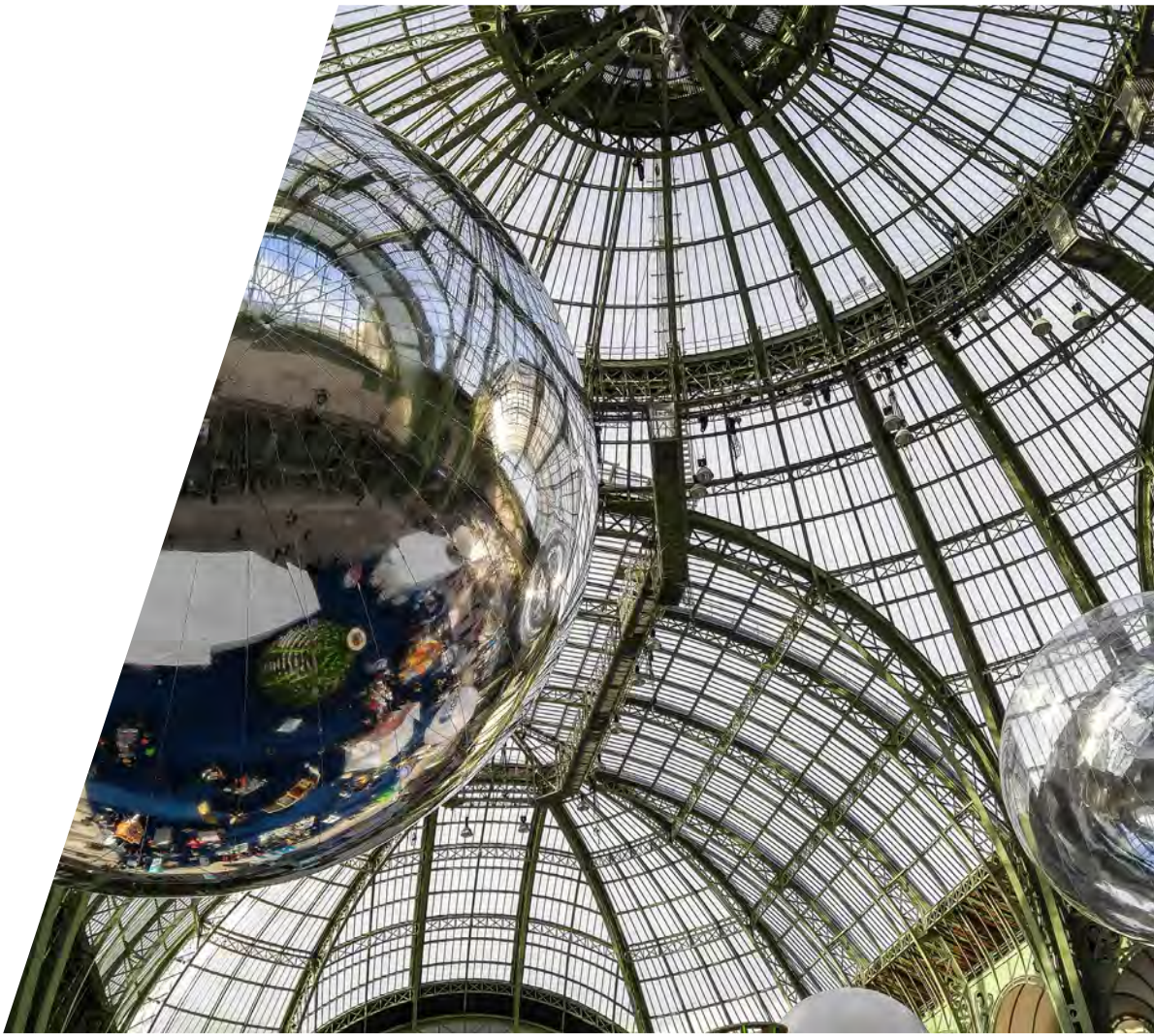
ARTS CENTER FOR ART, SCIENCE & TECHNOLOGY AT MIT



PROGRAMS 2015–16

MIT CENTER FOR ART,
SCIENCE & TECHNOLOGY
2015–16 PROGRAMS

THE ARTS AT MIT
are rooted in experimentation, risk taking and imaginative problem solving.

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Cover image: Tomás Saraceno, *Aerocene*. Installation view at Grand Palais, Paris during UN COP21 Climate Summit, 2015. Image: Studio Tomás Saraceno.

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FROM THE DIRECTORS

CAST's programming expanded in both scope and complexity in 2015–16. Challenging topics prevailed—megacities, dying coral reefs, fossil-free flight and enemy combatants. An opera based upon the film *Persona* and epic performances of Bach and Morton Feldman were highlights in the performing arts. The Center's first book was completed, *Experience: Culture, Cognition and the Common Sense* (MIT Press, 2016). Issuing from the 2014 symposium, "Seeing/Sounding/Sensing," the publication launched a series that will memorialize and extend the intellectual and creative reach of CAST's major symposia. The development of creative work and performances over longer periods and the sustained collaborations they embody are signs of the gathering energy of CAST's efforts, which are revealed as well in the cumulative data presented in this report (see pp. 5–6).

CAST solicits proposals for MIT-based projects through a biannual, campus-wide call, by which a collective portrait of the community's current preoccupations and ambitions emerge. Several overlapping concerns appear in the projects described here, which grapple with climate change, global conflict, nonfiction storytelling and a dynamic artistic and scholarly relationship with canon and archive. These archives range from classical and contemporary music, to repositories of 50 years of visual arts research at MIT to the Arab Spring uprising five years ago. We encourage and support numerous methods of pushing the limits of documentary, installation or performance practices, through visual and sonic layering of various digital platforms—mobile applications, virtual reality, drone photography, live digital looping and gestural electronic processing. The artists, engineers, scientists and humanists engaged in these projects are connected through their relentless dedication to experimentation, and by an attempt to activate experience in ways that expand our visual, aural and moral imaginations.

Here are a few examples from the projects assembled in these pages.

With a third of the world's coral reefs at risk of extinction, and an additional 2.7 billion people expected to live in metropolitan regions around the world by 2050, the photographers for a class in conservation photography and *The Megacity Initiative* have gone underwater and overhead to capture depleting or expanding populations. Marine photographer Keith Ellenbogen, MIT theoretical physicist Allan Adams and a group of students who are certified divers used high-speed imaging techniques for low visibility conditions to photograph the ecosystem of an atoll near Belize. For John Fitzgerald and Niederhauser, in contrast, the world's mass migration to cities can best be visualized from above. From the otherwise unremarkable bird's-eye view of the drone, significant patterns emerge. By displaying aerial photographs of suburban sprawl in installations and a mobile app, they hope to inform sustainable and equitable development in urban centers, a topic of ongoing investigation with their collaborators at the Center for Advanced Urbanism in the School of Architecture and Planning. Initial results from this vast undertaking were presented in "The Future of Suburbia" symposium and accompanying exhibition.

Making sense of current phenomena that are unfolding over time in disparate locations is quite a different matter from capturing an outpouring of expression during 18 days of spontaneous uprising—the purpose of *Vox Populi*, the web-based archive of the 2011 Egyptian revolution created by Lara Baladi, visiting artist and lecturer in the Program in Art, Culture and Technology and a participant in the events. To videos, photographs, slogans, graffiti, radio broadcasts and street art compiled from social media or on the scene, Baladi has added data visualizations, timelines, news accounts, court documents and more to create an unofficial history of the Arab Spring. In amassing this *living* archive, the ongoing artistic challenge is to find the most effective platforms and interactive interfaces for a new form of "info-activism" or "tactical media research."

In contrast to Baladi and a growing cadre of web-based installation artists, photojournalist Karim Ben Khelifa's virtual reality (VR) installation *The Enemy* deploys spatial engagement and first-person narratives by combattants on opposite sides of longstanding conflicts—for example, in Israel and Palestine, and the civil wars in Congo and El Salvador. The project seeks to test the possibility of generating empathy through simulated encounters and builds upon research conducted by the Imagination, Computation and Expression (ICE) Lab at MIT led by Professor Fox Harrell, which studies the effects of gaming and other interactive experiences on identity. Together, Ben Khelifa and Harrell are taking on the daunting task of trying to humanize "the Other." Donning the relatively cumbersome VR backpack and headgear, "feels as if I were getting ready for a spacewalk or a deep-sea dive," reports Randy Kennedy in *The New York Times*. Yet it becomes a "deeply affecting experiment in communication" that opens new possibilities for experiencing "empathy beyond the reach of traditional documentary."

A multimedia exploration of nonfiction modes of presentation and storytelling unites these otherwise divergent projects, and a related drive to reinvent performance animates *MIT Sounding*'s second season. What does radicalizing the performance experience itself—the theme of the series—entail? It may involve radically recontextualizing classic works from rock music or film. Maya Beiser's *Uncovered* tunes, in Ziporyn's arrangements, process the cello as if it were a rock vocalist or an electric guitar. Director Jay Scheib and composer Keeril Makan convert Ingmar Bergman's film *Persona* into a chamber opera using on-stage, real-time video to multiply points of view and electronically inspired, but acoustically realized, music to narrate the silences that permeate the plot.

Other works in the *MIT Sounding* series use duration to create a narrative or immersive framework for music, leading the audience into an expanded mode of listening. Hearing all of Bach's works for solo violin in one uninterrupted series elicits a visceral response to the endurance of the performer, Johnny Gandelsman, as well as to the music, as does the experience of Morton Feldman's long-form *String Quartet no. 2*, which lasts six hours; these works are rarely performed and made their Boston premieres in the *MIT Sounding* series.

Flux Quartet describes their presentation of Feldman's work as a performance/exhibit hybrid (as the group's name, inspired by the Fluxus movement in the 1960s and 70s, might suggest). This transposition and intermingling of sensorial evocations also characterizes the *Experience* book, which restages questions about experience as an encounter among essays from humanists, papers by neuroscientists, ingeniously designed pages by artists, and a rich set of dialogues, conversations and transcripts that convey a vibrancy particularly appropriate for the topic. The interventions by artists—in the form of a heat-sensitive cover, a score that invites the reader to *play* the book as a percussion instrument, a bookmark of threads that cascades from a centerfold print of a spider's web, and others—turn the ancient format of the codex into an experimental space.

It is CAST's privilege and opportunity to encourage and support this kind of free-range mobility across genres, scales, repertoires and disciplines, and we are gratified to see sustained, multiyear projects underway, which leverage local resources and outstanding visiting practitioners to achieve targeted research and artistic goals. Our premise in creating CAST four years ago was to recognize that MIT has long been a center for the creative intermingling of art, science and technological innovation, whatever origin story one favors (one could go back as far as MIT's 1861 charter, or as recently as the Festival of Art, Science & Technology, celebrating MIT's sesquicentennial in 2011). Given this legacy and the dynamic mix of laboratory, design studio, exhibition and performing arts activities on campus, our role is to provide a curatorial framework and supportive infrastructure for the creative culture of the Institute as a whole. The emphasis is on exploration and discovery and on research and development of new work. This open-ended approach puts artistic research on an equal footing with public presentation and allows a borderless, bottom-up creativity to flow.

Evan Ziporyn
Kenan Sahin Distinguished Professor of Music
Faculty Director, CAST and Artistic Director, *MIT Sounding*

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

Amanda Crider performing in Keeril Makan and Jay Scheib's *Persona* workshop at MIT.

