

## **Program in Science, Technology, and Society**

MIT's Program in Science, Technology, and Society (STS) helps educate scientists and engineers to engage the social and cultural dimensions of their work at the highest levels. In helping to differentiate MIT from the numerous engineering schools worldwide turning 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**

Our curriculum committee, led by professor Merritt Roe Smith and associate professor Natasha Schüll, made significant progress in revising the STS undergraduate curriculum in AY2010, a process which started in the summer of 2008. The committee finalized a list of eight Tier I subjects to replace Humanities, Arts, and Social Science Distribution (HASS-D) subjects as a requirement for our concentrators, minors, and majors. These subjects will be taught by STS faculty members at least every other year, and at least four will be offered each academic year. They will give MIT students a solid introduction to STS and better prepare them to take Tier II subjects in the future. All Tier I subjects except one now hold the Communication Intensive-Humanities (CI-H) designation. We also obtained HASS-D status for two additional subjects, which will give current undergraduates additional classes to choose from while trying to complete this requirement in its final years.

The committee also made changes to our section of the MIT Bulletin to reflect the changes in the HASS-D requirement, update our degree chart, and to open our program to all undergraduate students; not just those in the schools of engineering and science.

In 2010–2011, we plan to wrap up our curriculum reform by publicizing the curriculum updates to the undergraduate community, and by finalizing the shared introductory material for Tier I subjects, our major and minor requirements, and the cluster lists.

STS offered 25 undergraduate subjects and 23 graduate subjects in AY2010, including six undergraduate HASS-D subjects and six CI-H subjects, four of which held both designations. We created seven new subjects including one undergraduate- and one graduate-level class taught by adjunct professor John Durant, a Tier I subject which can be taught by three of our faculty members, and STS.050 The History of MIT, which was inspired by the upcoming MIT150 anniversary.

We continue to emphasize collaboration with other areas of MIT. We offered 17 subjects jointly with the following programs: Anthropology, Engineering Systems Division (ESD), Health Sciences and Technology, History, Linguistics and Philosophy, Management, Media Arts and Sciences, and Political Science.

Undergraduate enrollment totaled 470, a 21 percent increase over last year's enrollment. These students included majors from 23 different MIT departments, plus Harvard

University and Wellesley College. The two contingents with the largest numbers were from Course 6 and Course 2, the second and third most popular undergraduate majors. The freshman class had 145 students in STS classes. Graduate enrollment totaled 138 students from 20 different programs including ESD, Course 4, and Harvard.

STS.005 Disease and Society in America and STS.006J Bioethics had the two largest enrollments—110 and 111 students, respectively. Associate professor David Jones taught both subjects (STS.006J was co-taught with Caspar Hare of Linguistics and Philosophy). Professor Schüll's Neuroscience and Society class (STS.010) grew from an enrollment of 59 in academic year 2009 to an enrollment of 89 in its second year. Associate professor David Kaiser and assistant professor Hanna Rose Shell co-taught STS.003 The Rise of Modern Science for the first time with an updated syllabus and format as part of our curriculum reform, and attracted an enrollment of 60 students.

This year, STS had 13 undergraduate minors (seven of whom graduated in academic year 2010), 75 concentrators (39 graduating in the same period), and three students who worked with us on Undergraduate Research Opportunity Program projects.

### **Doctoral Program**

The doctoral program in History, Anthropology, and Science, Technology, and Society (HASTS) is run by STS with collaboration from the History faculty and the Anthropology Program. The program is administered by STS, which awards the degrees. Professor Kaiser served his first year as director of graduate studies in 2009–2010. In addition to running the admissions process and working closely with students to encourage them to meet deadlines in a timely manner, Kaiser implemented a monthly lunch for our graduate students. Two HASTS faculty members are invited to these lunches to talk with the students informally about their research, and this has proven to be informative for both students and faculty.

The program received 146 applications for admission in January 2010, the largest applicant pool in the program's history, and we are looking forward to enrolling five new students from this pool in the fall. The incoming class includes three international students and four women. Their educational backgrounds vary widely, with degrees in social anthropology, history of science, law, feminist studies, and electrical engineering.

