ARTS
CENTER FOR ART,
SCIENCE & TECHNOLOGY
AT MIT

MIT Massachusetts Institute of Technology

Programs 2019–20

**MIT Center for Art,
Science & Technology**

2019–20 Programs

The

**/ARTS
/AT MIT**

**are rooted in
experimentation, risk-
taking, and imaginative
problem-solving.**

Cover image: A participant immersed in Matthew Ritchie's *The Invisible College,* presented on
Sol LeWitt's artwork, *Bars of Color Within Squares*, a vibrantly colored floor in the U-shaped
atrium of MIT's Building 6C. Credit: Caroline Alden.

In This Issue

From the Directors

Little did we know. *The Invisible College*, a multidisciplinary artwork in progress about MIT's research culture by Matthew Ritchie, first appeared in January 2020 as an immersive, virtual reality experience, staged on the Sol LeWitt terrazzo floor in the atrium of the physics building. The Dasha Zhukova Distinguished Visiting Artist at CAST, Ritchie was inspired by Sir Francis Bacon's description of an eponymous entity in the unfinished utopian novel, *New Atlantis* (1627). Imagining the unseen topology of MIT's informational and physical spaces, he created a performative, multilayered game space by superimposing datasets from scientific papers morphed by customized neural networks (GANs, or generative adversarial networks) and 360-degree video footage of the campus, often of deserted corridors, empty classrooms, and labs at night. When MIT was evacuated in response to the COVID-19 pandemic, these empty spaces, only diagrammatic skeletons in the VR experience, became the real reality (RR); masked and virtual interaction, at a distance, became the new normal. Looking back, Ritchie has said, "There was already this odd resonance in the project of what was yet to come, which is an empty campus, a darkness visible."

The academic year had begun in July 2019 on a celebratory and optimistic note for the MIT Center for Art, Science & Technology–with the renewal of funding from the Mellon Foundation in support of CAST's vision and transition from growth to sustainability in the life cycle of this

relatively young initiative. The interruption of business as usual, although abrupt, nonetheless had the unexpected benefit of revealing emergent properties and latent possibilities in many of the year's projects. A CAST-sponsored class such as Digital Instrument Fabrication hardly missed a beat as the Institute transitioned to online learning; but in other cases, the transmedia and multiplatform innovation that the Center has long encouraged suddenly became urgent and necessary.

CAST's most recent publication, *Being Material*, which appeared in fall 2019, is an extended collaborative meditation upon the memorable claim that an increasingly networked and computational world would move experience from a realm of "atoms to bits." Designed to be a digitally activated object as well as a physical book, the hybrid publication used machine learning and computer vision to recognize graphic patterns on the dust jacket and on the interior printed pages to interact with a companion website. This allowed the reader to unlock soundtracks, videos, and creative coding that complement and extend the written material. The book was recognized by AIGA (American Institute of Graphic Arts) with a 50 Books|50 Covers award, ironically, just as public health lockdowns spread around the globe. It became acutely clear that the material, physical, and in-person interaction upon which artistic production relies would of necessity be entirely channeled through digital technologies in

the near future. Or, consider the MIT Critical Broadcasting Lab, which was established as an alternative platform for discourse in contemporary architecture, organized around curated conversations and collective activities. After the campus closed in March, the Lab continued its work by broadcasting "Conversations on Care" on the student-run radio station created for the dispersed school, What Are We Doing? Radio (WAWd?Radio).

Each category of work in the pages that follow embraces challenges for the arts that have become more vivid under the constraints of the current situation. **Social Spaces/Infrastructures** have been upended and indeed will have to be reimagined to incorporate new kinds of physical spaces and interactions. **Animating Knowledge** may come to mean not only translating scholarship into creative forms but also activating

emotional responses to lifesaving information in ways that the arts are uniquely equipped to do. One can hope that **New Materialisms** will render visible and invisible interconnections among materials and people more palpable and benevolent. And **Speculative Machines**, if able to envision imaginative technologies for the world to come, have never been more desirable.

Since CAST's inception, we have tried to maintain a nimble and responsive approach to the creative culture of the campus and to be attentive to how it is intertwined with the pressing problems that drive the research engine of MIT. We embrace unexpected outcomes. Flexibility and adaptability are watchwords. We will need them now more than ever, as we learn in the coming months and years how artists can make the virtual world more vibrant.

Evan Ziporyn
Kenan Sahin (1963) Distinguished
  Professor, Music and Theater Arts
Faculty Director, CAST
Artistic Director, *MIT Sounding*

Leila W. Kinney
Executive Director of Arts Initiatives
Executive Director, CAST

Image: Evan Ziporyn conducts the Ambient Orchestra as part of *MIT Sounding*. Credit: Caroline Alden.

About CAST

CAST Mission Statement

The MIT Center for Art, Science & Technology (CAST) creates new opportunities for art, science, and technology to thrive as interrelated, mutually informing modes of exploration, knowledge, and discovery. CAST's multidisciplinary platform presents performing and visual arts programs, supports research projects for artists working with science and engineering labs, and sponsors symposia, classes, workshops, design studios, lectures, and publications.

Funders

The Center for Art, Science & Technology is funded, in part, through 2024 by a grant from the Andrew W. Mellon Foundation. Additional support comes from Dasha Zhukova; Michael and Sonja Koerner; the late Fay Chandler; Ron and Carol Kurtz; Joan and Paul Gluck; Terry and Rick Stone; Eugene Stark; Peter Athens; and other individual benefactors. MIT support comes from Philip S. Khoury, Associate Provost with responsibility for the arts; Melissa Nobles, Kenan Sahin Dean, School of Humanities, Arts, and Social Sciences; Hashim Sarkis, Dean of the School of Architecture + Planning; and the Council for the Arts at MIT.

CAST Activities

Cross-Disciplinary Classes

Soliciting and supporting cross-disciplinary curricular initiatives that integrate the arts into the core curriculum and create new artistic work, materials, media, and technologies for artistic expression.

Public Outreach

Disseminating to the public the creative and intellectual production supported by the Center through performances, exhibitions, installations, videos, publications, and a biennial symposium.

Residencies

Producing a Visiting Artists program that emphasizes research and development of creative work, cross-fertilization among disciplines, and extensive interaction with MIT faculty, students, and researchers.

Support

Assisting in the presentation and curation of art relevant to the research of engineers, scientists, and the MIT community as a whole; supporting faculty, students, and postdoctoral researchers whose work advances the mission of the Center.

2012–20 Program Statistics

6,500+ students enrolled in classes or participated in a workshop, symposium, or performance.

130+ MIT faculty and staff representing all five schools collaborated with CAST.

90+ Visiting Artists engaged with students during **230+** class visits and individual meetings.

67,000+ people attended **170+** public programs in person, and another **4,800+** joined via live web streams.

30+ collaborative projects appeared in significant festivals or exhibitions in Amsterdam, Basel, Berlin, Cairo, New York, Paris, São Paulo, Tel Aviv, Tokyo, and Toronto.

Partners at MIT

Office of the Provost
List Visual Arts Center
MIT Museum

Office of the Vice President for Research
MIT.nano

School of Architecture + Planning (SA+P)
Architecture
Art, Culture and Technology
Community Innovators Lab
History, Theory and Criticism of Architecture and Art
Media Lab
Urban Studies and Planning

School of Engineering
Aeronautics and Astronautics
Civil and Environmental Engineering
Computer Science and Artificial Intelligence Laboratory
Electrical Engineering and Computer Science
Glass Lab
Materials Science and Engineering
Mechanical Engineering

School of Humanities, Arts, and Social Sciences (SHASS)
Anthropology
Comparative Media Studies/Writing
Global Studies and Languages
History
Linguistics
Literature
Music and Theater Arts
Science, Technology and Society

School of Science
Biology
Brain and Cognitive Science
Earth, Atmospheric and Planetary Sciences
Edgerton Center
Laboratory for Multiscale Regenerative Technologies
McGovern Institute
Physics

Sloan School of Management
Martin Trust Center for MIT Entrepreneurship
MIT Leadership Center

Student Life
Concourse Program
Hillel Program

Social Spaces/ Infrastructures

Reimagining the spaces of social interaction

What kinds of ideas, conversations, and dreams can spaces engender? How do built forms—the architecture of spaces—intersect with the ways in which we relate to one another in a shared world? These projects explore the intertwined relationships among physical spaces, intellectual production, and public life.

Ana Miljački's Critical Broadcasting Lab explores "new forms of operative criticism," staging workshops and public lectures to intervene in contemporary architectural discourse. In the new Spatial Sound Lab, Ian Condry examines how a 360-degree listening environment—transcending the unidirectional audio experience of the podium or stage—may give rise to new democratic possibilities. Matthew Ritchie, whose probing philosophical and creative investigations at the Institute stretch back 20 years, delves into the "invisible college" of MIT: the unseen layers of interactions, discussions, movements, and ideas that give the Institute its meaning and identity. At the same time, MIT students have the opportunity to learn how dominant media theories intersect with architectural practice in CAST Postdoctoral Fellow Will Lockett's course, Architecture as Media Theory.

In studying and reimagining the places where we congregate, debate, discuss, and work together to create new art and knowledge, these scholars and artists engage in a deep re-envisioning of the social sphere.

Image: Installation view, Ana Miljački's Critical Broadcasting Lab *PLAY ROOM*, MIT Architecture's Keller Gallery, 2020. Credit: Justin Knight.

Critical Broadcasting Lab
Experimental forms of architectural criticism

Exhibition: *PLAY ROOM*, The Keller Gallery, February 14 – March 9, 2020

Event: "Play Date: Barter Town" with Jeanette Kim,
All of the Above, and CCA, The Keller Gallery, March 6, 2020

Exhibition: *Retro-Utopian Alternatives for Belgrade, Serbia*, 2019 Seoul
Biennale of Architecture and Urbanism, September 7 – November 10, 2019

Exhibition: *Shared Trainers: A Dinner Party*, São Paulo
International Architecture Biennial, September 10 – December 9, 2019

Lectures: *Conversations on Care*, SA+P Long Lounge and What Are We Doing?
Radio (WAWd?Radio), various dates between September 2019 – May 2020

Every Friday this past spring, Ana Miljački hosted *Conversations on Care* on the Department of Architecture's What Are We Doing? Radio (WAWd?Radio), a station launched after the evacuation of the MIT campus. The conversations, which began as a series of live workshops and lectures, featured curators and writers, such as Beatrice Galilee, Tom Weaver, and Sylvia Lavin, and explored the idea of maintenance and caretaking—a timely and crucial topic in the age of COVID-19.

The dialogues were the latest product of Miljački's Critical Broadcasting Lab, which also includes an oral history project, "I Would Prefer Not To," and a series of exhibitions. Recognizing the urgent need for an intervention in the field, Miljački formed the Critical Broadcasting Lab as a way of producing experimental new forms of

architectural criticism. "Its key medium is the architectural exhibition, broadened to include experiments with the entire contemporary ecology of broadcasting media," Miljački notes.

"The project is powered by a political mission: to change the way we talk about contemporary architecture."

While architectural exhibitions have been important sites of testing, dissemination, and consensus building in the field, they have rarely received the type of analysis on par with anything in the art world—a serious dearth that the Critical Broadcasting Lab is now changing.

In an era of endangered public discourse—where information is so often simplified or distorted—the Critical Broadcasting Lab aims to elevate the level of public dialogue around architecture. By experimenting with a diverse range of media platforms—websites, social media, podcasts, print, workshops, and public events—the Critical Broadcasting Lab stages the vital conversations that can form a resistance to the status quo.

Already, the Critical Broadcasting Lab is making an impact on the field. The lab exhibited at the 2019 Seoul Biennale of Architecture and Urbanism and at the São Paulo International Architecture Biennial. At MIT, Miljački and Critical Broadcasting Lab presented *PLAY ROOM*, an exhibition of board games and card games, whose rules and mechanics were designed to exemplify a series of contemporary topics in architecture.

By digging deep into the past and present of architecture, the Critical Broadcasting Lab helps to envision a better and more just future for and through architecture.

Images: (left) The board game PORTFOLIO AGENCY, created by Yun Wang and Ziyan Shang, examines the market for architecture portfolio prep schools. Credit: Justin Knight. (right) Installation view, the Critical Broadcasting Lab's *PLAY ROOM*, MIT Architecture Department's Keller Gallery. Credit: Justin Knight.

**2018–20 Mellon
Faculty Grant Recipient**

**Ana Miljački, Associate
Professor of Architecture, MIT**

The Invisible College

A multiplatform exploration of MIT

Demonstration: *The Invisible College* beta tests,
Green Center for Physics, January 28 and 29, 2020

Matthew Ritchie's new transmedia work takes inspiration from the "invisible college" of MIT: the interactions, discussions, and thought processes that take place outside of the formal classroom and administrative structure of the Institute. Working in close collaboration with a multidisciplinary team of MIT artists, faculty, and students, Ritchie views the Institute as a complex system whose evolving conditions are constantly shaping new iterations of the work.

