

# 2022 YEAR IN REVIEW



# IMPACT

# GREETINGS from the Chair



**W**hat a difference a year makes! I did not expect, when 2022 began, that I'd be looking back on the year in the role of Division Chair.

We are experimenting with new initiatives in these transitional times—including some in these very pages. In addition to the annual compendium of the HSS division's many achievements, this 2022 review includes our first feature-length story. In this piece, alums and current students share the ways in which their academic work in the humanities and social sciences has helped them to succeed during their time at Caltech and in their subsequent careers, whether in academia or industry. Teaching is not a one-way street, though. Caltech students, both undergrads and grads, ask interesting and difficult questions that make us think harder about the research we are doing.

The prizes, grants, and publications highlighted in this Year in Review are among the many reasons why I'm glad to call this dynamic and accomplished division my intellectual home, and I look forward to doing my part to ensure that it continues to make an impact in the years to come.

## **Tracy Dennison**

*Edie and Lew Wasserman Professor of Social Science History;  
Ronald and Maxine Linde Leadership Chair, Division of the  
Humanities and Social Sciences*

DECEMBER 2022



## Under **New** Management

On October 1, Dennison began her term as the new Ronald and Maxine Linde Leadership Chair of the Division of the Humanities and Social Sciences. Her research focuses on the political economy of pre-modern central and eastern Europe, especially the role of institutions in long-run economic growth and development. Dennison has published extensively on serfdom, property rights, state capacity and state formation, and the economic divergence between western and eastern Europe. Her first book, *The Institutional Framework of Russian Serfdom*, was awarded the Economic History Society's prize for Best First Monograph, among other accolades. She is now working on a book about serfdom and state formation in Prussia and Russia, which she started during an Alexander von Humboldt Fellowship at the Ludwig Maximilian University in Munich.

# 2022 YEAR IN REVIEW



## Artificial Intelligence Gets Political

**Politics, Machine Learning, and Zoom Conferences in a Pandemic**

Following the 2020 U.S. presidential election, and while Caltech classes remained online due to COVID-19, undergraduate **Sreemanti Dey**, now a junior, embarked on a project with Professor of Political and Computational Social Science **Michael Alvarez** using machine learning to discover what motivated people to vote for one presidential candidate over another. The computer science major modeled data with the “fuzzy forest” algorithm, a technique developed by alumna Christina Ramirez (PhD ’99, social science), and she confirmed that partisan polarization was the strongest factor that influenced why people vote for a specific candidate. “I think we got pretty much what we expected, except for what the most partisan-coded issues are,” Dey told *Caltech News*. “The most partisan questions turned out to be about filling the Supreme Court seats.” Dey presented her paper at the fourth-annual International Conference on Applied Machine Learning and Data Analytics in December 2021, where it won the best paper award.



## Using AI to Combat Online Misinformation and Harassment

Another recent project for **Mike Alvarez**, supported by a grant from the National Science Foundation, uses artificial intelligence (AI) and machine learning to quickly identify online attacks on local election officials in order to generate instant actionable data for tech platforms or, potentially, law enforcement. The team of Alvarez, undergraduates **Sreemanti Dey** and **Sarah Hashash** (pictured above), and social sciences graduate student **Danny Ebanks** hopes to counter misinformation about

how voting and elections work. Alvarez explained to *Caltech* magazine, “We have to do everything we can to convince people that in the United States, elections are in fact being run freely and fairly and that they’re free from fraud. That’s a tall order for one faculty member at Caltech, but it is the sort of thing that here at Caltech we can do to help and that election scientists throughout the country are going to be doing in this [midterm] election cycle and in the future to try to help turn this around.”

As part of the Caltech Science Exchange’s online video series *Conversations on Artificial Intelligence*, Alvarez and Bren Professor of Computing and Mathematical Sciences Anima Anandkumar discussed how misinformation is amplified online and ways AI tools can identify and discourage online harassment, as well as how it can help uncover the spread of disinformation on social media platforms.



# Bringing History Forward

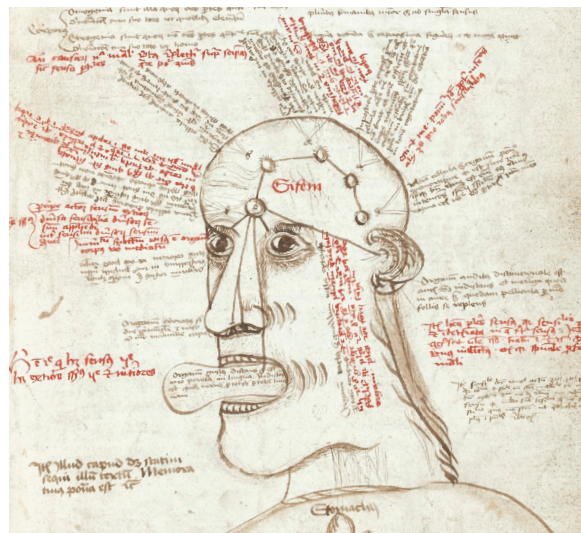
## The Rhetoric of Chance in Times of Pandemic



Professor of English **Jennifer Jahner** gave the Earnest C. Watson Lecture on April 13. In her talk, titled “The Rhetoric of Chance in Times of Pandemic,” Jahner explored the long history of thinking about chance, from the goddess Fortune of ancient epic to the modern rhetoric of personal risk. In present times, the COVID-19 pandemic disrupted our habitual ways of thinking about safety, uncertainty, and risk at the personal and collective scales, Jahner noted to *Caltech News*. “I’ve been especially struck over the last two years of the pandemic with what felt to me, at least initially, as a kind of disconnect between what we would think of as the science of the pandemic and the rhetoric of safety, certainty, vaccination, and anti-vaccination.... We essentially are still living in a kind of dual probabilistic world.” While much of the science is new, the arguments around questions of public health and uncertainty have ancient roots.



Image of Lady Fortune and her wheel, from Christine de Pizan, *The Book of Ladies*, London, British Library, MS Harley 4331, f. 129r.



Aristotle, *De anima*, London, Wellcome Library, MS 55, f. 93



Maynard Jackson with U.S. President Jimmy Carter, 1977.  
(MediaPunch Inc./Alamy Stock Photo)

## History's Echoes in Black Politics

The idea that events have a way of echoing times in the past is one of the central tenets of Assistant Professor of History **Danielle Wiggins**'s current book project, which is under advance contract with the University of Pennsylvania Press. Her manuscript examines the political approaches of Black leaders in the decades following the civil rights era, in which the movement for equality faced setbacks and struggles, and she finds connections to the way Black leaders approached politics during another trying time for African Americans—the Jim Crow Era.

