

SUMMER 2019

# *colloquy*

HARVARD UNIVERSITY | THE GRADUATE SCHOOL OF ARTS & SCIENCES

## **Lighting the Spark**

Quantum Science at Harvard



*to note*



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**GRADUATE STUDENTS** face a number of challenges as they work toward their degrees, but none can be more overwhelming than those associated with mental health. Because of this impact on the graduate student experience, GSAS partnered with Harvard

University Health Services to conduct mental health surveys in a variety of programs. Thanks to excellent response rates, we've learned a great deal about the scope of mental health problems throughout our student body.

But this is not an issue limited to GSAS. Over the past several years, institutions of higher education across the country have seen an increase in reports of mental health issues from students and in their subsequent use of related services. As part of the University's ongoing efforts to address this issue, Harvard has taken a leading role in convening a task force on managing student mental health, charged with examining how Harvard can best address the mix of academic, social, and institutional issues that have the potential to influence student mental health. I'm pleased to report that the task force includes students as well as faculty and administrators, and their input will be crucial as we develop University-wide solutions.

In addition to serving on the steering committee, I am leading the working group on graduate and professional students. GSAS students comprise a third of this category, and our PhD students are unique at the University in that they usually take five years or more to earn a degree. The information we've already gathered through our mental health surveys will help inform the development of a broad strategy, one that can effectively support all students. I also intend to consider these results as part of the advising project GSAS will launch during the upcoming academic year.

I am pleased that the University is focusing on this important part of the student experience. Ultimately, this is about improving the lives of students—their lives as scholars and their lives as human beings. I'm particularly drawn to a line in the document that lays out the task force's role: "Mental health is not a problem to address in a few students but an element of well-being to cultivate among all." That is very well said and something we all should bear in mind as we address this critical work.

—EMMA DENCH  
DEAN

## colloquy

SUMMER 2019

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Access current and back issues of *Colloquy*, as well as a range of other alumni services and information, at [gsas.harvard.edu/alumni](http://gsas.harvard.edu/alumni).

### LETTERS TO THE EDITOR

We welcome your feedback and ideas. Write to: *Colloquy*, Harvard University Graduate School of Arts and Sciences, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138-3846; or email [gsaa@fas.harvard.edu](mailto:gsaa@fas.harvard.edu).

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## REMARKS

What's the most helpful advice you received from an advisor or mentor? —COLLOQUY, WINTER 2019

The most helpful—the best—advice I received while at Harvard came from my advisor Otto Eckstein, a brilliant and pragmatic member of the economics Faculty, after defending my thesis. I had gone to the Maine Woods and returned with a unique method for estimating the unpriced value of outdoor recreation. His comment was, “Now, don’t spend the rest of your life on your thesis.” As it happened, I went from Harvard to a Washington think tank that had other plans for me. I never managed to get back to the thesis, but others picked up my technique, made further elaborations, and created the field of “Contingent Value Analysis.” Otto was right. Without lifting another finger, I became known as the pioneer in a flourishing new field. Instead of burnishing one small gem, I have had a rich and varied career that has taken me to many fascinating locations starting, I suppose it is fair to say, with the Northern Maine Woods and the support of Otto Eckstein. —ROBERT DAVIS, PHD '63, ECONOMICS

**Advice received in 1963:** “A wise person thinks twice before saying nothing.”

—LAWRENCE LITT, PHD '71, PHYSICS



## LETTERS

Harvard has a helluva long way to go toward inclusivity. Here and there in *Colloquy* you might mention the women who gained nothing from Harvard except lecture courses, use of the libraries and collections, and finally that piece of paper in a tube, called a diploma. Harvard has remained oblivious of the women in my cohort in spite of the significant research and many publications, even presidencies in our professional organizations, that we have achieved. “Nevertheless, she persisted” characterizes us.

—ALICE BECK KEHOE, PHD '64, ANTHROPOLOGY,  
PROFESSOR OF ANTHROPOLOGY,  
EMERITUS, MARQUETTE UNIVERSITY

[Kristina] Olson is compassionate in supporting children who believe that their gender has been wrongly determined. Fears and anxieties may underlie such dysphoria.... Accordingly, we should not accept gender dysphoria in a reflex manner. Transferring to the opposite

gender will have severe consequences and life-long losses, such as loss of any chance to become a biological parent. So, such children should routinely be offered psychotherapy, which might restore normal self-concept.

Hall's article revealed no such interest in helping via psychotherapy. Rather, the idea of “categorization” is demeaned as though it is wrong to categorize a child as a male or as a female. Olson cannot be fully helpful if she fails to accept the natural biology that governs over 99 percent of all people. It only seems liberal and humanistic to accept and support the child's own definition of his or her gender, despite pathologic sources.

For example, imagine dealing with children who pictured themselves as “witches” or “demonic agents.” It would *not* be kind to support that type of dysphoria. Olson's clients should also be helped to better lives and better futures.

—HERBERT S. CARON, PHD 1953, PSYCHOLOGY

## ENGAGE

What did you do to take a break from your academic work?

**Let us know!** Email [gsaa@fas.harvard.edu](mailto:gsaa@fas.harvard.edu)

●●● **Share your story with us!** Email [gsaa@fas.harvard.edu](mailto:gsaa@fas.harvard.edu). Or write *Colloquy*, Graduate School of Arts and Sciences, Harvard University, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138-3846.





## RESEARCH OF THE NEXT GENERATION

Sea sponge-inspired architecture. The true story of the Library of Alexandria. What makes a blue jay blue. These are three of eight topics delivered by the 2019 Harvard Horizons scholars at a symposium held in April. Each year, eight PhD students are chosen to receive in-depth, personalized mentoring and coaching designed to enhance their presentation skills before delivering their brief, compelling talks from the Sanders Theatre stage.

● ● ● Missed Harvard Horizons? Watch the symposium at [gsas.harvard.edu/horizons2019](https://gsas.harvard.edu/horizons2019).

## YOUR WINDOW INTO THE MINDS OF HARVARD PHDs

Will climate change force us all to eat vegan diets? Can King Kong do a backflip? Who decided that tuxedos should be black and white?

If there's a question you're curious about, chances are there's a Harvard PhD student who has the answers. On the GSAS podcast Veritalk, you can hear the latest big ideas across the humanities, sciences, and social sciences in just 15 minutes. Subscribe to Veritalk and get stories about everything from mermaids to microbes delivered directly to your mobile device.

*Veritalk recently won a Gold Circle of Excellence Award from the Council for the Advancement and Support of Education, which noted that GSAS "has made academics seem normal and everyday in a very good way."*

● ● ● Search for "Veritalk" in your favorite podcast app or visit [gsas.harvard.edu/veritalk](https://gsas.harvard.edu/veritalk).



## YOU CAN GO HOME AGAIN

Alumni returned to campus in April for a weekend of engagement at Alumni Day and the Harvard Biophysics Graduate Program Alumni Reunion and 60th Anniversary Celebration.

In multiple sessions at the biophysics reunion, alumni shared their perspectives on the journey from graduate school to their current profession as well as their proudest successes and the inevitable missteps they made along the way. The program included the North American premiere of *When DNA Makes Loops*, performed by the Callithumpian Consort and composed by Amir Bitran, PhD candidate in biophysics.

At Alumni Day, keynote speaker and Professor of Sociology Frank Dobbin shared the results of his research into faculty diversity programs as he considered the question "Why, if we are seeing disciplines across the country turning out women and minorities with PhDs, are we seeing so few getting tenure 10 years out?" Afternoon sessions included discussions of narcissism in public life, social science in the classroom, and viruses, proteins, and cells.

● ● ● Read recaps of the events at [gsas.harvard.edu/news/stories/alumni-day-2019](https://gsas.harvard.edu/news/stories/alumni-day-2019) and [gsas.harvard.edu/news/stories/biophysics60](https://gsas.harvard.edu/news/stories/biophysics60).



Save the date for the next Alumni Day: April 4, 2020.

