Mark Devlin builds a telescope that floats to the edge of space.

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Cover image by Gaelen Marsden
At a recognition ceremony for faculty and staff earlier this year, I received a lovely pewter bowl inscribed with the Penn shield above a caption that reads, “25 YEARS OF SERVICE.”

I came to Penn in 1982 as a lecturer in the English department, proud of my Ph.D. in comparative literature and delighted to be at Penn. However, at the time, the academic ethos mostly prized scholarship that did not stray far across disciplinary boundaries. I didn’t fit neatly into that box. I was excited to have my first office (however small), but the old Bennett Hall, which housed the English department, could be most charitably described as genteelly shabby. When I looked out my office window, there was a weed-filled lot. You could get a good cup of soup from Mom’s Truck, parked at the curb, but there were few neighborhood options for nourishing the social life of the campus community.

Twenty-five years later, Penn is transformed—physically, intellectually, culturally. It is a more vital and energetic place whose seeds of academic excellence and intellectual ambition—evident a quarter century ago—are now coming to fruition.

Together with the University, the School of Arts and Sciences has invested heavily in new construction and major renovations that have remade the campus. The Carolyn Lynch Laboratory, the McNeil Center for Early American Studies and the Weigle Information Commons are the most recent additions. Future construction projects for nanoscience, neural and behavioral sciences, and music will continue this transformation. All of our building projects—including a fully renovated Fisher-Bennett Hall, which is filled with light as well as instructional technology—are monuments to the School’s abiding commitment to teaching and research.

One of the most thrilling transformations of the last quarter century is the growing value we place on faculty who display a multidisciplinary hunger and curiosity. Increasingly, the boundaries between departments and disciplines are dissolving. The world’s problems are complex and multifaceted, and they can’t always be contained in the traditional academic silos. More and more, we are seeing scientists and scholars reach across disciplinary borders to challenge and to collaborate with each other. Much of this cross-disciplinary change has been driven by student interests. There are twice as many interdepartmental majors now as there were in 1982, with popular additions such as Cinema Studies and Health and Societies, and many of today’s traditional academic departments allow greater latitude for interdisciplinary study within the major.

When I first came to Philadelphia, there were a few grand, old arts establishments like the Philadelphia Orchestra and the Philadelphia Museum of Art. Over the last 25 years, the School of Arts and Sciences has increased its involvement and engagement in the burgeoning local art scene, whether in the visual arts, film or writing. Certainly, the open door of Kelly Writers House and its lively programs have made a strong contribution to the arts in the city, and we have worked closely with the Institute of Contemporary Art and the Slought Foundation on classroom and curatorial collaborations. And I am happy to report that the empty lot outside the window of my old office has sprouted a whole garden of coffee shops, book stores, eateries and other businesses.

All of these transformations show how far we’ve come in nurturing a dynamic intellectual vision in the School. Twenty-five years ago, I was happy just to be here, but we could all see that there was much to be done. The seeds of change needed to be cultivated in conjunction with the vision of the University. I am grateful to have been a part of that transformation. As dean, I am lucky to lead the School of Arts and Sciences at this critical moment, when we can shape its future for the next generation of faculty and students.
Sociology professor Frank Furstenberg was three chapters into his latest book when he became bored. For over four decades now, he’s documented the lives of nearly 300 women – from their teenage years when they were poor, unwed mothers in Baltimore, through their middle-age when they were family matriarchs. He’d already published numerous papers and two previous books about these women, and he wasn’t sure where else to go with the project. “I can’t do this,” he thought. So he threw the chapters away and shelved the project for three years.

Then it dawned on him how he could culminate the massive, longitudinal Baltimore Study that has loomed over his entire career. “I wanted to make a book about the policies that have grown out of the issue of teenage childbearing, how public policies have been bent and refracted for political reasons,” Furstenberg recalled recently in his McNeil Building office.

Destinies of the Disadvantaged: The Politics of Teen Childbearing tackles welfare reform, marriage promotion and reproductive health, among other highly politicized issues. From Reagan-era stereotyping of unwed, African-American mothers as “welfare queens” through modern-day abstinence promotion, Furstenberg, the Zellerbach Family Professor of Sociology and research associate in the Population
Studies Center, writes about how politicians distort social science information for fodder in electoral politics. “We created an enormous stereotype during the Reagan years – and the Bush-one and Clinton years – that poor women get addicted to welfare,” Furstenberg says. “There is a minority of these women who live up to the stereotype, there’s no doubt about that, but it’s a relatively small minority.”

The long-term costs of teenage childbearing among the women in Furstenberg’s study, 80 percent of whom are African American, have been only modest. About 20 years after giving birth, the vast majority of women had incomes above the poverty line, he reports. Fewer than one fifth remain on public assistance, and more than 75 percent hold regular jobs. Many of the women completed high school or received a GED, and about 20 percent have taken college courses.

Being a teenage mother isn’t their major impediment. Their greatest obstacle is that they started poor. “If you’re born poor, you don’t start on the 20 yard line,” Furstenberg argues. “You start well back in the end zone. You’ve got 120 yards to go. Most people have 80.”

America has the least amount of wealth redistribution in the world, he notes, and the largest divide between wealthy and impoverished. The education system perpetuates the existing status – the tax system allows for more affluent neighborhoods to have better schools. “We’re far from the promise of equal opportunity,” he contends. As a nation that scorns public assistance, aiding the disadvantaged is used as a wedge between political parties, Furstenberg explains. When welfare reform was enacted in 1996, for example, it lacked social programs for self-improvement, especially for men. “We’ve tried to get women more employable, leaving the men, more or less, to fend for themselves. That’s a silly policy.”

Marriage promotion is just as myopic. “Marrying a man who is not going to be able to carry the load of support is like marrying another child,” he observes. “Some of the women commented, ‘I’ve got two children. I don’t need a third.’” Instead of promoting marriage, he recommends giving couples the skills to manage relationships. “A marriage that isn’t viable right from the start is probably not going to get more viable over time.”

When it comes to teenage, premarital sex, the government takes a moral stance: Don’t do it. “We’ve adopted an approach that has been foolhardy,” Furstenberg scoffs. “We need to prepare teenagers to make intelligent, informed decisions for if and when they do have sex, because they will. Most of them do.” The real danger, according to Dorothy Mann, executive director of the Family Planning Council of Southeastern Pennsylvania and 25-year friend of Furstenberg, is that the government’s abstinence efforts don’t help young people deal with the situation if they do become pregnant. “Frank totally embraces the concept of prevention, but he also understands what can be done to improve their lives if they become young parents,” Mann says. “He bridges those two worlds.”

A Baltimore native who joined Penn in 1967, Furstenberg stumbled into this research because his mother was a social worker at Baltimore’s Sinai Hospital. She worked with teen mothers to avoid unwanted, repeat pregnancies, and she invited her son to evaluate the program in 1965.

Furstenberg has become an admirer of the women he’s documented. “In a certain way, the three books I’ve written are an effort to tell their stories,” he says. He’s pestered four decades of Penn students with anecdotes about his Baltimore Study. “Now,” he says with a smile, “I’m done.”

—G.W. Miller III, CGS’03
YOUR BRAIN ON POVERTY

Besides doing research on how the brain works, psychology professor Martha Farah has been applying the methods and insights of neuroscience to “real world” issues. One of them is the effect of poverty on brain development. Poverty can be a kind of neurotoxin, argues Farah, the Walter H. Annenberg Professor in the Natural Sciences and director of the Center for Cognitive Neuroscience. And the deprivation experienced by disadvantaged kids shows up in how their brains grow and function.

Farah and researchers from Penn’s and Children’s hospitals analyzed a long-term database that tracked 110 children born to mothers on welfare. Around half of the moms used crack while pregnant. Household visits over more than a decade recorded how the parents related to their children and how stimulating the home was. “The biggest effects,” says Farah, “are on language and memory.” The researchers found that kids who received better nurturing from parents scored higher on memory tasks, and those with access to books and toys and museum visits developed better language skills. Prenatal substance abuse seemed to have little impact on language or memory. MRI brain scans reveal that the children in the study who got less attention and love tended to have a larger hippocampus, the brain structure associated with forming and retrieving memories. The results are consistent with animal studies that show similar neural deficiencies in rat pups that had little contact with mothers or grew up in bland environments.

