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To share your thoughts about anything you have read in this publication, please email gsaseditor@columbia.edu. Unless you note otherwise in your message, any correspondence received by the editor will be considered for future publication. Please be sure to include in your message your name and affiliation to the Graduate School of Arts and Sciences. Superscript is published twice annually by the Graduate School of Arts & Sciences and the GSAS Alumni Association.

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The professional development of our graduate students is of paramount importance as we help them prepare for the spectrum of careers in academia, government, the arts, finance, and public service. To that end, the Graduate School of Arts and Sciences has created various programs for our students to supplement their academic education with practical experience in writing NSF grants, being Lead Teaching Fellows, interning with senior administrators, and creating Individual Development Plans. I would like to highlight here the Teaching Scholars program, one that no doubt will be especially appreciated by many of our alumni.

Typically, only graduate students in the language and literature departments, and students teaching in the University Writing Program or the Core, have been able to do any independent teaching in their graduate career; even in those instances, students teach from a syllabus that has been created by a language coordinator or faculty committee, and in which there is little room for personal inflection on the course's content. Yet, our doctoral students clearly would benefit professionally from greater occasion for independent teaching before they enter the academic job market.

To address the absence of such opportunities, the Graduate School of Arts and Sciences piloted in 2012 the Teaching Scholars program, which offered advanced graduate students the opportunity to prepare and teach independently a course of their own devising. Working closely with their sponsors, Directors of Graduate Studies, and the staff of the Teaching Center, select students create a rigorous syllabus based on their own research specialty. Course size is limited to 15 undergraduate students. A sample of the titles of recent courses will give you a sense of the breadth of offerings and possibilities:

- Atoms and Eve: Exploring Science and Religion in America
- Epistemology: Investigation, Experimentation, and Value
- Empire and Ecology in the Anthropocene: An Environmental History of the Middle East
- Social Movements: From Political Protest to Insurgency
- The Fantastic in Premodern China: Ghosts, Animals, and Other Worlds

In addition to teaching content on which they are experts, these students hone a distinct pedagogical style, receive feedback from faculty observations, and avail themselves of teaching workshops with their peers.

The inaugural year of the program fielded five Teaching Scholars across three departments in the humanities and social sciences. We are delighted to note that in fall 2015, as the program enters its fourth year, there will be 26 new courses offered across 13 departments in all three divisions, including the natural sciences. The experience of creating and teaching seminar-sized classes in their area of expertise will provide a culminating experience to our students' pedagogical training, as well as enhance their opportunities and possibilities when entering a challenging professional market.

The Teaching Scholars program is merely one of the ways in which the Graduate School endeavors to improve the academic, professional, and personal lives of our students. We encourage you to let us know if you have any original or meaningful suggestions in this regard.

From the Office of the Dean

Andrea R. Solomon
Vice Dean and Dean of Academic Affairs
Graduate School of Arts and Sciences
Nestled high above the campus of the University of California, Berkeley, with a panoramic view of the Golden Gate Bridge, the Lawrence Berkeley National Laboratory has attained iconic status in two seemingly disparate worlds. For scientists, the “Berkeley Lab” is where world-changing discoveries are made, beginning with the founding director Ernest Orlando Lawrence, who proved, by building the cyclotron in 1930, that magnetic fields could accelerate and bend the path of particles to produce collisions, earning him a Nobel Prize in Physics in 1939. In our era, the Berkeley Lab’s fame has also reached into popular culture. Filmmakers have used the location to depict Starfleet Command in the first wave of Star Trek movies filmed in the 1980s and, more recently, the site where mild-mannered scientist Bruce Banner transforms into the Incredible Hulk.

Dr. Carl Haber, a senior scientist and Columbia alumnus (BCC, Ph.D. ’85, Physics), has spent his entire 30-year career as a particle physicist at the Berkeley Lab. His career trajectory has bypassed the classroom’s pulpit, placing him instead alongside collaborative teams of scientists working at Fermilab in Batavia, Illinois, and as a member of the Berkeley Lab’s ATLAS Project, developing silicon particle detectors for the Large Hadron Collider at CERN in Geneva. Yet Haber, too, has had an impact on popular culture. In addition to his work on the ATLAS Project, Haber is widely known as one of the world’s premier audio preservation...
specialists. Around the world, archivists and sound historians reach out to Haber, knowing that he and his colleagues have restored long-lost recordings by Thomas Edison, Alexander Graham Bell, Jack London, Howard Hughes, and even Janis Joplin.

This doesn’t mean that Haber has switched careers. On the contrary, his work on sound restoration grew directly out of insights and instrumentation developed on the ATLAS Project, where he remains as a senior specialist. “As physicists,” he explains, “we use detectors much like cameras to create pictures of the interaction, creation, and decay of new types of matter, such as the Higgs particle.” In 2000, Haber was already wondering where else the Berkeley Lab might apply its well-developed approach to tracking the precise movement of trace particles. The answer came while he was stuck in traffic and listening to the radio.

During the broadcast, author and Grateful Dead enthusiast Mickey Hart was sounding the alarm for a wide range of recordings made during the last century that were in danger of disappearing. Describing the deteriorating and fragile state of lacquer discs and wax cylinders—the predominant recording media until 1950, when magnetic tape was widely adopted—Hart bemoaned the problems facing conservators. Many of the surviving artifacts were so fragile as to be unplayable. To hear these recordings was to risk destroying them.

Haber wondered if the ultra high-resolution optical scanning technology already in use in the ATLAS laboratory could be applied to this problem. At the time, the technology was being used to help develop very precise, camera-like detectors for eventual use in the CERN particle collider—detectors that could picture something as infinitesimal as the vertex of an exploding particle (the point at which a once-whole particle explodes into traces or lines). With such a willingness to engage and so much airplane travel, he came as no surprise that the first time I reached out to Carl Haber by telephone, he had laryngitis. The maestro of sound restoration had temporarily lost his voice. Despite the scratchy tone, Haber was patient and gracious, taking great care to explain the science behind his experiments and discoveries. Offering a tour of his laboratories, he said, “it’s my responsibility. Taxpayers make all this possible.”

On a spring day in Berkeley, the tour begins on the sixth floor in Haber’s office. In the antechamber, early prototypes of the optical imaging station, complete with differently-sized disc platforms mounted on plywood and protruding spindles and adjustable arms, fill the shelves. Within the office, where two shaded windows obscure a view of Oakland’s downtown skyline, every surface of three desks is covered with stacks of documents and reports. There are boxes of untested, still-wrapped energy bars, gifts from the manufacturers of precision optical equipment. Between the windows, Haber has pinned a photographic gallery of scientists, artists, and musicians who inspire him. Some are obvious: Enrico Fermi, Albert Einstein, and J. S. Bach. A few others—Andy Warhol?—require explanation.