*Students, faculty,  
and other mentors  
“have given me the  
confidence to pick  
battles, go after  
the more robust yet  
less flashy science,  
continue to seek  
appropriate feed-  
back from others,  
and come back to  
trusting my gut.”*

—VINIDHRA MANI, PHD '19, IMMUNOLOGY  
STUDENT SPEAKER FOR THE DIVISION OF  
MEDICAL SCIENCES HOODING CEREMONY



#### JUBILATION

On Thursday, May 30, 2019, GSAS students gathered with their families and friends to celebrate the 368th Harvard University Commencement Exercises. The culmination of years of study and research, Commencement marked the transition from students to alumni as graduates move on to diverse careers in industry, the nonprofit sector, government, and academia.



#### CONTINUING TRANSFORMATION

Since the October 2018 announcement that Dudley House would transition to the GSAS Student Center for graduate students and the Dudley Community for undergraduates, GSAS has been gathering information about what students and alumni would like to see in the newly envisioned Center. GSAS Dean Emma Dench has met with student leaders and affinity group members to hear their perspectives, and several students are serving on a committee to choose the Center's inaugural executive director.

GSAS also surveyed alumni for their thoughts. Enhanced programming and improved space topped the list of suggestions from alumni, with many sharing the positive impact that activities, such as intramural sports and connecting with students from other fields, had on their graduate student experience. All information gathered will be considered as the review and implementation process continues over the next academic year.



# Advocates for a Balanced Life

GSAS BIDS FAREWELL TO  
DUDLEY HOUSE FACULTY DEANS  
JAMES AND DOREEN HOGLE

BY KELLY HAHN

*Dudley has always been the most unconventional member of Harvard's undergraduate House system. It had its origins in 1936 as the College's non-residential undergraduate student center, before becoming a House in 1958 and incorporating all GSAS students in 1991. During their tenure, Faculty Deans Jim and Doreen Hogle strengthened Dudley's identity as a place for all students—from different backgrounds, following different paths, and with a wide variety of interests, both academic and personal—to come together and build well-rounded lives at Harvard. As the Hogles step down from their post, they will be remembered for their impact on students—graduate students and undergraduates—and for their unfailing enthusiasm for the importance of spending time away from academics.*

**JIM AND DOREEN HOGLE** have made history at Dudley House. Through 17 years of distinguished service, they have become, by a significant margin, Dudley's longest-serving faculty deans; in fact, they are among the longest-serving across Harvard's entire House system. But their legacy cannot be measured merely in years. In everything they have done, the Hogles have embodied warmth, openness, integrity, boundless energy, and true interest in and care for those around them. They have touched the lives of thousands of students, staff, and alumni.

When the Hogles became co-masters of Dudley House in 2002, they succeeded Everett Mendelsohn and Mary Anderson, who describe the Hogles' leadership as exemplary. "Jim and Doreen came into the mastership of Dudley House with smiles on their faces and with genuine enthusiasm for what they knew would be an adventure," Everett and Mary recall. "Over the years, as we checked in on activities and events at Dudley House, we saw that Jim and Doreen both maintained this enthusiasm and beautifully expanded the roles they filled. Their time at Dudley House represented the best of the original concept of the House."

When Allan Brandt thinks back on his GSAS deanship, from 2008 to 2012, he puts the Hogles at the top of his list of people who did things of real significance for students. "They understood how important it was to make the Graduate School a supportive and generous environment," Brandt says. "The history of graduate education was for students to be isolated in their departments, without the socio-intellectual opportunities made



possible by such an incredibly talented and committed student body. The Hogles made sure that students had a chance to utilize their many strengths and interests, and they were totally accessible in every way."

Margot Gill, who served for more than 20 years as administrative dean of GSAS, sees the Hogles' openness and accessibility as defining features of their leadership. "I think of Jim Hogle on stage at Sanders Theatre at Orientation, every single year, welcoming graduate students to Dudley House," Gill says. "He would say it with such energy and warmth and enthusiasm; it was just genuine. He'd put on his Dudley hat and his Dudley T-shirt, and he just embodied the open invitation to every single graduate student. What could be better than that?"

The Hogles made every year at Dudley House one to remember. At Discover Dudley, the annual start-of-year theme party, they have donned unforgettable costumes—Jim's turn as the Lorax is legend—and encouraged incoming students to explore the House and its many resources. The Hogles have been enthusiastic participants in student-faculty dinners, Senior Common Room gatherings, and a wealth of activities planned by the Dudley Fellows, a dedicated team





of 26 graduate students who organize everything from film nights and music performances to outings and athletic events—all helping to connect students who share common interests, regardless of academic department. At year-end dinners at the historic Commander's Mansion in Watertown, Jim has paid tribute to the unique contributions of each and every Dudley Fellow.

The Hogles have been superb advocates for graduate students, in part because they have firsthand knowledge

have found it deeply meaningful to have a senior member of the faculty so committed to encouraging them to have fun and live full lives at Harvard. As Zeba Wunderlich, PhD '08, reflects, "Graduate school is inevitably a stressful time for most, and the atmosphere at Dudley House was always a breath of fresh air, due to Jim and Doreen's dedication to bringing some balance to graduate school life. I know I am a much better person for having had the opportunity to serve as a Dudley Fellow."

In recognition of the Hogles' lasting contributions to student leadership development at GSAS, the position of head Dudley Fellow has been named in their honor. Lindsey Brown, a PhD candidate in applied mathematics, will serve as the first Hogle Coordinating Fellow next year. "I have been fortunate to work with Jim and Doreen and experience firsthand their leadership of the Fellows team," Brown says. "It is such an honor to carry their name forward into the leadership of the GSAS Student Center, and I am grateful that, no matter where their retirement travels may take them, a piece of them will always be here leading the Fellows team."

Co-op, others who live off-campus, and visiting undergraduates. Doreen has presided over undergraduate Commencement exercises, and she and Jim have enjoyed many meals at the Co-op and have opened their home and their hearts to undergraduates in need of support. Karen Flood, who served for seven years as Allston Burr Resident Dean, notes that the Hogles have always had a special fondness for undergraduates who take an unusual path through college. "Jim and Doreen respected the additional responsibility that Dudley Co-op and off-campus students took on," Flood says, "and they respected our students' activism in university, local, and national politics. They also had a lot of empathy for students who were experiencing distress of any kind. The idea of the whole student is something that they lived and breathed."

The Hogles' Harvard family extends beyond the graduate and undergraduate students of Dudley House. For the past seven years they have been faculty directors of Harvard's Graduate Commons Program and residents of Peabody Terrace, where they have hosted monthly open houses and worked to create a full sense of family and home within the Harvard University Housing community. They have also been a constant inspiration to alumni and staff who share their mission.

Susan Zawalich, who served Dudley's graduate student community for 26 years as House Administrator, is among those who have worked most closely with the Hogles, particularly with Jim and the Dudley Fellows. "The Hogles are wonderful, warm, and precious people, devoted to supporting students as whole human beings," Zawalich says. "They're beloved by the people that they work with, and they're enormously positive role models for students. Anyone who has been a student while they've been here has been lucky."

## ***"They understood how important it was to make the Graduate School a supportive and generous environment."***

—ALLAN BRANDT, AMALIE MOSES KASS PROFESSOR OF THE HISTORY OF MEDICINE

of what graduate school is like: Doreen is an accomplished lawyer, and Jim is Edward S. Harkness Professor of Biological Chemistry and Molecular Pharmacology at Harvard Medical School. Students

In addition to their unflagging support of graduate students, the Hogles have been deeply invested in the three branches of Dudley's undergraduate population: residents of the Dudley





# IMAGINED PAST

**EMILIO KOURÍ, AB '84, PHD '96,** STUDIES THE SOCIAL AND ECONOMIC HISTORY OF RURAL MEXICO SINCE INDEPENDENCE. HE IS PARTICULARLY INTERESTED IN THE IDEA OF THE "INDIAN PUEBLO," CREATED BY THE SPANISH BASED ON PRE-HISPANIC INDIGENOUS COMMUNITIES. THE MYTHOLOGY OF THESE COMMUNITIES CONTINUES TO RESONATE IN MEXICO TODAY.

