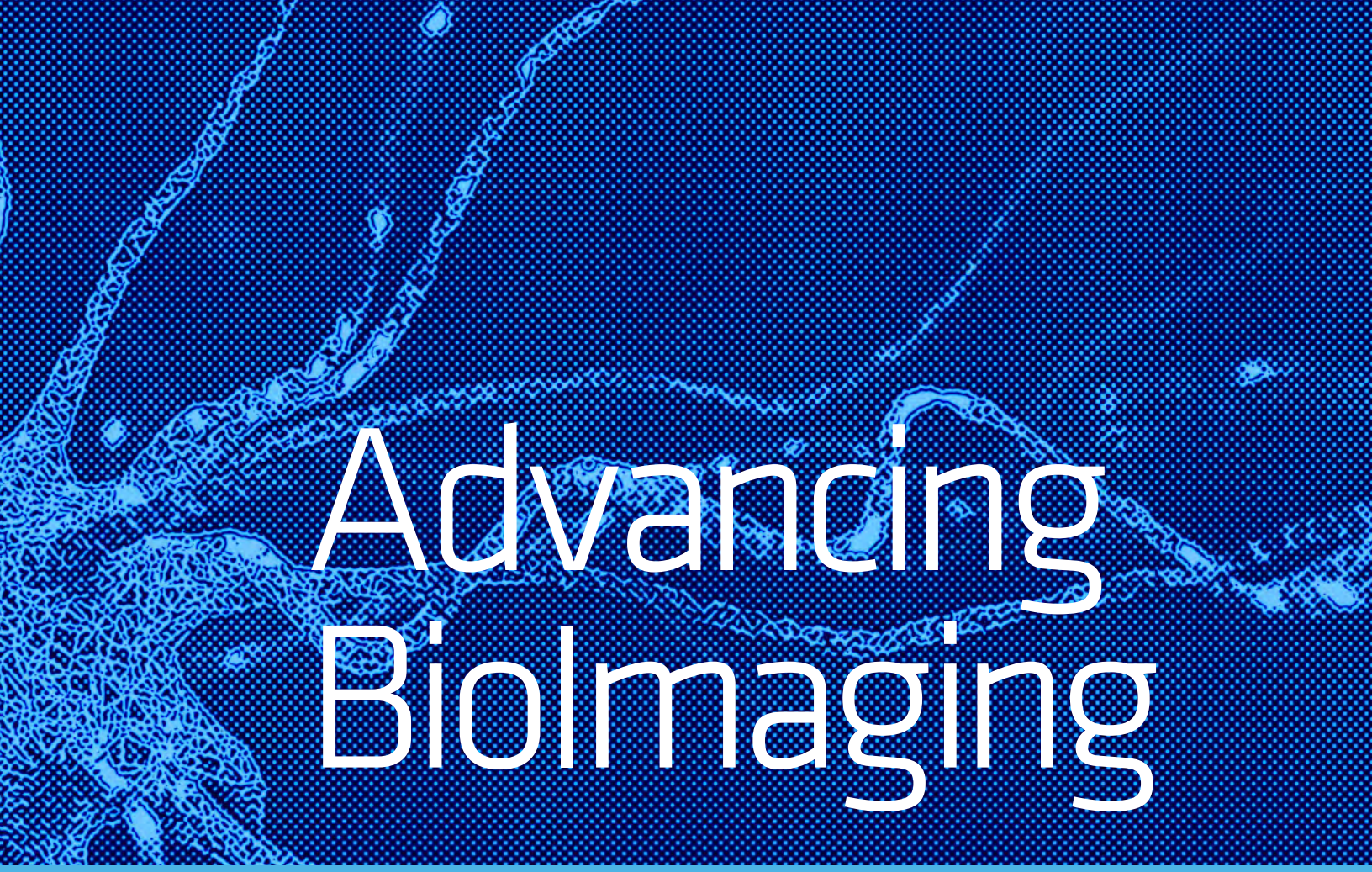


Advancing BioImaging

The Third Annual Scialog Conference
May 18-21, 2023

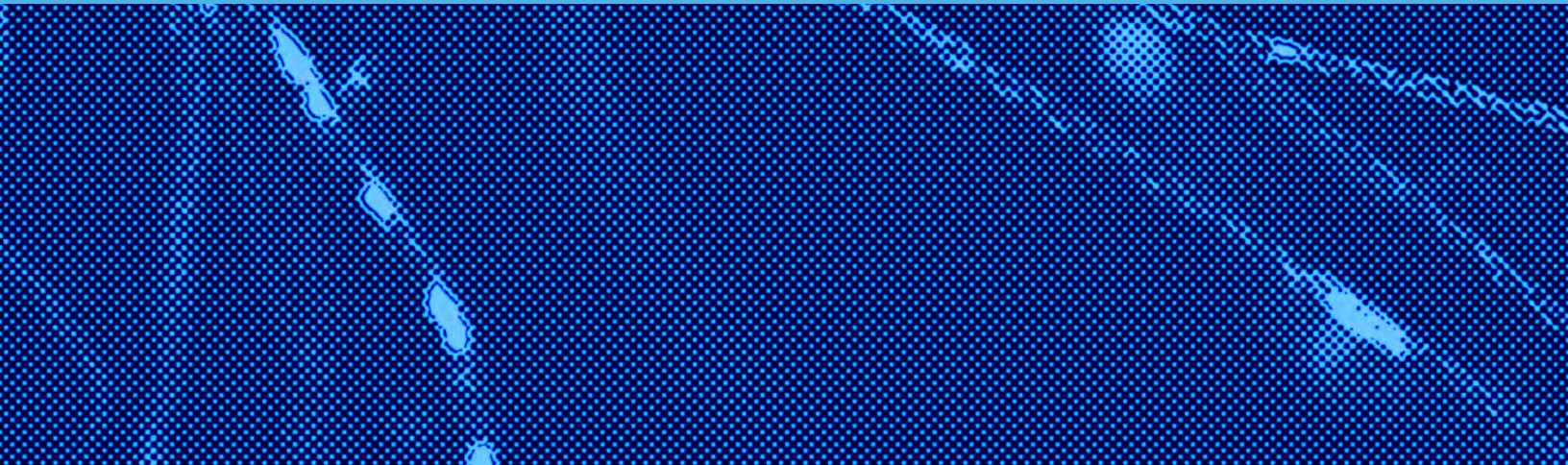
scialog2023®

Chan Zuckerberg Initiative

WALDER FOUNDATION

RESEARCH CORPORATION *for* SCIENCE ADVANCEMENT

THE FREDERICK GARDNER COTTRELL FOUNDATION



Objectives

Engage in dialogue with the goal of accelerating high-risk/high-reward research.

Identify and analyze bottlenecks to advance fundamental imaging science and improve its ability to impact human health and our understanding of biological structures and their function.

Build a creative, better-networked, collegial community that is more likely to produce breakthroughs.

Form teams to write proposals to seed novel projects based on highly innovative ideas that emerge at the conference.

Most importantly, enjoy the discussions about where this field should go and how we can work together to get there.

Process

Brainstorming is welcome; don't be afraid to say what comes to mind.

Consider the possibility of unorthodox or unusual ideas without immediately dismissing them.

Discuss, build upon and constructively criticize each other's ideas —in a spirit of cooperative give and take.

Make comments concise to avoid monopolizing the dialogue.

Diversity, Inclusion and No Harassment

Research Corporation for Science Advancement fosters an inclusive and respectful environment for listening in which the different identities, backgrounds, and perspectives of all participants are valued, and in which everyone is empowered to share ideas as fellow scientists.

RCSA does not tolerate any form of harassment, which could include verbal or physical conduct that has the purpose or effect of substantially interfering with anyone else's participation or performance at this conference, or of creating an intimidating, hostile, or offensive environment; any such harassment may result in dismissal from the conference.

Read RCSA's Code of Conduct

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From the President

Welcome to the 2023 Scialog: Advancing BioImaging meeting, cosponsored by Research Corporation, the Chan Zuckerberg Initiative and the Frederick Gardner Cottrell Foundation, and with additional support from the Walder Foundation. This is the third and final Scialog meeting on this theme. I hope that you have found these opportunities to connect with colleagues across multiple disciplines and to design new research projects that could advance the field to be stimulating and productive. Progress in imaging, even beyond what we currently consider to be firm limits, can unlock new ways to study biological processes, to make earlier and clearer diagnoses, and to treat disease. These advances will undoubtedly incorporate new optics and physics, new chemical probes, and new mechanisms for delivery of probes and sensors to highly specific sites.

