Why Mentoring Matters

A student-led initiative connects women scholars across generations, aiming to open the pipeline to careers — and lives — in the sciences
2 The Big Picture, the Details, and Everything in Between
How a student-run mentoring program is helping women PhD candidates prepare for careers — and lives — in the sciences

6 Putting Poetry in Its Place
Reading a poem shouldn’t be like eating your vegetables, says Stephen Burt, a delightful companion to the form

8 Colloquy with Valerie Weiss, PhD ’01
On science, film, and Losing Control

10 Twisting the Light Fantastic
Lifelong tinkerer Adam Cohen opens the door to creative discovery in the lab

14 Alumni Books
Fatherhood, gardening, revolution, and the history of English as global lingua franca — our alumni authors tackle those topics and more

17 Harvard Is . . .
For PhD candidate (and filmmaker) J. P. Sniadecki, GSAS resources provide the chance to do “serious art-making at the graduate level”

On the cover: In the foreground, professor Patricia D’Amore and PhD candidate Irene Kim, photographed by Martha Stewart. See page 2.
from the dean

Allan M. Brandt
Dean, Graduate School of Arts and Sciences; Amalie Moses Kass Professor of the History of Medicine, Harvard Medical School; professor of the history of science, Faculty of Arts and Sciences

Getting a Life — and Keeping It

This year, the Graduate School of Arts and Sciences is celebrating the 20th anniversary of Dudley House as the graduate student center. This spring, Dudley Fellows from each of those 20 years were invited to a reunion at the House, and next fall, we’re planning a gala dinner for the Harvard community to mark the official anniversary of the House’s dedication.

You’ll read more about the Fellows Reunion in the next issue of Colloquy, but for now I can tell you that the response of our former fellows, many of whom traveled to campus from far-flung locales to celebrate this festive milestone, has validated, yet again, my appreciation for the tremendous resource that is Dudley House.

As we’re fond of noting around here, Dudley makes a difference. The House is the hub of student life at the Graduate School, with offerings — recreational, social, and intellectual — that span every discipline and every conceivable interest. This term, the House and its fellows have sponsored an evening of Persian poetry, a clean-up project at the Charles River, an exclusive tour of the new American wing of Boston’s Museum of Fine Arts, dissertation bootcamps, a foray into the music of West Africa, an Indian cooking class, and a viewing party for the world cup of cricket — and that’s just for starters.

As this roster indicates, the House is also place where the global diversity of our student population is fully expressed. Students from many nations and ethnicities come together to share important cultural and gastronomical traditions, helping to reinforce their own community and extending it by welcoming newcomers. In this way, as disciplines, experience, and interests blend, Dudley House becomes a key microcosm of the broader opportunities, and the diverse resources, of Harvard itself.

But the House is not the only way in which GSAS is interested in building community for our graduate students. We also support an integrated residential community called the Graduate Commons Program, administered by Harvard Real Estate Services. This program, which involves handsome new buildings along the Charles (at 10 Akron Street and 5 Cowperthwaite Street), houses students from all of Harvard’s graduate and professional schools. It creates opportunities for interdisciplinary collaboration, social interaction, recreation, and a University-wide sense of community.

The GSAS Student Services Office and the resident advisors who keep our own four residence halls running — with creative programming and exciting outings — also foster connection and a sense of identity, something particularly important to first- and second-year students just getting to know Harvard and Cambridge.

And through our Graduate Student Council, GSAS supports more than 50 student organizations, groups that bring students together based on professional or scholarly affiliations, countries of origin, or extracurricular interests. These organizations provide not only a key point of connection, but also a way for faculty, deans, and administrators to tap into the ever-expanding talents and interests of our students.

Graduate school, as those of us who have survived it often recall, can be an isolating experience. Doing advanced research for a dissertation, discovering new knowledge and new points of view, is an endeavor that demands hours of solitary investigation. But our students are endlessly, and quite broadly, creative and engaged, and their interests do not narrow as they complete their degrees. Despite the demands of their work, we encourage them to continue to follow their passions and build a whole life at Harvard. We know that they, and our entire community, will be the richer for it.
The Big Picture, the Details,
How a student-run mentoring program is helping women PhD candidates prepare for careers — and lives — in the sciences

By Jennifer Doody and Bari Walsh

When Emily Gardel arrived at Harvard to start a PhD program in applied physics, she admits to experiencing “a bit of a culture shock.” Gardel had come out of an undergraduate physics major at Smith College, and the scale and tenor of life at GSAS made for a sharp contrast with all she remembered from her days in Northampton. “I felt like the interactions with students and faculty were very different,” she says. “I really missed the one-on-one interactions with professors.”

Gardel could have floundered, and her decision to change labs in her third year could have derailed her. Instead, she thrived. Five years into her program, she is the winner of an elite Department of Energy graduate fellowship that she’ll use to examine how bacteria can generate electricity. And she’s a co-chair of Harvard Graduate Women in Science and Engineering (HGWISE), a GSAS student organization that focuses on building a community for women scientists, helping them overcome precisely the kinds of challenges she experienced early on.

What got her over the hurdle? It’s reducative to point to any single factor, of course. And yet there is one thing that distinguishes her experience from that of any number of students who’ve struggled to find their place in graduate school: she has a mentor. And when it comes to women in the natural sciences, life sciences, and engineering sciences, that’s a key predictor of success, at all stages of the game.
Christine Kiely and Ye Grace Chen joined the HGWISE mentoring program three years ago, and — in what proved a fortunate bit of happenstance — were matched with a young faculty member named Sheila Thomas. They’ve met regularly since then, and the friendship among the trio is instantly obvious.

