

Colloquy

The GRADUATE SCHOOL of ARTS AND SCIENCES | HARVARD UNIVERSITY

ARE WE ALONE IN THE UNIVERSE?
(AND WHY DO WE CARE SO MUCH?)

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Colloquy

An alumni publication of Harvard University's
Graduate School of Arts and Sciences

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Photograph by Kiera Blessing.

Colloquy

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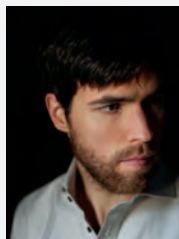
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Frank White has written numerous books about space exploration and the future, including *The Overview Effect: Space Exploration and Human Evolution*, and has spoken at numerous conferences on space exploration and space development. He authored the feature "Are We Alone in the Universe?"

a vision for the future

Now in my fourth year as dean, I continue to consider how to enhance the graduate student experience while positioning the Graduate School of Arts and Sciences for future success. As a way of focusing our thoughts, I turned to the Graduate Policy Committee, a group of faculty advisors, to help me develop an official mission and vision. The result is a bold statement that highlights our strengths and clearly demonstrates our purpose:

Mission

To identify and attract the most promising students to form a dynamic and diverse community, and to shape them into visionary scholars, innovative educators, and creative leaders.

Vision

To provide global leadership and innovation in graduate education.

While these statements identify what we already do, they also inform our thinking as we consider priorities for the future, which include developing programs that ensure our students are set up for success in their first jobs, as well as their positions five years after Harvard and beyond. For example, as we launched the search for the 2016 Harvard Horizons Scholars, we decided to award each of the 15 finalists with \$1,000 for professional development activities. For these graduate students, many in their final years, having the funds to travel to conferences and participate in other activities will enhance their ability to secure their first position. I look forward to seeing the positive results for our students in the job market thanks to GSAS's investment in their professional development.

You will read about a few of these talented students in this issue of *Colloquy*. Whether they are searching the universe for inhabitable worlds, trying to understand the intricacies of group dynamics, or pondering human behavior, all our students are developing into the visionary scholars, innovative educators, and creative leaders we aspire them to be.



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Prized Fellowships

GSAS students won an impressive number of fellowship awards for 2015–2016: six through the Institute of International Education Fulbright Cultural Exchange, four Mellon / ACLS Dissertation Completion Fellowships from the American Council of Learned Societies, and nearly 60 grants from the National Science Foundation.

Among the Fulbright winners is **Steffani Bennett**, a PhD candidate in the history of art and architecture, who will travel to Japan to access resources connected with the 15th-century artist Sesshū Tōyō. Bennett believes that Sesshū's travel to Ming-dynasty China profoundly influenced his artistic practice, which helped transform painting of the period and beyond. 俳




Harvard Origins of Life Launches Graduate Consortium

The Harvard Origins of Life Initiative has launched a graduate consortium designed to bring together students from nearly every part of Harvard's science enterprise in studying how life came—or could come—to be.

"This is one of the last remaining big questions in science," says Dimitar Sasselov, Philips Professor of Astronomy and director of the Harvard Origins of Life Initiative. "It's not a question purely for physics or for biology or for social sciences, but for all these disciplines working together—we wouldn't

be able to study the question without that collaboration."

The creation of the Consortium was driven by graduate students involved in the Initiative who wanted a more in-depth experience. Its key goals are to instill in students an enduring commitment to interdisciplinary collaborations and to equip them with the skills to excel, especially when the boundaries between disciplines are porous.

Read more about Dimitar Sasselov and his research on page 14. 

Hubble image of galaxy NGC 6503, which sits at the edge of a desolate area known as the Local Void. Photo Credit: NASA, ESA, D. Calzetti (University of Massachusetts), H. Ford (Johns Hopkins University), and the Hubble Heritage Team.

New Program Helps Graduates Enhance Research Skills

GSAS has launched a new Research Scholar Initiative, a non-degree granting program for individuals interested in pursuing a PhD in economics or life sciences, particularly those from groups currently underrepresented in academia. Each scholar works with a faculty member as a research assistant, gaining important experience and developing a strong mentoring relationship in the process. Scholars also take courses to enhance their academic preparation for doctoral work. The goal is to enhance an individual's competitiveness and preparation for a doctoral program.

The Research Scholar Initiative in economics is generously funded by the Alfred P. Sloan Foundation. 



Rosio Fernandez (right) with Sheila Thomas, director of the Research Scholar Initiative and associate dean for academic programs and diversity. Fernandez participated in the Summer Honors Undergraduate Research Program (SHURP) during summer 2014 and continues to work with her SHURP mentor Donald Coen, professor of biological chemistry and molecular pharmacology, as a research scholar.

STARTING FROM SCRATCH



Georgia Squyres, a PhD student in the Molecules, Cells, and Organisms graduate program, adjusts a lens as she builds a microscope.

Simple or complex, the microscope is the biologist's most indispensable instrument. In an age when highly sophisticated and expensive instruments are the norm, professor of molecular and cellular biology Venkatesh N. Murthy wanted to encourage more of a "maker culture" among the department's graduate students. So he taught them how to make one.

"For many years now in neuroscience," Murthy explains, "advanced training has involved building things. There have been times when instruments were not easily available, and neuroscientists had to build their own equipment."

Murthy also wanted to deepen students' knowledge of the fundamental principles of microscopy through experiential learning. "If you build something," he says, "you're going to understand it substantially more." For the 20 participants in the class "Make Your Own Microscope," that meant starting with "a bunch of parts," including lenses, LEDs and lasers, a digital camera, and software to build a simple fluorescence microscope, the same off-the-shelf instrument used in biology labs, including Murthy's, to study living cells.

Together with postdoctoral fellow Vikrant Kapoor, Murthy taught students how to use a light source to calculate the various properties of a lens, such as its focal length; how to use different light sources; how to assemble multiple lenses together to increase magnification; how to use filters to increase viewing contrast; and how to acquire images with a computer-controlled digital camera.

For Georgia Squyres, now a G2 in the Molecules, Cells, and Organisms (MCO) graduate program, learning to make a microscope was a chance to "get under the hood" of what at first glance appeared to be a very complex instrument. "As a biophysicist, I was excited to see an example of the very close relationship between engineering and life sciences," Squyres explains. "I was able to experience, first hand, how a biological discovery—fluorescent proteins—promoted engineering advances—fluorescent microscopy—that let us ask novel biological questions."

Squyres and her teammates started by "tinkering" to "understand the fundamentals," and despite being "a little rough around the edges" they got it to work. Ultimately they captured images and videos of several biological samples, including the heartbeat of a zebrafish, which she says was "probably the most exciting because it's dynamic."

Now that she's made a microscope, Squyres says she's up for more engineering challenges in the lab. She also feels more like a biologist. "Historically, many of the most important microscopists built their instruments themselves, and I feel connected to that tradition because of the course."

This nanocourse was generously supported by the Gochman Dean's Fund for Innovation and Development. ☞

GSAS Appoints Dean for Administration and Finance



Allen Aloise, PhD '04, joins the GSAS leadership team

In June 2015, GSAS Dean Xiao-Li Meng announced the appointment of Allen Aloise, PhD '04, chemistry, as dean for administration and finance. In this role, Aloise serves as GSAS's chief administrator, strengthening and sustaining overall planning, strategic management, and administrative services.

Aloise, a 17-year veteran of Harvard University, comes to GSAS from the Department of Chemistry and Chemical Biology, where he worked as director of laboratories and took on additional responsibilities related to graduate students as co-director of graduate studies in chemistry and as the first director of graduate studies for FAS Science. "I'm incredibly excited to be in this role," says Aloise. "I'm looking forward to engaging with graduate students across the University and learning more about what they do."

After earning a degree in chemistry from Penn State, Aloise came to Harvard to study for a PhD focused on organic chemistry. After earning his PhD, he remained at Harvard, taking a position as an instructor in the undergraduate labs, which enabled him to administer a program while remaining connected to academia. The experience was the beginning of his career in administration.

As dean for administration and finance, Aloise wants to continue GSAS's efforts in supporting students. This includes enhancing professional development opportunities, fostering vigorous academic thinking, strengthening communication skills, and increasing knowledge of job and career opportunities. It also includes tapping the terrific resource GSAS's alumni community represents. "My hope is that our partners around the University recognize the great strengths that we have here at GSAS." 🏆

ADMISSION STATS

GSAS admitted another diverse class of students for the 2015–2016 academic year, chosen from nearly 13,000 applications, who will study for PhD and master's degrees in 56 departments and programs.

PhD



MASTER'S



GENDER OF APPLICANTS



INCOMING STUDENTS



APPLICANT POOL

Q + A Susan L. Lindquist

A prize-winning biologist whose imaginative research has wide-ranging implications for how we understand and treat human disease at the molecular level.