Scialog's overarching purpose is to advance cutting-edge science of great significance to humanity by catalyzing innovative, basic research leading to fundamental discoveries. Our focus is on scientists in the early years of their independent careers. Through the unique Scialog process, we seek to lay the foundation for an ongoing, highly creative, cross-disciplinary community of scientists that will prove adept at identifying exciting areas for research advances for decades to come.

To that end, under the guidance of Program Directors **Andrew Feig**, **Richard Wiener**, and **Silvia Ronco** (Research Corporation), and with assistance from our initiative partners **Stephen Jett** and **Vladimir Ghukasyan** (Chan Zuckerberg Initiative) and **Shaun Kirkpatrick** (Frederick Gardner Cottrell Foundation), we hope you will be engaged in passionate discussions with colleagues, many of whom you will have met for the first time at Scialog. The process may even push you out of your comfort zone with the goal of stimulating new and better ideas. The result, we expect, will be a meeting unlike others that you attend. We are confident that you will find the next few days to be extremely worthwhile.

This is your opportunity to air that wild idea you have been reluctant to share with others, or to discuss a nagging hunch that does not yet have sufficient supporting data, or to take a leap on a high-impact/high-risk project instead of concentrating all your effort on somewhat more "incremental" studies. This is the time to come up with, and be open to, completely new ideas that may truly change the world and to find new colleagues and collaborators with whom to pursue them.

We hope this meeting yields a crop of outstanding team proposals, which will make our job of determining who receives funding very challenging. I wish you every success in exploring new and compelling ideas over the next few days.

Have a terrific meeting!

Daniel Linzer
President
Research Corporation for Science Advancement

From the Program Director

Research Corporation's highly interactive Scialog meetings have the goal of catalyzing new collaborations based on blue-sky ideas among Scialog Fellows who constitute a highly select group of exemplary early-career scientists from the U.S. and Canada. The emphasis is on dialogue, networking, and building new collaborations to pursue novel, high-risk discovery research. We are looking forward to this third and final year of the initiative, to hear about the progress teams from prior years have made on their projects and to support another cohort of innovative teams this year.

