



COLUMBIA UNIVERSITY Center for Science and Society

Fifth Anniversary Report

Transforming academia for the 21st century



DIRECTOR'S LETTER

It is my pleasure to introduce you to the Center for Science and Society. I founded the Center in 2014 in order to bring together researchers, scholars, and practitioners in the natural and social sciences, humanities, law, medicine, and the arts to engage in interdisciplinary research, teaching, and outreach. The Center works to break down traditional disciplinary silos, create new paradigms of interdisciplinary training and collaboration, and enhance public understanding of science in relation to pressing social concerns.

The simultaneously and irreducibly technical, political, and societal problems that humans face today cannot be confronted by the methods of the natural sciences or the humanities in isolation from each other. Some of the most important skills required include the ability to synthesize multiple perspectives and to communicate with colleagues from different fields.

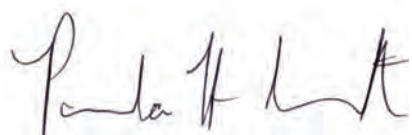
And yet, colleges and universities are still training students through the lens of traditional disciplinary and professional divisions. In order to meet the challenges ahead, it is crucial to create a university for the 21st century—a university that builds bridges across the divide of the sciences and humanities and facilitates the creation of new and integrative paradigms of collaborative research and teaching. The Center for Science and Society is needed now more than ever.

Work from the Center's Research Clusters, grant recipients, and affiliated students and scholars demonstrates the ways in which the presence of humanities- and social science-trained researchers collaborating with natural scientists has both expanded the purview of the humanities and influenced the perspectives of the natural scientists. These types of substantive interactions promote collaborative research, and, through co-taught courses, prepare students to ask new questions from interdisciplinary perspectives that will help bring solutions to the complex issues facing our world today.

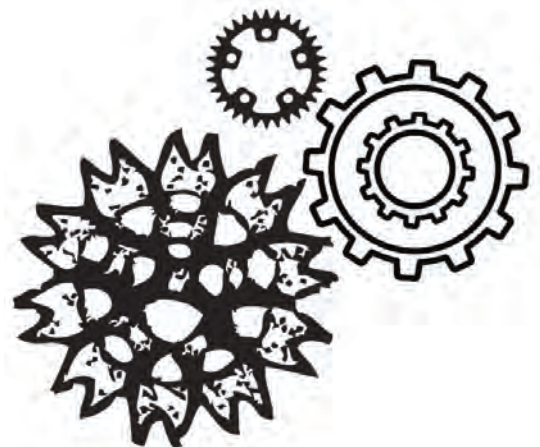
In celebration of the Center's fifth anniversary, we will be investigating the intersection of science and society through the lens of the theme: **Knowledge and Access**. In order to scale up the benefits of science and technology, we need equitable, protected, and inclusive policies, systems, and digital spaces. Interim Director Kavita Sivaramakrishnan is heading this initiative while I am on leave for the 2019-20 academic year.

In the report that follows, I invite you to learn more about the important work that the Center is doing to transform academia for the 21st century.

Sincerely,



Pamela H. Smith
Seth Low Professor of History
Founding Director, The Center for Science and Society
Columbia University in the City of New York



The Center for Science and Society creates opportunities for scholars in the humanities, natural and social sciences to form new communities, share ideas, and collaborate in order to articulate original questions and find new solutions across disciplinary divides. We explore everything from privacy issues of big data, to how trauma impacts the brain, to developing sustainable food-systems. We do all this through an array of activities that span research, teaching, public outreach, and events:

RESEARCH CLUSTERS

The Center's Research Clusters act as a crucible of interdisciplinary research, teaching, and programming at Columbia. As of 2019-20, there are six active Research Clusters, which organize an array of thematic activities and events throughout the year. Research Cluster leaders come from a variety of departments and support undergraduate and graduate students. The Center provides administration, fundraising, and partial financial support to the Cluster leaders and their teams.

EVENTS & CONFERENCES

The Center cultivates new cross-disciplinary connections through diverse public and academic programming. The majority of these events have been developed by our active faculty committees and Cluster leaders, as well as by student groups through grants and sponsorships. The Center organizes, sponsors, and supports more than 50 events each year, ranging from large two-day symposiums to intimate lunchtime talks.

SEED GRANTS & SPONSORSHIPS

The Center provides funding, sponsorships, and organizational support to innovative interdisciplinary programming and research projects developed across departments or disciplines, or that involve the study of science and society. Especially important are the Center's seed grants, which prioritize undergraduate and graduate student recipients.