“The three of us just really click,” says Chen, a fifth-year PhD student in chemical biology. “We are all at different places in our careers, what a life in academia can look like, and then supporting them on the way. Shortly after Harvard released findings from the 2005 Task Force on Women in Science and Engineering, which determined that the University had made “only limited progress in its efforts to create a genuinely diverse faculty,” HGWISE — formed that same year — took action on one of the report’s core recommendations: to enhance mentoring at all levels.

The HGWISE Mentoring Program, launched in 2008, matches PhD students with women faculty members across the scientific disciplines. It has seen demand for its services nearly triple in the three years of its existence; this year, 65 PhD students are participating in the program, meeting regularly in group or one-on-one sessions with one of 44 faculty members who’ve signed on as mentors.

“Women face a dearth of role models in many science and engineering fields,” says Carolyn Eng, a fourth-year PhD candidate in human evolutionary biology and the co-director of the Mentoring Program. “Women want to communicate with others in their fields, and our goal was to introduce them to faculty who are successful and who maintain a work/life balance, the latter of which can be challenging for female students. More than anything, this is an opportunity for women to meet and network with other scientists, and learn from those who have achieved success in the field before them.”

Heather Pon-Barry, a fifth-year PhD student in computer science and the other program co-director, says meeting with her mentor “gives me an understanding of the challenges I will face in my future.

“Being a PhD student can be an isolating experience,” Pon-Barry says. “The mentoring program helps you see the bigger picture. Participants may maintain their relationships for years. They often focus on long-range goals, whereas with advisors, you tend to focus on short-range plans.”

Conversations with HGWISE mentors and students reveal a mutually beneficial relationship built with equal parts commiseration and inspiration. Mentors say they become more attuned to the concerns of their own advisees and lab members. And students learn to envision a professional life that balances all of their interests, in the lab and beyond.

OPENING THE PIPELINE

According to the 2010 annual report of the Office of the Senior Vice Provost for Faculty Development and Diversity, just over one-quarter (27%) of Harvard’s faculty are female — an all-time high. And for the first time in history, women comprise 22% of Harvard’s senior faculty.

There is wide disparity in the distribution of senior women, however. Despite gains elsewhere, percentages remain “stubbornly low across the sciences,” the report concludes, citing Engineering (9%), FAS Natural Sciences (14%), and the Medical Quad (15%), among other Harvard units.

Harvard is hardly alone in facing a problem in the pipeline that feeds senior-level positions in the sciences. And the University reports hopeful news in the junior faculty ranks, where women comprise 36 percent of the population, and where the percentages of women in the sciences are at or near all-time highs, including in FAS Natural Sciences (32%), the Medical Quad (34%), and Engineering (26%).

If part of the challenge is to make sure the pipeline runs more efficiently, part of the solution may lie in showing women scientists, early in their careers, what a life in academia can look like, and then supporting them on the way. Shortly after Harvard released findings from the 2005 Task Force on Women in Science and Engineering, which determined that the University had made “only limited progress in its efforts to create a genuinely diverse faculty,” HGWISE — formed that same year — took action on one of the report’s core recommendations: to enhance mentoring at all levels.

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LESSONS ABOUT PERSPECTIVE

Christine, Grace & Sheila

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academic careers and have different mind-sets. But we talk about everything — working in the lab, our daily lives, our goals, and our research.”

“She’s one of the most involved faculty members that I know,” says Kiely, now in the final stages of her PhD program in biological and biomedical sciences. Thomas is a cancer-cell biologist in the Department of Medicine at Harvard Medical School and Beth Israel Deaconess Medical Center. “She’s on so many committees and is really involved with students,” says Kiely. “You can tell she really cares about us and about our experience here. It’s great just to be able to watch her, as a role model, and see that it is possible to achieve at high levels and still be a well-rounded person.”

Chen agrees. “One of the most important lessons that I’ve learned from Sheila is about perspective,” she says. “As graduate students who spend many hours a day focused on a specific question or model, we sometimes get tunnel vision. Having conversations with Sheila and Christine helps me broaden my view and realize that I’m not the only person to ever experience these emotions — professors were graduate students once, too — and that communicating clearly can help prevent misunderstandings.”

“Mentoring is part of my scientific upbringing,” says Thomas, who directs diversity programs at the Division of Medical Sciences (the joint PhD program of GSAS and HMS), and who recently became assistant dean for diversity and minority affairs at GSAS. “I’ve had great mentors all along the way, and I wouldn’t be where I am without them. None of us did this alone.”

**In a conversation** that ranges widely over issues of science, gender, self-confidence, and career-building, Eun Young Choi and her mentor, Jesse Snedeker, seem to delight in their easy rapport. Both women are honest and reflective, confident enough to discuss the challenges and doubts that go along with the life’s work they have chosen.

“The most valuable thing I received from this relationship is that Jesse became a role model of someone who is quite different from me in outward behavior — assertive and confident in her actions and thoughts,” says Choi, a fifth-year PhD candidate in neuroscience, who was one of two founders of the HGWISE Mentoring Program. “She is an example of someone who simply lives without the doubts that I have, so it was valuable to me to see this completely different perspective. It’s made me consider that there is another way of thinking.”

“I don’t know that I don’t have doubts,” replies Snedeker, a professor of psychology, with a smile. “I might have different doubts at this stage in my career. But everyone needs multiple perspectives, because there is no one right way to do this. You need the ability to look across different solutions to the problems you’re facing, because there are many different ways that people combine their work and their life, and there are many different ways that they organize a research program.”