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.

CAST'S ACTIVITIES INCLUDE:

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.

FUNDERS

The Center for Art, Science & Technology is funded through 2020 by a grant from the Andrew W. Mellon Foundation. CAST also receives generous support from Dasha Zhukova; the late Fay Chandler; Ron and Carol Kurtz; Terry and Rick Stone; and Peter Athens. Additional 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 and Planning; and the Council for the Arts at MIT.

2012–16 CAST PROGRAM STATISTICS

1,800+ students enrolled in classes, attended workshops and symposiums, or participated in performances

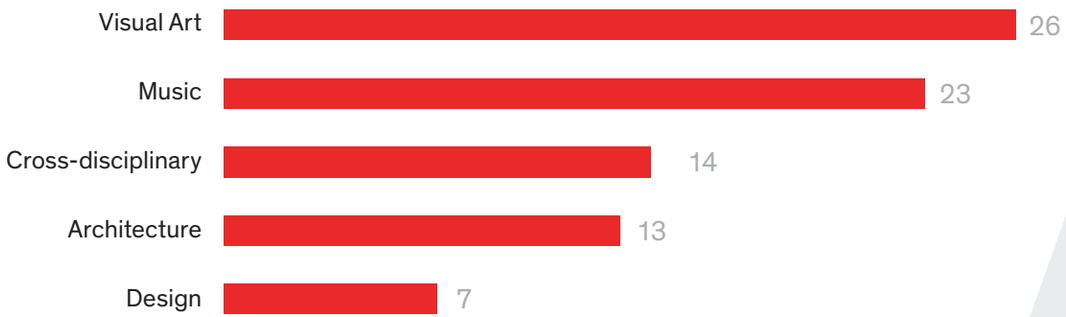
80+ MIT faculty and staff collaborated with visiting artists

Visiting artists engaged with students during **127** class visits and individual meetings

15,700+ people attended **73** public programs in person, and another **4,500** joined via live web streams

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

PROJECTS BY ARTISTIC DISCIPLINE



PARTNERS AT MIT

OFFICE OF THE PROVOST
List Visual Arts Center
MIT Museum

SCHOOL OF ARCHITECTURE AND PLANNING (SA+P)
Program in Art, Culture and Technology
Department of Architecture
Community Innovators Laboratory
Department of Urban Studies and Planning
History, Theory and Criticism of Architecture and Art
Media Laboratory

SCHOOL OF ENGINEERING
Aeronautics and Astronautics
Department of Civil and Environmental Engineering
Computer Science and Artificial Intelligence Laboratory
Electrical Engineering and Computer Science
Glass Lab
Department of Mechanical Engineering
Materials Science and Engineering

SCHOOL OF HUMANITIES, ARTS, AND SOCIAL SCIENCES (SHASS)
Anthropology Department
Comparative Media Studies/ Writing
History Department
Global Studies and Languages
Linguistics Department
Literature Department
Music and Theater Arts
Program in Science, Technology and Society

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

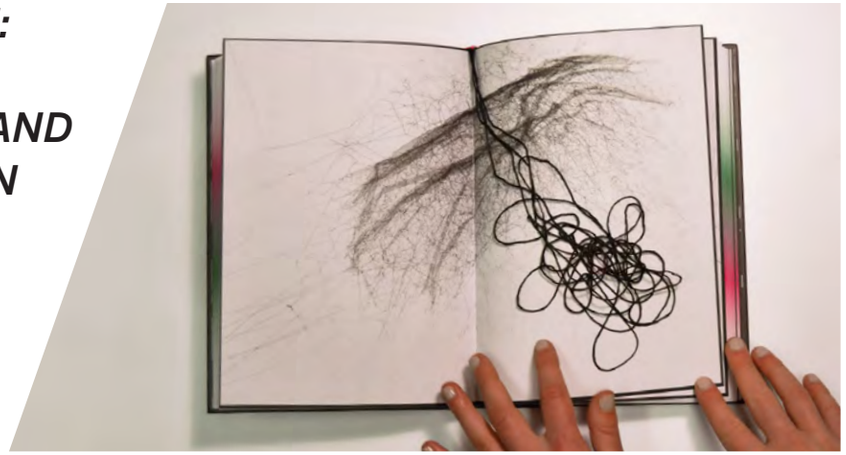
STUDENT LIFE
Concourse Program
Hillel Program

SLOAN SCHOOL OF MANAGEMENT
MIT Leadership Center
Martin Trust Center

An inquisitive expression of a polyclad flatworm as it crawls over the coral reef. Image: Keith Ellenbogen.

EXPERIENCE: CULTURE, COGNITION, AND THE COMMON SENSE

Confronting sensory experience



/ BOOK: *EXPERIENCE: CULTURE, COGNITION, AND THE COMMON SENSE* (MIT PRESS, 2016)

In this creative brief, the editors of Experience: Culture, Cognition, and the Common Sense, *Caroline Jones, David Mather and Rebecca Uchill, describe the unusual material features, artistic interventions and intellectual provocations that make this book object something more than a typical codex.*

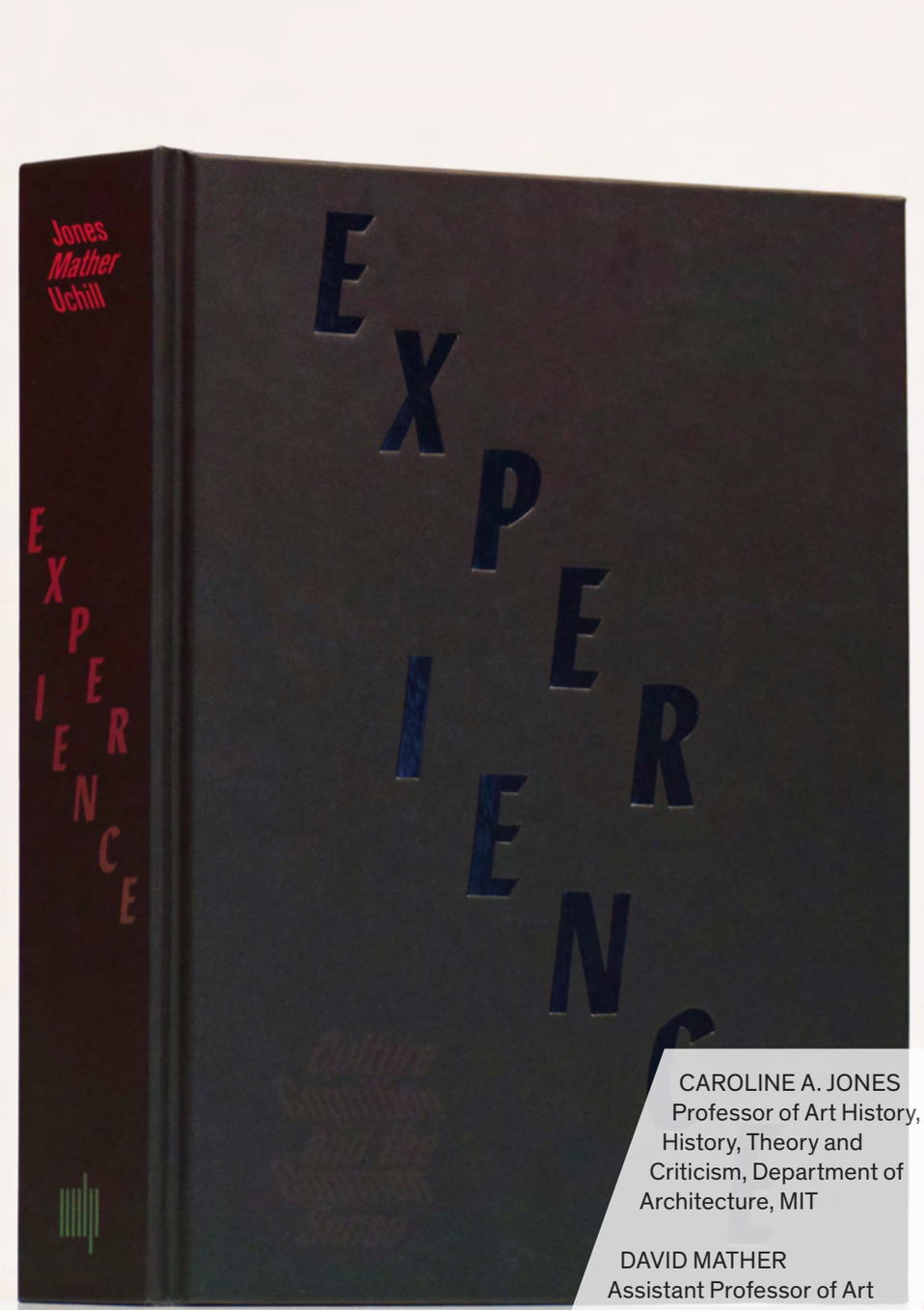
Experience: Culture, Cognition, and the Common Sense is conceived as an exploration of the category of "experience" from a range of disciplinary perspectives and material confrontations. The first publication of the MIT Center for Art, Science & Technology (CAST), the book convenes artists, musicians, philosophers, anthropologists, historians and neuroscientists, each of whom explores experience across sensorial and cultural realms. As part of this undertaking, the editors invited leading contemporary artists to produce aesthetic experiences that unfurl during the reader's engagement with this book object.

A special heat-sensitive thermal cover by Olafur Eliasson incorporates both tactile and cosmic concepts. When exposed to heat, the changing ink reveals typeset words, powerful colors and an Eliasson drawing underneath the all-black cover.

Carsten Höller designed front and back endpapers in the form of the Zöllner illusion printed with a special ink impregnated with encapsulated synthesized human pheromones, estratetraenol and androstadienone. (As the names suggest, these are tuned to female and male olfactory signal systems, respectively.)

Artist Tauba Auerbach designed the book's outer edges. *Gradient Flip*, a design in complementary colors bleeding off the outer margins, appears to be green-fading-to-magenta on one side of the book, and the reverse pattern on the other side. When the book is manipulated, the colors oscillate for a dynamically shifting effect.

Renowned experimental composer and sound artist Alvin Lucier produced an original musical composition for the book. The score *Closed Book* instructs the reader to "play" the volume as an instrument by tapping on the object of the book in certain rhythmic patterns.



CAROLINE A. JONES
Professor of Art History, History, Theory and Criticism, Department of Architecture, MIT

DAVID MATHER
Assistant Professor of Art History, Art Department, State University of New York Stony Brook

REBECCA K. UCHILL
Mellon Postdoctoral Fellow, CAST

Previous page, left: The center pages of the book display images of Tomás Saraceno's spiderweb and bookmarks. Image: Heidi Erickson.

Previous page, right: Heat-sensitive thermal cover by Olafur Eliasson. Image: Heidi Erickson.

Above: A glimpse of Carsten Höller's front and back endpapers, Tauba Auerbach's *Gradient Flip* on the edges of the pages and Tomás Saraceno's spiderweb bookmarks. Image: Heidi Erickson.

Renée Green contributed a reflective piece of design and visual poetry from her deeply colorful *Space Poems* series, which can be seen as an exploration of artistic process.

A sculptural intervention by Tomás Saraceno tangles the reader in a set of wildly extended bookmarks that cascade from the center of the book when opened. They emerge from a backdrop of his inked spiderweb prints. These bookmarks invite readers to contemplate Saraceno's interest in social spiders, whose different silks combine with those of other species to create dynamic collective structures.

