of dollars, and he did it without venture capital and without partners.

A few weeks after Farrell’s visit, the same room in Statler Hall was crowded with students to hear Eli Zabar recount how he came to own restaurants, wine bars, markets, a busy catering business, bakeries and a farmers’ market; how he turned bread from a commodity to an artisanal luxury item; and how – in short – he (with his older brothers) became synonymous in New York City with gourmet food.

“I managed to get fired from every job I ever had,” Zabar told the students proudly. After failing at real estate development as a young man, he traveled Europe for three months,

where in London he came across a store making and selling high-quality prepared foods. “I thought, ‘I’m going to do that!’” Zabar said. “I couldn’t cook, bake or run a business, but that’s what I wanted to do.”

The Pillsbury Institute has helped add entrepreneurial courses to the school’s curriculum, and runs a residence program that brings entrepreneurs – like Brad Tolkin ’80, chief executive officer of World Travel Holdings, and Kenneth M. Blatt ’81, principal of Caribbean Property Group LLC – to campus to teach classes and advise students in launching companies.

The Pillsbury Institute was created in 2006 with a \$15 million commitment from the Pillsburys. Among its many programs, the institute launched the first annual Cornell Hospitality Business Plan Competition this fall thanks to generous support from Stanley Sun ’00 and his parents, Dennis and Betty Sun. The winning team will receive a cash prize of \$15,000, which will be awarded during Hotel Ezra Cornell with Lee Pillsbury among the judges.

“I’m excited about it,” Pillsbury admits. “I think we’re going to see a lot of good creative thinking, and I’m hoping we’re going to see the *new new* thing.”

KNIGHT FAMILY LEGACY SUPPORTS BUSINESS-SAVVY ENGINEERS

BY ANNE JU

Lester B. Knight ’29 felt that a well-trained, successful engineer should have as much business savvy as brains for technology and science. In 1980 he gave \$1 million to endow the Lester B. Knight Jr. Scholarships, which would award students pursuing both a master’s degree in engineering and an MBA from Cornell.

Today, Knight’s vision still holds true. This year, close to 20 Ph.D., M.Eng. or MBA students are benefiting from Knight’s original gift 30 years ago.

In celebration of the 30th anniversary of the Knight Scholars program, Cornell hosted a luncheon in October in honor of the late Lester Knight’s son, Chuck Knight ’57, who has continued supporting Cornell in such areas as engineering, athletics and the Johnson School. The Knight family legacy at Cornell spans four generations, and the event, co-hosted by Provost Kent Fuchs and Johnson School Dean Joe Thomas, was held in appreciation of the Knights’ generosity over the years.

Knight scholars can opt for a two-year program, which earns them a master’s degree in engineering and a Johnson School MBA. Past M.Eng. graduates may also return to Cornell as Knight scholars to complete their MBA.

Since its endowment, the Knight Scholars program has grown to keep pace with changes in graduate-level engineering and business education. Originally an accelerated six-year joint engineering/MBA program completed without interruption, today the scholarship allows a student to get a master of engineering degree while deferring admission to the Johnson School for three to five years.

In addition to the M.Eng./MBA scholarship, the Knight Charitable Trust also supports graduate students in engineering fields.

In 2004, the Knight Charitable Trust increased the Knight Scholars endowment by \$3.3 million to demonstrate continued support for this program. The endowment is now close to \$6 million total.

SHAI EYMAN/PROVIDED



Chuck Knight '57



Eat'n Park

Hotel School alumni Jeff and Mark Broadhurst of the Eat'n Park Hospitality Group and Parkhurst Dining Services meet students after their presentation in October.





Iryna Dolgikh, head coach of Cornell women's fencing.

BY JULIE GRECO

Fencing coach's determination carries her from Ukraine to Big Red

When Iryna Dolgikh, Cornell's head women's fencing coach, was a 15-year-old in the Ukraine, a chance encounter with a crying woman in a hall of her high school changed her life.