Susan L. Lindquist's pioneering investigation of how proteins function has shed new light on the causes of cancer, neurodegeneration, and infectious diseases, as well as contributed to new understandings of evolution and biomaterials. Lindquist, PhD '76, studies the problem of protein folding. When proteins transform from their normal structures into misfolded forms (sometimes called prions), they can cause diseases, such as Alzheimer's, Parkinson's, and a host of other devastating conditions. Her research has also revealed that the same types of protein misfolding that wreak cellular havoc in some situations may help cells adapt in others, presenting new clues for understanding evolution.

Lindquist received her BA in microbiology from the University of Illinois before earning a PhD in biology from Harvard. She is the recipient of numerous prizes, including the National Medal of Science, the nation's highest honor for scientific research. A professor of biology at MIT, Lindquist is a member and former director of the Whitehead Institute for Biomedical Research, an associate member of the Broad Institute of MIT and Harvard, and an associate member of MIT's David H. Koch Institute for Integrative Cancer Research, as well as an elected member of the Royal Society, the American Academy of Arts and Sciences, the National Academy of Sciences, and the Institute of Medicine.

Her latest undertaking is Yumanity Therapeutics, a drug development venture focused on translating her discoveries into new therapies for neurodegenerative diseases.

"If you love science, there are lots of avenues for pursuing science now, and if you're passionate about it, you can succeed. There are enough other women in science now to act as mentors and provide a network of help that women should and can take advantage of."

Q+A ID

NAME:

**Susan L.
Lindquist,
PhD '76**

FIELD OF STUDY:

**Molecular
Biology**

TODAY:

**Professor of
Biology, MIT,
and Scien-
tific Founder,
Yumanity
Therapeutics**



What drew you to science?

I had a fifth grade teacher who posed the question "what is life?", and I was absolutely fascinated by that discussion. I read books about Elizabeth Blackwell, the first woman to earn a medical degree in the United States. I read about Jane Addams and Hull House. I was trying to work out the question of whether I could be a doctor, or could I be a social worker. When I first proposed to my parents that I might want to be a doctor, they thought the idea extremely amusing. I had loving parents, but they did not expect I would have a career.

I went to the University of Illinois, not really knowing what I was going to do. I took some science classes and had a wonderful teacher, the microbiologist Sam Kaplan, who really got me excited about the concept of research. I majored in microbiology because Sam was a fabulous teacher. I found it fascinating that he taught a course focused on the question “how do you learn something new?” He was asking essential questions: How do you create new knowledge? How do you discover principles in biology? And then Jan Drake, a geneticist, offered me a job in his lab for the summer. I had been working in the summers as a waitress to help pay my way through school, so the thought that I would be paid to do science for a summer was amazing. Then Jan encouraged me to go to graduate school, and I did. That’s how it all got started.

When you arrived at Harvard for your graduate work in biology, what did you envision as your career path?

I had no expectations of myself because of the way I was raised. I went to graduate school because I thought it was a great privilege to be able to participate in research and in discoveries. My highest aspiration then was that I was going to be working in some man’s laboratory and that maybe I would be able to write my own grants to get my own salary support, because that was how many women working in science in those days did it.

When and how did that change?

In graduate school in the 1970s, I was working in Matthew Meselson’s biochemistry lab—he was my advisor. He provided an example of a person who is unbelievably ethical, rigorous, and analytical. But the project he had me working on wasn’t going anywhere, so I came up with this new idea to work on the heat-shock response of *Drosophila*—the fruit fly—and it worked fabulously well. That gave me confidence, so I continued that work, and

uncovered some of the first molecular biology on the topic. I decided I would try to find a postdoctoral fellowship where I could continue working on it. That led me to the University of Chicago. I joined a lab where the principal investigator had people doing all kinds of different things. He was chair of the department, and he thought the heat-shock work was a cool idea. He really was impressed with the work I was doing, and that led to him asking if I would be interested in joining the faculty. I said yes—I jumped at the chance.

You’ve spoken before about the risk you took when you decided to switch from studying fruit flies to studying yeast. It’s a risk that paid off, but it also speaks to the challenges you’ve faced as a woman scientist.

It was at Chicago that I decided I was going to try to learn how to work with yeast, because it was easy to make mutations to the organism’s genes and put them back in the genome. A colleague encouraged me not to switch from *Drosophila* because it would jeopardize my chances at tenure. But I decided, what the heck, I’m probably not going to get tenure anyway—I’m going to go ahead and do it. The switch allowed me to begin developing yeast models for neurodegenerative disease.

You’ve been very open about speaking to the challenges faced by women in science. What’s your sense of where we are now? What advice would you give to women scientists at the beginning of their careers?

We still have a long way to go. Women are not as well represented in biotech or in faculties as they should be. It is even worse in the venture capital community. But it’s important to realize how far we’ve come. If you love science, there are lots of avenues for pursuing science now, and if you’re passionate about it, you can succeed. There are enough other women in

science now to act as mentors and provide a network of help that women should and can take advantage of.

"The road to fixing neurodegenerative diseases is going to be a very long and arduous one. We need new out-of-the box approaches that can help develop new therapies. It's been an extraordinary privilege to discover new things about life."

What’s next?

I’ve founded a company called Yumanity—the “Y” is for yeast, used in service of humanity—to focus on drug discovery and development based on my research in protein folding. The road to fixing neurodegenerative diseases is going to be a very long and arduous one. We need new out-of-the box approaches that can help develop new therapies. It’s been an extraordinary privilege to discover new things about life. Basic research is what drew me to science, and I remain committed to basic science and basic research because I think we need to understand the principles of life. But as the systems for study have improved and we’ve learned more and more, it seems time to apply that to tackling this group of diseases for which there’s such a dire need for new therapies. At their heart, diseases like Alzheimer’s and Parkinson’s are caused by proteins misfolding and misbehaving, and so research from my lab at MIT has, I hope, a role to play in understanding the fundamental processes of these diseases and develop therapies for them. 🍷

Shelf Life



Wesleyan University, 1910–1970: Academic Ambition and Middle-Class America (Wesleyan University Press, 2015) traces Wesleyan’s rise from regional college to top-ranking national institution, one that truly merits the appellation “university.” **DAVID POTTS** (PhD ’67, history of American civilization) has produced a work of meticulous scholarship, not a warm-and-cuddly alumni-relations project. He closely examines the university’s fundraising, its expanding academic programs, and its sometimes uneasy adjustment to a more diverse student body. He opens memorably with an academic-freedom case: the 1913 dismissal of Willard Fisher, professor of economics and social science. (Fisher certainly did himself no favors by disclosing that William Shanklin, the last Methodist minister to serve as university president, repeatedly plagiarized in his sermons!)

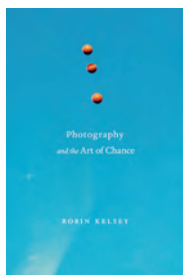


ROBERT BIRELEY (PhD ’72, history) notes that Holy Roman Emperor Ferdinand II (1578–1637) has not been the subject of a full biography for a generation. His **Ferdinand II, Counter-Reformation Emperor, 1578–1637** (Cambridge University Press, 2014) meets that scholarly gap with a measured recounting of Ferdinand’s politics and policies. Ferdinand was a leading figure in the Counter-Reformation and a staunch opponent of Protestantism. Throughout his reign as Holy Roman Emperor (1619–37), Ferdinand was embroiled in the massively destructive Thirty Years War. Bireley conveys the emperor’s deeply felt Catholicism and his political inflexibility, noting that on more than one occasion the emperor squandered an opportunity for peace (on advantageous terms) because he brooked no compromise with Protestants.



Every voter has a voice in presidential elections: Does that make presidents truly national in outlook? **The Particularistic President: Executive Branch Politics and Political Inequality** (Cambridge University Press, 2015), by **DOUGLAS KRINER** (PhD ’06, government) and **ANDREW REEVES** (PhD ’08, government), concludes that presidents are often “particularistic,” driven by their desire to win a second term or strengthen the party’s base. Swing states (like Ohio in 2012) benefit from election-year largesse. Presidents play favorites with highway projects, military contracts, even disaster relief. George W. Bush acted decisively during Hurricane Charley (which struck Republican Florida in 2004) but not during Katrina (which devastated Democratic New Orleans in 2005—not an election year). A national electorate doesn’t magically lift presidents above politicking.

Photography and the Art of Chance (Belknap Press, 2015) traces photography from a bit of chemical legerdemain to acceptance as a fine art. **ROBIN KELSEY** (PhD ’00, history of art and architecture) frames his narrative around five nineteenth- and twentieth-century photographers who exemplify this transit: Henry Fox Talbot, Julia Margaret Cameron, Alfred Stieglitz, Friederick Sommer, and John Baldessari. In alternating chapters, Kelsey explores broader developments in art history, arguing that chance (and the camera’s instantaneous image-making) challenged traditional definitions of art. In photography, luck vies with intentionality, and instantaneous creation seems to trump artistic mastery. Ultimately, modernism and its embrace of the industrial and aleatory aspects of contemporary life opened the way for photography’s acceptance.