**Would you say that the history of Mexico is a history of farming and land ownership?** For thousands of years, the life of people in the Mexican region—particularly in the center and the south—has been bound to agriculture. It is the birthplace of corn cultivation, and a series of cultures that arose and continue today were built around the consumption and cultivation of corn. Prior to the Spanish conquest, village life and agricultural life were the center of everyone's existence. Even after Independence in the 19th century, Mexico remained centered on agriculture. I'm interested in that agrarian path because it's really at the core of the lived experience, back to the origins of agriculture—maybe 5,000 years before the common era until a short while ago.

**It sounds as though the area was fertile and profitable. What happened after the Spanish arrived?**

The identity of Mexico is largely tied to the story of indigenous people living in villages that governed themselves. The arrival of and conquest by the Spaniards changed everything dramatically, but it did not change the centrality of agriculture. A huge percentage of the native population—some say up to 90 percent—died from epidemics, violence, war, and disruptions, but most of those who remained continued to live in the countryside.

What did change was that the Spaniards reorganized land tenure. From the existing pre-Hispanic communities, the Spanish created pueblos that were endowed with lands by the King of Spain.



# ***“These imagined communities were reinvented...without a political component.”***

—EMILIO KOURÍ

Much of the political and social history since the Spanish conquest and into the 19th century is really about the fate of those communities: the lands, the political rights, the efforts to fend off interlopers from the neighboring states that the Spaniards controlled. This is a core part of the history, but it's also a core part of that idea of the past—that this was a place of natives and later mixed communities who held the land that way.

## **How long did these communities last?**

That structure stood in place until the second half of the 19th century, when modern ideas of social progress and the idea of the individual farmer took hold in Mexico. Politicians abolished collective or communal property because they thought that it was a drawback to economic and social progress.

In part, the disruption, the dispossession, and the disaffection produced by that major transformation in the historical status of communal property led to the agrarian outbreaks around the Mexican Revolution of 1910. Certainly, some of the groups that rose to fight during the revolution wanted the restoration of the communal status of village lands. After the revolution, profound agrarian reform in the 20th century created new communities imagined to be like the old ones, but, in fact, they were quite different.

## **Does your research address this difference?**

My work is, in part, about how that reform was predicated on certain ideas about the past: about the nature of those communities, what held them together, and how they worked. I argue that some of the difficulties that 20th-century land reform faced have to do with the implementation of policies that were based

on an understanding of the past that was, in some ways, defective. Communal property is connected to romantic social qualities: egalitarianism, reciprocity, and solidarity working harmoniously until, in the second half of the 19th century, politicians pushed them to dissolve as a path to progress and modernity.

In fact, it was a much more complicated story. As land holding units, they were from the start very unequal, very stratified. Their real virtue lies in the way they became the foundation for local political power and organization. When these “imagined communities” were reinvented by the government, they were reinvented without a political component. And I say imagined communities because, although they did exist as communal land holding communities, the meaning of communalism in pre-Hispanic times was often not the same as the romanticized version.

## **How has that lack of political engagement affected Mexico?**

Land reform was a huge political achievement. By the late 1930s, it had led to the destruction and dissolution of the old estates that had arisen after the Spanish conquest in the 16th and 17th centuries, and those lands were distributed into a newly created communal land holding association of the sort that I mentioned. That is, historically, without question, quite significant. The issue is why they didn't lead, in the countryside, to the kind of prosperity and progress that people once hoped they would.

The absence of the political element left them unable to establish or fight for what they needed and, through a kind of growing clientelism, they essentially became wards of the state when it came to political rights and representation.

## **CURRICULUM VITAE**

**University of Chicago**  
Professor of History  
and the College  
Chair, Department  
of History  
Director, Katz Center  
for Mexican Studies

**Harvard University**  
AB in Philosophy,  
cum laude, 1984  
PhD in History, 1996

Mexico had a single party in power from the 1940s until the year 2000, and the political foundation of that stability came largely from these captive communities that had no other political form of redress.

## **Did that absence of political power and development of a single party have negative impact on the country as a whole?**

Agricultural reform was one example of a neglect that has had long-term consequences. Municipal or city power was stripped out of politics in the land communities and elsewhere, and that weakened the fabric of local society. The revolution initially promised to reverse that but, in fact, did not and continued the process of weakening local power. And many of Mexico's problems—not just the ones related to agriculture—in localities that feed the violence of drug dealing and so on are connected to the sense of abandonment of space at the local level. Sooner or later, that is going to have to be restored.



*Un*



The new gene-editing tools that  
are poised to transform humanity

# *boxing* *CRISPR*

BY ANN HALL  
ILLUSTRATION BY  
JODY HEWGILL

THE WORLD OF SCIENCE FICTION is full of cautionary tales that chronicle the consequences of tinkering with the human genome. The movie *Gattaca* explored the societal effects of genetic choice, imagining a world that had divided humanity into those considered worthy of success and those banned from it because of their “inferior” nature. In *Star Trek: Deep Space Nine*, it was discovered that a character had undergone a genetic therapy to boost his intelligence, a procedure outlawed when genetic engineering was banned after the Eugenics Wars. These stories and a multitude of others portray the dangers, often deadly, of “playing God” with

what nature intended for humans.

But in the real world, genetic modification in some form or another has been practiced for millennia, for example, through selective breeding and artificial selection. When Gregor Mendel conducted his experiments on peas more than 150 years ago, he inspired the new field of modern genetics, which led, ultimately, to experiments designed to understand and improve the human genome. Over time, technological advances have challenged society’s belief systems and raised ethical concerns, spurring public debate over ideas that once seemed confined to fiction.





The latest disruptive technology to take aim at our genetic makeup is known as CRISPR: Clustered Regularly Interspaced Short Palindromic Repeats. Discovered in the 1980s and initially dismissed as “junk DNA,” CRISPR has emerged as a tool with the power to eradicate disease, and it is transforming scientific research throughout the world.

Turns out, that “junk” plays a key role in immunity to reinfection, a discovery made through bacterial DNA research. Bacterial DNA is made up of repeats and spacers—the CRISPR—along with a CRISPR-associated, or Cas, enzyme. When a virus invades, Cas enzymes attack and snip off portions of the virus’s genome. These bits are stored in the spacers so that the bacterium “remembers” what attacked it in case the virus returns.

Jennifer Doudna, PhD ’89, and her colleague Emmanuelle Charpentier of the Max Planck Institute for Infection Biology in Berlin, realized that they could capitalize on this defense system and use it as a tool for directed gene editing. Their technique involves combining a guide-RNA produced by CRISPR with a specific enzyme called Cas9 to form a Cas9 complex. The guide-RNA is programmed to find a specific section of DNA, and when it does, Cas9 cuts it out.

But there’s a drawback: Sometimes, the scissors don’t stop and continue along, modifying similar genetic material and causing unintended consequences. Though research to thwart these “off-target effects” is promising, until they can be eradicated, the technique could lead to circumstances that harm patients. And this leads to an important question: What are our ethical responsibilities when new technologies arise and are implemented as quickly as CRISPR?

Jacob Moses studies the changing notions of medical harm.

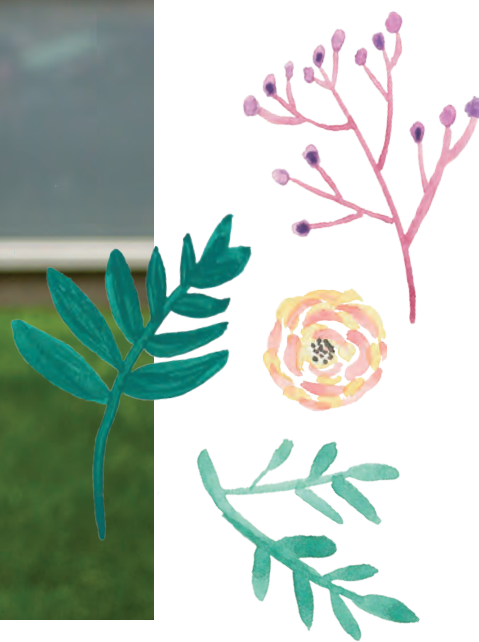
## FIRST, DO NO HARM

Medical harm is what Jacob Moses, a PhD student in the history of science, focuses his research on. “I’m interested in changing notions of medical harm: what it is, who defines it, and how it has changed over time,” Moses explains. “I’m looking at moments of therapeutic reversal, where something widely practiced and thought to constitute good care comes to be seen as a harmful form of intervention.”