Haber, a compact man with a good dusting of gray in his close-cropped hair and beard, laughs as he offers a Fig Newton or a slice of apple to his visitor. “Warhol reminds me of the trips I’d take into the city from Queens in the 1970s,” he says. “I was not focused on science in high school. I was oriented toward art and journalism. People like Warhol and Patti Smith were spectacular. Also, Warhol’s work in Pop Art, and his assertion that ‘in the future, everyone will be famous for 15 minutes,’ was very prescient about the state of our current digitized culture.”

The switch to physics, Haber explains, came during his freshman year at Columbia. Intending to major in bioengineering, he became interested in quantum mechanics thanks to Theodore Talbot, a graduate student preceptor who taught the history of science as part of Contemporary Civilization, one of the school’s Core Curriculum courses. After taking a summer job in the Columbia physics lab, Haber found himself hooked.

“Columbia’s Physics Department was friendly and welcoming,” he recalls. “I enjoyed tasks like drawing up schematics, taking measurements, compiling data, and building equipment. And the proximity of Columbia’s star professors and Nobel Prize winners just...
For years he discussed the idea of sound preservation via optical scanning with his lab colleagues. Some said it would never work. Others brought in wobbly old 78 rpm discs. Haber even made a bet with his supervisor, predicting their success would lead to an interview on NPR.

Finally, on a weekend in 2002, one of Haber’s postdoctoral colleagues, Vitaly Fadeyev (who continues to work on the ATLAS Project at UC Santa Cruz), wrote a bit of computer code. He redirected the movements of the high-resolution microscope to scan the surface of an old 78 rpm shellac disc by the Weavers, a group of folk singers prominent in the late 1940s through the early 1960s. On Monday, Fadeyev played an audio clip of their hit “Goodnight, Irene” for Haber.

“That was a magical moment,” Haber recalls. With a tip of the hat to Fadeyev’s effort, he named the technology (consisting of the scanning platform, optical equipment, digital metrology analysis, and customized software) “IRENE,” an acronym for “Image, Reconstruct, Erase Noise, Etc.” After further experiments, Haber and Fadeyev published their findings in the Journal of the Audio Engineering Society in December 2003. With this proof-of-concept blueprint in hand, Haber launched an outreach campaign, emailing the article to cultural archives and preservationist institutions in the U.S.

“Not many people will respond to a cold email,” he says. Most archivists, Haber continues, thought IRENE “was just another attempt to bounce a laser on the object.” However, the chief of the Preservation Directorate at the Library of Congress gave the paper to Peter Alyea, a digital preservation specialist. “His father was a physicist, so he understood what we were talking about,” Haber laughs.

Alyea, who read the paper during his lunch hour, says he realized that Haber had identified a process that would improve the conservation process significantly. He redirected his efforts toward that goal. Alyea, who read the paper during his lunch hour, says he realized that Haber had identified a process that would improve the conservation process significantly. He redirected his efforts toward that goal. Alyea, who read the paper during his lunch hour, says he realized that Haber had identified a process that would improve the conservation process significantly.
Clar de la Lune” until 2008, when the material was analyzed by the IRENE software.

In 2009, Smithsonian curator Carlene Stephens reached out to Haber and his team to restore experimental recordings created at the Volta Lab by Alexander Graham Bell in the late 19th century. The material, curated for an exhibit called Hear My Voice: Alexander Graham Bell and the Origins of Recorded Sound, is now on display at the Smithsonian in Washington, D.C., and available online.

AN INTERNATIONAL COLLABORATION

While the MacArthur grant singled out Haber for recognition, he takes care to emphasize the collaborative nature of the audio project. Returning to the sixth floor, Haber seeks out Earl Cornell. A tall, thin man who works in the Berkeley Lab’s Engineering Division, Cornell is Haber’s primary collaborator on the IRENE project. Haber also cites Professor Ottar Johnson at the University of Applied Science in Fribourg, Switzerland, who had developed a different photographic approach to preserving disc recordings. Their collaboration, which began in 2006, has resulted in some 40 Swiss engineering exchange students coming to work in Haber’s lab.

One of them is Simon Marti, an exchange student from the Zurich University of Applied Sciences at Winterthur. Marti, who is working on his master’s thesis, is bent close to the computer screen. There are whiteboards on one wall, a row of computers, and shelves with boxes of wires, bolts, and extra power sources for hands-on tinkering. Resting on a table in the far corner is the model itself—the lab’s most current iteration of assembled tools and scanning equipment that IRENE comprises.

Next to him is a box of sharp, broken record pieces, old lacquer ‘78s that were too brittle to survive intact. Marti has scanned each piece separately and is using customized software to stitch the images of audio wave patterns into a continuous whole. “Where the edges line up is still rough,” he admits, asking Haber’s advice on ways to smooth out the assembled image.

After brainstorming with Marti, Haber walks over to a wall cabinet and pulls out a box of recording artifacts—pre-war transcription records, where the lacquer coating is either peeling away, bubbled from the surface, or separated entirely with the aluminum core exposed. “By photographing the entire surface of a recording artifact,” he says, “IRENE can restore some materials facing even this level of deterioration.”

PROJECTING INTO THE FUTURE

Haber’s team has built five IRENE models. One, of course, is located in Haber’s sixth-floor lab. The Library of Congress has two models, with one in Washington, D.C., and the other at the National Audio Visual Conservation Center in Culpeper, Virginia. The fourth IRENE, housed at the Northeast Document Conservation Center in Andover, Massachusetts, is available for use by the public for a small fee. The fifth model is in the Roja Muthiah Research Library in Chennai, India. A sixth will be installed at UC Berkeley’s Moffitt Library for the next project Haber will embark on. Working under the auspices of the Hearst Museum of Anthropology at UC Berkeley, Haber and his team will restore some 2,700 recordings of Native American speech and song made on wax cylinders in the early 20th century. Funding for the UC Berkeley project will come from a joint National Science Foundation and National Endowment for the Humanities initiative called “Documenting Endangered Languages.”

To build each new IRENE requires an estimated $200,000 in equipment, time, and labor. That doesn’t cover continued support or additional research. To pay for that, Haber has put funds from his MacArthur Fellowship into the Berkeley Experimental Particle Physics Center on the UC Berkeley campus. The Center, which has an interdisciplinary mission, will also work on audio preservation. He cites the expenses incurred in December 2014 when he traveled to Chennai to inspect its model. Humidity and condensation had damaged the instrumentation, and Haber insisted on repairing it. The funds came out of his MacArthur prize.

Haber divides the great untapped collection of wax, shellac, or lacquer-based media in the world into three broad categories: commercial recordings from the turn of the century comprising perhaps one million unique titles; experimental recordings made by inventors and pioneers in the late 19th century (the focus of Haber’s past decade of restoration work); and field recordings made by researchers, anthropologists, and ethnographers between 1890 and 1950. In this last category, Haber estimates there might be 100,000 wax cylinders and transcription discs to unlock in the United States alone. “These field recordings represent our greatest opportunity,” he says. “Are there millions of undiscovered commercial recordings capable of changing our conception of the world? Probably not. But there are many items out there that only researchers know about. And these scholars are only beginning to explore what it means to have this sonic heritage available.”
As a child, Rae Wynn-Grant fell in love with nature through television, watching shows on PBS. She marveled at the large charismatic species—lions, jaguars, tigers—and the exotic places in which they lived. She dreamed of hosting a nature show, traveling to these faraway places and seeing these wild creatures. But that felt impossibly far away. Growing up in the heart of San Francisco, she was within driving distance of the backwoods of Yosemite, but her parents were not the "outdoorsy" type, and the family did not spend much time in nature.