Originally sited at Sol LeWitt's *Bars of Color within Squares*, a vibrantly colored floor in the U-shaped atrium of MIT's Building 6C, early iterations of the project featured a VR phantasmagoria overlaid upon LeWitt's bright,

minimalist grid. The visuals and soundscape, scored by Evan Ziporyn, drew on datasets representing scales of the universe—from nanoparticles to dark energy—reinterpreted by generative adversarial networks (GANs), a class of machine learning systems.

The Invisible College engages with and incorporates the many layers of the Institute— social, material, intellectual, and technological— from the rush of activity in the hallways between classes to the cutting-edge technologies being developed in the labs. Ritchie's goal is to explore how the Institute manifests itself as both an information space and a physical one—in all its productive messiness and chaos.

With the onset of the pandemic, the project transformed even further, evolving into a short, poetic film of the empty spaces on campus. It was filmed at night in 360 degrees before the campus was evacuated, which Ritchie sees as eerily prescient.

"But what remained was the idea of a multiplatform project that looks at MIT as an anthropological entity that's still continuing in time and space."

– Matthew Ritchie

Ritchie's works span installation, performance, painting, drawing, sculpture, and sound, investigating generations of systems, ideas, and their subsequent interpretations. Together, they weave a kind of cerebral web, concretizing ephemeral and intangible theories of information and time. Ritchie has engaged in many cross-disciplinary collaborations, extending his own projects to explore the possibility of shared systems and aggregations in contexts as diverse as opera, contemporary music, architecture, horticulture, urban design, theology, and science.

Through these projects, Ritchie explores themes of chaos and indeterminacy—the multivalent spaces in which, he says, "the radical rethinking of reality is going to happen." The CAST residency, he observes, offers this same rich open-endedness. Embracing chance and collaboration, the residency allows the

work to keep growing and adapting in new and unexpected ways.

Images: (left) Caroline A. Jones and Matthew Ritchie test a prototype of *The Invisible College*. Credit: Caroline Alden. (middle) A meeting is held in a conference room nearby as a participant explores *The Invisible College*. Credit: Heidi Erickson. (right) A participant immersed in *The Invisible College*. Credit: Caroline Alden.

Markus J. Buehler, Jerry McAfee (1940) Professor and Department Head, Civil and Environmental Engineering, MIT

Peter H. Fisher, Professor and Department Head, Physics, MIT

Caroline A. Jones, Associate Dean for Strategic Initiatives, School of Architecture + Planning, and Professor of Art History, Theory, and Criticism, Department of Architecture and Art, MIT

Matthew Ritchie, Dasha Zhukova Distinguished Visiting Artist, MIT

Sarah Schwettmann, PhD Candidate, Department of Brain and Cognitive Sciences, MIT

Evan Ziporyn, Kenan Sahin Distinguished Professor, Music and Theater Arts, MIT
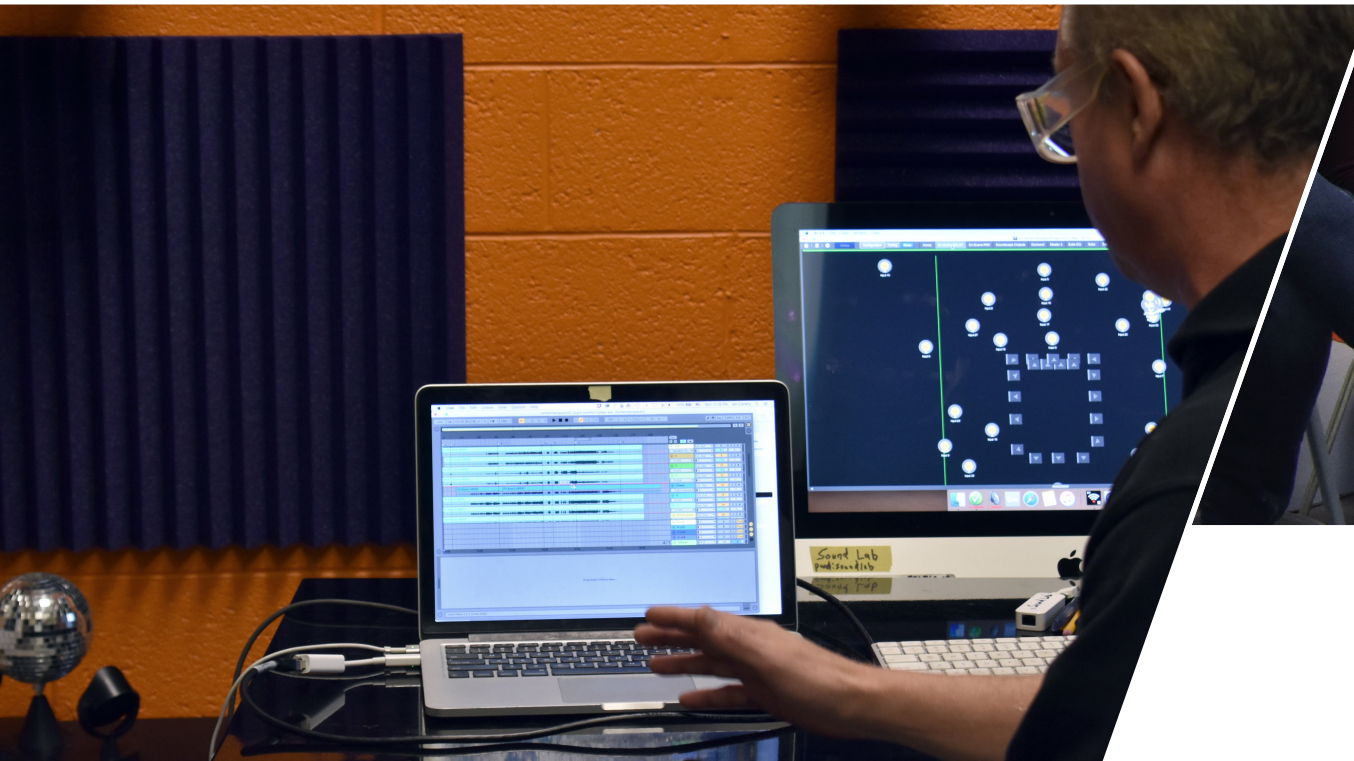
The Spatial Sound Lab
Listening in 360 Degrees

Program: *After Live: Reworking the Archive through Spatial Sound with Andy Graydon*, ACT Cube, November 14, 2019

Program: "Dissolve Music @ MIT: Spatial Sound Festival," Building W97, February 19–21, 2020

Program: "Sound, Learning, and Democracy," MIT START Studio, Building W97, 2019–22

Images: (left and above) Ian Condry demonstrates the 360-degree sound environment to MIT students. Credit: Harry Bachrach.

How better to actualize the promise of democracy—the power of many voices—than through a room that allows one to hear from multiple perspectives and in all directions?

The Spatial Sound Lab, launched by Ian Condry, is an experimental community studio for surround-sound productions in music, archival reimaginings, sound art, sensory ethnography, data sonification, teaching, and more. Working with the d&b Soundscape—a new technology that enables high-resolution, precise localization of sound objects—the lab explores the aesthetic and political possibilities of listening in 360 degrees.

Condry is a cultural anthropologist interested in "globalization from below"—cultural movements that achieve worldwide traction without support from major corporations or governments. His current research explores music and inequality, examining how new social and economic approaches to music offer insights into the disparities wrought by capitalism. In forming the Spatial Sound Lab, Condry wanted to create a space for using sound to disrupt hierarchies, reduce inequalities, and cross borders.

Through a series of workshops and listening sessions, his project "Sound, Learning, and Democracy" gave rise to new musical and sonic works created specifically for the 360-degree environment of the lab. These works reflected new approaches to performance and teaching that abandoned the podium to embrace the immersive and multiple perspectives of surround sound.

In February, Condry hosted the three-day conference and sound festival, "Dissolve Music 2020: Spatial Sound Festival at MIT," a collaboration between the Spatial Sound Lab and Non-Event, a Boston-based concert series for experimental new music. Featuring 30 performers from MIT and beyond, the festival aimed to melt away boundaries: between academic disciplines, between performers and audience, and between music and sound art. Combining art and scholarship, the festival highlighted the rich diversity of approaches to sound, while pointing the way toward alternative and more inclusive futures.

While we most often receive sound through unidirectional modes of communication—the stage, the screen, the earbud stream—immersive surround-sound experiences enable us to listen from all angles. They encourage us to hear voices from the margins and to recognize our own unique roles for acting in the world.

Fay Chandler Creativity Grant

Alban Bassuet, Acoustician

Susanna Bolle, Non-Event

Ian Condry, Professor of Global Studies and Languages with joint appointments in Comparative Media Studies/Writing and Anthropology, MIT

Andy Graydon, Video and Sound Artist

Kyle Keane, Lecturer and Research Scientist, MIT

Nicole L'Huillier and Juan Necochea, Musicians, Breaking Forms

Russell Pasetes '20, MIT

Architecture as Media Theory

The connections between the built form and bodies of thought

Class: Architecture as Media Theory, Spring 2020
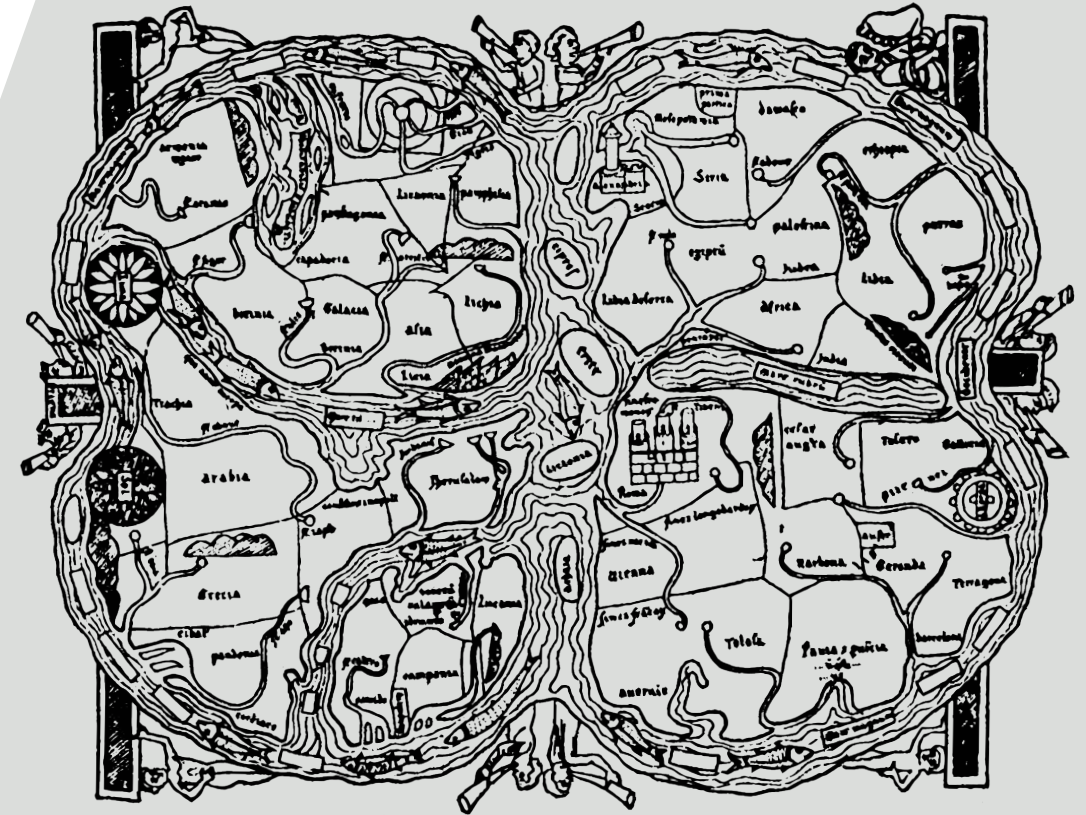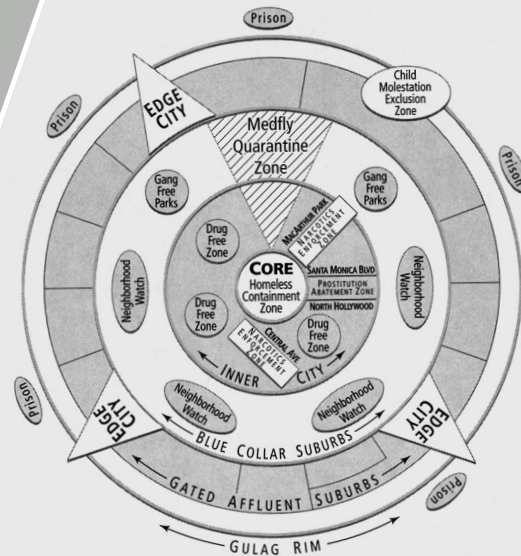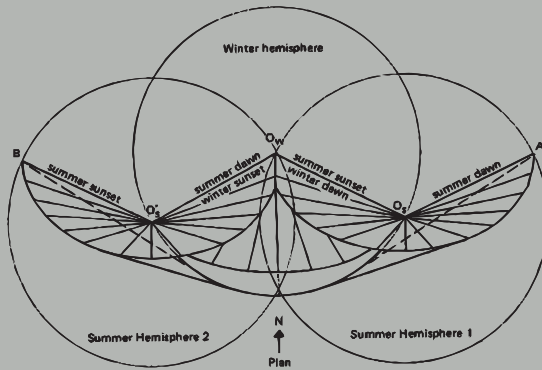
Buildings enact and modify media theories. In other words, buildings don't merely realize theories—they also function to organize the relationship of an individual to the natural, social, and political contexts that they inhabit. In William Lockett's course, Architecture as Media Theory, MIT students study the role that architecture plays in catalyzing and controlling these ways of life.

