Program in Science, Technology, and Society

The Program in Science, Technology, and Society (STS) helps MIT offer an education that teaches scientists and engineers to engage the social and cultural dimensions of their work at the highest levels. This education sets MIT apart from the numerous engineering schools worldwide that turn out technical specialists. The STS program continues to distinguish itself as the leading department, and graduate program, of its kind in the United States.

Educational Activities

Undergraduate

In 2020–2021, 46 students from at least 15 different majors were active STS concentrators, and five students worked on or completed a minor in STS. The students with a minor in STS had majors in Biology (two students); Electrical Engineering and Computer Science (EECS); Computation and Cognition; Earth, Atmospheric and Planetary Sciences (EAPS); and Aeronautics and Astronautics, and included at least one double major. Five students worked with us on Undergraduate Research Opportunities Program (UROP) projects, three of whom had projects supervised by Professor Kate Brown and in collaboration with the MIT Digital Humanities Lab.

Two students pursued a major with STS this year. In fall 2020, Vaibhavi Shah converted her STS minor to a double major and finished a successful thesis project in one semester. Her STS thesis was "The Politics and Perceptibility of Breath During the COVID-19 Pandemic," advised by Associate Professor Robin Scheffler. She held a thesis presentation open to our academic community and to her family and friends via Zoom on February 8, 2021. She is starting medical school at Stanford in the fall. Julian DuBransky graduated from the Humanities and Engineering (Course 21E) program in the spring with a focus in STS and Civil and Environmental Engineering. His thesis, "The Politicization of Science During the COVID-19 Pandemic in the United States," was supervised by Adjunct Professor John Durant.

Outreach to and engagement with undergraduates was difficult during a fully remote year. However, we did participate in academic fairs organized by the Office of Admissions, Office of the First Year, and the School of Humanities, Arts and Social Science's (SHASS) Dean's Office.

Subjects and Enrollment

STS offered 27 undergraduate subjects and 17 graduate subjects in AY2021, including four Communication Intensive in the Humanities, Arts, and Social Sciences subjects. All of our classes were fully remote. The vast majority were offered only synchronously. We continue to emphasize collaboration with other areas of MIT and offered 19 subjects jointly with the following academic programs: Anthropology; Comparative Media Studies/Writing; EAPS, EECS; History; Institute for Data, Systems and Society; Nuclear Science and Engineering; Philosophy; Physics; Political Science; Urban Studies and Planning (DUSP); and Women's and Gender Studies.

STS also offered one new graduate class, STS.430 Multi-Species Histories of Plant People, Wild and Cultivated, taught by Professor Brown.

Undergraduate enrollment totaled 640 students (an almost 150% increase over last year), and graduate enrollment totaled 217 students. Our largest classes were STS.006J Bioethics and STS.042J Einstein, Oppenheimer, Feynman: Physics in the 20th Century. Students majoring in almost every course number at MIT outside of SHASS took our classes, as did students from Harvard University and Wellesley College. In addition, more than 65% of our graduate class enrollment was made up of students outside of History, Anthropology, and Science, Technology, and Society (HASTS).

Doctoral Program

The doctoral program in HASTS is run by STS with collaboration from the History faculty and the Anthropology Program. The doctoral program is administered by STS, which awards the degrees. Anthropology Department Professor Graham Jones took over the role of director of graduate studies on July 1, 2020.

In AY2021, 34 students were enrolled in the graduate program, including two who graduated in September 2020. To honor their achievements, we held a program wide end-of-semester and graduation celebration on Zoom after the MIT Commencement activities. One of the graduates is now a senior human-centered design researcher at Alliance Innovation Lab in Silicon Valley and the other is a postdoctoral fellow at the Berggruen Institute.

Travel restrictions brought on by the COVID-19 pandemic had a serious negative impact on our students, nearly all of whom travel for their dissertation research, although some were able to pivot to online meetings. In addition, a vast majority of libraries and archives, which are normally critical research locations, were closed to visitors all of this past year. These factors have caused significant disruption in academic progress for most of our students, a number of whom advocated for an additional semester or year of funding from MIT for all PhD students, pointing to other peer intuitions as models.

Many of our peer programs suspended admissions for the fall 2021 cycle in acknowledgment of the pandemic's significant impact on student progress. We normally open our admissions application on September 15, but delayed the opening of it twice as we tried to gauge the impact of COVID-19 restrictions on our students and in hopes that financial resources might materialize to help them if they needed additional time to complete their program. We continued with our Prospective Students Visit Day in October 2020, holding it entirely over Zoom for the first time. That format was a success with 112 attendees, compared to the usual of 25–40 in person.

However, with continued restrictions and without a guarantee of additional funding for our students, we made the following announcement to prospective students on November 15:

> As most of you know, the HASTS Steering Committee has been deliberating for several months about the feasibility of running admissions this year. We thank you for your patience in bearing with us as we grappled with this incredibly difficult decision.

> Unfortunately, we will not be able to run admissions this year. This comes as a huge disappointment to all of us, as I'm sure it will be to you. We believe deeply in the value of a HASTS education and want to offer as many people as possible the opportunity to join our intellectual community. We met some extraordinary prospective students at last month's Visit Day, and hope that many of you will consider our program when we reopen admissions next year.
>
> In making this painful decision, we have been guided by one core value: commitment. HASTS is so vibrant and successful because of our students' commitment to the program and the program's commitment to them. At a moment of ongoing uncertainty about long-term institutional impacts of COVID-19, we have chosen to prioritize using our resources and time to help current students navigate the ongoing crisis and successfully complete the program.
>
> We look forward to being able to accept applications again in 2021. The next cohort of entering students should have every confidence that HASTS will steadfastly support them throughout their time in the program.

In the spring, the HASTS Steering Committee undertook a review of our program requirements. There were a few reasons for this:

- We are anticipating a new funding model provided by the dean's office and provost, which will provide more stable funding for students but limit program enrollment based on how quickly students finish their requirements including fieldwork and dissertation.
- Without an admissions process to run this year, we allocated extra time to the review process.
- It had been quite a while since we took a comprehensive look at the requirements and we wanted to incorporate a professionalization component, which we have been hearing about from MIT senior leadership.