In 2009–2010, there were 29 students in the program. One student, Alexander Brown, received his doctoral degree during this period. He is now working for the New Zealand Ministry of Justice.

A few of our recent graduates accepted new positions. Richa Kumar has accepted a position as assistant professor of sociology and policy studies at New Delhi's Indian Institute of Technology. Jamie Pietruska became an American Council of Learned Societies New Faculty Fellows postdoctoral associate and will join the History Department at Rutgers University in the fall.

Our students continue to be successful at winning competitive fellowships to support their graduate studies. This year students received funding from the Fulbright Program, Max Planck Institute for the History of Science, Andrew W. Mellon Foundation,

American Institute of Indian Studies, Social Science Research Council, Wenner-Gren Foundation for Anthropological Research, and the National Science Foundation (NSF).

### **Projects, Grants, and Initiatives**

Professor Jones will continue his research in the history of cardiac revascularization techniques in order to discover the factors that influence therapeutic practice and change in American medicine and their immediate relevance to health policy. This research is supported by an award from the Robert Wood Johnson Foundation. The Center for the Study of Diversity in Science, Technology, and Medicine completed its final year under his direction with a series of conferences and workshops supported by the Mellon Foundation.

Professor David Mindell formed the Laboratory for Automation, Robotics, and Society to map relationships between humans and machinery within broad engineering and social landscapes. This research is supported by a donation from an MIT alumnus.

The postdoctoral fellowship grant under the direction of Professor Kaiser will continue for a second year. The fellowship was designed to foster research in the history of modern physical sciences, and the selected fellow, having completed his first year, will now be able to continue for a second term. The physical sciences encompass disciplines such as physics, astronomy, chemistry, mathematics, and earth sciences, as well as border fields between these disciplines.

Theodore Postol, professor of science, technology, and international security and staff member of the Science, Technology, and Global Security Working Group received additional support from the John D. and Catherine T. MacArthur Foundation to continue his research in preserving and enhancing technical security research and education.

### **Ongoing Program Activities**

Ongoing STS activities bring a wide variety of distinguished scholars to the MIT campus on a regular basis. The longest running of these activities is the STS Colloquium Series. In 2009–2010 we hosted a joint colloquium series with Harvard's Department of History of Science titled the Subway Series. Faculty hosts from STS and Harvard included David Mindell and Adelheid Voskuhl (Harvard) in the fall and Hanna Rose Shell and Jimena Canales (Harvard) in the spring. The series had a total of 11 speakers on topics including "The Adventures of Mr. Machine with Morals," "Embodying Control in the Operating Room," "The Credit Crisis as a Problem in the Sociology of Knowledge," "Charming Augustine and the Dramatization of Mental Disturbance," and "Critical Judgement in the Age of Artificial Eyes."

Every year STS also sponsors the Arthur Miller Lecture on Science and Ethics, which is promoted to the larger MIT and Boston-area communities. This past fall, Troy Duster, Silver professor of sociology at New York University and author of *Backdoor to Eugenics*, delivered the Miller lecture on the topic "Reflections on the Shifting Political and Cultural Status of Human Molecular Genetics."

MIT's History faculty and STS continue to cosponsor the MIT Seminar on Environmental and Agricultural History (formerly called the Modern Times, Rural Places Seminar Series), which brought six speakers to campus to give talks on environmental and agricultural history.

The Benjamin Siegel Prize of \$2,500 is awarded to the MIT student submitting the best written work on issues in science, technology, and society. The prize is open to undergraduate and graduate students from any school or department of the Institute. This year's prize committee (Hanna Rose Shell and Clapperton Mavhunga) awarded the 2009–2010 Benjamin Siegel Prize to HASTS graduate student Alma Steingart for her paper "In Practice and On Paper: Embodiment and Materiality in the Twentieth-Century Convergence of Mathematics and Origami."

### **Knight Science Journalism Fellowships**

This past year was the 27th year of the Knight Science Journalism Fellowships program at MIT, and the second year under the leadership of Philip J. Hilts. The program continues to attract science journalists from around the world seeking to learn more about the science and technology they cover.