In media theory, scholars have called the ways in which the built form and bodies of thought intertwine as "media ecology," "political theology," and "discourse networks." Examples of these pairings include the energy-consuming infrastructures and anthropological theories of the nature-culture boundary, utopian urban plans and critical social theories, diagrams of global communications systems, and 1960s information theory.

Canonical texts in the history and criticism of architecture ground the course's approach to these three media theories. Students learn to nuance and enrich critical and speculative thought by selecting archival evidence and developing descriptive passages that fit with and modify those theoretical discussions. They also create diagrams, models, and booklets to help them formulate their own architectural media theories, using the visual language of ecological models, institutional footprints, and communications systems.

In studying how architecture embodies certain ways of being, students weave together the inseparable threads of making and thinking, illuminating how these dual strands are reflected in the architecture of our time.

Images: (left) Building plan geometry ordered by the motion of the solar flux. Credit: Ralph L. Knowles, *Energy and Form*, Cambridge, MA: MIT Press, 1974. (middle) Urban plans as white anxiety controls and criminalizes Blackness. Credit: Mike Davis, *The Ecology of Fear*, New York, NY: Vintage, 1999.

(right) Eighth-century CE map of the ancient world; spatial logic ordered by centers of writing. Credit: André Leroi-Gourhan, *Gesture and Speech*, translated by Anna Bostock Berger, Cambridge, MA: MIT Press, 2018 [1964–1965].

William Lockett, Postdoctoral Fellow, CAST, MIT

Animating Knowledge

Translating scholarship into creative forms

In these projects, artists, graphic artists, and composers translate and communicate academic knowledge—whether it's cosmic data from the universe or the sociology of water rights—into new creative forms, engaging broader audiences with the most exciting and urgent ideas of our time.

Elena Ruehr's otherworldly musical composition, *Songs for Extrasolar Spaces*, was inspired by the celestial information transmitted from the Transiting Exoplanet Survey Satellite (TESS), an MIT-led NASA mission to discover new planets around nearby stars. Artist Sarnath Banerjee and MIT Professor of Economics Abhijit Banerjee translate Professor Banerjee's Nobel Prize-winning research into a dramatic multimedia extravaganza, in the style of a nineteenth-century illustrated lecture. Rosa Colón Guerra, a comics artist from Puerto Rico, collaborates with Mikael Jakobsson, an MIT Comparative Media Studies Research Scientist, to unpack the intricacies of the island's debt crisis from an Indigenous perspective—in the playful form of a board game.

What these projects show, uniting intellectual expertise with artistic methodologies, is that academic ideas need not be bound by the conventions of the traditional research paper—that the most cutting-edge scholarship may find wide public expression in myriad creative ways.

In This Section

Songs from Extrasolar Spaces

"The Land of Good Intentions"

A Counter-Colonial Board Game

Image: Lorelei Ensemble performs *Songs from Extrasolar Spaces* in MIT Kresge Auditorium, 2019. Credit: Danny Goldfield.

Songs from Extrasolar Spaces
Translating the cosmos into music

Concert: *Songs from Extrasolar Spaces: Music Inspired by TESS*,
MIT Kresge Auditorium, July 30, 2019

Part of an MIT conference on TESS—the Transiting Exoplanet Survey Satellite—*Songs from Extrasolar Spaces* was the brainchild of MIT graduate Natalia Guerrero, who manages the team finding planet candidates in the TESS images at the MIT Kavli Institute for Astrophysics and Space Research. Launched in April 2018, TESS is an MIT-led NASA mission that scans the skies for evidence of exoplanets: bodies ranging from dwarf planets to giant planets that orbit stars other than our sun. During its two-year mission, TESS and its four highly sensitive cameras survey 85% of the sky, monitoring more than 200,000 stars for the temporary dips in brightness that might signal a transit—the passage of a planetary body across that star.

Images: (left and above) The Lorelei Ensemble performs *Songs from Extrasolar Spaces* in MIT Kresge Auditorium, 2019. Credit: Danny Goldfield.

"A sense of vastness, of infinity. This is the sensation I tried to capture and transpose into vocal music."

– Elena Ruehr

For astronomers and the public, *Songs from Extrasolar Spaces* served as a source of inspiration for what is to come in the human search for understanding. "Music has the power to generate incredibly powerful emotions," says Ruehr. "So do these images from TESS. In many ways, they are more beautiful than any stars we might ever imagine."

Images of outer space have long provoked fundamental questions, both scientific and poetic, about humanity's place in the universe: What is essential for life? Are we alone? Are we unique?

At MIT's Kresge Auditorium, a group of composers and musicians rendered visions from space in a concert titled *Songs from Extrasolar Spaces*. Featuring Lorelei Ensemble—a Boston-based women's choir—the concert included premieres by MIT composers John Harbison and Elena Ruehr, along with compositions by Meredith Monk and Molly Herron. All the music was inspired by discoveries in astronomy.

"There is a feeling you get when you look at these images from TESS," says Ruehr, an award-winning MIT faculty member and former Guggenheim Fellow. "A sense of vastness, of infinity. This is the sensation I tried to capture and transpose into vocal music."

Fay Chandler Creativity Grant

Natalia Guerrero, TESS TOI Manager, MIT

John Harbison, Professor, MIT

Lorelei Ensemble

George Ricker, TESS Principal Investigator, MIT

Elena Ruehr, Music and Theater Arts Lecturer, MIT

Sara Seager, Class of 1941 Professor of Physics and Planetary Science and TESS Deputy Director of Science, MIT

"The Land of Good Intentions"
Demystifying economics through live storytelling

Lecture: "The Role of Visual Imagination in Unraveling a Tangled World," Building E15-207, September 19, 2019

In his recent graphic novel, *All Quiet in Vikaspuri*, Sarnath Banerjee depicts an apocalyptic battle for water in the drought-plagued city of Delhi, tracing one hero's journey to the center of the Earth in search of the mythological Saraswati River against mounting mayhem. In a surreal and humorous style—the images saturated with contemporary Indian culture—Banerjee deftly connects the problem of water shortage to the lives of everyday people.

These themes of growth, greed, and power are mirrored in Nobel laureate and MIT professor Abhijit Banerjee's critically acclaimed work on global poverty. Now, using the graphic novel as a point of departure, the artist and economist (who are not related) are collaborating to create an innovative public performance-lecture that bridges the gap between the specialized discourses of social science and the loud, inchoate, but intuitive, expressions of daily life.

The project emerged from years of conversations between the economist and artist—with topics spanning from rogue politicians and humbug policymakers to the Indian middle class and their childhoods in Calcutta. Both share the conviction that storytelling is an essential tool to reach broader audiences and reexamine the key ideas—such as poverty and efficiency—used to justify policies that can have disastrous and far-reaching effects.

"Art is how we construct new languages—so, in a sense, that's at the core of what we're trying to do."

– Abhijit Banerjee

Set against the backdrop of the fictitious Water Wars of Delhi, the series of short, interconnected melodramas will be presented as a theatrical lecture performed by Professor Banerjee.
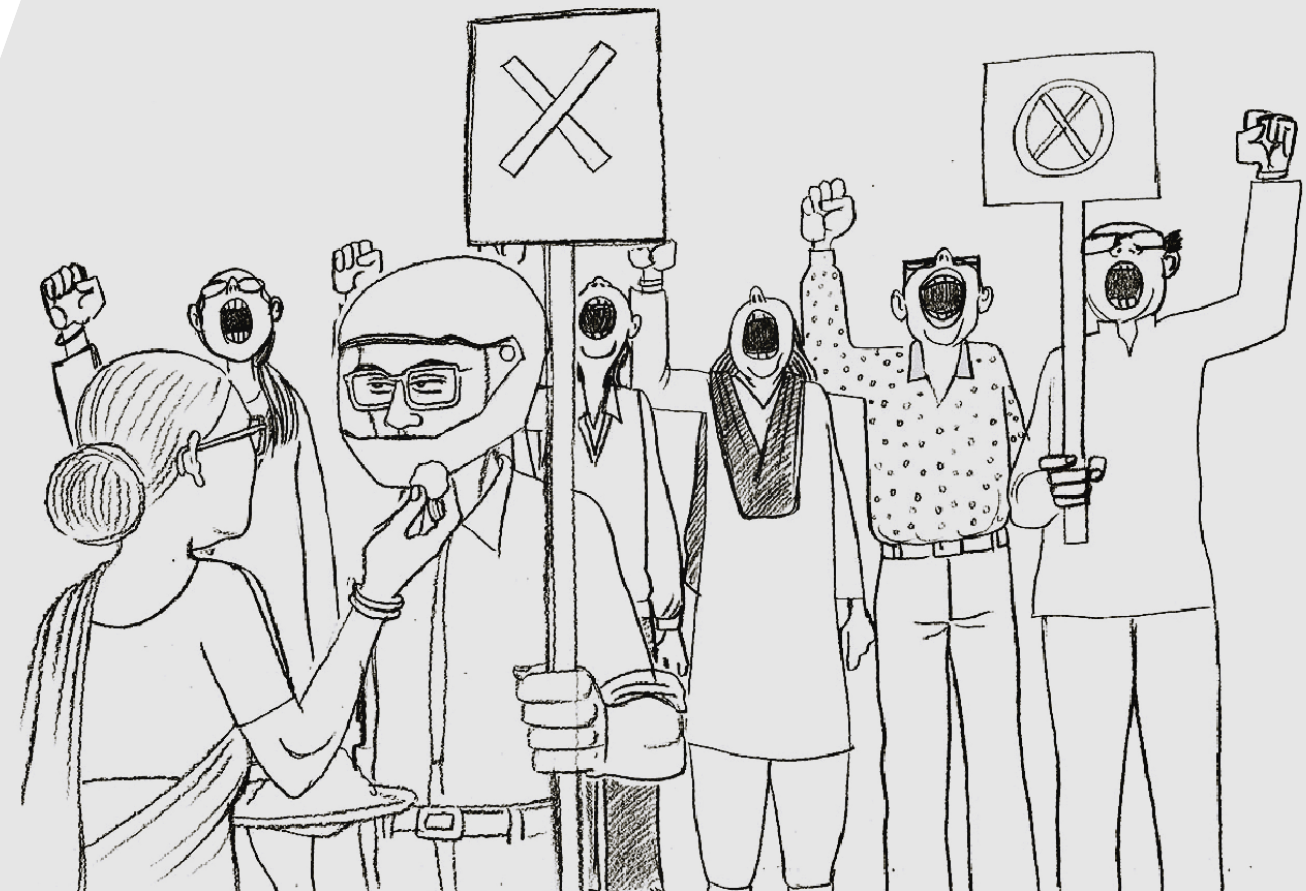
It echoes the nineteenth-century lectures by luminaries such as Charles Darwin, Prafulla Chandra Ray, Acharya J.C. Bose, Mary Wollstonecraft, John Locke, and Michael Faraday, which were held in London, Berlin, Calcutta, and other centers of learning. These lectures were dramatic presentations of provocative scientific discoveries, playing to the theatrical culture of the time to impart a lasting impression on audiences.

Professor Banerjee and Sarnath Banerjee re-enchant the subject of economic growth, using animation, sound, drawings, and stagecraft to illustrate the human dimensions of the water crisis. The performance-lecture showcases the productive synergy between social scientists and artists, as academic research finds powerful expression in creative media. "Art is how we construct new languages—so, in a sense, that's at the core of what we're trying to do. We're trying to construct a new language for saying the same things," says Abhijit Banerjee. "New languages have the function of waking us up."

Images: (left) Sarnath Banerjee (right) and Abhijit Banerjee present "The Role of Visual Imagination in Unraveling a Tangled World" together as part of the ACT Lecture Series. Credit: Heidi Erickson. (right) Rendering for "The Land of Good Intentions." Credit: Sarnath Banerjee.

Abhijit Banerjee, Ford Foundation International Professor of Economics, MIT

Sarnath Banerjee, CAST Visiting Artist, MIT

Niusha Ramzani, Artistic Assistant

A Counter-Colonial Board Game
Understanding Puerto Rico's debt crisis through play

IAP Workshop: "Playing Counter-Colonialism in the Americas," January 21–22, 2020

Discussion: "CAST Conversations with Rosa Colón Guerra and Sam Mendez," Online, Friday, May 8, 2020

In the popular board game *Puerto Rico*, players are placed in the role of colonial governors. Their task, while growing crops on plantations, is to earn points by shipping goods to Europe and owning buildings—the project of territorial expansion reduced to a friendly tabletop game for three to five players. Such games, inspired by a long history of exploitation, are "a playground for Western heroes," as Mikael Jakobsson notes, in which "the Indigenous peoples are represented as resources, obstacles, or exotic flavor, and have very little agency."