We held five community meetings in spring 2021 and invited all of our faculty, current students, and recent alumni. As we continue to await confirmation of the new funding model, there remains much to sort out in redeveloping the student handbook and adjusting some of the milestones. However, we plan to submit two program changes this fall to become effective in AY2023: (1) the addition of a HASTS Professional Perspective requirement and (2) an optional Master of Science in HASTS that our students can earn en route to the PhD.

It was challenging to keep connected with each other while most everyone was working remotely. The HASTS weekly Program Seminar was still held for the graduate students via Zoom, and in the spring semester a few faculty members and staff sent out invites to the community to go on walks. The academic administrators held a few social events online. In June 2021, we held the first on-campus social gathering for our graduate students since March 2020. It was outdoors, and almost every student who was in the Cambridge area at the time attended. We look forward to returning to campus with our graduate students this fall, especially the rising second years, who have yet to take a class on campus.

Projects, Grants, and Initiatives

Associate Professor Robin Scheffler completed the first year of his project, Genetown: Tracing the History of the Biotechnology Industry in the Greater Boston Area, 1973–2000, sponsored by the National Science Foundation. The grant will continue through February 2023.

The National Science Foundation Doctoral Dissertation Improvement Research Grant awarded to doctoral student Rijul Kochhar has been extended through April 2022. The grant supports his project, Antibiotic Resistance, Planetary Crisis, and Bacteriophage Futures in the 21st Century. Andrew W. Mellon Professor of Humanities Michael M.J, Fischer is the principal investigator (PI).

Led by Germeshausen Professor of the History of Science and MacVicar Faculty Fellow David Kaiser, The National Science Foundation project, INSPIRE: Testing Bell's Inequality with Astrophysical Observations, established a sub-award with the Harvey Mudd College for the last three months of the project. The project will end on August 31, 2021.

Bern Dibner Professor of the History of Science and Technology Jennifer Light served as the faculty sponsor for postdoctoral fellow Chamee Yang. Dr. Yang received the American Council of Learned Societies (ACLS) Emerging Voices Fellowship. Dr. Yang ended her ACLS fellowship on June 30, 2021.

Ongoing Program Activities

In AY2021, STS produced two panel discussions and one special event using Zoom. In addition, STS faculty and affiliates collaborated with the History department and with Radius to hold special yearlong online seminars.

Professor David A. Mindell—Frances and David Dibner Professor of the History of Engineering and Manufacturing, professor of aeronautics and astronautics, and co-chair of the MIT Task Force on the Work of the Future—conducted a Zoom meeting, "Work of the Future," to discuss the task force report's findings. The report provided insight into how new technologies are changing the nature of work and what institutional reforms are needed to support workers and promote broader shared prosperity.

A Zoom webinar panel discussion, "Artificial Intelligence and Ethics," moderated by Professor D. Fox Harrell, included Stephanie Dick, University of Pennsylvania; Paul Dourish, University of California, Irvine; and Safiya Noble, University of California, Los Angeles. The discussion focused on the concerns raised by social scientists about the realities and directions of AI, something few of us have seen with previous technologies. The panelists offered a lively discussion about the issues and broader currents in computer science, AI, and society.

The postponed 2020 Morison Prize and Lecture in Science, Technology, and Society was conducted as a Zoom webinar. Dr. Alondra Nelson was this year's recipient. Dr. Nelson is president of the Social Science Research Council and Harold F. Linder Professor at the Institute for Advanced Study. A leading scholar of science, technology, and social inequality, she is author of *The Social Life of DNA: Race, Reparations, and Reconciliation After*

the Genome, which explores an unprecedented journey into how the double helix has wound its way into the heart of the most urgent contemporary social issues around race.

In the spirit of collaboration, STS co-sponsored faculty and affiliates work with other departments to develop yearlong seminars.

Associate Professor Dwai Banerjee and Professor Brown collaborated with MIT History Associate Professors Sana Aiyar, Malick Ghachem, and Professor Elizabeth Wood to create the Seminars in Environmental Agricultural History Series.

The series hosted the following discussions:

- "Race and Pandemics," Adia Benton, Northwestern University and Kathryn Olivarius, Stanford University
- "Demography and Biopower," Anne McCants, MIT andJohn Brown, Clark University
- "Public Health, Biopower, and Inequality," Carlo Caduff, King's College London and Amy Moran-Thomas, MIT
- "Plants and Plagues," Jean Beagle Ristaino, North Carolina State University; John McNeill, Georgetown University; and Tristan Brown, MIT
- "Sovereignties, Plagues, and Policing," Mary Augusta Brazelton, University of Cambridge and Laura Spinney, independent writer and science journalist
- "Premodern Pandemics," Nükhet Varlik, University of South Carolina and Michael McCormick, Harvard University
- "Working Across Disciplines on Endemic Livestock Disease," Abigail Woods, University of Lincoln
- "The Cosmology of Mining: Ecological Knowledge in Qing China," Tristan Brown, MIT

Subrata Ghoshroy, MIT STS Program research affiliate, collaborated with Radius to produce the Global Peace and Insecurity Seminar Series. Mr. Ghoshroy acted as moderator.

The series hosted the following discussions:

- "Is Third-Party Mediation Necessary for Resolution of the Dispute in Kashmir?" The Honorable Shireen Mazari, Minister of Human Rights, Pakistan
- "Whither US–Russia Nuclear Arms Control?" Vladimir Kozin, Member of Military Academy and Natural Sciences Academy, author of 16 monographs on arms control
- "Accidents, Mistakes and COVID-19: Risks and Necessity of High-Level Biosafety Labs," Monica Zoppe, Institute of Biophysics, Italian National Research Council, Milan, Italy

- "The Bang and the Bucks: Post-9/11 Military Spending and the Shortcomings of Other Urgent Needs," Heidi Peltier, Boston University
- "Biden or Trump: What's at Stake on November 3?" Noam Chomsky, MIT, University of Arizona
- "Climate Change and International Security," Juergen Scheffran, University of Hamburg, Germany
- "The Non-Proliferation Treaty at 50: A Mid-Life Crisis?" Paul Meyer, Simon Fraser University, Vancouver, Canada, and former Canadian ambassador for disarmament
- "Ten Years After Fukushima: The Future of Nuclear Power in Japan," Jun Tateno, Ph.D., Executive Director, Nuclear and Energy-Related Information Center, Tokyo, Japan
- "What's Next for the US–India Strategic Partnership?" Dr. George Perkovich, Carnegie Endowment for International Peace
- "Missile and Nuclear Insecurity in East Asia," Masako Ikegami, Institute of Technology, Japan

In the spring, the STS Program administered the annual Benjamin Siegel Prize, which is awarded to the MIT student submitting the best-written work on issues in science, technology, and society. Competition for the prize, in the amount of $2,500, is open to undergraduate and graduate students from any school or department of the Institute. This year's selection committee, composed of Kaiser and Bern Dibner Professor of the History of Science and Technology, Emerita Rosalind Williams, awarded it to two papers that use compelling case studies to illustrate how information systems are also political projects: "Quantifying the 'National Physique': Deterioration, Degeneracy, and the British National Anthropometric Survey, 1904," by Michelle Spektor, HASTS; and "Deprivation Codes: Mississippi's Welfare System in the Age of Computers," by Marc Aidinoff, HASTS.