PUBLIC OUTREACH

In 2018, the Center launched a public outreach grant program to support affiliates across the University for projects that help boost public understanding of societal concerns surrounding science, technology, or medicine; teach K-12 students about current issues in science and society; or work with communities to respond to issues that affect or are affected by science. The Center also organizes a number of public *Conversations in Science and Society* each year.

CURRICULUM & CO-TEACHING INITIATIVES

The Center has a robust curriculum development initiative which supports new cross-disciplinary courses in science and society, either taught by a single instructor or co-taught as a collaboration between one instructor from the sciences and one from the humanities or social sciences. Each semester, the Center collects interdisciplinary courses for Columbia and Barnard students in an online repository on the Center's website.

RESEARCH CLUSTERS

BIG DATA AND SCIENCE STUDIES

Led by Matthew Jones

James R. Barker Professor of Contemporary Civilization



Big Data and Science Studies brings together the new tools and techniques of large-scale digital humanities with the critical resources of science studies. The Cluster connects the development of superior digital tools, and the care required in using them, to a critical historical and sociological account of the development of big data as well as the social, political, and ethical ramifications of big data and data mining. Collaborators include historians, computer scientists, anthropologists, sociologists, legal scholars, and journalists from Columbia and the broader metropolitan community.

HIGHLIGHTS

COURSE: DATA: PAST, PRESENT, AND FUTURE

Co-taught by Matthew Jones and Christopher Wiggins, Associate Professor of Applied Mathematics and Chief Data Scientist at the *New York Times*, this course focuses on the history, practice, and ethics of data science. Offered as an elective to both engineering and humanities students, the course explores the context and assumptions underlying data-driven narratives, and how to integrate analysis and modeling of data as part of contemporary discourse.



EVENT: TOWARDS A HISTORY OF ARTIFICIAL INTELLIGENCE

Over a two-day workshop held in spring 2019, the Cluster brought together technical practitioners, anthropologists, sociologists, and historians of computing to create a more comprehensive account of AI's complex history. While seeking to revisit major narratives centered on the UK and US, workshop participants created a global story of AI that included a broad range of methodological approaches, kinds of histories, and historians.



CURIOSITY Led by Jacqueline Gottlieb Professor of Neuroscience

Despite its crucial importance for topics ranging from brain and behavior to the organization of societies, the mechanisms of curiosity are relatively poorly understood. The Research Cluster on Curiosity takes an interdisciplinary approach to examine the nature, mechanisms, and societal implications of curiosity and provides a forum for interdisciplinary discussions of these questions. The Cluster takes a broad view of this topic and consider its implications for fields including neuroscience and psychology, education and child development, psychiatry, philosophy, economics, and artificial intelligence.



HIGHLIGHTS

EVENT: EXPLORING THE ROLE OF VIRTUAL REALITY (VR) IN CREATING IMMERSIVE LEARNING ENVIRONMENTS



Held in spring 2019, this event provided attendees the opportunity to learn about how VR is used to drive education initiatives. Led by Travis Felder, Founder of TechRow Fund, the event showcased the potential of VR to foster curiosity in the classroom and its usefulness for gathering data about the mechanisms of curiosity and active learning in real-world settings. Through an active demonstration with the VR headsets, participants experienced the immersive qualities of VR technology first hand within a learning context.

EVENT: BOREDOM - BEHAVIORAL AND CLINICAL IMPLICATIONS



Is boredom the dark side of curiosity? In this fall 2019 public seminar, three guest scholars were invited to discuss the significance of boredom from the perspectives of neuroscience, psychology, and psychiatry. The panel explored questions around how to define boredom and its related behaviors in animals and humans, what are the known neural mechanisms, and whether boredom has evolutionary and clinical significance.

RESEARCH CLUSTERS

ENVIRONMENTAL SCIENCES AND HUMANITIES

On hiatus 2019-20; Past leaders (2017-19)

Shahid Naeem

Professor and Chair of Ecology, Evolution,
and Environmental Biology

Sara Tjossem

Senior Lecturer in International
and Public Affairs

This Research Cluster aims to connect scholars in the ecological and earth sciences, economics, political science, anthropology, philosophy, history, geography, and literature to explore the possibilities for an integrated approach to environmental problem solving. The paradigm of “integrated assessment” has combined the methods of the natural and social sciences to analyze the interactions between physical and human factors in environmental management.

From 2017-19, the Cluster’s unifying theme was *Food, Farming, and Sustainability*.

HIGHLIGHTS

SERIES: AGRO-FOOD DISCUSSION GROUP

This series provided a forum for students, staff, faculty, and affiliates to gather and explore food-related issues from multiple perspectives. The lunch discussion series served as an incubator for members to share their current research while uncovering, exploring, and developing linkages among the diverse agro-food system efforts across the University; including participants from Arts and Sciences, the Earth Institute, Lamont-Doherty, Mailman School of Public Health, SIPA, the School of Nursing, and Columbia Business School.