Snedeker says she joined the Mentoring Program to pay back the support she received at critical junctures in her career, such as when she decided to have a child during her second year in graduate school. “But I’m much more aware of what I get out of the situation. This has made me a much better graduate advisor. It has made me aware of things I had not considered before.”

She’s come to see, for instance, that “there are work-life balance issues when you’re 25,” even if they may be less perceptible to senior faculty members years removed from that time in their own lives. “Graduate students who are just starting to build their research programs are often at a loss for how to cram in eating actual meals, getting some reasonable degree of exercise, keeping track of their families, who live 200 or 2,000 miles away, and getting the work done,” she says. “Those are very real work-life balance issues.”
**LEARNING TO GIVE AND TAKE**

**Irene & Pat**

Irene Kim and Patricia D’Amore share an easy hug as they arrive for a recent coffee date at Harvard Medical School. It’s a hug you’d give a friend — and that’s just what they are now, three years into a mentoring relationship that has paid dividends on both sides.

D’Amore, a professor of ophthalmology and pathology at HMS, says her connection with Kim, a sixth-year PhD candidate in virology, has made her more sensitive to the needs of people in her own lab. “I’m not someone who complains at people in my lab, or micromanages them, but I also didn’t tend to give much positive feedback,” says D’Amore. “I realize now what a difference that makes.”

In her own life, mentors came to her mostly as a result of luck, not any programmatic emphasis, says D’Amore, the co-director of research at Schepens Eye Institute. When she arrived at Children’s Hospital in 1981, there were just four tenured women on the faculty at HMS, she says, and the not-so-hidden message was that pedigree and insider status were key to promotion.

“That changed over the years,” she continues, recalling one of HMS’s early mentoring programs for junior faculty, in which she was paired with the late Ramzi S. Cotran, the F. B. Mallory Professor of Pathology, remembered as an outstanding supporter and guide for students. “Even though he was phenomenally busy, he gave me a lot of great, practical advice. For instance, I was doing a lot of traveling at that time, and he looked at my CV and said, ‘One good paper is worth twenty meetings.’ I cut back on traveling at that point, and I’ve passed that advice on to many other people.”

For Kim, the relationship validates her interest in hearing “different stories, different perspectives” — an interest that drove her to get involved with HGWise in the first place.

“When I talk to someone in my own field, I’m usually talking about something very specific, discussing the results of an experiment or troubleshooting an assay. When I talk to Pat, the conversation is broader, less technical. I talk about what my project is about, what my progress is. I’m starting to think about postdocs, and I’ve been running some ideas by her. Pat will say, ‘Oh, do you know about this person?’ She has a whole other field of knowledge that I can access,” says Kim, who now joins D’Amore on Grand Rounds at Brigham and Women’s Hospital — an opportunity not normally open to students in her program.

“Our interaction is more about general approach, and also about encouragement,” adds D’Amore. “If something’s not working in the lab, well, that happens no matter what field you’re in, and it always happens, and it especially happens when you’re about to be done.”

**HOW SCIENCE FITS**

For Laura Brattain and Emily Gardel, sharing a mentoring group led by Rachelle Gaudet, an associate professor of molecular and cellular biology, has not only illuminated their career paths, but also inspired them to greater heights individually.

“Hearing about others’ achievements makes me realize that I can do even more,” says Brattain, a second-year graduate student in bioengineering. “The benefits of a group are that you get a variety of perspectives from lots of different angles. From Rachelle, I learned about the tenure process. From Emily, I learned about the process of giving a talk at a college, the challenges of being a teaching assistant, how to juggle lots of responsibilities and make it all work.”

When Gardel changed labs as a third-year student, “Rachelle helped immensely with that process. She’s provided a lot of emotional support as well as feedback on research, organizing papers, and what journals I should submit to and consider. I definitely feel that she’s very invested in me and in my career.”

Building the relationship has been “a great opportunity to get a better perspective on the life of a Harvard professor — what’s expected as far as administration, grants, committees, and so on,” Gardel continues. “I feel like I have a lot on my plate, and then I look at what she’s doing.”

“I think it tends to be more difficult for women to identify and connect with appropriate mentors, for a variety of reasons,” says Gaudet, who did not have a mentor during the beginning stages of her own academic career. “Through my mentoring, I hope that I provide the opportunity for my students to think about the big picture — how they fit into science, how science fits into their lives. We can talk about the big picture and the details, and everything in between.”

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*Irene Kim, left, in the sixth year of her virology PhD program, says her relationship with Professor Patricia D’Amore has widened her network and created new professional opportunities.*

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*Emily, Laura & Rachelle*
It’s probably not typical for a critic who has spent his life and livelihood analyzing the nuances of a given artistic genre to suggest that his chosen pursuit does not have — and shouldn’t be required to have — the power to change the world. It’s undoubtedly less common for the critic to admit in published essays that sometimes he watches television rather than do that thing he lauds professionally. Or that at other times, he does the laundry.

But it’s precisely these admissions that make Stephen Burt, a leading reader and critic of contemporary poetry (and a poet himself), a compelling voice. Burt, appointed professor of English last May, after having joined the faculty in 2007 from Macalester College, has written about what Project Runway can teach poetry critics; how Alexander Pope was an early adopter of hip-hop conventions; and why Pindar beats everyone as a sportswriter.