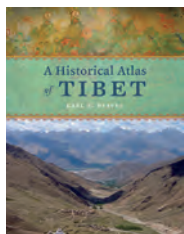
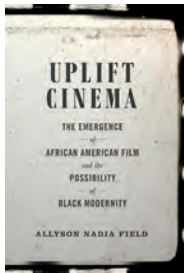
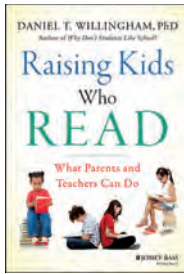


AMBER JAMILLA MUSSER (PhD ’09, history of science) explores the significance of masochism, drawing on queer theorists, radical feminism, and the ideas of Michel Foucault and Simone de Beauvoir. **Sensational Flesh: Race, Power, and Masochism** (New York University Press, 2014) weighs multiple interpretive approaches, considering masochism as a sociopolitical critique or a subversion of patriarchal values. Musser probes the life and oeuvre of performance artist Bob Flanagan—whose short film *Bob and Sheree’s Contract* features a voice-over by Flanagan, swearing total abnegation, while his partner Sheree Rose carves an “S” into his chest with an X-Acto knife. Musser also uses the writings of Frantz Fanon to examine the connections among masochism, post-colonialism, and race.

DANIEL WILLINGHAM (PhD ’90, psychology) takes a no-nonsense approach to encouraging children to become avid readers. **Raising Kids Who Read: What Parents and Teachers Can Do** (Jossey-Bass, 2015) reviews current research on the subject and wrestles with the relative merits of phonics-based versus whole-word strategies (phonics has a slight edge). Willingham devotes separate sections to addressing the needs of children in different age groups: preschool, kindergarten through second grade, and third grade and beyond. He offers general advice—above all, “start now”—though he’s far from endorsing a “tiger mom” approach to reading. He also provides specific, age-targeted exercises and games. The absence of buzzwords and ed-psych jargon shows a welcome respect for general readers.

Anthropologist Cora Bois Du (1903–91) isn’t as familiar as Ruth Benedict or Mar-

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, Suite 350, 1350 Massachusetts Avenue, Cambridge, MA 02138. Questions? E-mail gsaa@fas.harvard.edu.



garet Mead, but **Cora Du Bois: Anthropologist, Diplomat, Agent** (University of Nebraska Press, 2015) decisively challenges that obscurity. **SUSAN SEYMOUR** (PhD '71, anthropology) recounts Du Bois' struggles—as a lesbian, a young scholar seeking work in the Depression, and a woman in a male-dominated profession. Nevertheless, she opened doors. She pioneered the “culture and personality” approach to anthropology. During WWII, she headed an OSS station in Ceylon. Joining the State Department, she warned that Vietnam could become a quagmire. But anticommunist hysteria drove her back to academia. In 1954, she became Harvard's first tenured female professor. Her multifaceted life is well worth remembering.

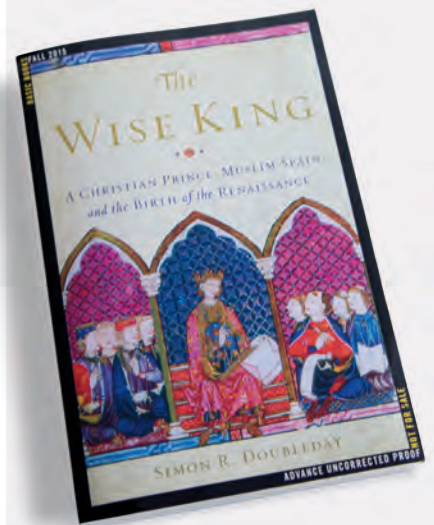
ALLYSON NADIA FIELD (PhD '08, comparative literature) faced a challenge in **Uplift Cinema: The Emergence of African American Film and the Possibility of Black Modernity** (Duke University Press, 2015). How do you assess pre-1915 motion pictures aimed at black audiences when none of these films survive? Field casts her net widely, marshaling letters, reviews in black newspapers, movie stills, etc. Besides theatrical releases, she addresses “local actualities” featuring local communities (meant to attract audiences eager to see themselves onscreen), and fundraising documentaries by Tuskegee Institute and Hampton Institute. These films represent “uplift cinema” by challenging the racist portrayals of blacks in mainstream films and by their embrace of Booker T. Washington's call for black bootstrapping.

A Historical Atlas of Tibet (University of Chicago Press, 2015) is brilliant, multidisciplinary, and visually sumptuous. Geographer **KARL RYAVEC** (AM '89, East Asian regional studies) has produced a tour-de-force that incorporates cutting-edge GIS technology; Paleolithic and Neolithic archaeology; political, religious, linguistic, and economic data; and varied historical sources from Tibet's imperial era, China's Song, Ming, and

Qing dynasties, and other powers from Mongols to communists. One striking map uses colored bands representing weeks of travel to show how long it took to journey across Tibet in 1900. Ryavec also provides a wealth of color and black-and-white photographs, drawings, charts, and graphs that further deepen one's understanding of this land and its rich culture and history.

To Make the Hands Impure: Art, Ethical Adventure, the Difficult, and the Holy (Fordham University Press, 2014) takes its title from a Talmudic instruction that sacred texts “make the hands impure” (but, paradoxically, not the other way around). This juxtaposition of impurity, text, and touch launches **ADAM ZACHARY NEWTON** (PhD '92, English & American language & literature) toward an “ethics of reading.” Drawing on Mikhail Bakhtin, Jacques Derrida, Stanley Cavell, and—above all—Emmanuel Levinas, Newton stresses proximity and the tactile immediacy of texts, from the book-as-artifact, to the naming of names (Holocaust victims, the Vietnam Memorial), to complex works with sometimes unintended audiences (for example, the 30,000-page archive of reclusive Chicagoan Henry Darger).

DEBRA PRAGER (PhD '03, Germanic languages and literatures) probes the image of “The East” in German literature. **Orienting the Self: The German Literary Encounter with the Eastern Other** (Camden House, 2014) analyzes works from Wolfram von Eschenbach's Parzival (early 1200s) to Thomas Mann's 1924 novel *The Magic Mountain*. Thus, Fortunatus (1509) juxtaposes a prosaic West with Eastern fantasies and desires, in part, as a response to nascent Western capitalism. In contrast, Theodor Fontane's *Effi Briest* (1895) seems couched in Freudianism; its Madame Bovary-like protagonist, trapped in a loveless marriage, struggles with erotic desires and conjures up a Chinese specter that embodies them. Prager thus grounds Edward Said's “orientalism” in the changes of time and historical context. 🏠



The Wise King: A Christian Prince, Muslim Spain, and the Birth of the Renaissance (Basic Books, 2015) is a vividly engaging biography of Alfonso X, 13th-century king of Castile and León. Particularly bracing is its success in locating Alfonso—a Renaissance man long before the Renaissance—within the cultural ferment of his time. Ranging far beyond Spain itself, **SIMON DOUBLEDAY** (PhD '96, history) challenges the all-too-common dichotomy of benighted, static Middle Ages and vibrant Renaissance. Without denying the Renaissance its due, he depicts it as a summit on a broad cordillera. Change, he argues, was already in the air.

Thus, Alfonso commissioned a wide range of works—notably, the astronomical *Alfonsine tables* (Galileo's heavily annotated copy survives), which drew on Islamic and Jewish learning, and the *Cantigas de Santa Maria*, a song cycle to the Virgin Mary, of which up to 20 pieces may feature his own lyrics and music. He ordered that many of these works be produced in the vernacular, including Spain's first vernacular legal code, the *Siete Partidas*. He also commissioned or supported innovative gothic-style architecture, such as the León cathedral and Alcázar, his palace in Seville. Above all, Alfonso embraced the intellectual influences of the Muslim world, securing translations of Greek and Arab texts into Castilian or Latin and serving as a cultural intermediary between Christian Europe and the Muslim realm.

Waiting to Be Known

For millennia, humans have looked up and been inspired by what they see in the night sky. Some, in awe of the great expanse of the universe, saw the craftwork of gods. Others contemplated their observations, wondering if those far-off points of light were similar to our sun or to our planet, perhaps sustaining intelligent, equally inquisitive life. Still others pondered the questions that arose from their curiosity: Are we alone in the universe? Why does it matter?

At Harvard, graduate students and faculty continue to reflect on these ancient questions, regardless of discipline. In this issue of *Colloquy*, you'll read about astronomers searching for inhabitable worlds, social scientists studying the politics and intricacies of group formation, and a philosopher who considers the human drive to connect with those beyond ourselves.

As human beings, we seem wired to seek out those like us, to find comfort in the same opinions. We marvel at our place in our community, our country, or the world. Some, like our ancestors, turn their attention to the night sky, hoping to find signs of life. Others relentlessly question everything, from why we live as we do, to why we do what we do at all. All of our searching can perhaps be summed up best by Carl Sagan, who once said, "Somewhere, something incredible is waiting to be known." ✚



ARE WE

A L  N E

IN THE UNIVERSE?

(AND WHY DO WE CARE SO MUCH?)

BY FRANK WHITE

When they first began their science careers, neither Phillips Professor of Astronomy Dimitar Sasselov nor sixth-year graduate student Elisabeth Newton intended to search for extraterrestrial life—but that is exactly what they are both doing today.