Farah suspects that the hormones released by stress are a major cause. “We know stress is itself neurotoxic,” she says. “And we know that the lower a family’s socio-economic status, the higher the level of stress on everyone. Poor children are especially vulnerable to the effects of stress on brain development.” The effects of below-average cognitive function not only last a life time for individuals but point to a physical mechanism that can keep communities locked away in poverty for generations.

—PN

UNDERGRAD EXPLORES CARBON NANOSTRUCTURES

Carbon may be ubiquitous in our world, but research by physics and math major Sujit Datta, C’08, shows there is still much to discover about this element’s remarkable features. Working in the lab of Associate Professor of Physics Alan T. “Charlie” Johnson, Datta has been exploring the unusual electrical properties of one-atom thick sheets of graphite called graphene and of carbon nanotubes, graphene cylinders that are one nanometer – a billionth of a meter – in diameter. His work is helping form the foundations for potential technology ranging from new biomedical instruments to more advanced computers.

In one project, Datta helped develop a carbon nanotube electrical device that can detect and bind certain viral proteins. Datta says, “This gives us a very simple and fast biomedical sensor that may eventually be of great use in medicine.” Datta also works on projects that help shape our basic understanding of single- and few-layer graphene, a material scientists learned to isolate only four years ago. After learning the skills to make high-quality graphene samples, Datta then examined them with a technique called electrostatic force microscopy. He found that the electrical properties of graphene vary significantly depending on how many layers of the material are stacked upon one another, and he was able to quantify these differences. Datta also discovered a better way to create graphene nanoribbons – cross-sections of graphene sheets with their own unique features. Other methods leave rough edges on the nanoribbons, which diminish their electrical properties, but Datta discovered a chemical process that can etch ribbons with crystallographic edges.

Datta explains, “If we can understand the capabilities of carbon nanostructures and eventually make transistors and other electrical components out of them, then we can cram many of these things on computer chips and have significantly more powerful computers.”

—PR
PARSING OUT JUSTICE

“I just have a lot of passion for doing economic analysis of political matters,” says Claire Lim. As an undergraduate at Seoul National University, she followed her passion, double majoring in economics and political science. As a Penn Ph.D. student in economics, she continued to foster that fascination with data and numbers and politics.

In the U.S., more than 90 percent of civil and felony cases are handled by state-court judges. With a dissertation-research grant from the National Science Foundation, Lim has factored how the decisions of appointed judges differ from those who are elected. “Appointment and election are typical ways of selecting public officials,” she explains. “If you can’t understand these two important institutions, then you are basically failing to understand an important part of government operation.”

For her study, Lim looked at judges in Kansas, where both systems of selection are used. In some districts judges are appointed by the governor. When their first term expires, they face no challenger but must be reelected by a simple yes-or-no majority. In other Kansas districts, judges face competitive elections for their first and subsequent terms. Lim put together a massive data set on the backgrounds, career profiles, sentencing behaviors and electoral outcomes for 243 Kansas judges who sat on the bench in 1976 and after. The data also captured the political climate in each of the state’s 31 judicial districts.

“What I found is that appointed judges are very homogeneous and elected judges are very, very heterogeneous in terms of their ideological preferences,” Lim says. The sentences of appointed judges clustered at a moderate point between lenient and severe, but elected judges handed down sentences that scattered across that spread.

“Elected judges are also much more responsive to voters’ preferences,” Lim interprets. “But in these noncompeting reelections appointed judges are almost always rubber stamped by voters – their reelection is not affected by their decisions at all.” Appointed judges, her data show, dispense a moderate and consistent form of justice while elected judges mete out harsher or more lenient sentences, depending on the political leanings of their district’s voters.

“Claire’s dissertation is original and ambitious,” observes her advisor, Antonio Merlo, the Lawrence R. Klein Professor of Economics. “It combines state-of-the-art economic modeling, data analysis and econometrics to study an extremely important set of issues.”

For the near term, Lim is heading to Stanford as an assistant professor of political economy. She plans to continue feeding her data-parsing passion with economic analysis of campaign spending, term limits and other political matters.

—PN
ART, UP CLOSE AND PERSONAL

From cataloging rare artifacts from West Africa’s Benin Kingdom to helping organize an exhibition of contemporary multimedia artist Vito Acconci, students in the Halpern-Rogath Curatorial Seminars gain an intimate perspective on art. Offered by the Department of History of Art, the seminar is one of the few in the country that teaches students practical and theoretical knowledge about curating.

This spring, students in a seminar led by visiting lecturer Kathy Curnow worked with Penn’s Museum of Archaeology and Anthropology to plan an exhibition of Benin artifacts and wrote entries for the exhibition’s catalog. In addition to analyzing exhibits of African art in New York, Washington, D.C. and locally, students examined priceless, centuries-old objects in the Penn Museum’s collection. “It was really interesting touching something you usually think of as being behind a big glass case next to a guard,” says history of art junior Laura Sagues. “We got to see details on the pieces that we would never have been able to see in photographs.”

Last fall, seminar students worked with art history professor Christine Poggi as she curated an exhibit of Acconci’s work called Power Fields, housed at the Slought Foundation. In the course of researching Acconci’s avant garde pieces and analyzing the theoretical issues involved in displaying them, students visited and interviewed the artist in his Brooklyn studio. The interview was filmed and became part of the exhibit. “It was an amazing experience,” says history of art junior Roland Betancourt. “The fact that we were engaging the work and that he (Acconci) had a personal investment in our conversation took our discussion to a new level.”

FROM SCREENING ROOM TO CLASSROOM

Most Penn students recognize actor Kalpen Modi, a.k.a. Kal Penn, from the characters he’s played on the big screen. But 100 Penn undergraduates recently got to know Modi in an entirely different role – that of teacher. Modi, whose credits include the television series House and movies like The Namesake and the Harold and Kumar series, taught a spring semester class called Asian Americans in the Media.

“Many great film classes that focus on theory are so insightful but don’t take into account some of the production-based focal points of what it’s like to make a film, set foot in a studio and have meetings with executives and producers,” Modi says. “On the flip side, some production-based classes don’t take into account the effects, beyond the marketplace, of what certain images mean to certain folks. I wanted to make sure students had a balance, and I hope I helped them think about the media in ways they may not have before.”

In developing the class’s rigorous curriculum, which included pop quizzes, exams and a 15-page research paper, Modi worked closely with Grace Kao, associate professor of sociology and director of the Asian American Studies Program. Students studied a unique combination of material, ranging from academic journals to trade publications like The Hollywood Reporter to a variety of films. They learned also from Modi’s experiences as an industry insider and gained a perspective that Kao says “academics can’t really share with students.”
POWER AID

This spring Kathryn Cunningham, C’08, received a letter saying that her namesake had been born in The Gambia. The note was from a woman whom Cunningham, a biology major, had met two summers ago while volunteering at the Sulayman Jungkung General Hospital (SJGH) in Africa. Although it is one of The Gambia’s largest, the hospital has electricity for less than 10 hours a day. When the woman came in needing a transfusion, there was no power to operate the blood bank. Cunningham found herself giving an on-the-spot blood donation that helped save the woman’s life. In gratitude, the woman promised to name her next child “Kathryn.”

This experience is one of many that drive Cunningham’s commitment to Power Up Gambia, the non-profit she founded to provide solar-powered electricity to SJGH. The hospital depends on generators and can only afford to run them for a few hours daily. It functions for most of each day without running water or power to operate basic equipment like ultrasound machines, incubators and refrigerators. “Patients showed up and we’d have to say, ‘We can’t run those tests right now because our microscope isn’t available,’” Cunningham explains. “It was unreal.”

During Cunningham’s stint there, the SJGH director showed her an estimate from the Gam-Solar company for a $300,000 solar energy system that would power round-the-clock electricity and running water for the hospital. “I thought, ‘I’m 20 years old and it’s $300,000’ – I mean I still pick up SEPTA tokens when I see them,” Cunningham says. “I came home not really expecting to do anything about it.”

But upon hearing her stories from The Gambia, Cunningham’s parents and friends encouraged her to raise money for the cause. Armed with a projector and a convincing presentation, Cunningham has since raised more than $250,000. The money has already provided SJGH with a solar-powered water pump that supplies all-day running water and energy-saving light bulbs that allow for more efficient energy use.

In the past two years Power Up Gambia has formed a 12-member board and has added educational activities to its goals. Cunningham says the organization gives presentations to schools about renewable energy, African cultures and “the importance of giving back.” The group was a finalist in this year’s J.P. Morgan Good Venture Competition, and Cunningham is a finalist for the 2008 BRICK Awards, which honor youth service.