All of which is not to say that Burt, AB ’94, is anything less than serious. In his six books of criticism, and in essays aimed at both popular and scholarly audiences — appearing in the New York Times Book Review, the New Republic, and the Times Literary Supplement, among many others — he writes forcefully about what he sees as poetry’s purpose, its virtues, and its joys. His integrity and humor make him a pragmatic and accessible, though not unchallenging, interpreter of new poets, and his admission of the difficulty of some contemporary poetry makes us feel better about our own shortcomings. His 2004 article “Close Calls with Nonsense,” in The Believer (available online), which gave a title to his 2009 collection of criticism, lays out a valuable, self-deprecating guide to new poets, written for lapsed or anxious readers, with the stated ambition of helping people find what’s next after Seamus Heaney or Elizabeth Bishop.

Burt, who says the goal of most of his writing is simply to help readers “enjoy and see farther into poets and poems,” is happy to occupy space in the worlds of both specialists and nonspecialists. “The guy I wrote my first book about, Randall Jarrell [Randall Jarrell and His Age, 2002], was someone who helped invent what we now think of as poetry criticism, in the middle of the century,” Burt says. “He was worried that modern poetry and contemporary poetry — the poetry of the twentieth century — would enter this world where you had to read it all day and be specially trained to read it. He didn’t really think that would happen, but he was worried about it, and he was more worried that poetry criticism would enter this world where all of the critics were talking only to other professionals.

“That’s fine for some academic disciplines,” Burt continues. “It’s fine if all of the people who are trying to sequence the DNA that makes your bone marrow are primarily talking to other people who study the DNA that makes your bone marrow, and then this separate set of people called science writers can come along and write books about how it works later on. But that kind of separation between the people doing the study and the people explaining what is studied did not seem to Jarrell, and doesn’t seem to me, like a good idea for literature.”
Burt takes pleasure in the fact that opening a book of poetry opens paths to new ideas; the pleasure is unaf-\textit{fected by whether he embraces those ideas himself. “One of the fun things about reading poetry is that just through these arrangements of words, you can discover some of the workings of very smart minds and very deep and very strange minds, that are not at all like yours,” he says. “And some of those minds are not at all like yours because they are separated in culture and in time. The mind of John Skelton is not going to be like mine because he wrote several hundred years ago and thought in three or four languages at once and was always thinking about what went on at the court of the king. But there are other minds that I really like trying to find my way around.”}

For Burt’s own readers, accustomed to his prolific output, it may have been surprising to come across an article he wrote for the Poetry Foundation last May, several months after the birth of his second child, in which he made a case for reading less poetry — or, more accurately, for feeling okay about reading less poetry. The article, titled “Art vs. Laundry,” lays out an approach to poetry for the serious but busy person — the person who has an infant, and housework, and a job.

“Poets and critics do their art a disservice when they try to make it an ethical obliga-
\textit{tion — when poetry becomes ‘eat your vegetables,’” Burt says. “Or, when it becomes the set of techniques that will somehow make our economy just. And fight global warming. And do all of the things that are politically, ethically, publicly, very important.}

“There have been societies in the past where tremendous talent in the crafting of verse could give you political power, help you mobilize a lot of people to do things they wouldn’t otherwise do. We don’t live in such a society,” he continues. “And that’s okay. Poetry can do a lot of things for some people. And it can do some things for a lot of people. And I like to try to make clear what it can do.”

Among other things, for Burt that means rejecting fashionable claims about poetry’s subversive powers. And it means laying aside other sorts of aesthetic claims — how poetry is good for you, and how it must be viewed in opposition to popular culture. For Burt, those claims devalue the actual power of an art form. “If Beethoven’s going to last, which

Burt’s most recent book, co-authored with David Mikics, is \textit{The Art of the Sonnet}, an anthology of 100 examples of the form, along with short critical essays. The goal was not to produce a best-of collection, but rather a way of charting the influence and impact of the sonnet over 600 years of history. Burt’s 2009 book, \textit{Close Calls with Nonsense: Reading New Poetry}, was aimed at a general audience and contains some of his most striking and spirited essays, many of which provide practical approaches to modern poetry.
Valerie Weiss first felt the lure of the performing arts as a child; by the time she was at Harvard — perhaps ironically, pursuing a PhD in biophysics — the call was irresistible. As the founder, filmmaker-in-residence, and festival director of the Dudley Film Program from 1999 to 2003 (she got her PhD in 2001 but stayed around to develop the program), she juggled two passions that, in many people, might each form a single-minded obsession. Now a full-time filmmaker who has written, directed, and produced her first feature-length film, Losing Control — an offbeat romantic comedy about a female scientist who wants proof that her boyfriend is “the one” — Weiss is happy to bridge the gap between the arts and the sciences. The film, now in negotiation for a distribution deal, premiered as the closing night screening at the Vail Film Festival this spring. In the meantime, she’s been honing her chops by shadowing the HBO series True Blood, preparing with the crew and working closely with show creator Alan Ball.

What attracts you to both science and the arts? People think it’s odd to be drawn to the sciences and the performing arts, but for me the connection to science is that I love to understand how things work, how theories can unify observations. For me, theater examined the same connection in a different way: it examined how we can find the heart of the matter.

So you find similarities between the two? Definitely. When I did my PhD, my approach to it was the same approach I had to making a movie: studying the literature and conducting the research, finding the story I wanted to tell and the questions I wanted to examine, developing a hypothesis. For me, the procedures are very similar. Science is a very collaborative process, as is film.

How did you come to found the Dudley House Film Program? When I got to Harvard, I knew I wanted to continue with theater and film [passions she’d indulged as an undergraduate at Princeton]. My first few years, I directed plays at Dudley House, which were performed with graduate student actors. By this time I’d been directing for about six years, and I told Susan Zawalich [Dudley House administrator] that I really wanted to move into films. I became a Dudley drama fellow and got filmmakers like James Toback AB ’66 [Tyson, The Pick-Up Artist, Bugsy] to come and teach classes. We also developed a festival of the film shorts that students had made.