Other art-based contributions to the book include an interview (never before published in English) with Tino Sehgal, as well as an excerpt of Bruno Latour's contribution to the collaborative theatrical production *Waiting for Gaïa*. Dialogues between the arts and other disciplines are also expanded on the pages of the book, for example, in Adam Frank's writings on Alvin Lucier through the lens of affect theory, or Latour's use of neuroscientist Bevil Conway's work on dynamic visual processes, or Conway's own close reading of vision science, explored as well in the paintings by Tauba Auerbach, also illustrated in the book.

The book was provoked and stimulated by a fall 2014 symposium sponsored by MIT's Center for Art, Science & Technology, "Seeing / Sounding / Sensing," and includes a selective set of its contributors, including historian Mara Mills, cognitive neuroscientist Josh Tenenbaum and anthropologist Stefan Helmreich. However, the matters of inquiry in this book have long been important to its editorial team. Caroline Jones, in her long commitment to a critique of visuality as the unnecessary obsession of modernity, realized that her successful MIT Press book *Sensorium*, in its exploration of multisensory modalities, left notions of "embodied experience" largely unexamined. David Mather, a scholar of early 20th-century visual art, sound and cinema, was the inaugural CAST Mellon Postdoctoral Fellow who helped to organize the 2014 symposium. Rebecca Uchill is a curator and scholar who has worked on the changing category of "experience" in art events and academic publications.

Collectively, the editors expanded the scope of the inquiry and solicited contributions ranging from newly commissioned essays from Douglas Kahn, Natasha Schüll, Adam Frank, Michael Rossi, and Vittorio Gallese, to classic existing texts by Joan W. Scott, Alva Noë, Jacques Rancière, Michel Foucault, John Dewey, Edmund Husserl and William James.

> "*Experience* produces experience while bringing the concept itself into relief as an object of contemplation."
>
> – MIT Press

Through the various evocations of experience offered by the book's material and aesthetic form, as well as the many conceptualizations of experience framed by its contributors, the reader is given an array of means for comprehending the world—socially, politically, and poetically. The stakes of this enterprise are high: as Bruno Latour notes in his contribution to the book, in discussing the urgency of cultivating sensitivity to environmental change, "becoming sensitive requires taking account of the everyday experience of being."

TACTICAL BEAUTY

Underwater photography serves conservation efforts

/ CLASS: UNDERWATER CONSERVATION PHOTOGRAPHY, JANUARY 2016

/ EXHIBITION: 8.S10 UNDERWATER CONSERVATION PHOTOGRAPHY STUDENT EXHIBITION, WIESNER STUDENT ART GALLERY, MARCH 2016

Coping with climate change is such a profoundly new part of the human experience that the neologism, *solastalgia*, has been coined to describe the emotional distress caused by violations against the planet. Underwater photographer Keith Ellenbogen may have hit upon the best remedy for this distinctly twenty-first-century form of anguish—action. Ellenbogen uses beauty as a call to arms.

Ellenbogen has spent his career documenting marine life around the world, including coral reefs in Palau, migrating bluefin tuna in the Mediterranean and penguins in Patagonia. Numerous conservation organizations have used his arresting images to promote understanding of marine ecosystems. At MIT, Ellenbogen, who is known for pushing the technological limits of his medium, explored new high-speed photography and underwater imaging techniques in collaboration with Jim Bales and Allan Adams. Ellenbogen and Adams created and co-taught Underwater Conservation Photography, a cross-disciplinary course that covered everything from using camera settings to constructing lighting systems for underwater photography to building remotely operated vehicles. The class spent several intensive weeks in the MIT pool honing diving and photography skills and testing equipment, before heading to the Wildlife Conservation Society on Glover's Reef off the coast of Belize. For their expedition to succeed, students needed to acquire an expansive skill set that combined knowledge from such varied fields as marine biology, mechanical engineering, ocean engineering, science journalism and photography.

In Belize, students photographed the ecosystem of coral reefs, dozens of species of fish and other sea creatures in order to tell a unique conservation story. They exhibited their photographs of damselfish, parrot fish, sea fans, sponges and eels in the Wiesner Student Art Gallery, accompanied by text explaining the technological, biological and ecological stories behind the images.

JIM BALES
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ALLAN ADAMS
Research Scientist,
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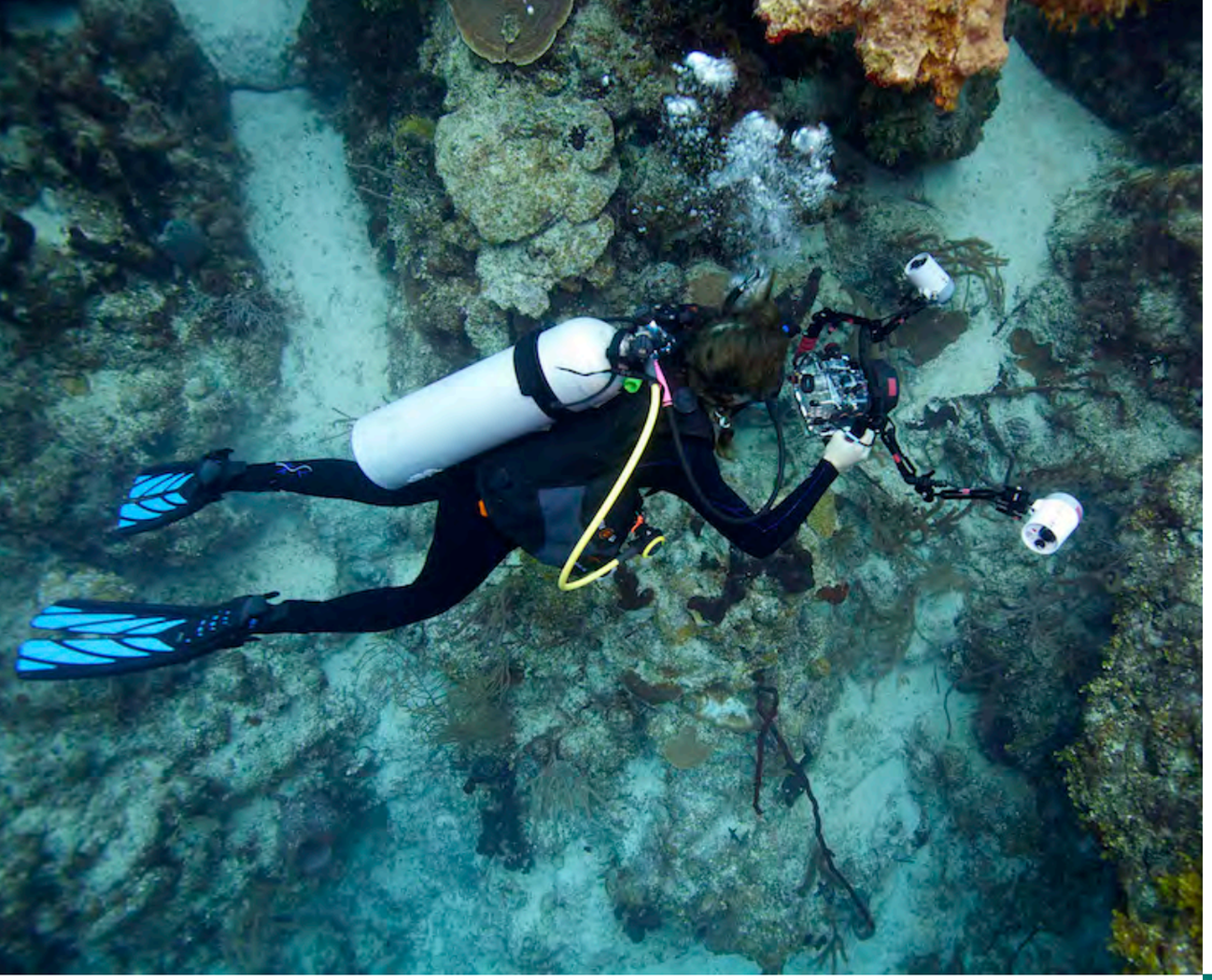
KEITH ELLENBOGEN
CAST Visiting Artist



Previous page, left top: Duncan Wheeler photographs his team's constructed underwater world in the Wang Alumni Pool. For this project, students Edith Chavez, Grant Gensman, Maha Haji and Duncan Wheeler created Trashtopia, a place where they say, "soda cans, plastic bottles, floppy disks and electric wire, are all given life, as they take on new forms." The project was an opportunity for students to develop both their diving and technical skills before the class trip to Belize. Image: Keith Ellenbogen.

Previous page, right: A school of silhouetted bull sharks (Carcharhinus leucas) circle for food near the ocean's surface. These sharks are estimated at a length of ten feet long and a weight of 600 pounds; Beqa Lagoon, Fiji March 2011. The health of the coral reef ecosystem is often determined by the presence of apex predators such as sharks. Image: Keith Ellenbogen.

Above: Student Sasha Chapman dives at the Wildlife Conservation Society's Glover's Reef Research Station off the coast of Belize. Image: Keith Ellenbogen.

Right: Students honed their technical skills in the Wang Alumni Pool, working with ROVs, DSLR cameras, underwater housings and strobe equipment, with limited air supply, to simulate the experience of photographing underwater at the Wildlife Conservation Society's Glover's Reef Research Station off the coast of Belize. Image: Maha Haji.

Right bottom: Photograph taken in Belize by student Sasha Chapman, Knight Science Journalism Fellow in the Program in Science, Technology and Society.

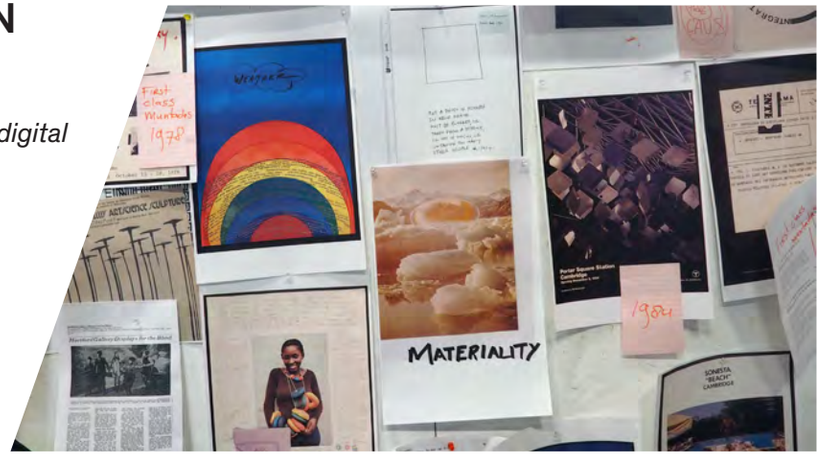
The enormity and complexity of problems such as climate change require a collective effort to offer solutions. While scientists must explain the facts, experiment and devise methods to reverse or prevent damage to the planet; politicians, economists, artists and countless other humanities researchers are needed to change policies and public opinions.

Through their work, artists have historically roused people from complacency—a point stressed in this course. Sasha Chapman, Knight Science Journalism Fellow, for instance, implored viewers, "When we look at a reef—healthy or bleached—what we see bound up in it are not just the fates of the creatures who live there, but our own fates, too. . . . Life is fragile. . . . Change one small thing, and the reef's exquisite balance changes too." The students' response was direct. Confronted with such beauty, can viewers resist caring? Appeals to human reason alone may not change people's behaviors, but perhaps stirring their hearts, as well as their minds, will.