Being a city kid was not the largest obstacle in her mind, though. Wynn-Grant recalls that none of the hosts on PBS when she was a child were anything like her.

"The hosts of these shows, at least back then, were the same kind of person every time," she says. "It would be an older white man—none of the things I was, as a young black female. Often not even an American, but someone with a British accent or an Australian accent, who seemed very familiar with these places."

She hasn't gotten a nature show quite yet, but she seems well on her way. Wynn-Grant recently defended her doctoral dissertation in the Department of Ecology, Evolution, and Environmental Biology at GSAS, but she has been studying environmental science since her freshman year at Emory University in Atlanta. Wynn-Grant recalls attending a department fair soon after arriving at Emory and being approached by a black professor.

"Even after a few moments of talking about my potential interest in science, I remember very distinctly he said, 'I really think you should try environmental science. It would be right up your alley. We'd love to have you in the department.'"

It was a pivotal moment in Wynn-Grant's academic life. She says it was then that she understood there was a place for someone like her in environmental science. "He really saw me and listened to me, and I believed him," she says of the professor.
After graduating from Emory in 2006 with a degree in environmental studies, she took a job as a research assistant at the World Wildlife Fund in Washington, D.C. She spent two years at the fund and then moved on to the Yale School of Forestry, where she received her master’s in environmental science. In 2010, she arrived at Columbia as a doctoral student. She has spent the past five years commuting between Morningside Heights and the Nevada backcountry, where she studies the effects of human activity on the health and movement of black bear populations.

Black bears need a lot of space to live. Their “home ranges”—the territory they occupy across a lifetime—can encompass more than 40 square kilometers. Wynn-Grant chose to study black bears because their need for space makes them particularly susceptible to the impact of human development. They are a canary in the coal mine, of sorts. And unlike many larger species, black bears are not endangered, which makes it far easier for a graduate student to study one up close.

Wynn-Grant’s research involves plenty of time in front of a computer analyzing data, but also a lot of time in the mountains carrying bear traps and a tranquilizer gun. Every year, she spends months in the Lake Tahoe Basin hiking isolated mountain ranges—sometimes with a small team, but often all alone. In order to tag a bear, Wynn-Grant digs a hole and places a trap, which she baits with fragrant food such as smoked fish or peanut butter. When a bear approaches and reaches into the hole, it releases a lever that snare the bear’s paw in a loop of thick cord that is fixed to a sturdy tree. This kind of trap is safe for the bear but not entirely reliable. Sometimes the bear will escape, but every few days or weeks, one will be trapped. Wynn-Grant checks her two traps each day to ensure that no bear is left untagged. Wynn-Grant is able to chart the movement patterns of the local population of black bears, giving her insight into how human activity impacts the animals. She has found that bears in the Lake Tahoe Basin no longer settle where there are significant levels of human activity—not only urban sprawl and busy highways, but also ski resorts and forest campuses. “Bears are actually changing how they use the landscape and avoiding certain areas because people are there, but which might otherwise be high-quality habitat for them,” she says.

There is also the problem of garbage. Bears like an easy meal, especially when they are storing energy for their winter hibernation. As humans encroach upon their habitat, bears are attracted to the vast quantity of food waste that humans produce. Venturing out of their ranges in search of this food is perilous for black bears. They may be struck by cars along the highway or captured and relocated by wildlife authorities who are called in to handle a “problem bear”—one that is wandering in populated areas, often rummaging through trash cans.

These encounters are happening all over the country, not just in Nevada. New Jersey, Colorado, California, New York—anywhere there is human activity in bear country, the bear population is threatened, sometimes existentially.

For her dissertation, Wynn-Grant made recommendations on how humans and bears can better coexist in a landscape they increasingly share. Drawing on literature indicating that waste handling has a major impact on human-bear conflicts, she suggested the implementation of better waste management techniques, such as the use of bear-proof containers for garbage. She also recommended highway overpasses and underpasses for wildlife, which allow bears to move across their ranges without crossing treacherous roads.

“As human populations expand and we find ever more creative ways to impact the landscapes around us, we are increasing the potential for conflicts between humans and non-human animals,” says Eleanor Sterling, chief conservation scientist at the Center for Biodiversity and Conservation at AMNH, and a thesis adviser of Wynn-Grant’s. “Rae not only explores theoretical issues regarding carnivore habitat use and black bear interactions in human-dominated landscapes, but she is also committed to thinking about management applications of her work to reduce the conflict.”

This summer, with her graduate work completed, Wynn-Grant will begin a postdoctoral fellowship at the Center for Biodiversity and Conservation at AMNH, where she will continue her research on the impact of human activity on black bears. She will also serve as a mentor in the museum’s Student Research Mentorship Program and join the museum’s diversity initiative. In this role, Wynn-Grant will advance a cause that has been a focal point of her academic career: promoting diversity in environmental science.

Scholars like Wynn-Grant notwithstanding, environmental science remains a disproportionately white and male field. A 2011 study from the U.S. Census Bureau found that 74.9 percent of the more than three million Americans who reported holding a bachelor’s degree in biological, agricultural, and environmental sciences were white. Only 5.7 percent were black, and 5.5 percent Hispanic or Latino, compared with 13 percent and 17 percent for these groups, respectively, in the general population. Women accounted for just over 45 percent of degree holders.

As a founding member of the diversity committee of the Society for Conservation Biology, one of the largest and most influential organizations in the field, Wynn-Grant is striving to challenge what she describes as this “extreme underrepresentation of black and Latino students or practitioners” in the field. The committee is developing strategies for exposing high school students from underrepresented backgrounds to conservation biology and connecting them with research opportunities.

“Studying the environment is for everybody,” Wynn-Grant says. “It is really important to make sure that more people are exposed and understand that there are opportunities.”

As Wynn-Grant leaves Columbia, she is keeping her mind open about where her research will ultimately take her. She is also holding on to a childhood dream. “In my heart of hearts—I’m going to be completely honest—I have never, ever been able to shake the dream of wanting to host a wildlife show,” she says. “I would love to expose more people, like my younger self who was watching these shows, to environmental science.”
GSAS Celebrates Graduates in 2015 Convocation Ceremonies

On May 17, GSAS celebrated the Class of 2015 in two ceremonies honoring master’s and Ph.D. candidates.

More than 400 students in fields ranging from African-American Studies to Statistics participated in the M.A. Convocation ceremony, which featured remarks by Alexandra Schultz, M.A. ’15, Anthropology, and keynote speaker Carl Haber, Ph.D. ’85, Physics.

