



Cornell University

THE REPORT

Collaborative Approach World-Class Facilities

Research at Cornell
Office of the Vice Provost for Research



Jason Koski/CU

Robert Barker/CU

We recognize that Cornell has excellent strengths across the campus—and it's exciting.

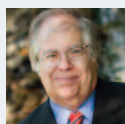
– Robert A. Buhrman

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Aggregating Excellence

THE FOUNDATION OF CORNELL'S PREMINENCE IN RESEARCH



The basis of Cornell's leadership in research is a commitment to excellence in diverse and collaborative research. Cornell's amazing

breadth of research includes large-scale projects that will help improve the well-being of our national and global societies, smaller ingenious projects that will lead to breakthroughs in many areas, and scholarly work that supports and enhances the spirit of humanity.

To continue to lead, we must also continue to renew our faculty. Our excellent cadre of young faculty who won many national awards over the past year, including a notable number of National Science Foundation Early Career Development awards, strongly confirms the success of Cornell's recent efforts at renewal.

Cornell faculty continue to increase the university's external funding for top-flight research and to secure our leadership position in academic research. In FY 2009 Cornell was second among the nation's research universities in total National Science Foundation (NSF) research funding. Prior to the American Recovery and Reinvestment Act (ARRA) stimulus funding, Cornell had a 5 percent increase in research funding on the Ithaca campus for FY 2009, with a marked increase in nonprofit and foundation funding. A Bill and Melinda Gates Foundation's award of \$26.8 million established a Cornell global

partnership to fight stem rust, a lethal wheat disease that threatens global food security. The NSF's renewal and increase in funding for the National Nanotechnology Infrastructure Network (NNIN) for the next five years confirms the impact of this network led by Cornell.

By the end of 2009, Cornell researchers on the Ithaca and New York City campuses had received more than \$140 million in stimulus funding, garnering exceptional success across areas with the immediate potential to address some of the nation's urgent needs. We received \$17.5 million from the Department of Energy, along with additional funds from New York State, for an Energy Frontier Research Center: the Energy Materials Center at Cornell (EMC²). Cornell's Ithaca campus and Weill Cornell Medical College, partnering with the University of Buffalo, received \$13 million from the National Cancer Institute to fund the Center for the Microenvironment and Metastasis, which brings physicians and engineers together to gain a deeper understanding of the complexity of cancer. NSF's yearlong review of the Cornell High Energy Synchrotron Source and Energy Recovery Linac R&D program culminated in NSF's National Science Board approving up to \$125 million in funding for CHESS and ERL over the next four years.

Cornell continues to lead in research and technology development, including advanced materials, computer and information sciences, and nanoscience and nanotechnology—which are rapidly evolving fields that are

now playing a fast-growing role in medical technology. Cornell leads in research on personal decision making and lifestyle in human health, including such issues as obesity and smoking, which extract steep personal and societal costs. The impact of Cornell's work in genomics touches on all areas of the life sciences. Analysis of genetic information that was unattainable 10 years ago—now available at ever-decreasing costs—is yielding knowledge and insights that will reshape biology in coming decades.

ENDORISING EXCELLENCE

We recognize that Cornell has excellent strengths across the campus—and it's exciting. We want to support all of our strengths, based on our ability to make strategic investments and attain external resources in areas where available; advance in areas where Cornell has strong potential; and excel in areas of current strength. By recognizing and supporting excellence, Cornell has been, and still is, at the forefront of trends where we can make significant contributions to meeting societal needs and enriching humanity. I aim to extend our support of excellence and to ensure, to the extent possible, that Cornell faculty have the facilities, particularly shared facilities, and tools they need to excel.

Robert A. Buhrman

Senior Vice Provost for Research

TO REIMAGINE

As we look toward Cornell's future, our vision for Cornell research is straightforward. We want the Cornell research enterprise to have

► tactics

and actions that will enhance our research productivity and enable Cornell to excel in emerging, breakthrough areas defined by the faculty;

► mechanisms

by which new initiatives of the faculty with the prospect of expanding Cornell's research leadership, yielding a strong impact, and winning external funding in the appropriate areas can be addressed, as they as they emerge;

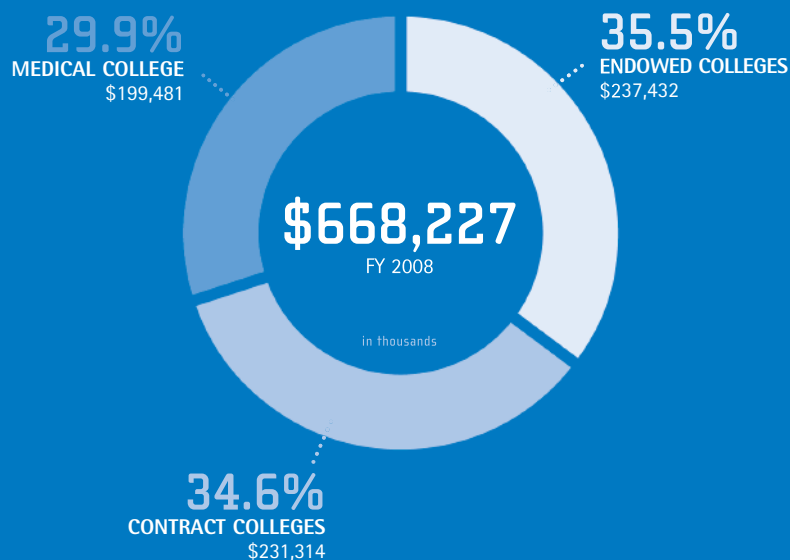
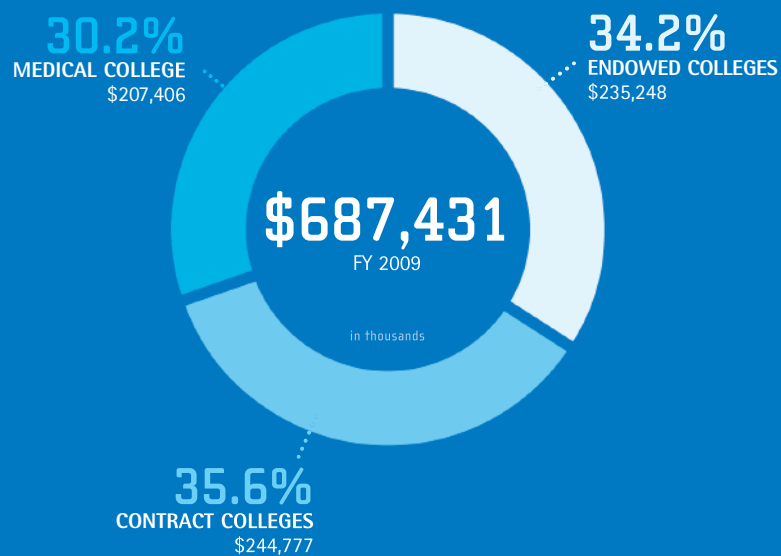
► a way to use

the resources we have—which are limited—as effectively and efficiently as possible, taking our best practices in organizing shared facilities, administering research, and stimulating and supporting interdisciplinary initiatives and implementing these successfully and appropriately across campus; and

► a strategy

to identify Cornell's best areas and determine how to make those areas even better, without detracting from other areas.

Cornell's Total Research Expenditures



Source: Cornell University, Sponsored Financial Services

Ranking Cornell Nationally

in thousands

| BY RESEARCH EXPENDITURES | | FY 2008 |
|--------------------------|---|-------------|
| 1 | Johns Hopkins University* | \$1,680,927 |
| 2 | University of California, San Francisco | 885,182 |
| 3 | University of Wisconsin, Madison | 881,777 |
| 4 | University of Michigan | 876,390 |
| 5 | University of California, Los Angeles | 871,478 |
| 6 | University of California, San Diego | 842,027 |
| 7 | Duke University | 766,906 |
| 8 | University of Washington | 765,135 |
| 9 | University of Pennsylvania | 708,244 |
| 10 | Ohio State University | 702,592 |
| 11 | Pennsylvania State University | 701,130 |
| 12 | Stanford University | 688,225 |
| 13 | University of Minnesota | 682,662 |
| 14 | Massachusetts Institute of Technology | 659,626 |
| 15 | Cornell University | 653,996 |

Ranking Cornell in New York

in thousands

| BY RESEARCH EXPENDITURES | | FY 2008 |
|--------------------------|--------------------------------|-----------|
| 1 | Cornell University | \$653,996 |
| 2 | Columbia University | 548,704 |
| 3 | University of Rochester | 375,218 |
| 4 | SUNY, Buffalo | 338,300 |
| 5 | New York University | 310,699 |
| 6 | Mount Sinai School of Medicine | 296,380 |
| 7 | SUNY, Albany | 270,414 |
| 8 | SUNY, Stony Brook | 252,745 |
| 9 | Rockefeller University | 247,505 |
| 10 | Yeshiva University | 197,311 |

* Johns Hopkins University includes the Applied Physics Laboratory, with \$845,396 in total R&D expenditures. Source: National Science Foundation

Note: Research expenditures of \$12,586 for Cornell's National Astronomy and Ionosphere Center (NAIC) are reported separately and are not included in the above NSF amounts. Nonscience and Engineering research expenditures of \$1,645 are not included in the above NSF amounts.

Funding Cornell's Research

| in thousands | | | |
|-----------------------------------|--|------------------|------------------|
| BY DOLLARS EXPENDED | | FY 2009 | FY 2008 |
| Total Federal Sources | | \$383,246 | \$377,896 |
| Sponsored Research | | 375,118 | 368,540 |
| Appropriated Research | | 8,128 | 9,356 |
| Total Nonfederal Sources | | 304,185 | 290,331 |
| Sponsored Research | | 132,160 | 111,829 |
| State & Local Governments | | 25,917 | 20,449 |
| Corporations & Trade Associations | | 27,715 | 25,947 |
| Foundations | | 36,066 | 25,996 |
| Nonprofit Organizations* | | 41,913 | 37,919 |
| All Others | | 548 | 1,518 |
| Appropriated Research | | 172,025 | 178,502 |
| Cornell Support** | | 117,888 | 123,476 |
| New York State | | 54,137 | 55,026 |
| Federal Agencies | | | |
| DHHS | Department of Health & Human Services | \$192,485 | \$190,792 |
| NSF | National Science Foundation | 115,067 | 116,000 |
| DOD | Department of Defense | 19,759 | 16,428 |
| USDA | Department of Agriculture | 17,204 | 16,227 |
| NASA | National Aeronautics & Space Administration*** | 10,538 | 10,599 |
| DOE | Department of Energy | 9,519 | 7,195 |
| AID | Agency for International Development | 2,213 | 2,822 |
| All Others | | 8,332 | 8,476 |

* Includes sub-awards of federal funds from other universities, national labs, nongovernment organizations, etc.

** Consistent with NSF reporting guidelines, university support includes institutional cost sharing, GRA tuition fellowships, university seed research grants, unrecovered facilities and administrative costs, and organized research allocation of NYS-funded employee benefits.

*** NASA includes JPL funds under subcontract.
Source: Cornell University, Sponsored Financial Services
Discrepancies may occur due to rounding.

Expending Research Dollars

| in thousands | | | |
|---|--|-----------|-----------|
| BY DISCIPLINES | | FY 2009 | FY 2008 |
| Medical Sciences | | \$256,605 | \$247,623 |
| Biology | | 102,407 | 98,354 |
| Multidisciplinary | | 57,187 | 58,542 |
| Agriculture | | 57,158 | 49,543 |
| Physics | | 42,055 | 45,730 |
| Astronomy | | 29,412 | 26,892 |
| Chemistry | | 20,858 | 20,526 |
| Computer Sciences | | 17,744 | 19,935 |
| Electrical Engineering | | 17,387 | 15,975 |
| Economics | | 14,333 | 5,540 |
| Institutional & College Research Support* | | 13,413 | 10,724 |
| Metallurgical & Materials Engineering | | 9,362 | 7,835 |
| Sociology | | 9,257 | 9,918 |
| Mechanical Engineering | | 6,890 | 7,758 |
| Civil Engineering | | 6,207 | 6,912 |
| Earth Sciences | | 5,884 | 6,158 |
| Chemical Engineering | | 5,706 | 5,083 |
| Mathematical Sciences | | 4,603 | 5,250 |
| Psychology | | 4,941 | 4,243 |
| Bioengineering & Biomedical Engineering | | 4,206 | 2,755 |
| Humanities | | 916 | 756 |
| Political Sciences | | 632 | 359 |
| Communication, Journalism, & Library Sciences | | 185 | 1,300 |
| Oceanography | | 96 | 270 |
| Other Social Sciences | | 74 | |
| Law | | 51 | 90 |
| Business & Management | | 17 | 9,985 |
| Visual & Performing Arts | | | 9 |

* Expenses incurred at the administrative unit level in support of research.
Disciplines are defined by the National Science Foundation.
Source: Cornell University, Office of Sponsored Accounting
Discrepancies may occur due to rounding.