> "What would you do, if in your lifetime, one-third of the world's cities would be completely destroyed? Unfortunately, if nothing is done, this is the exact plight faced by the world's coral reefs today."
>
> – Maha Haji

ACTIVATING AN ARCHIVE

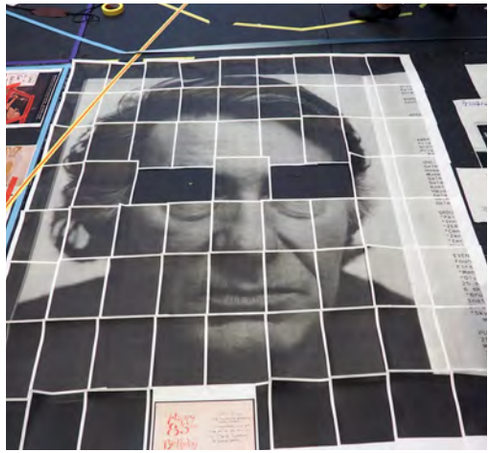
NODE/Bengler create a digital repository for the CAVS Special Collection



/ WORKSHOP: "ON THE RECORD: BROADCASTING PRACTICES WITH NODE BERLIN OSLO/BENGLER," FEBRUARY 20, 2016

With the advent of new media, it is easier than ever to experiment with multiple publishing platforms. *On the Record*, a series of programs focused on the public side of publishing and research, began with an investigation of a significant archive at MIT—that of the Center for Advanced Visual Studies (CAVS). Thanks to an NEA Art Works grant, designers from NODE Berlin Oslo and Bengler will create a digital repository of this collection that will be publicly accessible, visually engaging and interactive.

The CAVS Special Collection is the repository of the forty-five-year history of the collaborative and time-based art productions of more than 200 internationally recognized fellows. The collection includes books, documents, films, images, video and audio tapes from such prominent artists as Vito Acconci, György Kepes, Charlotte Moorman, Antoni Muntadas, Nam June Paik and Otto Piene. Serge Rompza of NODE and Even Westvang of Bengler, together with ACT archivist Jeremy Grubman, led a workshop in which participants mined this collection to explore connections among its diverse



JEREMY GRUBMAN
Archivist, Art, Culture and Technology, MIT

SERGE ROMPZA
CAST Visiting Artist

EVEN WESTVANG
CAST Visiting Artist

Previous page, left top: A selection of CAVS archival materials. Image: Irina Chernyakova.

Previous page, left middle: For many patrons of the CAVS archive, questions get raised through serendipitous encounters with the materials. The workshop aimed to simulate these chance encounters with archival materials by providing slides and binders of images and documents for the participants' use. Image: Irina Chernyakova.

Previous page, left bottom: One group made this image of Otto Piene from photocopies. A leading figure in kinetic and technology-based art, Piene was the first fellow of the MIT Center for Advanced Visual Studies in 1968. In 1974, he succeeded founder György Kepes as its director until retiring in 1994. Image: Irina Chernyakova.

Previous page, right: Participants worked in groups making their own categories and connections for CAVS archival materials. The installation was in some ways a physical representation of the digital repository. Image: Irina Chernyakova.

Above: Groups discussed how they selected and organized the CAVS archival materials, and how that might translate to an online database. Image: Irina Chernyakova.

Right: The workshop gave Grubman, Rompza and Westvang insights into the CAVS Archive's patrons. Grubman explains: "We wanted to know, for instance, what architects ask? What connections do people find? We got interesting things that we couldn't anticipate. We had an archivist use library-standard descriptive terms, but we had another participant using Greek myths as a way of categorizing materials." Image: Irina Chernyakova.

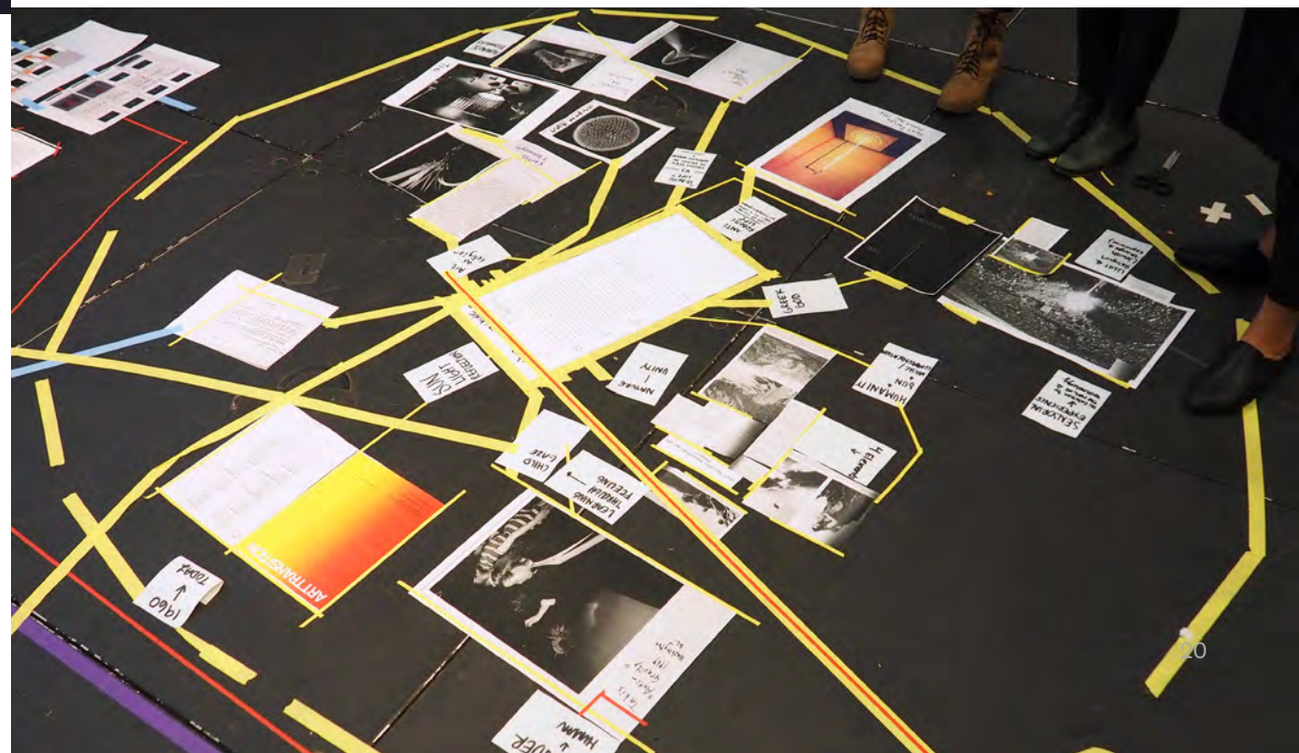
materials. Grubman says that attendees "were participants in a social experiment" that "aimed to better understand how users from different backgrounds approach research in this collection."

Westvang believes that "craft and a proximity to material qualities are highly relevant when making things for digital media." To that end, they strived to make the workshop bridge the digital/physical divide. Participants were invited to sift through binders of correspondence, posters, photographs and slides, and to photocopy items. These copies formed the basis of a vibrant installation of archival materials, linked across user-generated categories with colored tape. A challenge of the workshop was visualizing in physical form how a digital repository looks, and the photocopier was a means to simulate the endless replication possible in a digital environment.

One feature that NODE and Bengler will import from the physical realm into the digital repository is transparency. Just as participants witnessed each other's thought processes as they selected items to copy and link, researchers using the digital repository will be able to see other users' annotations and suggestions. This sort of curated crowdsourced content will be especially valuable in instances where CAVS fellows comment on projects they developed at MIT.

> "We hope to excavate [the archive]."
>
> – Serge Rompza and Even Westvang

Grubman points out, "These layers are tools that are going to arm users with more information about how collection materials are interconnected, but it is also going to inform us about how people are using the site." With this digital collection, researchers will be able to share their insights, add meaning and pose new questions as they make visible the liveliness and currency of the archive.



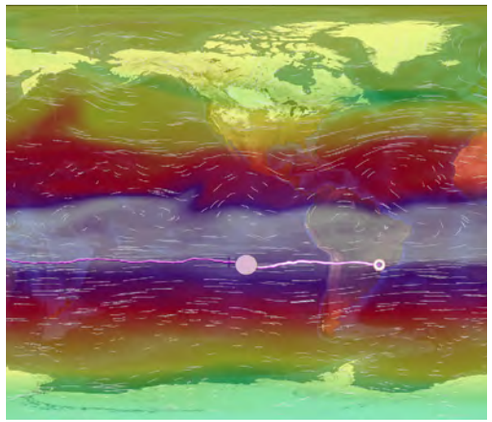
BECOMING AEROSOLAR

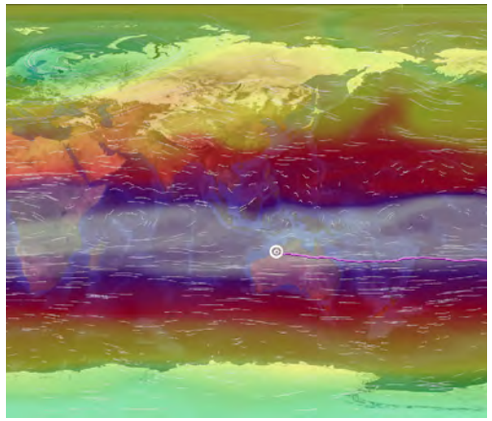
Tomás Saraceno's Aerocene, *on and above terra firma*

/ EXHIBITION: *AEROCENE*, GRAND PALAIS, PARIS, COP21, DECEMBER 2015

"We are trying to reimagine how human beings will navigate around the world," says artist Tomás Saraceno, describing the lofty goal of his *Aerocene* project. These "climate-conscious sculptures," made from silver and transparent Mylar, are designed to travel around the earth without helium, batteries or solar panels. Instead, they will glide on wind currents and are kept afloat by solar and infrared radiation.

"There are highways in the sky; the jet stream moves at a speed of 300 kmph," Saraceno points out, "but first, you need to know where the jet stream is." With this knowledge, Saraceno hopes to change the laws of aviation and mitigate the impact of big fossil fuel burners. The air-fueled sculptures prompt us to "speculate about how mobility shapes the way we live on the earth," Saraceno explains. "Mobility is responsible for a lot of carbon in the air," and he points out, "we need to rethink how we fly."