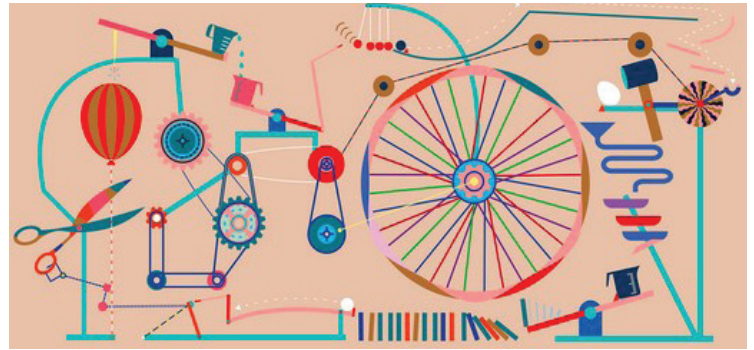
Wiggins received two competitive fellowships to support her work on the book; the first is the Career Enhancement Fellowship for Junior Faculty from the Institute for Citizens and Scholars, and the second is



from the American Council of Learned Societies. She told *Caltech News* that she hopes to publish her book in fall 2024 during the next U.S. presidential election. "If our current vice president runs, she is this sort of politician whose origins I describe in my work," Wiggins explained. "I want to release the book potentially at a time when people would be very interested in these questions of Black politics and Black Democratic leadership in particular."

# Extending Our Reach

## Causality Explored



*Simons Institute for the Theory of Computing*

**Frederick Eberhardt**, professor of philosophy, chaired a semester-long program on causality at the Simons Institute for the Theory of Computing at UC Berkeley, where he brought together dozens of scholars from diverse backgrounds. With participants from statistics, computer science, philosophy, economics, physics, biology, the health sciences, and law, as well as industry representatives, the program produced ample opportunities for interdisciplinary exchanges. “For someone like me working in the field, it is enormously exciting to see how the topic of causality, which was once shunned as folk science in the early twentieth century, is now being broadly researched, developed, and applied across many academic fields,” said Eberhardt. “There is a determination to precisely characterize the different concepts and to ensure that causal inference methods work reliably across different domains.”

## American Institute of Mathematics Moves to Caltech

The American Institute of Mathematics (AIM) announced plans to relocate from the San Francisco Bay Area to Caltech, with Professor of Economics and Mathematics **Omer Tamuz** playing an instrumental role in drawing the independent nonprofit organization to campus. AIM organizes and funds collaborations among pure and applied mathematicians, theoretical biologists, computer scientists, physicists, and other scientists working on long-standing math problems. “Mathematics is a very social activity, and direct interaction with other mathematicians is crucial for our work,” Tamuz explained to *Caltech News*. “Bringing AIM to Caltech will roughly double the amount of mathematical activity on campus, giving us the benefit of interacting with hundreds of top mathematicians every year.”





# The Next Generation of Social Science

## Mistakes and Rethinking Behavioral Economics

When people do not behave according to an economic theory, economists have tended to assume the theory is bad and should be reconsidered. But a recent paper by **Kirby Nielsen**, assistant professor of economics and William H. Hurt Scholar, proposed a simpler explanation: sometimes people just make mistakes. “Maybe they didn’t make their decision

according to what the model would say to do, but maybe they would rather have,” Nielsen said to *Caltech News*. “So maybe they violated this principle called transitivity, but they just didn’t realize that they were doing it.” She explored people’s propensity for mistakenly violating economic models through a series of experiments designed to reveal these kinds of errors, applying an economic principle known as independence. The paper, co-authored with John Rehbeck of Ohio State University, appeared in the *American Economic Review* (July 2022).

Nielsen enjoys writing haiku summaries of her research papers. She told *Caltech* magazine the practice helps her think about the most efficient way to describe and present her work. Read her poetic perspective on “When Choices Are Mistakes”:

*You like a choice rule  
but then you violate it.  
Was it a mistake?*



## Introducing Pawel Janas

*Caltech News* interviewed **Pawel Janas**, who joined HSS as an assistant professor of economics this past summer. Janas is an economic historian with research interests in finance and urban economics. He studies the consequences of financial crises on governments and households, focusing on local public goods, education, and long-run growth. “My specific research interest has so far been the Great Depression and what happened when cities all of a sudden couldn’t pay their debts and became financially constrained,” Janas said. In his research, he uncovers and digitizes large historical data sets and uses quantitative methods to answer important empirical questions. Janas holds degrees in economics (BA ’16) and applied mathematics (BS ’16, MS ’16) from the University of Colorado Boulder, as well as in finance from Northwestern University (PhD ’22).



## ... and Peter Caradonna

HSS also welcomed Assistant Professor of Economics **Peter Caradonna**, who completed his PhD in economics at Georgetown University earlier this year. He is working to build better tools for studying individual preferences, which in turn serve as the building blocks of larger group trends examined in behavioral economics. In his recent interview with *Caltech News*, Caradonna explained, “Ideally, we’d like to know how good our assumptions about individual behavior are ... and see how well they perform in practice. Because if these basic assumptions are off base, it is going to bleed into every other type of analysis we could hope to conduct.” When asked what drew him to economics, he said, “In its modern form, it’s so young compared to the natural sciences. There are so many basic questions that we as a field just aren’t that close to satisfactorily answering yet, and that makes it this kind of wonderful intellectual melting pot, where all kinds of tools and ideas from a whole host of different fields are being combined in new and exciting ways.”