As a Vassar undergraduate studying science, technology, and society, Moses became intrigued by efforts to use genetic technology to modify humans. After graduation, he worked for a bioethics research institute but ultimately decided that he wanted to conduct his own research and develop an identity as a scholar. PhD studies in the history of science seemed a perfect fit.







“In debates about genetics, synthetic biology, or emerging biotechnologies like CRISPR, many of the participants invoke the past,” he says. “By studying these debates, you can find areas of overlap, agreement, or differences that present challenges for ethics and governance. It provides opportunities for us to clarify fundamental issues of how we want to live and what our future will be as a society.”

At first glance, the potential for harm can seem an obvious ethical reason for not using a particular technology. But the reality is far more complicated. “You have cases of patients advocating for acceleration of the availability of certain therapies; HIV/AIDS is the central example of that,” Moses says. “But you have other cases where patient advocates suggest that a practice should be abandoned or

curtailed.” He gives an example from his own research into radical mastectomies, once common practice until surgeons came to recognize new harms in light of patient activism and advocacy.

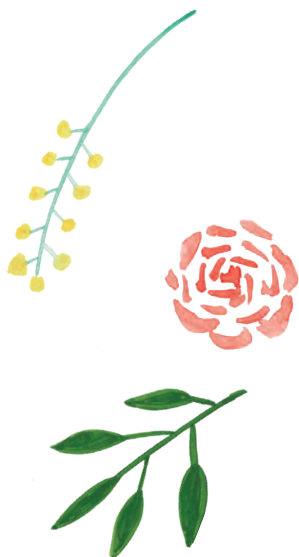
Whether CRISPR as a therapeutic tool faces the same fate is anyone’s guess, as debate over its ethics is ongoing. “I think that people are excited and concerned about CRISPR because of visions of the future informed by science fiction,” Moses says. “Many of the scientists I know are thinking about the possibilities and what the risks and future harms could be, too.”

### LUCKY NUMBER 13

The desire to reduce harm is what fuels research undertaken by Catherine Freije, PhD student in virology, and Cameron Myhrvold, PhD ’16. Based in the lab of Pardis Sabeti, professor of

organismic and evolutionary biology and a leader in the Broad Institute’s Infectious Disease and Microbiome Program, they use CRISPR technology, but one that takes advantage of a different protein. “There are many Cas proteins out there,” Myhrvold explains. “We work mostly with Cas13, which is different from Cas9 in that it targets RNA instead of DNA.”

Cas13 was identified about two years ago, and its discovery has enabled Freije and Myhrvold to target infectious viruses that use RNA as their genetic material, as well as develop diagnostic tools for viruses. Cas13 operates differently than Cas9 and many other proteins that have been discovered. “We like to think of CRISPR as a toolbox with different tools for different applications,” says Freije. “Cas13 is another tool in that box.”



*Forbes* included Catherine Freije and Cameron Myhrvold in the 30 under 30 list for 2019.

And that toolbox is a game changer. “It’s revolutionizing research in many ways,” says Myhrvold.

Freije and Myhrvold decided to start with Zika and dengue, two viruses that are often found in the same region and are notoriously difficult to diagnose. Using Cas13, they and their colleagues developed a diagnostic platform that correctly identified when the Zika or dengue viruses were present in a patient sample, with minimal sample processing. After they published their results in *Science*, they received a nod from *Forbes* magazine, which named them one of their 30 under 30 for 2019.

While Freije and Myhrvold initially worked on developing a diagnostic tool to inform treatment, the next step is to target and destroy a virus. “The ultimate goal would be to develop a drug with Cas13 designed to cure a disease caused by a certain pathogen, and allow a patient to recover faster,” says Freije. “But we’re far away from that at the moment.”

## FLOATING ALL BOATS

Harm isn’t the only ethical consideration in the conversation about CRISPR and other forms of genetic modification. For some, new technologies provide altruistic opportunities. “I believe we have an ethical obligation to maximize benefits and minimize harm,” says George Church, PhD ’84, professor of genetics, Blavatnik Institute, Harvard Medical School. “If we have an opportunity to eliminate infectious and genetic diseases, or some subset of them—even one of them—then we should pursue it.”

Church is a world-renowned geneticist whose research runs the gamut from age reversal and disease reduction to woolly mammoth resurrection and genetic modification for space travel. Each project is evaluated for potential risks and benefits, with an eye to risk reduction. And while some may raise concerns about the dangers of augmenting humans, Church believes that the practice should be pursued—but fairly.

“I don’t think there’s an ethics of augmentation, other than it should be equitably distributed,” he says. “It should be inexpensive. It should be safe and effective, both short and long term.” Church points out that CRISPR isn’t the first method to precisely edit the genome but rather is simply the latest in a series of technologies that have existed and been debated since the 1980s. The game-changing aspect of genome editing is a possible 10,000-fold improvement in the number of edits that can be made at high efficiency. Multiplexing, or making multiple







“I believe we have an ethical obligation to maximize benefits and minimize harm.”

—GEORGE CHURCH

edits at once, is something that Church has investigated for years, and this type of editing could completely eradicate the potential for certain diseases. His lab recently announced a breakthrough in multiplexing, where 13,200 edits were made in the genome of a single cell.

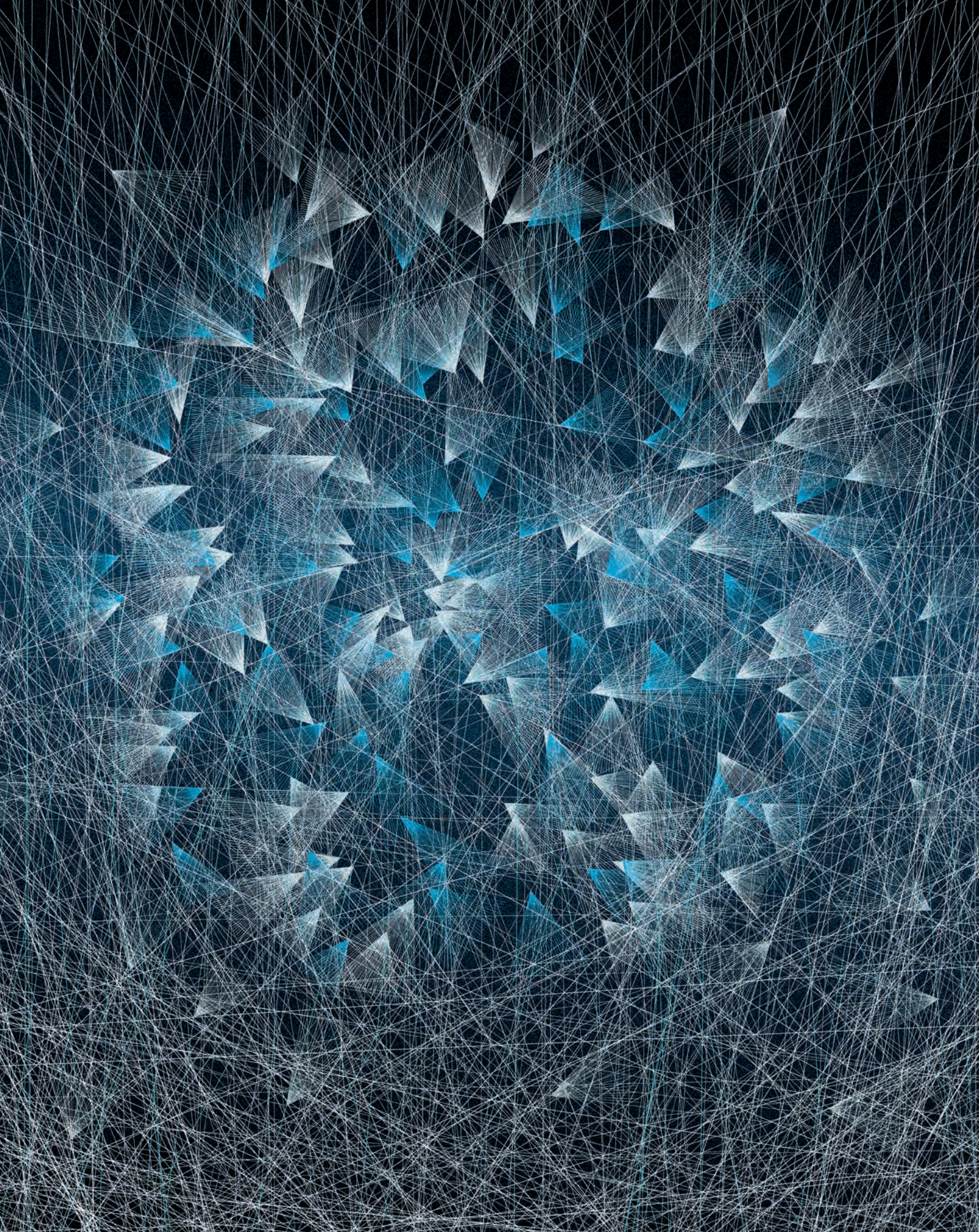
This breakthrough hints at the possibility of improving human health to a state where diseases—at least those encoded in our genes—could be eliminated. As a stopgap against the dystopian futures prophesied in fiction, Church believes that we should ensure that such a technology not be limited to the wealthiest. “One of my team’s obsessions is reducing the price of technologies,” he says. “I’m not particularly motivated by helping the rich get yet another advantage, fair or unfair. I’m motivated by floating all boats.”