The Ph.D. Convocation ceremony recognized more than 300 graduates earning the University’s highest degree. Ari Ezra Waldman, Ph.D. ’15, Sociology, gave the student address, while Professor Sean C. Solomon, director of the Lamont-Doherty Earth Observatory, delivered the keynote address. In addition, the Graduate Student Advisory Council (GSAC) Faculty Mentoring Awards were given to Professor of Sociology Karen Barkey and Associate Professor of Sociomedical Sciences Helen-Maria Lekas. The Presidential Awards for Outstanding Teaching were given to Spencer Brucks, a Ph.D. student in Chemistry, Elham Seyedsayamdost, Ph.D. ’15, Political Science, and Christine Webb, Ph.D. ’15, Psychology.

The texts of the two student addresses are reprinted in this issue of Superscript.

Alexandra Schultz, M.A. ’15, Anthropology

Dean Alonso, Provost Coatworth, Executive Vice President Madigan, members of the faculty, administration, and staff, family, friends, and fellow graduates...

I have a confession to make—I didn’t step too far outside the box when it came to choosing a topic upon which to speak today. Some might even accuse me of unoriginality. Today, I would like to speak to you about education.

I imagine a silent groan has just erupted inside many of you: How predictable! Yes, we’re bombarded with newspaper articles on the topic: links between education and lower rates of HIV; correlations between schooling and the increased married age of young women in poverty-stricken countries. Politicians wax lyrical. In Australia—where I’m from (I’m sure you figured that out already)—our prime minister, Tony Abbott, claims that the key to overcoming the atrocious disparities between indigenous and non-indigenous Australians is education. He says, “It’s hard to find work without a basic education, and it’s hard to live well without a job.”

Indeed, for most people here today, quotes regarding the power of education have most likely peppered every event that you have attended in your academic life. I’m sure that you have heard, “It is the mark of an educated mind to be able to entertain a thought without accepting it” (Aristotle). Or, “Education is the most powerful weapon which you can use to change the world” (Nelson Mandela).

We are told that education is the key to better health outcomes and reduced crime, to social cohesiveness, personal well-being, community well-being, health literacy, computer literacy, and, of course, “literacy-literacy”...

I know—you get it! But do you?

When I sat down to write this speech in the hope that I might be selected to speak today, I pondered the succinct instructions for its creation: “It should be no longer than 1,250 words, and it should reflect on your experience as a student and your perspective on the future.”

My experience. As a student. And I had to reflect, because I left Columbia to return home to Australia almost twelve months ago.

When I first thought back, I remembered glorious snow days: days upon which walking through the gates into Columbia was akin to entering an ethereal, blanketed, winter wonderland. And then I remembered how jaded I became when I realized that snow days were really about being sprayed with icy taxi
Gifted as we are with the power of language, human beings have learned to manipulate words. Some are evocative and forceful and hold great value. “Freedom!” Others lie esoterically and almost comically off the tongue: “phenomenology.” However, it is a great travesty that others, like “education,” seem to have been hollowed out of all meaning, overused. Like a word that as a child—in some kind of a precocious cognitive experiment—you’d repeat over and again just to experience the odd sensation of it becoming completely devoid of meaning to your brain. “muffin, muffin, muffin, muffin, muffin.”

I should like to make an attempt today to bring back a little of the word’s meaning to us all—“education,” not “muffin”—in the hope that we might comprehend the great accomplishment and privilege that we are here to celebrate.

Let’s begin with language. Language, arguably, is the first step on a road to formal education, and it shapes us intimately and profoundly. It wires our brains in myriad wonderful, terrible, and irreversible ways. It shapes what we see and how we think. It gives us the ability to retain thought, memory. It gives us the ability to share thought. Language defines our perceptive abilities. For example, having a word for a particular color allows us to more accurately “see” that color. Some languages have limited categories of color, and consequently, speakers of such languages have more difficulty discerning between variations. If the word for green does not exist in your vocabulary—it is subsumed under “yellow” and “blue”—you will find it more difficult to distinguish what English speakers call “green” from other “yellows” and “blues.”

More amazingly, however, as we learn new languages, we also acquire the perceptive abilities that come with them. It’s exciting to think that “out there” are not only new ways of thinking, but truly new ways of experiencing the world. Language is fortunately denied to statistically few who come into this world. Nonetheless, the same cannot be said for literacy. To read and write plays an almost incomprehensible role in shaping and reshaping our brains, in dictating the ways in which we communicate with the world, each other, and indeed ourselves. Imagine not being able to write a shopping list? A note to a loved one? Imagine your ability to communicate limited to the here and now. Not only has literacy allowed societies to function in novel and increasingly complex ways, it has allowed us to expand thought outside of our minds, our inner workings to spill onto pages and loose into the world. Indeed, Walter Ong tells us, “Without writing, the literate mind would not and could not think as it does.” More than any other single invention, writing has transformed human consciousness.

Only 74 percent of the world shares the gift of literacy with the graduates before me. (But formal education, of course, extends far beyond mere functional literacy.) And in 2012, 58 million of the world’s children were not enrolled in school. While I’m determined not to quote statistics at you, I do wish to highlight that at every stage of your education, you became increasingly differentiated from those you left behind. Every skill that you acquired reshaped your brain and created new ways for you to see the world. You discovered that there were things that you never knew you did not know. And then you learned them. You became one of approximately a third of Americans to hold a bachelor’s degree, and now you are one of only 8 percent to hold a master’s. And that does not take into consideration the exceptionality of the institution at which you have done so. You are indeed unique, and your brain is irreversibly changed because of it.

A quarter of the world cannot read the label on a medicine bottle, or enroll their child in school. A quarter of the world does not live with electricity. A quarter of the world does not have access to a toilet. And then you learned them. You became a member of a society that has allowed you to converse with the great minds of human existence. You have knowledge, and so you also have power. And you got through the “thing” so presumably you also have fortitude. You have the privilege of possessing an exceptional education, and therefore, an exceptional mind.

The only question remains: what will you do with it?

Prior to Columbia, Alexandra Schultz earned a B.A. with First Class Honours from the University of Adelaide. She currently works at the Australasian Centre for Rural and Remote Mental Health as the manager of indigenous programs.

Ari Ezra Waldman, Ph.D. ’15, Sociology

Dean Alonso, Provost Coatsworth, Executive Vice President Madigan, members of the faculty, administration, and staff, family, friends, and fellow graduates...

It is an honor to speak with you today; indeed, a privilege second only to the honor it was to work alongside you this last several years. It is true that a Ph.D. is as much about the people we meet as it is about the books we read and write. I’ve met scientists making drugs smarter and more precise so they attack microscopic viruses and not the cells around them. Among us is an anthropologist who is doing groundbreaking research on cross-cultural exchange. And our cohort includes a social scientist who will influence early childhood education with her work on how children learn to read.