While I was writing my thesis, I directed my first film, Dance by Design, which was a collaborative project with Harvard dance students. We made it for $5,000 with grants from Harvard and Dudley House, and production-wise, it was my beginning.

How did you transition from Boston to LA, and from academia to film? My husband [Rob Johnson] and I met at Princeton, when we were doing the play Cyrano De Bergerac. He was interested in...
acting, but then went to Wall Street, and then to law school. When I started making movies, I gave him acting classes as an engagement gift, and it reignited his passion for acting. Once we decided to move to Los Angeles so I could start directing, he decided to return to acting. It was scary, but once you know what you want to do, it’s scarier not to do it. I founded PhD Productions in 2004, and we used that production company from the very start.

Have you received any explicit film training?
I was accepted into the Catalyst Workshop at the American Film Institute, which was for scientists who wanted to develop science into movies. I had already begun to develop the idea for Losing Control, but this was the first time I ever discussed it publicly. People were really responsive. Later I was accepted to the American Film Institute’s Directing Workshop for Women. We went through three weeks of classes and each received some funds and equipment to make a short film within one week. I made a film called Transgressions.

That was your first time working on a professional level?
Right. By this point, I’d made shorts and films, but this was working with professional cinematographers, shooting on a soundstage, and working with an incredibly professional team. The movie won several awards; we were even nominated for a BAFTA [British Academy of Film and Television Arts award] and won second place.

For the first time, I felt that I was making a film with my vision, with a solid, professional team. You never have enough money or time, but it opened a lot of doors and got me an agent. I started writing and re-writing Losing Control, workshopping it with actors, refining my vision and storyboarding it, then shopping it again, and we had a very positive response. The New York Times wrote about it; everyone wanted to see the script.

What was that experience like?
I always wanted it to be an independent, quirky film that I would direct. Ultimately, I decided to raise funds on my own to make the film I wanted to make. That was a big turning point. Getting a company to make your film can lead to an eternity of meetings, and you can wake up two years later and the film still isn’t accomplished. Once I decided to raise the money to make the film, we raised the entire budget within three and a half weeks. In July 2009 we had our financing, and we started shooting on October 12 of the same year.

One of the benefits of doing a PhD is the realization that you are the catalyst for everything that happens. You don’t wait for an opportunity to do your work; you have to just do it.

Was it important to you to portray scientists as three-dimensional characters?
Absolutely. The characters in Losing Control have the curiosity, innocence, and sweetness that the scientists I knew had: they’re offbeat, quirky, unusual characters, rather than the very fringe, evil scientists that you usually see in films.

The film was partially shot in Boston, and at Harvard, right?
We got to shoot in laboratories at Harvard Medical School, on the Duck Tours, and on the MBTA. It was an amazing experience. It’s very much an exaggerated experience of my PhD, but it reflects the culture of academic science and the culture of Boston. I’m very proud that we were able to do that.

Losing Control

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Twisting the Light
Fantastic
Lifelong tinkerer Adam Cohen opens the door to creative discovery in the lab

By Janelle Weaver

Growing up on the east side of Manhattan, Adam Cohen didn’t have a typical upbringing. He didn’t have a functioning TV, for one. Instead, he lugged home broken TVs, along with computers and microwaves he had found in garbage bins, and took them apart and repaired them in his bedroom. He also built gadgets — a microscope, for instance, and a contraption that allowed him to shift a computer cursor by moving his eyes. His parents, both professors, not only tolerated this behavior — they encouraged it.

“The only rules were that I couldn’t electrocute myself or take apart working equipment in the house,” says Cohen, AB ’01, assistant professor of chemistry and chemical biology and of physics. “Everything else was fair game.”

This support, along with science tutorials from his father as they walked two miles to school every day, from the first grade to the end of senior year, fueled his innate fascination with the natural world. “My dad played a big role in fostering my interest in science,” he says. “I’ve wanted to become a scientist since as early as I can remember.”

His friendship with a Liberian science technician at his high school was formative. At lunchtime, Asumana Jabateh Randolph would conduct impromptu science demonstrations, showing students how to make a pickle glow by running electricity through it, for instance. Soon, Cohen was president of the school’s science club, where his first order of business was to buy a video microscope so that club members could watch the erratic bouncing of water particles on television.

That sense of wonder guided him through his academic life, from his undergraduate years at Harvard to his PhD training in theoretical physics at the University of Cambridge and experimental physics at Stanford. With his Stanford advisor, physical chemist W. E. Moerner, he developed a tool for trapping individual fluorescently labeled particles in a solution and keeping them still. The device, known as the Anti-Brownian Electrokinetic (ABEL) trap, enables researchers to examine DNA, proteins, vesicles, viruses, and other molecules for long periods of time.

Cohen continued this line of research after joining the faculty at Harvard in 2007, but he was open to exploring new areas, too. He attracted students from several departments, including chemistry, physics, applied physics, and biophysics, and rather than assign projects, he sat down with them and asked, “Of all the possible things our lab could work on, what would be the most interesting and unusual things we could do?”

Lab members began addressing questions that aren’t confined to particular fields. “I prefer to start with something about the world we want to explore, and then take from whatever disciplines are needed,” Cohen says. “Harvard is a very conducive environment for doing that.”