### A BETTER FUTURE

It is hard to find a positive representation of genetic modification in science fiction. All stories tease a benefit that is stripped away, replaced by a doom-filled future. But in a world where debate is informed by scholars like Moses, where research by scientists like Freije and Myhrvold could limit or eliminate harm for patients ravaged by viruses, a more positive future of the kind Church works toward seems more likely.

As a comparison, Church points to the development of life-saving vaccines for smallpox and polio and notes that the diseases’ extinction will be completely egalitarian because everyone in the world will benefit. “They won’t have to get the government to pay a penny for them to get vaccinated because the world is free of it,” he says. “That inspires me.” 🍀







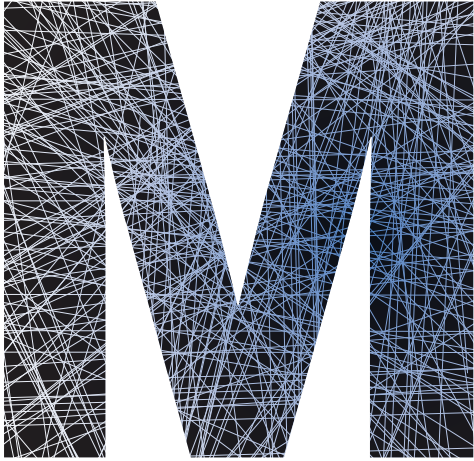
BY ANN HALL  
ART BY KAI AND SUNNY

# LIGHTING THE SPARK

## HARVARD SIGNALS ITS INVESTMENT IN QUANTUM SCIENCE

**IMAGINE, FOR A MOMENT,** that you could forget everything you ever knew about the way our reality works. That two objects hundreds of miles apart could communicate instantaneously. That the act of measuring something could change what is being measured. That something—a cat, perhaps—could be both alive and dead at the same time.

But this actually is the way our reality works. Or at least it does at the microscopic level. When you look at smaller and smaller objects—objects at the atomic and subatomic levels—quantum effects seem to make interactions between objects operate differently than predicted by the kind of classical physics most of us learned in high school. The quantum world is so counterintuitive, so strange, that even Max Planck (who coined the term *quanta*) searched for an alternative explanation for his results.



More than a century later, quantum theory may seem mysterious to the lay person, but mathematically, it's 100 percent calculable. "Quantum mechanics tells you what is going to happen, very precisely," says John Doyle, Henry B. Silsbee Professor of Physics in the Faculty of Arts and Sciences (FAS). "When you do the calculations, there's no mystery about it at all. The mystery is only that microscopic physics behaves differently than what we see in our daily lives."

Doyle is one of the co-directors of the Harvard Quantum Initiative (HQI), a cross-disciplinary community dedicated to expanding research, development, and education on quantum information and its possibilities. Launched in November 2018, HQI forms part of a larger effort in the United States to advance understanding of quantum science and technology and initiate the development of innovative materials and devices for high-speed computing, networking, and ultra-precise sensing. Doyle and his colleagues—co-directors Evelyn Hu, Tarr-Coyne Professor of Applied Physics and of Electrical Engineering at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS), and Mikhail Lukin, George Vasmer Leverett Professor of Physics at FAS—see the advancement of quantum science as a radical effort to expand scientific boundaries and rethink how research is accomplished.

"We believe that quantum science represents a profound change in the understanding of what information is, which will affect everything we do moving forward," says Hu. "That change will affect how we measure, how we compute, and how we communicate." By embracing the physics that operates at the quantum level, researchers can tackle problems—or reinvestigate old ones—in groundbreaking new ways that hold transformative potential. "For people in the sciences, this is a tremendous opportunity to create novel applications and instrumentation that can be used to further enable scientific research," Hu says.

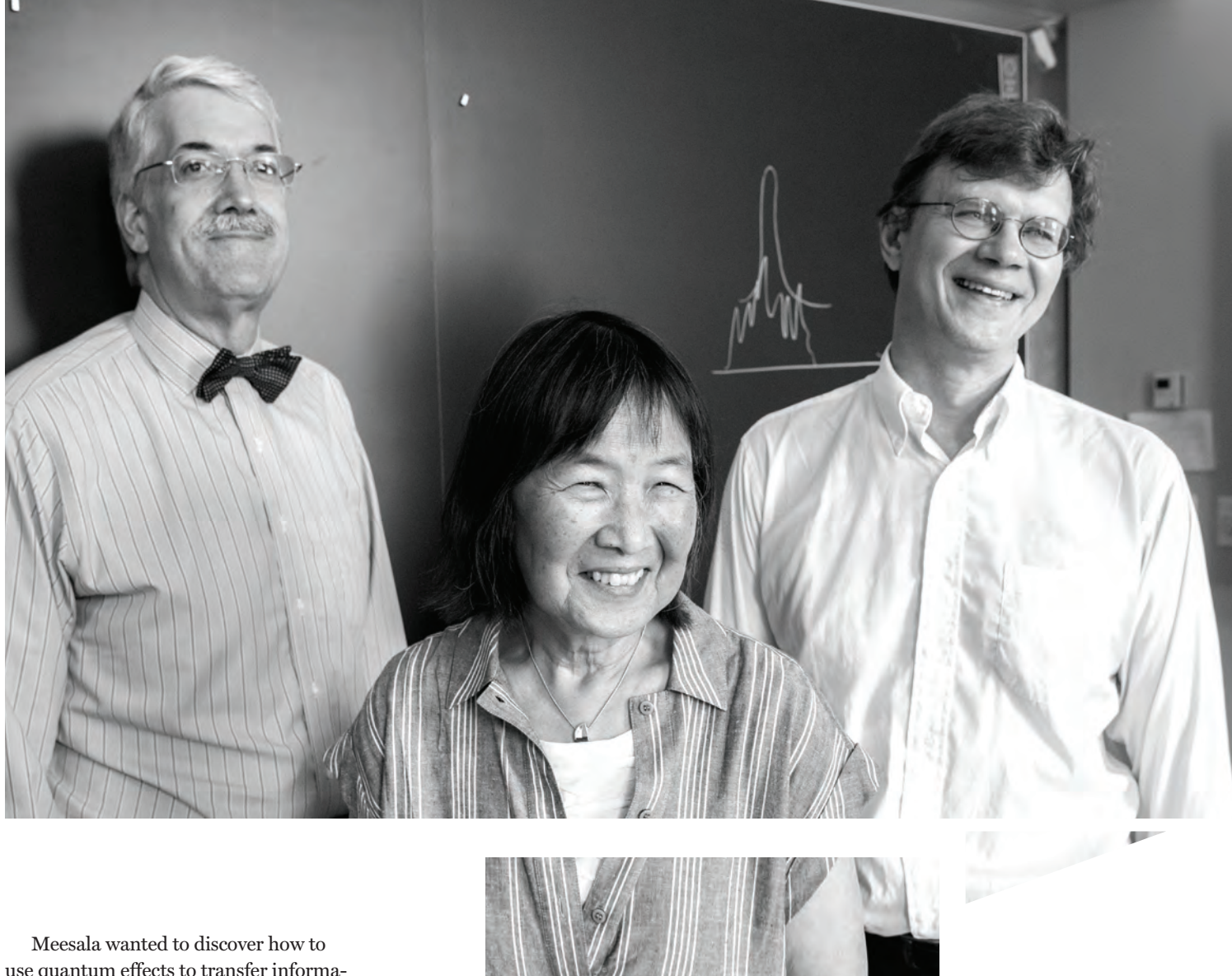
John Doyle, Evelyn Hu,  
and Mikhail Lukin lead the  
Harvard Quantum Initiative.

