

VISUALIZING SCIENCE SYMPOSIUM: The Impact of Art on Scientific Discovery

Including the Panel Discussion:
Navigating the Future: Art, Science, and AI

November 7, 2024 , 9:00 A.M. to 5:30 P.M.



COLUMBIA UNIVERSITY
THE ITALIAN ACADEMY
FOR ADVANCED STUDIES IN AMERICA

1161 Amsterdam Avenue
(south of 118th Street)



SCHEDULE

MORNING SESSION

9:00 AM - 9:30 AM: Registration and Coffee

9:30 AM - 9:45 AM: Opening Remarks



David A. Freedberg, Pierre Matisse Professor Emeritus at Columbia University, renowned for his research on the intersections of art, science, and emotion. His influential works explore how art impacts human behavior and cognition, bridging gaps between disciplines to enhance understanding of visual culture.

Session 1: Art Meets Science

9:45 AM - 10:05 AM— *The Jazz of Physics*
Stephon Alexander, Professor of Physics, Brown University

10:05 AM - 10:25 AM— *Beautiful Bacteria: Encounters from the Microuniverse*
Tal Danino, Associate Professor of Biomedical Engineering, Columbia University

10:25 AM - 10:45 AM— *Friends of a Feather: Integrating Art, Natural Sciences, and Preservation*
Carolina Rojas, Part-time Faculty and Doctoral Candidate, Program in Art & Art Education, Teachers College, Columbia University

10:45 - 11:00 AM | Q&A for Session 1 Speakers

11:00 AM - 11:10 AM: Mid-Morning Coffee Break

Session 2: Visualizing Medicine

11:10 AM - 11:30 AM— *Drawing Blood: Making Art and Knowledge from the Dead in Nineteenth-Century Europe*
Richard Barnett, Freelance Writer and Broadcaster

11:30 AM - 11:50 AM— *The Interpretation of Images for Science*
Roberto Osti, Master Teacher of Anatomy & Drawing at the New York Academy of Art

11:50 AM - 12:10 PM— *Drawing What Can't Be Seen: Medical Illustration's Pedagogic Power*
Jill Gregory, Associate Director of Instructional Technology, Icahn School of Medicine at Mount Sinai

12:10 - 12:25 PM | Q&A for Session 2 Speakers

Lunch Break: 12:25 PM - 1:10 PM

AFTERNOON SESSION

Session 3: Pushing Boundaries

1:10 PM - 1:30 PM— *Game Design for Science*
Owen Harris, Director Súil Vision

1:30 PM - 1:50 PM— *Communicating Scientific Concepts Through Visual Metaphor*
Beata Mierzwa, Postdoctoral Researcher, UC San Diego & Science Artist, Beata Science Art

1:50 PM - 2:10 PM— *Cultivating Transdisciplinary Creativity at Harvard: A Case Study at the Art-Science Interface*
Kit Parker, Tarr Family Professor of Bioengineering and Applied Physics, Harvard University

2:10 - 2:25 PM | Q&A for Session 3 Speakers

2:25 PM - 2:35 PM: Coffee Break

PANEL DISCUSSION AND Q&A

Session 4: The Future of Art, Science, and AI

2:35 PM - 4:00 PM: The discussion will focus on the evolving landscape of science visualization, the integration of AI in art and science, and potential for future interdisciplinary collaborations.

Moderator: Steven Feiner, Professor of Computer Science at Columbia University.

Lydia Chilton, Assistant Professor of Computer Science at Columbia University

Gaël McGill, CEO & Founder of Digizyme, Inc.; Faculty at Harvard Medical School

Vishal Misra, Vice Dean for Computing and AI, Professor of Computer Science at Columbia University.

Vikash Sehwal, Research Scientist at Sony AI

Jeannette Wing, Executive Vice President for Research and Professor of Computer Science, Columbia University

Q&A Session

An opportunity for attendees to engage with the panelists, asking questions on interdisciplinary projects.

4:00 PM - 4:10: Closing remarks

EXHIBITION SPACE

4:20 - 5:30 PM | Networking Reception & Exhibition Viewing (held in a separate room).