Research Corporation, Chan Zuckerberg Initiative and Frederick Gardner Cottrell Foundation chose to focus on Advancing BioImaging because we believe this critical area of science will impact the way we understand biology and human health. Gone are the days of just seeing physiological features. Modern imaging crosses spatial and temporal boundaries with the ability to see not just the physical morphology of a cell or piece of tissue, but also chemical and biological pathways taking place within the physical structures. And by combining multiple imaging technology and the ability to design photophysical probes and new hardware, and new algorithms that process data in real time and adjust data collection in response, imaging across wide fields and while stopping to acquire high resolution at the most critical loci is becoming possible We believe these breakthroughs can be accelerated by bringing together chemists, physicist, biologists, bioengineers and medical imaging specialists to work together collaboratively on novel, high-risk projects.

We have an outstanding speaker, **Brad Smith** (University of Notre Dame), to set the stage for breakout discussions.

We also have a team of terrific discussion facilitators: **Maryellen Giger** (The University of Chicago); **Matthew Kupinksa** (University of Arizona), **Ed McClesky** (Former Science Officer, CZI, retired); **Kyle Myers** (Puente Solutions, LLC); **Brian Pogue** (University of Wisconsin-Madison), and **Brad Smith** (University of Notre Dame).

Scialog meetings focus on dialog and team building with the goal of creating novel strategies and collaborative approaches. An important feature is the opportunity for Scialog Fellows to form teams and write proposals to pursue particularly creative ideas that emerge through the dialogue. We hope this competition is exciting, but regardless of which proposals are funded, the primary purpose is to catalyze a deeper and more meaningful exchange of ideas than ordinarily occurs at scientific conferences. Our intent is for this process to help participants gain new insights and connections that significantly advance fundamental science to enable major advances in imaging technologies.

We hope each participant finds the Scialog experience of great value. Please do not hesitate to provide feedback on how to make the conference better. My fellow Program Directors, **Richard Wiener** and **Silvia Ronco**, the RCSA staff, and I are here to help make the meeting a great experience!

Andrew Feig
Senior Program Director
Research Corporation for Science Advancement

Conference Agenda
May 18 – 21, 2023

Thursday, May 18

2:00 pm	**Registration Opens**	Sonoran Foyer
2:00 – 5:00 pm	**Snacks & Informal Discussions**	Sonoran Foyer
5:00 – 6:30 pm	**Poster Session and Reception**	Javelina/Sonoran Terrace
6:00 – 6:30 pm	**Meeting for Discussion Facilitators**	Sonoran Ballroom
6:30 – 7:30 pm	**Dinner**	Sonoran Rooftop Patio
7:30 – 8:30 pm	**Welcome** Dan Linzer, President, RCSA Stephen Jett, Program Manager, Imaging, CZI **Conference Overview, Outcomes and Proposal Guidelines** Andrew Feig, Senior Program Director, RCSA **Introductions/Ice Breakers**	Sonoran Ballroom
8:30 – 11:00 pm	**Starlight Cafe**	Sonoran Rooftop Patio

Friday, May 19

7:00 – 8:00 am	**Breakfast**	Sonoran Rooftop Patio
8:00 – 8:45 am	**Keynote Presentation** *Smart Molecules for Imaging, Therapy, and Health* Prof. Bradley D. Smith Director Notre Dame Integrated Imaging Facility	Sonoran Ballroom
8:45 – 9:00 am	**Breakout Session Overview and Instructions**	Sonoran Ballroom
9:00 – 10:15 am	**Breakout Session I**	Mesa, Canyon, Palm, Desert, Sonoran Ballroom
10:15 – 10:35 am	**Report Out**	Sonoran Ballroom
10:35 – 11:15 am	**Conference Photo and Morning Break**	Stairs Near the Main Pool
11:15 – 11:45 am	**Mini Breakout Session I** (Fellows) **Facilitator Meeting**	All Spaces Sonoran Ballroom
11:45 – 1:00 pm	**Lunch**	Sonoran Rooftop Patio
1:00 – 2:15 pm	**Breakout Session II**	Mesa, Canyon, Palm, Desert, Sonoran Ballroom
2:15 – 2:35 pm	**Report Out**	Sonoran Ballroom
2:35 – 3:05 pm	**Mini Breakout Session II** (Fellows)	All spaces
3:05 – 5:15 pm	**Afternoon Break, Informal Discussions and Leisure Time**	Sonoran Foyer
5:15 – 6:45 pm	**Poster Session and Reception**	Javelina/Sonoran Terrace
6:45 – 7:45 pm	**Dinner**	Sonoran Rooftop Patio
7:45 – 8:30 pm	**Previous Team Awards Discussion**	Sonoran Ballroom
8:30 – 11:00 pm	**Starlight Cafe**	Sonoran Rooftop Patio