EVENT: FOOD, FARMING, AND SUSTAINABILITY

This public one-day conference brought together scholars and practitioners to discuss equitable solutions to feeding the global population. Given that this issue cannot be solved through the lens of any one discipline, the conference looked at the cultural, economic, and environmental aspects of sustainability in our food system.



GLOBAL HISTORIES OF SCIENCE

Led by

Marwa Elshakry

Associate Professor
of History

Kavita Sivaramakrishnan

Associate Professor
of Sociomedical Sciences
Mailman School of Public Health

Eugenia Lean

Associate Professor
of History and East Asian
Languages and Cultures

Global Histories of Science engages in an interdisciplinary study of science in society that focuses on understudied places, peoples, and periods. In the past, the approach to the history of science in Asia or Africa has primarily been traced in reference to some abstract notion of “the West.” The aim of this Cluster is to explore a broader, more inclusive, and interlinked history of science, technology, and medicine among different regions or geographies. This Cluster highlights global social and policy issues surrounding these fields by bringing together scholars from an array of departments (History, East Asian Languages and Cultures, Middle Eastern, South Asian, and African Studies) centers (Weatherhead East Asian Institute, South Asian Institute, Middle East Institute) and schools (Public Health, International and Public Affairs).

HIGHLIGHTS

SERIES: COMPARATIVE HISTORIES OF HEALTH AND MEDICINE IN THE GLOBAL SOUTH



This series provides an opportunity to critically appraise important texts of the historiography on health and medicine. The workshop has become a forum for distinguished scholars, encourage in-depth analysis of critical texts in history of health and medicine, and for workshopping participants' articles and dissertation chapters.

EVENT: SCIENCE AND SOCIETY IN GLOBAL ASIA WORKSHOP



This fall 2018 workshop furthered the ongoing debate on decentering science, technology, and society (STS) from Western contexts by inviting a group of researchers to explore the globalizing, heterogeneous, syncretic, and plural facets of connected histories of science and society across Asia. Building on a wide range of recent scholarship in the history of science and medicine, this workshop sought new conceptual vocabularies that neither fully universalize nor fully provincialize the experiences of “East” or “West.”

RESEARCH CLUSTERS

HISTORICAL STUDY OF RACE, INEQUALITY & HEALTH

Led by Samuel Kelton Roberts

Associate Professor of History and of Sociomedical Sciences



The mission of this Research Cluster is to promote, often in partnership with other academic or non-academic entities, curricular innovations, research, and public discussion of various aspects of the historical relationships between race, inequality, and health. This once underdeveloped field has found increasing traction through the study of political economy, technological development, subject formation, and social movements.



Jerome Friar/UNC Libraries

The Research Cluster in the Historical Study of Race, Inequality, and Health supports several principal activities. It is the institutional partner of the Legal Action Center's *No Health=No Justice* campaign. It organizes and edits the *Columbia University Press* series in *Race, Inequality, and Health*. It is also building a program of research and public engagement around the theme of harm reduction titled, "Race, Recovery, and the Movement for Black Lives."

HIGHLIGHTS

PODCAST: PEOPLE DOING INTERESTING STUFF

The Cluster supports *PDIS: People Doing Interesting Stuff*, a podcast in which host Samuel Kelton Roberts talks with guests who work in public health and health justice, anti-mass incarceration, and other fields of critical engagement, about what they do and how, why, and where they do it.



EVENT: NO HEALTH = NO JUSTICE: DISMANTLING SYSTEMIC INEQUALITY IN CRIMINAL JUSTICE AND HEALTH

Together with the Legal Action Center, this Cluster co-hosted a national *No Health = No Justice* conference in spring 2019 to confront the issues of racism and inequality within both the health and criminal justice systems. The meeting provided an opportunity to spotlight innovative state and local models for reform and identify collective next steps that can be undertaken to de-carcerate our nation and foster health equity, particularly for individuals living with mental illness and substance use disorders.