A Review of Selected Faculty Research

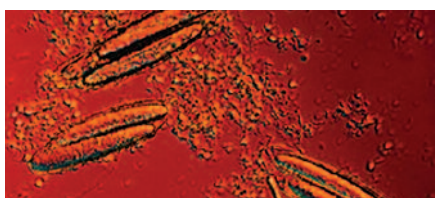
Forming Earth's Crust



Christopher Andronikos, Earth and Atmospheric Sciences, and research colleagues puzzled over the conditions that create granulite, a key component of the Earth's crust. Granulite forms from moving, molten rock at a wide range of depths, but a narrow range of temperatures. The Cornell team created a mathematical computer model of the formation of granulite that explains how granulite is instead formed as the molten rock migrates upward through the crust.

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How Big a Bacterium?



Esther R. Angert, Microbiology, and her research team showed how the unusually large size of the bacterium *Epulopiscium sp.*—roughly the size of a grain of salt—may be due to its ability to copy its genome tens of thousands of times. The bacterium lives in the gut of surgeonfish. Prior to this study, other bacteria have been known to generate multiple copies of their genomes, but only as many as a few

hundred. The researchers are interested in how the process emerged in surgeonfish and how it may affect the organism's biology.

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Fish-Speak



Andrew H. Bass, Neurobiology and Behavior, and his research group found that the neural network behind sound production in vertebrates can be traced

backed to the hums and grunts of fish. Cornell researchers mapped the developing brain cells in newly hatched larvae of the midshipman fish, a species known for the loud humming sounds adult males generate with their swim bladders to attract females to their nests. They compared this system to the neural circuitry behind vocalizations of amphibians, birds, reptiles, and mammals, including primates. They discovered that the complexity of networks varies, but the fundamental attributes are the same. The findings put human speech and the social communications of all vertebrates into evolutionary context.

therapy, sparing the patient common side effects of receiving the drug intravenously throughout the body.

Emotions and Memories



Charles Brainerd and Valerie Reyna, Human Development,

led a study on how negative events result in more false memories than neutral events. The researchers found that negative events actually distort memory.

People may not remember the details of what happened to them, but they remember that the incident was negative, and this allows them to fill in the blanks with memories of negative events that did not happen. The research will influence understandings about the accuracy of legal testimony in criminal cases and how interviews and interrogations in violent cases should be conducted.

Apples on the Fast Track



Susan K. Brown, Horticultural Sciences, Geneva, tracked new Cornell apple selections at 30 New York orchards to determine their commercial viability. The aim is to fast track grower testing of 42 advanced apple-breeding selections. Brown's expectation of identifying two new

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varieties with the potential for commercialization has been realized. In the spring of 2010, two new Cornell varieties, developed by Brown, were licensed exclusively to a New York grower owned company.

A New Maize Genetics Map



Edward S. Buckler, Plant Breeding and Genetics, and research colleagues identified thousands of diverse

genes in genetically inaccessible parts of the maize genome and created the first map of haplotypes—sets of linked gene variants known as alleles. The lines selected for study included a cross-section of maize varieties used for breeding, representing worldwide diversity. The haplotype map will help researchers and breeders to develop molecular markers and create new tools—previously out of reach—to improve maize varieties.

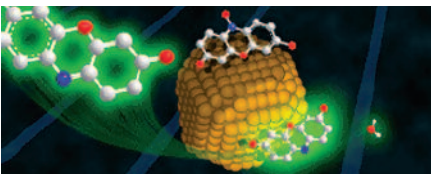
A Vaccine for Johne's Disease



Yung-Fu Chang, Population Medicine and Diagnostic Sciences, and research colleagues developed a vaccine

for Johne's disease, which results in annual losses of \$220 to \$250 million for the U.S. dairy industry. The contagious, chronic, and unusually fatal bacterial infection—caused by the *Mycobacterium avium* subspecies *paratuberculosis*—primarily infects cattle, sheep, goats, and farm-raised deer, elk, llamas, alpaca, bison, and zoological wildlife. Changes in management practices were previously the only way to prevent the disease.

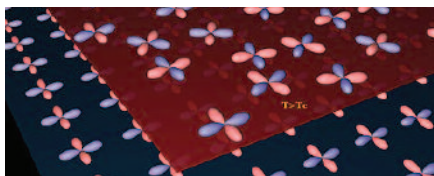
Observing Single Catalytic Events



Peng Chen, Chemistry and Chemical Biology, and research group developed a microscopic method for observing the behavior of single nanoparticles

of a catalyst, down to the resolution of single catalytic events. They showed that some nanoparticles in a batch carry out their reactions differently and that each nanoparticle changes the speed of its catalytic reaction over time—and they measured the time scale. Nanoparticles provide a larger surface area to speed reactions, and in some cases, materials that are not catalytic in bulk become so at the nanoscale. Nanocatalysts therefore hold promise for such applications as fuel cells and pollutant removal.

Superconductivity at Room Temperature?



J. C. Séamus Davis, Physics, and his research team took new measurements revealing that high-temperature superconductors may have the potential to go even higher. These findings raise the possibility of creating room-temperature superconductors or superconductors that will work with conventional refrigeration. Superconductors conduct electricity with zero resistance—but only when cooled to very low temperatures. Recently developed materials called cuprates, consisting of copper oxide doped with other elements, superconduct up to temperatures as high as 150 Kelvins (-123°C or -253°F). Such materials could lead to far more efficient electric generators, lossless power transmission, and other energy-saving applications.

A New Genetic Engineering Technique



Matthew DeLisa, Chemical and Biomolecular Engineering invented a new genetic engineering

technique—a protein readout method for cells. The technique will allow researchers to create and catalog disease-specific antibodies in the lab, revolutionizing antibody-based drug treatments for such diseases as Alzheimer's and cancer. Inspired by nature, the method encompasses efficient readout of protein-to-protein interactions within cells. An Ithaca-based biotechnology company, Vybyion Inc.,

negotiated an exclusive license with Cornell to use the technology, which the company is now applying to its in-house drug development and related projects.

Switching Off



Scott D. Emr, Weill Institute for Cell and Molecular Biology, and his collaborators provided a new insight into

how receptors on cell surfaces turn off signals from the cell's environment, a vital contribution to cell functions such as growth, division, and death. Their findings will improve understanding of cancer, AIDS, neurodegenerative disorders, and other illnesses, because such diseases can result when receptors go awry by failing to turn off, a function known as down-regulation.

Light Moves Molecules



David Erickson, Mechanical and Aerospace Engineering, Michal Lipson, Electrical and Computer Engineering, and

research colleagues demonstrated that a beam of light can trap and move particles, including DNA molecules, as small as 75 nanometers in diameter. This application of optofluidics—using the pressure of light to move and manipulate biological molecules—could overcome the obstacle of moving materials at the nanoscale. A tiny biological sample could be carried through microscopic channels for processing. The research may lead to scientific breakthroughs such as a lab on a chip; a portable, fast-acting detector for disease organisms or food-borne pathogens; and rapid DNA sequencing.

Stress and Cognitive Development



Gary W. Evans, Design and Environmental Analysis, and research staff confirmed that the chronic stress of growing up in poverty can physiologically impact children's brains. It can impair their working memory and diminish their ability to develop language, reading, and problem-solving skills. The study is the first to tie cognitive development to physiological stress in children living



Booker Lab/MCH

in impoverished environments. Their findings suggest that government policies and programs that aim to reduce the income-performance gap should also consider the chronic stress children experience at home.

Night Vision, an Evolutionary Quirk



Barbara L. Finlay, Psychology, and research colleagues determined that an evolutionary mechanism shows how important changes in primates' brain structures evolve. The researchers reported that evolution appears to proceed through simple genetic changes that affect the timing

of development in brain regions. Minor differences in the timing of cell proliferation can explain the large differences found in the eyes of two species of monkeys—owl monkeys and capuchin monkeys—evolving from a common ancestor. They studied the developing eyes of these species of monkeys during embryonic growth for insight into how nocturnal owl monkeys develop retinas with many more rod cells than cones, while capuchin monkeys, which are active during the day, develop more cone cells than rods.

Cancer Cell Growth in 3-D



Claudia Fischbach-Teschl, Biomedical Engineering, demonstrated that a previously underestimated protein secreted by cancer cells could be key in allowing cancer to grow and spread. Fischbach-Teschl and her research team studied the behavior of cancer cells grown in two and three dimensions. They looked

at how cancer cells, binding to the material that surrounds them—called the extracellular matrix—regulate the secretion of proteins called angiogenic factors. These proteins allow tumors to develop blood-vessel networks and metastasize.

An Ultrafast Oscilloscope



Alexander Gaeta, Applied and Engineering Physics, Michal Lipson, Electrical and Computer Engineering, and

research colleagues created an ultrafast oscilloscope that can plot the waveform of an optical signal with a resolution of less than a trillionth of a second. Although some current methods can measure such brief waveforms by averaging many repeating events, the new oscilloscope can capture events that happen only once in a while. Applications include analyzing intermittent glitches in fiber-optic communications and observing such fast-moving events as chemical reactions and laser fusion.

Price and the Perception of Quality



Ori Heffetz, Johnson Graduate School of Management, and research colleagues tested the link between price and consumer perceptions of quality in two food-related experiments. Contrary to previous studies, they found that higher prices did not cause the predicted higher demand for the products, but instead decreased demand. Although more expensive products may generate more positive consumer regard, the higher price tags discourage consumers from buying them. The study anchors economics to real-world situations, rather than relying just on abstract theoretical models to explain how money moves—a study in behavioral economics.

ASL Cell Phones



Sheila S. Hemami, Electrical and Computer Engineering, and research colleagues created cell phones that allow deaf people to communicate in sign language the same way hearing people use phones to talk. The technology allows deaf people unfettered communication in their native language. The researchers—the Mobile American Sign Language (ASL) team—designed the video compression software so that ASL users can send clear, understandable video over existing bandwidth networks. Twenty-five deaf people have received the first phone prototypes.

The Mating Duet



Ronald R. Hoy, Neurobiology and Behavior, Laura C. Harrington, Entomology, and their research teams discovered how male and female mosquitoes (*Aedes aegypti*) interact acoustically with each other when they are within a few centimeters' hearing distance. They create a harmonic duet around 1,200 hertz, a multiple of their wing-beat frequencies,



just before mating. The frequency is much higher than what was thought to be the upper hearing limit of the mosquito. This study is also the first to show definitively that female mosquitoes are not deaf. The findings will lead to new and better ways to control the mosquito population in areas plagued by yellow and dengue fevers.

From Flickr to Online Travel Guidebook

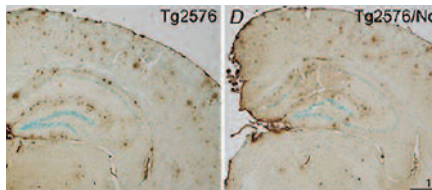


Daniel P. Huttenlocher, Computing and Information Science, David A. Lifka, Cornell Center for Advanced Computing, and their collaborators developed a new classification method for large-scale collections of digital images. They downloaded and analyzed nearly 35 million Flickr photos taken by more than 300,000 photographers from around the world. Their method provides a practical and automatic way to organize, label, and summarize collections at this scale. It could lead to an online travel guidebook that can identify the best sites to visit on a vacation. The research also generated statistics on the world's most photographed cities and landmarks, including New York City, London, San Francisco, the Eiffel Tower, and Trafalgar Square. The researchers used a supercomputer at the Cornell Center for Advanced Computing (CAC).



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Targeting an Enzyme for Curbing Alzheimer's Disease



Costantino Iadecola, Neurology and Neuroscience, Weill Cornell Medical College, and research colleagues demonstrated that curbing harmful processes in the brain's vasculature set off by the enzyme NADPH oxidase may reverse some of the cognitive decline associated with Alzheimer's disease. After the enzyme was genetically switched off, mice with a type of dementia

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that mimics Alzheimer's regained important cognitive abilities. Identifying the enzyme's role in dementia could translate into a new drug target for Alzheimer's disease in humans.