As the group’s recognition grows, so does Cunningham’s greatest challenge – time. This semester she has juggled work for Power Up Gambia with applying to Penn’s School of Medicine, planning her upcoming wedding and finishing undergraduate coursework. But Cunningham plans to maintain a place for Power Up Gambia well into her future. After she meets her goal for SJGH, she wants to turn the group’s attention to the hospital’s satellite clinics in The Gambia’s hinterlands. She dreams of eventually turning Power Up Gambia into a self-sustainable organization. “Hey,” Cunningham exclaims, “why not Power Up Africa!”

—PR
A powerful mix of frustration and curiosity has fueled Joshua Cook’s accomplishments. This drive will soon take the College senior to a place that has educated scientists who have asked some of the most definitive questions in human history. Cook is the recipient of a prestigious 2008 Gates Cambridge Scholarship. With it, he will pursue an MPhil in clinical biochemistry at the University of Cambridge in England. “To be able to study in the environment that fledged Isaac Newton, Darwin, and Watson and Crick — that’s something pretty amazing,” Cook says.

The biology major came to Penn with a longstanding interest in clinical medicine, but he soon found himself drawn to research. During his freshman year, he found a job in the lab of Bryan Wolf, a professor in the Department of Pathology and Laboratory Medicine in the School of Medicine. “I really came to love what I was doing in the lab,” Cook explains. “I wasn’t just washing glassware; I was planning and doing experiments that were getting published and making real contributions to the work of the lab.”

Cook’s research culminated in his thesis on how insulin-secreting cells of the pancreas regulate the production of a protein that may be involved in the development of type-2 diabetes. He has submitted the paper for publication and presented it at the American Diabetes Association’s 67th Scientific Session — the world’s largest conference in the field of diabetes research.

Cook’s experiences in the lab made him realize “the power of the life of a physician-scientist,” and after Cambridge he will be attending the M.D./Ph.D. program at Columbia University College of Physicians & Surgeons. He hopes to combine his devotion to medical practice with the researcher’s pursuit of knowledge. “Every question that you think you’ve answered presents a new question,” Cook says. “The more I learn, the greater effect my work can have.”

—PR

**PURSUIT OF KNOWLEDGE**

At this spring’s Levin Family Dean’s Forum, world-renowned experimental psychologist and popular science writer Steven Pinker gave a talk on “The Stuff of Thought.” The Harvard professor has won praise and sparked debate for work that explains how words relate to thoughts and what that reveals about human nature. In his lecture, he discussed how aspects of language, ranging from grammatical structures to swearing to innuendo, serve as a window into our thoughts, emotions and social relationships.

Pinker’s research on cognition and language has been honored with many prestigious academic awards, and his talent for wittily and eloquently translating complex ideas for lay audiences has garnered popular acclaim. He was named one of *Time* magazine’s 100 Most Influential People in the World Today. His newest general-audience book, *The Stuff of Thought: Language as a Window into Human Nature*, was a *New York Times* bestseller.

“At a time when genetics, neuroscience and cognitive psychology are revealing new insights about the brain at an explosive pace,” said SAS Dean Rebecca Bushnell, “it’s writers like Pinker who make it possible for the non-scientist to go along for this thrilling ride.”

—PR

**2008 LEVIN FAMILY DEAN’S FORUM**

Pursuit of Knowledge

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2008 Levin Family

Dean’s Forum

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—PR
It takes a giant machine to study nature’s tiniest particles. For more than a decade, Penn physicists have been hard at work with more than 5,000 scientists and engineers from around the world putting together the Large Hadron Collider, the biggest, most powerful particle accelerator ever built. The pioneering scientific instrument at CERN (the European Organization for Nuclear Research) in Geneva, Switzerland, is due to begin operations later this year. It will fling protons in opposite directions around a 17-mile circuit at nearly the speed of light — and then smash them together. Cosmologists believe the universe at the Big Bang was smaller than an atom. The subatomic debris that flies out of the head-on collisions will mimic conditions at the birth of the universe 15 billion years ago. Physicists hope to catch a glimpse of elusive but predicted particles, like the Higgs boson, that could help crack open the code of the physical world just as genetic discoveries led scientists to break the code of life. Penn’s scientists are part of the ATLAS experiment, one of four detectors that will track and measure what happens at the heart of matter when protons break apart at high energy levels. The monster detector, a small piece of the much bigger instrument, is about seven stories tall and weighs as much as the Eiffel Tower. ATLAS will search for answers to questions like, What are the origins of matter? What gives mass to elementary particles? What else can we learn about the basic forces that have shaped the universe and will determine its fate? “In some ways we know what we’re looking for, and in some ways we don’t,” says Assistant Professor and ATLAS collaborator Evelyn Thomson. “But that may be interesting. If we don’t find something that we’re looking for, then we can rule out the standing theories and search for others. Maybe we will find something completely unexpected that causes a revolution in our understanding of the universe.” —PN
Some cosmologists don’t do anything more physical than scribbling equations on a blackboard or tapping data into a computer. They ponder the universe from the comfort of an office or book-filled study. But Mark Devlin, the Reese W. Flower Professor of Astronomy and Astrophysics, finds cushy surroundings boring. You’re more likely to find him crawling inside the frame of a car-sized telescope, soldering gun in hand, or standing on the windswept ice of Antarctica preparing to send that high-tech appliance to the very edge of space on a NASA balloon.

Which is just what he was doing a few days before Christmas 2006. Devlin and his team of graduate students and international collaborators launched BLAST, the Balloon-borne Large Aperture Submillimeter Telescope. BLAST is a unique, hand-built, multi-million-dollar scientific instrument that literally hangs by a string 25 miles above the Earth. It drifted around the South Pole at an altitude of 130,000 feet, scrutinizing primeval galaxies at the edge of the visible universe and signs of star formation within our own Milky Way galaxy. You just don’t get to do such things sitting in front of a computer.

“The overriding theme behind all of my experiments is cosmology, understanding the formation and evolution of the universe,” says Devlin. He compares it to studying the development and growth of an individual human being: “If you were to show an alien a fertilized human egg and then show them a 75-year-old man and you say, ‘Well, this is how it started and this is how it ended,’ they’d say, ‘Well, what’s going on here? How can this possibly happen?’ So to fully study this you’ve got to take snapshots of the whole thing, the whole process, from toddler to teenager, middle age and so forth. And as you get all those snapshots, you get a full picture of how it evolved from something so simple to something big.” Devlin’s work, and the mission of BLAST, essentially involves taking snapshots of the history and development of the universe.

Now 41, Devlin grew up in New Brunswick, where his father, a particle physicist, taught at Rutgers. Later the elder Devlin worked at Fermilab, one of the world’s major high-energy physics labs, helping in the search for the elusive top quark. Young Mark spent his childhood immersed in the culture of scientists.

Devlin fully intended to follow in his dad’s footsteps and become a particle physicist, and after majoring in physics at the University of Wisconsin, he pursued his doctorate at the University of California at Berkeley. But his focus shifted from the very small to the very big. “I kind of saw the light, so to speak, and got converted to astrophysics while I was there, and started research in the cosmic microwave background,” he says. That meant building instruments and taking them to high altitudes, whether by flying them on balloons or installing them on telescopes on mountaintop observatories 17,000 feet above sea level in Chile. After a stint at Princeton, where he designed and built another balloon telescope, Devlin joined the Penn faculty in 1996, already an experienced experimentalist and dedicated hands-on guy. “The telescope I built at Princeton was converted into a ground-based telescope, which I then took to the high altitude plains of Chile,” he says. “At the time, that was actually the highest telescope observing ever, and we got some very good data from there.”
The idea for BLAST came together around 1999, as the next step in Devlin’s quest to explore the early universe. BLAST wasn’t designed to see back to the very beginning but to record a later era characterized by rampant star and galaxy formation. Galaxies, and the stars that comprise them, come together in huge clouds of gas and dust that tend to absorb visible light. The giant cloud gets warmed up and releases energy at longer wavelengths – the submillimeter range that BLAST detects – and carries precious information about what’s going on inside those primordial dust clouds.

That might seem like good news, but explains Devlin, those wavelengths are “incredibly difficult to observe, because our atmosphere doesn’t transmit submillimeter light. So you have to go above the atmosphere.” Flying into space on a satellite or the space shuttle is expensive and requires years of waiting, which is why NASA maintains a robust scientific balloon program. BLAST would be carried above most of the Earth’s thick atmosphere by a huge helium balloon.