# The Next Generation of Social Science

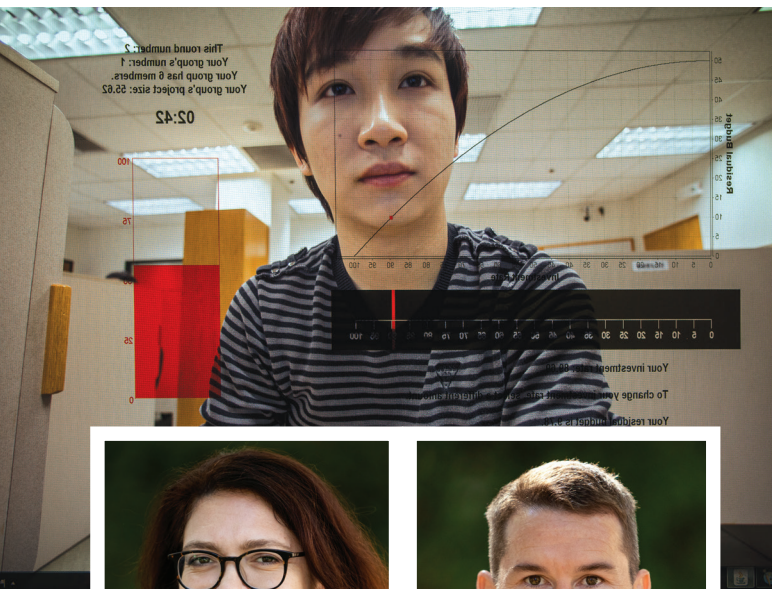
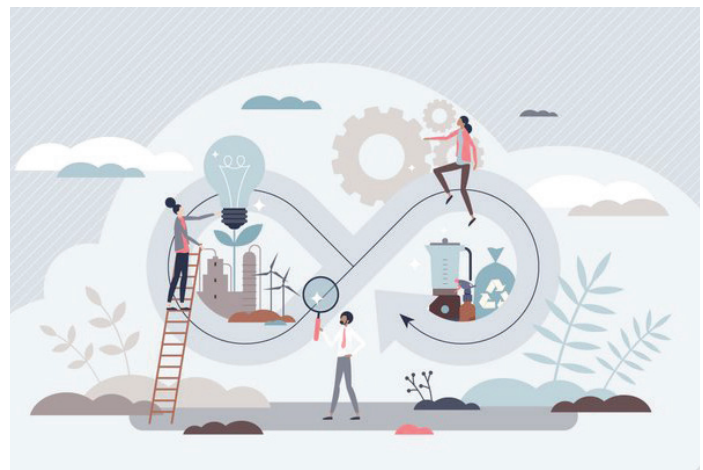
DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES

## A Practical Look at Sustainability Solutions

**Juni Singh**, postdoctoral instructor in social sciences of sustainability, designed her spring 2022 course on the Economics of Sustainable Development to train the next generation of scientists and economists to explore technologies that will reduce humanity's impact on the environment and advance economies. While scientists use mathematical models to identify trends and make predictions about how Earth's climate will change over time, economists model the behavior of companies and individual consumers to understand policy response. Singh taught her students to combine the two methodologies and use economic models to evaluate potential sustainability solutions. She told *Caltech News*, "I want [my students] to be able to say, 'This is what we know about the science, but this is where we can learn from economics, and this is how the market works.'" Singh will teach the course again in winter 2023.



Juni Singh (far left) with students



## CTESS Summer School

This past summer, Professors of Economics **Marina Agranov** and **Charles Sprenger** organized a summer program in theory-based experiments for HSS and other graduate students and young professionals interested in behavioral and experimental economics. Course material combined three key elements at the foundation of theory-driven experimental design and structural analysis pioneered by Caltech social scientists: modern experimental methodology, a theoretical focus of creating experimental data driven by core model predictions, and structural estimation from obtained data. The program, which Agranov and Sprenger intend to continue in future years, was supported by the Center for Theoretical and Experimental Social Sciences (CTESS), part of The Ronald and Maxine Linde Institute of Economic and Management Sciences.

# Humanities: From Underground to Outer Space

## The Cinema of Big Oil

Professor of Visual Culture **Brian Jacobson** studies architecture, cinema, and the creation of artificial environments—the human-built world. In an interview with *Caltech News*, he described his ongoing research into the visual culture of the oil and gas industry, and, in particular, the films created by oil companies themselves. One example is the 1970 film by British Petroleum (BP) titled *The Shadow of Progress*, which showed the role of oil and gas in pollution and climate change. “They knew that criticism was coming, so they wanted to get ahead of the story and try to control the narrative,” said Jacobson. “That’s what these films did. They said, ‘Yes, bad things have happened. Modernization always comes with some consequences. But don’t worry, put your faith in us, the oil companies, to take care of the problems. And look, we’re already doing it!’ I think that’s still the story these companies want to tell us in the visual culture they continue to create.”



A 1965 advertisement by Total, the largest energy company in France.



## What the Trash We Leave in Space Says About Us

From the moment humanity began exploring space, we started leaving our garbage there too. For Assistant Professor of History and William H. Hurt Scholar **Lisa Ruth Rand**, who specializes in the history of technology and the environment, this debris is not just a problem—it also tells a story. In an interview with *Caltech News*, she recalled being in graduate school when the first major accidental collision of two human-made objects in space occurred. Rand said, “I started reading reports about close calls and potential collisions between that debris and other objects in orbit, and it occurred to me that there’s an environmental history here.” Her current research investigates space as a global environment, a natural resource to be shared and governed at the international level, and how humans relate to space as a natural environment. Rand spent the later part of 2022 at the Smithsonian National Air and Space Museum as the Daniel and Florence Guggenheim Fellow.

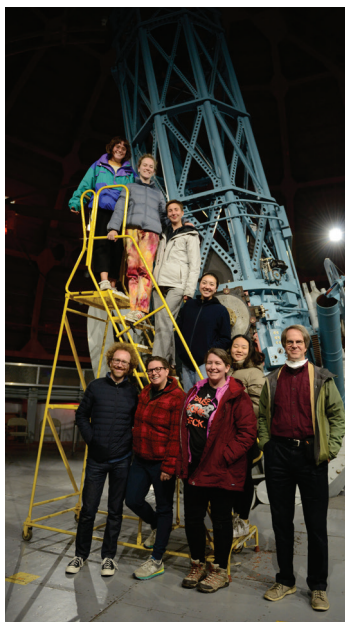
# Humanities: From Underground to Outer Space

DIVISION OF THE HUMANITIES  
AND SOCIAL SCIENCES

## Visualizations of California Groundwater Infrastructure

Water scarcity is a familiar problem across California, and it is particularly acute in the farming region of the Central Valley. While depleted and overdrawn aquifers can become visible on the surface when subsidence drops land levels or damages infrastructure, most often groundwater loss is hard to see. This past summer, SURF student Reggy Granovskiy (Caltech) and WAVE student Oliver Tom (USC) combed local archives for historical traces of groundwater and visible evidence of its management and loss.

Led by **Brian Jacobson** and Research Professor of Art and Design **Hillary Mushkin**, the students found extensive documentation—in the form of maps, diagrams, photographs, and related textual materials—of the Central Valley’s twentieth-century transformation and the technological and political choices that contributed to today’s water crisis. Those materials will support ongoing art projects and publications by Mushkin and Jacobson, which are currently being prepared with the assistance of visiting graduate student Annie Zeng. These initiatives received funding from The Andrew W. Mellon Foundation grant that helped establish the Caltech-Huntington Program in Visual Culture in 2019, for which Jacobson is the principal investigator and program director.