THE MAKING AND KNOWING PROJECT

Led by Pamela Smith

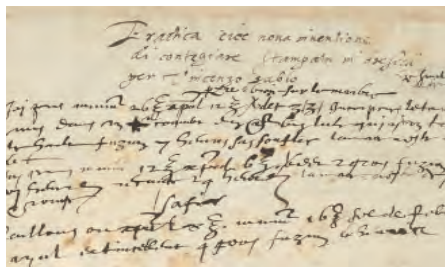
Seth Low Professor of History, Director of the Center for Science and Society

The Making and Knowing Project explores intersections between artistic making and scientific knowing. Today these realms are seen as separate, but in the early Scientific Revolution, nature was investigated by skilled artisans through experimentation in the making of objects—at this time “making” was “knowing.” Drawing on laboratory and archival research, the Making and Knowing Project crosses the science/humanities divide and explores the relationships between today’s scientific labs and craft workshops of the past. The Project’s current initiative is a five-year study of a 16th-century technical and artisanal manuscript, BnF Ms Fr 640—an unstudied compilation by an anonymous “author-practitioner” of roughly 1,000 entries detailing artisanal processes, first-hand experiments in material transformation, and observations about everyday life in and around Renaissance Toulouse.



HIGHLIGHTS

PUBLICATION: DIGITAL CRITICAL EDITION



Through “grad-sourcing,” the Project transcribed, translated, and encoded Ms Fr 640 to create an open-access critical edition that provides opportunities for interactive learning and computational analysis of historical data. The Project’s method of fusing pedagogy and research has been a case study in innovative experiential learning for history and the humanities. The Edition will launch in early 2020.

COURSE: TRANSFORMING TEXTS - TEXTUAL ANALYSIS, LITERARY MODELING, AND VISUALIZATION



Designed for graduate and advanced undergraduate students in the social sciences, humanities, and computer science, this hybrid course is situated at the crossroads of historical exploration and computer sciences. In spring 2019, students utilized the encoded English translation of Ms Fr 640 for their projects. The skills students learn over the course of the semester are widely applicable to other types of digital humanities projects, and in many fields outside of traditional academic study.

RESEARCH CLUSTERS

SCIENCE AND SUBJECTIVITY

Led by Robert Pollack

Professor of Biological Sciences



The Research Cluster on Science and Subjectivity (RCSS) provides undergraduates with the opportunity to take ownership of their own work and strive towards a more complete understanding of their respective fields and communities. The Research Cluster provides support for students who propose and carry out projects that bridge science, subjectivity, and service. It envisions future generations of scientists, scholars, and professionals building their careers in realization of a more complete human experience.

HIGHLIGHTS

COURSES: LIFE AT THE END OF LIFE AND MARGINALIZATION IN MEDICINE



Undergraduate interns have assisted in developing two courses that each combine interdisciplinary studies and service learning. Held each year since 2016, *Life at the End of Life* is a seminar designed to provide opportunities for reading and reflection on the experience of volunteer service work and small research projects at Terence Cardinal Cooke Health Care Center, an off-campus hospice. *Marginalization in Medicine*, taught each spring since 2018, is a class that explores the history of the idea of “race” in the context of changing biomedical knowledge formations. Students volunteer at a local community organization as part of the requirements.

EVENT: GIVING AND RECEIVING - A CONVERSATION ON THE ROLE OF CONTEMPLATIVE PRACTICE AT THE END OF LIFE

In this public conversation, co-hosted by the Research Cluster on Science and Subjectivity in partnership with the New York Zen Center for Contemplative Care, panelists shared what “contemplative palliation” may mean for our systems of care, health care policies, research, and developing technology. What does caring for the dying teach us about how to best to live and grow as a community?



The Center for Science and Society organizes and supports programming on topics at the intersection of science and society, both independently and in collaboration with a broad range of departments, centers, and institutes. These events have convened thousands of attendees from around campus and throughout New York City. The Center holds events under several annual series as well as academic conferences, seminars, and talks. Public programming includes panel discussions, film screenings, and even a research-themed musical, *Science, The Musical*.

HIGHLIGHTS



INTERDISCIPLINARY CONVERSATIONS ON KNOWING AND CERTAINTY

- Evidence: An Interdisciplinary Conversation about Knowing and Certainty (2016-17)
- The Success of Failure: Perspectives from the Arts, Sciences, Humanities, Education, and Law (2017-18)
- Narrative: Perspectives from the Humanities and Sciences (2018-19)



EMBODIED COGNITION WORKSHOP

- Dance and Physics (2015)
- Music and Movement (2016)
- Weaving: Cognition, Technology, Culture (2017)
- Embodied Cognition and Prosthetics (2018)



PUBLIC CONVERSATIONS IN SCIENCE AND SOCIETY SERIES

- The Promise and Challenge of Precision Medicine (2016)
- What Would it Mean to Understand Climate Change (2016)
- A Conversation about Early Life Trauma and the Brain (2018)
- A Playlist for our Future? Accelerating the Human Advantage in an Age of Technology and Complexity (2019)



PRESIDENTIAL SCHOLARS

The Center for Science and Society is the interdisciplinary home of the Presidential Scholars in Society and Neuroscience (PSSN) program. The program fosters, and independently funds, direct communication and knowledge sharing between researchers in neuroscience and related fields and experts from the social sciences, arts, and humanities, thus creating a new paradigm for interdisciplinary university-sponsored research. The program:

- Provides independent support for postdoctoral scholars for cross-disciplinary research projects. Each scholar is guided by two mentors, one from neuroscience, psychology, or the biological sciences, and the other from the arts, humanities, or social sciences. Presidential Scholars are housed in the Center for Science and Society.
- Awards collaborative faculty seed grants for interdisciplinary projects in Society and Neuroscience.
- Organizes events for the academic community and general public exploring cutting edge issues in mind, brain, and behavior, including the *Seminars in Society and Neuroscience* series.