“My initial interest was in the physics of stars and cosmology,” says Sasselov.

“I majored in physics in college,” says Newton, “and astronomy offered the most interesting physics.”

Now working at the Harvard-Smithsonian Center for Astrophysics (CfA), Sasselov and Newton are engaged in a quest to answer one of the most fundamental questions facing humanity: Are we unique—and alone—in the universe, or are we ordinary, with an expansive social network waiting for us “out there?”

Sasselov, Newton, and their colleagues now believe that the answer to that question is tantalizingly close after thousands of years of speculation, theorizing, and—finally—some solid scientific research.



THE DEBATE

What at first appears to be a very modern query is actually ancient in its origins. Since human beings began to ponder the “big questions,” the desire to understand what exists beyond the confines of the Earth continually surfaces. According to Michael J. Crowe (author of *The Extraterrestrial Life Debate 1750–1900*), no less a philosopher than Aristotle argued in the 4th century BCE that a so-called “plurality of worlds” could not exist because every solar system required a Prime Mover to keep it going, and he had trouble imagining an infinite number of those.

Around the same time, Epicurus penned a remarkably modern rejoinder to the Aristotelian perspective. He suggested that atoms were infinite in number and argued that “...there are infinite worlds both like and unlike ours.” Epicurus asserted that some of these worlds would sustain life similar to Earth.

Aristotle and Epicurus shared common ground in that they had *absolutely no observational data* on which to base their opinions, meaning that the controversy surrounding the possibility of extraterrestrial life raged on right through the Middle Ages and Renaissance up to our own time.

For example, Cornell Professor Carl Sagan, whose Public Television series *Cosmos* brought the concepts of astronomy to a broad audience, advanced a principle of mediocrity that echoed the writings of Epicurus. He argued that there was nothing special about our solar system or planet—there are billions and billions of stars in the universe, with many planets capable of sustaining life and intelligence.

Cosmologists John D. Barrow and Frank J. Tipler countered with the Anthropic Cosmological Principle, arguing that even with a universe full of planets, generating life on one is difficult—and it’s a big leap from single-celled organ-

isms to large-brained mammals who can debate cosmology. We should therefore reserve judgment as to whether we are alone or only one overachieving species among many.

Aristotle and Epicurus would be impressed to find that their argument continues 2,000 years after their deaths.

THE BREAKTHROUGH

Until 1992, we couldn’t say with certainty whether *any* planets existed outside our own solar system. This all changed, however, with the confirmed sighting of several such planets (known as extrasolar or exoplanets) orbiting the dense remnant of a supernova explosion in the constellation Virgo. While few believed that these highly irradiated, hostile worlds could support life, their mere existence set off the first of several tectonic shifts in thinking in the field.

In 1995, astronomers announced the first exoplanet orbiting a star similar to our Sun. A rush of discovery followed, accelerating in 2009, when NASA launched the Kepler space-based telescope to search for nearby Earth-like planets. By late 2015, researchers had found nearly 2,000 exoplanets in all, with a growing number of them similar to Earth. Most were detected by Kepler, located via a technique known as the transit method.

When a planet passes—or transits—in front of its sun, the starlight dims perceptibly. Exoplanet hunters can determine many things about their quarry from this simple piece of information, including the planet’s diameter, temperature, and the length of its year. These factors add up (or don’t) to the planet’s habitability.

For scientists who, unlike Aristotle and Epicurus, need data to do their work, finding these first planets marked the beginning of a golden age. “The discovery of exoplanets shifted my attention away from cosmology,” says Sasselov. “Since I was studying stars, it was a natural transition for me, because we now knew that some of those stars had planets, and my experience could help in the search.”

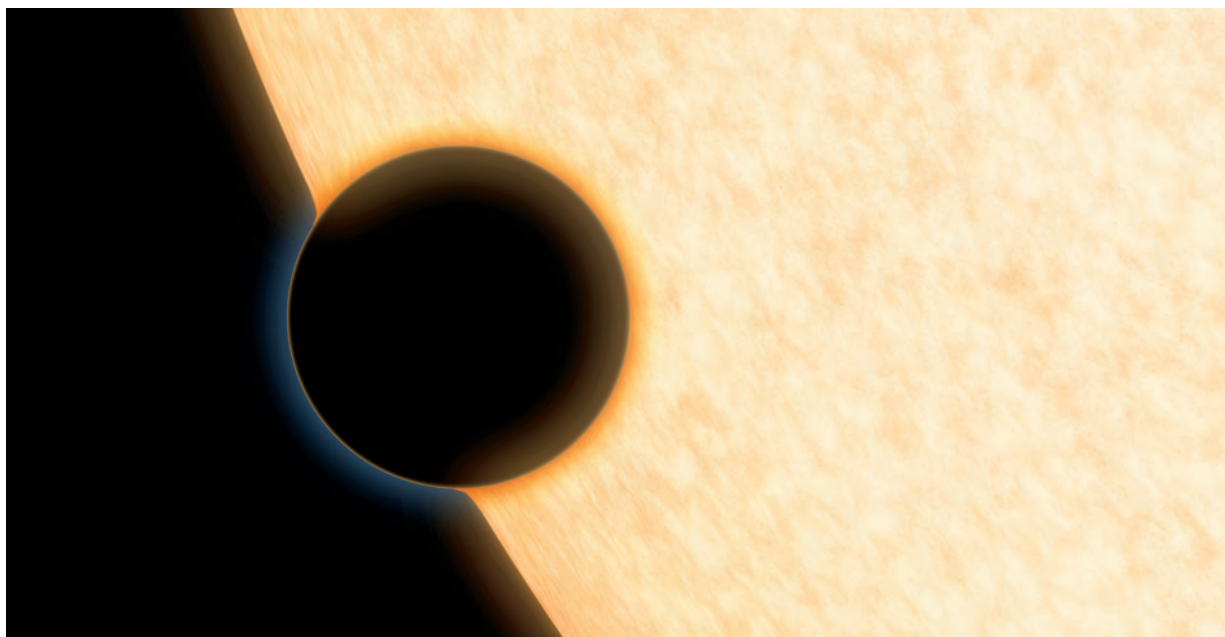
By 2002, Sasselov had left cosmology behind to work on exoplanets exclusively. He believes the lure of the chase

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Dimitar Sasselov
searches for exo-
planets while leading
Harvard’s Origins of
Life Initiative.



KRIS SNIBBE



By using telescopes like NASA's Hubble and Spitzer, astronomers can determine important information about faraway planets when they "transit" in front of their stars. Left, an artist's rendition of a Neptune-size planet orbiting its star. Credit: NASA/JPL-Caltech

for researchers has grown stronger in the past decade for a simple reason: "We are moving closer to the discovery of and ability to study Earth-like planets."

This is, of course, the Holy Grail of exoplanet research—finding "Earth 2.0," as some call it. In detecting life similar to that on our home planet, we hope to find similar intelligence. And if that happens, humanity will finally know that we are not alone.

Seizing the moment, Sassselov began conferring with chemists and geochemists about how to detect life on these exoplanets. His conversations resulted in the creation of Harvard's interdisciplinary Origins of Life Initiative in 2006.

"At first, we had the clear motivation to use the tools of remote sensing to find exoplanets as the critical step in the life search," says Sassselov. "Now we know that exoplanets are common, and the search can begin in earnest."

Moreover, one of Sassselov's colleagues, Nobel Prize-winner and Harvard Professor of Chemistry and Chemical Biology Jack W. Szostak, found that he could create self-replicating molecules in his lab with far less effort than expected. "This showed," says Sassselov, "that the enabling conditions for life are not overly strict."

As an undergraduate at the University of California at Santa Barbara, Elisabeth Newton found herself excited by the possibilities the search for exoplanets raised. She decided to move across the country to study at Harvard and in the CfA, where her path and Sassselov's would eventually intersect. "I had been studying galaxies, but wanted to shift the focus of my research to exoplanets," she remembers. "My advisor recommended I apply to work with Harvard's David Charbonneau, one of the pioneers in the field."

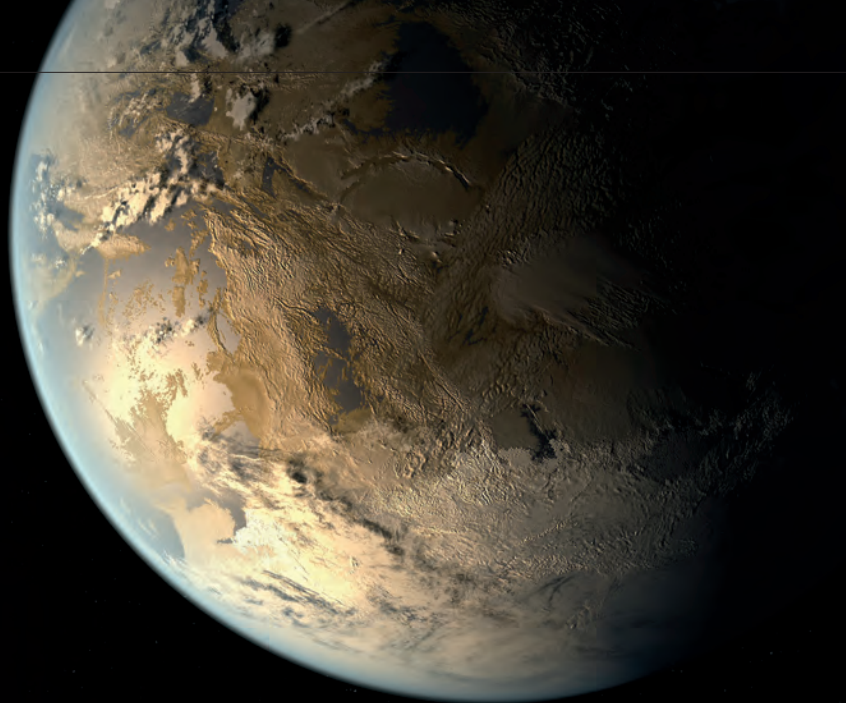
Just as Sassselov found that his study of stars led to exoplanets, Newton's interest in exoplanets turned her attention to red dwarf stars.