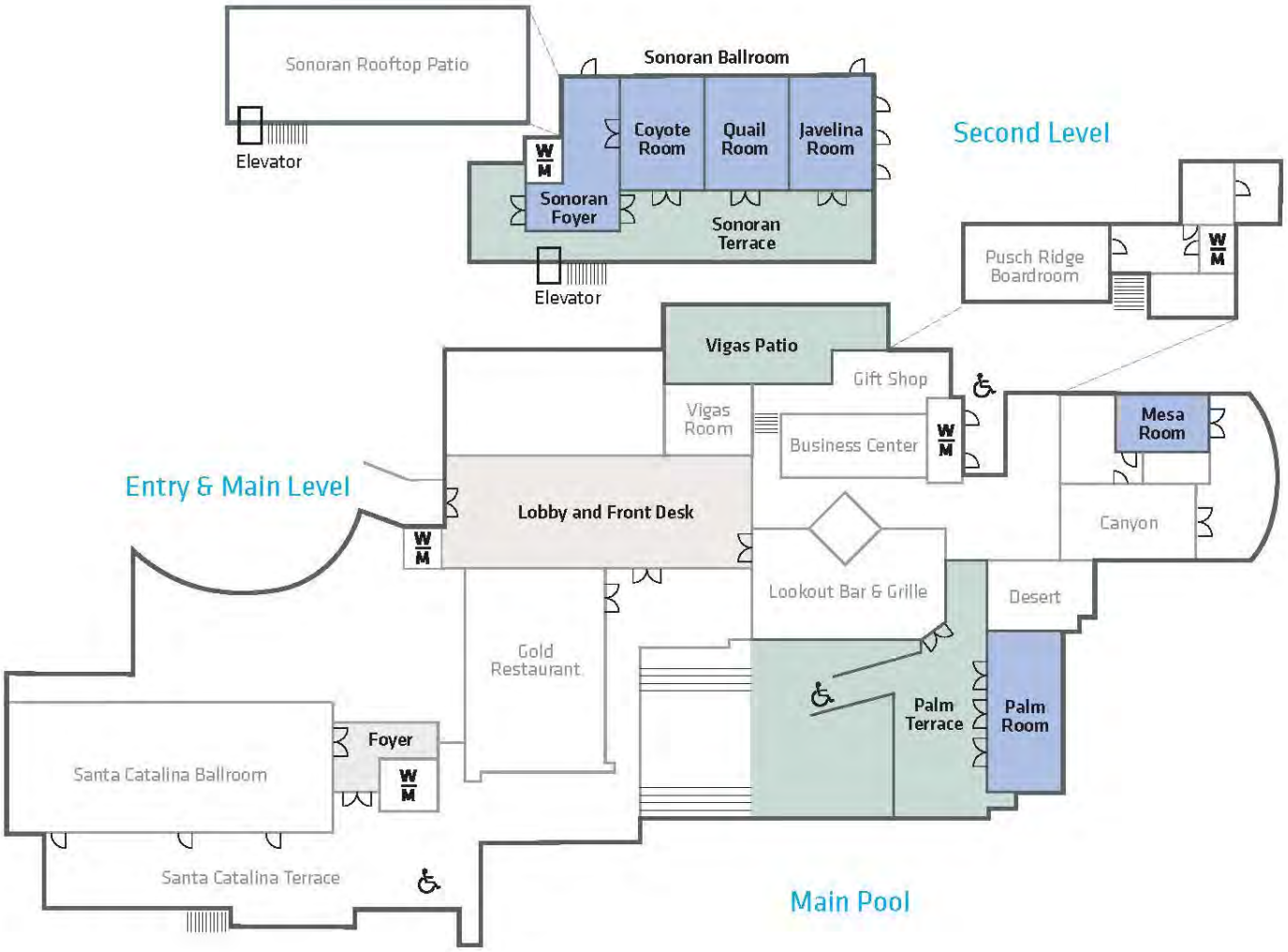
Saturday, May 20

6:45 – 7:30 am	**Optional Guided Nature Walk**	Meet on Vigas Patio
7:00 – 8:00 am	**Breakfast**	Sonoran Rooftop Patio
8:00 – 8:45 am	**Previous Team Awards Discussion**	Sonoran Ballroom
8:45 – 9:15 am	**Mini Breakout Session III** (Fellows)	All Spaces
9:15 – 9:45 am	**Morning Break**	Sonoran Foyer
9:45 – 11:00 am	**Breakout Session III**	Mesa, Canyon, Palm, Desert, Sonoran Ballroom
11:00 – 11:20 am	**Report Out**	Sonoran Ballroom
11:20 – 11:50 am	**Mini Breakout Session IV** (Fellows)	All Spaces
	Facilitator and Funding Partners Discussion	Sonoran Ballroom
11:50 – 1:00 pm	**Lunch**	Sonoran Rooftop Patio
1:00 – 5:45 pm	**Team Formation, Informal Discussions and Proposal Writing**	All Spaces
5:45 – 6:30 pm	**Reception**	Sonoran Terrace
6:30 – 7:30 pm	**Dinner**	Sonoran Rooftop Patio
7:30 – 11:00 pm	**Starlight Cafe**	Sonoran Rooftop Patio

Sunday, May 21

6:30 – 7:30 am	**Breakfast**	Sonoran Rooftop Patio
7:30 – 11:00 am	**Presentation of Proposals**	Sonoran Ballroom
	Assessment Survey and Wrap-up	
11:00 – 12:00 pm	**Lunch** (available to go)	Sonoran Foyer

Westward Look Resort



Keynote Presentation

Smart Molecules for Imaging, Therapy, and Health

Bradley D. Smith
Emil T. Hofman Professor of Science
Director, Notre Dame Integrated Imaging Facility