HIGHLIGHTS

SEED GRANT: MULTIMODAL INSTRUMENT DESIGN - EXPLORING THE LIMITS OF NEURAL ACTIVITY TO GENERATE MUSIC



Awarded for the 2019-20 academic year to Professor of Biological Sciences Darcy Kelley and musician and researcher Ursula Kwong-Brown, this project will utilize a highly-sensitive wristband that captures EMG signals to generate music. Over the course of a year, they will develop, program, and pilot the wristband into an interface that can be used to control multiple musical variables with limited bodily movement. The project will culminate in a public event including a live performance of a newly composed piece of music using the wristband and interface and a discussion with scientists and musicians.

EVENT: PROMISES AND PERILS OF NEUROPREDICTION

Neuroprediction can sound like science fiction. But with the advent of neuroimaging and the rapid development of other non-invasive brain measurements, the use of neuropredictive tools in legal proceedings is increasingly a real-world phenomenon. In this seminar held spring 2019, experts from neuroscience, law, and philosophy discussed recent findings in neuroprediction research, the predictive power of brain-based evidence compared to behavioral evidence, and the ethical and legal concerns emerging from the entrance of neuroprediction in the courts of law.



SEED GRANTS are awarded to innovative interdisciplinary projects involving the study of science in society that require modest amounts of seed money to initiate collaborative research and programming. Proposals are welcomed especially from undergraduate and graduate students and for projects that involve participants from different disciplines. Since 2014, the Center has awarded more than \$50,000 to 24 grant projects.

GRANTS AWARDED (SINCE 2016)

2019

- Serendipity and Epiphany in Scientific Research
- The Meaning of Craft in Postindustrial Society

2018

- Making Art in an Age of Algorithms
- Knowing Through Animals One-Day Workshop
- Advancing Methods and Communication Skills for Broader Scientific Impact
- Pregnancy Surveillance in an Era of Mass Incarceration
- Ecosalon! Year 2
- Sex, Gender, and Autism Spectrum Disorder
- Plants and Society: An Interdisciplinary Undergraduate Reading Group

2017

- Social Ties to Muslims and Political Engagement: A Social Network Approach
- The Fight Against 'Alternative Facts': Communicating Neuroscientific Information to the Public
- Ecosalon! Increasing Graduate Student Literacy Around Ecological Concepts
- Impairment and the Social World: Towards a Sociology of Disability

2016

- Ethnographic Surveying of NGO Work in Uganda
- Embodied Cognition Reading Group
- Diversifying and Strengthening Feminist Science and Technology Studies
- Global Urbanism: Interdisciplinary Investigation
- Coastal and Fishing Community Resilience in the Southeastern U.S.

FEATURED GRANT

Making Art in the Age of Algorithms

In order to address the skills and communication gap between the computer scientists developing algorithms and those in the arts using them, the group organized a discussion series. Participants explored technical and critical issues surrounding AI and the algorithms that generate art, culminating in a day-long public conference.

Images generated by Creative Adversarial Networks (2017) for the discussion group.



PUBLIC OUTREACH GRANTS

PUBLIC OUTREACH GRANTS award funding for projects which

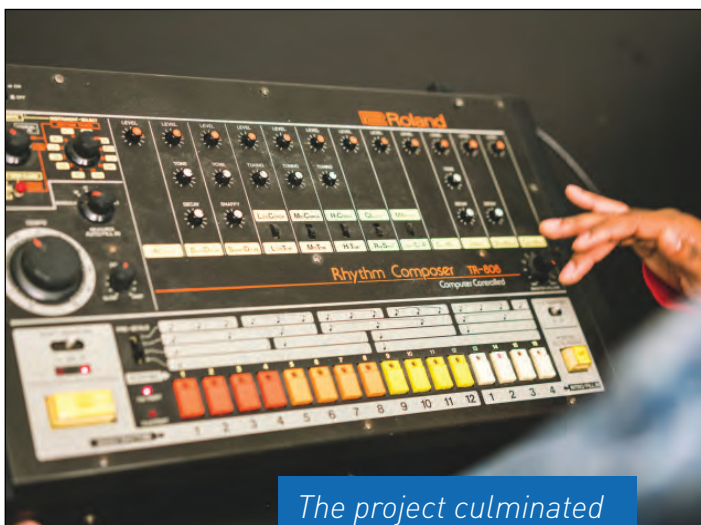
- Develop public understanding of issues at the intersection of society and science, technology, and/or medicine;
- Teach K-12 students about current issues in science and society; or
- Work with communities to respond to issues that affect or are affected by science