SPEAKERS

STEPHON ALEXANDER



Stephon Alexander, Professor of Physics at Brown University, is an award-winning theoretical physicist, author, and jazz musician whose work bridges cosmology, particle physics, and quantum gravity. In his acclaimed book, *The Jazz of Physics*, Alexander explores the profound connections between music and astrophysics, revealing how the principles of jazz mirror the complexities of modern physics and the early universe. He delves into the idea that innovations in physics can emerge from the “improvisational logic” inherent in jazz performance and practice. Alexander’s unique perspective offers a fresh, interdisciplinary approach to understanding the cosmos, blending the creativity of music with the rigor of science.

JILL GREGORY



The Association of Medical Illustrators once declared, “Medical illustrators draw what can’t be seen, watch what’s never been done, and tell thousands about it without saying a word.” As science evolves with nanotechnology, immunotherapy, and microsurgery, this statement is truer than ever. The expanding role of medical illustration in educating clinicians, scientists, and the public has brought issues of inclusivity and AI to the forefront. In this presentation, Jill Gregory, a Certified Medical Illustrator and Associate Director of Instructional Technology at Mount Sinai, will explore the history and current challenges of medical illustration, highlighting her work in creating visuals that educate thousands without saying a word.

ROBERTO OSTI



Roberto Osti, a master medical illustrator and educator, is renowned for his precise anatomical drawings that bridge art and science, making a significant contribution to medical education. In this presentation, Osti discusses how his illustrations for *Scientific American* were misappropriated—once by a pseudo-scientific institution and another by a conceptual artist with surreal results. He will also explore how even highly accurate illustrations can be misleading, and draw connections between traditional art and AI-generated images, questioning their accuracy. Osti authored three books on Figure Anatomy and Figure Drawing, holds degrees in surgical and anatomical illustration, and teaches Figure Anatomy at the New York Academy of Art.

RICHARD BARNETT



Between the French Revolution and the First World War, Europe and America experienced a golden age of medical image-making. Mass-market anatomical and pathological textbooks, with their crisp, detailed color illustrations, revolutionized how life, disease, and death were understood. Drawing from *The Sick Rose*—a pioneering collaboration between the Wellcome Library and Thames & Hudson—this talk explores a compelling corpus of art that is as beautiful as it is morbid, balancing aesthetic and clinical values. Richard Barnett, a distinguished historian of science and medicine, unveils the complex relationships between artists and anatomists, shedding light on the silenced voices behind these iconic images.

OWEN HARRIS



Owen Harris, Director of Súil Vision, is a Game Designer and VR designer working at the intersection of health, science, and playful design. When not leading the Súil Vision team, he creates games and VR experiences focused on mental health and human connection. Harris has taught Game Design at DIT and has spoken globally about the collaboration between creatives and scientists. His work bridges the gap between technology and well-being, offering innovative solutions that enhance human interaction through immersive experiences. With a passion for combining creativity and science, Harris continues to explore new frontiers in design and technology.

KIT PARKER



Over a decade ago, frustrated by the lack of creativity in his science and engineering students, Kit Parker transformed part of his lab at Harvard into a studio space for artists. He believed that if artists spent time with his scientists, some of their creativity would inspire his trainees working on regenerative therapies for children with congenital heart deformities. This presentation shares the story of what happened at @studio_dbg. Kit Parker is the Tarr Family Professor of Bioengineering and Applied Physics at Harvard, and the director of the Disease Biophysics Group, whose research focuses on pediatric diseases with an emphasis on the development of regenerative therapeutics. He also served multiple combat tours in Afghanistan and is the founder of two food companies.

TAL DANINO



The microbial world is undergoing a renaissance. Microbes, once seen mainly as disease agents, are now sources of fascination, influencing health, climate change, and biotechnology. This talk, inspired by the wonders of bacteria, explores our creation of bacterial artworks using petri dishes to showcase microbial diversity and complexity. By cultivating bacteria from human and environmental samples, we shape these organisms into aesthetic forms to communicate their histories and impacts. Tal Danino, Associate Professor at Columbia University, engineers “programmable” bacteria and transforms them into bioart. His work has been exhibited globally and featured in *Beautiful Bacteria* (Rizzoli Electa 2024). He’s a TED Fellow and award-winning researcher.