Abstract:

The lecture will describe new classes of long-wavelength fluorescent molecular probes for various types of targeted and activatable bioimaging applications. To help cell microscopists we developed deep-red fluorescent Squaraine-Rotaxanes as extremely stable and bright molecular probes that are especially useful for single molecule tracking studies. For in vivo imaging and fluorescence guided surgery we developed a new class of sterically shielded, near-infrared fluorescent cyanine dyes with unsurpassed optical and pharmacokinetic performance. Various targeted bioconjugates and enzyme responsive fluorescent probes are used for imaging cancer and microbial infection in living subjects. A collaboration with electrical engineers employs an implantable miniature wireless LED-based device as the light source and detector to produce a new paradigm for in vivo optical imaging and phototherapy. The lecture will conclude with a short summary of lessons learned directing a university-wide integrated imaging facility.

2022 Team Awards

Real-time AI for Programmable Training Arrays
Shiva Abbaszadeh, Electrical and Computer Engineering, University of California, Santa Cruz
Heather Whitney, Radiology, University of Chicago

Making Lenses Smart for Optical Imaging and Beyond
Yevgenia Kozorovitskiy, Neurobiology, Northwestern University
Abdoulaye Ndao, Electrical and Computer Engineering, Boston University

Democratizing Access to Macroscopic Bioimaging
Joshua Brake, Engineering, Harvey Mudd College
Kevin Cash, Chemical and Biological Engineering, Colorado School of Mines

Improving MRI Detection Limits
Mark Sellmyer, Radiology, University of Pennsylvania
Arnab Mukherjee, Chemical Engineering and Biological Engineering, University of California, Santa Barbara

MRI with Molecular Specificity for a New Realm of Neurodevelopmental Research
Kathryn Keenan, Applied Physics Division, National Institute of Standards and Technology
Crystal Rogers, Anatomy, Physiology, and Cell Biology, University of California, Davis
Ulugbek Kamilov, Computer Science and Engineering, Washington University in St. Louis

4D Imaging and Tracking to Resolve Organelle Form vs. Function
Alexandra Walsh, Biomedical Engineering, Texas A&M University, College Station
J**ohannes Schöneberg**, Pharmacology and Chemistry & Biochemistry, University of California, San Diego

Live tissue Clearing of Lymph Nodes Through Programmed Dendritic Cells
Ying Hu, Chemistry, University of Illinois at Chicago
Seunghyun (Seu) Sim, Chemistry, University of California, Irvine

High-speed 4D Morphodynamic Analysis of Migrating Cells
Arnold Hayer, Biology, McGill University
Rosario Porras-Aguilar, Physics & Optical Sciences, University of North Carolina at Charlotte

Transforming Imaging Collection in the Brain
Luke Mortensen, Regenerative Bioscience Center & School of Chemical, Materials and Biomedical Engineering, University of Georgia
Huanyu Cheng, Engineering Science and Mechanics, Pennsylvania State University

In Situ Protein Sequencing by Multiplexed Real-Time Single Molecule Imaging
Stephen Yi, Biomedical Engineering & Oncology, University of Texas at Austin
Ruixuan Gao, Chemistry and Biological Sciences, University of Illinois at Chicago

2021 Team Awards

NeedleScope: Developing the Smallest Microscope for Bioimaging

Aseema Mohanty, Electrical and Computer Engineering, Tufts University
Sixian You, Electrical Engineering and Computer Science, Massachusetts Institute of Technology

4-D Molecular Tracking Using Kilohertz Framerate Multi-Modal Microscopy

Nick Galati, Biology, Western Washington University
Shannon Quinn, Computer Science, University of Georgia
Doug Shepherd, Physics, Arizona State University

Nanophotonic Probes for Ultra-Deep Functional Multiphoton Imaging

Luke Mortensen, Chemical, Materials and Biomedical Engineering, University of Georgia
Aniruddha Ray, Physics & Astronomy, University of Toledo

Light-sheet imaging of 3D bioprinted islet organoids structure and function

Yevgenia Kozorovitskiy, Neurobiology, Northwestern University
Ping Wang, Radiology, Michigan State University

Enabling Noninvasive Lipid Profiling with Intermodal Deep Learning

Benjamin Bartelle, Biological and Health Systems Engineering, Arizona State University Fulton School of Engineering
Ulugbek Kamilov, Computer Science & Engineering and Electrical & Systems Engineering, Washington University in St. Louis
Lu Wei, Chemistry and Chemical Engineering, California Institute of Technology

Chip-scale Light Sheet for High Spatiotemporal Resolution Imaging

Aseema Mohanty, Electrical and Computer Engineering, Tufts University
Srigokul Upadhyayula, Molecular and Cell Biology, University of California, Berkeley

Deep Tissue Photoacoustic Imaging with Degradable Inorganic Nanoparticles

Carolyn Bayer, Biomedical Engineering, Tulane University
Allison Dennis, Biomedical Engineering, Boston University

Machine Learning to Identify Soft Tissue Molecular Signatures

Carolyn Bayer, Biomedical Engineering, Tulane University
Sapun Parekh, Biomedical Engineering, University of Texas at Austin
Paris Perdikaris, Mechanical Engineering and Applied Mechanics, University of Pennsylvania

Microendoscopy-Guided Diagnosis and Treatment of Early-Stage Ovarian Cancer

Barbara Smith, Biological and Health Systems Engineering, Arizona State University
Bryan Spring, Physics, Northeastern University

Wide-Field, Single-Pixel Fluorescence Imaging with On-Chip Nanophotonics

Lisa Poulikakos, Mechanical and Aerospace Engineering, University of California, San Diego
Douglas Shepherd, Physics, Arizona State University

2023 Proposal Guidelines

1. Awards are intended to provide seed funding for teams of two to three Scialog Fellows formed at this conference for high-risk, high-impact projects.