But although our diversity of expertise will open myriad doors, our singular journey unites us in an imperative to stand in defense of education. Unfortunately, that education is under attack from a culture and political class that are devaluing intelligence in general and a liberal arts education in particular.
Rick Scott, the conservative governor of Florida, said that his state doesn’t “need any anthropologists.” Floridians, he said, need to focus solely on math and engineering classes. The governor of North Carolina, Pat McCrory, who gutted his state’s education budget, called certain liberal arts classes “worthless.” Wisconsin’s Governor Scott Walker recently cut $300 million from his state’s university system, calling on faculty to just teach more classes and calling for curricular changes that emphasize “getting jobs.” And the left is not innocent, either. In his effort to expand vocational education opportunities, an otherwise noble goal, the President singled out art history as, perhaps, an “unnecessary” distraction.

The argument goes something like this: if the United States ever hopes to compete against technology powerhouses in other parts of the world, and if it ever hopes to “win” the economic wars of tomorrow, we have to train people for the technology jobs to come. In times of scarce resources, when we are all asked to do more with less, we do not have the luxury, these critics say, of a broad-based liberal arts education. It’s just not practical, and it doesn’t get people jobs.

I do not deny that American education can do better by its students, their parents, and the society it serves. Nor do I deny that education in science and technology is essential for our future. Like all of us here today, STEM [science, technology, engineering, and mathematics] education, and the liberal arts have to work together if our society’s goal is to educate and foster creative thinkers who come up with the next big idea rather than create mere functionaries who are content to implement the last one. Without such freethinking liberal arts majors, for example, we wouldn’t have YouTube or Facebook, smartphones or wind turbines, SoulCycle or Spanx. The technology for some of these innovations may come from STEM education, but the ideas, the philosophies, the sociological, anthropological, and cultural brainwork are from a far wider liberal arts education. Together, we need to stand up for the value of a broad liberal arts education because no one else will. Industry trade associations will continue to lobby for more trained bodies in their fields. Politicians will continue to cut budgets to fund whatever project or tax incentives that suit their ideologies. And interest groups will continue to press for specific changes that affect their constituent groups. Our society needs to have many of the debates these advocates will inspire. But someone must stand for the critical thinking that makes those debates possible. That responsibility falls to us.

We are the best examples of what broad-based learning can create. And I’m not just referring to the sociologists or psychologists, historians, and anthropologists among us. Consider the MIT technologist who spent years learning theory before putting it into action to create BuzzFeed. And the engineer who studied a problem of urban construction, assessed the city’s needs and future constraints, and challenged his industry’s norms to come up with a miracle of urban revitalization. We call his invention the High Line. And the literature student who did nothing less than revolutionize computing, technology, and daily life. His name was Steve Jobs.

We are all products of a comprehensive liberal arts education that pushed us to innovate in our chosen fields. But with this kind of education under fire, we must now become its advocates. We must do this so future generations can learn and think for themselves. Thank you, and congratulations.

Ari Ezra Waldman is currently an associate professor of law and director of the Innovation Center for Law and Technology at New York Law School, where he teaches intellectual property, privacy, Internet law, and torts. Before pursuing his Ph.D., he earned a J.D. from Harvard Law School in 2005 and a B.A. in history from Harvard College. His scholarship centers on the law and policy of Internet social life, with particular focus on privacy, cyberharassment, and online bullying.
Dean’s Award for Distinguished Achievement

Each May, the Graduate School of Arts and Sciences presents the Dean’s Award for Distinguished Achievement to two alumni. The award celebrates exceptional Ph.D. and M.A. recipients who have exerted a profound impact not only in academia, but also in the larger world. Awardees are recognized as models of what a Columbia graduate student can accomplish.

The recipients of the 2015 Dean’s Award for Distinguished Achievement are Robert H. Grubbs, Ph.D. ’68, Chemistry, and Jacques Pépin, M.A. ’72, French and Romance Philology.

Robert H. Grubbs

A native of Kentucky, Grubbs came to Columbia University to conduct research with Professor Ron Breslow in the Department of Chemistry. After earning his Ph.D. in 1968, he joined the faculty of Michigan State University in 1969, then moved to the California Institute of Technology in 1978, where he is now the Victor and Elizabeth Atkins Professor of Chemistry.

Grubbs’s research has made significant contributions to the field of organic chemistry. In 2005, the Royal Swedish Academy of Sciences awarded him and two others with the Nobel Prize in Chemistry for the development of the metathesis method in organic synthesis. Prior to their work, metathesis was a poorly understood chemical reaction. Grubbs developed powerful new catalysts for metathesis that enable custom synthesis of valuable molecules, including pharmaceuticals and new polymers with novel properties. Metathesis has led to industrial and pharmaceutical methods that are more efficient, simpler, and environmentally friendly.

In addition to his scholarship, Grubbs has mentored several hundred students and postdoctoral fellows in his career. He has been elected to the American Academy of Arts and Sciences, the National Academy of Sciences, and the National Academy of Engineering. He has been recognized with many prestigious awards in addition to the Nobel Prize, including the Franklin Institute’s Benjamin Franklin Medal, the American Chemical Society’s Arthur C. Cope Award, and the American Institute of Chemists’ Gold Medal.

Jacques Pépin

A native of France, Pépin served as the personal chef to three heads of state, including Charles de Gaulle, before moving to the United States in 1959 and becoming the director of research and new development for the Howard Johnson Company. He valued his academic pursuits, earning a bachelor’s degree from Columbia University in 1970 and continuing his studies at the Graduate School in French and Romance Philology, where he received a Master of Arts in 1972.

In the decades since, Pépin has built a reputation as an acclaimed chef, television host, prolific author, and respected teacher. His many popular programs on public television include Jacques Pépin’s Kitchen, Essential Pépin, and Julia and Jacques Cooking at Home, which he co-hosted with Julia Child and which won a Daytime Emmy Award in 2001. As an author, he has published numerous best-selling cookbooks and written columns for The New York Times and Food & Wine magazine. He also teaches the next generation of chefs as the dean of special programs at the International Culinary Center in New York, and as the co-founder of the Master of Liberal Arts program in gastronomy at Boston University’s metropolitan College.

In addition to the Emmy, Pépin has earned many accolades in his career, including three of France’s highest honors: the Chevalier de l’Ordre national de la Légion d’honneur des Arts et des Lettres, and du Mérite Agricole. He is also the 2005 recipient of the James Beard Foundation Lifetime Achievement Award.
Karnit Flug was appointed Governor of the Bank of Israel in 2013. She credits her Columbia education with providing a springboard for her career in economic policy.

After living and studying in Israel for many years, what brought you to Columbia University for a Ph.D.? After finishing my undergraduate and master’s at the Hebrew University of Jerusalem, I wanted to broaden my exposure to other excellent academic institutions. Columbia University presented me with a winning combination: academic excellence, particularly in the fields I was interested in (labor markets and international trade), living in New York City, and a fellowship that made all of this possible.

How would you describe your experience at Columbia and in New York City in the early to mid-1980s? Student life was very exciting, with students from all over the world forming close friendships, and studying was intense and stimulating. New York City was exciting, but also a bit overwhelming and even scary. There were streets and parks just near the University that were exciting, but also a bit overwhelming and even scary. I particularly enjoyed walking around the University in all directions.