Additionally, the Center seeks to cultivate an interdisciplinary core group of students interested in leading projects around themes of science literacy, diversity, and accessibility.

FEATURED GRANT

***For the Daughters of Harlem:
Working in Sound***

This multi-year project invites young women of color from New York City public high schools to engage with social and cultural issues in the field of music technology and audio engineering—as composers, improvisers, sound artists, and thinkers.



The project culminated in a final performance showcase of students' compositions.



GRANTS AWARDED

2019

- Formerly Incarcerated Research Science and Training (FIRST) Program
- Confluence: The History of North American Rivers

2018

- Colorant Sustainability Workshop
- For the Daughters of Harlem: Working in Sound
- *People Doing Interesting Stuff* Podcast
- Formerly Incarcerated Reintegration Science Training (FIRST) Program

Previous outreach projects supported:

- Metropolis of Science
- RCSS-TCC Clinical-Based Internship for Pre-Medical Students

COURSE DEVELOPMENT GRANTS

COURSE DEVELOPMENT GRANTS in Science and Society are awarded to Columbia and Barnard faculty members to support the development of new undergraduate and graduate courses on topics that bridge the sciences and the humanities, social sciences, and/or the arts. These interdisciplinary classes may be taught by a single instructor or co-taught by two or more instructors from different departments or fields.

GRANTS AWARDED

2019

- On Listening: Acoustics, Acousmatics, Noise/Music, and Worldly Encounter
- Mediating Science and Tech in Modern China
- Philosophy and Psychology

2018

- The Afterlives of Cybernetics: A Secret History of the 20th Century
- Music and the Electrical Imaginary
- The Nature and Uses of Evidence in Science

2017

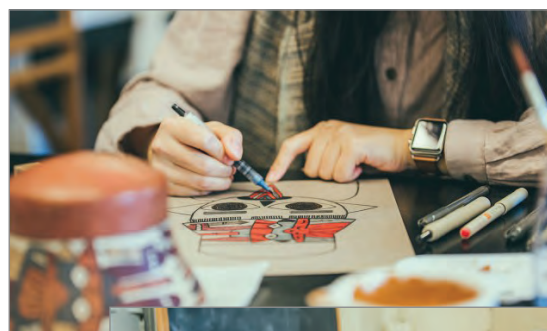
- Scientific Pluralism in Practice: Readings in the Philosophy and History of Science
- Neuroscience and the Novel
- Marginalization in Medicine: A Practical Understanding of the Social Implications of Race on Health
- Acoustic Ecologies

2016

- The Sciences of Black Life
- Plants and Power
- Science and Art in Archaeological Illustration
- Media, Science, and Technology in South Asia
- Music and Madness
- Harm Reduction, Drug Policy, and Public Health in Communities of Color

2015

- Bioethics and Narrative
- From Stains to Scans: A Critical History of Technique in Neuroscience
- Genocide in American Culture



Students were taught illustrative techniques to develop a practical and theoretical understanding of scientific illustration.

FEATURED GRANT

Science and Art in Archaeological Illustration

The class provided a laboratory for exploring how science constructs its subject, for thinking about the wider ramifications of archaeological representation, and for exploring the ongoing resonance of archaeology for artists and others.

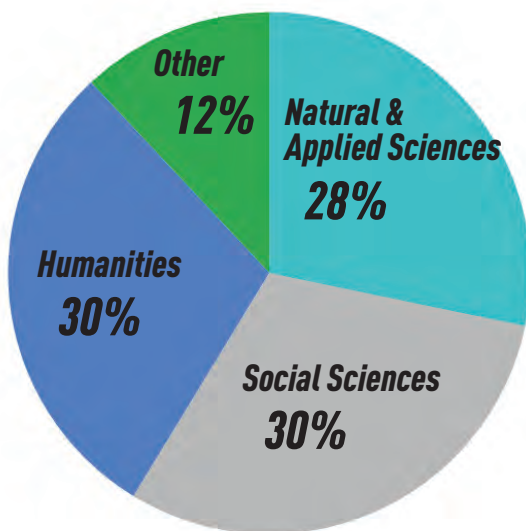
OUR IMPACT

MEASURING OUR IMPACT

In assessing the impact of our activities, the Center for Science and Society primarily focuses on the quality of the interactions that these activities foster. We look for what types of new collaborations develop between researchers, scholars, and students from different disciplines and the results of those collaborations, including any new research insights that evolve through these interactions. We collect information via surveys and narrative reports regarding quality and depth of the collaboration, the areas of research involved, and how participants overcome challenges of working between disciplines.