Adam Cohen, an assistant professor of chemistry and chemical biology and of physics, has found evidence for a heretofore unknown property of electromagnetic fields.
A scientist whose widely ranging interests run from rebuilding education in war-ravaged Liberia to sculpting light in the lab to control molecular activity.

“In most labs, there’s usually a core idea — they study one protein or one pathway or one system — but Adam’s really all over the place,” says Alex Fields, a biophysics PhD student who has worked in the lab since its inception and is helping to refine the ABEL trap. “The problems he approaches demand a lot of creativity, and he handles all of that while still having a day-by-day sense of what people in the lab are doing.”

Cohen’s ingenuity is bearing fruit. Last year, he received the Presidential Early Career Award for Scientists and Engineers and the National Institutes of Health New Innovator Award. And in a project that stemmed from a late-night brainstorm session, he discovered a new physical attribute of light, called optical chirality.

Molecules come in mirror-image forms, and this handedness, or chirality, governs how they interact with each other. A molecule’s handedness also interacts with certain properties of light, although the effects are subtle. For example, by changing the orientation of...
Light waves’ oscillations (or the polarization of light), it’s possible to stimulate one form of a particle slightly more than its mirror-image version.

Cohen figured that he could strengthen the influence of light on molecules by warping light waves. In a mammoth undertaking that lasted three years, he and his team used lasers and mirrors to mold the 3D shape of electromagnetic fields, making them superchiral, or extra twisty. Their experiments confirmed that curvy light can preferentially excite molecules with a particular handedness. Compared with other types of light, superchiral light is 10 times more selective for one form of a particle than for its mirror-image counterpart.

“People had never really thought about the idea that light itself could have this handedness, and that this handedness could be a tunable property,” Cohen says. “The idea that you can sculpt the shape of the light in order to interact with molecules in a specific way is something that hasn’t really been considered very much before.”

Because light can initiate certain chemical processes, the technique may allow researchers to control the chirality of the end products, perhaps even those made in the pharmaceutical industry. The two mirror-image versions of a medication can have drastically different consequences inside the body. Drug manufacturers use procedures that favor the synthesis of particles with the desirable handedness, but they aren’t foolproof. Cohen’s method could bias reactions in the right direction and spot bad batches of drugs. It could even detect the presence of life on Mars, because many biological building blocks, such as DNA and amino acids, exist in only one chiral form. In the future, he would like to investigate how controlling molecules with light could be used to design optical sensors and reveal trace levels of explosives, narcotics, and environmental pollutants.

Cohen’s ambitions outside the lab are just as far-reaching. Inspired by aid work done by his old science club advisor Asumana Randolph, he started an outreach project in the West African nation of Liberia, whose education system was destroyed by civil wars lasting from 1989 to 2003. Classrooms and school buildings were damaged, many teachers fled the country, and a whole generation missed out on an education.

In 1994, Randolph formed a group called the I-Help Liberia Project. He couldn’t visit his home country during the conflicts, so instead, he shipped over surplus school supplies, starting with pencils and books and later including larger items, such as desks and computers. Once the war ended, he returned to Liberia to help distribute supplies and rebuild schools, often taking his New York high school students with him.

Several years ago, Cohen invited Randolph to give a talk at Harvard about his efforts in Liberia. “It was amazingly inspirational, and it was obvious that he was making a big difference there,” says Cohen, who soon decided to organize a series of instructional workshops in the country with the help of his childhood friend Benjamin Rapoport, an MD/PhD student at Harvard and MIT.

The pair spent a few weeks over the past couple of years in Liberia. The first summer, they traveled to schools in the countryside and in the capital city of Monrovia, where they met with government officials and civic leaders to discuss how they could apply their knowledge to meet the educational needs. They saw that labs had been robbed of most of their paraphernalia, that teachers often didn’t know how to fix or use the remaining instruments, such as balances and microscopes, and that many labs stayed locked up.

So the duo bought provisions at local markets. They built scales using rubber bands, water bottles, and other available materials. They extracted DNA from tomatoes using kitchen utensils, soap, salt, and rubbing alcohol. They used a wood stove, water, and a thermometer to calculate the energy content of rubber, a major national export.

“Our goal was to show people that you don’t need fancy experimental equipment to do science,” Rapoport says.

Cohen and Rapoport eventually realized they could make a greater impact by focusing on higher education. During their second Liberian trip, they conducted workshops at universities and vocational schools, where they combined classroom and lab exercises to teach instructors how to teach science. They also launched an online journal called the Liberian Scientist. “Their main complaint was that they had been completely isolated for 15 years,” Cohen explains.

Early signs suggest the strategy is working. Many workshop participants not only have incorporated the principles into their own classrooms, but they’ve also spread them to villages nationwide. Cohen hopes the lessons will reach a curious boy or girl whose tinkering with pickles, metal nails, and copper wire will one day lead to scientific breakthroughs in the lab.
In *Fatherhood* (Harvard University Press, 2010), authors Peter Gray (PhD '03, anthropology) and Kermyt Anderson set out to lead an “evolutionary tour of human paternal care.” They note the broad cultural (and individual) variations in male engagement in parenting, yet in reviewing the archaeological and biological evidence, they conclude that despite such variations, human fathers are far more engaged in childrearing than our nearest evolutionary relatives, whether living (chimpanzees, bonobos) or extinct (australopithecines, *Homo erectus*). Gray and Anderson posit that high-stakes fatherhood probably emerged with modern *Homo sapiens*— some 150,000 years ago, an evolutionary blink of the eye — and they offer various reasons why that timing makes sense. The authors also probe the evolutionary benefits of long-term human pairings and discusses adoption, paternity, divorce, and stepfatherhood.