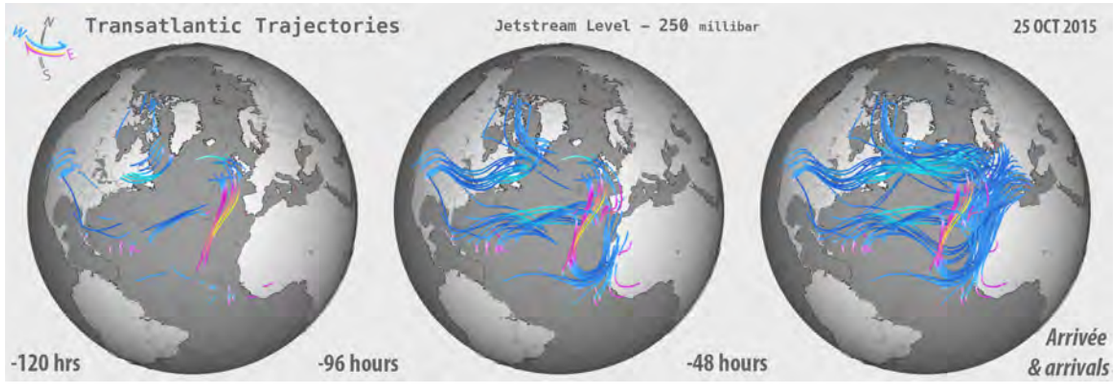


TOMÁS SARACENO
CAST Visiting Artist

GLENN FLIERL
Professor, Earth, Atmospheric and Planetary Sciences, MIT

LODOVICA ILLARI
Senior Lecturer, Earth, Atmospheric and Planetary Sciences, MIT

BILL MCKENNA
Researcher, Earth, Atmospheric and Planetary Sciences, MIT



Saraceno has collaborated with MIT meteorologist Lodovica Illari, MIT oceanographer Glenn Flierl and Bill McKenna, a researcher in Illari's lab in the Department of Earth, Atmospheric and Planetary Sciences, to study the jet stream and determine potential flight paths for the aerosolar inflatables. Using historical MIR (hot-air balloon) flight data and associated atmospheric data from the Centre National d'Etudes Spatiales, Illari and McKenna examined past trajectories. They also speculated on the best places and seasons for future launches based on various factors, including wind strength and direction, temperature, pressure and cloud cover.

"The project requires critical optimism," says McKenna, who worked with Saraceno on many phases of the project—in Cambridge, the Solomon Islands and Paris. "You have to find a balance between the best atmospheric conditions and maximizing solar and infrared radiation."

"We like to think of ourselves as living on the Earth's surface, but we are living at the bottom of an ocean of air."

– Tomás Saraceno

They presented their work at COP21, during the climate summit in Paris in December 2015, where Saraceno's sculptures were suspended from the glass and steel ceiling of the Grand Palais. Although aerosolar flight won't replace jet travel anytime soon, Saraceno and his collaborators around the world are one step closer to its realization.

Previous page, left top: Tomás Saraceno, College of *Aerocene* at flight altitude, 2015. Image: Studio Tomás Saraceno.

Previous page, left middle and bottom: Vertical distribution of ozone during the flight period—purple/white at high ozone concentrations. Ozone has a minimum concentration in the troposphere and a maximum in the tropical lower stratosphere at heights 28–42 km. Image: Courtesy of Illari/McKenna, EAPS.

Previous page, right: Tomás Saraceno, *Aerocene,* Grand Palais, 2015. Image: Studio Tomás Saraceno.

Left: Tomás Saraceno *Aerocene* Test #1, 2015. From the oceanographic expedition to Solomon Islands upon the invitation of TBA21 Academy. Image: Studio Tomás Saraceno.

Above: Trajectories at 250 mb, arriving October 25, 2015. Left image shows travel after 24 hours, and right, the fuller 5 days. Flow from the west is marked in cyan/blue, flow from the east is marked in pink/gold. Backward trajectories have been computed using forecast data (GFS model) from locations over western Europe. Image: Courtesy of Illari/McKenna, EAPS.

FILM & MEDIA

Future of Suburbia. Image: John Fitzgerald and Matthew Niederhauser.

THE ENEMY

Expanding ethical imagination with virtual reality

/ CONFERENCE: "VIRTUALLY THERE: DOCUMENTARY MEETS VIRTUAL REALITY," MAY 6 AND 7, 2016

/ CLASS VISITS: COMPARATIVE MEDIA STUDIES, CMS.628/CMS.828 ADVANCED IDENTITY REPRESENTATION, SEPTEMBER 28, 2016 AND CMS.950 WORKSHOP I, NOVEMBER 4 AND 11, 2015

/ PROTOTYPE DEMONSTRATION AND RESEARCH: *THE ENEMY*, SEPTEMBER 26–OCTOBER 7, 2016

The Enemy introduces participants to combatants from opposing sides in contemporary conflicts, including soldiers from Israel and Palestine, combatants from the Congo and opposing gang members from El Salvador. This virtual reality (VR) project is rooted in Karim Ben Khelifa's experiences as a photojournalist, working extensively in the Middle East. With Fox Harrell, he is combining interviews and photography with the latest research in artificial intelligence and cognitive science in order to explore VR's potential not only to engender empathy, but also to make us more self-aware. Ultimately, he hopes understanding oneself and one's enemy may thwart recruitment efforts and help end fighting.

The prototype of *The Enemy*, which was tested at MIT, begins with the Israeli–Palestinian conflict. We meet our protagonists, Gilad Peled and Abu Khaled, in a neutral space conducive to personal reflection.

KARIM BEN KHELIFA
CAST Visiting Artist

FOX HARRELL
Professor and ICE Lab Director, MIT

Each man tells us his hopes, dreams and fears (through an unseen translator). Their statements are strikingly similar. Ben Khelifa says, “It’s a highly charged conflict and everyone has an opinion about it.” Regardless of your personal views, he notes, the project forces you “to face a stereotype in one form or another. . . . Getting physically closer to that stereotype, to listen to him, is something that opens up the story in a very different way.”

“We make sense of the world through stories, and we remember the world through experience. That’s how it works as human beings. I am telling a story and making people live an experience at the same time. I think the combination of the two might stick with you longer,” he adds. This concern for triggering critical awareness and self reflection is what sets *The Enemy* apart from other VR projects, and incidentally, what led him to collaborate with Harrell.

Fox Harrell researches how one’s identity can shift during gaming and interactive experiences. He explains how his ideas and ethos overlap with Ben Khelifa’s: “[Karim] is modeling the grandest scale of discrimination and bias, which is a global conflict. And so we thought, can we use some of the models from these systems I’ve been developing to implement change within a VR system? So as you go through the installation, by the end, you are somebody different.”

The Enemy is not oriented around spectacle; rather, it uses VR to create intimacy and journalistic naturalism, Harrell points out: “Really, it is about the fidelity of the body language and the spatial engagement with people who are usually very far apart.”

> “You create an enemy without having met your enemy, because the society around you has created an enemy in the other. So, the question is, could I be you if I were on the other side?”
>
> – Karim Ben Khelifa

Ben Khelifa and Harrell are working on the project’s scalability, using augmented reality to ensure the widest possible distribution. They want to bring *The Enemy* to places where, for political or logistic reasons, the full-scale installation cannot be exhibited. After all, the goal of the project is not only to share the stories of men like Gilad Peled and Abu Khaled. It is also to make us examine our own biases, in the hope that after we remove the VR headset, we will see reality differently.

Previous page, left top: A virtual reality headset ready to be used in *The Enemy*. Image: Lenny Martinez.

Previous page, left bottom: Karim Ben Khelifa, left, and Fox Harrell, collaborated on the virtual reality project *The Enemy*. Image: Kayana Szymczak for *The New York Times*.

Previous page, right: Students experience the virtual reality project *The Enemy* in a multi-user environment. Image: Lenny Martinez.

Left: Behind the scenes of production of *The Enemy*. Image: Karim Ben Khelifa.

Below: A user at one of several demonstrations of *The Enemy*. “When we started the project,” says Ben Khelifa, “it was clear for me that this would not be a sitting experience. My instincts told me it would be more powerful if you walk the space.” Image: Lenny Martinez.

THE MEGACITY INITIATIVE

Illuminating the global impact of mass migration to cities

/ EXHIBITION: *FUTURE OF SUBURBIA*, JANUARY 25–APRIL 2, 2016

/ CONFERENCE: "FUTURE OF SUBURBIA," MARCH 31–APRIL 1, 2016

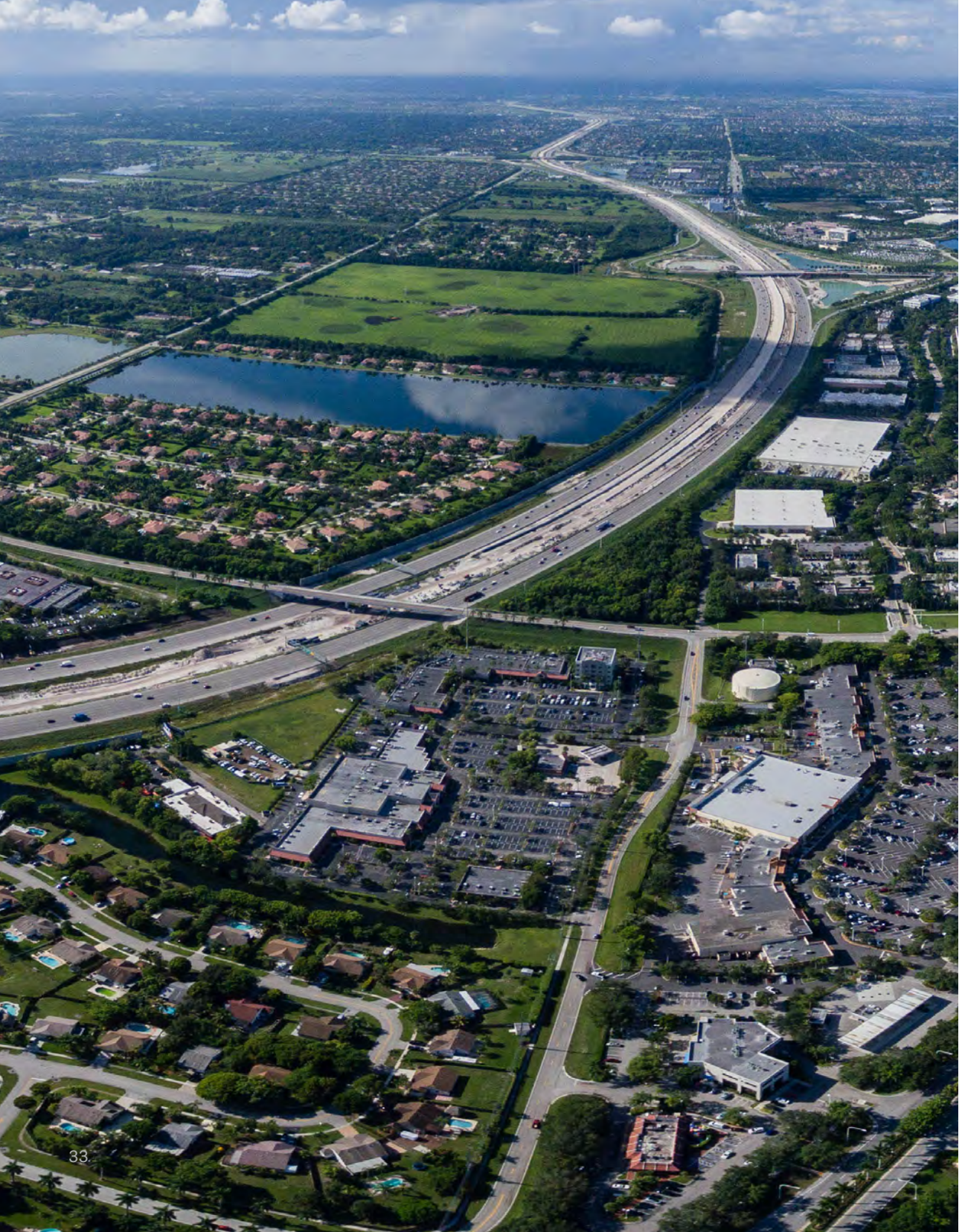
"In our dream, it has become a democratic society. You know, the city will become a kind of vehicle to help people live together and to be creative," says artist Ai Weiwei in *Kapital Creation: Chasing the Chinese Dream*. This video by Matthew Niederhauser and John Fitzgerald examines the urban explosion of Beijing through the eyes of creatives who envision a different future and recognize that the rest of the planet is bound to their fate. Niederhauser and Fitzgerald emphasize, "These are not isolated difficulties now that we live on a globalized planet. How 2.7 billion more people decide to live in cities will affect the entire world economically, socially and environmentally. Mutual understanding and international cooperation are absolutely vital to the process of improving quality of life in rapidly expanding metropolitan regions."