## A Star-Studded Field Trip

A group of students visited the Mount Wilson Observatory for a night of stargazing in connection with artist-in-residence **Lia Halloran**'s course *Relative to You: Representing Scale in Art and Science*. They viewed nearby nebula and galaxies, shared stories and poems about the universe, and captured long-exposure astrophotography of the night sky and grounds of the observatory. Halloran visited HSS for the winter 2022 term through the Caltech-Huntington Program in Visual Culture. Her forthcoming book, *The Warped Side of Our Universe*, will feature poetic verse by Nobel laureate Kip Thorne, the Richard P. Feynman Professor of Theoretical Physics, Emeritus, alongside paintings by Halloran.

# What's New in Neuroscience?

## How Do You Study Facial Bias Without Bias?

HSS neuroscientists continue to explore the snap judgments our brains make when we encounter an unfamiliar face and how those judgments ultimately influence the way we behave. Alumna and former postdoc **Chujun Lin** (PhD '19, social science), who will soon join the faculty of UC San Diego's psychology department, and former postdoc and current computational scientist **Umit Keles** led studies quantifying the psychological dimensions that underlie these judgments and the biases they can incorporate. Papers from their recent work were published in *Nature Communications* (August 2021) and *Affective Science* (September 2021).



In an interview with *Caltech News*, Bren Professor of Psychology, Neuroscience, and Biology **Ralph Adolphs** (PhD '93) emphasized there are limitations to these studies and many others like them, noting that many existing databases are largely composed of white faces with neutral expressions. "Representing the diversity of a general world population is a big challenge in our field," he shared. His team is working on a follow-up project that brings in more diverse faces, including faces of different races, that exhibit a broader range of expressions.

## This Is Your Brain on Social Media



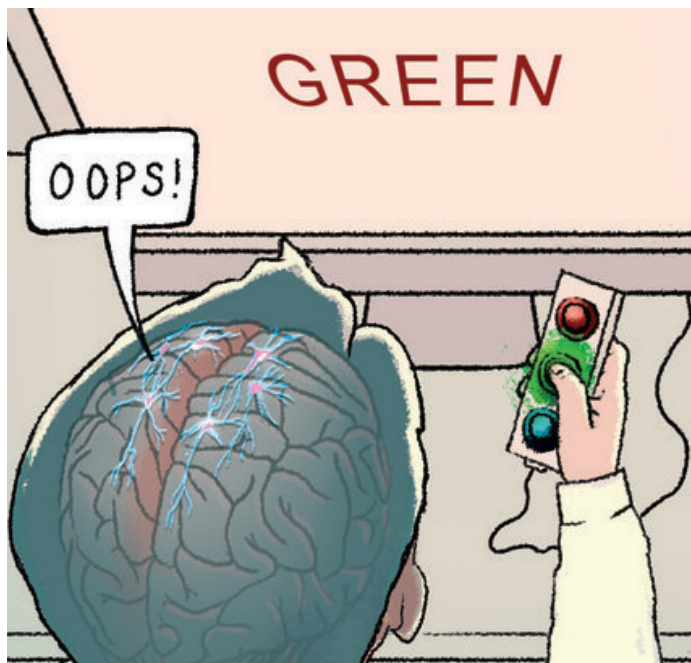
The rise of social media has meant that social and professional interactions are increasingly carried out online, with the digital world becoming more immersive and realistic. To understand how the human brain might be affected by this shift, **Dean Mobbs**, professor of cognitive neuroscience, is leading a new project that uses social psychology and neuroscience to explore the relationship between social media use and mental health. The initial phase of the project is supported by a generous gift from alumnus and senior trustee William "Bill" Davidow (MS '59). "At the moment, the relationship between mental health and well-being and social media use is just correlation," explained Mobbs, who is also director of the Caltech Brain Imaging Center. "Using tools from experimental neuroscience, we can test for causation." Two new postdocs recently joined the Mobbs lab to help pursue this research: **Swati Pandita** and **Ketika Garg**. Mobbs expects the group's findings will be used to design interventions and may help inform policy changes that could reduce harm.



## The Brain Hates Losing

Caltech kicked off the centennial season of the Earnest C. Watson lecture series in October with **Colin Camerer**, Robert Kirby Professor of Behavioral Economics, T&C Chen Center for Social and Decision Neuroscience Leadership Chair, and director of the T&C Chen Center for Social and Decision Neuroscience. In his lecture entitled “The Brain Hates Losing (and Other News from Neuroeconomics),” Camerer discussed how aversion to

loss and emotional response to such events can explain aspects of stock trading, sports, and politics, as well as how measurements of brain activity can improve decisions and cooperative outcomes. Camerer posed hypothetical situations to the audience and asked how they would respond. He and his lab members also engaged with a group of students from Santa Ana High School and their science teacher Joshua Gagner (pictured above) as a part of the Junior Watson Program, which connects area high school students with the Caltech campus and the research that is done here.



## To Err Is Human

The journal *Science* published a study in May by neuroscientists from the Adolphs lab and Cedars-Sinai Medical Center that revealed a general mechanism deep in the human brain that alerts us almost instantaneously when we make a mistake. The neurons involved in that mechanism also retain specific details related to the event, making it possible for other parts of the brain to access that information to correct the error quickly. These same neurons carry information about mistakes across different tasks, providing a mechanism for learning from mistakes in one task that could be flexibly transferred to apply in another situation. The paper's lead author **Zhongzheng (Brooks) Fu** (PhD '19, control and dynamical systems), a former HSS postdoc, is now a postdoctoral scholar at Cedars-Sinai.

# Life Lessons

HSS classes encourage Caltech student success in all academic pursuits as well as the world beyond campus.

BY KATIE NEITH





In a campus chock-full of microbes, robots, chemicals, and computers, the Division of the Humanities and Social Sciences puts exploring the human experience first, offering students rigorous examinations of literature, economics, philosophy, and so much more. For many, these classes offer a welcome contrast to STEM-focused subjects and an opportunity to expand their knowledge outside their chosen fields. For select others, a degree from HSS was their aim from the start. To understand the impact that HSS has on the student experience, we spoke to a handful of current undergraduates and alumni from both the undergraduate and graduate programs about how the division has had an influence on their studies and their lives.

## The Write Stuff

For most high school students, accepting an invitation to join the first-year class at Caltech requires little thought. But current senior **Maggie Sui** remembers having some reservations about choosing the Institute.



“I actually had a very difficult decision,” she recalls. “I was deciding between here and a liberal arts college that I was interested in, and my main concern about coming to Caltech was that there wouldn’t be all the English or other humanities courses that I wanted to take.”

In the end, she’s happy she chose the Institute, where she is pursuing a degree in bioengineering with a minor in English, and she has found that Caltech is much more focused on the humanities and social sciences than she had expected.

“I’ve been able to find a balance,” says Sui, whose interest in writing was able to blossom during her first year at Caltech, starting with a poetry class with HSS lecturer Jenny Factor.