2. The application package should be submitted as a single PDF file. Pages one and two should describe the project and role of each team member. A third page may be used for references. No budget is necessary.

3. Awards will be in the amount of $50K direct funding per team member, plus a small percentage for overhead. Grant duration will be one year.

4. No Scialog Fellow can be a member of more than two teams. If a Scialog Fellow is a member of two teams, other members of the teams must be different. No team can submit more than one proposal.

5. No Scialog Fellow who previously has won a Scialog ABI Collaborative Award can be a member of more than one team. The other team members must be different from the members of the previously awarded team.

6. Scialog Fellows who have previously won two Scialog ABI Collaborative Awards are not eligible to be funded members of a team, but they can participate as a non-funded team member.

7. Teams cannot include members who have previously collaborated with one another. If you are unsure of your status (e.g., prospective team members were part of a large collaboration but did not significantly interact), please check for clarification with an RCSA Program Director.

8. Teams are encouraged (but not required) to:
    a. Include members with different research approaches and methods.
    b. Include members from different disciplines.

9. Proposals must be submitted electronically by **6:30 a.m. PST Sunday, May 21, 2023**. Instructions for submission will be provided at the meeting.

10. Awards are anticipated to start around **September 1, 2023**.

Scialog Fellows

Shiva Abbaszadeh sabbasza@ucsc.edu
Electrical and Computer Engineering, University of California, Santa Cruz
I focus on detection materials and sensor development, into full system integration, and finally ending with image reconstruction and quantification.

Benjamin Bartelle Benjamin.Bartelle@asu.edu
School of Biological and Health Systems Engineering, Arizona State University
We build molecular tools to resolve and manipulate neuroimmune function. This includes synthetic biology to build new reporters and sensors for MRI and machine learning to correlate MRI/MRS with bioinformatic data.

Carolyn Bayer carolynb@tulane.edu
Biomedical Engineering, Tulane University
My research laboratory develops new imaging tools for imaging deep within tissue, including the placenta, cardiovascular system, and reproductive anatomy. Within this scope, my research focuses firmly on systematically addressing barriers to clinical translation.

Eszter Boros eszter.boros@stonybrook.edu
Chemistry, Stony Brook University SUNY
The Boros lab is involved in a a multidisciplinary research program focused on the design, synthesis, preclinical evaluation and clinical translation of metal-based imaging probes, sensors and therapeutics.

Josh Brake jbrake@hmc.edu
Engineering, Harvey Mudd College
I am interested in designing new optical tools to reclaim scattered light in biomedicine and creating the next generation of platforms for teaching optics and optical engineering.

Kevin Cash kcash@mines.edu
Chemical and Biological Engineering, Colorado School of Mines
The Cash Lab focuses on developing and using next generation imaging tools to better quantify metabolic dynamics at multiple scales, ranging from the cellular, to the organism, and communities of organisms.

Fanny Chapelin f1chapelin@ucsd.edu
Bioengineering, University of California, San Diego
My lab develops non-invasive magnetic resonance imaging (MRI) methods to track immune cell migration to foci of inflammation in different pathologies such as transplant rejection, autoimmune diseases and cancer.

Shwetadwip Chowdhury
shwetadwip.chowdhury@utexas.edu
Electrical and Computer Engineering, University of Texas at Austin
Research interests are in developing next generation smart imaging technologies for applications in science and medicine.

Scott Cushing scushing@caltech.edu
Chemistry and Chemical Engineering, California Institute of Technology
Development of ultrafast and entangled photon optics as related to time resolved spectroscopy, on-chip photonics, and various microscopies.

Shawn Davidson shawnd@princeton.edu
Lewis-Sigler Institute, Princeton University
My work is in progress in the following areas: developing imaging mass spectrometry for analysis of stable-isotope tracers and metabolism; investigating the metabolic dysregulation that occurs in specific disease states and mathematical modeling of metabolic fluxes.

Allison Dennis a.dennis@northeastern.edu
Chemical Engineering, Northeastern University
I develop semiconductor nanoparticles (quantum dots) for biomedical imaging and biosensing. We use NIR-II/SWIR fluorescence and absorbance for deep tissue imaging and photothermal therapy while working on biocompatible compositions with an eye towards clinical translation.

Joyoni Dey deyj@lsu.edu
Physics and Astronomy, Louisiana State University
Medical Imaging: Interferometric Imaging, Imaging system design and optimization reducing patient dose, imaging time; Image reconstruction with physical modeling; Deep-learning for oncological prediction and staging; Mathematical (pde) models of tumor growth and treatment.

Bin Dong bindong058@gmail.com
Chemistry and Biochemistry, University of Arkansas
Our group is interested in in-situ measurement of nanoscale dynamics in functional materials and biological systems by optical spectro-microscopy imaging methods.