Spektor's "Quantifying the 'National Physique'" traces the emergence of plans for a national survey of body measurements of British citizens after a 1903 War Office memorandum warned that 60% of the men considered for military enlistment in the previous two years were physically unfit for service. A national biometric survey was proposed to study reasons and possible remedies for this dismal state of national health. As debated by anthropologists, politicians, and others, however, the proposed survey began to be discussed as a means of identifying racial characteristics that might prove superiority of a supposed British "national race." Would the Survey become primarily a measure of nature or of nurture?

Debates over this question, and skepticism about the value of such an ambitious program, eventually dampened enthusiasm for a national anthropometric survey. By World War I any plans for it had faded away. However, the issues it raised—especially possible connections between biometrics and national identity—were raised again in 2004 in the form of a proposed "national identity scheme" that would issue IDs linked to a national identity register. This program was put into effect but was repealed after

the 2010 elections. In its short life it revived, without resolving, concerns about, the exclusionary implications of biometric information systems.

Also a case study of information systems that promote political objectives, Aidinoff's "Deprivation Codes: Mississippi's Welfare System in the Age of Computers" begins with the now-familiar announcement by a bureaucracy that it intends to implement a modern, efficient, cost-saving computer system. In the case this announcement was made in 1987 by the State of Mississippi concerning the benefit system Aid to Families with Dependent Children (AFDC). The system's practical purpose was to distribute financial support to those who needed it. Its symbolic purpose was to demonstrate the modernization of the Deep South through its entry into the "information age."

The new computer system, however, incorporated suspicions about the honesty of recipients, especially that of "deadbeat dads," which gave it a coercive dimension. Its design linked AFDC benefit payments to means of withholding income for debt collection. As the system developed, welfare benefits became connected with law enforcement, with payments delayed not only for overdue child support but also for other offenses such as suspended licenses. In the end, the writer concludes, "There was no welfare state separate from the carceral state—the two were integrated as one machine."

This evolution is presented not just as an abstract argument but as lived experience through the work habits of a caseworker in Mississippi whose job evolved from looking into recipients' eyes to looking mostly at a computer screen. Similarly, the case study of the British National Anthropometric Survey uses detailed archival evidence to trace the personalities and work experiences of the main actors. Both writers pay careful attention to the language used by the individuals and groups who are making their cases. They also choose their own language carefully in describing the intentions and motivations of the actors involved. Most of all, Spektor and Aidinoff focus intently on their core argument: that information systems incorporate intentions and anxieties beyond the stated ones, and that the information age is also always an age of politics.

Knight Science Journalism Fellosship Program

AY2021 at the Knight Science Journalism (KSJ) Fellowship program was characterized by adaptation to the COVID-19 pandemic—and experimentation with new and innovative forms of digital outreach and long-distance learning. Due to health and logical concerns related to the pandemic, we selected a class of remote project fellows. The project fellowships were designed to support essential US science journalism during a challenging time, and we selected 18 fellows for this, our 38th class. The project fellowships were either nine-month fellowships spanning the full academic year or one-semester fellowships based in either fall or spring.

Nine-Month Fellows

- Carrie Arnold, an award-winning independent journalist from Virginia. Her work for *Women's Health* on PTSD after sexual assault won several national awards, and her other work has appeared in *The New York Times*, *Scientific American*, *National Geographic*, *New Scientist*, *Quanta*, and others. Arnold's project

investigated the long-term health effects of a little-known 1970s chemical disaster in Michigan and how scientists are studying its impact on future generations.

- Ashley Belanger, an investigative science journalist whose health and politics reporting has been funded by the National Geographic Society and has appeared in *Teen Vogue*, *Ars Technica*, and other outlets. She trained as a journalist at the University of Florida and at the Graduate Program in Science Writing at MIT, where, she received an Honorable Mention for the Obermayer Prize for Graduate Student Writing. Belanger's project examined major factors limiting releases from civil commitment treatment facilities throughout the U.S.

- Jason Bittel, a freelance science writer who reports on a range of topics, including new scientific discoveries, emerging wildlife diseases, human–wildlife conflict, and conservation. His work has appeared in *National Geographic*, *The Washington Post*, *New Scientist*, *Earth Magazine*, and *Popular Science*, among others. He is a former National Geographic Explorer, a Student Conservation Association volunteer, a blood marrow donor, and a sniffer of sloth scat. Bittel's fellowship project was focused on a series of field guides aimed at reconnecting people with wildlife.

- Roberta Kwok, a freelance science writer who has contributed to publications such as *Nature*, NewYorker.com, NYTimes.com, *The Southern Review*, *Hakai*, and *Science News*. She earned an MFA in fiction writing from Indiana University Bloomington and a graduate certificate in science communication from the University of California, Santa Cruz. Her journalism has won awards from the American Geophysical Union and the American Association for the Advancement of Science. Kwok worked on a book proposal and conducted research for a collection of reported essays, which will create a kaleidoscopic view of tiny details that scientists study to illuminate big questions.

- Katherine Reynolds Lewis, an award-winning journalist covering race, gender, disability, science, parenting, and mental health, and author of *The Good News About Bad Behavior: Why Kids Are Less Disciplined Than Ever—and What to Do About It.* Her work has appeared in the *Atlantic*, *Fortune*, *Medium*, *Mother Jones*, *The New York Times*, *Parents*, *The Washington Post,* and *Working Mother*. A Harvard physics graduate and an active Asian American Journalists Association member, Lewis previously worked as a national correspondent for Newhouse and Bloomberg News. Lewis' project explored the science of changing racial bias in school.