Even for a scientist used to building sophisticated equipment, BLAST was a challenge. The telescope consists of a big two-meter-diameter primary mirror that focuses light into arrays of highly sensitive radiation detectors called bolometers, which have to be kept super cold with cryogenic equipment. Onboard computers stored the collected data, while all the electronic equipment had to be protected from the extreme temperatures and differences in atmospheric pressure that BLAST would encounter on its voyage. The entire apparatus couldn’t weigh much more than 4,000 pounds, had to fit inside a gondola that could be turned and pointed at different areas of the sky, and had to be able to operate more or less on its own while drifting along at the top of the atmosphere.

After a one-day test flight in the New Mexico desert in the fall of 2003, BLAST made its maiden scientific flight from Sweden in June 2005. It was a true baptism of fire: first, bad weather and technical glitches delayed the balloon launch for weeks. When BLAST landed four days later in the Northwest Territories of Canada, Devlin and his team (accompanied by an Inuit hunter to keep the scientists safe from prowling polar bears) discovered that the telescope mirror had broken during the journey. Devlin recovered some data on Milky Way star formation, but the telescope failure made it impossible to
Devlin’s work, and the mission of BLAST, essentially involves taking snapshots of the history and development of the universe.
capsule aboard the gondola. The container was lying somewhere along that 120-mile gash in the ice in the farthest, most hostile place on Earth. To make things worse, the data capsule was painted white. It would be almost impossible to see against the ice and snow.

Disheartened, nobody expected to find the capsule, but they had to try. “We went back another day with a lot of people and circled a bunch of times and just by pure chance, they happened to see, only 2 miles away out of 120, the data vessel sitting there,” says Devlin, still sounding awed by the fact. To everyone’s astonishment and relief, the data were recovered, and BLAST now has the distinction of completing the widest submillimeter extragalactic survey to date. Analysis of the data from the 2006 flight is just being completed and promises to keep Devlin’s more theoretically inclined colleagues busy for years to come.

Meanwhile, Devlin is building a new and improved BLAST that he hopes to fly as early as 2009. Back in South America, he’s working at a high-altitude observatory on the Atacama Cosmology Telescope.

“Even for a scientist used to building sophisticated equipment, BLAST was a challenge.”
As if being one of the world’s foremost and busiest experimental cosmologists isn’t enough, Mark Devlin has just added another occupation to his C.V.: movie star. It’s all the fault of his brother, Paul. Rather than follow in the Devlin family scientific tradition, Paul became an award-winning documentary filmmaker, television director and editor, winning five Emmy Awards for his work on NBC’s Olympics broadcasts and CBS’s coverage of the Tour de France.

When Mark was preparing BLAST for its first science flight from Sweden, he invited his filmmaker brother along to document the proceedings. “I’d been bugging him to come and film one of our launches, just so I could have it,” says Mark.

At first, Paul wasn’t too enthused, particularly after the not-very-successful Swedish flight. Mark laughs, “We didn’t do very well there, so he thought it was kind of a crappy movie.” But Mark convinced his brother to continue filming the next chapter of the BLAST story in Antarctica. The dramatic turn of events there convinced Paul that BLAST “was pretty good movie stuff,” as Mark puts it. The dedicated documentarian had found his next subject. The result is BLAST, a feature-length documentary that tells a story of science on the edge. Paul captures the day-to-day process of working scientists and grad students: the big and little successes and failures, the petty frustrations and major problems, the personal and professional interactions, and the jubilation of a major scientific achievement.

The film has already been sold to the BBC for broadcast and is being considered by various other outlets, while being shown in several major film festivals, including the prestigious Hot Docs documentary festival in Toronto. It may not be long before Dr. Mark Devlin will be appearing on a television or theater screen near you. “Makes me nervous,” he admits.

For more information on BLAST, the movie, visit http://www.blastthemovie.info.

For more information on BLAST, visit http://www.blastexperiment.info.

Mark Wolverton is a freelance writer and author living in Bryn Mawr, Pa.
By most accounts, Susan Schneider lives a pretty normal life. An assistant professor of philosophy, she teaches classes, writes academic papers and travels occasionally to speak at a philosophy or science lecture. At home, she shuttles her daughter to play dates, cooks dinner and goes mountain biking.

Then suddenly, right in the middle of this ordinary American existence, it happens. Maybe we’re all living in a Matrix, she thinks to herself. It’s like in the movie when the question, What is the Matrix? keeps popping up on Neo’s computer screen and sets him to wondering.

Schneider starts considering all the what-ifs and the maybes that now pop up all around her. Maybe the warm sun on my face, the trees swishing by and the car I’m driving down the road are actually code streaming through the circuits of a great computer. What if this world, which feels so compellingly real, is only a simulation thrown up by a complex and clever computer game? If I’m in it, how could I even know? What if my real-seeming self is nothing more than an algorithm on a computational network? What if everything is a computer-generated dream world – a momentary assemblage of information clicking and switching and running away on a grid laid down by some advanced but unknown intelligence?

It’s like that time, after earning an economics degree as an undergrad at Berkeley, she suddenly switched to philosophy. “I don’t think my parents really knew what to do with me,” Schneider recalls. Friends and acquaintances are sometimes amused by the tangled-up matrix of questions and answers that Schneider ceaselessly tries to unravel – all that wondering about free will and fundamental building blocks of reality and the Matrix thing. “It makes you a little weird,” she admits,
“I believe there are objective answers to the questions, but I’m a bit skeptical when it comes to our capacity to find them.”

...
least, she hopes her reflections will help clarify and inspire renewed appreciation for the answer space surrounding the ideas being put forth by discoveries in cognitive science.

In everyday life, Schneider inhabits an “answer space” hollowed out amid a torrent of questions many of us don’t see. Maybe we do live in a computer program. Maybe reality is informational. In The Matrix, the character Morpheus holds forth on a longstanding and archetypal philosophy question. “What is real? How do you define ‘real’? If you’re talking about what you can feel, what you can smell, what you can taste and see, then real is simply electrical signals interpreted by your brain.” What if? All the questions about mind and reality and the limits of knowledge come pouring down once more, streaming through the assistant philosophy professor’s mind.

“I believe there are objective answers to the questions philosophers ask, but I’m a bit skeptical when it comes to our capacity to find them,” she comments. “I mean, why should we be confident that we’re good philosophers? Maybe we can’t get at the answers due to our physical makeup. Maybe a supercomputer that we’ll create one day will be better at doing philosophy than we are.” Or maybe Morpheus is right and that computer has already been built, and we’re living in it. What if reality is a virtual one – shadowy experiences cast by lightning leaps across a computer grid? What if Plato is right about our mistaken assumption that the parade of flickering shadows on the wall of a cave is reality?

“Everything is pretty bizarre when you think about it,” Schneider remarks. “It’s a neat thing to be just bewildered. It’s the human condition.”

HUMAN CONSCIOUSNESS – IN 60 SECONDS

Suppose that you are sitting in a cafe studying before an exam. All in one moment, you taste the espresso you sip, consider an idea and hear the scream of the espresso machine. This is your current stream of consciousness. Conscious streams seem to be very much bound up with who you are. It is not that this particular moment is essential – although you may feel that certain ones are important. It is rather that throughout your waking life, you seem to be the subject of a unified stream of experience that presents you as the subject viewing the show.

Let us focus on three features of the stream. First, it may seem to you, put metaphorically, that there is a sort of screen or stage on which experiences present themselves to your mind’s eye. That is, there appears to be a central place where experiences are “screened” before you. Daniel Dennett calls this place the “Cartesian Theater.” Second, in this central place there seems to be a singular point in time when, given a particular sensory input, consciousness happens. For instance, there seems to be one moment in which the scream of the espresso machine begins, pulling you out of your concentration. Finally, there appears to be a self – a someone who is inside the theater, watching the show.

I challenge you to think about each of these features in more detail. Each is highly problematic. For instance, an explanation of consciousness cannot literally be that there is a mind’s eye in the brain watching a show. And there is no evidence that there is a singular place or time in the brain where consciousness congeals. Thought seems highly distributed throughout the cortex. So what and when and where is consciousness?

And, for that matter, why are we conscious at all? Suppose that cognitive science is correct that the mind is computational. Why does all this information processing in the brain, under certain conditions, have a felt quality? Couldn’t it simply go on “in the dark?”