The 27th class of fellows included Michael Barnes (a television producer and writer whose work has appeared on public television's *NOVA* as well as on other American and British networks); Daniela Hirschfeld (editor of *Galería* magazine, a part of the *Búsqueda* Newsweekly published in Montevideo, Uruguay; frequent contributor to and regional consultant of [SciDev.net](http://SciDev.net), an online news service covering issues in science and international development); Marcin Jamkowski (former editor-in-chief of the Polish edition of *National Geographic* magazine; now a freelance writer, photographer, and video producer for such publications as *Newsweek*, *National Geographic*, *Gazeta Wyborcza* newspaper, and *Focus* magazine); Konstantin Kakaes (prior to the fellowship, writer for the *Economist*, covering Mexico, Central America and the Caribbean), Chris Mooney (blogger at [blogs.discovermagazine.com/intersection/](http://blogs.discovermagazine.com/intersection/); author of three books, including *Unscientific America: How Scientific Illiteracy Threatens Our Future*, co-authored with Sheril Kirshenbaum); Susan Moran (freelance writer and frequent contributor to the *New York Times* and the *Economist*; co-host of *How on Earth*, a weekly radio program on KGNU in Boulder, Colorado); Onche Odeh (science writer for the *Daily Independent* in Lagos, Nigeria); Mary Otto (former reporter for the *Washington Post* and Knight Ridder newspapers; editor of the newspaper *Street Sense*); Rowan Philp (chief reporter for the *Sunday Times*, South Africa's largest newspaper); Eugenie Samuel Reich (freelance writer and contributor to *New Scientist* magazine and the *Boston Globe*; specializes in investigative reporting; author of *Plastic Fantastic: How the Biggest Fraud in Physics Shook the Scientific World*); Craig Simons (prior to the fellowship, Asia Bureau Chief for Cox Newspapers from 2005 to 2009; has covered China for over a decade); and Xiaojian Zhao (reporter for the Beijing bureau of *Southern Weekly*, the weekly newspaper with the largest circulation in China). Several of these individuals lost their jobs during the period of their fellowship due to the financial cutbacks and reorganization many newspapers are currently facing.

Fellows spent most of their time attending classes at MIT and Harvard, but also attended more than 40 specially organized faculty-led seminars, as well as other seminars and workshops devoted to science and technology and their wider impacts. In collaboration with Professor Kaiser of the STS Program, the Knight Program co-sponsored two brown bag lunch talks this year.

With the hiring of Dianne Finch as the Knight program's manager for new media in June 2009, the program added a new media component to the 2009–2010 fellowship year. Phil Hilts organized three week-long intensive seminars, referred to as boot camps or workshops, for current Knight fellows and other science journalists. These included the Medical Evidence Boot Camp (now in its eighth year and still as popular as ever), the Food Boot Camp, offered for the second time, and The Universe, the fourth Kavli Science Journalism Workshop.

In April, the Knight program contributed to and participated in the lecture series The Future of Science Journalism. Hosted by the MIT Museum as part of the Cambridge Science Festival, the series included speakers from MIT, New York University School of Journalism, and the *New York Times*. The program also began a complete rebuilding of the Fellowships website, which now hosts a broad array of multimedia content on science and journalism. Knight Fellows spent two days in October at the Marine Biological Laboratory and the Woods Hole Oceanographic Institute. The fellowships are supported by an endowment from the John S. and James L. Knight Foundation of Miami, by MIT, and by alumni and foundation gifts. More information about the Knight Science Journalism Fellowships program can be found at <http://web.mit.edu/knight-science/>