Your dissertation was titled “Government Policies in a General Equilibrium Model of International Trade and Human Capital.” Can you provide a synopsis? My dissertation dealt with the effects of government policies on the pattern of international trade. In particular, I developed a theoretical model to examine the effects of policies such as minimum wage and subsidizing education on the formation of human capital, and in turn on the type of products a small open economy will specialize in. In the empirical part of my dissertation, I tested implications of the theoretical model using cross-country data. I estimated the effect of minimum wages and government spending on education, on the skill composition of the labor force in each country, and on the skilled/unskilled labor ratio embodied in exports and imports of each country.

Were there any Columbia professors who were particularly influential for you as a young scholar? In both fields—international trade and labor economics—the professors who were most influential in my studies were Jacob Mincer, Ronald Findlay, and Jagdish Bhagwati.

When you first joined the Bank of Israel in 1988, you worked in the Research Department, publishing papers on the topics of macroeconomics, the labor market, and social policies. In 2001, you were appointed director of the department, a position you held for ten years. Would you say that a passion for economics research, both theoretical and empirical, has been a continuous thread throughout your education and professional life? My interest in economic policy started with the type of questions I chose to explore in my dissertation, continued with the choice of my first job as an economist with the IMF, and was also reflected in my professional life at the Bank of Israel. My work was always focused on economic policy questions, earlier on as a researcher and now as a policy maker. The research background provided me with the analytical tools to help understand the possible channels through which policies affect outcomes.

The President of Israel appointed you Governor of the Bank of Israel in November 2013. What have been your highest priorities since assuming the role? Since the global financial crisis in 2008, the role of the central bank of a small open economy like Israel has become very challenging because of the low global growth (and consequently low global demand for the products of the small economy) and an extremely accommodating monetary policy applied by all major central banks. Thus, the main priority has been to provide the stable conditions for the economy necessary for growth and employment within the stormy global environment. Another role I carry as Governor of the Bank of Israel is to provide economic policy advice to the government. In such a capacity, my main priority has been to focus on policies that could foster sustainable inclusive growth. This means policies that would improve the skills and employability of individuals from groups in society that tend to have a low participation rate and low earning capacity.

What do you enjoy doing in your free time? I don’t have much of it, but when I do I enjoy reading, walking, and cooking.

Do your travels ever bring you back to New York or the United States? Yes, I do get to NYC once in a while, and I enjoy that very much. I particularly enjoy walking around Columbia and seeing what has changed (the area has become much cleaner and safer) and also seeing some of the things that have remained the same.

Is there anything else you would like to add? This is an opportunity for me to say a big thank-you to Columbia University for providing me with the foundations on which my professional career has been built.
Kevin Elliott recently deposited his dissertation in political science. He honed his teaching craft by taking advantage of various professional development opportunities at Columbia, including the Lead Teaching Fellow, Summer Teaching Scholar, and Core Preceptor programs.

**Ph.D. ’15, Political Science**

Interview by Andrew Ng

Kevin Elliott

How did this passion for teaching come about?

It started with thinking about the difference that political theory can make in the world. I realized that educating students can make that impact—if I can help them gain a more critical perspective as they go out and shape the world, that is how a political scientist can make a difference. Plus, I’ve always liked to instruct people—my mother called me “Mr. Know It All.”

In the 2014–2015 academic year, GSAS started a pilot program called the “Lead Teaching Fellows” (LTFs). You were one of two LTFs appointed in the Political Science department. Tell me about your experience as part of this inaugural cohort.

The main thing we do is organize events in our departments that focus on teaching. It allows me to share the pedagogical insights that I’ve had, specifically in designing successful courses, writing good syllabus, and incorporating assessment. I had talked about these topics before with my peers, but not in any formal context. Also as an LTF, I attended events at the GSAS Teaching Center, which helped improve my performance as an educator of educators. In the end, it’s this type of training that aspiring university professors will need to train future Ph.D. students.

Did you take advantage of any other resources at the GSAS Teaching Center?

I attended a “Presentation Skills for Educators” workshop that was run by an improvisation artist [Jen Oleniczak]. The workshop helped me find my verbal tics. I discovered that I often speak too quickly, and that I need to slow down. She put an emphasis on the physicality of presentation. She corrected people’s posture (which aids in the volume of one’s voice), and she prevented people from wandering or rocking back and forth as they spoke. It was helpful to be made aware of how people present themselves physically.

I also attended a “Collaborative Learning” workshop, which focused on successful strategies for structuring group work and the rules to give. The Core class that I teach was doing group work at the time, so I was looking for tips and strategies.

As a Summer Teaching Scholar in 2013 and 2014, you had the opportunity to teach courses of your own design. How was that experience?

It was very rewarding. I had a number of non-traditional and international students in the summer who brought a variety of life experiences, extraordinary insight, and different perspectives to our political theory discussions. Teaching courses that I designed myself is a good way of testing how I understand the topics. By seeing how my students respond, I can gauge if my understanding is a natural way of thinking about the issues. You only know by trying. It closes the gap between scholar and teacher, research, and pedagogy.

When one of your advisers, Melissa Schwartzberg, received a Lenfest Distinguished Faculty Award in 2013, she credited you for persuading her to be more creative in her pedagogy. What is the story behind that?

Being a TF in her class was a collaborative experience. She wanted my input in designing assignments and crafting the substance of the syllabus. It was the model of how a professor can mentor and train young scholars to be educators—she was the lead, and I was the junior member of a teaching team. It was a great team experience.

How would you describe your time at Columbia overall?

It’s become like home. The support of the University community that I’ve found has been wonderful. I have a four-year-old daughter, and I commend the school for benefits like the child-care subsidy for student-parents. There’s still a long way to go, especially for mothers, but it’s still good support. I’ve influenced my peers in showing them that it’s possible to be successful in graduate school and have a child. Especially in academia, your schedule is flexible enough to be a parent. I think that the school and the University are taking steps forward in this respect.
The Infinite Image: Art, Time and the Aesthetic Dimension in Antiquity
Zainab Bahrani, Art History and Archaeology
Bahrani offers a new reading of Mesopotamian art, using the writings of Derrida, Hegel, Kant, and Plato and more than 100 illustrations to argue that these ancient images created an aesthetic that was both historical and evolving, while also addressing the politics of cultural heritage.

Dante’s Lyric Poetry: Poems of Youth and of the Vita Nuova
Teodolinda Barolini, Italian
In the first comprehensive English translation and commentary on Dante’s early verse to be published in almost 50 years, Barolini illuminates Dante’s transformation from young poet to the writer of the visionary Commedia.

Gateway to Freedom: The Hidden History of the Underground Railroad
Eric Foner, History
Drawing on newly discovered documents from Columbia’s Rare Book & Manuscript Library, Foner conveys the sweeping history of the Underground Railroad and elevates it from folklore.