So upon reflection, consciousness is both the most immediate aspect of our lives and one of the most mysterious.

Adapted from Susan Schneider’s 60 Second Lecture. Watch a video at http://www.sas.upenn.edu/60secondlecture.
The presidential candidates crisscross each state on the primary calendar, make their case to voters and repair to their suites on election night to await the verdict. What they hope to see is a big checkmark beside their name on the television screen. As a senior analyst in the Election Unit at NBC News, John Lapinski is among those who hold the gavel. The associate professor of political science scrubs the exit polls, and once there is convincing evidence, the “decision desk,” at which he holds a seat, declares a winner. He sits behind the scenes at NBC News in New York City, feeding information to Brian Williams and Tom Brokaw among others. Lapinski studies lawmaking in Congress as well as congressional and presidential campaigns and elections. He has been with NBC since 2000, the year he earned his Ph.D. from Columbia. This primary season, he’s worked every election night during the frenetic sprint to the White House. In the spring, he paused from his constant shuttle between campus and New York to talk about the Democratic contest and the general election.

How reliable are polls?

So many of the polls have not been good in this presidential primary season. Polls are becoming harder and harder to do, primarily because of changing habits and changing technology. It used to be that you’d get very high response rates because people had landline telephones and people answering them were willing to take surveys. Now everyone has cell phones, particularly young Americans. That, and the rise of answering machines, makes it much harder to reach people. If people decide either you can’t contact them or they won’t take the survey, it’s hard to get an accurate reading. Compounding this problem in 2008 is the fact that the polls have gauged the opinions of “likely voters,” and there have been so many new voters this election cycle, including many more African Americans and younger folks. Both of these groups are somewhat more difficult to reach than other groups via telephone surveys, thereby making surveys somewhat less reliable.

How about exit polls? Early ones incorrectly indicated that John Kerry would win the 2004 presidential election.

People who vote early in the morning oftentimes don’t look like the people who vote later in the day. This is why it is official policy that the networks do not release partial exit poll data (though it has on occasion been leaked). You have to remember, elections are determined by everybody who is voting. At NBC, we’re very conservative in making projections on winners based on exit polls.

What is motivating voters?

Different subsets of voters have different motivations. Some people who never thought of themselves as being political, or that the political system was important, are just finding their voices. They’re realizing that some very consequential decisions have been made — especially regarding the
War. The economy has been a constant concern of primary voters and became more important in later primaries as economic conditions grew worse. Some people are issues voters — gay marriage, right to life and those sorts of things are big. Then there are pocketbook voters. It will matter a lot to them not only what the president will do for the country as a whole but what he’ll do for them individually.

**What do you think will be the aftermath of the Democratic primary in the general election?**

Senator Hillary Clinton’s actions now, I think, will diminish divisions among Democrats. Particularly important are her remarks that distance her from the vice presidential spot, and her recent gestures toward asking her large donors to turn their support to Senator Obama. Nonetheless, Republicans hope to siphon off women voters. Given how the 2008 primary was so demographically driven, this is a reasonable hope but one that I think, for numerous reasons, will fall short.

**What are some of the key issues that will define the election in the months to come?**

I think that there are about a dozen or so states that will decide this contest. So, it’s critical to think about what issues are key in states like Pennsylvania, Michigan, Florida and Ohio. I think the economy will be more important in these states, and my gut — based on some of my academic research — is that the race issue is also key. It will be important in a number of ways, including differential turnout among African Americans in the general election as well as possible negative predispositions among some demographic groups toward African Americans. Our exit poll data for the 2008 presidential primary season showed that a non-trivial number of voters revealed that race would be a critical factor in determining their vote choice. This was true of African Americans as well as whites. Consequently, I think Senator Obama’s ability to appeal to white voters, particularly those in the middle-class, will determine whether he is able to win enough swing states to carry the election. How will he do this? This, in my mind, is the big question of the campaign.

**Which party will win the White House?**

This is going to be a very tight election. A lot of people thought the Democrats were just going to slip into office. It’s going to be a hard-fought, tough battle. They’re going to be fighting state by state. McCain could appeal to independent voters in battleground states.

*Larry Teitelbaum is editor of the Penn Law Journal.*
The big headline of the 2008 presidential election is “change.” None of the candidates want to become tied too tightly to George W. Bush’s sagging popularity. But that’s where the fun of this campaign begins.

As Barack Obama and Hillary Clinton lobbed mortar shells at each other, John McCain quietly cultivated the conservative Republican base (and the party’s big donors), trying to prove that he is a reliable conservative. Clinton and Obama burned barrels of pricey jet fuel scrapping over every last delegate. They bombarded each other about who best could wear the mantle of “change,” but their salvos nearly shredded the party. Clinton delegates wondered out loud if they could bring themselves to support Obama.

“Change” became a gauge of how far and how fast candidates want to run from Bush, especially on the economy, the mortgage meltdown, and the war in Iraq. The primary season established what they don’t want, but where McCain and Obama plan on taking us is anything but clear.

The Democrats are reaching back to the maxim that party strategist James Carville preached in Bill Clinton’s first White House run: It’s the economy, stupid. The focus on jobs and gas prices helps them tune into the big concerns of middle-class Americans and deflect the inevitable Republican counterattack that Democrats are soft on terrorism and weak on defense. As they turned from the haggling over who best could answer a 3:00 a.m. phone call, Obama began focusing the Democrats squarely on their core issues.

McCain burnished the foreign policy chops that came from his captivity in a North Vietnamese prison camp and his years in the Senate. As the Democrats lobbed mortars at each other, he readied a campaign based on policy maturity, senatorial experience, an uneasy link with the Republican base, and the uncertainties of the post-9/11 world.

For years, American voters have said that elections don’t matter because they never have real choices. It’s been hard to get college students to take campaigns seriously because they didn’t think elections mattered. This year’s campaign has bashed those cynical views. No election in recent memory has stirred up voters with such fervor. During the Pennsylvania primary, a stroll down Locust Walk became a gauntlet of rival signs. No one could accuse Penn students of apathy in this campaign, and as they return in the fall the students are likely to mobilize as never before.

Of course, presidents have to do more than preach about change. We elect them to run the government, but presidents really don’t act like CEOs (in large part because Congress has no interest in acting like a board of directors). We expect presidents to make sure the government works. They rarely get much credit for doing hard things well, but as the fallout from the government’s bungled response to Hurricane Katrina showed, big management problems can torpedo presidents.

The president we elect in 2008 will face a daunting array of big issues. There are the
twin problems of the economic downturn and the war on Iraq, and the new president won’t easily be able to snap his fingers to end either. There’s also a big collection of sneaky issues that could creep up unexpectedly. In the last year, dog food disappeared from supermarket shelves because a foreign company slipped melamine into the wheat gluten used to make it. Toy manufacturers pulled dolls and trains from distribution because they contained lead paint. Airline passengers found planes grounded because maintenance workers had made a quarter-inch mistake in repairing the insulation on wheel-well wires. The new president can count on more surprises with big consequences — perhaps a breakdown of food safety, mega-overruns on defense contracts, a meltdown in the 2010 census, a West Coast earthquake or an East Coast hurricane or dirty bomb.

We’ve expanded the role of contractors into virtually every nook of American government. Private contractors spend 90 percent of all the government dollars in NASA’s space shuttle program. The military has more private contractors than soldiers in Iraq. (Imagine how fast support for the war would erode if the military needed to find twice as many volunteers to fight the old-fashioned way.) Big problems have followed many federal contracts, and the new president is going to need to find a way to get the job done without allowing contractors to run amok.

And then there’s the mega-problem of fiscal sanity. The next president will face a rising tsunami of budgetary red ink, as deficits grow from the war in Iraq, big tax decisions and entitlement programs for retiring baby boomers. It won’t be much fun for any president preaching change without steps to get the nation’s fiscal house in order, and that road runs through rising red ink of social security and health-care programs. The new president’s second term won’t be worth serving without a solution to these issues.

Chanting about change won’t make it happen. The hard part is coming now that the primaries are moving into the fall campaign season and the inevitable problem of transforming big promises into practical results. Like a dog chasing traffic, one of these candidates is going to catch the car — and then, as president, will have to figure out what to do with it.

Donald F. Kettl is the Robert A. Fox Leadership Professor in the Department of Political Science and the Fels Institute of Government. His new book, The Next Government of the United States, will be published late this fall.