This drive to create a more robust civic lifestyle is at the root of Niederhauser and Fitzgerald's work, and with two-thirds of the earth's population expected to live in cities by 2030, there is urgency to their efforts. In their ongoing project, *The Megacity Initiative*, they use video, photography and immersive virtual reality (VR) technologies to illuminate this migration process and to empower people to interact meaningfully with their urban environments. Their work has taken them to India, South Africa, Brazil, China, Southeast Asia and West Africa, where they are examining sustainable development, social equity, land rights and freedom of expression in burgeoning metropolitan regions.

Using drones and 360-degree VR cameras, Niederhauser and Fitzgerald captured the complex changes to urban and suburban areas. The resulting videos and visualizations show the scale of these developments and place viewers in the midst of the sprawl. The artists say, "Our collaboration with [the Center for Advanced Urbanism] for the *Future of Suburbia* represents a huge leap forward in terms of how we exhibit our work. All of the media that we created from trips to India, South Africa, Brazil, China and around the United States is being incorporated into a dynamic installation that we would have otherwise been unable to produce or conceptualize on our own."

JOHN FITZGERALD
Visiting Scholar, Center for Advanced Urbanism, MIT

MATTHEW NIEDERHAUSER
Visiting Scholar, Center for Advanced Urbanism, MIT



A mobile app component of *The Megacity Initiative*, built on a framework that is easily translated into other languages, allows users from metropolitan regions around the world to take a greater stake in ensuring more sustainable and equitable development. This digital platform is striving to provide a voice for those who want to impact and participate more fully in the future of their cities.

"The city lies at the heart of this century, and now is the time to bring it new shape and form."
– Matthew Niederhauser and John Fitzgerald

Previous page, left: *Future of Suburbia.* West Coast 1, 2015. Image: Matthew Niederhauser and John Fitzgerald.

Previous page, right: *Future of Suburbia* exhibition opening, MIT Center for Advanced Urbanism. Image: Courtesy of the MIT Center for Advanced Urbanism.

Left: *Future of Suburbia.* Image: Matthew Niederhauser and John Fitzgerald.

Above: Attendees enjoy the *Future of Suburbia* exhibition opening, MIT Center for Advanced Urbanism. Image: Courtesy of the MIT Center for Advanced Urbanism.

VOX POPULI

Archiving a revolution

/ WORKSHOP: "TECHNOLOGY/AFFECT/SPACE: A WORKSHOP EXPLORING THE POLITICS AND AESTHETICS OF AFFECT SPACE," APRIL 6, 2016

/ PRESENTATIONS: "LARA BALADI AND ROBERT OCHSHORN," APRIL 14, 2016 AND "*VOX POPULI*, ARCHIVING A REVOLUTION IN THE DIGITAL AGE," APRIL 23, 2016

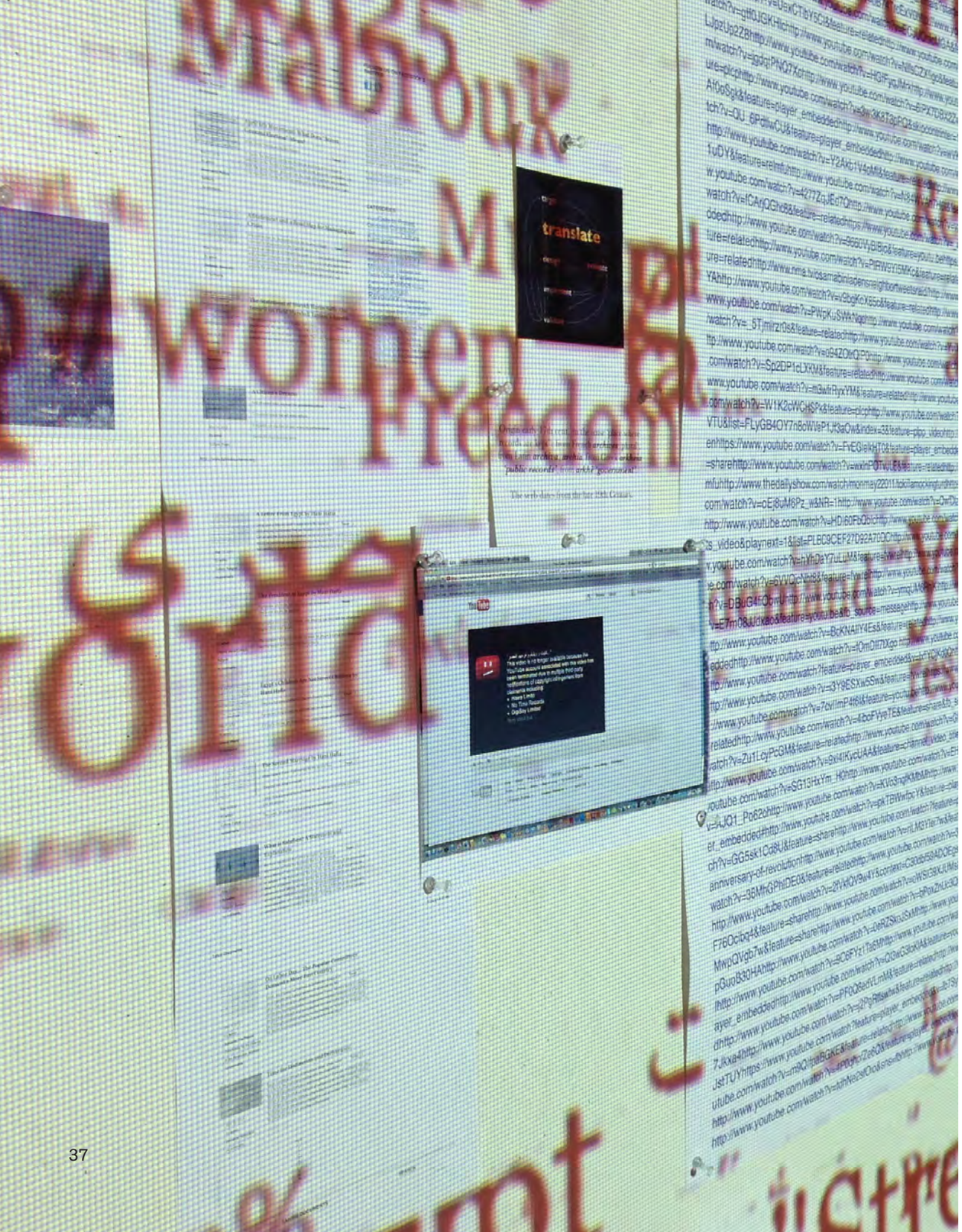
The pyramids, with their elaborate hieroglyphs, indelibly record the life and times of ancient Egypt's ruling class. Most people throughout history, however, have not had their stories enshrined, nor have all significant places been marked with stone monuments. For Egyptian-Lebanese artist Lara Baladi, digital and web-based media have led to countless possibilities for archiving and memorializing both the past and present, beyond the official histories told by nation-states. Moreover, archiving is, in her view, "another tool against the regime."

Baladi's firsthand experience of the events in Tahrir Square in 2011 marked a significant shift in her artistic practice. She recalls, "From the very first day of the 2011 uprisings in Egypt that toppled president Mubarak, archiving played

LARA BALADI
Ida Ely Rubin Artist in Residence, CAST

HALSEY BURGUND
Research Affiliate, Media Lab, MIT

DANIEL KOFF
Production Manager



a central role. During the eighteen days of the revolution in Tahrir Square, photographing was an act of seeing and recording. Almost simultaneously, because a photograph is intrinsically an archival document, this act of resistance turned into an act of archiving history as it unfolded."

During the demonstrations, Baladi began amassing a digital archive of videos, photographs and articles related to the Egyptian uprising. This effort became an ongoing art and research project titled *Vox Populi*, through which she explores how technology can enhance access to documentation of revolutions and other global events. *Vox Populi* is a multilayered online platform, comprised of an interactive timeline of the Egyptian revolution and its aftermath, data visualizations, media initiatives, events and immersive sculptural installations that rely on old and new technologies (from metalsmithing to virtual reality).

"Invisible Monument," one component of *Vox Populi,* is described on the project website as "an ongoing series of contributory audioscapes, which will be geolocated in spaces across the world where these social movements started and changed history." This project, a collaboration between Baladi, sound artist Halsey Burgund and designer Daniel Koff, offers narrative as an alternative to traditional, more permanent monuments.

> "I felt that the only way I could understand borders and front lines was to feel—to navigate on that level of our inner worlds, rather than our passport world."
> – Lara Baladi

As the distinction between online and offline worlds fades, Baladi claims that "connectedness appears to be based on shared beliefs and values more than on nationality or social class," and citizen journalists are better equipped than ever to defy "the way history has been, again and again, written by the victors." Baladi's *Vox Populi* may be predicated on features of contemporary online culture, but the project exists to achieve something timeless—to remember people's stories and to keep history alive.

Previous page, left top: In the ACT Mars Lab, Baladi fabricated metal "scolds" to house VR headsets for her installations. Image: Lara Baladi, © 2015.

Previous page, left bottom: The design for the metal "scolds" is based on the 18th century scold's bridle, a punishment for women who were deemed outspoken or troublesome. Image: Sue Ding, Lara Baladi and Daniel Koff, © 2016.

Previous page, right: Tahrir Square on Friday of Victory, Cairo, Egypt 2011. Image: Lara Baladi, © 2015. This photograph by Baladi has been so widely circulated that it has become an emblem of the revolution.

Left: Interactive and immersive web-based installation, *Vox Populi, Archiving a Revolution in the Digital Age*. Baladi describes the project as "a monument to the symbolic event that was, and still is, Tahrir Square." For this "transmedia painting," Internet archives related to Tahrir Square, YouTube videos, photos, graffiti, articles and other data and metadata are interlinked and displayed across a chronological timeline of events. Image: Lara Baladi, © 2015.

SOUND & PERFORMANCE

FLUX Quartet performs Morton Feldman's *String Quartet no. 2.*

UNCOVERED

Mining rock classics with cellist Maya Beiser

/ COMPOSERS FORUM: JHEREK BISCHOFF, SEPTEMBER 24, 2015

/ *MIT SOUNDING* PERFORMANCE: *UNCOVERED*, SEPTEMBER 25, 2015

Maya Beiser's album of classic rock covers, cheekily titled *Uncovered*, which she performed as part of *MIT Sounding*, may come as a surprise to those who know her as a daring cellist primarily focused on new classical works. But the soloist says that the project was hardly a departure. Every song, from Led Zeppelin's "Black Dog" to Janis Joplin's own cover of "Summertime," has personal meaning. "This is literally music that has changed me in one way or another," says Beiser.