- Lynne Peeples, a freelance journalist and former staff reporter for The Huffington Post. Her writing also appears in *Nature*, *PNAS, The Daily Beast*, and *Undark*. Peeples was a finalist for the 2018 National Association of Science Writers long-form reporting award. Before her move to journalism, she crunched numbers for clinical trials and environmental health studies as a biostatistician. For her project, she wrote a book proposal on the science and health effects of light, which she sold to major publishers in the US and the UK.

- John Sutter, an independent journalist and documentary filmmaker based in Salt Lake City. His work has won the Livingston Award for Young Journalists, the IRE Award, the Edward R. Murrow Award, and the Peabody Award, and he has

received two Emmy nominations—one for new approaches to documentary and the other for environmental reporting. His project involved work on a proposed film series, *Baseline,* which will track four communities in the United States on regular intervals to tell the evolving story of climate change.

Fall Fellows

- Lindsay Gellman, an independent investigative journalist based in New York. Her work focuses on the intersection of health and business and has appeared in *The New York Times*, *The Wall Street Journal*, *The New Yorker*, *The Atlantic*, *New York Magazine*, and *National Geographic*. She is a lecturer at Yale University, where she teaches nonfiction writing, and a visiting scholar in the Division of Medical Ethics at New York University Langone Health. Gellman received a 2016–2017 Fulbright grant to Germany to report on Berlin's technology startups. Previously, she was a staff reporter at *The Wall Street Journal* covering business schools and recruiting. Gellman's project focused on patient advocacy movements centered around bodily autonomy and has already been a major story in *Wired*.

- Jyoti Madhusoodanan, an independent journalist based in Portland, Oregon. She writes about life sciences, health, STEM careers, and ethics for *Nature*, *Science*, *The New York Times*, NPR, and *Discover*, among others. Her article about using sensory detail to enrich science reporting was anthologized in *The Craft of Science Writing* (2020). She has a PhD in microbiology and a degree in science journalism. Her project examined the origins and use of race-based adjustments to tests of heart disease, kidney function, and other health measures to understand how these biased measures drive healthcare disparities. Stories based on her project have already appeared in *Science*.

- Amy Maxmen, a senior reporter at *Nature* and a host of *Coronapod,* the journal's weekly podcast focused on the coronavirus pandemic. Her writing also appears in *National Geographic, Wired,* and *Scientific American,* among other outlets. She has won multiple awards for her features on Ebola and malaria from the National Association of Science Writers and the Association of Health Care Journalists. She has reported on infectious diseases, genetics, data science, and evolution from low-income countries around the world, supported by several fellowships from the Pulitzer Center on Crisis Reporting. Prior to writing, Maxmen earned a PhD in evolutionary biology from Harvard University. Her doctoral research on the origin of sea spiders was published in *Nature*. Maxmen's project involved researching the history and politics of pandemics and infectious disease outbreaks and has already led to stories about disease inequalities in *Nature.*

- Lourdes Medrano, a freelance journalist based in southern Arizona. Her reporting often focuses on matters relevant to both sides of the U.S.-Mexico border, including immigration and environmental issues. Her work has been featured in various print and online publications, such as *The Christian Science Monitor*, *Undark*, *The Washington Post*, *Pacific Standard*, and more. She is a former reporter for daily newspapers, including the *Star Tribune* in Minneapolis and *The Arizona Republic* in Phoenix. Medrano's project explored the evolution of corn.

- Peter Andrey Smith, a reporter who has covered science and medicine for *The New York Times Magazine, Outside*, *Wired*, and WNYC Radiolab, among other national outlets. His work has received recognition and support from the Pulitzer Center, the Investigative Fund, and the UC Berkeley 11th Hour Food and Farming Journalism Fellowship. Smith investigated the use of police canines and the safeguards currently in place to discriminate between junk science and real science.
- Duy Linh Tu, a journalist and documentary filmmaker, focusing on education, science, and social justice. His work has appeared in print, online, on television, and in theaters. He has won several awards for his documentary filmmaking and is the author of *Narrative Storytelling for Multimedia Journalists* (Focal Press). Tu is a professor at the Columbia University Graduate School of journalism, where he teaches reporting and visual storytelling. Tu's project, *Water Up, Water Down,* was a documentary film about climate change and its effects on global migration, Native American coastal communities, and the world's rivers and oceans.

Spring Fellows

- Christopher Cox, an editor at *The New York Times Magazine* and editor-at-large at *Orion*. He has written for *The New York Times Magazine*, *GQ*, *Harper's*, and *Slate* and has been named a visiting scholar at New York University's Arthur L. Carter Journalism Institute and a Logan Nonfiction Program fellow. He was formerly the editor of *Harper's* and executive editor of *GQ,* where he worked on stories that won the Pulitzer Prize, the PEN Literary Award for Journalism, and multiple National Magazine Awards. His book about the psychology of deadlines will be published by Avid Reader Press in 2021. Cox's project supported a book about drought, floods, atmospheric rivers, and the past and future of California's climate.
- Sarah Gilman, an independent writer and illustrator, a contributing editor at *Hakai*, and a former staff editor for *High Country News*. Her illustrated reporting has appeared in both *HCN* and *Hakai*, as well as *The Atlantic* and *Adventure Journal Quarterly*. She has also written for *Audubon Magazine*, *The Washington Post*, *The Columbia Journalism Review*, *BioGraphic*, *National Geographic*, and *Smithsonian*, among others. Gilman's project involved researching, writing, and drawing about pitched battles over proposed roads in wild parts of Alaska.
- Jodi Rave Spotted Bear is an award-winning journalist and opinion writer and the founder and executive director of the Indigenous Media Freedom Alliance. For her project, she worked on a book that addresses climate change, oil development, and the history of her tribe, the Mandan, Hidatsa and Arikara Nation, in North Dakota.
- Ted Wood is a freelance environmental photojournalist and multimedia producer based in Boulder, Colorado. His work has appeared in *Vanity Fair*, *Smithsonian*, *Yale E360*, *The New York Times*, *High Country News*, the *Nature Conservancy Magazine,* and other national and international publications. Wood holds a master's degree from the University of Missouri School of Journalism, He is also the author of 10 nonfiction children's books. As a mega-drought tightens its grip on the American

Southwest, Wood's projected involved photographing and filming pressing water issues throughout the Colorado River basin and creating a multimedia library housed at the University of Colorado's Water Desk to supply visual content for water reporters in the West. His photographs have already appeared in numerous publications.