## Faculty Activities

Professor Michael Fischer published *Anthropological Futures*, co-edited *A Reader in Medical Anthropology*, and continued editing his book series, *Experimental Futures: Technological Lives, Scientific Arts, Anthropological Voices* (his own book is third in the series; former advisee and HASTS alumnus Aslihan Sanal's monograph on organ transplantation is seventh, and former advisee and HASTS alumnus Kaushik Sunder Rajan's edited volume on biotechnologies is eighth). He served on the editorial boards of four journals: *The Human Genome Organization (HUGO) Journal*; *Cultural Anthropology*; *Cultural Politics*; and *East Asian Science, Technology and Society*. He continues to serve on the Board of Governors of the University of California Humanities Research Institute. He published two journal articles and three book chapters, plus a widely read scenario-building exercise about Iran on a PBS.org website (Tehran Bureau). He taught four courses, a graduate reading tutorial, and led a Freshman Advising Seminar Arts Program section. He chaired three dissertation committees, and served on two more. He helped organize workshops on translational medicine at MIT, on the ethnography of Iran at the University of California, Irvine, and served as rapporteur for the joint Organisation for Economic Co-operation and Development–HUGO meetings on biotechnology and the economy in Montpellier, France. He gave a keynote talk at the Summer School Capstone Conference, National University of Singapore, on STS in Asia, as well as serving as overall participant in a Harvard workshop on Political, Economic and Cultural Transformations in Indonesia.

Professor Jones, in addition to his research in the history of cardiology and cardiac surgery, received a grant (with two STS colleagues) from the NSF to continue work on modeling the dynamics of scientific research. He is now writing two book manuscripts based on this research. In addition to giving invited talks at McGill University and Harvard University, he presented his work at MIT's Academic Council. In the fall he taught an undergraduate subject, a HASS-D/CI course on the history of disease and medicine (STS.005) and a graduate survey of science studies (STS.260). In the spring he taught one undergraduate subject, a HASS-D/CI course on bioethics (24.06/STS.006). In addition to his work at MIT, he is a lecturer in the Department of Global Health and Social Medicine at Harvard Medical School, where he co-directs two required first-year courses on social medicine—one for students in the New Integrated Curriculum (SM.750), and one for students in Health Sciences and Technology (HST.934). His work on SM.750 was recognized with the 2010 Donald O'Hara Faculty Prize for Excellence in Teaching.

Professor Kaiser completed his book *How the Hippies Saved Physics* (W. W. Norton, forthcoming) during the 2009–2010 academic year. He also put the finishing touches on his edited volume *Becoming MIT: Moments of Decision*, which will be published by MIT Press in September 2010 to help launch the MIT150 anniversary celebrations. In addition to his books, he published two articles in *Physical Review D* pertaining to early-universe cosmology (one of them co-authored with a physics graduate student whose master's thesis he supervised); co-authored one historical article with one of his HASTS graduate students (to appear in an edited volume on the history of Cold War science and technology); guest edited and co-wrote an introduction for a "Focus" section in the journal *Isis* (on Cold War science); and published two brief essays in the *London Review of Books* (on the history of recent physics). He delivered seven invited seminars and colloquia, including a public lecture for the Cambridge Science Festival, and was filmed for a contribution to an upcoming NOVA television documentary on the nature of time. He completed his first year as director of graduate studies for MIT's doctoral program in HASTS; served on the MIT Faculty Policy Committee; was promoted to the editorial board of the journal *Historical Studies in the Natural Sciences*; and continued his service as an editorial board member of the MIT Press. With David Jones and Vincent Lépinay of STS, Kaiser proposed and was awarded a large new grant from the NSF to support two years of research in scientometrics. He also continued his consulting service for the Office of Scientific and Technical Information of the US Department of Energy.

Assistant professor Vincent-Antonin Lépinay finished up his book *Codes of Finance* (MIT Press, forthcoming), worked on a second manuscript, "How to Be a Bad Trader: Lessons from Economics and Law" (under consideration by Princeton University Press), and finished three articles. He presented papers at four conferences and collaborated with his colleagues David Kaiser and David Jones on the scientometrics initiative.

Assistant professor Clapperton Mavhunga worked on revisions to his manuscript "The Mobile Workshop," which he will resubmit to MIT Press by November 2010. The year started with a trip to Makuleke, a village in rural Africa, to direct his Traditional Knowledge of African Villages project. He used the occasion to conduct further research for "The Mobile Workshop" and to start conceptualizing a second book project based