Beiser started winning classical music competitions at an early age, but it was Janis Joplin who inspired her "to play cello the way she sings." On "Summertime," her cello turns tremulous and crackling as Beiser teases out the vulnerability in Joplin's own rendition of the jazz standard. She is anguished on Nirvana's "Lithium," transcendent on Pink Floyd's "Wish You Were Here," apocalyptic on AC/DC's "Back in Black."

"In classical music, so much of it is about the purity of the sound and perfection of the phrase," says Beiser. "And here, it's almost like the opposite of that. It's about the vibe. It's about being really, sometimes, down and dirty. It's about imperfection. It's about this very human quality. And this is the thing I love about Janis Joplin, and Howlin' Wolf and Jimi Hendrix. That it's anything but perfection. It's perfect in its own imperfect way."

Beiser's quest to harness the cello's imperfections is helped immensely by Evan Ziporyn's arrangements, which in turn rely heavily on Beiser's favored technique of looping and distorting her instrument to build vast, kaleidoscopic soundscapes. Beiser's residency at MIT offered something of a reunion for her and Ziporyn, who began collaborating in the 1990s in the acclaimed new music ensemble Bang on a Can All-Stars.

In live performance, Beiser uses loops and backing tracks to recreate the arrangements on her albums. The effect is strangely organic, as though a virtual cello orchestra is emanating

MAYA BEISER
CAST Visiting Artist

JHEREK BISCHOFF
Bassist

MATT KILMER
Composer and percussionist

EVAN ZIPORYN
Arranger

Previous page, left top: For her MIT concert *Uncovered*, Beiser was joined by drummer Matt Kilmer, the composer for the critically-adored TV show *Louie*, and bassist Jherek Bischoff, of Amanda Palmer and the Grand Theft Orchestra.

Previous page, right and below: Maya Beiser performing *Uncovered*, featuring Ziporyn's arrangements of such classics as "Wish You Were Here," "Black Dog," "Moanin' at Midnight" and "Lithium."

Right top: Jherek Bischoff, Maya Beiser and Matt Kilmer perform *Uncovered.*

directly from the lone instrument's fragile body. Beiser's concerts inevitably evoke wonder at all that the cello can do. But on *Uncovered*, the songs achieve new depths as well.

"If you think about it, as a classical performer, all we do is covers," says Beiser. "We take this music that was written already, a long time ago, that was played by a lot of different people, and we recreate it. . . . I don't see it as a separate thing. Rather the idea is, this music is just as important as classical music, to me. So it's about elevating it to this place where you could say, 'This music is really worth treating in a serious way.'"

"When I heard [Janis Joplin], I thought, 'Wow, I really want to play the cello the way she sings.'"
– Maya Beiser

OPERATIC ADAPTATION OF *PERSONA*

Ingmar Bergman's classic film transformed into a visceral new opera

/ *MIT SOUNDING* WORKSHOP PERFORMANCE: *PERSONA*, MIT, OCTOBER 17, 2015

/ PREMIERE PERFORMANCE: *PERSONA*, NATIONAL SAWDUST, BROOKLYN, NY, OCTOBER 23 AND 24, 2015

Ingmar Bergman's *Persona* is regarded as a classic of twentieth-century cinema, a powerful and enigmatic exploration of the human psyche in turmoil. Jay Scheib and Keeril Makan transformed this provocative film—which relies heavily on silence due to the protagonist's mute condition—into a bold chamber opera. This new incarnation rewards close listening, in the form of Scheib's libretto and Makan's score.

Bergman's use of film as a physical medium in the original was a particular inspiration to Makan and Scheib, whose debut mixed live performance with real-time and prerecorded video. "I was fascinated by the concept of using a multidimensional object [the film] as material," says Scheib. Makan says it was very much the abundance of silence in Bergman's *Persona* that led him to think an operatic adaptation of the film was possible. "Because of the silence, there's a lot of room for music," says Makan. "Issues that would be silent in the movie can be colored by the music."

Persona, released in 1966 and widely regarded as one of Bergman's greatest films, can be challenging to comprehend. The story features two characters, Elisabet Vogler, an actor, and Alma, her nurse. While on stage performing her role as Electra, Elisabet goes suddenly silent and her self-imposed muteness continues throughout the film. Intrigued by Elisabet and increasingly obsessed with her, Alma becomes ever more unstable as her sense of self blends with that of Elisabet. The film delves into weighty matters such as human frailty, cruelty and identity. Like Bergman himself, Makan and Scheib believe there is room for multiple interpretations of *Persona*.

Makan sees Elisabet's apparent depression as regenerative, allowing her a new beginning. Scheib, who acknowledges being "very struck by the beauty of the film," has incorporated a

KEERIL MAKAN
Associate Professor, Music and Theater Arts, MIT

JAY SCHEIB
Professor, Music and Theater Arts, MIT

EVAN ZIPORYN
Kenan Sahin Distinguished Professor of Music and Head, Music and Theater Arts, MIT

Previous page, left: Amanda Crider and Lacey Dorn performing in *Persona* workshop at MIT.

Previous page, right: Amanda Crider performing in *Persona* workshop at MIT.

Above: Amanda Crider and Lacey Dorn performing in *Persona* workshop at MIT.

Right top: Lacey Dorn performing in *Persona* workshop at MIT.

Right bottom: Eve Gigliotti performing in *Persona* workshop at MIT.

strong visual element into the production. The opera is staged as a film set, and features live video of the production—playing in real time—on television screens on set. Scheib stresses that the opera is the product of a "rich cross-disciplinary collaboration" involving many people in MIT's Music and Theater Arts program, not just himself and Makan. They conducted a workshop performance at MIT, before their fully-staged production premiered at National Sawdust in Brooklyn, NY. Both performances were conducted by Evan Ziporyn.

> "Issues that would be silent in the movie can be colored by the music."
>
> – Keeril Makan

Whether or not their audience has already seen Bergman's *Persona,* Scheib and Makan intend for the audience to remain open to the possibilities of the story, rather than assume they will be witnessing a wholly grim affair. "I think it would have been hard to write something that just gets deeper and deeper into a bleak and unrelenting space," Makan says. "It would have been hard for the listener to be in that sonic space for that long." Completing the project might not even have been possible, Makan suggests, with a totally dark view of the story. "I try to write beautiful music," Makan adds. "And for that to exist, there has to be some hope."

RETRACING BACH'S FAMED VIOLIN CYCLE

Johnny Gandelsman performs Bach's complete sonatas and partitas for solo violin

/ MIT SOUNDING PERFORMANCE: BACH'S *COMPLETE SONATAS AND PARTITAS FOR SOLO VIOLIN*, TERRY AND RICK STONE CONCERT, OCTOBER 30, 2015

Johann Sebastian Bach's sonatas and partitas for solo violin are Shakespearean in their iconicity. Every serious performer studies or memorizes them, tracing and retracing the familiar, fleet-footed phrases hoping that something of their magic will rub off.

Violinist Johnny Gandelsman tackled Bach's famed violin cycle, which was completed in 1720, as part of *MIT Sounding*. Gandelsman has eschewed the trappings of a traditional classical career, staking his reputation instead on his work with the genre-averse string quartet Brooklyn Rider and Yo-Yo Ma's globally adventurous Silk Road Ensemble.

The sonatas and partitas came to Gandelsman as a kind of challenge: In 2013, the Helicon Foundation invited him to perform the chaconne from *Partita no. 2 in D Minor*, under the condition that he play on gut strings with a baroque bow. The experience was so transformative that Gandelsman has made the complete cycle a regular part of his repertoire, though he now performs it on a modern instrument.

The trend towards *authentic* renditions of baroque music has caught on in recent years, and although Gandelsman is not a devotee of this historically-minded approach, some of its thinking has nevertheless inflected his interpretation. Baroque violin bows tend to be lighter than their modern counterparts, and weighted towards the frog, lending a rhythmic pulse to every downward stroke. They perform with particular clarity and liveliness in passages of quick, separate notes. "When I started using a baroque bow, many phrase-related things became clear," says Gandelsman. "Tempos, written-out improvisations, voice leading—a baroque bow suggests both possibilities and limitations that are refreshing and inspired me to dig further."

JOHNNY GANDELSMAN
CAST Visiting Artist

Previous page, left: Moscow-born violinist Johnny Gandelsman performing the sonatas and partitas in their entirety as part of the *MIT Sounding* series in the first Terry and Rick Stone Concert.

Previous page, right: During his residency, Johnny Gandelsman visited several music classes, including Teresa Neff's Monteverdi to Mozart, Evan Ziporyn's Musical Improvisation and Marcus Thompson's Introduction to Western Music.

Above: Johnny Gandelsman takes a bow.

Right: Johnny Gandelsman says, "In the classical tradition we spend a lot of time interpreting what's written. I think of it like one would approach learning a play. The text is set out for you. You learn the phrases and figure out the meaning of those phrases and how they relate in conversation to the other phrases. But then, how you deliver it will change from day-to-day."

Yet it may be Gandelsman's numerous brushes with folk music that have had the deepest impact on his playing. "Dance, groove, melody and improvisation are all so important in folk music. I look for those things in Bach's score, particularly in the partitas. Imagining someone dancing to a saraband is no longer abstract—I can hear and feel the steps one would need to make."

> "Reading the page takes attention away from listening. I try to be off the page as much as I can."
>
> – Johnny Gandelsman

In the sonatas and partitas for solo violin, Gandelsman employs vibrato sparingly. He possesses a translucent tone and a delicate touch. He is expressive in the manner of a classical violinist, stretching certain phrases for dramatic effect and lingering momentarily to let the occasional note shine. But he errs toward understatement, preferring modesty to melodrama. Gandelsman says that he tried to remain uninfluenced by other performances of the cycle. "I find it hard to listen to recordings: the better they are, the harder it is to quiet them in my head while searching for my own interpretation." And indeed he seems weightless at times, unencumbered by the burdens of history in his nimble perambulations through the past.

MARATHON PERFORMANCE OF MORTON FELDMAN'S MAGNUM OPUS

FLUX Quartet tackles the epic, avant-garde String Quartet no. 2

/ MIT SOUNDING PERFORMANCE: *STRING QUARTET NO. 2*, FEBRUARY 28, 2016

Morton Feldman's *String Quartet no. 2* is often called an experiment in scale. At approximately six hours (without breaks), players must prepare as though for a marathon. As a result, *String Quartet no. 2* has acquired a reputation of mythic proportions.

Many have tried to perform Feldman's infamous piece and failed, but New York City's FLUX Quartet has succeeded all of the thirteen times they have undertaken it. Their most recent attempt, as part of *MIT Sounding*, marked the Boston premiere.

"It's almost like a practical joke, right? Sometimes we feel that way," says Tom Chiu of the overwhelming duration of the Feldman Second. "Even if some people think of it as a gimmick, at the very worst it came from a place where Feldman wanted to bust out of that traditional thirty or thirty-five-minute piece."

String Quartet no. 2 is excruciatingly long, but it is also remarkably lovely, a dewy, shifting fog where dissonance slides in and out of focus and harmony breaks fleetingly. The point is not to make musicians miserable, but to produce a meditative state. The point is not to make audiences bored, but to conjure an exquisite sonic mist upon which their stray thoughts may drift.