Meghan Driscoll drisc269@umn.edu
Pharmacology, University of Minnesota Twin Cities
Focusing on cancer and immune cells, the Driscoll lab investigates how the interplay between cell 3D morphology, dynamics, and signaling governs cell function. To do so, we combine the development of image analysis algorithms with high-resolution light-sheet microscopy.

Uzay Emir uemir@purdue.edu
School of Health Sciences, Purdue University
I have been developing novel noninvasive Magnetic Resonance Imaging (MRI) techniques for the molecular and microstructural understanding of the cerebrum and cerebellum's role in health and disease.

Ashwanth Francis acfrancis@fsu.edu
Institute of Molecular Biophysics, Department of Biological Sciences, Florida State University
We are interested in imaging functional virus-host interaction at high spatiotemporal resolution inside living cells by combining non-invasive quantitative fluorescence imaging, single virus tracking and cryoEM.

Nick Galati galatid@wwu.edu
Biology, Western Washington University
I am interested in using high resolution microscopy to understand how organelle interactions impact the formation, signaling, and motility properties of cilia.

Rui Gao gaor@uic.edu
Chemistry and Biological Sciences, University of Illinois Chicago
My lab's research lies at the cross-section of chemistry, biology, and imaging sciences, with a primary focus on developing next-generation spatial biology and correlative imaging tools.

Anna-Karin Gustavsson
anna-karin.gustavsson@rice.edu
Chemistry, Rice University
We develop and apply 3D single-molecule tracking and 3D super-resolution imaging throughout mammalian cells for studies of cellular nanoscale structure, dynamics, and molecular mechanisms to address biophysical questions related to cellular function and pathogenesis.

Ying Hu yshu@uic.edu
Chemistry, University of Illinois Chicago
My group develops single-molecule and superresolution imaging tools to understand temporal and spatial regulations of human immunity. A hallmark of our work is the ability to employ innovative imaging and analysis techniques to understand immunobiology at the nanoscale.

Katy Keenan kathryn.keenan@nist.gov
Applied Physics, National Institute of Standards and Technology
I am excited about quantitative MRI including multiparametric methods for understanding underlying tissue properties, low field MRI, and validation of MRI methods, including assessing the limits of detection.

Fan Lam fanlam1@illinois.edu
Bioengineering, University of Illinois at Urbana-Champaign
My research focuses on developing magnetic resonance (MR) based molecular imaging and multimodal/multiscale brain mapping technologies, and their applications to the study of brain function and physiology at normal and diseased states.

Yi-Chih Lin yichih.lin@utexas.edu
Chemistry, University of Texas at Austin
My research interests include the visualization of various membrane phenomena at single-molecular level, e.g. membrane protein structure, assembly, diffusion, conformational dynamics, and intermolecular interactions via high-speed atomic force microscopy (HS-AFM).

Jing Liu urraliu@iupui.edu
Physics, Indiana University-Purdue University Indianapolis
Single molecule live cell imaging, live-cell imaging of chromatin, single molecule transcriptomic imaging.

Vivian Liu qian.liu3@mcgill.ca
Institute of Parasitology, McGill University
I am interested in using various super-resolution imaging tools and biosensors to study the complex virus and host interactions. My expertise lies in molecular virology and biochemistry, with a specific focus on super-resolution microscopy imaging and development.

Xiaocun Lu xlu@clarkson.edu
Chemistry and Biomolecular Science, Clarkson University
My ultimate research goal is to develop super-resolution ultrasound imaging for in-vivo deep tissue imaging. My research area is at the intersection of polymer chemistry, smart materials, and mechanical engineering, especially with expertise in mechanochemistry and sonochemistry.

Divita Mathur dxm700@case.edu
Chemistry, Case Western Reserve University
Nucleic acids, Delivery systems, Fluorescence, FRET, Atomic force microscopy, Live cell imaging, Nanoparticles, Gene delivery, Light harvesting, photonic wires, confocal microscopy, tomography.

Dylan McCreedy dmccreedy@bio.tamu.edu
Biology, Texas A&M University
My lab is currently developing a novel 3D imaging toolbox that enables morphological characterization of molecularly-defined spinal cord neurons through the use of transgenic fluorescent vectors, passive tissue clearing, lightsheet microscopy, and 3D image analysis.

Ryan McGorty rmcgorty@sandiego.edu
Physics and Biophysics, University of San Diego
My research group focuses on soft condensed matter and biophysics, working on projects studying the dynamics of crowded bio-inspired environments and the rheology of biological materials. We work on developing light-sheet microscopy methods and image analysis methods.

Luke Mortensen luke.mortensen@uga.edu
School of Chemical, Materials, and Biomedical Engineering, University of Georgia
We aim to develop optical technologies for fluorescence and label-free nonlinear scattering imaging of tiny sub-cellular features deep in highly scattering tissue to understand the dynamic processes of regeneration and differentiation in living organs like bone, muscle, and brain.

Sapun Parekh sparekh@utexas.edu
Biomedical Engineering, University of Texas at Austin
I am interested in new applications and developments in vibrational and two-photon microscopy, specifically in disease biophysics as related to cancer metabolism and neurodegeneration; Faster speed, better signal to noise, and finding the RIGHT biological problem.