on the archives he and Makuleke villagers are collecting and assembling into a local museum. Last summer, Mavhunga set up a library at Makuleke with a colleague who subsequently formed an independent nonprofit organization to develop resources for children's education and libraries. With the indigenous knowledge databank project, Mavhunga hopes to take students from MIT and other US universities to the village to work with locals to turn the collected material into solutions for local and global poverty and environmental problems, as well as improve student comprehension of science and technology in nonwestern societies. His Makuleke initiative, as well as his observations of villagers, prompted Mavhunga to propose a new course, STS.032 Energy, Environment, and Society, with a section titled Energy at the Grassroots in the fall of 2009. Mavhunga then expanded his course materials into a longer film or book narrative called "African Energy Innovations" and applied for funding. He additionally asked students enrolled in professor Jeffrey Steinfeld's 5.92J/10.191J Projects in Energy class to translate the narrative into a film script. The script is now ready, the funding is in place, and shooting will begin during the next Independent Activities Period. Mavhunga has also completed three papers now in press, including "A Plundering Tiger with Its Deadly Cubs? The USSR and China as Weapons in the Engineering of a 'Zimbabwean Nation,' 1945–2009", in Gabrielle Hecht (ed.), *The Technopolitical Shape of Cold War Geographies* (MIT Press, forthcoming) and "Vermin Beings: On Pestiferous and Human Game," in the journal *Social Text*. He also co-convened the Mobility and the Environment workshop at the Rachel Carson Center in Munich, in June 2010, for the *Inside Mobility* volume and book series he is co-editing with Gijs Mom for MIT Press and organized a panel on "STS in Non-western Context" at the Society for the History of Technology annual meeting in Pittsburg. In May, Mavhunga was named a BMW-Quandt Poesis young fellow for 2010–12, joining eight other early-career intellectuals from around the world to work under the mentorship of distinguished senior fellows.

Professor Mindell's book *Digital Apollo: Human and Machine in Spaceflight* (2008) was awarded the Eugene M. Emme Award from the American Astronautical Society for the best book on the history of astronautics and spaceflight. Mindell and MIT professor Edward Crawley published a white paper for Congress on "US Human Spaceflight: The FY11 Budget and the Flexible Path." Mindell became dual-appointed in MIT's Department of Aeronautics and Astronautics. He continues to serve as chair of the MIT150 Steering Committee. Mindell keyed the US Air Force Symposium on "The Future Operator," focusing on professional roles in a new world of automated and remote aircraft. Mindell is beginning a new research project called Automation, Robotics, and Society with initial funding from a gift by an MIT alumnus. This project examines a host of issues that arise with automated and robotic systems with a comparative perspective across several domains, including human spaceflight, commercial aviation, general aviation, air force unmanned vehicles, undersea exploration, and surgery. The project is beginning in collaboration with Lufthansa, FedEx, the US Air Force, and the Woods Hole Oceanographic Institution. Mindell developed and taught a new course with professor Merritt Roe Smith on the history of MIT.

Professor Postol continues his work on policy issues connected with missile defense systems in collaboration with the Science, Technology and Global Security Working Group.

Professor Schüll began her third year at MIT with a research sabbatical, during which she completed her first book, *Addiction by Design: Machine Gambling in Las Vegas*, forthcoming from Princeton University Press. She also conducted research on changing models of consumers in the new fields of neuroeconomics and neuromarketing. An article based on this work has been accepted for publication in the *Journal for the Social Studies of Science*. During the academic year, Schüll presented the keynote talk at the New York Council on Problem Gambling's annual meeting and gave expert testimony twice at the Massachusetts State House regarding the proposed Massachusetts gambling bill. She also served as a consultant to CBS's *60 Minutes*, helping to shape the development of a segment on new video slot machines and addiction, in which she will appear in the coming academic year. Schüll's teaching in the spring included STS.091 Critical Issues in STS and the HASS-D/CI-H course STS.010 Neuroscience and Society. Schüll continued to lead the committee on STS Curricular Reform, which has devised five thematic tracks to orient undergraduate students' course of study, each following a progressive Tier I/Tier II structure. The new curricular format has been serving as a compass to guide faculty teaching plans and future course development in the program. In the spring, Schüll was successfully promoted to associate professor (without tenure).

In 2009–2010, Professor Shell taught two new courses as well as an advanced graduate seminar in research and writing methods in STS (STS.390). The two new classes are STS.056 Science and the Cinema: Experiments on Film and STS.003 The Rise of Modern Science (co-developed and taught with David Kaiser). She continued work on her book project and wrote an article that will be published in the *Journal of Visual Culture*.