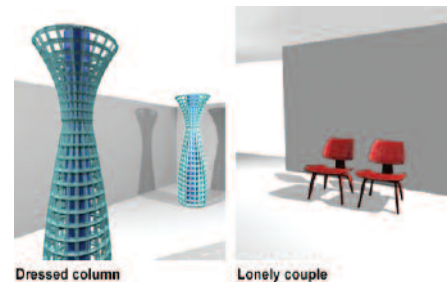
Spillover Effect in Teaching



C. Kirabo Jackson, Industrial and Labor Relations, and research colleagues confirmed that teachers improve their performance when the quality of their colleagues improves. The team analyzed 11 years of data on North Carolina schoolchildren, focusing on mathematics and adding test-score data for students in third through fifth grades with the same teacher for all of their core academic subjects. Offering some of the first evidence of a spillover effect in teaching, the study has implications for the national debate on merit-pay plans for teachers and school staffing practices. If teachers learn from their peers and the effects are significant, as this study suggests, then incentive systems should aim to foster the spillover effect.

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The Language of Design



Jan Jennings, Design and Environmental Analysis, and an interdisciplinary group of colleagues produced the first searchable, online database for contemporary design with imagery from actual buildings. They invented a naming practice—a vocabulary—for students to use in design. Interior designers can now name a dramatic staircase in the lobby of a luxury hotel, for example, or two similar chairs situated side by side in a large space. Having names for specific interior design features allows researchers to isolate issues related to them, such as their sustainability, for study. The project—Interior Archetypes Research and Teaching Project (Intypes)—was 13 years in the making.

Marker for Breast Cancer Metastasis



Joan G. Jones, Pathology, Weill Cornell Medical College, and fellow researchers identified a new marker for breast cancer metastasis. The marker, a group of three cell types together called tumor microenvironment of metastasis (TMEM), is associated with the development of distant organ metastasis via the bloodstream—the most common cause of death from breast cancer. A tissue test for metastatic risk could alleviate concerns about cancer spreading and limit the use of toxic and costly measures like radiation and chemotherapy. This discovery could change the way breast cancer is treated.

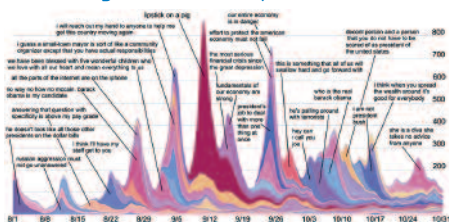
Innovations Preferred Early



Sheryl E. Kimes and Rohit Verma, Hotel Administration compared 11 technologies commonly used in restaurants and found that restaurant customers prefer virtual menus with nutritional information as the most

valuable technology, followed closely by online reservations, kiosks for ordering, and pagers for table management. After linking the 11 technologies to five dining stages, the researchers showed that customers are more comfortable with early dining-stage technologies, such as virtual menus and pagers. They recommend restaurateurs urge customers to try new technologies when they are introduced.

Tracking the News Cycle



Jon M. Kleinberg, Computer Science, and his research group used online versions of mainstream media and news blogs to analyze the way emerging news stories rise and fall in popularity. Tracking a total of 90 million articles—one of the largest analyses anywhere of online news—over the

three-month period prior to the 2008 presidential election, they were able to measure the temporal dynamics of the news. They found that stories rise to prominence slowly then die quickly in mainstream media, while in the blogosphere, stories rise in popularity very quickly and remain current longer. Their work suggests that the news cycle is a real phenomenon that can be measured, rather than merely a way to describe the readership's perception of media activity.

Cardiac Stem Cells



Michael I. Kotlikoff, Biomedical Sciences, and his research colleagues isolated and purified mouse heart

stem cells, settling scientific disagreement over the existence of cardiac stem cells. Using their method, researchers can now study factors that control the fate of such cells. This research will lead to a better understanding of whether genes can spur heart stem cells to differentiate fully into new cells after a heart attack.

Computer, Observe and Find



Hod Lipson, Mechanical and Aerospace Engineering, and research team taught a computer with no prior scientific knowledge to find regularities in the natural world representing natural laws. They tested their algorithm on simple mechanical systems—a spring-loaded linear oscillator, a single pendulum, and a double pendulum—but also believe it could be applied to more complex systems, ranging from biology to cosmology. This computer algorithm will expedite routine electronic data analysis, helping scientists to focus quickly on the interesting phenomena and interpret their meaning.

A Cloaking Device



Michal Lipson, Electrical and Computer Engineering, and her research team built a device that can make bumps in a flat surface appear invisible. Although devices that bend microwaves around small objects have been previously demonstrated,

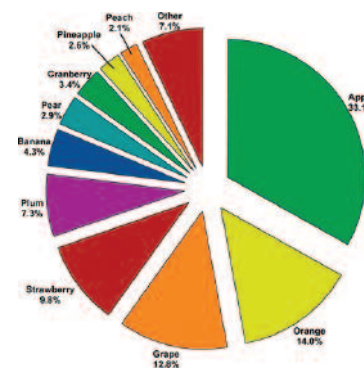
this is the first cloaking device to work at optical frequencies. The illusion is only effective at the nanoscale now, but the basic principle could eventually be scaled up for military and communications applications. The team used a silicon wafer as the base for a reflector about 30 microns long with a 5-micron-wide bump in the middle, placing an array of vertical silicon posts, each 50 nanometers in diameter, in front of the reflector.

Pinpointing Genes



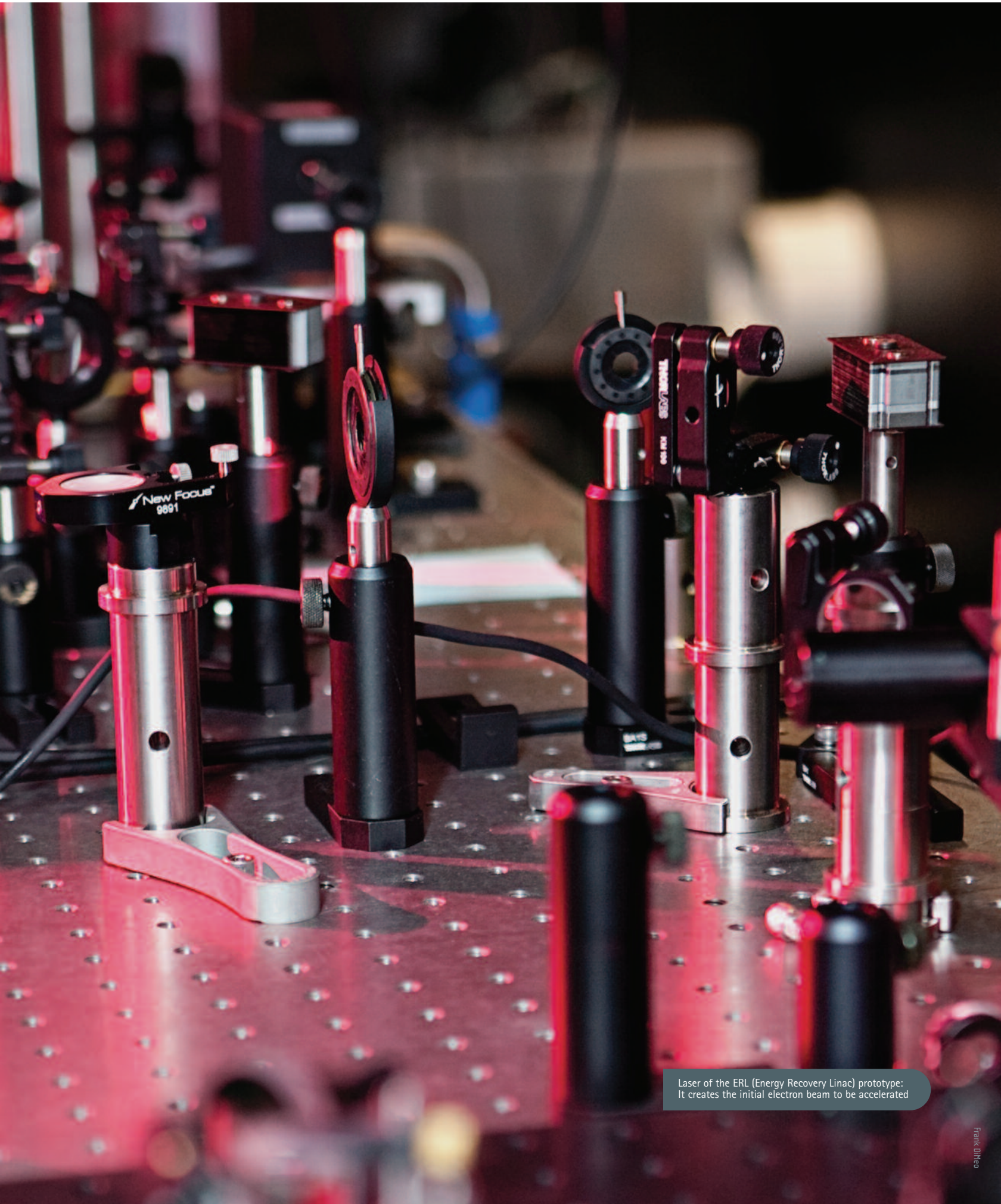
John T. Lis, Molecular Biology and Genetics, and research colleagues developed a new technique that takes a snapshot of all the locations on the human genome where RNA polymerases actively transcribe genes. The method provides a new and highly sensitive way to pinpoint all the active and silent genes in the human genome. The researchers also discovered—counter to the previous understanding that RNA polymerases read DNA in one direction—that polymerases travel in the both directions.

Apples and More



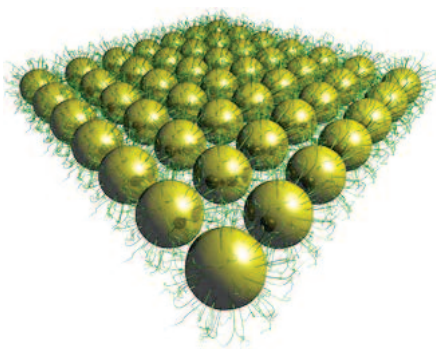
Rui Hai Liu, Food Science, and his collaborators published six studies during 2008–2009 showing how

apples and other fruits and vegetables can help prevent breast cancer. In the latest study, the team reported that fresh apple extracts significantly inhibit the size of mammary tumors in rats, with the effect increasing with the dose. These studies highlight the key role of phytochemicals known as phenolics or flavonoids—which are found in apples and other fruits and vegetables—and add to the growing evidence of the health benefits of eating more fruits and vegetables.



Laser of the ERL (Energy Recovery Linac) prototype: It creates the initial electron beam to be accelerated

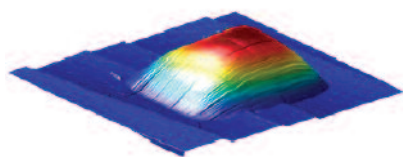
DNA For Nanocircuits



Dan Luo, Biological and Environmental Engineering, Christopher Umbach, Materials Science and

Engineering, David Muller, Applied and Engineering Physics, and their research teams created thin sheets of gold nanoparticles held together by tangled, hairlike strands of DNA—suspended, free-standing sheets of gold nanoparticles 20 nanometers thick. The researchers demonstrated easy control of the sheets' mechanical properties by changing the lengths of the DNA or the distance between nanoparticles. The work may have applications in thin transistors and other electronic devices.

World's Thinnest Balloon



Paul L. McEuen, Physics, Jiwoong Park, Chemistry and Chemical Biology, and research colleagues used a lump of graphite, a piece of Scotch tape, and a silicon wafer to create the world's thinnest balloon, one atom

thick. It is strong enough to contain gases under several atmospheres of pressure without popping. This balloon-like membrane is ultra-strong, leakproof, and impermeable to even nimble helium atoms. The research could lead to a variety of new technologies, from novel ways to image biological materials in solution to techniques for studying the movement of atoms or ions through microscopic holes.

Birds Immortalized



Todd McGrain, Art, immortalized the extinct passenger pigeon and four other extinct North American bird species—the Carolina parakeet, great auk, Labrador duck, and heath hen—in his work. One of six invited artists, he exhibited his “Lost Bird Project” at the Third Rochester Biennial at the University of Rochester's Memorial Art Gallery (MAG). The project includes five large, smooth-surfaced bronze sculptures, each more than six feet tall and weighing up to 700 pounds, and a corresponding series of somber ink-and-pencil drawings intended to maintain the memory of these species. The MAG acquired a passenger pigeon sculpture by McGrain, which is installed on the gallery's front lawn.

Racial Discrimination and Stress



Anthony D. Ong, Human Development, and his research colleagues showed how and to what effect

chronic racial discrimination erodes mental health. Their study revealed that a combination of two mechanisms—chronic exposure to racial prejudice leading to more experiences of daily discrimination, and the accumulation of daily negative events across various domains of life, from family and friends to health and finances—cause African Americans to have poorer mental health. They may have daily symptoms of depression, anxiety, and negative moods, with fewer resources to cope with the resulting stress. The study is one of the first to look at the underlying mechanisms by which racial discrimination affects the daily mental health of African Americans.