In order to gauge the Center's reach and growth, both within Columbia and beyond, we also collect quantifiable metrics such as the number and types of events we organize, attendee and participant demographics, analytics from our website users and social media communities, the range of grant proposals we receive, and the funding we award and are awarded every year.

OUR COMMUNITY



Over the past five years, the Center has worked to build a diverse community of faculty, researchers, and students. More than 100 Columbia affiliates have connected with us through our Research Clusters, grants, committees, and activities. These community members represent 38 departments, schools, and fields across Columbia, evenly divided between the natural sciences, social sciences, and humanities, as well as those from the arts, journalism, law, and public health. In the Center's next phase, our goal is to encourage deeper, longer-lasting connections between our affiliates through new initiatives aimed at faculty and students.

OUR GRANTS

Since 2014, the Center has awarded more than \$150,000 in grants to students and faculty for 54 seed, course development, and public outreach projects.

Approximately 1/3 of seed grant projects resulted in follow-on funding within 1-2 years.

Approximately 75% of seed and public outreach grants were awarded to students.

OUR REACH

Since 2014, the Center has organized and/or co-sponsored nearly 200 events, convening thousands of participants.

In 2018-19, the website received approximately 27,000 visitors from 155 countries and territories.

In 2018-19, the Center's twitter feed received a half-million impressions and our YouTube channel received 31,000 views.

OUR SUPPORT

Since 2014, the Center and our faculty have received more than \$2.5 million in funding, including generous support from the Andrew W. Mellon Foundation.

Research Clusters have been awarded external funding from 14 organizations including the National Science Foundation, National Endowment for the Humanities, and the American Museum of Natural History.

COMMUNITY BUILDING

In the Center's second phase, we aim to consolidate and expand upon the research and teaching activities that have proved most fruitful and have inspired the strongest collaborative efforts among our faculty and students.

STUDENT INITIATIVES

Some of the most striking feedback we have received from students and postdocs who join our community is that the Center's activities have been the **one and only opportunity** they have found to interact with faculty or students outside of their department. We therefore plan to continue to prioritize the support of student-focused and student-led activities in science and society. The Center has been working to develop a better reach to students craving interdisciplinary conversation, learning experiences, and research opportunities. For the 2019-20 academic year, the Center is developing a graduate student working group in science studies. Additionally, the Center plans to partner with a number of undergraduate groups and clubs, including the Columbia Science Review (CSR) and is forging a potential partnership with Frontiers of Science in the undergraduate core curriculum to organize expert conversations after its upcoming science film series. Several workshops are also planned for the remainder of the year around our 2019-20 theme of *Knowledge and Access*, which focus on indigenous/immigrant knowledge, access to technology, and climate change. A sixth round of seed grants and a second round of student public outreach grants will also be issued.

CO-TEACHING PROGRAM

Starting in the 2019-20 academic year, the Center will pilot a science and society co-teaching program in order to build on the current interdisciplinary curriculum development grants offered by the Center and to foster comprehensive, interdisciplinary education. New co-taught course proposals will be solicited and grants awarded in the spring semester. Co-taught courses will be organized by pairs or teams of instructors—at least one from the natural sciences, medicine or a related field, and another from the arts, humanities, social sciences, or law—with the goal of co-listing each course in at least two departments. Faculty matchmaking assistance for co-instruction will also be arranged by the Center. To better prepare students to address the multifaceted challenges of the 21st century, the Center will prioritize courses which offer experiential, service, or project-based learning opportunities or that are centered on a cross-disciplinary problem or question.

Successful applicants will receive funds that can be used towards syllabus development, graduate research/teaching assistants, software and materials, guest speakers, and experiential and project-related activities on or off campus. If required, funds will also be provided to offset departmental teaching obligations in the early years of the program. Courses will be encouraged to include a public outreach initiative—such as a group presentation at a high school or relevant community outreach program—allowing the reach of the program to extend beyond the University.