The piece—with its cycling musical cells, each only slightly different from the last, and each repeating a seemingly random number of times: nine, eight, thirteen—requires that players retain relentless focus in order to keep track of repeating measures, and also that they remain almost impossibly quiet. "You get into this transfixing sort of haze," says Chiu. "I almost liken it to an electronic sound installation. It sounds like a museum piece. It sounds like an art installation as much as it does a piece of music."

Appropriately, the MIT concert was something like a performance/exhibit hybrid. The quartet was situated in the middle of the room with the

FLUX QUARTET
CAST Visiting Artists

Tom Chiu
Founding member and violinist

Conrad Harris
Violinist

Max Mandel
Violinist

Felix Fan
Cellist

Previous page, left: FLUX Quartet performs Morton Feldman's *String Quartet no. 2.*

Previous page, right: One of the most challenging aspects of *String Quartet no. 2* is its softness. Playing quietly for that long is surprisingly strenuous. "We're trained to be in action, we're not trained to be suspended," says Tom Chiu.

Below: Evan Ziporyn, Kenan Sahin Distinguished Professor of Music, MIT and Artistic Director of *MIT Sounding*, speaks to the audience.

Right: "At the outset of the piece—thirty minutes in, sixty minutes in, ninety minutes in—there's easier human control over that," Tom Chiu explains. "But as the piece gets longer and longer, you start to lose control of that. You just go with the moment, whatever the moment is."

audience around them, allowing visitors to come and go as they pleased. "Everyone comes from different experiences, different amounts of exposure to this type of music," says Chiu. "So we try to set up . . . a space that allows people to experience it with the utmost degree of freedom." Chiu hopes to entice people to stay longer than they had planned. "I think everyone who's experienced it [has] left with some level wonderment."

And that may very well be the essence of *String Quartet no. 2*, for players and audiences alike. "There are surprises in the latter three hours of the piece," says Chiu. "And both as a player and as a listener, for those that stay for the whole time, you realize, 'Oh this has been all worth it. We've arrived at this completely gorgeous spot.'"

"The feeling, physically and aesthetically in this piece, is suspension."

– Tom Chiu

SCULPTING MUSICAL ABSTRACTIONS FROM EVERYDAY SOUNDS

Pamela Z's elegant physical gestures and intricate real-time digital processing form dense, complex sonic layers

/ MIT SOUNDING PERFORMANCE: *WORKS FOR VOICE & ELECTRONICS*, LE LABORATOIRE CAMBRIDGE, MARCH 11, 2016

It's easy, watching Pamela Z perform, to get distracted by her gadgets: the MIDI controllers strapped to her hands like bionic appendages, the ultrasound-activated box that sings when her fingers flutter past, the laptop with its glowing screen. But if you close your eyes, you'll find yourself enveloped in Z's voice, bell-like and unearthly.

"People always assume that, as soon as the voice is involved . . . there's some very concrete narrative or meaning or message," says Z. "And I like the fact that that doesn't have to be true."

Z walks the line between abstraction and literalness. She plucks words from their comfortable contexts and toys with the natural timbre and melody of speech. She wrests beauty from unexpected places, like sheet metal and the sounds of breathing.

For the San Francisco composer/performer, an eccentric collection of electronic tools enables her to fuse the seemingly disparate elements of her artistic vision. Sampling technology expands the parameters of her classically-trained voice; with the help of gesture-activated controllers, she can distort, chop, loop and layer it.

Z has been working with MIDI gesture controllers since the early '90s, when she began to experiment with the BodySynth, a futuristic contraption designed to react to muscular contractions through a network of electrodes. Now Z employs several MIDI controllers to activate preset samples—the clatter of a typewriter, the splatter of a dripping faucet—and to manipulate her own voice. One device straps directly onto her hand and reacts to the speed and angle of its movement; another reads infrared light. Z plays them with the fluid precision of a conductor, presiding over an inanimate electronic orchestra.

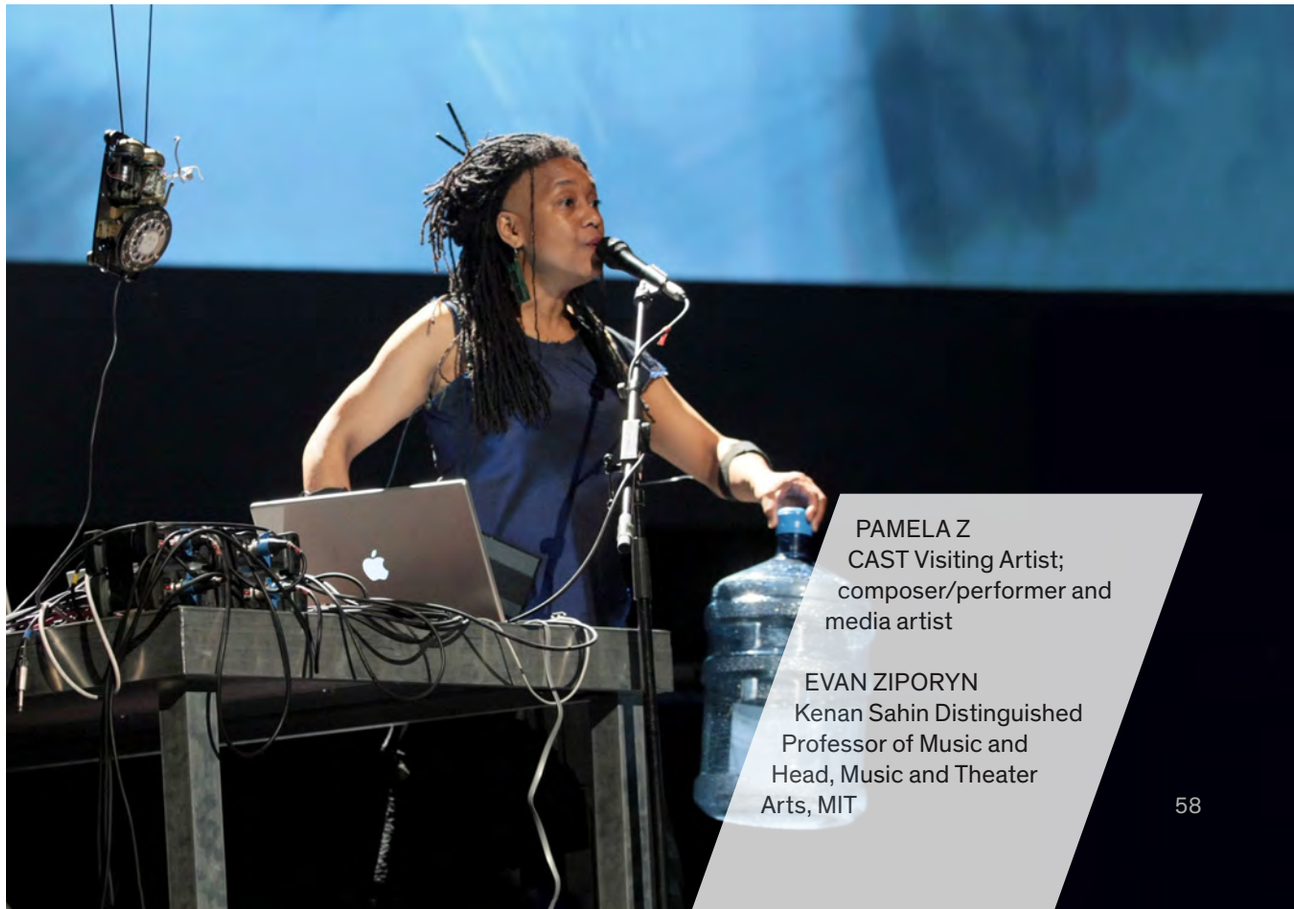
Above and right: Pamela Z performs at Ars Electronica, Brucknerhaus, Linz Austria, 2008. Image: Rubra.

"I'm a very, very visual performer," says Z. "Everything from my facial expressions and my physical gestures and just my physical attitude on the stage, and the visual look of what's happening on the stage—all of that, to me, is part of the work." For her *MIT Sounding* performance, Z used body sensors and customized hardware and software of her own design. Her elegant gestures and intricate real-time digital processing activated these tools to create dense, complex sonic layers that combined experimental, extended vocal techniques, operatic bel canto, found objects, text and sampled concrete sounds.

"What art does is beyond being able to be distilled down into a verbal summary."

– Pamela Z

"There are sculptors who spend their whole lives being able to pull a perfectly accurate portrait of the human form out of a piece of stone," says Z. "And then there are sculptors who just make these really powerful forms that may evoke, for people, various things—but they are not analogous to something specific that already exists. And I like the idea of being able to use sound in that same way."



PAMELA Z
CAST Visiting Artist; composer/performer and media artist

EVAN ZIPORYN
Kenan Sahin Distinguished Professor of Music and Head, Music and Theater Arts, MIT

EXPLORING “IMPROSITION”

Melding improvisation and composition with EVIYAN

/ MIT SOUNDING PERFORMANCE: “EXPLORING IMPROSITION—THE MELDING OF IMPROVISATION AND COMPOSITION,” APRIL 22, 2016

The interplay of composition and improvisation is central to many of the world’s most venerated musical traditions from Hindustani raga and Shona mbira to Javanese gamelan and American jazz. (Historically it was also an essential part of Western classical music, surviving today in baroque continuo parts and in classical cadenzas.) Today, musicians from a variety of backgrounds search for ways to creatively merge these practices, making music where the lines between the pre-set and the spontaneous are often indistinguishable. Among those groups is the EVIYAN trio—Iva Bittová, Gyan Riley and Evan Ziporyn—who returned to MIT on April 22, 2016 to collaborate with the MIT Festival Jazz Ensemble under the direction of Fred Harris for a program entitled “Exploring Improsition.”

EVIYAN
CAST Visiting Artists

Iva Bittová
Vocalist and violinist

Gyan Riley
Guitarist

Evan Ziporyn
Kenan Sahin Distinguished Professor of Music and Head, Music and Theater Arts, MIT

MIT FESTIVAL JAZZ ENSEMBLE

For the members of EVIYAN, this was a continuation of ongoing work with MIT students and community: the group made its debut at MIT in 2013, and returned for a collaboration with Terry Riley in celebration of that pioneering composer's 80th birthday in 2015. Violinist/vocalist Iva Bittová and guitarist Gyan Riley also have held a series of workshops and performances in conjunction with MIT Professor Evan Ziporyn's improvisation class, under the aegis of the music and theater arts program. The program included expanded versions of EVIYAN compositions, arranged for large ensemble by MIT alumni Jamshied Sharifi, as well as new compositions by MIT Festival Jazz Ensemble (FJE) members, and group improvisations developed by smaller ensembles within FJE and the MIT Vocal Jazz Ensemble.

In honor of Prince, who passed away the day before, and in the spirit of improsition, the groups quickly put together a version of the late musician's iconic "Purple Rain," performed as an encore featuring vocalists Bittova and Ricky Richardson '12.

Previous page, left: Violinist and vocalist Iva Bittová.

Previous page, left bottom: Guitarist Gyan Riley.

Previous page, right: Clarinetist Evan Ziporyn.

Above: EVIYAN performs featuring vocals by Iva Bittová, guitar by Gyan Riley and clarinet by Evan Ziporyn.

Right top: Iva Bittová, Neil Aggarwal '18 and Jan-Christian Hütter '17 perform "Vocal Tree."

Right bottom: Fred Harris conducts the MIT Festival Jazz Ensemble (FJE).

ACKNOWLEDGMENTS

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