Hu deliberately uses the term "quantum science" and "quantum engineering" instead of "quantum physics." While early breakthroughs in quantum science came from theoretical physicists, the next generation of quantum scientists has come from physics, computer science, chemistry, and mathematics. This broader collaboration is expected to, in turn, accelerate and enrich progress in these fields, but in ways that cannot at the moment be easily predicted. "Breakthroughs often happen at the interfaces of traditional disciplines," says Lukin.

## SPOOKY ACTION UP CLOSE

Those breakthroughs will rely on a strong foundation of basic science, built in part by faculty, graduate students, and recent graduates from Harvard. Srujan Meesala, PhD '19, is emblematic of the young scientists whose work sits at the intersection of multiple fields. Meesala studied electrical engineering as an undergraduate, and though he wanted to focus on physics for his graduate work, he's grateful for the hands-on experience he brings to his research. "There is a need for engineers who think about making devices to study interesting physics," he says, "and for people from hard physics backgrounds to become more engineering oriented." Meesala brought his expertise to the lab of Marko Lončar, the Tientsai Lin Professor of Electrical Engineering at SEAS.





Meesala wanted to discover how to use quantum effects to transfer information. To conduct this research, he's using sound and flaws in an unlikely source—diamonds. “My research uses defects inside diamonds, called color centers,” he explains. Diamond crystals are made of carbon atoms. By removing one carbon atom and replacing a second with another element—nitrogen or silicon, for example—he can create an individual quantum system inside a solid. “This is interesting for quantum information applications because you can store and process information at the level of the atom inside a solid.”

Experiments on color centers have shown certain quantum effects, such as when two quantum particles interact and become interdependent, a process known as entanglement. Einstein found the phenomenon so startling that he famously called it “spooky action at a distance.”

“We believe that quantum science represents a profound change in the understanding of what information is, which will affect everything we do moving forward.”

—EVELYN HU

“Entanglement is hard to observe in nature. You need to engineer very specific quantum systems to see it.”

—SRUJAN MEESALA



Meesala used sound in an effort to induce these interactions. “You can quantize sound at the quantum level into particles called phonons,” he says. “I wanted to determine if we could get one color center to interact with another by exchanging sound waves.” In their experiment, Meesala and his colleagues carved a thin string out of diamond, then applied voltage to stretch it and study how sound waves couple to a defect called the silicon vacancy center. They envisioned that sound can move along such a string like a pressure wave, causing some of the atoms to compress and others to elongate, essentially transferring information from defect to defect.

Meesala was able to conclude that a silicon vacancy center provides a good system for testing the sound-mediated transfer of quantum information, which could be applied in quantum computers and networks. The work was published last year in *Nature Communications*.

“Entanglement is hard to observe in nature. You need to engineer very specific quantum systems to see it,” Meesala explains. “Isolating and manipulating these individual defects is one way to do that.” By taking advantage of color centers, researchers have measured the entanglement of particles in two diamonds located a kilometer apart by using the light emitted by the defects.

But while quantum entanglement has been generated between diamond color centers at a distance, it is hard to achieve between two defects in the same diamond. “To perform local quantum operations with these color centers, we would ideally put a number of color centers on one chip and have them interact.”

At right: Di Wei engages in fundamental research questions.

### ALONG THE WAY

Di Wei, PhD '19, has taken a different approach to solving the problem of information transfer at the quantum level, but one still grounded in basic science research. As an undergraduate working in a condensed matter lab at the University of Denver, she connected with scientists like her whose inquisitiveness drove them to solve problems for their



own sake. “I’m of the school of thought that you should do basic research for the sake of basic research, and that technology will arise from that,” she says. “Special relativity is my favorite example of that because it’s so abstract, but it is the reason we have technologies like GPS today.”

These energizing collaborations fueled her decision to pursue graduate studies at SEAS, where she continues to satisfy her curiosity about physics. Wei joined the lab of Amir Yacoby, professor of physics and of applied physics at FAS and SEAS, where she found numerous opportunities to engage in fundamental research questions. One of Yacoby’s projects involved looking for spin superfluidity in graphene, a two-dimensional sheet of carbon atoms.

“Spin superfluidity is a magnetic analog to superconductivity, using the electron’s spin as carriers of information as opposed to their charge,” Wei explains. “You can think of each spin as a local magnetic moment that can interact with neighboring spins. If the spin at one site is tilted, its reorientation is felt by nearby spins.” This tilting creates a spin wave that can transfer angular momentum

from site to site, which can be used to send information with less heat than is currently generated by traditional electrical methods used in computerized devices. “A superfluid of spins would allow for the transfer of spins with no energy loss, which would be a fundamentally new kind of system to study,” she says.

Yacoby and colleague Bertrand Halperin, Hollis Professor of Mathematics and Natural Philosophy, Emeritus, had postulated that superfluidity could be found in graphene, and Yacoby and Wei set out to test this theory. Using a type of magnetic material known as a quantum hall ferromagnet, they observed some intriguing physics that could help measure exotic quantum states via a process called electron interferometry. “The first thing we saw was an interesting interference pattern between electrons,” Wei says. “The pattern confirmed that graphene was a good platform for electron interferometry.” This work was published in *Science Advances* in August 2017.

Next, Wei used an electric current to generate spin waves through the graphene and was able to detect those waves via an induced voltage. “It’s the

first transport measurement of spin waves in a graphene quantum hall ferromagnet,” Wei says. “They were predicted to exist in this system but were difficult to detect with electronic methods because they are excitations of an insulating material.” In October 2018, she was lead author on a paper about these findings, which appeared in *Science* magazine.

Although Wei wasn’t able to demonstrate spin superfluidity with certainty, her results do establish graphene as worthy of further study. “Often, the original idea that researchers set out to test doesn’t work, but they are still able to find interesting things along the way,” she says.

## A CHANGING WORLD

Doyle, Hu, and Lukin believe that Harvard is well positioned to make advancements in quantum science and engineering through the work of researchers like Meesala and Wei—large enough to tap existing intellectual prowess and small enough to act on ideas and move more quickly than other institutions. “A new discipline is being created right in front of our eyes,” says Doyle.

“It’s obvious that this is a special time,” Lukin continues. “We have a very special community of world-leading researchers. Harvard is home to the most powerful quantum machines ever made.” He notes that hundreds of young leaders who trained at Harvard are now conducting their own cutting-edge research at institutions around the world, pushing the boundaries of what is currently known about the quantum realm.

And while this new discipline holds tremendous potential—so much so that Harvard, the US, and the world are willing to invest in its promise—it’s impossible to anticipate what the ultimate impact will be. “No inventor could predict how the world would use their invention,” says Hu. “We don’t know where the spark will be lit, a spark that will burn a pathway to new applications.” ❧



# FEARLESS ADVOCATES, TRUSTED LEADERS

The achievements of the 2019 Centennial Medalists made fundamental and lasting contributions to knowledge, to their disciplines, to their colleagues, and to society.