Staff

Director Deborah Blum continued to lead the Knight Science Journalism Fellowship Program and serve as publisher of our award-winning digital magazine, *Undark*. Associate Director Ashley Smart, a former KSJ fellow and a long-time editor at *Physics Today*, continued as a senior editor at *Undark*, organized a remote seminar series, and oversaw a KSJ website redesign project, while supervising two interns from the Graduate Program in Science Writing. Dr. Smart also oversaw the selection process for the Victor K. McElheny Award, which presented its third award in 2021. Tom Zeller Jr., a former *New York Times* journalist, continues in his role as chief and founding editor of *Undark*, and Jane Roberts, deputy editor of *Undark,* has been working hard to further develop its widely respected fact-checking program. The whole team and the fellows receive excellent support from our program assistant Lucas Haugen, who also now serves as associate business manager of *Undark*. In March, our audience engagement editor Frankie Schembri left for health reasons, and we were fortunate to replace her in April 2021 with a new and talented audience engagement editor, Sudhi Oberoi, who has continued to build national and international recognition of both KSJ and *Undark*. In June, our program administrator, Bettina Urcuioli, left to take a position in MIT's Mechanical Engineering program. Bettina did an outstanding job welcoming and caring for the KSJ fellows, and she will be missed. A search process for a new program administrator is underway.

COVID-19

During the pandemic, *Undark* did pioneering work reporting on the COVID-19 pandemic, and the entire staff pitched in, writing news briefs and doing extra editing work. Blum even wrote a three-month series of questions and answers of coronavirus questions for *Undark* readers. The magazine continued its nonprofit mission to commission and publish exemplary science journalism in the public interest and to give that journalism away to other publications for use on their platforms. The roster of national and international publications that do so includes the *Atlantic*, *Slate*, *Salon*, *Wired*, *Scientific American*, *Smithsonian* magazine, and *Quartz*. Our work is also published widely in newspapers and magazines abroad, with translations of *Undark* stories appearing over the last year in Spanish, French, German, Mandarin, and even Farsi. We are proud to say that undark.org now sees some 12 million visits annually.

The director and associate director worked together to design a series of skill-based Zoom seminars for the Knight Fellows. These included a lecture on data visualization by Alezju Bajak, the senior data visualization editor at *USA Today*; a discussion of book proposals and sales with leading New York literary agent MacKenzie Brady Watson of the Stuart Krichevsky Agency; a two-hour presentation on successful public speaking by Jane Beard of Invisible Light; an exploration of accessing public records by Michael

Morisey, founder of Muckrock; and an interactive program on climate change from Jay W. Forrester Professor of Management John Sterman of MIT's Sloan School of Business. The fellows also participated in Zoom roundtable discussions of their projects, which were used to both keep track of progress and provide feedback as needed. KSJ staffers provided mentoring sessions with individual fellows, and the fellows themselves organized fellow-only meetings to provide support for each other's work, which was a very encouraging development.

Additionally, KSJ responded to the pandemic by embracing our mission to pursue excellence in science journalism. The updated KSJ website launched in October 2020, designed by the Linchpin Agency of Pawtucket, RI. It not only provides a new section focused on KSJ fellows, program news, and a photo-enhanced directory of previous fellowship classes but also homes two new and ambitious projects, a digital handbook for science editors, available online and as a downloadable pdf, and a new section on fact-checking, offering resources, a teaching module, and a database of fact-checkers for hire. The science editing program was funded by both the Kavli Foundation and Howard Hughes Medical Institute (HHMI), while the fact-checking project was developed with support from the Gordon and Betty Moore Foundation. In previous years, grant funding supported in-person workshops on both these subjects, but we pivoted to online instruction this year. The coordinator of our science editing project, Josh Hatch, has been supervising a series of six online science editing webinars, which began in April 2021 and will continue into September. Thousands of journalists from around the world have attended these webinars, and the handbook itself has been viewed more than 26,000 times. Meanwhile, we hosted a virtual fact-checking workshop in June 2021. More than 400 people applied to attend and we allowed almost 200 attendees, who represented 45 different countries. We are planning a second virtual fact-checking workshop for fall of 2021.

Awards and Grants

Under Smart's direction, a prestigious panel of jurists selected the third recipients of our Victor K. McElheny Award in Science Journalism in March 2021. Honoring excellence in local and regional science journalism, and this year the award recognized *Timber Wars*, a podcast series from Oregon Public Radio. Unfortunately, because of the pandemic, we were unable to hold an award celebration in person on campus, so we honored the recipients remotely and had their certificates, crystal awards, and checks mailed to them directly.

In AY2021, Blum secured a $60,000 grant from the Kavli Foundation in support of KSJ's ambitious webinar series. The program also has support from the Gordon and Betty Moore Foundation, the Rita Allen Foundation, HHMI, the National Institute for Health Care Management Research and Educational Foundation, and the Alfred P. Sloan Foundation.

In June 2020, we received confirmation from the Alfred P. Sloan Foundation accepting our grant proposal for $100,000 to support the publication of *The Tactical Guide to Science Journalism.* During the fall, Blum, Smart, and Zeller recruited 45 prestigious science journalists to write chapters and hired Scott Veale, *Undark*'s book editor, to supervise its production. By the end of June 2021, the book was largely completed. It is scheduled to be published by Oxford University Press in 2022.

Looking ahead, we believe that despite the challenges posed by the pandemic, KSJ will continue to strengthen its role in supporting and improving science journalism in multiple ways. Our greatly improved and expanded website provides new training and opportunities in both fact-checking and science editing for journalists around the world. Our project fellowship program will enable us to directly support some of best American science journalism during the coming challenging period. And we hope to expand our online training programs in the months ahead, maintaining the program's stature as the leading science journalism fellowship program in the world.

The Knight Science Journalism program is supported by an endowment from the John S. and James L. Knight Foundation, and by additional alumni and foundation gifts.