“It was a pretty pivotal year for me, in terms of how much I started writing during and after that class,” says Sui, who is now co-editor of *Totem*, Caltech’s literary and visual arts magazine. “It’s actually what made me decide to get an English minor.”

**Geoff Pomraning**, a senior studying plasma physics, had a similar experience in finding a deeper interest in writing. It started in Introduction to Academic Writing, an HSS course that some students are asked to take after completing a writing placement test the summer before their first year.



“I learned the art form of technical writing, which was astoundingly cool and made me a much better writer,” says Pomraning.

American Fiction her first year with Melanie Sherazi, then the Howard E. and Susanne C. Jessen Postdoctoral Instructor in the Humanities. This fall, Swafford started the much-lauded science communication master’s program at UC Santa Cruz.



“Every year I was taking two to three humanities classes because, for me, I need a mix of things,” says Swafford, who notes that a range of advanced topics—including nineteenth-century poetry, Black Feminisms, and astronomy in literature—kept her engaged with the division. “It’s hard for me to do purely one subject, so I felt that the HSS classes were a great break from those kinds of studies but also useful for stretching my brain in another way.”

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- Maggie Sui (BS '23 (expected), bioengineering and English (minor))

In fact, he became such a good writer that his HSS writing instructor recommended he apply to become a tutor at Caltech’s Hixon Writing Center, a place where Sui also volunteers and which she touts as an amazing resource.

“Since I’ve become a tutor, I’ve helped dozens of other Caltech kids with essay prompts, graduate admissions materials, et cetera,” says Pomraning. “I’m helping people write, and that’s something I find very rewarding. But I also think that being exposed to vastly different ways of writing at Caltech and seeing so many examples of very good and very analytical writing has helped me understand how to write well.”

Recent graduate **Isabel Swafford** (BS '22) has been so impacted by her experience with writing at Caltech that she is now pursuing it as a career. She earned her degree in astrophysics with a minor in English, which she was inspired to consider after taking Contemporary

Swafford says that during her senior year, when most of her peers were considering PhD programs, she felt herself drawn more toward sharing and communicating science with other people.

“There was a really well-timed webinar that I attended from the American Astronomical Society about science writing and science communication,” she says. “And so that really piqued my interest. I took a class called Communicating Science to Non-Experts with Susanne Hall, who is the director of the Hixon Writing Center [and teaching professor of writing]. At Caltech, since it’s a small student body, it’s easy to dive into something that you like, but don’t have any experience in, and learn a lot.”

**Anthony Chen** (BS '16), who graduated with a degree in biology and minored in English, also found the science communication classes to be extremely useful. They went on to earn a medical degree and

are currently completing advanced residency training at UC Davis in diagnostic radiology, with plans to use the lessons they learned in HSS.



“We were taught a way to express our knowledge in a palatable and shareable way to others,” says Chen. “In any sort of educational exercise, I find that the only way to prove you have a firm grasp on a subject is to be able to explain it to someone else. To me, the easiest way to bring this accessibility to others is through scientific writing.”

that created a great foundation for understanding modern neural networks. And I’d say that I use behavioral economics concepts informally on a nearly daily basis. It’s at the heart of how you should be thinking about both consumer and organizational behavior, and you need both to be successful as a leader in tech.”

Since selling her company to a subsidiary of Nielsen in 2018, Bhatt has led data science teams at Netflix, which she says has allowed her to come full circle and focus on how her teams can use data to help people at the company make better decisions.

“I think what HSS brings to Caltech is a consistent focus on people and societies. We need to think proactively about how shifts in technology fundamentally impact our social systems, and a [division] like HSS makes that a lot more likely.”

- Meghana Bhatt (PhD '08, social science)

## The Path Less Traveled

The division graduates relatively few students whose sole focus is in the humanities or social sciences. But those who have earned an undergraduate or graduate degree from HSS—or who have simply found new interests through experiences in the division—have reaped unique rewards.

**Meghana Bhatt** (PhD '08), who earned a doctorate in economics, says the skills learned in her social sciences studies have been essential to her career in industry.



“Econometrics and causal inference are wildly important, especially if you care about levers for impact in a business,” says Bhatt, who after graduation started a small technology business that developed video-recommendation software for media companies. “I also took classes with the computation and neural systems program

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**Melanie Goodrich** (BS '04), who majored in business, economics, and management, has been doing social science and survey research for the federal government since earning her PhD in politics from New York University in 2009.



“The single most impactful class I took in HSS was Introduction to Political Science with Mike Alvarez in the winter of 2001,” says Goodrich. “In the aftermath of the presidential election in 2000, Mike introduced a group of Caltech undergrads to the scientific study of American elections and voting behavior. That one class has driven my subsequent academic pursuits, professional career, and personal interests.”

And **Arnav Das**, who is a sophomore planning to option in physics, has already found new paths to explore through the philosophy classes he took in all three terms his first year.



“I think every physicist has a certain amount of prejudice when it comes to thinking about reality,” says Das. “One would like to believe that it’s all about formal mathematics. Since coming here, however, I’ve lightened up and looked further into the philosophy of mind and cognitive sciences; and in doing that, I’ve realized the utility of the many ways that you can approach these foundational ideas.”

## A Broader Perspective

And while not all students will find a new focus or potential career path through HSS classes or resources, a consistent and substantial benefit expressed across the board by undergraduates and alumni we spoke with was the opportunity to look at the world through different lenses.

“Science and engineering are often about pushing boundaries and discovering or creating entirely new frontiers,” says Goodrich. “Humanities and social

“Science and engineering are often about pushing boundaries and discovering or creating entirely new frontiers. Humanities and social sciences help us understand the one guaranteed constant even in those new frontiers: humanity.”

- Melanie Goodrich (BS '04, business, economics, and management)

He became so involved in philosophy in his first year that this past summer he traveled to an interdisciplinary conference in Germany on the nature of entropy and time with Charles (Chip) Sebens, assistant professor of philosophy, and Mario Hubert, who was then the Howard E. and Susanne C. Jessen Postdoctoral Instructor in Philosophy of Physics and is now on the faculty of The American University in Cairo. The experience, according to Das, felt “almost like a modern-day reincarnation of Plato’s Academy.”

After this exposure to people who have dedicated their careers to foundational questions, Das is excited about bridging what he sees as a gap between the hard sciences and philosophers.

“The philosophical underpinnings to scientific questions are what enable you to look at things in their full holistic context,” he explains. “And that’s something I have found in the humanities department, people valuing these fuller frameworks of understanding. I think the osmosis of that kind of enthusiasm, even just seeing someone overbrim with what they care about, makes it very easy to stimulate that part of you.”

sciences help us understand the one guaranteed constant even in those new frontiers: humanity.”