●●● Read more about the medalists: [gsas.harvard.edu/news/stories/fearless-advocate](https://gsas.harvard.edu/news/stories/fearless-advocate)

**Jane Lubchenco, PhD '75**, Organismic and Evolutionary Biology  
Marine ecologist and founding figure in the science of environmental sustainability, University Distinguished Professor and Marine Studies  
Advisor to the University President at Oregon State University



“**JANE LUBCHENCO** is deeply and morally grounded in this notion of stewardship and responsibility for the planet, and she is not reluctant to share her passionate commitment to stewardship, both in the interest of the environment and in the interest of people.”

—BILL CLARK, HARVEY BROOKS PROFESSOR OF INTERNATIONAL SCIENCE, PUBLIC POLICY, AND HUMAN DEVELOPMENT, HARVARD KENNEDY SCHOOL





**Joseph Nye, PhD '64,**  
Government  
Authority on foreign policy and power,  
Harvard University  
Distinguished Service Professor,  
Harvard Kennedy School

*“JOE NYE has been a pillar of strength at Harvard for 55 years, earning universal praise for his scholarship, his influence upon international relations, his leadership of University institutions, his service to country, and critically, his high standards of ethics and integrity. He has become a living embodiment of all that Harvard aspires to be.”*

— DAVID GERGEN, PUBLIC SERVICE  
PROFESSOR OF PUBLIC LEADERSHIP,  
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— 2019 CENTENNIAL MEDALIST CITATION

**Carroll Bogert, AM '86,**  
Regional Studies—East Asia  
International journalist  
and human rights advocate,  
president of The Marshall Project



**Roger Ferguson, PhD '81,**  
Economics  
American economist,  
president and chief  
executive officer of TIAA

“Our nation will always be grateful for **ROGER FERGUSON'S** steady hand at a moment of maximum peril, when much of the financial system's infrastructure was destroyed by September 11. Capable, confident, yet shunning the spotlight, Roger Ferguson is a model of public service.”

— LARRY SUMMERS, PRESIDENT EMERITUS AND  
CHARLES W. ELIOT UNIVERSITY PROFESSOR

**Lael Brainard, PhD '89, Economics**  
Expert in international trade, member of the  
Board of Governors of the Federal Reserve System

*“LAEL BRAINARD has been a trusted advisor to two presidents, a first responder in re-regulating markets after the 2008 financial crisis, and a shrewd observer of global systems, widely regarded as being ahead of the curve in recognizing changes in financial markets.”*

— 2019 CENTENNIAL MEDALIST CITATION





## TESTING IDEAS

**Jessica Levin Martinez**, PhD '04, history of art and architecture, has been named director of Cornell University's Herbert F. Johnson Museum of Art. Martinez formerly served as head of the Division of Academic and Public Programs at the Harvard Art Museums. "I want the museum to be a site for research and development, a place where people can test ideas," Martinez said in the announcement of her appointment. "Nearly 400 classes are already visiting the Johnson Museum each academic year, and that constant flow of opportunity with new students, fresh eyes, and bold questions is exciting to me."

Martinez at the Harvard Art Museums in front of Rothko's Harvard Murals.



## ALUMNI UPDATES



**S. M. Blinder**, PhD '61, chemical physics, professor emeritus of chemistry and physics at the University of Michigan, Ann Arbor, remains actively engaged in scientific activities and is currently a senior scientist for Wolfram Research. During his career, he has produced nearly 200 research publications and seven books in mathematical physics and theoretical chemistry, most recently cowriting *Twenty-First Century Quantum Mechanics* and editing *Mathematical Physics in Theoretical Chemistry*.



**Emery N. Brown**, PhD '88, statistics, of Harvard Medical School, MIT, and Massachusetts General Hospital, won Carnegie Mellon University's Dickson Prize in Science for 2018, awarded annually to the person who has made the most progress in the scientific field in the US. The award announcement noted that Brown's research on anesthesia "has been 'truly transformative' to that field," and the team he directs "is deciphering the neuroscience of general anesthesia."



**Paula Goldman**, PhD '10, anthropology, has joined Salesforce as the company's first chief ethical and humane use officer, focused on developing strategies to use technology in an ethical and humane way at the company. Goldman previously served as vice president, global lead, Tech and Society Solutions Lab at Omidyar Network, a social impact investment firm, and is the founder and director of Imagining Ourselves at the International Museum of Women.



**Michelle Murphy**, PhD '98, history, won the Ludwik Fleck Prize for *Economization of Life*, a critique of the global political and economic system created by Western nations that puts profit ahead of people. The Fleck Prize is awarded by the international Society for Social Studies of Science for an outstanding book in the area of science and technology studies, and Murphy becomes the first academic to win the Prize twice.



The Freedom Bank of Virginia announced the election of **Maury Peiperl**, PhD '94, organizational behavior, to the company's board of directors, citing his "deep leadership experience and vast domain knowledge." Peiperl is dean of the George Mason University School of Business and a member of the Graduate School Alumni Association Council. He has previously taught at or led schools of business in the UK and Switzerland.



**Mark Peterson**, PhD '93, history, has moved from the University of California, Berkeley, where he served as chair of the History Department from 2015–2018, to Yale University, where he joined the history faculty in September 2018, teaching colonial and revolutionary American history. His new book, *The City-State of Boston: The Rise and Fall of an Atlantic Power, 1630–1865*, was published by Princeton University Press in April 2019.



**Frank Popper**, PhD '72, government, continues to teach land-use planning at Rutgers and Princeton. He and his wife, Deborah Popper, have kept up their work on declining rural regions, such as the US and Canadian Great Plains, and declining large cities, such as Detroit and Cleveland. Their vision for the Plains' environmental prospects, the Buffalo Commons, continues to materialize and, in their opinion, will win out in the end.



**Wendy Raymond**, PhD '90, biochemistry, became the president of Haverford College on July 1, 2019. Formerly vice president for academic affairs and dean of faculty at Davidson College, Raymond has had a distinguished career as a molecular biologist. For 19 years, she served on the faculty of Williams College and dedicated herself to diversity, equity, and inclusion in higher education, becoming Williams' first associate dean for institutional diversity.

AUTHOR PROFILE

## BEYOND ACCESS

*Anthony Abraham Jack earned a PhD in sociology from the Graduate School of Arts and Sciences in 2016. A junior fellow in Harvard's Society of Fellows and assistant professor of education at the Harvard Graduate School of Education, Jack holds the Shutzer Assistant Professorship at the Radcliffe Institute for Advanced Study. His book, The Privileged Poor: How Elite Colleges Are Failing Disadvantaged Students has galvanized national conversations about inclusion in American higher education.*

**In *The Privileged Poor*, you distinguish between access and inclusion.**

Access is getting in. Inclusion happens once students get on campus. It refers to the processes by which students are made to feel not just that they belong, but also that they are full members of the community and are entitled to all the rights and privileges of that membership.

**Your research broke new ground by identifying a previously invisible distinction between disadvantaged students that originates with their high school experiences.**

As a graduate student, I was interested in culture and inequality. I wanted to understand how social class shapes how students navigate college. It was a research question born of my own experience. What I was reading in the sociology literature about lower-income students told a monolithic story of poor family, poor neighborhood, poor school. This was not my experience as a student at Amherst College and as a diversity intern in the admissions office. It also came from realizing that a group, especially at selective colleges, was missing from sociological research. No one was talking about the ways in which lower-income students were entering private school and prep school.

In my research, I saw a pattern emerge between those students who went to private schools and were poor, who I came to call “the privileged poor,” and those who went to public school and were poor, the “doubly disadvantaged.” The modal experiences of the two groups diverged in high school, and they experience college very differently. The “privileged poor” are economically poor but socially and culturally privileged in the sense that they’ve had the academic and social experiences of the top 1 percent. The doubly disadvantaged have less access to that cultural capital.

**Your research also shed new light on the ways in which university policies shape student lives.**

Universities are not passive receivers of students. There’s a social component and a structural component to college. Academic life is inherently social. Students learn material in class but master it in the dining hall, in the common room, in office hours. The reason I always say office hours are such an important part of a student’s academic experience is because it is often in office hours that professors become advisors, and advisors become mentors. But the language we use in everyday ways is incredibly loaded. Not all students arrive on campus understanding what “office hours” means.