Faculty Activities

Dwaipayan Banerjee

Associate Professor of Science, Technology, and Society Dwaipayan Banerjee completed the fifth year of his appointment at MIT. During this time, his monograph *Enduring Cancer: Life, Death and Diagnosis in Delhi* was published with Duke University Press. He also co-organized a semester-long seminar with MIT colleagues in History and STS, 21H.000 The History of Now: Plagues and Pandemics. His writings on this theme were published in leading public journals and magazines, including the *Caravan* and *Social Text Online*. Prof. Banerjee continued work on his new manuscript, "A Counter-History of Computing in India." He joined the editorial board of the leading journal of his field, *Medical Anthropology,* and accepted an invitation to serve as an associate editor for *Critical AI* and *Societies*. He was also selected as one of two editors of the Position Pieces section of *Medicine Anthropology and Theory.*

Banerjee served on an internal committee on STS strategic initiatives and in a collaborative project with the Schwarzman School of Computing. He also served as the STS department's undergraduate officer and on the department's curriculum committee, which was organized to update and revise syllabi and teaching. He taught two classes aimed at undergraduate students, STS.008 Technology and Experience and STS.012 Science in Action, both of which had significant enrollment. He also co-taught a graduate class, STS.417 STS Seminar on the Global South, across MIT and Harvard that drew in students from his own and other departments. In addition, he served on an exam committee for two HASTS graduate students.

Kate Brown

Professor of Science, Technology, and Society, Kate Brown became the inaugural Thomas M. Siebel Distinguished Professor in the History of Science. In 2021, Brown prepared publication for a co-edited volume forthcoming by Taylor Francis with Jonathan Hogg called *British Nuclear Mobilisation Since 1945* and wrote five articles for publication. With colleagues in STS and the History section, Brown organized a History of Now lecture series and course for undergraduates. The theme was the history of pandemics. Brown founded a writer's workshop among scholars in the STS program and History section at MIT and gave a number of invited lectures and keynote addresses, all of them virtually.

She continued to serve as the founding, consulting editor of History Unclassified, a section in the *American Historical Review,* and as senior editor of *International Labor and Working Class History*. She joined the editorial board of *Kritika: Explorations in Russian and Eurasian History* as well as the advisory committee of the Humans and the Microbiome project of the Canadian Institute for Advanced Research. Brown led a two-week workshop at the University of Zurich on creative nonfiction for the Anthropocene in June 2021. She reviewed and endorsed a half-dozen books and manuscripts and five articles for publication.

At MIT, Brown served on the tenure committee for Banerjee and is a faculty mentor of Megan Black, associate professor in the History section. She is on the Gender Equity Committee and the Martin Society of Fellows Nominating Committee. Brown directed the reading lists and general exams of two HASTS students. She is on the dissertation committee for a HASTS student, an anthropology student at the University of Chicago, a geography student at the University of Toronto, and a history of science student at Harvard. Brown served on master's and undergraduate honor's thesis committees for students at MIT DUSP, Tufts and the University of Maryland, Baltimore County. She reviewed the tenure or promotion files for historians at University of Texas, Austin, University of Houston, Brown University, University of Florida, and University of San Francisco. She reviewed grant applications or awards for the National Science Foundation and the American Academy in Berlin. She was a faculty member of the HASTS Program Seminar for fall semester, and supervised two UROP students in the fall and three in the spring semester. Brown was nominated as a Digital Humanities Teaching Fellow at the Digital Humanities Lab for spring 2022.

William Deringer

Associate Professor of Science, Technology, and Society, William Deringer completed his sixth year as a member of the STS faculty in AY2021. He continued research toward his current book project, *Discounting: A History of the Modern Future (in One Calculation)*. In January, he discussed his 2019 article, ""Michael Milken's Spreadsheets: Computation and Charisma in Finance in the Go-Go '80s" and other research on the *Drinks with the Deal* podcast.

Deringer taught two undergraduate courses, STS.002 Finance and Society and STS.047 Quantifying People: A History of Social Science, as well as a graduate seminar, STS.412 Quantification, adapting all three to a virtual format. He currently serves as a member of three ongoing dissertation committees at MIT, two in the HASTS program and one in the Philosophy department, and on one dissertation committee at Harvard (History of Science), and participated in one General Examination for the HASTS program.

Deringer made several service contributions to the MIT community, including as a member of the Presidential Committee on Distinguished Fellowships, as the SHASS representative on the Subcommittee on the HASS Requirement, and as a working group participant and peer reviewer for the Social and Ethical Responsibilities of Computing (SERC) in the Schwarzman College of Computing. Beyond MIT, he has served as a peer reviewer for grants from National Science Foundation and the Social Sciences and Humanities Research Council (Canada), for a fellowship competition for the American Philosophical Society, for book manuscripts from University of Chicago Press and

Cambridge University Press, and for articles for multiple journals including *IEEE Annals of the History of Computing* and *The Historical Journal*.

Michael M.J. Fischer

Andrew W. Mellon Professor of Humanities, professor of Anthropology, and professor of Science, Technology, and Society, Michael M.J. Fischer taught three subjects in the fall term and was a co-convener of the weekly Joint MIT-Harvard ("Friday Morning") Seminar in Medical Anthropology (now running for over 40 years). While his formal residency and research at the Singapore University of Technology and Design has finished, he continues to work with a research assistant there. He continues as a co-PI on the Hewlett-Packard Foundation grant and as executive committee member on the Initiative for Information Policy led by Daniel Weitzner and Professor Hal Abelson. He continues to work on a small grant from MIT-Israel in collaboration with a former postdoc (now faculty at Hebrew University) and a professor at Ben-Gurion University. He serves as chair of one dissertation committee and as a member of several other committees. He served as the moderator for a two-day workshop on cryptic commons (cryptography, math, social science) at Aalborg University and serves on the editorial boards of *Cultural Politics*, *Cultural Anthropology*, *Science, Technology and Society*, and *Annuário Antropológico*.

He continues to co-edit the leading STS book series, Experimental Futures, at Duke University Press with 44 titles published and several in the pipeline. His own book, *Probing Arts and Emergent Forms of Life* has been accepted for publication, and a second book, *At the Pivot of East and West: Ethnographic, Literar,y and Filmic Arts*, is under review; a third is being drafted. An essay, "Bacurau Flies at Dusk," has been published in *Anuario Antropologia*; and a book chapter, "Hauntology's Genesis, Catacoustics and Future Shadows," is in press.