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Why red dwarfs? As it turns out, it is easier to find Earth-sized exoplanets circling a red dwarf than around a star like our own Sun.

"Red dwarfs are the most numerous kinds of stars in the galaxy and because of their small size, it is much easier to spot a planet as it transits," Newton explains. "They also emit much less radiation than our Sun, so the so-called habitable zone is much closer to the star. Around a red dwarf, a potentially habitable exoplanet has an orbital period of just a few weeks, as opposed to one year around a Sun-like star. This means we can make many more observations in a much shorter period of time."

The red dwarf study evolved into Newton's dissertation, which she is now completing. Being a graduate student dur-



Above: An artist's image of the first confirmed Earth-sized planet, known as Kepler-186f, believed to orbit its sun in a habitable zone.

Credit: NASA Ames/JPL-Caltech/T. Pyle

Below: Elisabeth Newton studies red dwarf stars in an effort to identify exoplanets.

ing one of the greatest periods of discovery in astronomy has been a tremendous—and challenging—experience. “As I look back on my tenure at the CfA,” she says, “it’s been an exciting and intense time.”

SUPER-EARTHS

Sasselov has become a leading expert on so-called Super-Earths, rocky planets that are somewhat larger than the Earth, but similar in other ways. Their size turns out to be useful in retaining an atmosphere, an essential component for maintaining life. Sasselov wrote a book about them (*The Life of Super-Earths*), and developed the class “Super-Earths and Life” for the online edX platform. Knowing of Newton’s red dwarf work, he invited her to help him write the course, which did very well in its first year, with about 1,500 students completing it.

Sasselov asserts that the “plurality of worlds” debate is over, ended thanks to the rapid-fire discovery of planet after planet, many of which seem capable of sustaining life. “It is no longer a question of *if* we will find life on other planets,

but more a question of *when*,” he says. “I want to make it happen sooner rather than later!”

The next great challenge, he says, is to find biosignatures in the atmospheres of the Super-Earths and any other planets that might harbor life.

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FROM LIFE TO INTELLIGENCE: SETI

On Earth, it has taken millions of years of evolution for the earliest forms of life to develop into intelligent creatures capable of contemplating the entire process and asking questions like, “Are we alone in the universe?” Speculating that intelligent entities in other star systems might be sending out radio signals that human beings could read and interpret, astronomers launched a scientific search for extraterrestrial intelligence (SETI) in the 1960s. While



SETI has not produced definitive results during its 50-year existence, hope remains in the form of an investment from Russian billionaire Yuri Milner, and the imprimatur of famed physicist Stephen Hawking. The Breakthrough Listen project, with \$100 million in funding, could revitalize SETI worldwide.

Sasselov supports Breakthrough Listen, but prefers his current approach. “At the moment, I am looking at the easier task—detecting life,” he says.

AND WHY DO WE CARE?

Most of those involved in the search for life and intelligence in the universe probably don’t ask themselves, “Why am I doing this?” The answer seems obvious: Who wouldn’t want to know more about our place in the cosmos? Whether the answer is “yes” or “no,” Elisabeth Newton acknowledges that the implications are enormous. “I can’t even begin to comprehend what it would be like to discover life or intelligence elsewhere,” she says, “but it will have a profound impact on society.”

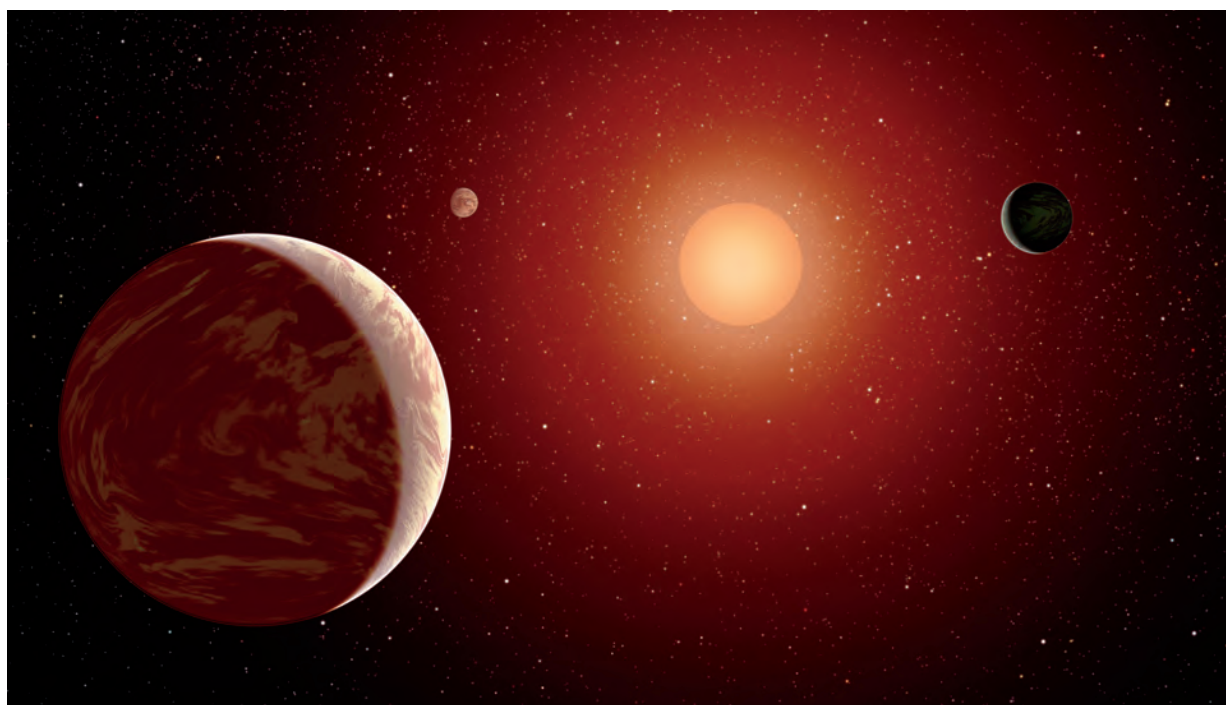
Dimitar Sasselov continues to ponder the “why” question, and in his book on Super-Earths, he offers a cogent answer. “It is the age-old question of ‘the Other,’” he says, “but on a grand scale.”

Sasselov explains that the Other is how a conscious human being perceives his or her own identity. This identity comes front and center in “first encounters,” such as those between *Homo sapiens* and *Homo neanderthalensis*, Mayans and Spanish conquistadors, English colonists and Native Americans.