In 2018, Jakobsson, alongside his team at the MIT Game Lab, traveled to Colombia and Puerto Rico to lead creative generative workshops on game design with professional designers, students, and Indigenous peoples. Jakobsson, who researches how gaming fits into social and cultural practices, wanted to create a counter-colonial board game. This would be a game that focused on the Indigenous experience, rather than on glorifying the violence of European conquest.

Enter Rosa Colón Guerra, a comic artist from Puerto Rico whose work illustrates Puerto Rico's financial crisis and life during Hurricane María and its aftermath. Together, Jakobsson and Colón Guerra are prototyping a new board game about PROMESA, the 2016 government act established in response to the island's debt crisis—a law that turned over the management of the country's finances into the hands of American lawmakers. In the game, Puerto Rico's debt is depicted floating atop a raft. Players must then work together to push the raft off-island by investing in public goods like infrastructure or education.

Creating comics about political issues, such as the legal and economic intricacies of PROMESA, is a way for Colón Guerra to work through knotty problems, both for herself and her readers.

"I didn't understand politics, so I started researching and writing about it. I asked myself, 'What is the best image that explains this?' or 'How can I put this in a way that I get it and everybody gets it? Art, became a way of problem-solving."

– Rosa Colón Guerra

Through gaming, Jakobsson and Colón Guerra hope that more audiences will come to understand the complexities of Puerto Rico's status as a modern-day American colony. "There are all of these little obstacles that don't allow us to have the same things that the United States has," Colón Guerra says. "And it's not necessarily about money. It's more about dignity and a feeling of owning your country."

Images: (left and right) Students test a prototype of Jakobsson and Colón Guerra's board game in "Playing Counter-Colonialism in the Americas," IAP Workshop. Credit: Rik Eberhardt.

Rosa Colón Guerra,
CAST Visiting Artist, MIT

Rik Eberhardt, Studio Manager of the MIT Game Lab, MIT

Mikael Jakobsson, Research Coordinator in the MIT Game Lab and Lecturer in Comparative Media Studies, MIT

Sam Mendez, Graduate Student in Comparative Media Studies, MIT

New Materialisms

Exploring the vibrancy of matter

Experimentation with materials, and their unique properties, is a concern shared by artists, scientists, and technologists alike. Inspired by a wave of new scholarship over the last decade, these works investigate, challenge, theorize, and experiment with the meaning of materiality in diverse fields from finance to architecture.

In an extraordinary optical feat, artist Diemut Striebe worked with Brian L. Wardle, MIT Professor of Aeronautics and Astronautics, to create a "disappearing diamond" that debuted at the New York Stock Exchange, using Wardle's groundbreaking discovery of the "blackest black on earth." Architects Hans Tursack and Violet Ago explored new materialisms in their design of an "ecological pavilion" at a famed modernist landmark—asking how architecture could move beyond eco-conscious design and into a deeper and more cooperative engagement with both animate and inanimate matter. CAST's award-winning hybrid publication *Being Material*—at once an artist's book, digitally activated object, and collection of scholarship—chronicled the complex interdependencies between the material and contemporary digital technologies.

Though we live in an age dominated by the digital—as social relations, media, and commerce increasingly move from "atoms to bits"—these projects compellingly reveal that we have not quite left the material world behind.

In This Section

Understorey

Being Material

The Redemption of Vanity

Image: Installation view of Understorey at *Exhibit Columbus*, 2019. Credit: Viola Ago.

Understorey
Toward a twenty-first century ecological design

Exhibition: Understorey, *Exhibit Columbus*, August 24–December 1, 2019

Columbus, Indiana, seems an unlikely location for a collection of modernist masterpieces. Yet, courtesy of a design-minded patron—a local auto manufacturer—the downtown is studded with historically significant architecture. Buildings by I.M. Pei, Gunnar Birkerts, Robert Venturi, Eero Saarinen, Deborah Berke, and Kevin Roche led to Columbus being dubbed the "Athens of the Prairie."

This fall, architects Hans Tursack and Viola Ago had a chance to update this modernist legacy for the twenty-first century. As part of the biannual experimental showcase *Exhibit Columbus*, Tursack and Ago designed the pavilion, Understorey, a large open-air vivarium built from a combination of off-the-shelf agricultural products and custom, digitally fabricated structural elements. They built the pavilion on a lawn designed by the modernist landscape architect Dan Kiley in 1964, which adjoins Eero Saarinen's iconic North Christian Church.

Understorey is an ecological education center, taking its title from the scientific term to describe plant life growing on and just above the forest floor. Highlighting samples of Southern Indiana's geological composition, the design plays with the recognizable elements of a greenhouse—prefabricated materials, plants, and artificial lighting—and recasts them as both a sculptural gesture and educational tool nestled beneath the built canopy of Saarinen's church and the natural umbrella of Kiley's landscape.

As Understorey highlights the agency of visible and invisible material networks, Tursack and Ago believe that environmental and disciplinary engagement are not mutually exclusive.

"While their proposal is modest—an ecological education center staged as a site of social and material exchange—their ambition is large."

Taking inspiration from political philosopher Jane Bennett, Understorey points toward what Tursack and Ago call "an architecture of vibrant materialism." The pair envision an architecture that eschews the time-worn clichés of environmentally conscious design to embrace how buildings exist in a vitally interconnected system of human and more-than-human forces.

Images: (left and right) Installation view of Understorey at *Exhibit Columbus* in Columbus, Indiana, 2019. Credit: Viola Ago.

Being Material

A new book explores the interdependence of digital and material worlds

The book *Being Material* explores the worlds of materialities and materialisms today: the unexpected convergences in the practices of artists, designers, engineers, and scientists who work with programmable matter, self-assembling structures, 3D/4D printing, wearable technologies, and bio-inspired design.

Originating in a symposium hosted by CAST in spring of 2017, the book extends our understanding of how material dynamics limit, expand, transform, and vivify our biological, social, and political lives. At once a compendium of artistic research, a digitally activated object, and a compilation of scholarship across the arts, humanities, and sciences, the book is organized according to five different modes of being material—thinking through being programmable, wearable, livable, invisible, and audible.

In the current historical moment—when machine learning reshapes human agency, when wearable and portable devices with digital capacities reorder our daily activities, when biotechnology modifies reproduction, when algorithms encode social possibilities and inequalities, and when extractive industries disrupt land claims and environments—we need to understand how processes that may seem immaterial are, in fact, deeply embedded in material conditions. The form of the book itself brings the tangibility of paper together with the possibilities of the digital. Opening the book's companion website— beingmaterial.mit.edu—on any camera-enabled

phone, laptop, or desktop computer and then pointing the camera toward the first page of each author's section will unlock films, music, images, and other dynamic content that complement and extend the book's physical pages.

"In our time, the activity of being digital is entrenched in its conditions of being material."

Machine learning and computer vision enable communication with the website through the unique visual arrangements of images and text on each page throughout the book. The camera recognizes the graphic pattern of the printed page and then orchestrates digital content that can be played and controlled. The content can be as simple as a soundtrack that plays as you read through the book, videos that extend the written text, or a variety of other digital elements. AIGA (American Institute of Graphic Artists) recognized Being Material in March with a 50 Books|50 Covers award.

The contributions in this book take a range of formats—research reports, demos, manifestos, philosophical essays, artist portfolios, and more. This publication offers something unique: a way of employing graphic design, printed ink, machine learning, and computer vision to create a book that is a true hybrid of being digital-material.

Images: (left and right) *Being Material*, Cambridge, MA: MIT Press, 2019. Credit: Heidi Erickson.
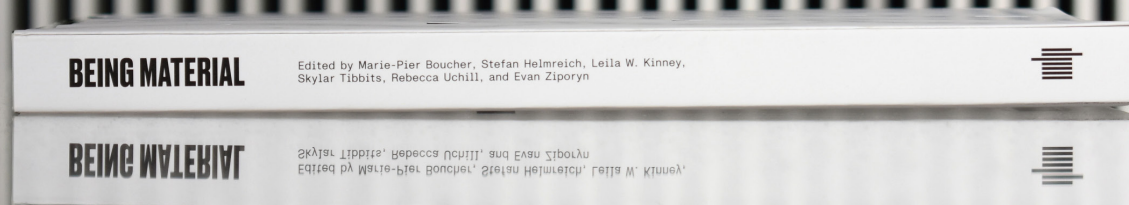
Marie-Pier Boucher, Assistant Professor of Media Studies, University of Toronto and former Mellon Postdoctoral Research Fellow, MIT

Marcelo Coelho, Head of Design, Formlabs and Lecturer, MIT

Stefan Helmreich, Elting E. Morison Professor of Anthropology, MIT

E. Roon Kang, Interdisciplinary Designer, Math Practice Studio

Leila W. Kinney, Executive Director of Arts Initiatives and the Center for Art, Science & Technology, MIT

Lukas Lesina Debiasi, Graduate Student, Architecture, MIT

Skylar Tibbits, Associate Professor of Design Research, Architecture, MIT

Rebecca Uchill, Lecturer, UMass Dartmouth and former Mellon Postdoctoral Research Fellow, MIT

Evan Ziporyn, Kenan Sahin Distinguished Professor, Music and Theater Arts and Faculty Director, the Center for Art, Science & Technology, MIT

The Redemption of Vanity
How to make a diamond disappear

Exhibition: *The Redemption of Vanity*, New York Stock Exchange,
September 2019 – February 2020

Images: (left) Ashley Kaiser and Diemut Strebe (back) inspect the results of a test application of CNT. Courtesy of Diemut Strebe. (right, top) The uncovered 16-carat diamond on the left compared with the CNT-covered diamond on the right. Credit: Diemut Strebe. (bottom) The covered diamond rests on a gold stand in the necstlab at MIT. Credit: Brian L. Wardle.

Brian L. Wardle hadn't intended on discovering a new optical wonder. Instead, his lab was experimenting with ways to grow carbon nanotubes on electrically conducting materials, such as aluminum, to boost their electrical and thermal properties. It was through his collaboration with conceptual artist Diemut Strebe that he realized the breakthrough: a carbon nanotube that absorbs 99.9995 percent light, the blackest black material on Earth.

"Our group does not usually focus on optical properties of materials, but this work was going on at the same time as our art-science collaborations with Diemut. So, art influenced science in this case," says Wardle, whose group, necstlab, explores new concepts in engineered materials and structures.

With the help of Wardle's team, Strebe decided to make a 16-carat diamond disappear. They realized that growing a "forest" of carbon nanotubes (CNTs) on the exterior of the diamond would effectively block the gem's brilliant luster. Strebe called the piece, *The Redemption of Vanity.*

Although the diamond and CNTs are made of the same element—carbon—the different structural arrangements of their atoms create radically different appearances when exposed to light. While one reflects light, the other swallows it. Due to the substance's super light-absorptive properties, the CNTs cast no shadows—reducing the three-dimensional object to the flatness of the void.

"The project explores the material and immaterial value attached to objects and concepts in reference to luxury, society, and art."

– Diemut Strebe

The New York Stock Exchange displayed the light-trapping diamond under a pristine glass dome. For Strebe, the literal devaluation from a $2 million stone to a tiny black hole is a challenge to the art market. "The project explores the material and immaterial value attached to objects and concepts in reference to luxury, society, and art," the artist says. Through a trick of light, what was once a luxury commodity suddenly appeared to be nothing at all.

Luiz Acauan, Postdoctoral Associate, Department of Aeronautics and Astronautics, MIT

Estelle Cohen, Research Scientist, Department of Aeronautics and Astronautics, MIT

Ashley Kaiser, Graduate Student, Department of Materials Science and Engineering, MIT

Robert S. Langer, David H. Koch Institute Professor and Professor of Chemical Engineering and Biological Engineering, MIT

Diemut Strebe, CAST Visiting Artist, MIT

Brian L. Wardle, Professor of Aeronautics and Astronautics and Director of the necstlab and the Nano-Engineered Composite aerospace STructures (NECST) industry Consortium, MIT

Speculative Machines

**Building imaginative technologies
for the world to come**

In the sixteenth century, Leonardo da Vinci carefully sketched an idea for a flying machine: two enormous wings, resembling those of a bat, maneuvered by a wooden crank that propelled the pilot skyward. Although a functional flying machine—an airplane—would not arrive until centuries later, this early drawing, one among many ideas, presented a radical possibility for what the world could be.

In a similar fashion, multimedia artist and composer Thom Kubli collaborated with Hiroshi Ishii, the Jerome B. Wiesner Professor of Media Arts and Sciences and Associate Director of the MIT Media Laboratory, who heads the Media Lab's Tangible Media Group, to prototype a 3D printer that could churn out a pantheon of ultra-lightweight floating sculptures, transforming the original significance of the objects while creating an alternate metaphysical reality. In the course, Paranormal Machines, artist Seth Riskin and anthropologist Graham M. Jones explored apparatuses that produce ambiguous, and transformative, perceptual experiences. Designer Ian Hattwick, drawing upon his own background in music technology, showed MIT students how to design, program, and build their own unique musical instruments using a custom-made hardware platform.