Deborah Fitzgerald

Professor Deborah Fitzgerald had a great deal of academic activity ground to a halt because of the pandemic. Libraries and archives were closed to scholars all over the world, which curtailed much of her own research because she could not access source material.

Fitzgerald wrote the afterword for *Risk on the Table: Food Production, Health, and the Environment* (Berghahan Books), and worked on several other articles to be published in the next year or two. She served as an invited panelist at the virtual colloquia "Workshop on Agricultural Transformations," held at the University of Chicago. She also served as an external reviewer for the University of Virginia's Program in Engineering and Society, and served on the external review committee for the Korea Advanced Institute of Science and Technology's 50th anniversary self-evaluation.

At MIT, Fitzgerald served on the Committee on Nominations, the Commencement Committee, the MIT Museum Collections Committee, and the MIT Museum Advisory Board. She continued to co-host the Seminar on Environmental and Agricultural History with Professor Harriet Ritvo, over Zoom.

Fitzgerald taught the introductory undergraduate class in STS.

David Kaiser

During AY2021, Kaiser continued to serve as associate dean for social and ethical responsibilities of computing in MIT's Schwarzman College of Computing. Related to those duties, he continued to co-chair MIT's Legal, Ethical, Equity committee for campus planning and operations, which has been active in response to the COVID-19 pandemic.

Kaiser completed a new edited volume, *"Well, Doc, You're In": The Life and Legacy of Freeman Dyson* (MIT Press, in press) as well as four research articles in physics. He also oversaw the selection, review, and publication of a series of original peer-reviewed case studies within the new MIT Case Studies series on Social and Ethical Responsibilities of Computing, for which he serves as series editor. In his role as associate dean, Kaiser co-directed six action groups, some involving faculty and others with undergraduate volunteers, which focused on creating original pedagogical materials to foreground social and ethical responsibilities of computing throughout the undergraduate curriculum, as well as to work on a roadmap for new campuswide efforts on computing, data, and racial justice.

Kaiser continued to co-direct the Density Perturbations Group in MIT's Center for Theoretical Physics with Professor Alan Guth, which focuses on theoretical studies of early-universe cosmology. During the year he delivered invited (virtual) keynote presentations, colloquia, and public lectures for the Max Planck Institute for Gravitational Physics, the international Copernicus astrophysics colloquium consortium, the Radcliffe Institute at Harvard University, Vassar College, the University of British Columbia, the Institute for Artificial Intelligence and Fundamental Interactions (MIT and Boston-area partners), and the University of Pennsylvania. He also delivered an invited two-part (virtual) "master class" for The Academy for Teachers, which focuses on teaching at the high-school level.

Kaiser chairs the editorial board of the MIT Press, serves as an associate editor of *Historical Studies in the Natural Sciences*, and on the advisory boards for *Nautilus* and *Undark* magazines. He is also a member of the advisory boards for the Catalyst Collaborative (MIT and Central Square Theater) and for the MIT Museum, for which he chairs the subcommittee on student engagement. He continues to serve on the Alumni Advisory Board for the Department of Physics and Astronomy at Dartmouth College, and he chaired the Committee on Honors and Prizes for the History of Science Society. Kaiser served as an advisor and on-screen contributor for two new documentary films about physics and cosmology, each of which is scheduled for broadcast during fall 2021. He served as the principal advisor for one postdoctoral scholar (in Physics), four PhD students (three in HASTS, one in Physics), and as a dissertation committee member for another three PhD students (one in HASTS, two in Harvard's Department of History of Science).

Jennifer S. Light

Professor of Urban Studies and Planning and department head, Program in Science, Technology, and Society, Jennifer S. Light completed her second term of service as director of STS on June 30, 2021. In addition to adapting departmental activities to the pandemic context, a priority for the year was reviewing and revising the STS curriculum so it better addressed issues related to race, racism, and inequality.

Light published *States of Childhood* with MIT Press. She lectured for the JFK Library and several podcasts about her work, which received the Outstanding Scholarly Contribution Award from the American Sociological Association's Section on Children and Youth. She also launched her next multiyear research and curriculum development project, which included successfully auditioning for a preprofessional circus program for her sabbatical in AY2022.

Light served on editorial boards for *IEEE Annals of the History of Computing*; *Information and Culture*; and *Journal of Urban History*. She refereed manuscripts for these and other journals, as well as several university presses, and also reviewed multiple tenure and promotion cases for peer institutions. She served as academic advisor for the Museum of the City of New York, fellowship reviewer for the American Academy in Berlin, and a senior research fellow at the Charles Babbage Institute.

At MIT, Light served on dissertation and qualifying exam committees for PhD students in HASTS, DUSP, and Architecture. She mentored a postdoctoral fellow through the ACLS Emerging Voices program. She continued service on the Computing and Society Concentration Steering Committee and SERC Advisory Board. And she used a second grant from the d'Arbeloff Fund for Excellence in Education to develop additional course materials for the NEET Program, following from the success of the curriculum piloted in fall 2019.

Chakanetsa Mavhunga

Professor of Science, Technology, and Society (STS), Chakanetsa Mavhunga has committed to three legacy projects:

1. a book series with MIT Press called Global South Cosmologies and Epistemologies, a collaborative project with some of the most distinguished indigenous, Latin American, African, Asian, and Pacific scholars;

2. a hybrid and field-based class, Multidisciplinary Learning Through Problem Solving, to be composed of one semester of residential learning Zoom-connected with two universities in Zimbabwe, and one summer field class, with up to 10 competitively selected MIT students traveling with Mavhunga over summer 2022 for collaborative, community-based projects; and

3. STS.421 Graduate Super-Seminar on Global South Cosmologies and Epistemologies, team-taught with distinguished colleagues from across all the planet's continents via Zoom.

Mavhunga was able to complete his book manuscript "Dare to Invent the Future: Knowledge in the Service of and Through Problem-Solving," in which he declared the objective of fostering knowledge in the service of problem-solving.

Mavhunga was promoted to full professor this year. He was part of the MIT Task Force on MIT and Beyond, charged with charting the future of MIT for the next decade. He also served on the Schwarzman School of Computing's SERC committee, where he provided useful directions in the racial equity questions in digital technology design and deployment. The highlight of his service thus far remains the MIT Climate and Sustainability Consortium.