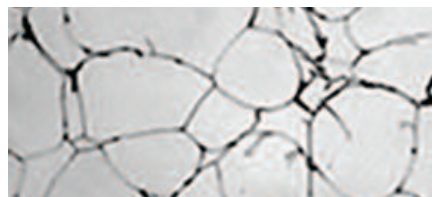
Nursing Home Violence



Karl A. Pillemer, Human Development, Mark S. Lachs, Medicine, Weill Cornell Medical College, and their collaborators confirmed that aggression and violence between nursing home residents is a prevalent and serious problem. In one of their studies at a large urban nursing home, the researchers

found 35 different types of physical and verbal abuse between residents. Screaming was the most common form of aggression, followed by physical violence, such as pushing and punching. This kind of aggression can have serious consequences for both aggressors and victims, but there are few proven solutions to prevent it. Future research will seek to address the problem by identifying risk factors and preventive measures.

Causing Obesity



Ling Qi, Nutritional Sciences, and his research team discovered how two related proteins and their

functions in a molecular pathway are key to creating obesity-causing fat cells. Targeting these proteins, known as IRE1alpha and XBP1, may lead to therapeutic strategies for treating obesity. This research is the first to show that the endoplasmic reticulum—the organelle where new proteins are made and folded, and then transported out for use by the cell—and the IRE1alpha-XBP1 pathway are involved in the genesis of fat cells. Although lack of physical activity and overeating can cause or aggravate obesity, genetic mutations can also cause the condition.

Moving From Antibiotics to Anti-infectives



Luis Quadri, Microbiology and Immunology, Weill Cornell Medical College, and research colleagues, seeking

to combat multidrug-resistant infectious diseases such as tuberculosis and leprosy, developed the first inhibitor of a key small molecule from *Mycobacterium tuberculosis*, which

destroys the human host's defenses, and *M. leprae*, which damages the host's cells during infection. This work proves in principle that the virulence of bacteria cultured in the lab can be inhibited. The next step is to explore whether the inhibitor can stop pathogens from multiplying in a mouse, curtailing the host's infection. The researchers are looking to move beyond anti-microbials such as antibiotics, which kill bacteria directly, to anti-infectives that may have no effect against the pathogen in the test tube but compromise its ability to infect and spread in the host.

The Allergy-Cancer Connection



Paul W. Sherman,
Neurobiology and Behavior,
and his research team

demonstrated that allergy symptoms, such as sneezing, coughing, and itching, may prevent cancer. After building the most comprehensive database yet available on allergies and cancers, the researchers analyzed 646 studies published over the past 50 years. They believe that allergy symptoms may help protect against cancer by shedding foreign particles from the body—particularly colon, skin, bladder, mouth, throat, uterus and cervix, lung and gastrointestinal tract cancer, which are cancers in organs that interface with the external environment. Some of the particles eliminated in this fashion might be carcinogenic or carry carcinogens.

A Commission and a Grammy Nomination



Roberto Sierra, Music,
received a commission to
compose the inaugural
work for the Sphinx

Commissioning Consortium. The consortium is an alliance of 12 American orchestras—including the Baltimore, Cincinnati, Detroit, and Philadelphia symphony orchestras—established to encourage major compositions by black and Latino composers. Sierra's orchestral work, *Carnaval*, is featured in the repertoire of each consortium member for the 2009–10 season. Sierra was also nominated for a Grammy Award in the Contemporary Classical Composition category for his *Missa Latina* "Pro Pace." Commissioned by the National Symphony Orchestra in 2006, the

mass was recorded by the Milwaukee Symphony Orchestra and Chorus, with conductor Andreas Delfs and soloists Heidi Grant Murphy and Nathaniel Webster. The CD was released in May 2009 on the Naxos label.

First Synthetic Tree



Abraham D. Stroock,
**Chemical and Biomolecular
Engineering,** and members
of his research team devel-
oped the first synthetic tree, using a slab of
hydrogel with nanometer-scale pores, that
mimics the flow of water inside plants. The

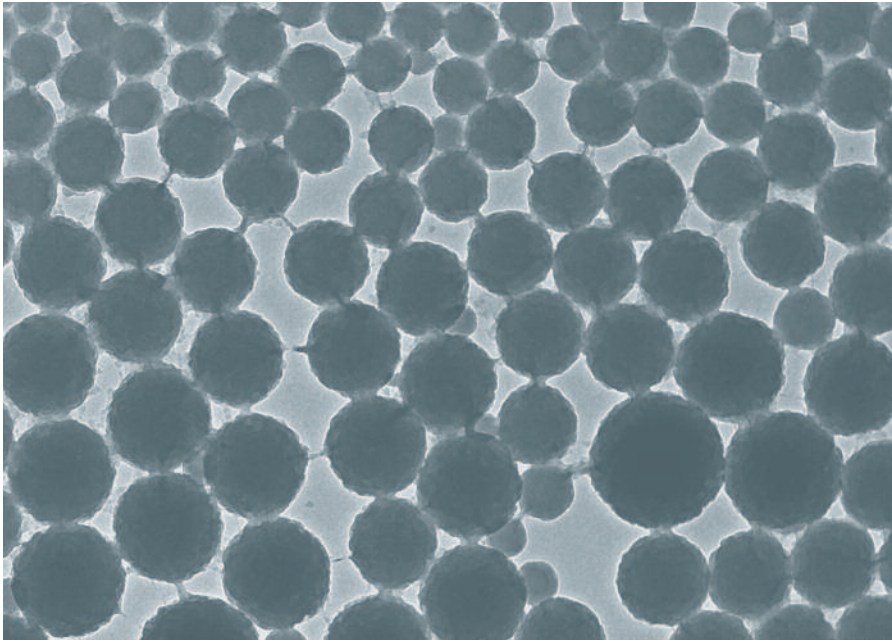
device is an embedded microsensor that measures real-time water stress in living plants. The sensor could help vintners measure water stress in grapevines, which affects the quality of wine grapes. The technology also has implications for manufacturing, food processing, and electronics.

Stem Cells: Fruit Fly versus Mouse



**Tudorita Tumber, Molecular
Biology and Genetics,** and
research colleagues found
that some stem cells in
mice behave differently than in fruit flies





Cornell Center for Materials Research 7th Microscopy Image Contest Winner in the First Place Category: Postdoc Jingguo Shen, Kaust-Cornell Center for Energy and Sustainability. Image: Polymer nanoparticles showing "cross-linking" cores. Instrument: TEM:FEI12 (materials). Advisor: Lynden A. Archer, Chemical and Biomolecular Engineering.

(*Drosophila*), where most of the pioneering stem cell research has been done. In fruitflies, normal adult stem cells generate two daughter cells: one becomes another stem cell, and the other becomes a differentiated cell with a fixed number of cell divisions left in its life. In adult mice, the researchers, using new genetic tools, found that daughter cells of a hair follicle can both become either stem cells or differentiated cells. Among the first studies to consider how dividing stem cells choose their fate in undamaged mouse tissues, this research implies that previously held assumptions about stem cell behavior in mammals may not be applicable to stem cells in all organ systems.

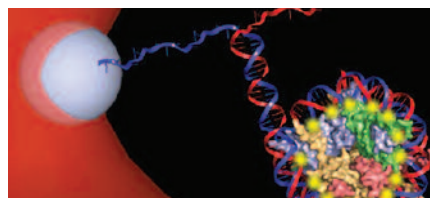
Autism and Environmental Triggers



Michael Waldman, Johnson Graduate School of Management, Sean Nicholson, Policy Analysis and Management, and research colleagues showed that autism rates are higher in counties with higher rainfall in the states of Washington, Oregon, and California than in drier parts of the states. Although rainfall itself may not directly lead to autism, the research results strongly suggest

an environmental trigger correlated with precipitation. The researchers propose that bad weather causes children to be indoors, where they may be exposed to other triggers that combine with a genetic vulnerability leading to autism. They also theorize that autism-triggering chemicals in the upper atmosphere fall to earth with rainfall or that increased rainfall promotes weed and insect population growth, prompting the use of pesticides, which some studies suggest may trigger autism.

Unzipping Single DNA Molecules



Michelle D. Wang, Physics, John T. Lis, Molecular Biology and Genetics, and research colleagues gained new insight into how genes are packed and expressed within cells. By unzipping each DNA double helix through a nucleosome using an optical trap—a technique developed in Wang's lab—they unwrapped strands of DNA from their histone cores, observing with near-base pair

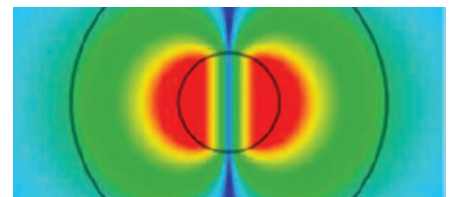
accuracy the interactions that took place along the way. In their search to understand what happens during the unwrapping process, the researchers have performed the first direct, precise measurements of histone-DNA interactions.

Calories and *The Joy of Cooking*



Brian C. Wansink, Applied Economics and Management, and his research team examined 18 recipes published continuously since 1936 in *The Joy of Cooking*, discovering that the average calories per serving increased by 63 percent. The average number of calories per recipe in 1936, when the cookbook was first published, was 2,124—about 268 calories per serving. By 2006, the average number of calories per recipe was 3,052—about 436 calories per serving. The recipes ranged from macaroni and cheese, beef stroganoff, Spanish rice, and goulash to brownies, sugar cookies, and apple pie. The researchers attribute the calorie increases to changes in serving size and in ingredients—usually increases in fat and sugar.

From Cornell Dots to Nanolaser



Ulrich B. Wiesner, Materials Science and Engineering, and research colleagues modified nanoparticles known as Cornell dots to make the world's smallest laser reported to date, and the first operating in visible light wavelengths. The device could be incorporated into microchips to serve as a light source for photonic circuits and may also have applications in sensors, solar collectors, and biomedicine. Using nanoparticles 44 nanometers wide, the device holds significant promise for future technologies requiring miniaturization.



Cornell's Colleges and Divisions

College of Agriculture and Life Sciences
College of Architecture, Art, and Planning
College of Arts and Sciences
College of Engineering
College of Human Ecology
College of Veterinary Medicine
Division of Nutritional Sciences
Faculty of Computing and Information Science
Graduate School
Johnson Graduate School of Management
Law School
School of Continuing Education and Summer Sessions
School of Hotel Administration
School of Industrial and Labor Relations
Weill Cornell Graduate School of Medical
Sciences (New York City)
Weill Cornell Medical College (New York City)

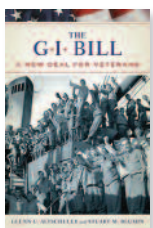
Selected Books by Cornell Faculty



The GI Bill: The New Deal for Veterans

(OXFORD UNIVERSITY PRESS, 2009)

by Glenn C. Altschuler, *American Studies*,
and Stuart M. Blumin, *History* (emeritus)



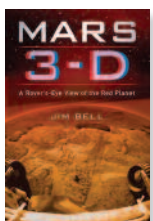
The authors tell the story of the G.I. Bill and its impact on American life. They show how an unlikely coalition emerged to shape and pass the bill, bringing together New Deal Democrats and conservatives who had opposed Roosevelt's social-welfare agenda. The bill provided for job training, unemployment compensation, housing loans, and tuition assistance, allowing millions of Americans social mobility. The results included a transformation of the modern university.



Mars 3-D: A Rover's Eye View of the Red Planet

(STERLING, 2008)

by James F. Bell, *Astronomy*



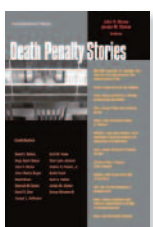
The book showcases 120 intriguing 3-D and color images of Mars shot by the two robotic geologists, Spirit and Opportunity, that have been roaming the Red Planet since 2004. Rocks, craters, valleys, and other geologic configurations that define the terrain of Mars bring us as close as we can currently get to setting foot on the planet. The text—compelling and accessible—reveals the thrill of each discovery.



Blume and Steiker's Death Penalty Stories

(FOUNDATION PRESS, 2009)

by John H. Blume, *Law*, (with Jordon M. Steiker)



The authors give detailed accounts of the most important capital cases in American law. They present comprehensive coverage of the canonical cases, such as *Furman v. Georgia*, *Gregg v. Georgia*, *Penry v. Lynaugh*, and others, along with in-depth analysis of cases involving core death penalty issues, including representation, protections for the innocent, and execution methods.



The New Palgrave Dictionary of Economics

(PALGRAVE MACMILLAN, 2008)

by Lawrence E. Blume, ed., *Economics*,
(with Steven Durlauf)



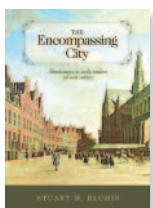
This 7,680-page, eight-volume work, and its new online version, is the first revision of this standard work in 21 years. It has 1,850 articles by more than 1,500 eminent economists, including 25 Nobel Prize winners. The work is the leading reference in the field.