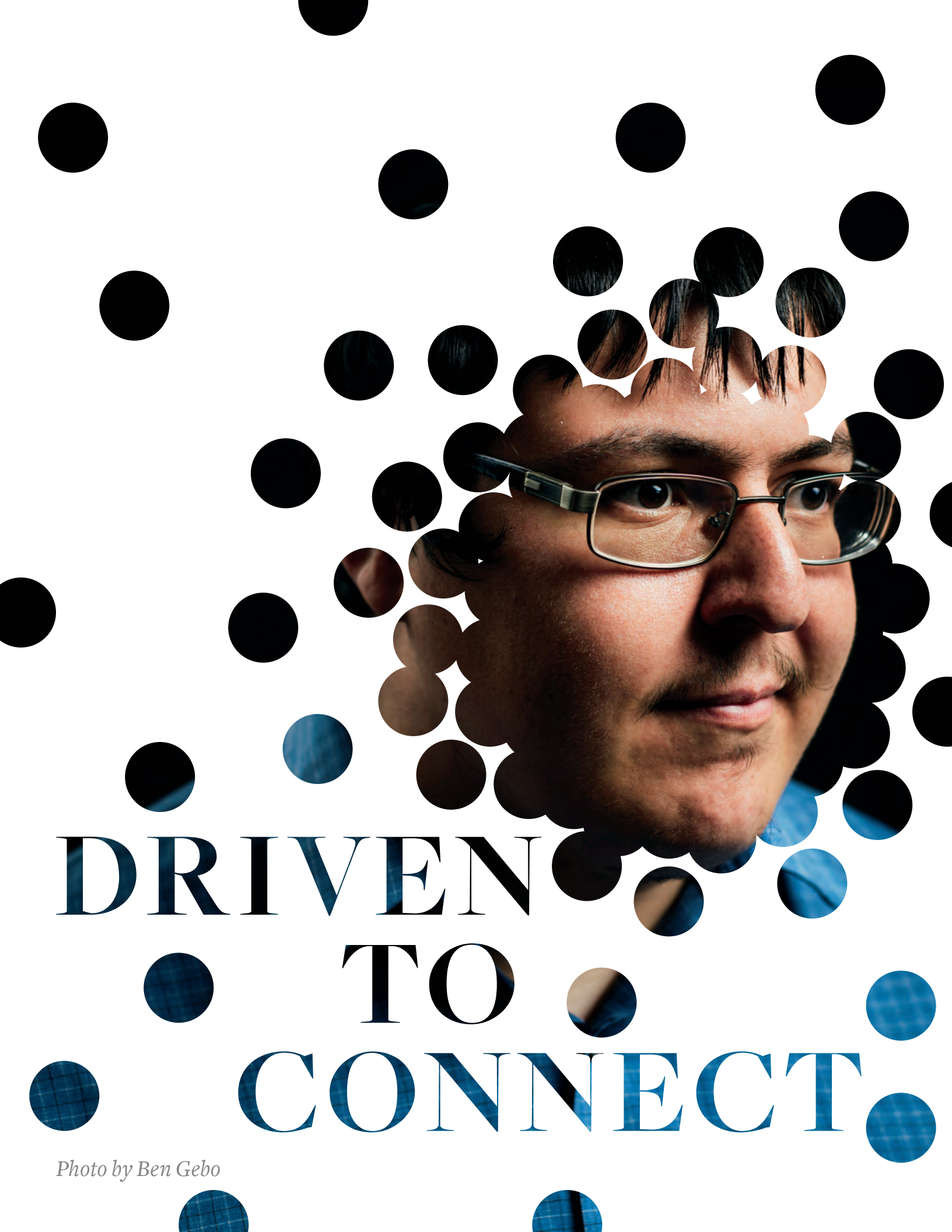
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In our interconnected world, human beings know too much about one another to experience these encounters—but space offers new possibilities. “The discovery of new worlds orbiting distant stars offers a fresh opportunity to contemplate a first encounter,” Sasselov says. “As in the past, humans approach it with both insatiable curiosity and fear, with mixed, very strong emotions.”

Yet, approach it we inevitably will. Sasselov sees his search, and that of Newton and their colleagues, as ultimately fueled by the human drive to understand ourselves. Are we alone? Soon, very soon, we may know. 🍷



Because they have properties less bright than yellow stars like our Sun, red dwarf stars are used by astronomers to search for exoplanets. At left, an artist's depiction of a red dwarf star surrounded by three planets. Credit: NASA/JPL-Caltech



DRIVEN TO CONNECT.

Photo by Ben Gebo

Whether researchers are studying the cosmos for signs of life or investigating the motivations behind political formation (or lack thereof), they seem driven by the same impulse: to seek out others. Considering why is the province of philosophers, and graduate students in the Department of Philosophy turn to the writings of the past to inform their own observations of human motivation.

In considering questions of human behavior, PhD student Noel Dominguez turns to German philosopher Immanuel Kant, known as one of the most influential thinkers in the Western world. Colloquy sat down with Dominguez to get his (and Kant's) take on why we are driven to connect with others.

Human beings seem to have the need to seek out others, for example, by forming political groups or states. Why is that?

One answer to this question is that humans are right to think of this seeking of others as a *need*, and not merely as a very strong desire—perhaps in addition to our wanting to seek out others because of our natural sentiments of curiosity and community, we could have *moral* reasons to form communities with others for the sake of our joint autonomy.

Kant held a position like this in his political philosophy, where he claimed that we are all obligated to form a political state independent of any further benefits we might accrue by forming it. He believed that an individual's ability to plan anything depended on an assurance that someone else wouldn't illegitimately interfere with that plan—for example, I can't grow my own garden if I don't know you won't steal from me. A mechanism must exist that grants us a mutual assurance that we would each do our part in our interactions with each other. Kant thought that only the formation of a just state could allow for the possibility of morally just free action.

What do you think this need to organize says about the human race?

It's easy to imagine that humans are social creatures solely because of evolutionary traits or the benefits that come from being part of a group. But Kant thought there was more to the story than that. Kant believed that, by and large, every meaningful action *depends upon* the existence and cooperation of others taking our ends as their own. You can't ask a question unless there's someone who understands that that's what you're trying to do, for example, you can't get married unless people besides your potential spouse understand your relationship in that way. The possibility of independently valuable actions depends upon the existence of institutions allowing those actions to be recognized as such. This need to organize is really the need to create the conditions of the possibility of moral agency. Organizing ourselves into stable groups is not something we do for the benefits of doing it, then, but is the process that leads to any social goods at all.

Is searching for other forms of life the right thing to do?

Kant never wrote on this topic, but it is possible he would have considered that searching for other forms of life is morally obligatory for the same reasons forming a just state is. The moral legitimacy of what we want to accomplish depends upon the claim that these projects should not be undermined by people who do not endorse our current social structure—the *whole notion* of a just social structure for Kant, after all, is simply one where every person in the group would have reason to endorse and advance that structure. The existence of other forms of life would require that we respect their right to thrive, otherwise our just social structures would not be just after all.

This problem already exists in our interactions with other animals, and it is not implausible to think that we may stand in a similar relation to forms of life we have not yet encountered. Just as Kant would think the use of sonar is morally prohibited because it impinges on our ability to treat whales with the respect they deserve (because sonar physically harms whales in ways they would not endorse if they could), our practices here on Earth could have negative and undeserved repercussions for beings elsewhere in the universe. Because we must be assured this is not the case to ensure that our practices are legitimate, we might have some responsibility to look for other forms of life.

Kant said, “Two things fill the mind with ever-increasing wonder and awe, the more often and the more intensely the mind of thought is drawn to them: the starry heavens above me and the moral law within me.” Do you think he saw a connection between the great unknown of what is “out there” and the human responsibility to seek it out?

Whether or not Kant thought there was a connection there, we can see the outlines of one. Kant's philosophy is largely motivated by considerations of the *conditions of the possibility* of certain entities and what that implied for what those entities are really like. When he's thinking of the awe provided by the moral law within him, part of what he's fascinated by is how the necessary nature of acting on *any* reason can provide guidance concerning which reasons we *should* act on, or what we should and shouldn't do.

Likewise, in his wonder of the starry skies above him, Kant seems to be in awe of the nature of the world as providing the conditions of the possibility of existence itself. His expression of wonder at how the complex depths of internal cognition are matched by the great expanses of outer space hints at a belief that both ideas “call out” to us in certain ways, and that the form of their existence grounds the obligations we have concerning them. People sometimes claim we should explore other planets “just because they're there,” and while Kant probably did not conceive of the possibility of ever exploring other planets, the above statement gives us an inkling that he'd endorse that line of reasoning. ♣





GROUP THINK

By Ann Hall
Illustration by Keith Negley

Throughout our history, human beings have sorted themselves into groups. From bands of hunters to citizens of nation states, from tribes to political parties, human history is a story of groups. But why did groups form in the first place?

"There are a variety of answers to that question," says Jennifer Hochschild, Henry LaBarre Jayne Professor of Government. "Hobbes argued that life in the state of nature was solitary, poor, nasty, brutish, and short, so we formed groups for self-protection." In other words, human beings learned through evolutionary selection that combining their resources provided beneficial outcomes, for example, when hunters worked together they could take down a mammoth, whereas a solitary person would starve. "Over time," Hochschild continues, "primitive groups expanded into larger groups, which required management and internal organization as well as defense against other groups."

But other theorists have also weighed in on the origins of humans' desire to gather together. Sigmund Freud, for example, followed a logical chain of familial attachment: children are linked to their mothers, who are attached to fathers and siblings. Family ties, extended outward, create group ties. Evolutionary sociologists and psychologists, on the other hand, argue that individuals developed a deep psychological need for emotional attachments because connections with others helped them better explain the world around them.

Political scientists like Hochschild offer yet another explanation. "The political scientist's answer is that politics makes possible the authoritative division of good things in a society," she says. "Politics is, in effect, that choice of who gets what, when, and where. It is seldom the case that you can win these good things by yourself." For Hochschild, the key to understanding group formation involves a combination of rationality, psychology, culture, and self-interest, which ultimately leads to the distribution of desired things. "In a world of finite resources, we can either fight over them or we can enact laws," she explains. "On balance, creating a system of government is preferable."

AN EVOLUTIONARY PROCESS

Groups may coalesce around specific people or ideals, yet they are far from static. As circumstances change, pressures form, and beliefs evolve, the composition and structure of human groups change along with them. "The creation of new groups is *the* story of human history," says Hochschild.



Jennifer Hochschild

"Through intermingling, intermarriage, and dissolution, group identities do in fact blur and merge over time. This is not to say that groupness goes away, but that the nature of a particular identity and boundary can change."