CONCENTRATION OR MAJOR IN SCIENCE AND SOCIETY

In 2017 and 2019, the Center organized interdisciplinary pedagogy workshops for faculty and instructors who have previously taught/co-taught interdisciplinary courses or had received course development grants. One of the major recommendations from both of the workshops was to build better infrastructure for these courses, which often feel isolated from the faculty member's home department. Additionally, there has been persistent and continual interest from the students for more cross-disciplinary educational opportunities and real-world experiences. The long-term results of the Center's efforts to develop a more interconnected faculty and research community, a cadre of interdisciplinary courses, and an enduring group of students interested in science and society, is to consolidate this community into a concentration or major in science and society at Columbia University. The Center plans to explore the curricular requirements and funding in the coming years.

IMPACT STORIES

Sarika Khanwilkar and Pooja Choksi are graduate students in the Ecology, Evolution, and Environmental Biology department (E3B). They were awarded a seed grant in 2018 for their project Advancing Methods and Communications Skills for Broader Scientific Impact. From November 2018 to April 2019, they held four events for undergraduate, masters, and doctoral level students to gain an interdisciplinary understanding of science and its place in the modern world. Sarika and Pooja note:

"We gained several insights from organizing the series. The first is that students desire and support interdisciplinary conversations and believe them to be an essential part of our training. For example, the students voiced a need to be educated on the social and cultural intricacies of doing international fieldwork, such as how to conduct oneself in places with strong colonial history and different gender norms. Second, the events were a reminder of the need for better communication between social and natural scientists, policymakers, journalists and the larger community as well as the benefits of simple and clear communication as scientists.



The seed grant provided us with a number of opportunities that we would not have had otherwise. First, we were able to invite distinguished academics and practitioners in the field of science communication, scientific research, and policy making to Columbia to share their expertise with our student group. Secondly, the seed grant allowed us to hold networking receptions after the events, which were effective in increasing interdepartmental interactions. We do not often get a chance to spend time with students from other departments and the events gave us an opportunity to do so. Further, organizing this discussion group, including moderating a panel and running a workshop, have given us a chance to develop valuable public speaking and organizational skills."



By piloting this student discussion group through a Center seed grant, Sarika and Pooja were able to demonstrate a need for the practice of scientific communication skills with their academic peers and the public. This has supported the success of their work and provided them with an opportunity to receive follow-on funding from E3B to continue this interdisciplinary initiative.

"...organizing [the discussions], moderating a panel, and running a workshop have given us a chance to develop valuable public speaking and organizational skills."



Christopher Medina-Kirchner is a PhD student in the Psychology department. He was awarded public outreach grants in 2018 and 2019 to pilot and then expand the FIRST program, which trains formerly incarcerated students to address social justice issues through interdisciplinary scientific research. Chris was inspired to create the FIRST (Formerly Incarcerated Research and Science Training) program from his own experiences in college after serving time in prison and finding friendship and support through a similar initiative. FIRST Scholars receive research training and mentorship throughout the month-long program. Formerly incarcerated mentors work with the Scholars, and are available to help guide projects, develop career goals, construct professional networks, and provide advice and encouragement. In the second year of the program, the students' research was focused around the theme of psychoactive substances and drug law enforcement policies. Chris writes:

"FIRST Scholars come from a variety of backgrounds and different fields of study. Everyone in the program has been to prison for drug-related charges. This makes the topic of psychoactive substances more pressing and meaningful, as they have felt the consequences of drug law enforcement first-hand. I've come to the realization that some of the FIRST Scholars likely will not go on to pursue a science related career. Still, in the program they learn to use data and evidence to dictate their positions. This surely will be beneficial to them in life and in their chosen career.

The FIRST Scholars are some of the brightest and hardest working students I've ever encountered, and have accomplished this despite overwhelming adversity. One of the FIRST Scholars was living in a federal half-way house, which is meant to be a stepping stone from federal prison to the outside world. Every time he planned to attend a FIRST event, he had to apply for a pass. The half-way house rules were so strict that if he was late coming back from class, he risked reincarceration. Despite these additional burdens, he excelled in the program. All of the FIRST Scholars have stories of dealing with and overcoming adversity while seeking education. They are all inspiring and have motivated me to keep the program going."

Some FIRST Scholars have gone on to continue research after the month-long program, including one Scholar who is working as a research and teaching assistant for Dr. Ciara A. Torres, mentor and Adjunct Professor in the Columbia Psychology Department, assessing the effects of prenatal cannabis exposure on cognitive performance. Chris plans to apply for larger grants in the coming year in order to accept more people into the program and provide them with more resources. Additionally, Chris plans to implement a similar mentoring program inside of prison so students can be prepared for graduate school upon their release.

***"Without [the outreach grant],
the FIRST program would not be
possible."***



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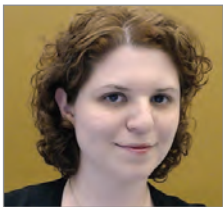
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