ON OBAMA’S SIDE

Like hordes of college students, Ross Avila, C’08, enlisted in the Obama brigade. Avila, a psychology major who graduated last month, says he’s been entranced by Senator Obama since he delivered his now-famous speech at the 2004 Democratic convention. So when his best friend at Penn, Jordan Grossman, C’08, decided to spend part of the holiday break in Iowa as an Obama organizer, Avila jumped aboard.

He spent more than a week going door-to-door, making phone calls and volunteering at rallies in Iowa City, home to the University of Iowa. Avila spent election night of the Iowa primary as a caucus observer, reporting turnout and the results. He was standing in the student union and watching television when he saw the networks put a check mark next to Obama’s name. Excited, he barged into his friend’s ongoing caucus, and later celebrated at a bar packed with young supporters, who cheered as Obama declared victory.

“It was one of the most memorable nights of my life,” says Avila. “I had the sense since he declared his candidacy that it would be something big, but I didn’t expect it to be this big.”

Obama’s Iowa victory foreshadowed an historic campaign, which now resembles the long-running soap series “All My Children” — with Ross Avila and David Helfenbein on opposite sides of history.
What is democracy? Citizens of the United States tend to associate it with freedom of speech, freedom of conscience, freedom of religion. We assume that democratic societies are better than tyrannies, theocracies or militia states. We may assume too that democracy includes “checks and balances” that make elected officials less liable to make bad decisions than leaders in other forms of government.

Modern democracy is largely inspired by one of the earliest democratic societies: ancient Athens. It is from the Athenians that we get the word democracy, from the ancient Greek demokratia, “rule by the people.” But our assumptions about democracy would not have been shared by many in classical Greece. By the standards of Athens, whose electorate had a direct vote on big decisions, the U.S. is not really a democracy at all but an oligarchy of elected representatives.

Athens offers some corrective lessons for anyone who idealizes democracy. For one thing, the Athenian democracy destroyed itself through democratic means: by voting again and again for disastrous wars. For another, a legally appointed jury voted the death penalty for the public intellectual Socrates.

To Athenians in the later years of the 5th century B.C.E., as the Peloponnesian War dragged on and on, it was clear that voters could be swayed to favor the best speaker or the most charismatic personality in a political debate – even though that person might not have made the best argument. Wars make voters restless and unhappy, but they do not necessarily help people make good decisions. The Knights, a play by Aristophanes, vividly depicts People (Demos) as the slave to Cleon, a general and demagogue who whipped up popular feeling against the Spartans and persuaded the populace to perpetuate war at enormous cost in treasure and lives. The play suggests that democracy need not mean freedom. It may mean that the people sometimes choose bad masters. The personality politics created by today’s media risks taking us closer to the demagoguery and ruin of the Athenian political scene.

The Athenians killed Socrates not despite their democratic system but because of it.

After almost 30 years of fighting, Athens lost the war. A military junta seized power, but democratic government was eventually restored. One of the first actions
of the new democracy was to put on trial its most notorious citizen: the outspoken gadfly Socrates. The charges against him were primarily religious. He was accused of not worshiping the gods of the city and corrupting the young. Socrates was condemned to death by hemlock in 399 B.C.E.

In the United States, religious fundamentalism and liberal democracy are assumed to be opposed. Those who defended the war in Iraq argued that we could fight “Islamic extremism” by creating Western-style democracies in the Middle East. From a modern perspective, it may be tempting to see the death of Socrates as the failure of Athens to live up to the principles of democracy. We might respond that it ought not to be a crime to believe in whatever gods one pleases and that teachers should be free to explore intellectual possibilities with students. Surely excessive oversight of education is antithetical to democratic freedom.

But Socrates’ contemporaries did not see things this way. The association of democracy with secularism is a modern invention, as is the assumption that democracy and freedom of speech go together. The Athenians killed Socrates not despite their democratic system but because of it. Piety toward the gods was a central value, and citizens voted to execute a man who threatened their religion and their children’s morals.

Socrates’ student Plato insisted that his teacher’s condemnation was a lesson in the failings and dangers of democratic government. An obvious lesson was that democracy allows ignorant, uneducated citizens to have power over the lives of the few who might teach them. Plato’s Republic, in which philosophers are kings and the masses are kept under strict surveillance and control, is an anti-democratic ideal inspired by the death of Socrates.

Whether or not we agree with Plato, a look back to Athens seems essential at a time when we idealize our own version of democracy – and try to impose it on the world. Democracy does not, in itself, ensure that human rights will be protected. Restrictions on intellectual and religious freedom, along with torture, unfair trials, and unequal access to education, work, money and political power are features of democratic societies, ancient and modern. If Socrates left any lasting legacy, it ought to be a reminder to ask questions, even about our most cherished beliefs.

Emily Wilson is an assistant professor of classical studies and author of The Death of Socrates. Her essay is based on an article that first appeared in the March 16, 2008, Philadelphia Inquirer.

Democracy need not mean freedom. It may mean that the people sometimes choose bad masters.
The Island of Likoma sits in the northern part of Lake Malawi in western sub-Saharan Africa. A rocky rectangle of sparse grassland and baobab trees, it has a population of roughly 7,000. It’s not a place of passage. Once a week, an ancient-seeming steamer boat traverses the 40 miles from the nearest mainland port, a trip that generally takes more than 10 hours. The islanders gather to mark the steamer’s arrival and to drink the cheaper beer on board.

Fishing is the main economic activity. The men spend hours on the lake, and women travel often to the mainland to sell the catch. There is a trading center in the middle of the island, and an anachronistic cathedral – comparable in size to Winchester – built by Anglican missionaries at the turn of the 19th century. There are soccer games and dances, and there is electricity until 10 o’clock at night. There is also a high rate of HIV infection, about 10 percent of the population.

Since the beginning of the world’s HIV epidemics, most research has focused on “high-risk” behaviors – whether or not one uses a condom or engages in sex with someone who has a large number of partners. But in most of these studies, there has been no real correlation between risky behavior and the risk of becoming infected. Enter the Malawi Research Group at Penn.

In 2005, Stephane Helleringer, Gr’07, then a doctoral student, together with colleagues from the Wharton Healthcare Management Program and Penn’s School of Nursing, took that lumbering steamer to Likoma. Laden with computers, GPS equipment, survey forms and lab supplies, the group set out to map the social networks of the island and to identify sexual partnerships and how HIV spread along the paths that connected them.

Social network analysis is not new and not unfamiliar. Think six degrees of separation. But most studies of HIV transmission that have adopted this perspective have been artificial, based only on computer simulations and projections, or they have included only a small portion of a population.
and focused on an individual’s behavior. In surveying the entire population, asking not only who did what but with whom they did it and where those people are located, Stephane’s team hoped to discover the specific means by which HIV had become so diffuse within the Likoma community.

It was a major undertaking that required a major public relations campaign. Though Likoma has been favored with government initiatives and general education is pervasive on the island, knowledge of the disease is not wide-spread. Witchcraft still has a strong hold, and most premature deaths are interpreted as the work of occult forces. The team recruited 50 volunteers that included students from Malawi’s College of Medicine, medical staff to provide HIV testing and care, and interviewers from the local population. They called large and long public meetings in each village to familiarize the islanders with the disease, to demonstrate the team’s procedures and to generate collaboration among the inhabitants. “People were very, very welcoming,” Helleringer reports. “They took care of things for us. They found us accommodations. They helped us find food. And I think it had to do with the fact that, you know, the study was bringing some kind of life to the island.”

One of the reasons Likoma was chosen for the study, besides its diffuse HIV rate, is its position as a “dead angle.” Unlike bustling capital cities or metropolitan areas, there are not a lot of people coming to the island or leaving it. This stability and the manageable size of the population would prove crucial in mapping individuals’ relationships.

In 2005, before beginning work on the survey, Helleringer and his team took a census of the island, recording the names, nicknames and ages of everyone.

Ladened with computers, GPS equipment, survey forms and lab supplies, the group set out to map the social networks of the island and to identify sexual partnerships and how HIV spread along the paths that connected them.
in a particular household as well as the GPS coordinates of the houses and various landmarks: the primary school, the village center, the local well. This data would become the basis for identifying sexual partnerships and exactly where those partners were located.