Taking the current banking crisis as his starting point, Richard S. Grossman (AB ‘82, PhD ‘88, economics) offers a long-term view of banking history, stretching back to the late eighteenth-century emergence of the commercial bank. In *Unsettled Account* (Princeton University Press, 2010), Grossman identifies a common pattern of banking growth, crisis, bailouts or mergers, and regulation in the United States, Great Britain, Canada, Australia, Scandinavia, and Japan. Apart from these national cycles, he stresses the global impact of the Great Depression and World War II, which — particularly in the United States — yielded a strict regulatory system and a generation of stability (1945–71). And he details how advocates of deregulation began to chip away at restrictions and constraints during the 1980s, leading to a sharp increase in crises, mergers, and government bailouts.

The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times (Chelsea Green Publishing, 2010) is a practical guide to gardening that focuses on techniques for growing food crops when times are difficult. Carol Deppe (PhD ’74, biology) explains that the idea came to her as a result of her own gardening challenges while caring for her mother through a terminal illness. But Deppe is interested in more than simply promoting the benefits of low-maintenance gardening. Growing your own food is an excellent way to ensure that what you eat is truly healthful, she argues, and that environmental impact is controlled. She explores the emotional sustenance that gardening can provide, as well as the physical benefits of gardening as exercise, and she argues in measured tones for gardening’s importance as a survival skill in any potential “mega-hard times.”

Some argue that just as English displaced French as an international language, so will Chinese displace English. Leslie Dunton-Downer (AB ’83, PhD ’92, comparative literature) has her doubts. In *The English Is Coming! How One Language Is Sweeping the World* (Touchstone Books, 2010), she describes how a West Germanic sliver of Indo-European emerged as our global lingua franca. Combining linguistic analysis, cultural history, and her own lively sense of humor, Dunton-Downer focuses on 30 words that exemplify “Global English.” Some — film, credit card — have ancient Indo-European roots. Others are borrowed — shampoo, from Hindi; safari, from Arabic via Bantu. Still others arrived through recent cultural developments — jazz, bikini, robot. (She also notes that there are now more English-speakers in China than in the United States.)

The American Revolution: A Grand Mistake (Prometheus Books, 2010), by Leland Stauber (PhD ’64, government), is bold counterfactual history. Asking what would have happened if the colonists had opted for Commonwealth status rather than independence, Stauber deftly examines other British colonies — including Canada, Australia, and South Africa — and concludes that continued British rule would have eliminated slavery sooner. Any Civil War would have been earlier, shorter, and less destructive. And America’s resulting parliamentary government would be more responsive than our current system of checks and balances. Yet the reader might well ask, wouldn’t Britain have restrained America’s westward movement and industrialization? And wouldn’t less cheap land and manufacturing mean fewer immigrants, a smaller population and industrial base, and — come WWII — no “arsenal of democracy” to insure Hitler’s defeat?
Hidden Harmonies (Bloomsbury Press, 2010) explores the origins of the Pythagorean theorem — that famed relationship among the sides of right triangles, $a^2 + b^2 = c^2$. Who first discovered it? Probably not Pythagoras, whose life in any case has been so obscured by myth that we can hardly know. Rather, Robert Kaplan (AM ’69) and Ellen Kaplan (AB ’57, AM ’59 fine arts) focus on other claimants or antecedents, including the ancient Babylonians and the Chinese of the third century CE. Along the way, the authors investigate ancient methods for calculating square roots, chronicle the astonishing number of proofs of the Pythagorean theorem, and share intriguing cultural observations. The book’s lively style bolsters the Kaplans’ claims for the excitement of mathematics, even as it presents a solid familiarity with mathematical concepts.

Still on Call (University of Michigan Press, 2010) is the latest installment of “orderly miscellany” — mix-and-match journal entries, autobiographical snippets, lectures, and blog posts — from novelist and University of Chicago literature professor emeritus Richard Stern (AM ’50, English and American literature and language). Aging, time, and memory serve as continuing themes, and he’s also drawn back to his own misreading of cultural and historical complexities, as seen in journal excerpts describing his trips to Afghanistan (1973) and Rwanda (1981), long before either had garnered much in the way of headlines or handwringing. Among the autobiographical selections, “Becoming a Writer: The Forties” and “How I Think I Got to Think the Way I Think” are particularly vivid.

While downsizing and outsourcing continue to count as sound corporate strategies, Jody Heymann (MD ’88, MPP ’89, PhD ’92, public policy) concludes that the opposite approach may be the key to profitability. Profit at the Bottom of the Ladder (Harvard Business Press, 2010) presents her findings, based on close case studies of diverse companies, from apparel and brick manufacturers to Costco to the Australian branch of the world’s largest manufacturer of seatbelts and airbags. Each of these companies offered its employees more — variously, higher wages, profit-sharing options, health care plans, or incentive pay. In each case, despite the added costs, company profits rose, due to reductions in absenteeism and turnover and a sizable increase in productivity. In short, treating your employees better pays.

A Tenth of a Second: A History (University of Chicago Press, 2009) isn’t historical specialization run amok; it’s a dense but bracing piece of intellectual history. Jimena Canales (PhD ’03, history of science) examines how the ability to measure tenths of a second affected late nineteenth- and early twentieth-century science. But first she must overcome our own complacency, in a world where camera shutters commonly reach a thousandth (0.001) of a second and “nanosecond” (0.000000001 second) is increasingly bandied about. The tenth-of-a-second increment was particularly important in astronomy (astronomers reaching slightly different results in timing celestial events) and psychology (yielding the concept of reaction time). Canales also contends that the capture of tenths of a second was vital to the larger cultural construction of “modernity.”