Professor Smith continued his appointment as distinguished lecturer for the Organization of American Historians and honorary guest professor at the Kanazawa Institute of Technology (Japan). He ended his six-year involvement as co-principal investigator of the NSF/Integrated Graduate Education and Research Traineeship-funded Program on Emerging Technologies at MIT. In addition to serving on several MIT committees (Dean for Undergraduate Education Faculty Advisory Committee, Student Support Services Faculty Advisory Committee, Ad Hoc Advisory Committee of the Alumni Association Travel Program, and Convener of the Housemaster's Council), Smith is housemaster of MIT's Burton-Conner undergraduate student residence. He continues to edit the Johns Hopkins Studies in the History of Technology series for the Johns Hopkins University Press and serves on advisory committees for the American Precision Museum, WGBH's American Experience television series, the Thomas A. Edison Papers project at Rutgers University, the American Textile History Museum, and the Lincoln Prize at Gettysburg College. In addition to delivering keynote lectures at four National Endowment for the Humanities Landmarks of American History Teacher Workshops at the Tsongas Industrial History Center/U-Mass Lowell (summer 2009), he also spoke at Westfield State College, the Deerfield Teachers Center, and the University of Northern Illinois/Rockford School System. Smith continues to work on his book about technology during the American Civil War. *Reconceptualizing the Industrial Revolution*, which Smith co-edited, will be published by MIT Press in the fall.

Professor Sherry Turkle's work this year focused on completing *Alone Together: Why We Expect More of Technology and Less of Each Other*, to be published in January 2011



by Basic Books. The book reports on fifteen years of work studying sociable robots and the networked life. Professor Turkle was featured on the BBC series *The Virtual Revolution* and on Frontline's *Digital Nation* on PBS. On radio, she has been interviewed on numerous National Public Radio broadcasts, speaking about the human side of the networked life. She was quoted as an expert in a series of *New York Times* articles that centered on the psychological effects of the digital revolution. Professor Turkle's presentations in 2009–2010 included the Snyder Presidential Lecture at Tufts University and the Lowell Lecture at Harvard. She has also spoken at the annual meeting of the Washington Psychoanalytic Institute, the Middlesex School, the Massachusetts College of Art, the Paley Center for Media, and the Media Group at WGBH, Boston. She is now working on a new book on the developmental effects of networking.

Professor Rosalind Williams continues to serve on a variety of committees related to European STS programs. In July 2009 she attended the first meeting of the Lisbon Network on The Crisis and its Aftermath: Socio-cultural Perspectives, a three-year research project sponsored by Gulbenkian Foundation. She is developing a research project on experiencing history, with a case study on "The Revolt at Berkeley in 2009–10," to be presented at the final meeting of the network in July 2011. In September she attended a review meeting of the Scientific Commission for the Internet Interdisciplinary Institute at the Universitat Oberta de Catalunya (Open University of Catalonia). In November she gave an invited lecture and a workshop on the role of STS in engineering education at the Technical University of Eindhoven, the Netherlands. Finally, in January, she participated in a review committee as a member of the International Advisory Board for the research master's program in Cultures of Arts, Science, and Technology, at the University of Maastrich, the Netherlands. She continues to serve on the editorial board of Cultures of Arts, Science, and Technology and the Advisory Board and Collections Committee of the MIT Museum. She has also been part of a small editorial team preparing a special cluster of 14 papers from an NSF-sponsored workshop at the 50th anniversary of the Society for the History of Technology for publication in the society's journal *Technology and Culture*. In the spring her article "Second Empire, Second Nature, Secondary World: Verne and Baudelaire in the Capital of the Nineteenth Century" was published in *Urban Assemblages: How Actor-Network Theory Changes Urban Studies*, ed. Thomas Bender and Ignacio Farias (Routledge, 2009). This is part of her large 2009–2010 book project which is now ready to find a publisher.

**David A. Mindell**

**Director**

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*More information about the Program in Science, Technology, and Society can be found at <http://web.mit.edu/sts/>.*