The woman told Dolgikh that she had come to the school – the seventh she had visited – to recruit athletes for a fencing team, but not one student had registered.

Dolgikh signed up immediately and convinced 10 friends to join. From that fluke meeting developed a world champion who later became a well-respected international coach.

After just two years, she had won a national tournament and was invited by the Ukrainian national coach to attend the Olympic Reserve Training School, a

school for members of the Ukraine's 30 different national sports teams. Dolgikh had been attending a school for gifted science students, ranking sixth in her class, but she chose to leave and begin training seriously as a fencer.

"My dad was supportive, but my mom was a little upset," Dolgikh laughs. "She thought I'd be a professor."

A stint with the USSR's Junior World team followed, and in 1976, just five years after first picking up a foil, a 20-year-old Dolgikh won the International Fencing Federation (FIE) World Championship.

The next step should have been the Olympics, but instead of automatically qualifying as the reigning world champion, Dolgikh needed to earn her place on the USSR team via a two-day, 24-person tournament.

During a bout on the first day, her opponent's blade broke, and Dolgikh was impaled through the thigh. The on-site doctor advised that she go to the hospital, but Dolgikh was resolute in finishing.

"They stuffed the wound with cotton and covered it with tape," explains Dolgikh. "Not athletic tape. Just regular black tape."

Even with the serious wound, she finished the day in first place, before taking second overall at the tournament. However, she was denied her rightful spot on the team, a political decision that Dolgikh recalls as an injury worse than the one to her thigh.

Despite the disappointment, Dolgikh moved on, winning a gold medal at the 1977 World Cup, graduating in 1982 from the Kyiv Institute of Physical



Clockwise from top left: Dolgikh speaks to team members during practice; a co-ed practice with members of both the women's varsity team and men's fencing club in Bartels Hall; Dolgikh spars with a fencer.

Education and marrying Oleksandr "Sasha" Gutor, a member of the Ukrainian national volleyball team.

The couple started a family – a daughter, Olena, and a son, Alex – while Dolgikh began coaching. But on April 26, 1986, their life in the Ukraine was irrevocably changed by the Chernobyl Nuclear Power Plant disaster.

"One of our good friends was an army officer," she explains. "Nobody knew what happened that night, but the army was going there, and this friend said to Sasha: 'I will try to call you and if it's dangerous, I will tell you to get out.' So we were sitting all night with our bags packed, and once he called, we jumped into our car and left."

The couple drove 300 miles to Gutor's parents, staying for 10 days before he needed to return for his job as the Ukraine's junior national volleyball team coach. Fearing for the safety of their children, Dolgikh spent a year in Moscow with her parents.

"In the beginning, the government didn't tell the truth, but when we started to receive illegal information from other countries we began to understand what

big trouble it was," she says. "So we started to look at going outside the country."

Luckily, Gutor was offered a job in Hungary, and later Dolgikh was hired by the Slovakian national fencing team. Over the next several years, many of Dolgikh's fencing contemporaries emigrated to the United States, and she began to wonder if she could do the same. In 2000, shortly after she posted her resume online, she received an offer by the Fencing Institute of Texas. Dolgikh accepted even though she barely spoke English and had to leave her family behind for a year.

Her stint in Texas brought great success, as well as an Extraordinary Ability Green Card, which led to a job as an assistant coach at Penn State. In three seasons, she helped the Nittany Lions to a pair of national runner-up finishes and saw her epee fencers sweep the top three spots at the 2003 NCAA championships.

When Cornell's coaching position became available in 2005, Associate Athletic Director Steve Erber turned to a former colleague, Paul Pesthy, one of the most accomplished epee fencers in U.S. history, for advice. It was Pesthy who informed Erber that an outstanding candidate was just a few hours away.

"We did not have a long list of candidates, but we had a number of very good candidates, of whom Iryna was and obviously remains the best choice," says Erber. "Iryna is an underrecognized asset to our coaching staff. If I was a Cornell coach, regardless of sport, I would be learning from her as much as I could about her coaching techniques and philosophy."