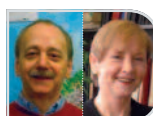
The Encompassing City: Streetscapes in Early Modern Art and Culture

(MANCHESTER UNIVERSITY PRESS, 2008)

by Stuart M. Blumin, *History* (emeritus)



Blumin examines the history of the streetscape—the view of a city's streets, squares, canals, buildings, and people—a new artistic genre that emerged in the early modern era. He traces earlier forms of urban representation in European art into the growth of the streetscape genre in Italy and the Low Countries during the middle years of the seventeenth century. He explores the genre through the eighteenth century, including its appeal to such artists as Canaletto, Bernardo Bellotto, Francesco Guardi, and Giovanni Battista Piranesi.



Rural Retirement Migration

(SPRINGER, 2008)

by David L. Brown and Nina Glasgow,
Development Sociology



This book examines the challenges and opportunities presented by migration at older ages both for successful aging and for community development in the United States. Brown and Glasgow pay particular attention to the process by which older in-migrants become socially integrated into their new communities. They conclude that retirees or older people—sometimes called “grey gold”—who move to rural areas often have a positive impact on local economies, but can also have negative effects, such as driving up housing prices.



Left of Karl Marx: The Political Life of Black Communist Claudia Jones

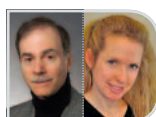
(DUKE UNIVERSITY PRESS, 2008)

by Carole Boyce Davies, *Africana Studies and Research Center*



Davies examines the activism, writing, and legacy of Claudia Jones (1915–64), an Afro-Caribbean radical intellectual and dedicated communist whose activism expanded Marxism-Leninism to incorporate gender and race. Jones was born in Trinidad, lived in New York for 30 years, and was deported and given

asylum by Great Britain after the United States prosecuted her as a communist. Exploring the FBI files on Jones, the author contrasts their record of her life with Jones' own narration. Jones is buried in London's Highgate Cemetery to the left of Karl Marx. The book won the 2008 Letitia Woods Brown Book Award.



The Mathematics of Sex: How Biology and Society Conspire to Limit Talented Women and Girls

(OXFORD UNIVERSITY PRESS, 2009)

by Stephen J. Ceci and Wendy M. Williams, *Human Development*



The authors propose three key explanations for the lack of women in math-intensive careers—innate ability, social and cultural biases, and women's interests. Examining research in endocrinology, economics, sociology, education, genetics, and psychology, they conclude that the imbalance of

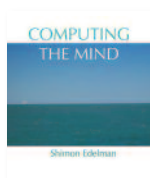
women in math-oriented fields is due to choices women are compelled to make in our society, and not to sex differences in mathematical and spatial ability or current biases.



Computing the Mind: How the Mind Works

(OXFORD UNIVERSITY PRESS, 2008)

by Shimon J. Edelman, *Psychology*



Edelman presents a computational account of the entire spectrum of cognitive phenomena that constitutes the mind, beginning with sentence. He identifies computation as the common denominator in the emerging answers to questions such as these: What does it mean to be a mind? How is the mind

related to the brain? How are minds shaped by their embodiment and environment? What are the principles behind cognitive functions such as perception, memory, language, thought, and consciousness? The book is accessible, yet unified and rigorous, and supported by evidence ranging from neurobiology to computer science.



Educating Scholars: Doctoral Education in the Humanities

(PRINCETON UNIVERSITY PRESS, 2009)

by Ronald G. Ehrenberg, *Industrial and Labor Relations*, (with Harriet Zuckerman, Jeffrey A. Groen, and Sharon M. Brucker)



In 1991 the Andrew W. Mellon Foundation launched the Graduate Education Initiative (GEI), the largest effort ever undertaken to improve doctoral programs in the humanities and related social sciences. This book reports on GEI's success in reducing attrition and time to degree, the positive changes implemented by specific graduate programs, and the many challenges still to be addressed. This is the only book to focus exclusively on the current state of doctoral education in the humanities.



Funny Words in Plautine Comedy

(OXFORD UNIVERSITY PRESS, 2009)

by Michael S. Fontaine, *Classics*



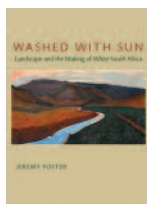
This examination of the comedies of Plautus, Rome's earliest extant poet, acclaimed by ancient critics for his mastery of language and jokes, shows that many of Plautus' jokes and puns were misunderstood in antiquity, and that with them the names and identities of familiar characters were misconceived. Fontaine also explores Plautine language, style, psychology, coherence of characterization, and irony.



Washed with Sun: Landscape and the Making of White South Africa

(UNIVERSITY OF PITTSBURGH PRESS, 2008)

by Jeremy Foster, *Landscape Architecture*



Foster explores how the influence of painting, travel writing, photography, and architecture helped to construct white national identity in early twentieth century South Africa. He examines how the construction of a shared, romanticized landscape perceived as inseparable from "being South African," helped forge the imagined community of white South Africa.

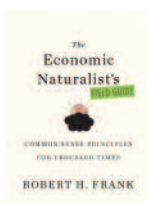
This multidisciplinary study connects South Africa's defining national characteristics—political turmoil and natural beauty—to achieve an innovative history.



The Economic Naturalist's Field Guide: Common Sense Principles for Troubled Times

(BASIC BOOKS, 2009)

by Robert H. Frank, *Johnson Graduate School of Management*



In this compilation of essays previously published in the *New York Times*, now thematically grouped, the author discusses large-scale policy decisions on regulation, tax policy, and health care, as well as personal decisions on paying for food and gasoline and even how we choose to love. When confronted with economic choices—and almost every choice people make is economic—self-interest alone does not explain our decisions. The author suggests that context shapes every decision, consistent with human weaknesses, as put forth by

models of the emerging field of behavioral economics. The book presents revealing insights about our pocketbooks, policies, and personal happiness.



The Nightingales of Troy (NORTON, 2008)
by Alice Fulton, *English*



Fulton's first work of fiction, a collection of 10 linked short stories, tracks the lives of four generations of women from Troy, New York. The first story in the collection, "Queen Wintergreen," set in 1908, was inspired by the search to know her great grandmother. Subsequent stories are spaced a decade apart. "In Happy Dust" is about a young mother with a wasting disease and about to give birth, who finds relief in a mysterious potion given to her by a fallen nun. In "The Real Eleanor Rigby," a girl infatuated with the Beatles and Herman Melville resolves to give the Beatles a first edition of *Typee*, but is upstaged by her domineering mother. Reviewers describe the collection as scintillating, surprising, pleasurable, and stealthily affecting.



The Norton Anthology of Drama (NORTON, 2008)
by J. Ellen Gainor, ed., *Theatre, Film, and Dance*,
(with Stanton Garner and Martin Puchner)

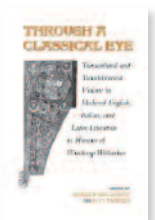


This is the first major drama anthology in the Norton series. It contains 65 plays, some unavailable in any other drama anthology, by ancient Greek to leading contemporary playwrights. The two-volume work is a comprehensive collection, with each volume providing a 50-page critical introduction for students and general readers, annotated play texts, informative head notes that introduce each play, and illustrations.



Through a Classical Eye: Transcultural and Transhistorical Visions in Medieval English, Italian, and Latin Literature in Honour of Winthrop Wetherbee

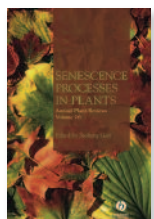
(UNIVERSITY OF TORONTO PRESS, 2009)
by Andrew S. Galloway, ed., *English*,
(with R. F. Yeager)



This collection of essays demonstrates strategies for studying transcultural and transhistorical works of the late medieval period and examines the overlap of medieval literature and culture in English, Italian, and Latin sources. Winthrop Wetherbee, who the collection honors, made groundbreaking contributions to this area of study. Providing key insight into medieval literature and culture, the book advances Wetherbee's legacy and the field of medieval literary studies.



Senescence: Processes in Plants (WILEY, 2007)
by Susheng Gan, ed., *Horticulture*

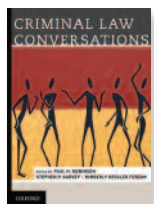


The book summarizes recent progress in the physiology, biochemistry, cell biology, molecular biology, genomics, proteomics, and biotechnology of plant senescence, which has a tremendous impact on agriculture. For example, leaf senescence limits crop yield and biomass production and contributes substantially to postharvest loss in vegetable and ornamental crops during transportation and on store shelves.

The volume begins with a chapter on terminology and current knowledge of mitotic senescence in plants; later chapters examine the development of new biotechnologies for manipulating the senescence processes of fruit and leaves.



Criminal Law Conversations
(OXFORD UNIVERSITY PRESS, 2009)
by Stephen P. Garvey, ed., *Law*, (with Paul Robinson and Kimberly Ferzan)

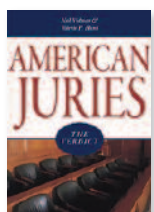


This authoritative overview of contemporary criminal law debates in the United States is a collection of scholarly papers assembled using an innovative, interactive method of nominations and commentary by the nation's top legal scholars. Every leading scholar in the field participated. The book provides

insight into the most fundamental and provocative questions in modern criminal law.



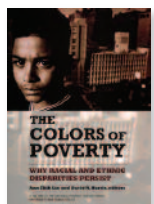
American Juries: The Verdict (PROMETHEUS, 2007)
by Valerie Hans, *Law*, (with Neil Vidmar)



The authors have produced a comprehensive work that reviews more than 50 years of empirical research on civil and criminal juries. Placing the jury system in its historical and contemporary contexts, the authors give the stories behind important trials and answer critical questions: How do juries make decisions? What roles do jury consultants play in influencing trial outcomes? Can juries understand complex expert testimony? The researchers conclude that, for the most part, the jury system works.



The Colors of Poverty: Why Racial and Ethnic Disparities Persist (RUSSELL SAGE FOUNDATION, 2008)
by David R. Harris, ed., *Sociology*
(with Ann Chih Lin)



The editors present a collection of articles by a multidisciplinary group of 15 prominent scholars that explore why racial and ethnic differences continue to lead to socioeconomic disadvantage. The analysis uncovers a series of complex mechanisms that connect poverty and race. Articles are categorized under three



topics: group identity and group outcomes; nonracial explanations for racial disparities in poverty; and policy, race, and poverty.



Biocultural Diversity and Indigenous Ways of Knowing: Human Ecology in the Arctic

(UNIVERSITY OF CALGARY PRESS, 2009)

by Karim-Aly S. Kassam, *Natural Resources*



The peoples of the circumpolar arctic figure prominently in issues of biological diversity of life and human cultural diversity. In this empirical and theoretical work, Kassam traces the synthesis between culture and biology, using human ecology as a conceptual and analytical framework. He uses three case studies illustrating how subsistence hunting and gathering remain essential to both cultural diversity and human survival—research done in partnership with indigenous northern communities. The book covers climate change, indigenous knowledge, and the impact of natural resource extraction.



Civilizations in World Politics: Plural and Pluralist Perspectives (ROUTLEDGE, 2009)

by Peter J. Katzenstein, ed., *Government*



The book examines the cultural dimension of international politics, providing an account of the relevance of cultural categories for analyzing world politics. The existence of plural and pluralist civilizations is reflected in transcivilizational engagements, intercivilizational encounters, and occasionally in civilizational clashes. The book consists of six case studies by experts in their fields. It combines contemporary and historical perspectives, while addressing the civilizational politics of America, Europe, China, Japan, India, and the Islamic Middle East.

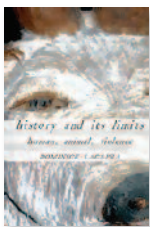


History and Its Limits: Human, Animal, Violence (CORNELL UNIVERSITY PRESS, 2009)

by Dominick C. LaCapra, *History/Comparative Literature*



JAMES AUGUSTINE MCKENNA '12
NORWOOD MACLEOD '10
ROSS McMILLAN '00
RAY STEWART McWHINNEY '12
JAMES RUSSELL MAILLER '16
ROBERT BENJAMIN MARKHAM '17
RALPH RICHARDSON MARTIN '15
LEWIS HATOLITE MARTIN '14
RICHARD THOMAS CASSIDY MARTIN '0
JOSEPH JOHN MASON '13
ALEXANDER FERDINAND MATHEWS '1
WILBER ALAN MATHEWS '15
GEORGES MAUXION
THEODORE FLETCHER MEAD '08
RANSOM HAYWARD MERRITT '17
HAROLD BAKER MERZ '14
DANIEL JOSEPH MESKILL '10

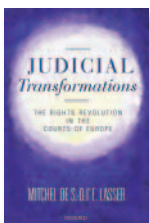


LaCapra examines the relations among intellectual history, cultural history, and critical theory, as he investigates the recent rise of “practice theory” and probes the limitations of prevailing forms of humanism and anthropocentrism. He focuses on understanding events and experiences involving violence and victimization, and explores how historians treat and are simultaneously implicated in the traumatic processes they attempt to represent. The book also investigates violence’s impact on various types of writing, establishes a distinctive role for critical theory, and questions the long-standing quest for a decisive criterion separating the human from the animal.