A pillar of the Department of Government, where she has taught since 2001, Hochschild studies the intersection of American politics and political philosophy—particularly in the areas of race, ethnicity, and immigration—and focuses in particular on education and social welfare. A lifelong student of public opinion, political culture, and American political thought, she is currently considering the politics and ideology of genomic science, immigrant political incorporation, and how citizens use factual information in political decision-making.

This last topic is the focus of Hochschild's most recent book, *Do Facts Matter? Information and Misinformation in American Politics*, coauthored

"THE CREATION OF NEW GROUPS IS THE STORY OF HUMAN HISTORY IN A VERY, VERY BIG, GENERAL SCALE."

with Katherine Levine Einstein, PhD '12, an assistant professor of political science at Boston University. In the book, Hochschild and Einstein address the ways that individuals often act on misinformation to advance their group's cause. In many instances, they show, people avoid facts that contradict their beliefs and automatically accept others without question. Despite the common assumption that more educated people are *less* prone to accept agreeable statements without question, their research showed quite the opposite. And the reasons why may be tied to group dynamics.

"Some evidence shows that people with more education are more likely to cling to their beliefs, so education is certainly not a panacea," Hochschild explains. The reason is that group membership may outweigh critical analysis, particularly if a group takes strong partisan or ideological positions. Even *questioning* an established idea can threaten an individual's inclusion. "For example, if a member of a liberal group questioned whether global warming is a problem, she would have to question whether she can still be a good Democrat, perhaps stop talking, at least about this issue, to her colleagues and others in their class and peer groups," Hochschild says. "That's a big cost. Why would anyone want to do that?"

RIISING DEBT

Tess Wise, a PhD candidate in government, frames the issue in a somewhat different way. For her, the question isn't why people form groups—it's why they don't. "I'm interested in what happens to the middle class in America when they experience economic shocks," Wise says. "Does this change the way they join groups or behave politically?"

At a time when social scientists increasingly use Big Data to explain trends, Wise is turning to the richer stories of individual Americans. "Big data is incredibly powerful and incredibly interesting," she says, "but

what it gives you is lots of information about a few things that we measure, or a few things that are easily quantifiable. I felt like I wasn't understanding the human story during the research process." While she still looks at data trends, she marries that approach with small-scale interviews of middle-class Americans who, according to the theorists, should be grouping together to lobby for change. According to her findings, however, a huge number of them aren't.

"Middle-class Americans are experiencing more economic uncertainty than they used to," Wise says. "Over the last generation, the level of debt held by this group has increased substantially." Rising household debt coupled with job insecurity and wage stagnation has blurred the line between the middle class and the working class, and Wise wonders why both groups aren't forming a kind of "debtors union" to push for expanded social welfare programs. Turns out, the reasons are complicated, and in many ways, psychological.

GROUP RESISTANCE

Political scientists have long noted that our common definitions of economic class depend as much on perceptions and identities as they do on

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income levels. "Even though the idea of the middle class is an amorphous concept," says Wise, "it is defined as 'not working class.' A large number of people in the middle of the income distribution have decided that they're part of this group, and they want to hang onto that identity, even if the factors that originally made them middle class have gone away."

Personal debt complicates an already tricky set of class identities. "Over the past 10 years, the most common group using payday loans are people who have some college education, and the number of people with college degrees using payday loans has gone way up," explains Wise. "This type of debt—which we think of as being exploitative, damaging, and the kind of solution educated people wouldn't resort to—is actually being used by middle-class Americans more and more."

Yet part of the traditional middle-class value system is the belief that individual effort is sufficient for success. "People really want to believe that the world in which we live is a just one," says Wise. Because they believe in the system, middle-class debtors tend to blame themselves and assume they aren't working hard enough. Yet when it comes to predatory lending, even those educated enough to "know better" are being set up for failure.

Through her interviews, Wise found that people trapped in this form of debt initially believe that the process is fine and fair, and that morally people are responsible for paying what they owe. When she pushes back on that claim, however, many change their narrative. "It starts off as an awkward conversation because people don't want to admit that they ended up in this situation," she says. "But when you ask them if they think that the interest rate on the debt is fair, they say, well, no, it isn't."

Those conversations have helped Wise understand why a groundswell of support for a "debtors union" hasn't materialized. That is, it explains why a

group *has not formed* to redress a common problem. "The topic is so painful for people to think and talk about, and it really contradicts their understanding of fairness," she says.

EFFECTING REAL CHANGE

Wise's research into the *absence* of group formation breaks new ground precisely because of deep historical, psychological, and theoretical explanations for the formation and growth of groups. In the 1970s, the social psychologist Henri Tajfel conducted an experiment where he assigned nearly 50 teenage boys to random groups based on their preferences for one of two pieces of modern art. What he found was that even without a shared belief system for their categorization, the boys nevertheless behaved as though their group identities mattered. They quickly demonstrated favoritism to other boys within their group and rejected or minimized the others. This experiment showed that even artificially constructed groups, or groups formed at random, can have profound effects on behavior and identity.

If debt-plagued middle-class Americans could overcome their conflicted class identity and engrained cultural attitudes, Wise argues, forming a collective group would be a powerful way to effect real change. "Groups allow for a diffusion of responsibility," she says. "Politically, this is great because you can push for things that might be slightly controversial without feeling like you're sticking your neck out." In addition, forming a group could help ameliorate the paralyzing helplessness and shame that people in debt suffer from. "A group gives us a place where we can recognize and we can help. It's collaborative—I recognize you, you recognize me," says Wise. "It reduces my uncertainty about who I am in the world, and that, I think, is cognitively satisfying for people. That's what I think of when I think of why people join groups." Groups, it turns out, give us all a reason for being. 🍷

Tess Wise



Noted

ANTHROPOLOGY, MIDDLE EASTERN STUDIES, AND PUBLIC POLICY

Swarthmore College welcomes **Sa'ed Atshan, AM '10, PhD '13**, to their Peace and Conflict Studies Program and **Syon Bhanot, PhD '15**, as an assistant professor of economics. Atshan researches nonviolent Israeli and Palestinian social movements and has taught courses on social movements in the Middle East at Harvard and Brown. He is currently a postdoctoral fellow at the Watson Institute for International Studies at Brown. Bhanot conducts field experiments that use behavioral concepts to influence decision making, including pro-social behavior, environmental conservation, and personal finance decisions.

THE CLASSICS

Justina W. Gregory, PhD '74, Sophia Smith Professor of Classical Languages and Literatures, has won the Kathleen Compton Sherrerd '54 and John J. F. Sherrerd Prize for Distinguished Teaching at Smith College, which highlights the college's ongoing commitment to outstanding teaching. The award is given to faculty members who show superior skill in fostering

learning and inspiring achievement, whether it is in the classroom or out of the classroom. Gregory is editor of *A Companion to Greek Tragedy* (Wiley-Blackwell, 2008) and is currently completing a book on ideas of education in epic and tragedy.

ECONOMICS

Patricio Millán-Smitmans, PhD '75, released his latest publication, *Terminar con el Hambre: Seis Políticas Públicas Claves* (Editorial of the Catholic University of Argentina, 2014), last winter. In the book, he argues that hunger in developing countries cannot be eliminated by the social assistance action of the public and private sectors alone, but must be addressed through structural reform policies that enable those suffering from hunger to permanently and securely increase their income. He recommends establishing zero hunger and child malnutrition goals in all countries. Millán-Smitmans is a professor of economic policy at Universidad Católica Argentina.

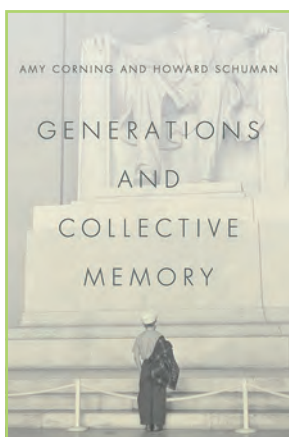
ENGLISH

E. San Juan, Jr., PhD '65, has published two new books this year, one in English and one in Filipino. A collection of San Juan's essays on culture, politics, and history, *Between Empire and Insurgency: The Philippines in the New Millennium* (University of Philippines Press, 2015) continues his historical-materialist critique *From Globalization to National Libera-*

tion (University of Philippines Press, 2008). *Lupang Hinirang, Lupang Tinubuan* (De la Salle University Publishing House, 2015) includes commentaries on the writings of the poet Francisco Balagtas and the Filipino nationalists José Rizal and Andrés Bonifacio, while considering the achievements of the writers Amado V. Hernandez and José Corazón. San Juan is currently professorial lecturer at the Polytechnic University of the Philippines.

Ross Howell, Jr., AM '74, an assistant professor of English at Elon University, will publish his first novel, *Forsaken* (NewSouth Books, 2016) in February 2016. The book tells the chilling story of an uneducated, 16-year-old African American girl in 1912 who, having been convicted of murdering her white employer, faces execution by electric chair. Howell has previously published his fiction in the *Virginia Quarterly Review*, *Sewanee Review*, and *Gettysburg Review*.