For **Daniel Quintana**, a senior studying computer science (CS), HSS classes provide an opportunity to sit down once or twice a week and talk about something completely unrelated to his major, which he sees as a healthy approach to education.



“The classes also typically involve exposure to completely new topics and material, which I think is especially important at a school like Caltech, since it’s very easy to get fully absorbed into pure science and engineering,” he says. “Students have the chance to establish awareness of and interest in new, equally important areas of education.”

Quintana also notes that classes in economics have been helpful in relation to his option in CS, as well as in his day-to-day life.

# Life Lessons

DIVISION OF THE HUMANITIES  
AND SOCIAL SCIENCES

“In the most extreme case, Bayesian Statistics actually covers an essential topic for machine learning, which has helped immensely in my machine learning courses,” he says. “Economics courses also help students to become more informed people outside of the classroom. Unsurprisingly, it’s very helpful to develop an understanding of, for example, how markets function, how companies and customers behave, or what the effects of governmental policies are. I expect that as I leave college and start my career, this kind of education will prove to be essential.”

**Daniel Nagles**, a junior studying astrophysics, remembers his very first HSS class, Knowledge and Reality, with Frederick Eberhardt, which explores the scope and limitations of rational belief and knowledge.

“It is, to this date, my favorite class, not even out of the humanities and social sciences but possibly in general,” he says. “As a theoretical physicist, I want to understand *why* the world works. All these different interactions, all these different rules give rise to the systems that you observe, and Knowledge and Reality was, in large part, a discussion about that. I can’t tell you the number of times I’ve started a project with one approach and solved it with a completely different one that I got from a totally different field. The humanities give you exactly that, a way to view things from different angles, a new perspective you might not have had had you stayed so STEM-minded.”

**Elsa Palumbo**, a senior, also gained a strong interest in philosophy during her first year at Caltech after taking Philosophy Through Science Fiction with Chip Sebens.



“I had so much fun, it was my favorite class all year, and I was just, like, I need to see more of this,” says Palumbo, who is now pursuing degrees in astrophysics and philosophy. “Even though I’m probably not going to do something strictly in philosophy for my career, I just really wanted to learn more for myself.”

For her thesis in philosophy, she is exploring ways to develop a more philosophically sound but still practical test for statistical independence. If successful, she says, there could be important applications to the field of causal discovery, which focuses on obtaining causal knowledge directly from observational data.

“Caltech is so heavily focused on science that it’s really helpful, I think, to have a chance to look at things from a broader perspective, something that’s a bit more tied to, say, people,” says Palumbo.

Or, as Nagles puts it, “the STEM classes make our careers, but the HSS classes make us human.”

(from left) Daniel Quinatana; Elsa Palumbo, Professor Chip Sebens, and Arnav Das; Maggie Sui and Geoff Pomraning



# WHERE ARE THEY **NOW**?

## AFTER EARNING THEIR PhDs IN 2022 . . .

**Saba Devdariani** is a postdoctoral researcher at the University of Chicago's Harris School of Public Policy.

**Yimeng Li** is a postdoctoral scholar at Florida State University's Institute of Politics and the LeRoy Collins Institute.

**Shiyu Zhang** is an associate consultant at McKinsey & Company.

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## AFTER COMPLETING THEIR POSTDOCTORAL APPOINTMENTS IN 2022 . . .

**Alexander Bloedel** is an assistant professor of economics at UCLA.

**Jian Cao** is a research fellow at Trinity College Dublin.

**Julia Michiko Hori** is a member of the English faculty at the University of Cambridge.

**Mario Hubert** is an assistant professor of philosophy at The American University in Cairo.

**Umit Keles** is a computational scientist with the Adolphs lab.

**Jaejoong Kim** began a residency in psychiatry at the University of Minnesota Medical School.

**Jonathan Koch** is an assistant professor of English at Pepperdine University.

**Omar Pérez** is an assistant professor in the department of industrial engineering at the University of Chile.

**Anne Sullivan** is a coordinator for UC Riverside's Teaching Assistant Development Program.

**Tomislav Zbozinek** is an assistant project scientist in the department of psychiatry and behavioral sciences at UCLA.

With the return to on-campus instruction, HSS was pleased to expand its roster of in-person events over the course of the past academic year.

HERE ARE A FEW HIGHLIGHTS FROM THE BUSY 2022 SPRING TERM.

Actor and writer Jake Broder presented a staged reading of his play *UnRavelled*, based on the true story of scientist Anne Adams, who developed obsessive artistic talents after the onset of frontotemporal dementia. Broder also discussed the science and art of the play with **Colin Camerer** in a conversation moderated by Eli and Edythe Broad Professor of English **Cindy Weinstein**.

Charles Holt, A. Willis Robertson Professor of Political Economy at the University of Virginia, gave the latest Banks-McKelvey Memorial Lecture, a series endowed by Caltech alumnus Howard Jessen (BS '46) to honor the research and teaching of two late HSS colleagues who made seminal contributions to political economy and social science more generally.

HSS honored **Thomas Palfrey, III**, Flintridge Foundation Professor of Economics and Political Science, and his seminal paper "Quantal Response Equilibria in the Normal Form Games" (written with Richard McKelvey and published in *Games and Economic Behavior* in 1995) at the 25+ Years of QRE Conference in March.

Myles W. Jackson, Albers-Schönberg Professor in the History of Science at the Institute for Advanced Study, gave the William and Myrtle Harris Distinguished Lecture, titled "Engineering Fidelity: Early Radio and the Trautonium in Berlin in the 1920s and '30s."

Professional development expert Dr. Koritha Mitchell led a well-attended workshop on "Ethical Orientations for Collegiality, Mentoring, and Teaching," co-organized by the HSS Diversity, Equity, and Inclusion Committee and the Caltech Center for Inclusion and Diversity (CCID).

HSS and CCID hosted a screening of *Ferguson Rises*, a film about the 2014 murder of Michael Brown Jr. at the hands of police in Ferguson, Missouri, and the civil uprising that followed. The screening, organized by **Omer Tamuz**, was followed by a Q&A with the film's award-winning director, Mobolaji Olambiwonnu, facilitated by **Danielle Wiggins**.

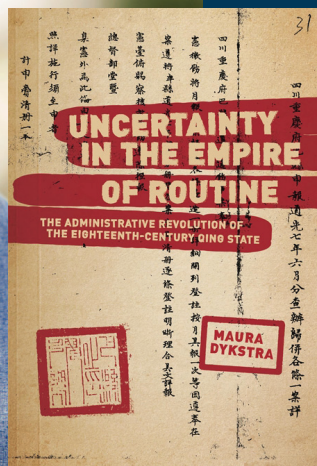


On November 3, HSS hosted its first fall party in three years, where we honored **Jean-Laurent Rosenthal** (PhD '88), the Rea A. and Lela G. Axline Professor of Business Economics, for his service and leadership as HSS Chair. His term (2014–2022) was bookended by the celebrations of the HSS 50th anniversary and navigating the division through the COVID-19 pandemic.