All Things Shining (Free Press, 2011) is an eloquent philosophical critique of our tendencies to nihilism and inwardness. Hubert Dreyfus (PhD ’64, philosophy) and Sean Dorrance Kelly, the chair of Harvard’s philosophy department, contend that Christianity and the Enlightenment turned the compass for truth inward. For Christians, inward faith trumped the law (applied from without), and since the Enlightenment, the way to self-understanding has been to look within. But such metaphysical mirror work can dethrone everything beyond the self, as Nietzsche well knew. In response, Dreyfus and Kelly commend the ancient Greeks, for whom the individual’s inner life mattered less than outward action, and self-understanding was more collective (defined by family, community, shipmates, etc.) than individual. Above all, the authors celebrate the Homeric sense of “gratitude and wonder” in the face of an unpredictable world.

Reviews by James Clyde Sellman, PhD ’93, history

Alumni authors: Would you like your book (general interest, published within the past year) considered for inclusion? Send it to Colloquy, Harvard Graduate School of Arts and Sciences, Holyoke Center 350, 1350 Massachusetts Avenue, Cambridge, MA 02138. Question? E-mail gsaa@fas.harvard.edu.
EXTRACURRICULARS IN JANUARY
For the second year, the Graduate School played a leading role in campus activities in January, helping to shape a winter break that Harvard’s new calendar has made longer and more flexible. With fall-term obligations (mostly) behind them, GSAS students were able to take advantage of more than 75 events on offer, centering on career planning, research tools, writing, financial advice, quantitative analysis skills, and plain old recreation. The most popular were those focusing on immediate career concerns, such as the GSAS Fellowships Bootcamp and Real-life Stories from the Academic Job Search, a panel discussion co-sponsored by the Office of Career Services, in which recently minted PhDs provided targeted job-search advice to current students.

WELCOMING NEW ALUMNI COUNCIL MEMBERS
The Graduate School Alumni Association (GSAA) has expanded the ranks of its governing Council by adding three new members this year. They are: Yonatan Eyal, AM ’02, PhD ’05, history, an assistant professor of American history at the University of Toronto; Imad Kordab, PhD ’09, applied mathematics, a quantitative analyst, currently at State Street, focusing on risk analytics in the financial industry; and Abe Lowenthal, AB ’61, MPA ’64, and PhD ’71, government, a professor of international relations at the University of Southern California. The GSAA Council now has 42 members, with Allen Sangines-Krause, PhD ’87, economics, as chair. Visit www.gsas.harvard.edu/alumni/council for complete biographies.

RESEARCH NOTES
The Mind Is a Frequent, But Not Happy, Wanderer
People spend 46.9 percent of their waking hours thinking about something other than what they’re doing, and this mind-wandering typically makes them unhappy. So says a study that used an iPhone app developed by psychology PhD candidate Matthew Killingsworth to gather 250,000 data points on subjects’ thoughts, feelings, and actions as they went about their lives. The research, by Killingsworth and Professor Daniel Gilbert, was described in the journal Science last fall. More than 5,000 people are now using Killingsworth’s app, found at www.trackyourhappiness.org.

Programming on a Nanoscale
Engineers and scientists at Harvard and the MITRE Corporation have developed and demonstrated the world’s first programmable nanoprocessor. The groundbreaking prototype computer system, described in a paper that appeared in Nature earlier this year,”represents a quantum jump forward in the complexity and function of circuits built from the bottom up, and thus demonstrates that this bottom-up paradigm, which is distinct from the way commercial circuits are built today, can yield nanoprocessors and other integrated systems of the future,” says principal investigator Charles M. Lieber of the Department of Chemistry and Chemical Biology and School of Engineering and Applied Sciences. Lieber’s co-authors on the Nature paper included Hao Yan, SungWoo Nam, Yongjie Hu (all PhD ’10), and PhD candidate Hwan Sung Choe.

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I CHOOSE HARVARD...

“The Thanks to the Sensory Ethnography Lab, there is a place for serious art-making at the graduate level,” says filmmaker J. P. Sniadecki. A PhD candidate in the new media anthropology program, Sniadecki credits interdisciplinary collaboration and facilities like the Sensory Ethnography Lab (SEL) as instrumental in the production of his documentaries, now earning prizes at film festivals and rave reviews in the New York Times and Washington Post.

“At Harvard, I set out to craft a multimedia approach to research — to bring together various media, such as film, sound, and text,” says Sniadecki, whose films include Songhua, Demolition, and Foreign Parts (codirected with Véréna Paravel).

Sniadecki, a native of Michigan, is now in Beijing completing PhD fieldwork and working on a new film. Despite the distance, he draws regularly on the creative community he became a part of at Harvard. Sniadecki was galvanized by collaborations with people like Ernst Karel, lecturer in anthropology and SEL manager, and Lucien Castaing-Taylor, John L. Loeb Associate Professor of the Humanities and of the Social Sciences and director of Harvard’s Film Study Center.

“Ernst and Lucien have a vision that’s both inspiring and practical. Without their incredible mentorship and the support of the Graduate School, I wouldn’t be able to produce the kind of films I am making right now,” says Sniadecki.

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To nominate: Submit a letter stating your reasons for selecting the candidate, marked for the Centennial Medal Nominations Committee, to gsaa@fas.harvard.edu or GSAS Alumni Association, Holyoke Center 350, 1350 Massachusetts Avenue, Cambridge, MA 02138.

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