Judicial Transformations: The Rights Revolution in the Courts of Europe

(OXFORD UNIVERSITY PRESS, 2009)
by Mitchel Lasser, *Law*



Lasser tells the story of the rights revolution—an explosion of fundamental rights in all areas of law—in Europe. The book, grounded in comparative law and political science, provides an important contribution to understanding the current dynamics of European judiciaries and the extent of the impact of transnational law on domestic legal culture.



Castle: A Novel

(GRAYWOLF PRESS, 2009)
by J. Robert Lennon, *English*



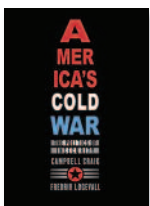
Lennon’s novel about memory, guilt, power, and violence involves a former resident, Eric Loesch, returning to a rural New York town in the winter of 2006. Loesch buys 612 acres in upstate New York, with a dilapidated house. As he begins to renovate the run-down house, he explores the surrounding acreage and discovers a piece of land in the middle of his woods that he does not own. The title to this property has the owner’s name blacked out. Thus

begins what has been described as a riveting novel, a psychological thriller—chilling, shocking, and terrifying.

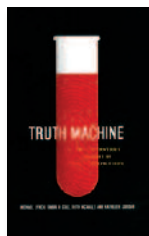


America’s Cold War: The Politics of Insecurity

(HARVARD UNIVERSITY PRESS, 2009)
by Fredrik Logevall, *History*,
(with Campbell Craig)



In this new interpretation of America’s Cold War, the authors reexamine its successes and failures. Described as a “creative, carefully researched, and incisive analysis of U.S. strategy,” the book scrutinizes the continuation of the Cold War long after the containment of the USSR and asks how this critical phase in international politics began and ended.



Truth Machine: The Contentious History of DNA Fingerprinting

(UNIVERSITY OF CHICAGO PRESS, 2008)
by Michael E. Lynch, *Science and Technology Studies*, (with Simon A. Cole, Ruth McNally, and Kathleen Jordan)

The authors trace the controversial history of DNA fingerprinting—the proclaimed truth machine that can overturn convictions based on eyewitness testimony, confessions, and other forensic evidence—by examining court cases in the United States and United Kingdom from the mid-1980s, when the practice was developed, to the present. They use interviews, observations of courtroom trials and laboratory processes, and documentary reconstruction to provide an original ethnographic account of DNA fingerprinting, also known as DNA profiling, and its evolution. The authors conclude that DNA profiling is not foolproof criminal evidence.

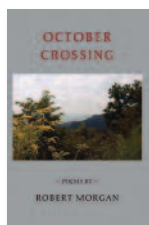


Color: Essays on Race, Family, and History

(UNIVERSITY OF NOTRE DAME PRESS, 2009)
by Kenneth A. McClane, *English*



In this autobiographical collection of interconnected essays, McClane explores race and life as an African American. He recollects Martin Luther King’s visit to his family’s cottage in Martha’s Vineyard, his experience as the first black student at a prestigious college prep school, his mother’s journey to change her racial designation on her birth certificate, his father’s quest to gain admission to medical school in the 1930s, his parents’ decline due to Alzheimer’s, and other memories. The book is described as beautifully written, graceful, and insightful.



October Crossing

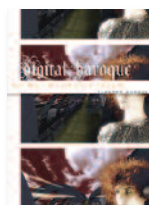
(BROADSTONE BOOKS, 2009)
by Robert R. Morgan, *English*

This collection of poetry continues Morgan’s exploration and celebration of the culture and curiosities of Appalachia. Reviewers describe the collection as full of “delightful lore” and “exciting, precise knowledge of country things” from the Southern mountains.



Digital Baroque: New Media Art and Cinematic Folds

(UNIVERSITY OF MINNESOTA PRESS, 2008)
by Timothy C. Murray, *English*

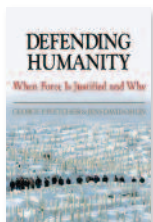


Murray explores the relationship between digital, in the form of new media art, and baroque, a highly developed early modern philosophy of art. He makes an unexpected connection between the old and the new, as he analyzes the philosophical paradigms that inform contemporary screen arts. Murray reflects on the rhetorical, emotive, and social forces inherent in the screen arts’ dialogue with early modern concepts in a range of art forms, such as

digitally oriented films, video installations, and interactive media. The book is described as a work of “tremendous originality.”



Defending Humanity: When Force Is Justified and Why (OXFORD UNIVERSITY PRESS, 2008)
by Jens David Ohlin, Law, (with George P. Fletcher)



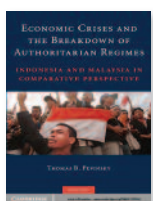
When is war justified? The authors present an innovative theory on the legality of war, with clear guidelines for evaluating interventions. They explore self-defense and preemptive war and trace a persistent misunderstanding of the article in the Charter of the United Nations regarding military force—allowed when authorized by the Security Council or in self-defense. Chapters in the book

include analyses of aggressive war, humanitarian intervention, and the “Bush Doctrine” of preventive war.



Economic Crises and the Breakdown of Authoritarian Regimes: Indonesia and Malaysia in Comparative Perspective

(CAMBRIDGE UNIVERSITY PRESS, 2009)
by Thomas B. Pepinsky, Government



Pepinsky uses the experiences of Indonesia and Malaysia and the analytical tools of open economy macroeconomics to answer the question: Why do some authoritarian regimes fall during financial crises, while others do not? He shows that differences in cross-border asset specificity produce dramatically different outcomes in regimes facing financial crises. Reviews characterize the book as “an outstanding piece of scholarship, with innovative theorizing.”



Living in a Material World: Economic Sociology Meets Science and Technology Studies (MIT PRESS, 2008)

by Trevor J. Pinch, Science and Technology Studies and Richard Swedberg, Sociology, (eds.)



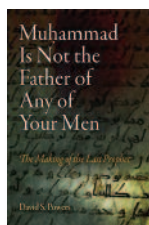
This book links economic sociology to science and technology studies via materiality, suggesting materiality—the idea that social existence involves not only actors and social relations, but also objects—as the theoretical point of convergence. The collection

of essays includes topics, such as the materiality of the household in economic history, the stock ticker, the effect of e-commerce on consumption, and the reputation economy represented by online product reviews.



Muhammad Is Not the Father of Any of Your Men: The Making of the Last Prophet

(UNIVERSITY OF PENNSYLVANIA PRESS, 2009)
by David S. Powers, Near Eastern Studies



The Islamic claim to supersede Judaism and Christianity is embodied in the theological assertion that the office of prophecy is hereditary, but that the line of descent ends with Muhammad, who is the seal, or last, of the prophets. Exploring historical, theological, and familial aspects of Muhammad and the Qur'an and early Islam, Powers contends that a series of radical moves were made in the first two centuries of Islamic history to ensure Muhammad's position as the last prophet.



Body against Soul: Gender and 'Sowlehele' in Middle English Allegory (OHIO STATE PRESS, 2009)
by Masha Raskolnikov, English

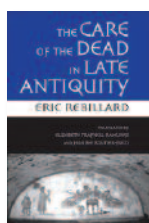


Body versus soul was a frequent debate in medieval allegory. According to Raskolnikov, these debates were a way of thinking about psychology, gender, and power in the Middle Ages. Works of *sowlehele* (“soul-heal”), which were neither theological nor medical, described the self to itself in everyday language, much like today's self-help writing. The author connects contemporary feminism, queer theory, and medieval psychology as she examines Piers Plowman, the thirteenth-century Katherine Group of texts praising virginity, and the history of psychological allegory and debate.



The Care of the Dead in Late Antiquity

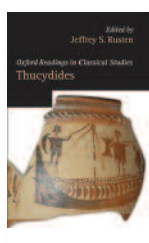
(CORNELL UNIVERSITY PRESS, 2009)
by Éric Rebillard, Classics



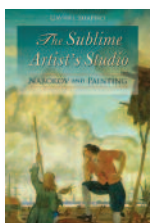
Scholars of early Christianity have argued that the Church owned and operated burial grounds for Christians as early as the third century. Rebillard challenges these and other long-held assumptions about early Christian burial customs. Exploring primary sources such as legal codes, theological works, epigraphical inscriptions, and sermons, Rebillard finds little evidence that early Christians occupied exclusive or isolated burial grounds. The book brings a new perspective to the role of the Church during late antiquity.



Thucydides (OXFORD UNIVERSITY PRESS, 2009)
by Jeffrey S. Rusten, ed., Classics



Thucydides gave us the first great work of political history—a perpetually fundamental text for political science and international relations—with his magisterial account of the war between Athens and Sparta. In this collection of essays, Rusten brings together classic and influential studies of Thucydides that are frequently cited but not always accessible. The collection's aim is to accompany, instruct, and stimulate modern readers of Thucydides.



Sublime Artist's Studio

(NORTHWESTERN UNIVERSITY PRESS, 2009)

by *Gavriel Shapiro, Russian*

Shapiro presents an in-depth and detailed study of the relationship of the visual arts to the work of Vladimir Vladimirovich Nabokov, who aspired to become a landscape artist in his youth. He examines

Nabokov's literary legacy of poetry, short prose, novels, plays, memoirs, lectures, essays, interviews, and letters to reveal the function of landscape in the author's writings, Nabokov's lifelong fascination with the Old Masters, and his relationship to contemporary artists. The book offers a new approach to the study of Nabokov.



In Defense of Reading: Teaching Literature in the Twenty-First Century

(WILEY, 2008)

by *Daniel R. Schwarz, English*

Schwarz probes why we read, how we read, and what we learn from reading literature. Employing his 40 years of teaching experience, he explores the life of the mind, the rewards of committed teaching, and the relationship between teaching and scholarship in the contemporary university, as well as issues and problems in today's university. The book also features insightful and important readings of

texts by Joyce, Woolf, Conrad, Forster, Gordimer, and many others.



Integration of Insect-Resistant Genetically Modified Crops within IPM Programs

(SPRINGER, 2008)

by *Anthony Shelton, ed., Entomology (with Jörg Romeis and George G. Kennedy)*

With chapters on recent research and on social, political, and economic issues that surround genetically modified (GM) crops, this book aims to contribute to a more rational debate on the role that GM technology can play in integrated pest management (IPM) for food and fiber production. Providing an overview of insect-resistant GM plants—including corn, cotton, rice, eggplant, cabbage, and cauliflower—in different crop systems worldwide, the work reveals the importance of GM crops to an IPM system for sustainable farming.



The Religious Left and Church-State Relations

(PRINCETON UNIVERSITY PRESS, 2009)

by *Steven H. Shiffrin, Law*

Shiffrin examines constitutional law and political discourse on a broad range of issues related to church-state relations. Shiffrin argues that the religious left—not the secular left—is best equipped to lead the battle against the religious right on



Lindsay France/CU

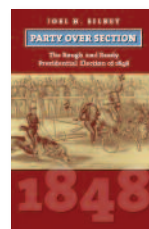
questions of church and state in America today. He covers topics such as school vouchers, the teaching of evolution in public schools, religious symbols in government, the pledge of allegiance, and state funding of religious institutions. Shiffrin maintains that a strict separation between religion and the state benefits both religion and government.



Party over Section: The Rough and Ready Presidential Election of 1848

(UNIVERSITY PRESS OF KANSAS, 2009)

by *Joel H. Silbey, History (emeritus)*



Silbey examines the presidential campaign of 1848: a three-way race, with the new Free Soil Party challenging the Whigs and Democrats. The campaign capped a decade of political turmoil, raising the issue of slavery to unprecedented prominence. The book describes the tumultuous events of the election and explains the outcome, which put war hero and Whig Party candidate Zachary Taylor in office. The book concludes that, although Taylor would serve for just 16 months, 1848 nonetheless stands as an important harbinger of political change to come.



The Integrity Dividend: Leading by the Power of Your Word

(JOSSEY-BASS, 2008)

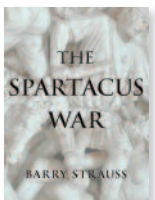
by *Tony L. Simons, Hotel Administration*

Simons shows how leaders' personal integrity drives the profitability and overall success of their organizations. Based on his research, he reveals that businesses led by managers of higher integrity have deeper employee commitment, lower turnover, superior customer service, and substantially higher profitability. This improved performance is the "integrity dividend."