At the party, new HSS Chair **Tracy Dennison** acknowledged several notable accomplishments from Rosenthal's tenure, including the expansion of The Ronald and Maxine Linde Institute of Economic and Management Sciences (of which Rosenthal is now director) to include the Center for Social Information Sciences (CSIS), the Center for Theoretical and Experimental Social Sciences (CTESS), and a new center for science, society, and public policy to be announced in early 2023; the establishment of the Caltech-Huntington Program in Visual Culture, the Research Institute for the History of Science and Technology (RIHST) at Caltech and The Huntington, and the T&C Chen Center for Social and Decision Neuroscience (part of the Tianqiao and Chrissy Chen Institute for Neuroscience); as well as a significant increase to the division's graduate fellowship and postdoctoral instructorship capacity, among other important endowment gifts.



# Honors & Congratulations



Caltech named **Maura Dykstra**, assistant professor of history, the recipient of the 2021–22 Richard P. Feynman Prize for Excellence in Teaching. Established in 1993, the prize is awarded annually to a professor who demonstrates unusual ability, creativity, and innovation in undergraduate and graduate classroom or laboratory teaching. Dykstra is the third HSS faculty member to receive the Institute’s highest accolade for teaching, joining the company of **J. Morgan Kousser**, professor of history and social science, emeritus, and **Kevin Gilmartin**, William R. Kenan, Jr., Professor of English and vice president for student affairs.

A historian specializing in late imperial Chinese history (the Qing dynasty), Dykstra is interested in how government and economic institutions of the time interacted with the daily lives of people. She published her first book, *Uncertainty in the Empire of Routine: The Administrative Revolution of the Eighteenth-Century Qing State*, in August (Harvard University Press, 2022).

**Brian Jacobson** was named one of the inaugural Visual Culture Visiting Research Fellows by the Department of History of Art at the University of Cambridge, where he will be in residence in early 2023. The fellowship program aims to renew and catalyze the study of “the visual” by bringing fresh voices and approaches to Cambridge and to extend visual culture studies into other research fields.

Jacobson’s edited volume, *In the Studio: Visual Creation and Its Material Environments* (University of California Press, 2020), received the Premio Limina for best international cinema studies book, jointly awarded by the Film Forum Udine and the journal *Cinéma & Cie*, as well as the 2021 Society for Cinema and Media Studies’ Best Edited Collection Award.

In March, Caltech awarded tenure to **Luciano Pomatto**. He is now a professor of economics.



Colleagues toasting Pomatto at his tenure celebration.

Richard N. Merkin Professor of Mathematical Finance **Jakša Cvitanic** became the president of the Bachelier Finance Society, the largest society of academics in mathematical finance.



# 2022 YEAR IN REVIEW

Professor of English **George Pigman**'s article "Versions of Imitation in the Renaissance" was one of the 12 articles recently voted into the 75th-anniversary collection of *Renaissance Quarterly*.

The Associated Students of the California Institute of Technology (ASCIT) honored **Danielle Wiggins** with a teaching award for the 2021–22 academic year. Since the mid-1970s, the undergraduates have bestowed this award upon professors, instructors, and TAs who demonstrate exceptional commitment to teaching and concern for their students' learning.



*Memoir Magazine* named **Cindy Weinstein**'s book, *Finding the Right Words: A Story of Literature, Grief, and the Brain*, one of its 2022 Grand Prize Winners.

The 67th annual Staff Service and Impact Awards honored four current HSS staff members for the important work they do to advance the mission of the Institute:

- **Sarah (Emily) de Araujo**, Executive Project Assistant & Senior Publicity and Editorial Assistant for the Einstein Papers Project (15 years)
- **Ze'ev Rosenkranz**, Senior Editor and Assistant Director of the Einstein Papers Project (20 years)
- **Julian (Michael) Tyszka**, Associate Director of the Caltech Brain Imaging Center (25 years)
- **Candace Younger**, Division Operations Officer (15 years)

Highlights of competitive external funding awarded to HSS professorial faculty during fiscal year 2022 include:

- **Ralph Adolphs**, for "Dissecting Social Attention in Autism Using Large-Sample Eye Tracking Over the Internet," from the Simons Foundation.
- **Marina Agranov**, for "Persuading People on More and Less Divisive Issues," from the National Science Foundation.
- **Michael Alvarez**, with Anima Anandkumar (EAS), for "AI for Detecting and Mitigating Toxic Behavior," from Activision Publishing, Inc.
- Professor of English **Dehn Gilmore**, with a Graves Award in Humanities, administered by Pomona College under the auspices of the American Council of Learned Societies.
- Robert M. Abbey Professor of History and Director and General Editor of the Einstein Papers Project **Diana Kormos Buchwald**, for the Einstein Papers Project, from the National Historical Publications and Records Commission, affiliated with the National Archives and Records Administration.
- **Danielle Wiggins**, for a 2022 Career Enhancement Fellowship, from the Institute for Citizens & Scholars; and for "The Politics of Black Excellence: Atlanta and the Making of Modern Black Politics," from the American Council of Learned Societies.

The division awarded internal fellowships to the following HSS graduate students during Caltech's 2021–22 academic year:

- **Alena Buinskaya** (Linde Institute Graduate Fellow)
- **Polina Detkova** (Linde Institute Graduate Fellow)
- **Kexin Feng** (Repetto-Figueroa Family Graduate Fellow)
- **Meng Jhang Fong** (Lance E. Davis Graduate Fellow)
- **Aniek Fransen** (A. Michael and Ruth C. Lipper Graduate Fellow)
- **Lindsey Gailmard** (Lance E. Davis Graduate Fellow)
- **Marcos Nazareth Gallo** (A. Michael and Ruth C. Lipper Graduate Fellow)
- **Sumit Goel** (Linde Institute Graduate Fellow)
- **Wanying (Kate) Huang** (Roger and Marjorie Davisson Graduate Fellow; Repetto-Figueroa Family Graduate Fellow)
- **Claudia Kann** (Stephen A. Ross Memorial Fellow)
- **Shunto Kobayashi** (Linde Institute Graduate Fellow)
- **Po Hsuan Lin** (Roger and Marjorie Davisson Graduate Fellow)
- **Aldo Lucia** (Stephen A. Ross Memorial Fellow)
- **Ke Shi** (James and Karen Gerard Fellow in Social Sciences)
- **Jeffrey Zeidel** (Clarence J. Hicks Scholar)