Since the day she was hired, Dolgikh has helped the Big Red to improve on

'IF I WAS A CORNELL COACH, REGARDLESS OF SPORT, I WOULD BE LEARNING FROM HER AS MUCH AS I COULD ABOUT HER COACHING TECHNIQUES AND PHILOSOPHY.'



— ASSOCIATE ATHLETIC DIRECTOR
STEVE ERBER

the strip and has also been selected as a national coach for her adopted country, most recently serving as head coach of the U.S. Veteran fencing team for the past two years.

"The World Championships was a fantastic opportunity for me to shine some light on our great athletic program, which improves the reputation of our growing fencing program," says Dolgikh.

With the same resolve of that young fencer who continued to battle despite being stabbed through the leg, Dolgikh now works tirelessly to bring in top fencers and provide them with the training they need.

"When I look at my career, I am very grateful to my country and everyone who allowed me to develop my talent," Dolgikh says. "I have many stories about travels and competitions that I have been a part of as a fencer, but the most important achievement for me so far has been rebuilding the Big Red program."



Members of the women's fencing team suit up before a practice.



Natalie Bazarova

**Assistant professor,
communication**

College: Agriculture and Life Sciences

Academic focus: The intersection of interpersonal communication, social cognition and new technologies. Research interests focus on the psychological dynamics of computer-mediated communication in the context of group collaboration and personal relationships. Recent projects are concerned with cross-cultural groups, social behavior explanation and relationship development in online interactions.

Previous position: Postdoctoral associate, Department of Communication, Cornell, 2009-10.

Academic background: B.S., linguistics and English philology, Far Eastern National University, Vladivostok, Russia, 2000; and M.S., 2005 and Ph.D., 2009, communication, Cornell.

Last book read: "The Pleasure of Finding Things Out" by Richard Feynman.

In her own time: "Traveling, leisure time with my family and friends, reading, hiking."

The latest academic talent on campus

Introducing four new members of the university's faculty



Nate Foster

**Assistant professor,
computer science**

College: Engineering

Academic focus: Programming language design and implementation, especially semantics and type systems for data-processing languages.

Previous position: Postdoctoral research associate, Princeton University, 2009-10.

Academic background: B.A., computer science, Williams College, 2001; M.Phil., history and philosophy of science, University of Cambridge, 2008; Ph.D., computer and information science, University of Pennsylvania, 2009.

Last book read: "Middlesex" by Jeffrey Eugenides.

In his own time: Cycling, hiking and cooking.



Christopher Hernandez

**Assistant professor,
mechanical and aerospace
engineering and
biomedical engineering**

College: Engineering

Academic focus: The material properties of bone and how the bone remodeling process modulates material properties.

Previous positions: Assistant professor, Case Western Reserve University; postdoctoral fellow, University of California-Berkeley; postdoctoral fellow, Mount Sinai School of Medicine.

Academic background: B.S., engineering sciences, Harvard University, 1996; M.S., 1997, and Ph.D., 2001, both in mechanical engineering, Stanford University.

Last book read: "Mockingjay" by Suzanne Collins.

In his own time: Playing with his toddler and infant, improving his homemade Poblano mole sauce.



Wendy Wolford

**Associate professor,
development sociology**

College: Agriculture and Life Sciences

Academic focus: Political economies of development, social movements and resistance, agrarian societies, political ecology, land use, land reform and critical ethnography, all with a regional concentration in Latin America, particularly Brazil.

Previous positions: Director of graduate studies, 2008-09, associate professor and associate chair, 2007-08, assistant professor, 2001-07, all in the Department of Geography, University of North Carolina-Chapel Hill; postdoctoral fellow, Program in Agrarian Studies, Yale University, 2004-05.

Academic background: B.A., economics and international development, McGill University, 1994; M.S., 1997, and Ph.D., 2001, both in geography, University of California-Berkeley.

Last book read: "Mennonite in a Little Black Dress: A Memoir of Going Home" by Rhoda Janzen

In her own time: "I like to run, hike and travel; my goal this year is to take my kids to as many county fairs as possible."