The book presents the research and offers tools to help managers achieve the integrity dividend.



The Spartacus War (SIMON AND SCHUSTER, 2009)
by Barry S. Strauss, *History*



This dramatic account of the most famous slave rebellion in the ancient world is the result of years of research. The book is based on written documents, archaeological evidence, historical reconstruction, and the author's extensive travels in the Italian countryside that Spartacus once conquered. It reveals new evidence on the slave rebellion, the rebels' tactics, and their ultimate defeat. Reviewers describe the book as "a page-turner and an eye-opener," challenging the myths surrounding Spartacus, who has been immortalized in literature and films.



The Calculus of Friendship: What a Teacher and a Student Learned about Life while Corresponding about Math

(PRINCETON UNIVERSITY PRESS, 2009)

by Steven H. Strogatz, *Mechanical and Aerospace Engineering*



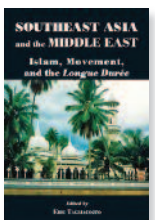
This book tells the story of the connection between a high-school calculus teacher and his star student—Strogatz himself—as chronicled through more than 30 years of letters. The relationship between the two is unique, because it is based almost entirely on their shared love of calculus. Calculus for them is a game they enjoy playing together, as well as a constant when all else is in flux.



Southeast Asia and the Middle East: Islam, Movement, and the Longue Durée

(STANFORD UNIVERSITY PRESS, 2009)

by Eric Tagliacozzo, ed., *History*



Tagliacozzo assesses the significance of the more than 700-year connection between Southeast Asia and the Middle East, as he explores the political, economic, familial, educational, and religious bonds of these areas, both historically and in the contemporary world. Called a timely book with a "breath-taking scope," it shows how interactions between the two regions have shaped their character and will continue to influence political and economic relations, migration patterns, dissemination of knowledge, and Islamic militancy.



Developing Countries in the WTO Legal System (OXFORD UNIVERSITY PRESS, 2009)
by Chantal Thomas, ed., *Law*, (with Joel P. Trachtman)

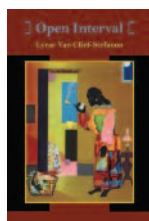
A comprehensive volume on the position of developing countries within the World Trade Organization (WTO) system, Thomas' work reflects on the groundbreaking book, *Developing Countries in the GATT Legal System*, by Robert E. Hudec, which argued against preferential and



nonreciprocal treatment for developing countries. The author, with contributions from leading experts in international trade, law, and economics, evaluates developing countries in the WTO, examines market access and competition law, and discusses the countries' special arrangements with international financial institutions.



Open Interval (UNIVERSITY OF PITTSBURGH PRESS, 2009)
by Lyrae Van Clief-Stefanon, *English*



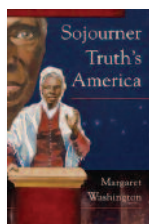
This collection of poetry uses the intersections of astronomy and mathematics, history, literature, and lived experience as a framework. The book was nominated for a 2009 National Book Award and named a finalist for the 2009 Los Angeles Times Book Prize in Poetry.



Sojourner Truth's America

(UNIVERSITY OF ILLINOIS PRESS, 2009)

by Margaret Washington, *History*



This biography of nineteenth-century activist Sojourner Truth separates fact from myth and brings into view the realities and scope of African American slavery and America's most significant reform era. The book examines the dynamics of Truth's times, Truth's early life as a slave, and her ascent as a charismatic preacher and political orator despite her inability to read and write. Washington delivers meaningful insights into the turbulent cultural and political climate of this period in American history. The book has been honored as the winner of the inaugural 2010 OAH Darlene Clark Hine Award and co-winner of the 2009 Letitia Woods Brown Memorial Book Award.



Beyond the Architect's Eye: Photographs and the American Built Environment

(UNIVERSITY OF PENNSYLVANIA PRESS, 2009)

by Mary N. Woods, *Architecture, Art, and Planning*



Woods explores how amateur and professional photographers used the camera to record architectural structures of a diverse American landscape—New York City, Miami, the rural South—before World War II. The work reflects a time when the differences between rural and urban man-made landscapes and these regions' associated cultural shifts increased, in step with massive industrialization in U.S. cities. Woods considers the work of Alfred Stieglitz, Frances Benjamin Johnston, Marion Post Walcott, Berenice Abbott, Helen Levitt, Alice Austen, Eudora Welty, Walker Evans, and others. The book melds histories of American art, cities, and architecture with visual studies of landscape, photography, and cultural geography.

ARRA's Impact

Since the American Recovery and Reinvestment Act (ARRA)—also known as the economic stimulus package—was enacted in February 2009, Cornell has received funding for an array of projects, from research on tuberculosis to energy. Cornell's ARRA-supported research will not only lead to innovations and discoveries, but also create and retain jobs, upgrade research facilities and equipment, and train graduate students—and thereby contribute to economic growth.

ARRA FUNDS

CORNELL, ITHACA CAMPUS

155

AWARDS

\$111.5 M

TOTAL DOLLARS

208*

TOTAL JOBS CREATED/RETAINED

WEILL CORNELL MEDICAL COLLEGE

92

AWARDS

\$40.9 M

TOTAL DOLLARS

99.29*

TOTAL JOBS CREATED/RETAINED

As of August 2010

* Full-time equivalents

ARRA Projects Include

\$17.5 million to establish the Energy Materials Center, directed by Hector D. Abruña, Chemistry and Chemical Biology, to concentrate on energy materials—fuel cells, batteries, solar photovoltaics, and catalysts—boosting energy research and jobs;

\$1.5 million to Shu-Bing Qian, Nutritional Sciences, to study the accumulation of misfolded proteins in cells, a leading cause of neurodegenerative disorders and other human disease;

\$600,000 to David G. Russell, Microbiology and Immunology, to study how the bacterium *Mycobacterium tuberculosis* survives inside human cells and feeds off lipids, leading to the development of tuberculosis therapies;

\$750,000 to Olena K. Vatamaniuk, Crop and Soil Sciences, to determine how a gene (HMT-1) works to allow humans to detoxify heavy metal exposure, using the worm *C. elegans* as a model;

\$937,000 to Gerald Feigenson, Molecular Biology and Genetics, for studying cholesterol in cell membranes;

\$19 million to support the Cornell High Energy Synchrotron Source (CHESS) and the planned Energy Recovery Linac;

\$2.3 million to fund the dissertation research of 95 PhD students in 30 different disciplines;

\$633,000 to help a Cornell interdisciplinary group create tiny 3-D models of tumors to help researchers understand how tumors create blood vessels that facilitate tumor growth.

More Notables

Cornell's **Applied and Engineering Physics Program** was ranked number one among its peers for the fourth consecutive year, according to *U.S. News and World Report's* 2009 college rankings.

The arXiv (pronounced "archive")—an online repository for electronic preprints of scientific papers in physics and related fields, hosted by Cornell University Library—achieved a new milestone with half a million e-print postings in 2008, reinforcing its place in the scientific community as a primary daily source of information. The project received an \$883,000 ARRA grant at the end of 2009 to transform the database into a place where users and resources can "talk to each other."



Cornell's new **Social Science Gateway** to TeraGrid, NSF's national supercomputing infrastructure, delivers access to vast social sciences data on people, jobs, and firms—right to Cornell researchers' workstations. This research tool was created at Cornell and funded by a

2009 NSF grant. John M. Abowd, Industrial and Labor Relations, is principal investigator.



Arecibo Radio Telescope identified a massive, fast-spinning binary pulsar with a mysterious elongated orbit, which has challenged accepted views of binary pulsar formation and provided new opportunities for scientists to study the fundamental properties of highly dense matter.

Cornell's NanoScale Science and Technology Facility opened a satellite office housed at the Institute for Computational Biomedicine at Weill Cornell Medical College, providing a closer link to nanotechnology capabilities for medical researchers.



At **Cornell High Energy Synchrotron Source**, scientists uncovered a lost artwork using a confocal x-ray fluorescence technique developed at the center. American artist N. C. Wyeth recycled an earlier canvas by painting "Family Portrait" (1924)



over his 1919 magazine illustration of two men in a brawl.



The Institute for Computational Sustainability was launched in 2008 with an NSF award of \$10 million. Bringing together computer scientists, applied mathematicians, economists, biologists, and environmental scientists from Cornell and five other academic institutions and organizations, the institute applies computer science to problems in managing and allocating natural resources. Carla P. Gomes, Computing and Information Science, is principal investigator.

The Cornell Population Center received a \$1.15 million grant from NIH to expand its capacity to conduct national and international demographic research focusing on families and children, health behaviors and disparities, and poverty and inequality.

Wendy M. Williams and Stephen J. Ceci, Human Development, received \$1.4 million over four years to establish the **Cornell Institute for**

Women in Science, aimed at assessing and reducing gender bias in recruitment, mentorship, and evaluation in science, technology, engineering, and math fields.



Making Electoral Democracy Work, an international collaborative research project, funded with \$2.5 million (Canadian) by the Social Sciences and Humanities Research Council of Canada, is studying how electoral rules influence the strategies of political parties and the choices voters make by examining 27 past elections in Canada, France, Germany, Spain, and Switzerland. The project is co-led by Cornell's Christopher J. Anderson, Government.



For **food safety** research, the USDA awarded \$1.67 million to Randy W. Worobo, Food Science and Technology, Geneva, and Martin Weidmann, Food Science. The researchers are studying preventive methods of keeping food-borne pathogens from contaminating fruits and vegetables during all phases of

production—growing, processing, transport, and preparation.

The first large-scale study on **nursing home violence**, led by Mark S. Lachs, Medicine, WCMC, and Karl A. Pillemer, Human Development, received a four-year, \$2.5 million NIH grant to focus on prevalence, risk factors, and physical and psychological consequences of verbal and physical aggression among nursing home residents.



To explore **why we sleep**, Joseph R. Fetcho, Neurobiology and Behavior, received a \$2.5 million award from NIH.



Alexander J. Travis, Baker Institute for Animal Health, received an NIH award of \$2.5 million to develop tiny **biomachines for drug delivery** that use the strategy of a sperm's tail to drive the locomotion.

To model the internet in a new way, three Cornell researchers—Eric

J. Friedman, Operations Research and Information Engineering, Steven H. Strogatz, Mechanical and Aerospace Engineering, and Ao Tang, Electrical and Computer Engineering—received a \$1.5 million NSF grant. Their team is creating computer models of large networks that recognize small details, using test cases in controlling Internet congestion and creating incentives for fair distribution of resources in peer-to-peer networks.



The Tisch University Professorships were established with a gift of \$35 million from Andrew and Ann Tisch, allowing Cornell to honor and retain current faculty members and recruit the most talented young scholars and researchers from around the world.



Cornell received a five-year, \$3.2 million grant from the NSF's Integrative Graduate Education and Research Training (IGERT) program to establish the **Graduate Traineeship in Materials**

for a Sustainable Future, which allows 30 graduate students to work in the Cornell Center for Materials Research on developing materials to advance sustainable living. Paul Chirik, Chemistry and Chemical Biology, is principal investigator.



To train graduate students in food systems and poverty, Cornell received a five-year, \$3.2 million IGERT grant from the NSF to support 25 PhD students for two years each. The students are exposed to different disciplinary approaches to crucial problems, such as water shortages, climate change and vulnerability to food systems, soil degradation, pests and diseases, and food supply chains. Christopher Barrett, Applied Economics and Management, is principal investigator.

William M. Trochim, Policy Analysis and Management, received an NSF grant for \$2.3 million to develop a web-based system that will help **evaluate science-based education programs**.



Cornell was awarded \$26.8 million from the **Bill and Melinda Gates Foundation** to launch a broad-based global partnership to fight wheat rust, a deadly disease that threatens global food security. Ronnie Coffman, Plant Breeding and Genetics, is project director.



The Center on the Microenvironment and Metastasis was established with a \$13 million NCI grant over five years. This collaboration of the Ithaca campus of Cornell, Weill Cornell Medical College, and the State University of New York at Buffalo will focus on using nanotechnology to advance cancer research. Michael L. Shuler is the center's director.