While we tend to think of machines as strictly utilitarian, performing the perfunctory tasks necessary to daily life, these projects tell us differently. They urge us to consider how such speculative machines, instruments, and technologies can model and produce new knowledge, sensations, and aesthetic experiences—and lead to exciting new discoveries.

Image: A class member participates in a demonstration of a project for Paranormal Machines. Credit: MIT Video Productions.

Orbiting
3D printing of floating sculptures

Exhibition: Beyond the Cradle, Ars Electronica, September 9–13, 2020

Artist Thom Kubli is fascinated by what he calls "speculative machines," fantastical devices whose function is more metaphysical than utilitarian. They are machines, like da Vinci's early sketches of flying contraptions, which question the basic assumptions–such as the force of gravity–of the world in which we live.

In 2016, Hiroshi Ishii encountered "Black Hole Horizon" at Ars Electronica, the electronic arts festival whose theme "Radical Atoms" was inspired by his pioneering work on human-machine interfaces. Afterwards, Ishii invited Kubli to join forces with the Tangible Media Group, the research team he leads at the MIT Media Lab. Together, they are now working on a new speculative machine: a 3D printer that can produce ultra lightweight floating sculptures. What Kubli imagines is a floating choreography: the sculptures floating upwards and caught in a thermal stream, slowly circulating in dreamlike motion. While floating, these ethereal objects participate in a continuously changing series of celestial movements.

Both Kubli and the Tangible Media Group share an interest in how computation and digital information can transform objects in real time. Just as previous technologies revolutionized the distribution of images, sounds, and texts, leading us into an era of endless remixing and sampling, 3D fabrication techniques will reconstruct the material world.

> ## "No one has ever made a machine that produces a floating object. So from the scientific or engineering point of view, it's really interesting and very challenging."
>
> ### – Kyung Yun Choi

Orbiting is both a technical and conceptual challenge: Once they are replicated in floating form and released from the laws of gravity, how will the meaning of the objects change? For Kubli, the condition of zero gravity is a state of loss– what once had weight does no longer–but one that also presents the possibility to reconfigure the world afresh. "You have to pick up the pieces and see how you make new relations with them," he says, "no matter what kind of quality they're holding themselves. Even if it's super emptied out or meaningless in a way, you still can rechoreograph and make it into something beautiful."

Images: (left) Joshua Van Zak and Thom Kubli (right) experiment with materials. Credit: Joseph Kennedy. (right) Kyung Yun Choi spins the Orbiting rotomolding machine. Credit: Joseph Kennedy.

Hiroshi Ishii, Jerome B. Wiesner Professor of Media Arts and Sciences and Associate Director, Media Lab, MIT

Thom Kubli, CAST Visiting Artist, MIT

Bill McKenna, Lab Assistant, Synoptic and Fluid Labs, Department of Earth, Atmospheric, and Planetary Sciences, MIT

Benjamin Miller, Graduate Student, Department of Mechanical Engineering, MIT

Hila Mor, Research Assistant, Tangible Media Group, Media Lab, MIT

Valentina Sumini, Postdoctoral Associate, Responsive Environments, Media Lab, MIT

Michael Tarkanian, Senior Lecturer, Department of Materials Science and Engineering, MIT

Skylar Tibbits, Assistant Professor of Architecture and Founder and Co-Director of the Self-Assembly Lab, MIT

Krysten Van Vliet, Associate Provost and Michael (1949) and Sonja Koerner Professor of Materials Science and Engineering, MIT

Joshua Van Zak, Research Assistant, Mediated Matter Group, Media Lab, MIT
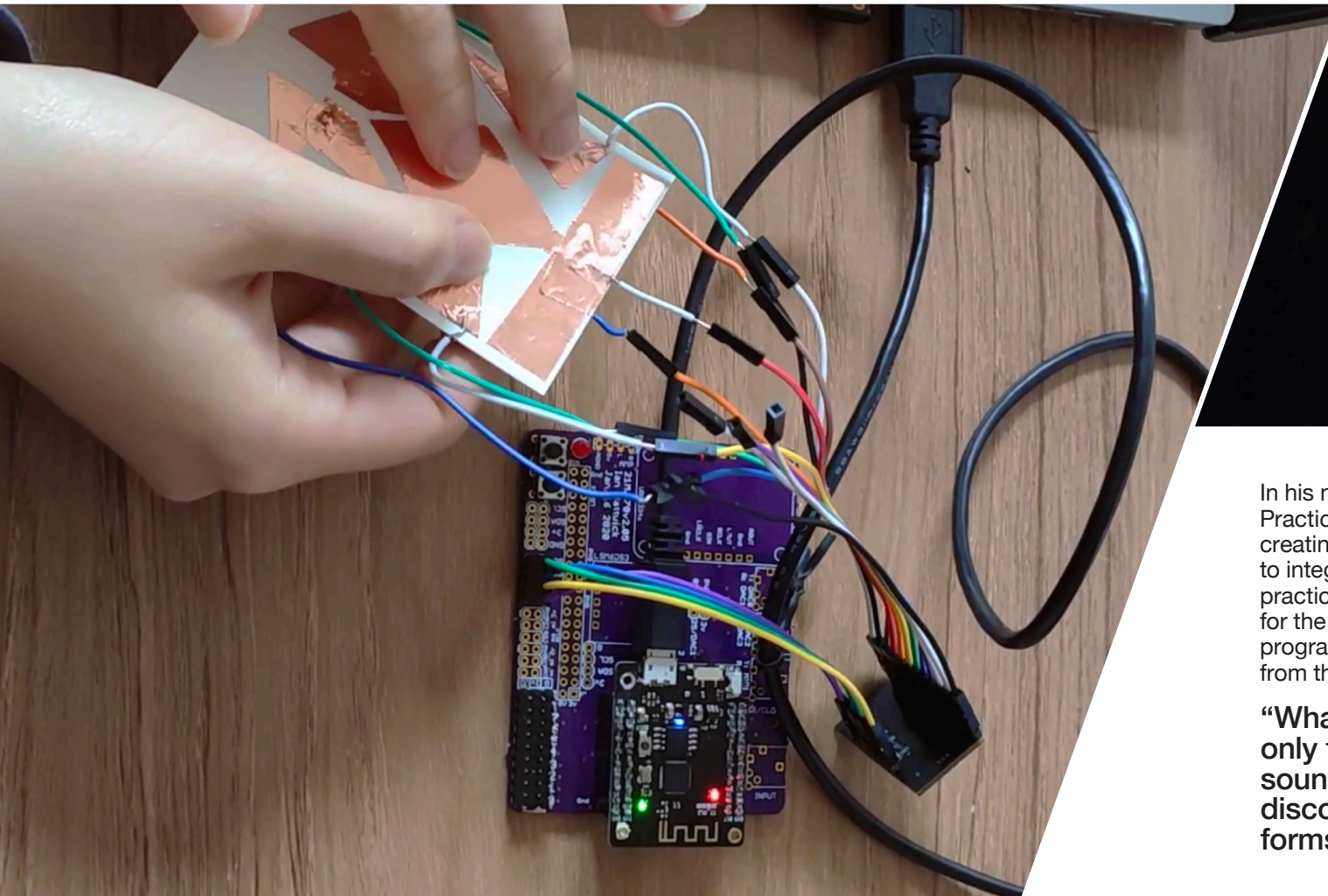
Joao Henrique Wilbert, Research Assistant, Tangible Media Group, Media Lab, MIT

Kyung Yun Choi, Research Assistant, Tangible Media Group, Media Lab, MIT

Instrument Design as Artistic Practice

Discovering forms of music-making

Course: Digital Instrument Design, Spring 2020

Ian Hattwick's Guitamaton, inspired by the rhythms of African music, uses a custom-made hardware controller with a microprocessor to play the guitar as both a simple drum and a prepared string instrument. Another instrument, designed for dancers, is performed not only with the hands but also with the whole body. In creating such unique instruments, he reveals new possibilities for the way that sound, movement, materials, and culture can come together—a skill that he's now teaching to MIT students.

Instrument building—part of the field of music technology, a burgeoning area of study at MIT—has become a common part of artistic practice, whether through the design of software systems, hardware interfaces, or interactive artworks. With a background in music composition and performance, Hattwick is interested in the use of multimodal hardware systems to explore and facilitate social and embodied interaction.

In his new course, Instrument Design as Artistic Practice, students gain hands-on experience in creating these types of systems, learning how to integrate instrument building into their artistic practice. The hardware platform developed for the course enables students to start programming and designing musical experiences from the very beginning.

> "What we [humans] can imagine is only the beginning… we can make sounds you can't imagine. We can discover new sounds and new forms of music-making."
>
> —Ian Hattwick

This course situates the design of technological systems firmly within lived, embodied experiences, and challenges the idea that commercially viable instruments are the most successful. In addition to current designers of digital systems, the class examines instrument makers such as Hugh Le Caine, Gunnar Schonbeck, and Bart Hopkin, and the role of instrument design in musical performance practice across different traditions, from the mbira dzavadzimu of the East African Shona people to the role of the guqin in Chinese philosophical traditions.

With guest lectures by artists such as Dance Divine, Jeff Snyder, and Marije Baalman, students learn how to design instruments for musicians from diverse cultural, musical, and personal backgrounds, critically engaging with how the act of technological development plays a role in the reproduction and dissemination of aesthetics, social formations, and culture.

The course culminates in each student designing an entirely new, unique instrument, gaining practical experience in digital design as they continue to develop their artistic practices.

Images: (left) Capacitive Sensing Instrument, a student project by Tara Liu. Courtesy of the artist. (right) Ian Hattwick's *Prosthetic Instruments* have touch-sensitive panels along their length. Here, Marjolaine Lambert plays the Ribs while they are worn by Sophie Breton. Credit: Michael Slobodian.

Cross-Disciplinary Class Grant

Ian Hattwick, Lecturer,
Music and Theater Arts, MIT

Paranormal Machines

In a new anthropology and studio art course, MIT students investigate the technologically uncanny

Course: Paranormal Machines, Fall 2019

Event: "Final Critique of Student Projects, Paranormal Machines, Course 21A.S01," MIT Museum Studio and Compton Gallery, 10-150, December 11, 2019

An audible gasp went through the classroom as Seth Riskin used his hand to trace streams of light through the empty air. The illusion was a simple one: Gradually turning up the speed on a strobe light, Riskin created the visual magic by sweeping his hand through the rapidly changing beam.

A strobe light is hardly the most advanced technology found at MIT, but as co-instructor Graham M. Jones, whose anthropological research focuses on stage magic, tricks, and illusions, comments, "In 10 years of teaching at MIT, I've never heard a whole classroom gasp like that." However basic, Riskin's deft manipulation of light had produced a moment of collective surprise and wonder. This was the subject of the new studio art course, Paranormal Machines: the human experience of the uncanny in relation to technology, and how cultures build stories and beliefs around out-of-the-ordinary experiences.

In everyday parlance, the word paranormal usually refers to the phantasmal world of ghost hunters and clairvoyants. But Riskin and Jones use the word to more broadly encompass qualities of human experience that challenge our typical perceptions. It turns out that this is a great topic of mutual inquiry not only for the arts, with their capacity to create new and transformative experiences, but also for anthropology, a science that studies the diversity of experience.

> "This approach allows us to learn along with our students. I'm constantly discovering things that enrich my anthropological understanding, and that I want to fold back into future iterations of the class."
>
> – Graham M. Jones

Students are first introduced to anthropological readings and artistic creations—from kinetic art to ritual objects—and then they strive to develop an understanding of how the human mind can perceive these works as alive, aware, or responsive. CAST's support also ensures that students have the resources to develop their own demos and engineer emotive machines that could produce uncertainty and wonder. The class gives students the opportunity to consider the ways in which humans make meaning around enigmatic experiences, including interactions with advanced technologies.

The qualities of experience that students in Paranormal Machines study have a new relevance in our era, as artificial intelligence becomes ever more a part of our daily lives and we begin to encounter machines that seem to think, see, and understand. The course brings key questions about human perception into contact with the cutting edge of human-interfacing technology: How can technologies deepen human experience and enrich the inner landscape? How do we push technology to feel more "alive" or more human? What—as we chat with Alexa or name our Roombas—makes us treat our technology as if it really has a life of its own?

Images: (left) Project by Erica Yuen, a graduate student in Electrical Engineering and Computer Science. Credit: MIT Video Productions. (top) Members of the class with instructor Seth Riskin (center), examine a demonstration. Credit: Graham Jones. (below) A class member interacts with project in preparation for a class critique. Credit: MIT Video Productions.

Graham M. Jones, Margaret MacVicar Faculty Fellow and Associate Professor of Anthropology, MIT

Seth Riskin, Manager, MIT Museum Studio and Compton Gallery

MIT Performing Series

A season of audacious innovation

Image: *The Silence* presented in MIT Building W97, featuring Anna Kohler (center), Lacy Dorn, and Ayesha Jordan (projected). Credit: Caroline Alden.