June heralded Caltech's 128th commencement exercises, when HSS was pleased to present three outstanding PhD recipients (listed with their dissertations):

- **Saba Devdariani** ("Agency Problems in Political Science")
- **Yimeng Li** ("Three Essays on Survey Methods and Their Applications to Measuring Political Behavior and Attitudes")
- **Shiyu Zhang** ("Three Essays in Applied Economics")

The HSS student prize winners recognized at Caltech's commencement on June 10 included:

- **Lily DeBell** (Mary A. Earl McKinney Prize in Poetry)
- **Elia Gorokhovskiy** (Gordon McClure Memorial Communications Prize in History)
- **Abigail (Abby) Jiang** (Eleanor Searle Prize in Law, Politics, and Institutions)
- **Shalini Kurinchi-Vendhan** (Hallett Smith Prize)
- **Margaret (Maggie) Lee** (Gordon McClure Memorial Communications Prize in English)
- **Elsa Palumbo** (Gordon McClure Memorial Communications Prize in Philosophy)
- **Ke Shi** (John O. Ledyard Prize for Graduate Research in Social Science)
- **Maggie Sui** (Mary A. Earl McKinney Prize in Prose Fiction)
- **Avirath (Avi) Sundaesan** (Alexander P. and Adelaide F. Hixon Prize for Writing)

The list of impressive HSS-affiliated undergraduates continues with **Yun Emily Du** (BS '22, chemistry and history and biology (minor)) and **Isabel Swafford** (BS '22, astrophysics and English (minor)) receiving the Merck Index Award and the Mabel Beckman Prize, respectively, and Stanford University selecting **Myra Cheng** (BS '22, computer science and history) to join the 2022 cohort of Knight-Hennessy Scholars as she pursues a PhD in computer science.

HSS postdoc and graduate student research was also recognized with competitive external funding, including:

- Postdoctoral scholar **Patrick Burauel** received a two-year fellowship from the Leopoldina, the German National Academy of Sciences, to continue his work on "Causal Inference using the Principle of Independent Mechanisms."
- The John Randolph Haynes and Dora Haynes Foundation awarded a grant to social and decision neuroscience graduate student **Marcos Nazareth Gallo** for "Characterizing Decisions of the Los Angeles Poor."
- The National Institutes of Health awarded a grant to Postdoctoral Scholar in Neuroscience **Nina Rouhani** for "Dissecting the Features and Neural Mechanisms Supporting Naturalistic Social Inference."
- Postdoctoral Scholar in Affective Neuroscience **Sarah Tashjian** received a grant from the National Science Foundation for "Computational and Neural Mechanisms of Human Safety Decisions."
- **Cristiano Zanetti** joined HSS as a postdoctoral scholar in the history of science as part of his Marie Skłodowska-Curie fellowship awarded by the European Commission for "AUTOREN, Automata and Power in the Culture of Machines of Renaissance Florence, Milan and Venice (1400-1600)."

At its holiday gathering on December 6, HSS awarded two Brass Division Awards for outstanding contributions in teaching and learning as well as two for outstanding service. The honorees are:

- **Jenny Factor**, Lecturer in Poetry (teaching)
- **Jennifer Jahner**, Professor of English (service)
- **Cecilia Lu**, Division Events Coordinator and Administrative Assistant (service)
- **Luciano Pomatto**, Professor of Economics (teaching)

# ALSO IN THE NEWS

In advance of the midterm elections, **Michael Alvarez** appeared on KPCC's biennial *AirTalk* special, "Ballot Cram Session—Voter Game Plan," during which the panel of political experts discussed all of the state propositions on the November 8 ballot.

Wharton School professor Katy Milkman described her research collaborations with **Colin Camerer** in a KCRW interview, specifically the science behind the formation of habits and why some habits are easier to maintain than others.

A *Mashed* article about a new, simplified menu at Popeyes, the chicken fast-food chain, cites a study by **Camerer** that demonstrates people have trouble making decisions when they have too many choices.

The *California Art Review* published an interview with winter 2022 artist-in-residence **Lia Halloran** in which she talked about the creation of cyanotypes, her *Dark Skate* series, and the influences of mythology and science on her practice.

In March, Professor of Political Science **Alexander Hirsch** participated in the University of Chicago's *Politics Podcast* about his 2019 paper "Fear, Appeasement, and the Effectiveness of Deterrence."

The summer *Caltech* magazine's feature story "Writing in the Language of Math" included contributions from three HSS faculty members. **Diana Kormos Buchwald** explained that Albert Einstein would write out calculations on both sides of envelopes due to the paper shortage after World War I. **Omer Tamuz** pondered the words people invent to explain math, like "matroid" and "pointless topology." To conclude the segment, J. O. and Juliette Koepfli Professor of Philosophy **Christopher Hitchcock** presented the ideas of the two main philosophical camps when it comes to the meaning of math and numbers.

As the U.S. Supreme Court prepares to rule in a case about how states define who does or does not count as Black in voting district maps, NPR interviewed **J. Morgan Kousser**, who joined a friend-of-the-court brief with other historians to support the groups challenging Alabama's redistricting.

In September, the Institute published its latest topic on the Caltech Science Exchange website, Artificial Intelligence, with input from **Eric Mazumdar**, assistant professor of computing and mathematical sciences and economics, and **Adam Pham**, the Howard E. and Susanne C. Jessen Postdoctoral Instructor in Philosophy.

**Lisa Ruth Rand** shared her expertise on the early history of space travel and the prevalence of space junk with media outlets, including *Inverse*, *Tech Times*, and the *Washington Post*, and she collaborated with NASA historian Stephen Garber on a piece that appeared in the spring 2022 volume of *Issues in Science and Technology*.

**Sarah Tashjian** led a study that revealed new details on the brain's reaction to fear and its impact on others, with co-authors **Dean Mobbs**, **Colin Camerer**, former research technician assistant Virginia Fedrigo (now earning her PhD at the London School of Economics and Political Science), and former postdoctoral scholar Tanaz Molapour. The study appeared in the February 2022 issue of *Psychological Science*. Several news platforms, including KTLA, KFI, and *Scientific American*, covered the paper, and *Ars Technica* and SyFy published interviews with Tashjian.

**Cindy Weinstein** was a guest on KPCC's *AirTalk*, with co-author Dr. Bruce Miller, to discuss their book, *Finding the Right Words: A Story of Literature, Grief, and the Brain*. The authors also appeared on *The Nocturnists* podcast, and Weinstein's alma mater shared an article about her book in *Brandeis Magazine*.

## Visit Us Online!

In February, HSS released an all-new website design with an interactive feature on professorial faculty research, among other new content. Check it out!

[hss.caltech.edu](https://hss.caltech.edu)



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