Faculty Honors & Distinctions

AMERICAN PHILOSOPHICAL SOCIETY



Benedict R. Anderson
Government



Peter J. Katzenstein
Government

AMERICAN ACADEMY OF ARTS AND SCIENCES



Barbara A. Baird
Chemistry and Chemical Biology



John M. Guckenheimer
Mathematics

George P. Hess
Molecular Biology and Genetics



Carol L. Krumhansl
Psychology



G. Peter Lepage
Physics

NATIONAL ACADEMY OF SCIENCES



John E. Hopcroft
Computer Science



Eric D. Siggia
Physics

NATIONAL ACADEMY OF ENGINEERING



Jon M. Kleinberg
Computer Science

HOWARD HUGHES MEDICAL INSTITUTE INVESTIGATOR



Michelle D. Wang
Physics

PRESIDENTIAL EARLY CAREER AWARD FOR SCIENTISTS AND ENGINEERS



Jiwoong Park
Chemistry and Chemical Biology



Derek Warner
Civil and Environmental Engineering

NATIONAL SCIENCE FOUNDATION EARLY CAREER DEVELOPMENT PROGRAM

Largus Angenent
Biological and Environmental Engineering



Rachel E. Bean
Astronomy

Matthew K. Belmonte
Human Development

Daniel R. Cosley
Information Science

Peter J. Diamessis
Civil and Environmental Engineering



David Erickson
Mechanical and Aerospace Engineering



Lara A. Estroff
Materials Science and Engineering



Christine L. Goodale
Ecology and Evolutionary Biology



John T. Hale
Linguistics



Michael R. King
Biomedical Engineering



Matthias U. Lieve
Physics

Jiwoong Park

Chemistry and Chemical Biology

Rafael N. Pass
Computer Science



Maxim Perelstein
Physics

Paat Rusmevichientong
Operations Research and Information Engineering

Anders Ryd
Physics



Chris Schaffer
Biomedical Engineering

Kyle M. Shen
Physics



Abraham D. Stroock
Chemical and Molecular
Engineering



Gookwon Edward Suh
Electrical and Computer
Engineering



Jeffrey D. Varner
Chemical and Biomolecular
Engineering

**NATIONAL SCIENCE
FOUNDATION CAREER AWARD**



Scott Blanchard
Physiology and Biophysics
Weill Cornell Medical College

**GUGGENHEIM MEMORIAL
FOUNDATION FELLOWSHIP**



Michael Ashkin
Art

**ALFRED P. SLOAN FOUNDATION
FELLOWSHIP**



Peng Chen
Chemistry and Chemical
Biology

Liam McAllister
Physics

Adam C. Siepel
Biological Statistics and
Computational Biology

Matthias U. Liepe
Physics



Robert D. Kleinberg
Computer Science

FULBRIGHT SCHOLARSHIP



Raymond R. Geddes
Policy Analysis and
Management

**NATIONAL SCIENCE BOARD
PUBLIC SERVICE AWARD**



Roald Hoffmann
Chemistry and Chemical
Biology

**HUMBOLDT FOUNDATION
FRIEDRICH WILHELM BESSEL
RESEARCH AWARD**



Paul Chirik
Chemistry and Chemical
Biology

THOMAS WOLFE PRIZE



Robert Morgan
English

**ACADEMY OF MANAGEMENT
HUMAN RESOURCES EARLY
CAREER ACHIEVEMENT AWARD**



Bradford Bell
Industrial and Labor
Relations

**ARMENIA'S MINISTRY OF
SCIENCE AND EDUCATION GOLD
MEDAL**



Yervant Terzian
Astronomy

**AMERICAN ASTRONOMICAL
SOCIETY CARL SAGAN MEDAL**



Steven W. Squyres
Astronomy

Transferring Technology

Three New Cornell Start-ups



Cornell Start-ups Launched in New York State in 2009

REPARO THERAPY

Reparo Therapy develops DNA repair-enhancing ingredients and products for consumer and clinical use. The technology is based on a discovery at Weill Cornell Medical College of a mechanism that improves the ability of cells to repair DNA damage caused by UV or chemical carcinogens.

GENEWEAVE BIOSCIENCES

Geneweave Biosciences develops rapid molecular diagnostic tests for infectious diseases. The invention is based on bacterial detection technology from Cornell's biomedical engineering and microbiology departments.

INFLORA

InFlora is commercializing a collection of unique woody ornamental plants, which are popular for defining outdoor living spaces. The flowers are used in creative floral arrangements.

Fabrics with Super Powers



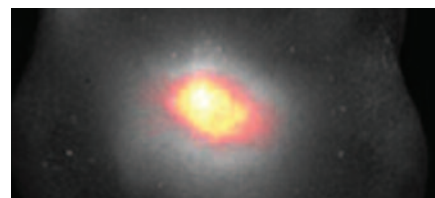
iFYBER

iFyber customizes fabrics for use in military, medical, and technical settings by treating them with nanoparticles. The start-up company began in 2008 to bring to market this highly viable technology that deposits nanocoatings on natural and synthetic fibers with nanoscale precision. The chemical process endows the fabric with properties, such as simultaneous water and oil resistance, antimicrobial behavior, and electrical conductivity. The technology has a wide range of potential applications, from detecting counterfeiting devices, explosives, and dangerous chemicals to serving as antibacterials for hospitals.

iFyber has received two Small Business Innovative Research grants from the U.S. Department of Defense to develop custom fabrics using nanotechnology: a material that can detect and identify leaks in chemical warfare suits used by the U.S. Air Force and a novel antibacterial fabric for wound dressings and surgical sutures for the U.S. Navy.

The technology was developed by Juan Hinestroza, Fiber Science and Apparel Design, with research associate Aaron Strickland, Food Science. iFyber was launched and funded by KensaGroup, in collaboration with the Cornell Center for Technology, Enterprise, and Commercialization.

Cornell Dots Light Up Tumors

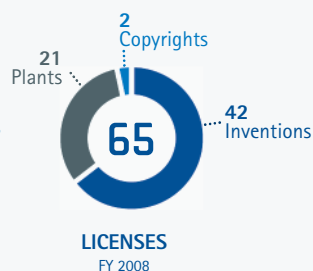
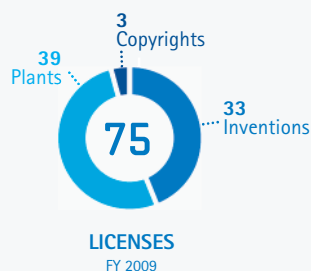
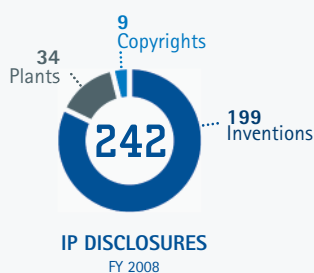


HYBRID SILICA TECHNOLOGIES

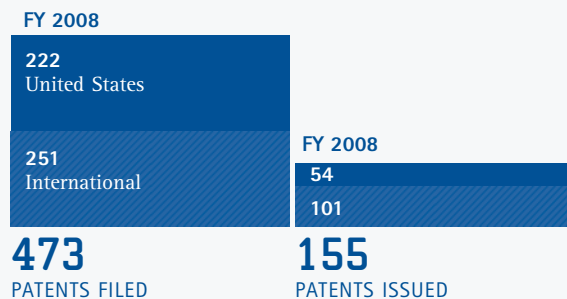
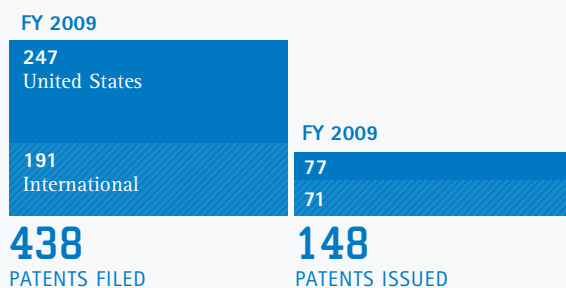
Cornell dots—developed in 2005 in the lab of Ulrich Wiesner, Materials Science and Engineering, and commercialized into a start-up, Hybrid Silica Technologies—have been proven effective in showing surgeons where tumors are located. Researchers at Memorial Sloan-Kettering Cancer Center demonstrated that the bright fluorescent nanoparticles are biologically safe and can be efficiently excreted from the body after completing the task of lighting up tumors. Work at Memorial Sloan-Kettering also demonstrated that the technology reveals the extent of cell death and a tumor's blood vessels, treatment response, and invasive or metastatic spread to lymph nodes and distant organs. A single Cornell dot, also known as C dot, is approximately five nanometers in diameter and consists of several dye molecules encased in a silica shell.

Refinement of C dots has continued in the labs of Wiesner and Michelle Bradbury at Memorial Sloan-Kettering since the company's founding. C dots also have potential applications in displays, optical computing, sensors, and DNA chips.

IP DISCLOSURES & LICENSES



PATENTS



in thousands

| REVENUE | FY 2009 | FY 2008 |
|-----------------------|----------------|----------------|
| Total | \$7,800 | \$9,553 |
| Fees and Royalties | 5,084 | 6,831 |
| Reimbursements | 2,671 | 2,703 |
| Extraordinary Income* | 45 | 18 |



* Includes nonrecurring income, such as sale of equity.
Source: Cornell Center for Technology, Enterprise, and Commercialization (CCTEC)

Crossing Disciplines

Selected Research Centers at Cornell

Nanoscale Science and Technology

Center for Nanoscale Systems
 Cornell Center for Materials Research
 Cornell NanoScale Science and Technology Facility*
 Kavli Institute at Cornell for Nanoscale Science
 Kaust-Cornell Center for Energy and Sustainability
 Nanobiotechnology Center

Medical Research

Abby and Howard P. Milstein Chemistry
 Biology Center
 Ansary Stem Cell Institute
 Arthur and Rochelle Belfer Institute of
 Hematology and Medical Oncology
 Center for Aging Research and Clinical Care
 Center for Complementary and Integrative Medicine
 Center for Reproductive Medicine and Infertility
 Center for the Study of Hepatitis C
 Center for Vascular Biology
 Clinical and Translational Science Center
 Clinique Skin Wellness Center
 Comprehensive Center for Excellence in Disparities
 Research and Community Engagement
 Cornell Center for Behavior Intervention Development
 Cornell HIV/AIDS Clinical Trials Unit
 Howard Gilman Institute for Valvular Heart Diseases
 HRH Prince Alwaleed Bin Talal Bin Abdulaziz
 Al-saud Institute for Computational Biomedicine
 Institute of Geriatric Psychiatry
 Lehman Brothers Lung Cancer Research Center
 Margaret M. Dyson Vision Research Institute
 Raymond and Beverly Sackler Center for
 Biomedical and Physical Sciences
 Sackler Institute for Developmental Psychobiology

Life Sciences

Agricultural Experiment Stations (Geneva, Ithaca)
 Baker Institute for Animal Health
 Cancer Protein Expression Laboratory
 Center for Life Science Enterprise
 Center for Reproductive Genomics
 Center for Vertebrate Genomics
 Center on the Microenvironment and Metastasis
 Cornell International Institute for Food,
 Agriculture, and Development
 Cornell Stem Cell Program
 Institute for Biotechnology and Life
 Science Technologies
 Institute of Food Science
 Institute for Genomic Diversity
 National Biomedical Center for Advanced
 ESR Technology
 Sprecher Institute for Comparative Cancer Research
 Weill Institute for Cell and Molecular Biology

Physical Sciences and Engineering

Center for Advanced Computing
 Center for Applied Mathematics
 Center for Emergent Superconductivity
 Center for Radiophysics and Space Research
 Cornell High Energy Synchrotron Source*
 Cornell Laboratory for Accelerator-Based
 Sciences and Education
 Energy Materials Center
 Laboratory of Atomic and Solid State Physics
 Laboratory for Elementary-Particle Physics
 National Astronomy and Ionosphere Center*

Social Sciences and Humanities

Africana Studies and Research Center
 Behavioral Economics and Decision Research
 Bronfenbrenner Life Course Center
 Center for Analytic Economics
 Center for the Study of Economy and Society
 Center for the Study of Inequality
 Cornell Institute for Research on Children
 Cornell Institute for Social and Economic Research
 Cornell Language Acquisition Lab
 Cornell Population Program
 Employment and Disability Institute
 Institute for the Social Sciences
 Institute for Women and Work
 Mario Einaudi Center for International Studies
 Program on Ethics and Public Life
 Society for the Humanities

Business and Management

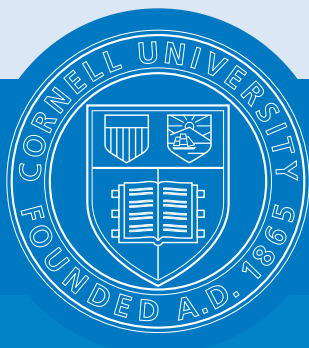
Center for Advanced Human Resource Studies
 Center for Hospitality Research
 Parker Center for Investment Research
 Smithers Institute for Alcohol-Related Workplace Studies

Sustainability

Cornell Center for a Sustainable Future

*National Center





By recognizing and supporting excellence, Cornell... is at the forefront of trends where we can make significant contributions to meeting societal needs and enriching humanity.
– Robert A. Buhrman

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