The powerful trifecta of live cinema, dance theater, and socially inspired music comprised the *2019–20 MIT Performing* series, curated by Jay Scheib. Now in its second year, this season featured a richly layered series of collaborations, workshops, prototypes, and community discussion-cum-dance-parties.

The season launched in September with the premiere of *The Block: An Afro-Musical*, choreographer McKersin Previlus's interdisciplinary performance with Lakaï Dance Theatre. A vibrant, conceptual mix of music, personal narrative, and Afro-diasporic dance styles, *The Block* drew upon the intricate rhythms and vernacular of Haitian language and culture.

Award-winning dance theater maker Constanza Macras brought her collaborative choreographic practice to MIT this fall, employing documentary forms, community engagement, and biography-driven performance techniques. As she has with dance companies around the globe, Macras began a collaboration with the MIT community as co-creators and performers in a brand-new choreographic theater piece.

The visceral intensity of Ingmar Bergman's films has long inspired Jay Scheib, who reinterpreted the Swedish director's cinematic language. In December, Scheib's *The Silence* transformed the classic film's tense physicality and foreboding dialogue into a new live cinema, multiplatform performance.

Described as a sensory exploration of life and the eternal, *The Day*, set to a score by Pulitzer Prize-winning composer David Lang, is a collaboration among distinguished artists: cellist and CAST 2016–18 Inaugural Mellon Distinguished Visiting Artist, Maya Beiser; Associate Artistic Director (and former principal dancer) of New York City Ballet, Wendy Whelan; iconic postmodern choreographer, Lucinda Childs; prolific scenic designer and MIT Music and Theater Arts assistant professor, Sara Brown; and projection designer and MIT lecturer, Joshua Higgason. Though a performance at the ICA Boston was postponed due to COVID-19, the collaboration continues to unfold.

As the 2019–20 CAST Mellon Distinguished Visiting Artist, Irish actress, producer, and director Lisa Dwan returned to MIT, building upon her lecture/ demonstration, "A Body of Beckett," which so vividly demonstrated the mental fortitude and physical stamina required by the Irish bard's solo works.

Through this vibrant lineup, *MIT Performing* worked to explore the power of personal and collective storytelling, both the private, existential narratives and the larger stories that bind performers to their communities.

The Day

A music and dance collaboration reflects on life and the eternal

Performance: "Summer Stages Dance @ ICA: Maya Beiser, Wendy Whelan, Lucinda Childs, and David Lang, *The Day* Work-in-Progress Showing," ICA Boston, July 21, 2019 (second showing postponed due to COVID-19)

The Day charts two journeys: life and the eternal voyage of the soul. "It's a Jewish mystical concept about what happens when we die and the soul separates from the body," says cellist Maya Beiser. "As I was recording the piece, I kept seeing this image of a woman dancer. There was just something about the idea of a woman who is embodying all these people, all these stories, and who creates a connection with me as I play the piece."

The new music and dance work received a work-in-progress showing at the Institute of Contemporary Art in Boston before premiering at Jacob's Pillow in Becket, Massachusetts (a second performance at the ICA was postponed due to COVID.) The piece brings three legendary female artists together on the stage: cellist Maya Beiser, dancer Wendy Whelan, and choreographer Lucinda Childs. MIT Music and Theater Arts Assistant Professor Sara Brown and Technical Instructor Joshua Higgason joined the collaboration as designers.

> "To me, there's something very meaningful about three mature women bringing our experiences and our knowledge into this piece."
>
> — Maya Beiser

Beiser, who conceived the piece, has been described by *Rolling Stone* as a "cello rock star." Wendy Whelan, widely considered one of the world's leading dancers, spent 30 years as a principal dancer with New York City Ballet. Onstage, the two embody the iconic choreography of Lucinda Childs, who began her career at the Judson Dance Theater in New York in 1963. Pulitzer Prize winner David Lang scored the composition.

Beiser and Lang first began working on the piece in the aftermath of 9/11, when they were both living in New York City. Spoken memories are hauntingly threaded throughout the composition—found text unearthed when Lang keyed the phrase "I remember the day" into a search engine—which form a ghostly chorus, as if spoken from the afterlife. "The text comes in every six seconds exactly, so it's sort of like a heartbeat and becomes this meditative experience," says Beiser.

As it explores the universal themes of time, memory, and mortality, the performance wrestles with big questions through the shared languages of music, dance, and design. "The arts are a celebration of humanity. They teach us how to think bigger, how to think more creatively, how to think outside the box, how to ask questions, how to work together," says Whelan. "I think that is the greatest thing we can do for ourselves." Both celebratory and melancholic, *The Day* is a tender and striking exploration of our earthly existence—and what lies beyond.

Images: (left and right) Maya Beiser and Wendy Whelan perform *The Day* at Jacob's Pillow. Credit: Hayim Heron. Courtesy of Jacob's Pillow.

Fay Chandler Creativity Grant

Maya Beiser, Cellist and CAST 2016–18 Inaugural Mellon Distinguished Visiting Artist, MIT

Sara Brown, Assistant Professor and Director of Design for Music and Theater Arts, MIT

Lucinda Childs, Choreographer

Joshua Higgason, Technical Instructor, Music and Theater Arts, MIT

Wendy Whelan, Associate Artistic Director, New York City Ballet

The Block: An Afro-Musical

Sharing stories of young people of color through dance

Performance: *The Block: An Afro-Musical*, MIT Theater
Building, W97, September 27 and 28, 2019

In *The Block: An Afro-Musical*, presented by Lakaï Dance Theatre, the street became a stage for self-reflection on toxic masculinity, racial profiling, mental health, and violence. In telling stories through jazz, hip-hop, and Afro-diasporic movement styles, the performance gave an important voice to the young people of color whose stories are so often underrepresented.

"I want people to experience our culture, without any translation."

– McKersin Previlus

The brainchild of choreographer McKersin Previlus, Lakaï Dance Theatre takes its name and driving purpose from the word for "home" in Haitian Creole, Previlus's native language. Lakaï incorporated powerful spoken word and live music to paint complex stories that reflect the realities of inner-city existence.

The Block was presented in W97, MIT's new performing arts facility, where it was first developed through a rehearsal residency. "I was able to think freely, without limit," says McKersin of the experience. Ultimately, he says, *The Block* is a conversation that will keep evolving. "I want people to experience our culture, without any translation." Lakaï Dance Theatre then premiered the performance at MIT in two sold-out shows.

Over the course of two on-campus residencies, the performers challenged stigmas around Black and Brown vulnerability, as well as the difficulties of asking for help. Developed from the individual narratives of the director and performers, the script shared personal stories of hardships and triumphs experienced in a tough and violent yet ultimately creative and resilient community. The piece also included an original musical score composed by the company.

In sharing these stories through dance, the company uses the idea of home to trace the ripple effects not only of harm, but also of healing. "The idea of home is sacred," McKersin says. "I realized that many issues stem from a toxic home. I want my company to be a safe home environment for all those who pass through."

Images: (left, bottom, and right) Lakaï Dance Theatre presents *The Block: An Afro-Musical* at MIT Building W97. Credit: Caroline Alden.

MIT Performing Series

Lakaï Dance Theatre

McKersin Previlus, Executive Artistic Director, Lakaï Dance Theatre

"Thinking Choreographically"
Building community-based dance theater

Lecture: "Thinking Choreographically: A Talk with Constanza Macras,"
MIT Theater Building, W97, October 31, 2019

At MIT, Macras began a collaboration with Kurt Fendt—who teaches digital humanities and media studies courses, in addition to german studies courses—and with other faculty members and students in Music and Theater Arts, focusing on dance, choreography, and improvisation. Though the project was postponed due to COVID-19, Macras still enjoyed a period of intensive development and collaboration at MIT Building W97.

Images: (left) Constanza Macras leads a workshop with class members of Dan Safer's 21M.623 Physical Improvisation: Bodies in Motion. Credit: Heidi Erickson. (right) Constanza Macras discusses her background in documentary, community, and biography-driven performance work with Jay Scheib. Credit: Harry Bachrach.

Over the past two decades, award-winning Constanza Macras has built an international reputation as a director-choreographer of uncommon eclecticism and unbridled kineticism. Her high-energy pieces have tackled such subjects as the fate of Chinese acrobats; the arc of memory, particularly in Germany; Roma communities in Europe—and, most notably, the social, physical, and human structure of cities, especially the way a physical location has an impact on how we think, move, interact, and even remember.

Macras developed an interest in cities while growing up in Buenos Aires. She left in 1992 to study dance at the Merce Cunningham Studio in New York, and has lived in Berlin for the past 25 years. "I've always been fascinated by the iconography of big cities," she says. "Cities own a very fascinating choreography." Tellingly, Macras's shows are distinguished by their extreme density—something is always happening somewhere, often at high velocity or high volume—and their juxtapositions of movement and text. Her works, Jay Scheib says, embody a "reckless joyride energy" that speaks to the exuberance and terror of being alive.

Through a highly collaborative creative process, Macras's work foregrounds the voices and experiences of the community members who contribute to the project as co-creators and performers. Themes in her previous community-based performances include urban planning, globalization, migration, and xenophobia in communities in South Africa and Germany.

"It's my dream to see [cross-disciplinary collaboration] happening more, academics and researchers and scientists working together with iconography, with theater, to make art. I don't want theater to be a dead space that does not relate to life."

—Constanza Macras

MIT Performing Series

Kurt Fendt, Senior Lecturer in Comparative Media Studies/Writing, MIT

Constanza Macras, CAST Visiting Artist, MIT

Jay Scheib, Class of 1949 Professor of Music and Theater Arts, MIT

The Silence

In a theatrical reinvention of Bergman's masterpiece, dreams collide with the real in an endless downward spiral

Performance: *The Silence*, MIT Theater Building, W97, December 12–14, 2019

Conversation: "CAST Conversations: Jay Scheib and Rian Flynn," Online, May 1, 2020

In Ingmar Bergman's 1964 film, *The Silence*, two antagonistic sisters, accompanied by the young child of one, interrupt a train journey to spend a few days in a foreign city's hotel. The trio doesn't understand the country's language, which was made up by Bergman, and around them tanks ominously roll by, portents of impending war.

Over a half-century after the release of *The Silence*, Jay Scheib is adapting the modernist masterpiece for the stage. The film, described both as a "landmark of modernist cinema" and a "tangle of brooding confusions and despairs," explores alienation, incommunicability, and the opposition between carnality and intellect—themes Bergman tackled in a frank, often brutal, way.

For Scheib, the motifs seemed apt for an age of increasing ecological devastation.

"What would it look like to put two people in a hotel room in a coastal New England town with the water rising and fires burning and mega-migration under way? How would it feel? What sacrifice might be necessary to make things right?"

– Jay Scheib

Scheib, a winner of an Obie and a Guggenheim, is internationally known for genre-defying works of daring physicality and the integration of new (and used) technologies in live performance. In *The Silence*, the child roams the hotel and Gunnel Lindblom's Anna sets out on explorations of her own, while Ingrid Thulin's sickly Ester is stuck in her room. The combination of live action and video that characterizes much of Scheib's work allows him to suggest these parallel narratives.

"In a film, we cut from one room to another; but on stage, the thing that's happening in that other room is still happening, it's still moving forward in time," Scheib explains. "I think we can experience all of those realities roughly at the same time—I need to find a way, of course, to shape the experience—but the simultaneity feels like life, like life-like."

Images: (left) Kyleigh DeSilva performs in *The Silence*. Credit: Caroline Alden. (top, right) Ayesha Jordan and Lacey Dorn in *The Silence*. Credit: Jay Scheib. (right) Lacey Dorn and Kyleigh DeSilva are viewed through a doorway in the set while the live video stream is projected on the wall above. Credit: Caroline Alden.

2019 Mellon Faculty Grant Recipient

Sualeh Asif '22, MIT

Kyleigh DeSilva, Actress

Shanise DeSilva, Stylist

Lacey Dorn, Actress

Rian Flynn '21, MIT

Christian Frederickson, Lecturer in Sound Design, Music and Theater Arts, MIT

Kevin Fulton, Technical Instructor in Lighting, Music and Theater Arts, MIT

Joshua Higgason, Technical Instructor, Music and Theater Arts, MIT

Ayesha Jordan, Multidisciplinary Performance Artist

Paulina Jurzec, Video Designer and Filmmaker

Anna Kohler, Senior Lecturer, Music and Theater Arts, MIT

Afsoon Pajoufar, Scenic Designer

Brandon Sanchez '18, MIT

Jay Scheib, Class of 1949 Professor of Music and Theater Arts, MIT

The Body as Media
Interpreting the Physicality of Beckett

Class Visit: Media Theory, Online, Spring 2020

Lisa Dwan is one of the greatest modern interpreters of Samuel Beckett. This year, the acclaimed Irish actress, producer, and director returned to MIT as the CAST Mellon Distinguished Visiting Artist to further her explorations at the intersection of text, live performance, and technology.