Initially that summer, the team interviewed half the adult population, asking intimate questions. One of the reasons data on sexual networks remains scarce is the belief that people will not answer questions like, Who are you currently sleeping with? But Helleringer found that the islanders were willing to give their answers once it was explained why the information was important and once they were assured of confidentiality.

There were some tense moments though. To enhance individual privacy, the team used speech-enabled laptops rather than human interviewers to ask the questions. But a number of islanders became alarmed. “How can this machine be asking me questions?” they worried. “How does this machine know where I live?” In a few cases, the “speaking computers” — and the staff members — were accused of witchcraft. Emergency community meetings were called to explain the process and demonstrate the use of recordings.

While the data gathered from the interviews will be studied for some time, one early result is both surprising and counterintuitive. Past research has focused on individuals who have many partners, “super spreaders,” who single-handedly spread the virus. Helleringer’s data reveal a large, interconnected web of people, 65 percent of Likoma’s population, who reported having an average of only two or three partners over three years. “We did not expect to find that having a small number of partners would actually connect such a large part of the population in one big network,” he says. This finding

“I think it had to do with the fact that the study was bringing some kind of life to the island.”

Jemima A. Frimpong
This finding suggests that it’s not necessarily one’s own behavior that puts one at risk but what the community is doing – what one’s partner does and what his or her partners do.

Helleringer returned with his team to Likoma in the summer of 2007 and interviewed the entire population between the ages of 15 and 59, around 2,500 people. He hopes to use those data to tease out changes that have occurred in relationships on the island, to track the effects of antiretroviral drugs, to ascertain whether HIV has become more or less prevalent, and, if it has become more widespread, to map out behavior patterns that could explain why.

The initial funding for Helleringer’s project came from a pilot grant from Penn’s Population Studies Center. “I doubt that granting institutions like the NIH would have taken the risk of funding this research,” he speculates. “Indeed, it really wasn’t clear early on that inhabitants of Likoma would be willing to disclose their sexual partnerships or tell a computer whom they had slept with in the past three years. But our reviewers at Penn deemed it was a risk worth taking.” Following publication of the study’s initial results, Helleringer has secured additional funding from the NIH and now hopes to extend the study to a five-year project.

Beyond the value of what the research will ultimately reveal, the Likoma study breaks new ground by showing what a real-life sexual network looks like where HIV has spread extensively. It is not a computer simulation. It proves that personal data can be collected, which should encourage other studies in other contexts.

Helleringer defended his dissertation on the initial Likoma study last year and is a post-doctoral researcher in the sociology department. He steamed across Lake Malawi in April and continues his work on the island.
Three students huddle around the little LED screen of a camcorder. Each has a notebook and pen. One is monitoring a kitchen timer. A few minutes before, the eye of the video recorder was focused on a VW-size cage while 15 different male cowbird songs played at 60-second intervals from a speaker on the left side. The two plain-brown female cowbirds inside are known to be familiar with some of the males whose songs were burned onto the CD. The students are testing whether the females are more interested in the songs of males they know than in birds that are unfamiliar to them.

Suddenly you hear one of the songs: “Ploink-sleeee!” It has a metallic ring. The undergrad experimenters perk up and watch the screen. After a few moments, they start twiddling and clicking their pens again. “Nothing’s happening,” Erin Sullivan, C’08, laments. Justin Flores, C’09, sighs. A big-bearded, dour-looking Darwin stares down at them from a portrait on the wall. “One of them keeps getting water,” Hollis Karoly, C’09, observes. “Maybe we should take it out next time.”

“Ploink-sleeee!” The group leans in and stares hard at the screen. “I think she’s stuck,” Sullivan wonders out loud, breaking the silence. “Sometimes they don’t react at all,” Flores sighs again. “When’s a good time to come to the aviary again? I’m not around Friday to Monday.”

“Oh, wait!” Karoly exclaims. “One flew over at 41 seconds!” A bird had flitted into the partition where the speaker is positioned. The experimenters scribble down the data and then turn back to the bird show on the little screen.

The students make up one of four teams that planned and carried out experiments in David White’s hands-on course, Research Experience in Animal Behavior. White, an assistant professor of psychology, is himself an animal behaviorist. It is his brown headed cowbirds (Molothrus ater) that Flores, Karoly and Sullivan were experimenting with at his aviaries at the Morris Arboretum, about 30 minutes from campus. The other research groups White supervised studied guppies, mallards and fiddler crabs. The 14 students met only twice as a class: once at the beginning of the semester to present their research projects and at the end to report and discuss findings. Their first papers resembled a grant proposal, a description of the methods they would use to test hypotheses. The second followed the conventions researchers use when submitting work to scientific journals.

“When you run an experiment yourself, all of a sudden it becomes real.” I’ve got to control for this. I’ve got to check that, I’ve done this completely wrong. And what is another possible explanation for this finding I’ve got?”

The cowbird group ran 13 playback trials to test female preference for the songs of familiar males and found a “statistically significant” preference – one not due to chance – for birds they knew. The females spent more time in the speaker chamber after familiar-male songs (60 percent) played than they did when songs of unknown birds were heard (40 percent). The results show females can discriminate among individuals based on song, and the fact that some birds are recognized as familiar suggests that cowbirds have memories of past interactions. Still, the experimenters could not nail down why cowbirds, who lay their eggs in nests of other species for them to raise, should show an interest in familiar birds, since there is no need to pair up and raise young. “We learned how simple experiments can be,” noted Flores, “and yet how complex the implications are from the results. You never get as complete a picture of the research process in a typical classroom.”

Elizabeth Shayne, C’09, of the fiddler crab group, characterized her experience this way: “Research is not just studying nature. It’s coming up with ingenious ways to disentangle nature while she’s fighting right back to remain tangled.”

Angela Yeh, C’09, a member of the mallard group, had a different take: “I’ve read many science papers throughout college, but I’ve never thought of writing one on my own. Designing and running experiments and writing papers similar to the ones we read has made me realize that doing science is not so out of reach.”
Inside the aviary, from left, Erin Sullivan, David White, Hollis Karoly, Justin Flores
In response to the ever-increasing scale of social, political and economic interaction across cultural and national boundaries, the School of Arts and Sciences identified cross-cultural contacts as a priority multidisciplinary initiative in its strategic plan. Now, funded by a $750,000 grant from the Andrew W. Mellon Foundation, the School is partnering with the University of Pennsylvania Press to develop a publication program that advances humanistic scholarship in this area.

“Penn is exceptional among its peers in the strength and breadth of its research and teaching on cross-cultural issues, and the School of Arts and Sciences is committed to further investment in this area,” says SAS Dean Rebecca Bushnell. “The Cross-Cultural Contacts Publication Program will energize humanities scholarship on the complex challenges facing today’s global society.”

The program comprises four major components: the cross-cultural contacts Distinguished Lecture Series, a human rights journal, books based on cross-cultural contacts courses, and a conference and publication fund. Scholars who participate in the lecture series will produce books based on their talks, and grant-funded University-wide conferences and seminars will also form the basis for a variety of publications.

The lecture series will kick off next April with Jonathan Spence, Yale’s famed scholar of interactions between China and Europe. The program’s first conference, called “Beyond Individual and Society: Mass Mediated Forms of Personhood,” is taking place this July.

A committee chaired by Ann Matter, Associate Dean for Arts and Letters and William R. Kenan, Jr. Professor of Religious Studies, and consisting of faculty and Penn Press representatives oversees the grant. This collaboration aims to capitalize on the synergy of the School’s and the Press’s unique strengths. “The real excitement about the program,” says Matter, “is that it allows us to expand our offerings in topics having to do with cultural diversity, always with an eye to making some part of the exploration available in printed form. We could never have launched anything so ambitious without the help of the Penn Press.”

The Penn Press has a long history of collaborating with members of Penn’s academic community, starting with the publication of W.E.B. Du Bois’ *The Philadelphia Negro: A Social Study*. Its extensive and growing involvement with the humanities at Penn include ongoing book series and journal projects with the University’s Center for Advanced Judaic Studies and the McNeil Center for Early American Studies.

“We’re fortunate to benefit from a Mellon grant,” says Penn Press director Eric Halpern, “that will deepen connections between Penn Press and the University’s academic core, that will make what we do even more relevant to Penn’s scholarly community, and that will do so in a way that promises to be sustained beyond the life of the grant. We’re grateful to the Mellon Foundation for giving us this welcome opportunity not only to serve scholarship in general but, especially, scholarship at Penn.”