In September, **Leonard Cassuto, PhD '89**, published his fourth book, *The Graduate School Mess: What Caused It and How We Can Fix It* (Harvard University Press, 2015). In it, Cassuto discusses how graduate students take too long to complete their studies and then face a disappointing academic job market if they succeed. He offers insight into how the value of university research comes at the expense of teaching, and teaching is where



MEDICAL SCIENCES & REGIONAL STUDIES—RUSSIA, EASTERN EUROPE, & CENTRAL ASIA

Microbiologist **Howard Shuman, PhD '80**, and research investigator **Amy Corning, AM '87**, have published *Generations and Collective Memory* (University of Chicago Press, 2015). Corning and Shuman draw on a striking range of research to show how generations share memories of formative experiences. They explain how understanding the way those memories form and change can help us understand society and history. Shuman is a professor of sociology and research scientist emeritus at the University of Michigan and has been a part of the department of microbiology at the University of Chicago since 2010. Corning is currently a research investigator at the Institute for Social Research at the University of Michigan.

reforming graduate school should begin. Cassuto also writes a graduate education column for *The Chronicle of Higher Education* and teaches American literature at Fordham University.

HISTORY

The Council of the American Historical Association has selected **Asuncion Lavrin, PhD '63**, to receive the AHA Award for Scholarly Distinction at their 130th Annual Meeting in January 2016. Created in 1984, this award is one of the highest honors that a historian in the United States can receive, and winners are recommended based on their originality, creativity, and achievement. Lavrin is the author of more than 100 publications on topics of gender and women's studies in colonial and contemporary Latin America, and religion and spirituality in Colonial Mexico. Among the first class of women to receive a doctorate from GSAS, Lavrin is currently professor emerita at Arizona State University.

HISTORY OF ART & ARCHITECTURE

Coordinator of Instructional Development and Research at the University of Nevada, Las Vegas, **Mary-Ann Winkelmes, PhD '95**, was featured in the *Chronicle of Higher Education* regarding her compelling project, "Transparency in Teaching and Learning in Higher Education." The project aims to improve higher education teaching and learning experiences for both faculty and students through the idea of developing student understanding of how they learn. It guides faculty to benefit from the way students learn by coordinating their efforts across disciplines, institutions, and countries. Since 2010, this study has involved more than 25,000 students from 160 courses and 27 institutions in 7 countries. Winkelmes is also associate graduate faculty in the department of history at UNLV.

PHYSICS

Physicist and composer, **Eric Sirota, PhD '86**, presented his new musical,

Your Name on My Lips, during August and September 2015 at the Theater for the New City in New York City. The production featured a young artist who fights to hold onto his childhood friend and love of his life, while the world tries to tug her away. Sirota is a highly-published research scientist and fellow of the American Physical Society.

PSYCHOLOGY

Edward F. Kelly, PhD '71, has co-edited and published *Beyond Physicalism: Toward Reconciliation of Science and Spirituality* (Rowman & Littlefield Publishers, 2015). In this publication, editors Kelly, Adam Crabtree, and Paul Marshall seek to develop believable concepts of the spiritual nature of human beings, detailing how these phenomena (paranormal, postmortem survival, mystical experiences, etc.) can occur. Kelly is currently a research professor in the Department of Psychiatry and Neurobehavioral Sciences at the University of Virginia.



REGIONAL STUDIES—EAST ASIA

Tanya Selvaratnam, AM '96, is a documentary and theater producer, a writer, an actor, and an activist. Since 2011, Selvaratnam has been an advisor to the DO School, a creative educational organization offering learning experiences that produce global impact. Her recent bibliography, *The Big Lie: Motherhood, Feminism,*

and the Reality of the Biological Clock (Prometheus, 2014), is a candid assessment of the pros and cons of delayed motherhood. Selvaratnam is currently the communications and special projects officer for the Rubell Family Collection and has previously worked for the World Health Organization, Ms. Foundation, and the NGO Forum on Women.

Dana Tang, AM '90, has been appointed partner at Gluckman Tang Architects (GTA), formerly Gluckman Mayner Architects. Tang is responsible for GTA's work in China where, because of her deep understanding of Chinese culture, the firm will design four major museums. Tang is lead architect for three of the four museums, acting as designer, project architect, and senior associate.

SOCIOLOGY

Founding director of Seoul National University Asia Center, **Hyun-Chin Lim, PhD '82**, has been elected to the National Academy of Sciences, considered the highest honor for scholars in South Korea. Previously nominated as National Distinguished Scholar by the Korea Research Foundation, Lim served as the dean of the college of social science at Seoul National University and now serves as president of Korean Social Science Research Council. Lim is professor emeritus of sociology and specializes in political sociology, comparing Asian and Latin American development.

VIROLOGY

Assistant director of the Louisiana Office of Public Health Laboratories, Baton Rouge, **Errin C. Rider, PhD '08**, earned certification as a diplomate of the American Board of Medical Microbiology, the highest credential a doctoral-level clinical microbiologist can earn. Rider's skills and knowledge in directing laboratories have aided her efforts toward advancing the microbiological diagnosis of human disease. 🏆

Global GSAS Korea 2016

The Harvard Graduate School of Arts & Sciences, the Harvard Korea Institute, the Harvard Club of Korea, the Harvard Yard Club of Korea, and the Harvard Alumni Association invite you to gather with local Harvard alumni in Seoul for a reception and panel conversation about Harvard and global outreach featuring GSAS Dean Xiao-Li Meng and members of the Harvard Faculty.

*Monday, January 11, 2016
Seoul, South Korea*

Registration 6:00 p.m.

Remarks and Reception 6:15 p.m.

*Westin Chosun Hotel, Orchid Room
106 Sogong-ro, Jung-gu, Seoul*

Find out more at:

*www.gsas.harvard.edu/alumni or
e-mail gsaa@fas.harvard.edu.*



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Alumni Stay C-o-n-n-e-c-t-e-d

For GSAS alumni, receiving their diplomas at Commencement marks the beginning of a lifelong engagement with Harvard and with the Graduate School of Arts and Sciences. Graduates remain connected to their departments, often participating in events and giving advice to current students about the state of the field. Some departments maintain LinkedIn pages, organize networking meetings or colloquia, or arrange receptions during professional meetings.

For example, over the past year the Program in American Studies hosted a successful panel discus-

sion on interdisciplinary careers, bringing to campus seven alumni who spoke compellingly of the challenges and rewards of working at the junctions of established disciplines. Regional Studies—East Asia also convened a group of alumni who participated in breakout sessions focused on academic careers and nonacademic career paths.

Be an active participant in alumni programming. Contact Jon Pettitt, director of alumni relations and publications, at gsaa@fas.harvard.edu or 617-495-4945, to learn more.

Supporting the quest for knowledge.



Jahm Najafi, MA '86, is a global investor, CEO of the private investment firm Najafi Companies, and co-owner of the Phoenix Suns. "I've had my unfair share of good fortune," he jokes. Najafi credits much of his success to an ability to think critically, a skill he first developed as a student at the Graduate School of Arts and Sciences (GSAS).

"I wanted to attend Harvard ever since I was 12-years-old and had just moved to the United States, but they rejected me as an undergraduate," says Najafi. He wanted to prove he could learn with the best and have the chance to take classes from top economists like Richard Caves and Jeffrey

Sachs. When he arrived to pursue a master's degree in business economics, he felt instantly welcomed by classmates and faculty.

"Harvard exceeded my expectations," says Najafi. "Professors provided so much guidance. They would challenge me to think beyond what I thought I was capable of. They taught me to think outside of any established framework."

In gratitude for his Harvard experience, he and his wife Cheryl have made several gifts to GSAS. "We are both thankful to the people who believed in us at a time when we weren't much," he says. "I feel my personal success and ability to overcome challenges in my life had a lot to do with my education and my experiences interacting with people at Harvard."

To support this community of scholars, the Najafis have dedicated one of these gifts to graduate financial aid. "So many people who attend GSAS love research and expanding human thought," says Najafi. "And I want to make a small contribution to allow people to continue those quests."

The couple has also made an unrestricted gift to help advance new initiatives led by Dean Xiao-Li Meng, such as the Harvard Horizons program and symposium, the new Parental Accommodation and Financial Support program, and other professional development offerings. "Xiao-Li is an amazing dean," says Najafi. "He's so passionate about students at GSAS."

Najafi lives with his wife and their three children in Arizona, and he doesn't get the chance to return to Cambridge as much as he'd like. Still, he takes great comfort in knowing that he and his wife are supporting ongoing activity at the graduate school.

"The only reason we are where we are is that people have gone beyond their comfort zone to expand what we know," he says. "This is due to people who go to graduate school, with Harvard at the forefront. We need to continue to support their good work."

Support the



HARVARD

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alumni.harvard.edu/ways-to-give/gsas-giving

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- Leave a portion of your estate to GSAS or
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Harvard's 100-year-old Alvin Clarke & Sons
refractor still scans the sky from the
Center for Astrophysics.
Photograph by Kris Snibbe