As part of the inaugural 2018–19 *MIT Performing* series season, Dwan presented "A Body of Beckett," a lecture/demonstration in which she examined the under-recognized influence of movement and dance in Beckett's work. Dwan, who originally trained as a ballerina, reflected on Beckett's complicated metaphysics—his visceral, chaotic musicality—and what she discovered in absorbing his texts into her own mind and body.

"Beckett requires us to offer up our nervous system."

– Lisa Dwan

Weaving together sections of selected Beckett texts with highly physical demonstrations and her own musings on his preoccupations, Dwan performed a hybrid piece that was part master class, part performance.

As the Mellon Distinguished Visiting Artist, Dwan continued to work with faculty members across the Media Lab, Literature, and Theater Arts departments. In April, Dwan visited Caroline A. Jones's and Eugenie Brinkema's Media Theory class remotely, where she delved into the idea of "the body as media," and how she employs dance as a communicative tool and a form of thinking. "Dancers are trained to invest everything in the fantasies and fictions the body creates," she says. "We must infuse metaphor into every gesture, to give it purpose, to make it live." The lessons of Beckett, she notes—the way in which his works force us to confront our loneliness and mortality—are particularly relevant during the pandemic.

Dwan has produced three short, one-woman Beckett plays: *Not I*, *Footfalls*, and *Rockaby*; and she co-directed her performance of Beckett's *Texts for Nothing*, the first performance of that work by a woman. In 2016, Dwan conceived and performed *No's Knife*, 13 fragmented prose pieces selected and arranged by the actress from *Texts for Nothing*. In embodying these canonical texts, Dwan pushes language to the brink of breakdown, unlocking Beckett's contemporary relevance to gender, identity, and the human condition.

Images: (left and right) Lisa Dwan's performance at the Old Vic Theatre of *No's Knife*, a selection of Samuel Beckett's *Texts for Nothing* (1950–52). Credit: Manuel Harlan. (right) Lisa Dwan in *Rockaby*, by Samuel Beckett at the Royal Court, 2014.

MIT Performing Series

Eugenie Brinkema, Associate Professor of Contemporary Literature and Media, MIT

Lisa Dwan, CAST Mellon Distinguished Visiting Artist

Caroline A. Jones, Associate Dean for Strategic Initiatives, School of Architecture + Planning, and Professor of Art History, Theory, and Criticism, Department of Architecture and Art, MIT

Jay Scheib, Class of 1949 Professor of Music and Theater Arts, MIT

MIT Sounding Series

A new season of collaborations, remixes, and musical innovations

Image: Seven DJs perform in a turntable septet in the MIT Theater Arts Building W97, January 2020. Credit: Caroline Alden.

In its eighth year, the 2019–20 *MIT Sounding*, curated by Evan Ziporyn, presented another season of wide-ranging musical experiences that have found a vibrant home at MIT.
The eclectic journey continued with Boston premieres of music from New York, Czechia, and Nepal, as well as returning artists who persist in pushing new musical boundaries.

MIT Sounding saw many inventive firsts, beginning with the Glenn Branca Ensemble and the Ambient Orchestra, an all-too-rare performance of music by the late proto-punk legend known for his *sui generis* compositions featuring as many as 100 guitars. In *the wave function collapses*, seven DJs gathered to create an unstoppable turntable septet with Visiting Artist DJ Rob Swift. Virtuoso violinist Johnny Gandelsman returned to perform Bach's cello suites on the violin—a true tour de force.

The series also continued its commitment to global sonic futures, exploring how the ingenuity of vernacular traditions can be preserved and radically reinterpreted. Lochan Rijal, the award-winning Nepali multi-instrumentalist singer and songwriter, performed काँचो आवाज (*Raw Sounds*), new and traditional compositions based on his own musical narrative of everyday life in Nepal. Legendary Czech vocalist/violinist Iva Bittová, a familiar force of nature at MIT, returned to launch the MIT Symphony Orchestra's (MITSO) 2019–20 season with her composition, *The Heart is a Bell*, inspired by Czech, Slovak, and Roma traditional music.

In the spirit of collaboration and cross-genre pollination, *MITSO MOVIES MACHOVER*, broadcast virtually due to the pandemic, marked the end of the season with its blend of music and the moving image. Part of the MIT Symphony Orchestra's 2019–20 season, Tod Machover's crowd-sourced, multimedia *City Symphonies*, including a new section called "MIT Interprets Toronto," streamed over social media. A second online concert paid tribute to the art of film music from classic Hollywood soundtracks to new works, featuring the world premiere of renowned composer and clarinetist Don Byron's *Three Pieces from the Saul Bass Project* and selections from classic cinematic scores, from *Friday the 13th* to *The Witches of Eastwick*.

"The program feeds the hunger of a diverse audience for music at MIT," says Ziporyn. In its refusal of any neat and simple categories, this season of *MIT Sounding* was an imaginative, heterogeneous, and overflowing offering of the many ways to make music.

Glenn Branca Live

The rarely heard orchestral music of an avant-garde punk pioneer

Lecture: "Reg Bloor: Composer Forum," Lewis Music Library, Building 14, September 19, 2019

Concert: *The Music of Glenn Branca Live: The Glenn Branca Ensemble/Ambient Orchestra*, MIT Kresge Auditorium, September 20, 2019

Glenn Branca's guitar music has a reputation for being dangerously loud. "Branca's symphonies for multiple guitars—sometimes up to 100 at a time—were Brutalism in musical form," says Evan Ziporyn. The music of the adventurous iconoclast, who passed away in 2018, was performed in the concert, *The Music of Glenn Branca Live: The Glenn Branca Ensemble/ Ambient Orchestra*.

His 45 years of composing included music for experimental rock bands, large ensemble instrumentals for electric guitars, symphonies, chamber ensembles, an opera, a ballet, choral works, and music for film, dance, theater, and installation art. Branca influenced artists as diverse as Sonic Youth, David Bowie, Swans, and many other composers and sound artists.

"He embraced the energy of noise, distortion, and feedback, but in a carefully organized way, activating overtones and microtones to create amazing, almost hallucinogenic textures."

– Evan Ziporyn

The concert showcased Branca's multi-faceted oeuvre, including his eponymous guitar ensemble, led by his longtime concertmaster and collaborator Reg Bloor, as well as seldom-heard orchestral compositions performed by the Ambient Orchestra, under the direction of Ziporyn. The concert presented both sides of Branca, demonstrating how deftly the pioneering composer applied his musical concepts across both classical and rock music, thereby bridging the disparate aesthetics.

While many know Branca's guitar ensemble, few have experienced his orchestral music. The concert performed two of Branca's rarely performed orchestral works: *Free Form*, followed by the first movement of *Symphony No. 14: 2,000,000,000 Light Years from Home*, both performed by the Ambient Orchestra. *Free Form* was full of shifting polyrhythms and quicksilver meter changes, both signature elements of Branca's compositions. His *Symphony No. 14: 2,000,000,000 Light Years from Home* moved through episodic sound clusters, tolling chimes, and microtonal scales, finding within them hidden swarms of energy.

Led by Bloor, the Glenn Branca Ensemble performed the multi-movement *The Third Ascension*, and Branca's last composition, *The Light (For David)*, dedicated to David Bowie. The group filled the auditorium with a flood of sound, brimming with overtones, microtones, and melody, driven by relentlessly powerful drumming. The set ended with *Cold Thing*, a full-out audio experience that included dramatic drops in volume as it reached ever higher, with surging intensity. The piece culminated at a sound level that, fittingly, seemed beyond comprehension, even for Branca.

Images: (left) The Glenn Branca Ensemble on stage in MIT Kresge Auditorium. Credit: Caroline Alden. (right) The Ambient Orchestra performs in MIT Kresge Auditorium. Credit: Caroline Alden.

MIT Sounding Series

Ambient Orchestra

The Glenn Branca Ensemble, directed by Reg Bloor

Evan Ziporyn, Kenan Sahin Professor, Music and Theater Arts and Faculty Director of the Center for Art, Science & Technology, MIT

काँचो आवाज (Raw Sounds)
Original compositions on rare Nepalese instruments

Lecture: "Amalgamating Tangible Heritage with Intangible Musical Heritage in Nepal: Past, Present, and Future Perspectives," Building 32, September 25, 2019

Concert: काँचो आवाज *(Raw Sounds)*, MIT Kresge Auditorium, October 5, 2019

Born in a remote village in eastern Nepal, Lochan Rijal grew up surrounded by music. "Drummers once started the day at 4am," he recalls. Traveling minstrels, playing on homemade instruments, would share stories of everyday life. "Musicians were highly valued within Nepal's then strict caste system," notes Rijal.

At MIT, for the concert काँचो आवाज *(Raw Sounds)*, the ethnomusicologist and multi-instrumental singer-songwriter performed original compositions on guitar and traditional Nepali instruments, including the Sarangi and the nearly extinct Gandharva lute arbaja that he discovered during his research.

The visiting artist residency was hosted by Jeffrey S. Ravel, professor of history and head of the History faculty, with support from MITeri, the Nepali student association at MIT. Together, Rijal and Ravel are committed to preserving Nepal's musical traditions. "He's a fantastic musician and musicologist," says Ravel. "Rijal is leading the charge to preserve and grow Nepal's rich musical heritage."

Part of Nepal's cultural heritage was lost due to the 2015 earthquakes in the Kathmandu Valley. Rijal, returning home after receiving his doctorate in ethnomusicology from the UMass Amherst, found a devastated country—including

Kathmandu University's music department, whose building was destroyed. The MIT-Nepal Initiative, which helped sponsor the residency, was established in response to those earthquakes. Led by Professor Ravel and Special Advisor to the Vice President at MIT Aaron Weinberger, the initiative has sought to engage in projects that benefit the people of Nepal and create enriching educational experiences for MIT researchers and students.

"Rijal is leading the charge to preserve and grow Nepal's rich musical heritage."

– Jeffrey S. Ravel

Rijal's commitment to cultural preservation has led to the restoration of the temple, Tripura Sundari, in the heart of Kathmandu. Amid the ruins, Rijal saw opportunity and asked, "Why not rebuild a tangible entity using one of Nepal's heritage sites to archive and support its intangible musical heritage and traditions?"

A labor of love, the temple restoration has involved local construction teams and artisans, including bricklayers, metalsmiths, and woodcarvers, many of whom learned their skills from previous generations of Nepali craftspeople.

Ultimately, the new department of ethnomusicology at Kathmandu University will connect local musicians with historians, professors, and other specialists. Together, they will work to preserve and document Nepal's rich musical traditions, as well as bring Tripura Sundari and its customs to its former glory. "Our ultimate goal," says Rijal, "is to bring Nepal's long-lost cultural heritage to the world."

Images: (left, right top, right bottom) Lochan Rijal performs as part of *MIT Sounding* in the MIT Stratton Student Center, Building 32. Credit: Caroline Alden.

MIT Sounding Series

MITeri, Nepali Student Association, MIT

Jeffrey S. Ravel, Professor of History and Head of the History Faculty, MIT

Lochan Rijal, CAST Visiting Artist, MIT

The Heart is a Bell
A contemporary take on Czech folk music

Concert: *The Heart is a Bell: Iva Bittová with the MIT Symphony Orchestra*, MIT Kresge Auditorium, October 10, 2019

The MIT Symphony Orchestra (MITSO) began its 2019–20 season with music inspired by Czech and Slovak traditional music. But instead of the oft-played symphonic fare from Czech composers like Antonín Dvořák or Bedřich Smetana, *The Heart is a Bell: Iva Bittová with the MIT Symphony* presented compositions by two modern Czech women: the US premiere of Bittová's *Zvon* and the *Suita Rustica* by Vítězslava Kaprálová.

Composed over 75 years apart, Kaprálová's *Suita Rustica* and Bittová's *Zvon* both offered a decidedly modern take on Czech folk music,

exemplifying the ongoing ways in which composition can fiercely assert identity and difference. "Kaprálová composed *Suita Rustica* in October of 1938, as the Nazis were occupying 'Sudetenland,' that is, as Czechoslovakia was losing its independence. Iva, meanwhile, started her career during the final years of the Iron Curtain, as the country was gaining it back," says Evan Ziporyn, curator of the *MIT Sounding* series and acting director of MITSO this season.

Bittová's *Zvon* consists of original songs influenced by these same traditions, with an ensemble that included Bittová's unique solo

voice and a jazz combo featuring bassist and MIT Affiliated Artist Keala Kaumeheiwa. The program also included *Frog's Eye* by Ziporyn.

Bittová, the avant-garde violinist, singer, and composer, is a frequent musical collaborator at MIT who has performed with a variety of groups, including the improvisational trio EVIYAN (with Gyan Riley and Ziporyn), the Festival Jazz Ensemble, and Pilobolus Dance, for MIT OneWorld.

Bittová, says Ziporyn, brings a singularly eclectic approach to music-making, and an opportunity to expand MITSO's musical repertoire as only she can. Known for her musical fluidity and riveting performances, the former actress is adept at culling diverse musical languages while retaining their authenticity.