The Language Hoax: Why the World Looks the Same in Any Language
John H. McWhorter, English and Comparative Literature
McWhorter argues that all humans process life the same way, regardless of language, and provides a sociopolitical analysis of the issue and its history.

Aurality: Listening & Knowledge in Nineteenth-Century Colombia
Ana María Ochoa Gautier, Music
Drawing from nineteenth-century Colombian sources, Ochoa Gautier explores how listening has influenced notions of language, music, voice, and sound that determine the politics of life.

The Mirror of the World: Subjects, Consciousness, and Self-Consciousness
Christopher Peacocke, Philosophy
Peacocke develops a new metaphysics of subjects, integrating it with a theory of first-person representation and applying the results to some classical and modern problems.

The Archaeology of American Cities
Nan A. Rothschild, Anthropology
Rothschild and co-author Diana di Zerega Wall provide an archaeological guide for understanding the social forces that influence the development of American cities.

Readings
Gayatri Chakravorty Spivak, English and Comparative Literature
Through close analysis of J. M. Coetzee’s Summertime and Elizabeth Gaskell’s North and South, as well as her own essays and those of others, Spivak suggests that a deep reading of literature fosters a will for peaceful social justice.
To Catch a Virus
Marilyn J. August, Ph.D.

August and co-author John Booss weave together the history of infectious diseases, descriptions of technological advancements, and human stories to chronicle the development of diagnostic virology.

Bookmarked: Reading My Way from Hollywood to Brooklyn
Wendy Fairey, Ph.D. ’75, English and Comparative Literature

In this memoir, Fairey recounts the influence of classic English novels on her life from childhood to adulthood.

Debating the American State: Liberal Anxieties and the New Leviathan, 1930-1970
Anne Kornhauser, Ph.D. ’04, History

Kornhauser traces the encounter between liberal thought and the rise of the administrative state, explaining why it continues to be haunted by programmatic dysfunctions and political attacks today.

Reassuring the Reluctant Warriors: U.S. Civil-Military Relations and Multilateral Intervention
Stefano Recchia, Ph.D. ’11, Political Science

Drawing on declassified documents and numerous interviews, Recchia demonstrates that America’s top-ranking generals and admirals play an underappreciated role in steering U.S. intervention policy toward multilateral bodies like NATO and the United Nations.

Eric Ford, Ph.D. ’97, Physics

was elected a Fellow of the American Association of Physicists in Medicine.

Mark Jackson, Ph.D. ’04, Physics

founded Fiat Physica, a fundraising platform that connects potential donors with groups seeking support for physics research, education, and outreach.

The following faculty members were awarded fellowships from the John Simon Guggenheim Memorial Foundation: Brent Edwards, Ph.D. ’98, professor of English and comparative literature; Carmela Vircillo Franklin, professor of classics; and George E. Lewis, professor of music. Benjamin Taylor, Ph.D. ’92, English, was named a trustee of the foundation.

The following faculty members were honored with the Lenfest Distinguished Teaching Awards: Brian Cole, professor of physics; Patricia Dailey, associate professor of English and comparative literature; Souleymane Bachir Diagne, professor of French and Romance philology; Brad Garton, professor of music; Stathis Gourgouris, professor of classics and English; Feng Li, professor of East Asian language and cultures; Molly Murray, associate professor of English and comparative literature; Carol Rovane, professor of philosophy; and Dorothea von Mücke, professor of Germanic languages.

Rachel Schutt, Ph.D. ’10, Statistics

was nominated for membership in the Forum of Young Global Leaders, a division of the World Economic Forum.

Arturo C. Sotomayor, Ph.D. ’04, Political Science

received the Luciano Tomassini Latin American International Relations Award for his book The Myth of the Democratic Peacekeeper: Civil and Military Relations and the United Nations.

Nina Young, a D.M.A. student in Music

was awarded the Rome Prize in Musical Composition, which for a century has been one of the greatest honors in the world of composition.

Announcements

Jacqueline Barton, ’74BC, Ph.D. ’78, Chemistry

received the Priestley Medal, the highest honor of the American Chemical Society.

Eric Ford, Ph.D. ’97, Physics

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Mark Jackson, Ph.D. ’04, Physics

founded Fiat Physica, a fundraising platform that connects potential donors with groups seeking support for physics research, education, and outreach.

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In Memoriam

Yi-Hsiang Chang
M.A. ’08, M.Phil. ’10, History
Yi-Hsiang Chang, a Ph.D. student in history, died in December. Chang is remembered as a wonderful scholar and a kind person. His memorial service was held in Taipei, Taiwan, on January 26, 2015.

Val Fitch
Ph.D. ’54, Physics
Val Fitch died in February at 91. After joining the Princeton University faculty in 1954, he and his colleague James Cronin began collaborating on experiments, eventually concluding that the laws of physics are not the same for particles and their antiparticle opposites—a discovery that earned them the Nobel Prize in 1980. According to Samuel Ting, MIT physics professor and Nobel laureate, Fitch’s work “is one of the most important in the 20th century to show how laws of physics actually change with time.” Fitch earned many more honors and awards during his career, including the National Medal of Science in 1993.

Edna Choi Law
M.A. ’47, English and Comparative Literature, ’51LS
Edna Law died in July 2014 at 90 in Staten Island, New York. Law graduated from Barnard College and received master’s degrees in both English and library science before becoming a finance executive for more than 25 years. Law also worked with the New York Public Library system and held leadership positions at both Barnard College Library and the New York University Graduate Library of Business Administration.

Mark Lyons Peisch
Ph.D. ’59, Art History and Archaeology
Mark Peisch died in May 2014 at the age of 92. He is remembered fondly as an educator and administrator, serving as the foreign student adviser and director of University admissions and financial aid at Columbia, as a lecturer in art history at Dartmouth and Columbia, and as associate dean of student affairs at New York Medical College. He also co-founded the first Montessori School in New Jersey in 1963.

Martin Perl
Ph.D. ’55, Physics
Martin Perl died in September at the age of 87. Perl won the Nobel Prize in 1995 for discovering the tau lepton, a subatomic particle. A native of Brooklyn, Perl conducted his doctoral research on the sodium nucleus under the mentorship of Isidor Isaac Rabi, also a Nobel laureate. After graduating from Columbia, Perl held positions at the University of Michigan and then Stanford University, where he taught and conducted research for half a century.

Leonard J. Rosenfeld
M.A. ’39, Political Science
Leonard J. Rosenfeld, a Staten Island native, died in September at the age of 98. He was a member of the U.S. Army Eighth Air Force from 1942 to 1945 and a lawyer for Schenley Industries from 1946 to 1981. He is survived by two daughters, three grandchildren, and ten great-grandchildren.
**Anthropology**


Maria del Rosario Ferro. Between the magic of magic and the magic of money: The changing nature of experience in the Sierra Nevada de Santa Martha. Sponsor: Michael Taussig.


**Applied Physics and Applied Mathematics**


**Architecture**

Ralph Ghioche. The symbolic, the ethic, and the legible. Simon-Claude Constant-Dufex and mid-nineteenth-century architectural eclecticism. Sponsor: Mary McLeod.