The process I call “structural exclusion” demonstrates how official university policies push lower-income students to the margins. Spring break is one example: When colleges and universities shut down dining halls and assume all students can afford to leave campus, they are putting already financially and sometimes emotionally stressed students into even more precarious positions.

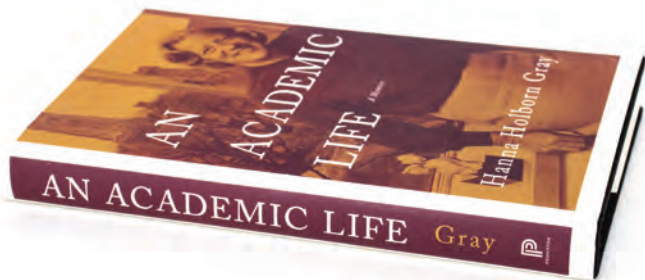
**What’s next?**

Next year I’m back at Harvard’s Society of Fellows. I’m going to start my next project, which is on the world of work among undergraduates. We know what happens to students after college, but we don’t actually investigate the experience that students have working in school. I want to know how that shapes their identity and how they move through college.



Anthony Abraham Jack





## FEATURED REVIEW

When **Hanna Holborn Gray** (PhD '57, history) and her husband, Charles, left Harvard in 1960 for his appointment teaching history at the University of Chicago, she was unsure about her own future in the academy. A scholar of Reformation and Renaissance political thought, she had been an assistant professor at Harvard and the first female head tutor of History and Literature, but her gender barred her from Lamont Library or walking through the front door of Harvard's faculty club. By 1964, she would be tenured in Chicago's history department and would go on to have an illustrious academic career, subsequently serving as dean of the College of Arts and Sciences at Northwestern and provost and acting president at Yale. From 1978 to 1993, she served as president of the University of Chicago—the first woman president of a major American university.

In *An Academic Life: A Memoir*, Gray traces her intellectual legacy as part of a refugee scholar “second generation.” Her family had fled Germany after Hitler's rise in 1933. Her mother was a classical philologist; her father taught German history at Yale for 35 years. Her family's home was a waypoint for refugee intellectuals, including Paul Tillich, Erwin Panofsky, Herbert Marcuse, and Hannah Arendt. Gray majored in history at Bryn Mawr (where she interviewed T. S. Eliot for the college paper). While studying at Oxford on a Fulbright, she was befriended by E. H. Gombrich and his wife.

She also sets her personal story against the backdrop of dramatic transformations in American higher education in the second half of the 20th century, sparked by the GI Bill, co-education, and politics, from the Red Scare to Vietnam, which illuminates her service to Harvard. Gray was a member of the Harvard Corporation from 1997 to 2005 and the Board of Overseers from 1988 to 1994, spanning the presidencies of Derek Bok, Neil Rudenstine, and Larry Summers. Her experience at Radcliffe in the 1950s, when “women at Harvard were, at best, second-class citizens” was a formative one that would make her a champion of coeducation and motivate her to help negotiate the Harvard-Radcliffe merger in 1999.

Gray also offers an important perspective on the university's relationship to politics through her discussions of the repercussions of the Red Scare at Harvard and as addressed by Chicago's 1967 Kalven Report. She is a critic of consumerist attitudes toward and instrumental defenses of the university and a passionate defender of freedom of expression: The university ought to “resist speaking as a corporate entity when its principal purpose is to create the conditions under which members can speak individually and freely for themselves, whatever their view on topics of common concern.”

The common cause of Gray's family legacy and her extraordinary stewardship of the university as an institution is revealed in the book's closing pages: Her faith in academic freedom and dedication to the academy, she writes, was motivated by watching her parents and fellow academic refugees “survive the most extreme assault ever launched against universities from a totalitarian regime.”

• • • **Would you like your book considered for inclusion?** Send it to *Colloquy*, Graduate School of Arts and Sciences, Harvard University, 1350 Massachusetts Avenue, Suite 350, Cambridge, MA 02138. Questions? Email [gsaa@fas.harvard.edu](mailto:gsaa@fas.harvard.edu).

## RECENTLY PUBLISHED

Below are recently published books written or edited by GSAS alumni.

**Frank Bergon**, PhD '73, English and American Literature and Language, *Two-Buck Chuck and the Marlboro Man: The New Old West*, University of Nevada Press, 2019

**Edythe Haber**, PhD '71, Slavic Languages and Literatures, *Teffi: A Life of Letters and of Laughter*, I.B. Tauris, 2019

**Emily Oster**, PhD '06, Economics, *Cribsheet: A Data-Driven Guide to Better, More Relaxed Parenting, from Birth to Preschool*, Penguin Press, 2019

**Sophia Rosenfeld**, PhD '96, History, *Democracy and Truth*, University of Pennsylvania Press, 2019

**Nancy Shatzman Steinhardt**, PhD '81, Fine Arts, *Chinese Architecture*, Princeton University Press, 2019

**Cynthia Wachtell**, PhD '98, History of American Civilization, *The Backwash of War*, Johns Hopkins University Press, 2019

**Donald Wesling**, PhD '65, English and American Literature and Language, *Animal Perception and Literary Language*, Palgrave Macmillan, 2019

**Ellen Winner**, PhD '78, Psychology, *How Art Works: A Psychological Exploration*, Oxford University Press, 2019

**Kristin Wobbe**, PhD '91, Biochemistry, *Project-Based Learning in the First Year*, Stylus Publishing, 2019



## On the Road

DEAN EMMA DENCH HIGHLIGHTS PARALLELS BETWEEN THE ROMAN EMPIRE AND TODAY DURING ALUMNI ROADSHOW

**AT ALUMNI EVENTS HELD THROUGHOUT THE WORLD** during the 2018–2019 academic year, GSAS Dean Emma Dench underscored the leadership lessons that can be learned from her scholarship of the Roman Empire. During the events, Dench discussed the parallels between ancient Rome and the modern day, particularly with regard to blind spots, diversity, and soft vs. hard power. She also highlighted how her experience as a scholar informs her leadership of GSAS and how she prepares students to be leaders.

The alumni roadshow allowed Dench to connect with alumni in 11 cities, from Athens to Zurich, as she explained the role of GSAS within the University and its impact across all of Harvard's Schools—as well as how the research conducted by GSAS students fuels innovative solutions to some of today's most urgent problems.

Dean Emma Dench with Sarah Rugheimer, PhD '15, at an event in London.

### CONNECT WITH GSAS AND DEAN DENCH AT UPCOMING EVENTS

Hong Kong:  
September 17, 2019

Taipei:  
September 18, 2019

Beijing:  
September 20, 2019

Delhi and Bangalore:  
November 17–22, 2019

Silicon Valley, Seattle,  
and Portland:  
January 20–24, 2020

Miami:  
February 11, 2020

Baltimore:  
March 3, 2020

Philadelphia:  
April 14, 2020

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**Victoria Hwang**, a fifth-year PhD candidate in applied physics, took to the Harvard Horizons stage to explain why blue jays look blue. Sounds simple, but her research on structural colors in nature is incredibly complex. Luckily, she knows how to break it down for a broad audience. “The Horizons program gave me the communications skills essential to building a successful career,” says Victoria. “I am so grateful for the personalized mentoring and training from faculty.”

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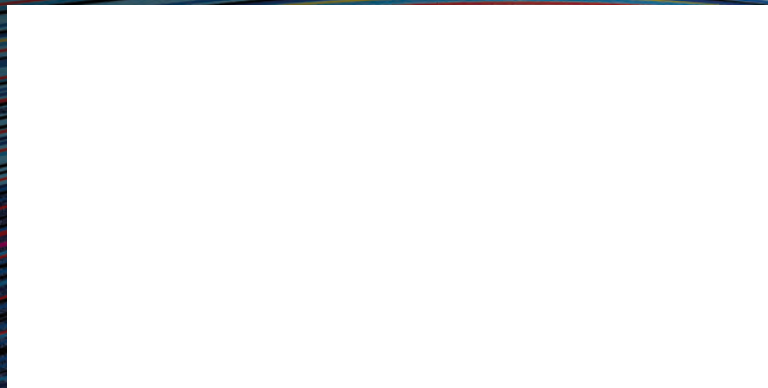
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