> **"Her music is a full reflection of who she is."**
>
> **– Evan Ziporyn**

"She comes from a family of traditional musicians, plays jazz, has a degree in early music; she's played Donna Elvira in Mozart's *Don Giovanni* and performed Schoenberg's *Pierrot lunaire*, Berio's *Folk Songs*, and Schnittke's *Faust Cantata*. And, in all of these contexts, she sounds inimitably like herself."

Images: (left and right) Iva Bittová performs with the MIT Symphony Orchestra, conducted by Evan Ziporyn, in MIT Kresge Auditorium, October 2019. Credit: Caroline Alden.

MIT Sounding Series

Iva Bittová, CAST Visiting Artist, MIT

Keala Kaumeheiwa, MIT Affiliated Artist

MIT Symphony Orchestra

Evan Ziporyn, Kenan Sahin Distinguished Professor, Music and Theater Arts, MIT and Faculty Director, Center for Art, Science & Technology, MIT

the wave function collapses
An experimental turntable ensemble

Concert: *the wave function collapses*, MIT Building W97, January 16, 2020

Class: How DJs Invented Hip-Hop: The Rise and Rise of Turntables in Rap Music, MIT Building W97, January 2020

Workshop: *Table Talk with Rob Swift*, MIT Building W97, January 9, 2020

By rule, the DJ profession is a solitary one. With the exception of turntablist performance groups like the X-Ecutioners or the Invisibl Skratch Piklz, DJs are rarely seen spinning in groups. This year, veteran journalist and historian Harry Allen, DJ Rob Swift, and MIT faculty Eran Egozy and Philip Tan combined forces to change that with the advent of a groundbreaking hip-hop DJ septet.

The DJ septet *harbanger* (pronounced "harbinger"), dreamed up by Allen, is a collection of seven DJs performing as a single unit. Featuring DJs Axis Pro, Bobby Bangers, Don Santos, Emoh Betta, Menace, Slipwax, and Treeman, under the direction of legendary DJ Rob Swift, each DJ played his part: using the turntable as an instrument to bring seven or more different sounds together into one piece.

"In terms of production, there is a lot of music at MIT, and that was one thing that attracted me to being there. Plus, the kind of weird types of music that can take root there."

—Harry Allen

Harry Allen came to the attention of the general public for his work with Rock & Roll Hall of Fame inductees Public Enemy in the late 1980s. Since then, he has remained on the forefront of music journalism. Due to MIT's fertile history supporting diverse musical genres, from mainframe computer music in the '60s to Indonesian

gamelan percussion today, MIT was Allen's foremost choice to host an experimental DJ septet and residency.

"When I spoke to Harry, I got pretty excited about what he was trying to do because it was so crazy. I had never heard of trying to mix music with that many DJs at one time," says Egozy. "I thought MIT would be the perfect place for this kind of experiment."

At MIT, Allen led a six-class course entitled, How DJs Invented Hip-Hop: The Rise and Rise of the Turntable in Rap Music, while Swift taught students the six basic hip-hop scratches. The MIT community received a vibrant introduction to the musical style, which included lectures on the antecedents of hip-hop, the founding fathers of the genre, battling, the future of DJing, and more.

The DJ septet was the latest iteration of the art form's rich history of musical invention. DJ techniques "were literally created from rubble," says Swift. "It's not like any of these pioneers had lessons in music; it's not like they studied Bach or Beethoven. And yet, through being resourceful, intuitive, and creative, they developed ways of manipulating the turntable that didn't exist before them."

Images: (left) Seven DJs perform as a single unit. Credit: Caroline Alden. (right top) DJ Rob Swift introduces turntable techniques demonstrated by students from his workshop. Credit: Caroline Alden. (right bottom) Da Odd Couple (Rob Swift and Mista Sinista) perform together. Credit: Caroline Alden.
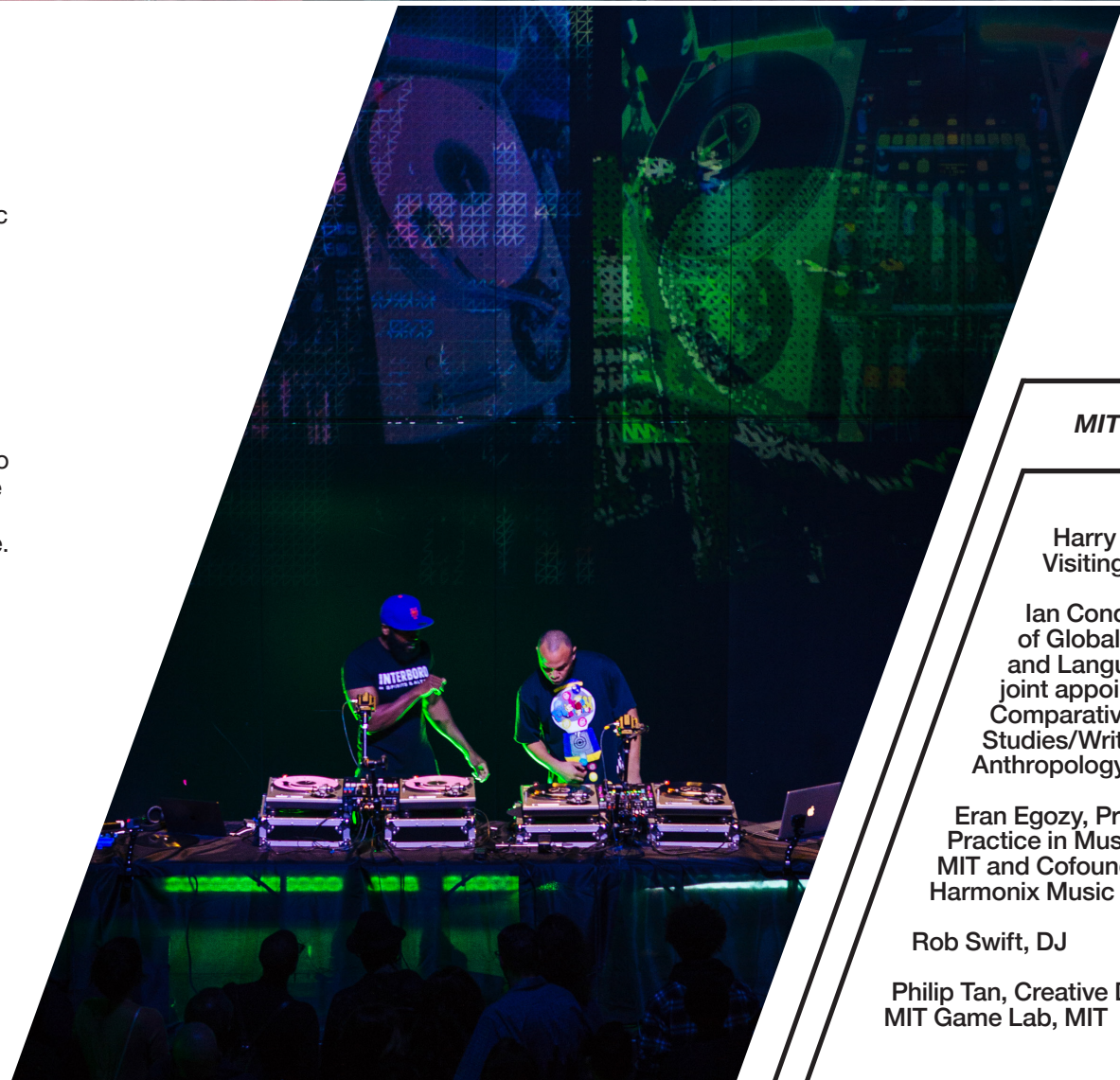
***MIT Sounding* Series**

Harry Allen, CAST Visiting Artist

Ian Condry, Professor of Global Studies and Languages with joint appointments in Comparative Media Studies/Writing and Anthropology, MIT

Eran Egozy, Professor of the Practice in Music Technology, MIT and Cofounder of Harmonix Music Systems

Rob Swift, DJ

Philip Tan, Creative Director, MIT Game Lab, MIT

The Cello Suites

Reinventing Bach's Cello Suites for the violin

Concert: *JS Bach: Complete Cello Suites*, MIT Kresge Auditorium, February 8, 2020

Following up on his celebrated debut recording of J.S. Bach's *Sonatas* and *Partitas*, Grammy award-winning violinist and producer Johnny Gandelsman returned to MIT with an ambitious new project: Bach's immortal cello suites—on the violin.

In January 2015, Gandelsman gave an unadvertised pop-up recital at MIT, performing Bach's *Complete Sonatas* and *Partitas for Solo Violin* to a small but packed house. Lloyd Schwartz, describing the event on NPR's *Fresh Air,* said, "I've heard some famous violinists attempt this epic feat, but none of them gripped me and delighted me as thoroughly as Gandelsman."

Gandelsman then brought his powerful interpretation of these landmark works to a much larger concert hall the following October, reprising his riveting performance for the first annual Terry and Rick Stone Concert in MIT's Kresge Auditorium. The work was described by *The Boston Globe* as "…sparklingly personal Bach, shorn of grandeur, lofted by a spirit of dance, and as predictable as the flight of a swallow."

> **"…sparklingly personal Bach, shorn of grandeur, lofted by a spirit of dance, and as predictable as the flight of a swallow."**
>
> **– The Boston Globe**

This year, Gandelsman performed all six magisterial *Cello Suites* in a solo performance. Like Bach's *Partitas*, the cello suites follow the pattern of an introductory prelude preceding a series of stylized versions of once-familiar seventeenth- and eighteenth-century dances. Though written for a single instrument, their innate linear nature is transformed through a sort of musical sleight of hand into rich polyphonic constructions that amaze both by their technical ambition and expressive power.

Why would Gandelsman, celebrated for his mastery of the *Sonatas* and *Partitas*, decide to play the cello suites on the violin? It helps to consider that Bach himself was an inveterate rearranger and repurposer of his own music.

If an oboe concerto can metamorphose into one for harpsichord, or a German cantata movement can find a new home in a Latin Mass, why not play the cello suites on the violin? With an MIT spirit of playful inventiveness, Gandelsman gave the time-honored music a new spin.

Images: (left and right) Johnny Gandelsman performs Bach's *Complete Sonatas* and *Partitas for Solo Violin* in MIT Kresge Auditorium. Credit: Leon Yim.

MIT Sounding Series

Johnny Gandelsman,
CAST Visiting Artist

MITSO MOVIES MACHOVER
Bringing together music and visual images

Concert: *MITSO: The Night Before*, Facebook Live, July 11, 2020

Concert: *A Toronto Symphony*, Facebook Live, May 9, 2020

In a second online concert, MITSO performed the world premiere of *Three Pieces from the Saul Bass Project* by composer and multi-instrumentalist Don Byron. This new work took its inspiration from graphic designer and filmmaker Saul Bass. Bass's iconic title sequences—the opening number from Alfred Hitchcock's *Psycho*, for example—defined mid-century cool. Byron's piece was performed alongside title sequences from noir classics *Something Wild*, *The Shrike*, and *Walk On the Wild Side*.

Finally, the concert featured John Williams's "Devil's Dance" from *The Witches of Eastwick*, Angelo Badalamenti's brooding overtures to David Lynch's *Twin Peaks*, and the US premiere of Harry Manfredini's revamped score, *Friday the 13th Suite*. Film music is the primary way many people today experience orchestral music, Ziporyn notes.

"Film music is a wellspring of creativity and inspiration."

– Evan Ziporyn

MITSO MOVIES MACHOVER, in its broad and all-embracing approach, demonstrated that the sound of the symphony orchestra is alive and well. In exploring a variety of ways to pair sound with the moving image, the concert celebrated the music—from film soundtracks to the everyday sounds of a city—woven into our common experience.

Images: (left and right) MIT Symphony Orchestra performs Harry Manfredini's *Friday the 13th Suite*. Credit: Screenshot from filmed rehearsal.

Though the MIT Symphony Orchestra (MITSO) was founded more than 100 years ago, *MITSO MOVIES MACHOVER* showed that orchestral music is as vibrant as ever. "There is a common truism that the orchestra is a museum or is dying or at least on life support," says Evan Ziporyn, who served as this year's director of the orchestra. "But as soon as I spent several days listening to 100+ MIT students auditioning, and talking to them about what the orchestra means to them, I realized there was a lot more to it than that."

The concert featured Tod Machover's participatory *A Toronto Symphony* (though the concert was canceled due to COVID-19, the dress rehearsal was broadcast online). In this piece, the public was invited to record and upload sounds using a series of custom apps that Machover developed with his research group, Opera of the Future, at the MIT Media Lab. Incorporating collected field recordings, material developed in workshops throughout the city, and contributions from local musicians, the result was a comprehensive musical portrait of the city. To add to the site-specificity of the work—performed at MIT for the first time outside the original city that commissioned it—Machover collaborated with MIT students to create an entirely new section of the piece, an "MIT Reflection on Toronto."

MIT Sounding Series

Don Byron, Composer

Tod Machover, Muriel R. Cooper Professor of Music and Media, Media Lab, MIT

MIT Symphony Orchestra

Evan Ziporyn, Kenan Sahin Distinguished Professor, Music and Theater Arts and Director, Center for Art, Science, and Technology, MIT

Acknowledgments

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Special Thanks

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