Eden Medina

Associate Professor of Science, Technology, and Society, Eden Medina was the 2020–2021 Rita E. Hauser Fellow at the Radcliffe Institute of Advanced Study at Harvard University. As a Radcliffe Fellow, Medina made progress on her new book manuscript, "Bones and Lives: Making and Unmaking Truth After Dictatorship." While on leave, she delivered talks to audiences at Georgia Tech, Harvard University, and Stanford University, and participated on the panel "Responsible Computing Research: Ethics and Governance of Computing Research and its Applications," convened by the National Academies of Science, Engineering, and Medicine. She shared her research findings with the public as a guest on the podcast *Tech Won't Save Us.* Her book *Cybernetic Revolutionaries* was published in Chinese by East China Normal University Press. She also received a Global Seed Fund grant from MIT International Science and Technology Initiatives for the project Designing a Revolution: Histories of Design and Political Change.

Medina served as the primary advisor for three PhD students (one at MIT HASTS, two at Indiana University, Bloomington) and as a committee member for six PhD students (three at MIT HASTS, one at Indiana University, Bloomington, one at Northwestern University, one at the Universidad Alberto Hurtado). She mentored the research of three undergraduate students at Harvard University as part of the Radcliffe Research Partners program and served as the second reader for an MIT undergraduate thesis. Medina also served as a referee for the journals *Technology and Culture, American Historical Review,* and the *IEEE Annals of the History of Computing*, as well as for the National Science Foundation and the American Academy in Berlin. She served on the editorial board of *Hispanic American Historical Review* and the executive committee of the Society for the History of Technology. At MIT, she served as a member of the Legal, Equity, and Ethics Committee, SERC Advisory Committee, and the SERC action group on active learning. Medina continues to serve as the associate head of house of East Campus.

David A. Mindell

David A. Mindell wrapped up his co-leadership of MIT's Task Force on the Work of the Future, which published a series of research briefs and a final report in November. The report was well-received, from Congress to community colleges, and well-covered in the press, its conclusions already having an impact on policy making in the new administration. A book (co-authored with Professor David Autor and Dr. Elizabeth Reynolds with a preface by Robert Solow), *The Work of the Future, Building Better Jobs in an Age of Intelligent Machines,* will be published by the MIT Press in fall 2021.

Mindell serves as a principal member of the MIT Mobility Initiative. He worked with MIT alum L. Dennis Shapiro and the Development Office to create an endowed graduate fellowship and program fund in STS for students studying the history of African American experiences with technology, and named the first fellow, graduate student Kelcey Gibbons. Mindell's company, Humatics, has pioneered the use of ultra-wideband navigation in the New York City subway. He continues to serve as Head of House in Edgerton House and has been deeply involved in the campus response to the COVID-19 pandemic, particularly in helping administrators think through risk management, and in encouraging MIT to improve equitable employment practices for front-desk and housekeeping staff in MIT graduate dorms. Those staff, who were previously contract workers, are being hired as full-time MIT employees.

Robin Wolfe Scheffler

Associate Professor of Science, Technology, and Society, Robin Wolfe Scheffler had an active year of teaching, research, and service during his sixth year at MIT. Scheffler taught three courses—an undergraduate course on biotechnology, a jointly taught class with the Philosophy department on bioethics, and a graduate seminar on methods in science and technology studies. He also serves on two dissertation committees. Scheffler continued to make steady progress on his second book project, Genetown: Boston and the Rise of the Modern Biotechnology Industry. His work on this project was recognized by his peers through the Cold Spring Harbor Library's Sidney Brenner Research Fellowship, which he will hold for part of 2022. Scheffler also completed work on several articles.

Within STS, Scheffler served on the Strategic Initiatives Committee. Within the Institute more broadly, he continues to serve as a member of the MIT Museum Life Science Advisory Committee, a member of the Center for Environmental Health Sciences, and on the steering committees for the Environmental Solutions Initiative Minor and the Global Health and Humanities Minor. He has also continued his service to history of science as a whole as a member of the History of Science Society's Suzanne J. Levinson Prize Committee, an application reviewer for the Science History Institute's Beckman Scholars Program, and as a reviewer of articles, books, and manuscripts for major journals and academic presses.

Merritt Roe Smith

Leverett Howell and William King Cutten Professor of the History of Technology and MacVicar Faculty Fellow at MIT, Merritt Roe Smith taught remotely via Zoom last year and refrained from accepting any outside speaking engagements, owing to the pandemic. During the summer months, Smith continued to work on his book about technology and its implications during the American Civil War. He continues to serve on the editorial board of *Vulcan* (a journal devoted to the history of military technology) and on the national advisory committees of the Thomas A. Edison Papers (Rutgers University), the American Precision Museum (Windsor, VT) and the Lincoln Prize in Civil War History (Gettysburg College).

Sherry Turkle

Abby Rockefeller Mauzé Professor of the Social Studies of Science and Technology, Sherry Turkle published her intellectual memoir, *The Empathy Diaries*, with Penguin Random House in March. Turkle has spoken at the Aspen Institute, Harvard Hillel, the American Academy of Arts and Sciences, and the Aspen Ideas Festival. Her media time has included multiple NPR appearances including *Fresh Air* and a special program from Jerusalem with NPR's Robert Siegal, as well as an appearance on Nicole Wallace's *Deadline White House*, talking about the need for rituals of remembrance in political life.

Other writing this year included articles about the pandemic in *Time* magazine, the *Guardian*, the *Financial Times*, and *Technology Review*. Additionally, Turkle published two book chapters, "Rejecting the Sirens of the Friction-Free World" (*Which Side of History?* Chronicle Books, 2020) and "The Year of Not Living Thickly" (*Now Comes Good Sailing*, Princeton University Press, 2021).

Turkle continued her nonprofit board and advisory work for the Electronic Privacy Information Center, the Boston Children's Museum, *Harvard Magazine,* the Children's Screen Time Action Network, and the Society of Responsible Robotics. She is on the executive boards of *The Public Eye; Science, Technology, and Human Values;* and *Philosophy and Technology.* She is on the visiting committee for Harvard College.

Deborah Fitzgerald
Department Head 2021–2022
Leverett Howell and William King Cutten Professor of the History of Technology Professor of the History of Technology (STS)