Why collaborating across boundaries is a new career path for researchers

Career advancement for a faculty member at a major research university like Cornell has usually required single-minded pursuit of a narrow research program in a single discipline. This state of affairs is becoming less dominant.

While following such an approach can still lead to individual success, it contributes little to the solution of many of the most challenging problems now facing global society: adapting to and mitigating the effects of climate change, solving the health, nutritional and infrastructure problems in desperately poor countries and resolving long-festering geopolitical conflicts. None of these critical problems is likely to be resolved without the engagement and collaborative efforts of numerous scholars working across disciplinary lines.

The most encouraging example to date of promoting such cross-disciplinary connections among researchers at Cornell is the recently announced gift of \$80 million by David Atkinson '60 and his wife, Patricia, to create and permanently fund the David R. Atkinson Center for a Sustainable Future. The new research center will involve chemists, economists, biologists and sociologists focusing on challenges in the global energy, environmental and economic development arenas.

The center is an outgrowth of a pilot program (the Cornell Center for a Sustainable Future) established in 2007 by then Provost Carolyn "Biddy" Martin, and funded by a \$3 million gift from the Atkinsons, to help advance multidisciplinary research and cultivate innovative collaborations within and beyond Cornell to foster a sustainable future. One of the program's initial mandates was to facilitate strategic faculty hiring in the three thematic areas of energy, environment and economic development. The program quickly announced a plan for strategic faculty hiring in sustainability that would provide bridging and startup funding to colleges and departments committing faculty lines to areas of particular strategic importance to the broader Cornell community.

Martin had long been an advocate for interdisciplinary research. In the early 2000s she initiated a program of cluster hires in the life sciences. She believed that by recruiting clusters of researchers, or teams in allied but different disciplines, the university could enhance its ability to take the lead in some of the most challenging problems in the life sciences. An unusual feature of the faculty recruitment program was that it left to the newly recruited researchers the choice of which department to join. By most accounts this program has been very successful in attracting and retaining working groups of top-flight scholars.



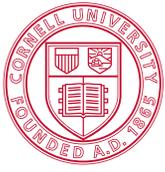
'AN UNUSUAL FEATURE OF THE FACULTY RECRUITMENT PROGRAM WAS THAT IT LEFT TO THE NEWLY RECRUITED RESEARCHERS THE CHOICE OF WHICH DEPARTMENT TO JOIN.'

In the same way, the new sustainability center will use its funding to promote cluster hiring across disciplines. However, the connections between scholars will need to be more problem-defined, with multiple units across colleges deciding which areas to focus on. New recruits will still be able to select their home departments, within a specified range.

The first focus area defined under the pilot program in 2008 was climate change, falling within the College of Agriculture and Life Sciences. The second was related to energy supply, distribution and end use, in association with the College of Engineering's efforts to establish an energy institute. In 2009 focus groups of faculty members developed seven strategic hiring proposals. Four of these proposals have been approved by the faculty advisory committee of the center, and cluster hires will proceed in the critical areas of biodiversity, boundary layer and coastal fluid dynamics, environmental economics and sustainable enterprise, and sustainable systems. Searches will be authorized once college and departmental commitments of faculty lines and bridge funding availability have been confirmed.

Thanks to the Atkinsons' additional generous gift to the university and to the new sustainability center, the future of cross-disciplinary research in the area of sustainability is looking particularly bright.

Kieran Donaghy is professor and chair of the Department of City and Regional Planning and the director of graduate studies in the Field of Regional Science. He has been a member of the Atkinson Center for a Sustainable Future's Faculty Advisory Committee since the inception of the center.



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Rachel Bean, PhD, Assistant Professor
Department of Astronomy, College of Arts and Sciences

Astrophysicist Rachel Bean studies how the universe began and has evolved over time. She recently received a 2010 Presidential Early Career Award for Scientists and Engineers. Gifts from alumni, parents, and friends helped to recruit her to Cornell.



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