**Art History and Archaeology**

Anne-Hurwitz Chen. From the seed of the gods: Art, ideology, and cultural exchange with the Persian Court under the Roman Tetrarchs, 264–324 CE. Sponsor: Francesco de Angelis.


Megan Kathleen McCarthy. The emerging monument of Germanic art and design in America, 1890–1914. Sponsor: Elizabeth W. Hutchison.


Sarah C. Schaefer. From sacred to spectacular: Gustave Doré’s biblical imagery. Sponsor: Anne Higonnet.


**Astronomy**


**Biochemistry and Molecular Biology**


**Biomedical Engineering**


Yopi Härä. Adaptive quantification and subtyping of pulmonary emphy- 

Yrjö Häme. Adaptive quantification and subtyping of pulmonary emphy-

vakovic. Adaptive quantification and subtyping of pulmonary emphy-

models and In vitro and In vivo fidelty cardiac tissue by biophysical 


Biomedical Informatics 

Daniel Fort. Understanding and re-

ducing clinical data biases. Sponsor: Chunjua Weng.


Biostatistics 


Cedel Rozenbaum. Do firms contribute to the variation in employees’ performance in knowledge-intensive industries? The case of equity re-

search. Sponsor: Trevor S. Harris.


Cell Biology 

Guilherme Pedreira de Freitas Nader. FAK and SRC kinases maintain integrin activation during endocytic recycling to polarize adhesion formation. Sponsor: Gregg G. Gundersen.

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Cellular Biology and Biophysics 


neurotransmission in vivo. Sponsor: Brian McCabe.


Alisa Umanataya. Physiological and pathophysiological regulation of the tyrosine receptor in skeletal muscle. Sponsor: Andrew R. Marks.

Chemical Engineering

Chemical Physics

Chemistry
Hasti Amini. Ion conduction characteristics in small diameter carbon nanotubes and their similarities to biological nanochannels. Sponsor: Colin P. Nuckolls.


Conrine Nicole Foley. The development and application of a new approach to the rapid synthesis of polysilylpropionate stereoids. Sponsor: James L. Leightin.


Lindsay Marie Leone. Single molecule studies of dynamic heterogeneities in supercooled liquids. Sponsor: Laura Kaufman.

Myles Wanick Smith. Strategies for the concise synthesis of the akacimine alkaloids. Sponsor: Scott A. Snyder.


Civil Engineering and Engineering Mechanics


Suparno Mukhopadhyay. Structural identification, health monitoring, and uncertainty quantification under incomplete information with minimal requirements for identifiability. Sponsor: Raimondo Betti.


Communications


Computer Science


Katharina Volk.

Earth and Environmental Sciences


Wenchang Yang. The hydroclimate of the past and present. Sponsor: Steven L. Goldstein.

Ru Pei. New paravian fossils from the Mesozoic of East Asia and the troodontid evolution. Sponsor: Mark A. Norell.


Shuo Huang. Accretion and subduction of oceanic lithosphere. 2D and 3D seismic studies of off-axis magma lenses at East Pacific Rise 9°37-40'A area and downwarping Juan de Fuca plate at Cascadia subduction zone. Sponsor: Suzanne M. Carbotte.

Liangliang Zhan.


Earth and Environmental Engineering
Michael Chen. Protein structure dynamics and function at micelle and particle interfaces. Sponsor: Ponisseril Samudram.

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Earth and Environmental Sciences

Anna Elizabeth Foster. Surface wave propagation and phase-velocity structure from observations on the USArray Transportable Array. Sponsor: Goran Ekstrom.

Shuo Huang. Accretion and subduction of oceanic lithosphere. 2D and 3D seismic studies of off-axis magma lenses at East Pacific Rise 9°37-40'A area and downwarping Juan de Fuca plate at Cascadia subduction zone. Sponsor: Suzanne M. Carbotte.

Liangliang Zhan.
ters using ocean bottom geophysical techniques. Sponsor: Spahir C. Webb.

East Asian Languages and Cultures


Stacey Alison Van Vleet. Medicine, monasteries, and empire: Tibetan Buddhism and the politics of learning in Qing China. Sponsor: Gray Tuttley.


Ecology, Evolution, and Environmental Biology


Bénédicte Marie-Philippe Elanore Bachelot. The role of arbuscular mycorrhizal fungi and natural enemies communities on seedling dynamics in a secondary tropical rain forest. Sponsor: Maria Urata.


Economics


Ran Hao. Panel data model with interactive fixed effects: A Bayesian approach. Sponsor: Jushan Jia.


Joan Monnisa. Essays in international and international migration. Sponsor: Ronald D. Davis and Eric Verhoogen.


Electric Engineering


Cathy Chen. Photonic interconnect networks for applications in heterogeneous utility computing systems. Sponsor: Keren Bergman.


Kagin Irie. Use of monostatic optical logic in scaled, leaky CMOS technologies. Sponsor: Charles Zukowski.


English and Comparative Literature


Veena Kuiken. Active enchantments: Form, nature, and politics in Ameri- can literature. Sponsor: Branka Arsic and Ross Posnock.


Environmental Health Sciences


Epidemiology


Maria Corina Barque. Is it a Hispanic paradox? Examining the effect of individual and neighborhood factors on birth outcomes. Sponsor: Laura N. Barel.

David Barnes. Depression and dis- stress in blacks and whites in the U.S.: Testing a hypothesis to explain a double paradox. Sponsor: Sharon Schwartz.


Gene B. Poole. Prospective studies of proteinuria and dyspepsia as po- tential predictors of all cause and chronic-disease mortality in a rural Bangladesh population. Sponsor: Habibul Ahsan.
**French and Romance Philology**

Lotte Katz. Theatricality in La Château de Parme. Sponsor: Elisabeth Ladenson.


Rebecca Lynn Sapchik. Deadly speech: Denunciation and the radicalization of discourse during the French Revolution. Sponsor: Joanna Stalnaker.

**Genetics and Development**


**Germanic Languages**


**History**


Christopher Robin Craig. The middlemodernity of modernity: Local elites and agricultural development in Meij Japan. Sponsor: Carol Gluck.


**Industrial Engineering and Operations Research**


Peter L. Macie. Excluding induced paths: Graph structure and coloring. Sponsor: Maria Chudnovsky.


**Mathematics**

Nawa Kayba Balsam. The parity of analytic rank among quadratic twists of elliptic curves over number fields. Sponsor: Dorian Goldfeld.


John Frederick Straussberger III. The “particular situation” in the Futa Jallon. Ethnicity, region, and nation in twentieth-century Guinea. Sponsor: Gregory Mann.

**Music (D.M.A.)**


**Microbiology, Immunology, and Infection**


Irene Song. New quantitative approaches to the Monge–Ampère equation. Sponsor: Cividu Savin.


Sevan Richard Oungoulian. Friction and wear measurements of bovine articular cartilage against non-fatigued material surfaces. Sponsor: Gerald A. Ateshian.


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