BEATA MIERZWA



Creativity is essential in both science and art, and merging these disciplines offers unique ways to communicate scientific information. Alongside her academic career, Beata Mierzwa, a postdoctoral researcher at UCSD and AAAS IF/THEN Ambassador, explores visual science communication through hand-drawn illustrations, science fashion, and interactive media. Her art conveys complex biological concepts by translating scientific findings into aesthetic visuals using metaphors. This visualization fosters communication among researchers, sparks curiosity, and inspires future scientists. In this talk, Beata will share her journey of blending science and art, highlighting how artistic practices have enriched her research and opened new avenues for scientists to explore.

CAROLINA ROJAS



Rojas’s artistic practice explores the intersections of education, art, design, and the natural world, inspired by Colombia’s extraordinary biodiversity. She creates digital and analog art, including drawings, installations, and ceramics, focusing on the rich avian life of Colombia. Her work challenges traditional scientific portrayals, highlighting the delicate balance between life and death. By integrating art with ornithological research, she enhances education and fosters conservation awareness. A Colombian artist, designer, and educator based in New York, Rojas is a Fulbright doctoral candidate at Teachers College, Columbia University, and holds an M.F.A. from Pratt Institute, along with degrees from Colombian universities.

PANELISTS

STEVEN FEINER, Moderator



Feiner is a Professor of Computer Science at Columbia University, directing the Computer Graphics and User Interfaces Lab. With over 25 years in VR and AR research, Feiner is a prominent figure

in the field. He is a Fellow of the ACM and IEEE, and a member of the SIGCHI Academy and IEEE VGTC VR Academy. His achievements include the ACM SIGCHI Lifetime Research Award, IEEE ISMAR Career Impact Award, and IEEE VGTC Virtual Reality Career Award. Feiner's pioneering work continues to influence the development of immersive technologies and user interfaces.

VISHAL MISRA



Misra is a Professor of Computer Science and Electrical Engineering at Columbia University and Vice Dean for Computing and AI in the School of Engineering. An ACM and IEEE Fellow,

his research focuses on mathematical modeling of systems, bridging practice and analysis. Misra co-founded CricInfo, later acquired by ESPN, and developed one of the first commercial applications built on GPT-3 for ESPN CricInfo. He played a key role in India's Net Neutrality regulation, with his definition adopted by both citizens and regulators. He has received Distinguished Alumnus Awards from IIT Bombay (2019) and UMass-Amherst (2014).

LYDIA CHILTON



Chilton is an Assistant Professor of Computer Science at Columbia University, specializing in computational design—using computation and AI to aid in design, innovation, and

creative problem-solving. Her research focuses on human-computer interaction, particularly viewing design from a computational perspective. Current projects include creating visual metaphors for ads and using computational tools for humor and satire writing. Chilton earned her PhD from the University of Washington and both her Master's and SB in Engineering from MIT.

VIKASH SEHWAG



Sehwag is a research scientist at Sony AI, where he leads initiatives to enhance the safety and utility of large-scale generative models. With a strong foundation in artificial intelligence, Sehwal's work

focuses on making AI systems more trustworthy in complex, real-world settings, especially in safety-critical applications like self-driving cars. He earned his PhD from Princeton University, where his research centered on improving AI's reliability under unknown future conditions. He has also interned at Meta AI and Microsoft Research, and his innovative contributions have earned him prestigious awards, including the Qualcomm Innovation Fellowship.

GAËL MCGILL



Driven by a passion for science visualization, McGill co-founded Digizyme while a research fellow at Dana-Farber Cancer Institute and Harvard Medical School. As CEO and creative lead, he

brings a unique perspective from his background in biomedical research, multimedia design, 3D animation, and education. He is also faculty and Director of Molecular Visualization at Harvard Medical School, where his work focuses on scientific visualizations. He is the creator of Clarafi.com and the Molecular Maya software toolkit, both dedicated to advancing the communication of science.

JEANNETTE WING



Wing is the Executive Vice President for Research and a Professor of Computer Science at Columbia University. She is highly respected for her contributions to computer science and data science,

particularly in trustworthy AI, computational thinking, and the societal impacts of technology. Wing's influential work has helped shape the future of data-driven innovation. She has held significant positions at Microsoft, Carnegie Mellon University, and the National Science Foundation. Wing earned her degrees in Computer Science from MIT and is a member of the National Academy of Engineering. Her current research focuses on trustworthy AI.



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