—PR
The School of Arts and Sciences is Making History with its project to provide a fitting home for its top-ranked Department of Music. The $15.3 million renovation and expansion of Penn’s historic Music Building will ensure that the department has facilities that reflect its strength and integral role at the University.

Plans for the Music Building renovation include overhauling and redesigning the interior; restoring the exterior’s rich, orange terra cotta; building a new addition that will almost double the facility’s size; and creating light-filled, soundproofed and technology-ready teaching and performance spaces.

The new Music Building will better support the research activities of our renowned music faculty, facilitate learning for students across campus, and enrich the culture of performance at Penn.

Join us in Making History in the Arts and Sciences

Watch a video on the power of music performance at: www.sas.upenn.edu/home/campaign/music/video.html

For more information about the Music Building renovation, contact Michael Baker at bakerm@sas.upenn.edu or 215-898-5262.
If you’ve ever had an MRI or a mammogram or even an old-fashioned x-ray, then you’ve benefited from the work of a medical physicist. Since the discovery of x-rays in 1895, the application of physics to the diagnosis and treatment of disease has led to crucial—if not astonishing—advances in such fields as medical imaging and radiation oncology. Increasingly, these complex technologies are used to treat patients with ever-increasing precision and success. The growth in demand for these innovative tools has led to a shortage of clinical medical physicists who have the necessary expertise.

In 2006, the School of Arts and Sciences set about to meet this demand. The Master of Medical Physics Program, housed within the College of General Studies, has been revamped under its new director, Kate Spillane, with a completely redesigned curriculum that will provide students with classroom and laboratory, as well as clinical experience. The program will enroll its first student cohort in the fall, consisting of 11 outstanding students selected from 75 applicants.

The revitalization was made possible by the support and shared vision of Daniel Dosoretz, a practicing radiation oncologist and parent of Amy Dosoretz, C’99, Abigail Dosoretz, C’09, W’09, and Arie Dosoretz, C’04, M’10. Spillane says, “Dr. Dosoretz not only understands the need for well-trained master’s-level medical physicists, but he also recognized that Penn, because of its unique assets and resources like the world-class Roberts Proton Therapy Center, could prepare exceptionally well-qualified professionals.”

In addition to tapping the University of Pennsylvania Health System’s state-of-the-art facilities and the School of Arts and Sciences distinguished Department of Physics and Astronomy, the program will stress communication, ethics and responsibility—in both clinical and research settings—to promote the highest standards in patient care.

There are only 11 accredited medical physics degree programs in the United States. The College hopes Penn’s MMP program will become the 12th. Spillane says, “It is our intention to attract and enroll the best and brightest applicants and to provide them with the best well-rounded medical physics education available.”

To learn more about the Master of Medical Physics Program, visit http://www.sas.upenn.edu/CGS/graduate/mmp/ or contact the College of General Studies at cgs@sas.upenn.edu or 215-898-7326.

—AC
Lorraine Carrady Quinn’s family has been involved in film since 1951, when her father, Victor Carrady, first came to Puerto Rico and built movie theaters. He created what is today the largest cinema chain in the Caribbean. When her middle son, Gregory, stepped onto Penn’s campus as a freshman, he brought with him a deep-seated interest in all aspects of the industry and made his way to the door of Timothy Corrigan, a professor of English and Cinema Studies. When Greg introduced his mother to Corrigan, they immediately hit it off, and Cinema Studies at Penn suddenly gained a valuable ally who was eager to offer her own hard-earned experience and develop meaningful opportunities for the program’s students.

Head of real estate for the family company, Caribbean Cinemas, Carrady Quinn is an industry pioneer and thus provides cinema students with a terrific role model. Karen Beckman, the Elliot and Roslyn Jaffe Endowed Associate Professor in Film Studies and director of Cinema Studies, says Carrady Quinn “has come up with innovative and unique ways in which she can support the vision of the program by making first-hand experiences with the film industry available to our students.” For the past three years, she has offered a paid summer internship for a student at her headquarters in San Juan, providing airfare and an apartment. And she works to customize the internship according to the student’s interest, whether it be art cinema or the business side of the industry. Carrady Quinn also sends a student and faculty member each year to ShoWest in Las Vegas, the most prestigious and longest running trade show devoted to cinema exhibition and distribution. Both of these opportunities provide students with substantial knowledge and real experience, not to mention the benefit of a mentor who generously shares her true passion for film.

In addition, she and her husband, Christopher Quinn, have donated funds to name the Cinema Studies director’s office in Fisher-Bennett Hall. Last year, she hosted a benefit for the Penn Club of Puerto Rico at her new Fine Arts Café and Cinema, featuring Corrigan as a speaker. Most recently, the family endowed a scholarship in the College to support an undergraduate majoring in film studies. “As a Penn graduate myself,” Carrady Quinn says, “as well as my husband and now my son, I feel a great connection to the University and am eager to promote the Cinema Studies major in any way I can.”

“We feel really privileged to know her and to have her support,” Beckman says. “The opportunities she offers help Cinema Studies participate in Penn’s serious commitment to moving between theory and practice, which we feel is invaluable for our students as we try to expose them to the history of global cinema and the key issues facing film and media professionals today.”

For more information about Cinema Studies at Penn, visit http://www.cinemastudies.upenn.edu

CARIBBEAN CINEMAS
This is the history of a story. Or, more specifically, it’s the history of the letters that tell a story, fabulous, almost unbelievable — untold for more than 60 years.

Between the first and last letter there are over 300 others. They tell about North African tank battles, Italian stalemate and German concentration camps. These are the stories of my grandfather’s World War II experience as a volunteer ambulance driver with the American Field Service, an organization of young “college men” who were disqualified from military service but wanted to be part of the “excitement.” My grandfather never spoke a word about his story to anyone. These letters are my family’s first glimpse into a heroic service that gave little back but the horror of transporting the dead and dying.

In 1995, my grandfather died unexpectedly in a car crash. He left behind a box that contained every letter he had written to his parents between 1942 and 1945. There were more than 150 letters, many longer than five pages. His mother saved his bi-weekly correspondence along with the clippings and souvenirs he sent home to his four younger siblings. After he died, my mother placed the letters into another old box, where they remained.

In May 2002, another box arrived on our doorstep with 150 more letters – opened, still in the original envelopes, carefully preserved. These had also been written by my grandfather to a woman named Dickie, a childhood friend who later became his girlfriend. They grew apart after the war, but she had kept his letters. When Dickie was diagnosed with Alzheimer’s, her brother searched for our family so as to return them. After a year, he found my mother’s cousin, who still spent part of the year in the same community my grandfather and Dickie had summered during their youth. My mother carefully placed Dickie’s letters with the others and forgot about them for five more years.

One night, my brother and I went into the attic to look for something my mother had asked for. He suggested rummaging through the oldest-looking boxes, when we found the letters and recognized our grandfather’s handwriting. We forgot what we were supposed to be doing. My brother was more interested in the medals in small velvet cases, but I lifted out the envelopes, along with a Geneva card and my grandfather’s passport, and snapshots fluttered to the floor. My grandfather had captured moments in North African villages, the bombed-out countryside in Italy, and men posed around ambulances boldly marked with insignias of the British Eighth Army and riddled with bullet holes. Buried at the bottom was an envelope on which my grandfather had written “Belsen.” The photographs inside showed the last days of the camp where he had evacuated inmates for almost a month: the burning of the huts and the tearing down of barbed wire. No one in our family knew that he had been in Germany during the war.

In the summer of 2007, as we read and transcribed all the letters, I decided to write my senior honors history thesis about my grandfather’s experience with the American Field Service. My mother wondered if he would be proud or horrified to get such attention. He never talked about the war. She doubted if he would have wanted his story to be told because he knew many men had been braver and given far more than he. After 60 years, I told her, it is an unusual and important story. And, after all, history is about stories.

Alice Hickey, C’08, is a diplomatic history major who lives in New Hampshire.
Deserted Road

You can almost hear the silence pooled beneath the dawn bird calls in this photo by Jackie Nicole Rivera, C’09. The scene is a mangrove forest in Miami. Jackie, a fine arts major who concentrates in photography and graphic design, goes there often when she’s home. The practice of photography, she says, “allows you to notice and explore facets of existence that often go unappreciated. You begin to find yourself in the images that you collect.”
“The past is never dead. In fact, it’s not even past.”
-William Faulkner

To hear alumni tell stories about their student days at Penn, visit
www.sas.upenn.edu/pennbackthen