Rosario Porras-Aguilar rporrasa@uncc.edu
Physics and Optical Sciences, University of North Carolina at Charlotte
Quantitative Phase Microscopy, Superresolution Microscopy, Imaging through Scattering Media, Noninvasive Microscopy.

Colin Rathbun rathbunc@dickinson.edu
Chemistry, Dickinson College
My lab seeks to develop new bioluminescent imaging tools for in vivo and in vitro use via protein engineering and directed evolution. Interesting mutants are discovered via amplicon sequencing and machine learning. Right now we are interested in the NanoBiT split reporter.

Aniruddha Ray aniruddha.ray@utoledo.edu
Physics and Astronomy, University of Toledo
Develop novel imaging and biosensing platforms based on nanotechnology & multiple optical modalities such as fluorescence, interferometry, non-linear optics and photoacoustics.

Crystal Rogers crdrogers@ucdavis.edu
Anatomy, Physiology, and Cell Biology, University of California, Davis
Our lab studies the molecular mechanisms that control early embryonic development. We use characterization and functional studies, fluorescence microscopy, and transcriptional and protein-level analyses in avian and amphibian research organisms to model human congenital defects.

Devleena Samanta dsamanta@utexas.edu
Chemistry, University of Texas at Austin
Our research program focuses on developing a highly modular platform for intracellular biosensing and sub-cellular imaging based on enzyme-oligonucleotide conjugates that 1) enter cells and 2) are catalytically activated by specific intracellular molecules.

Danielle Schmitt dlschmitt@chem.ucla.edu
Chemistry and Biochemistry, University of California, Los Angeles
My lab develops fluorescent protein-based genetically encoded reporters for metabolites, amino acids, and kinases to study how metabolism is organized in space and time in single cells. We aim to understand how metabolism is regulated in healthy cells and perturbed in disease.

Doug Shepherd douglas.shepherd@asu.edu
Physics, Arizona State University
Development and application of quantitative imaging methods to understand self-organization and cellular "decision making" in the context of the physical principles that govern the microscopic world.

Lingyan Shi Lingyanshi@ucsd.edu
Shu Chien-Gene Lay Department of Bioengineering, University of California, San Diego
My team (Shi Lab) at UC San Diego is developing multimodal imaging platforms (SRS, MPF, SHG) for visualizing metabolic dynamics at sub-cellular resolution, and its applications for studying aging and diseases in animals and human beings.

Seu Sim s.sim@uci.edu
Chemistry, University of California, Irvine
The Sim lab develops living/dynamic biomaterials by engineered small-molecules, polymers, and living entities such as cells and spores.

Bryan Spring b.spring@northeastern.edu
Physics, Northeastern University
The Spring Laboratory at Northeastern University bridges biophysics, biomedical optics and cancer biology to selectively target microscopic deposits of tumor cells left behind by standard therapies that limit our ability to cure many malignancies.

Lei Tian leitian@bu.edu
Electrical and Computer Engineering, Boston University
We develop next-generation imaging systems that synergistically combine optics and computations. These computational imaging systems can overcome physical limitations and achieve novel capabilities that one could not with traditional imaging methods.

Alex Walsh walshaj@tamu.edu
Biomedical Engineering, Texas A&M University
My research interests include optical microscopy, label-free imaging, cellular metabolism, mitochondria dynamics, laser-tissue interactions, quantitative image analysis, and machine learning.

Ping Wang wangpin4@msu.edu
Radiology, Michigan State University
Dr. Wang's research focuses on imaging guided cell therapy for type 1 diabetes, and development of novel imaging techniques for cell-based therapy in general.

Rongsheng (Ross) Wang rosswang@temple.edu
Chemistry, Temple University
Chemical Biology, Bioorganic Chemistry. The design, synthesis, and utilization of chemical biology probes to dissect cell biology.

Katie White kwhite6@nd.edu
Chemistry and Biochemistry, University of Notre Dame
We study how intracellular pH dynamics regulate proteins, pathways and cell behaviors, with approaches across experimental scales. We investigate the molecular mechanisms driving pH-sensitive behaviors and how those mechanisms can be exploited for effective cancer therapies.

Heather Whitney hwhitney@uchicago.edu
Radiology, University of Chicago
Heather Whitney conducts research in medical physics in the following areas: computer aided diagnosis, performance metrics and evaluation, fairness of AI, and characterization of repeatability and robustness. Modalities include MRI, x-ray, and ultrasound.

Sheng Xu shengxu@ucsd.edu
Nanoengineering, Bioengineering, and Electrical and Computer Engineering, University of California, San Diego
My research interests are developing wearable ultrasound technologies for continuously imaging deep tissues, including blood pressure, blood flow, hemoglobin distribution, tissue modulus, and cardiac activities.

Ruobo Zhou ruobo.zhou@psu.edu
Chemistry, Pennsylvania State University
We develop and apply fluorescence-based molecular-scale protein imaging and transcriptome-scale RNA imaging techniques to study the protein organizations/interactions and gene regulations involved in fundamental cell functions as well as in cancer and neurodegenerative diseases.

Discussion Facilitators

Maryellen Giger m-giger@uchicago.edu
Radiology, University of Chicago
My interests are on computer-aided diagnosis/machine learning/deep learning in medical imaging for diagnosis and management of cancer, thoracic diseases, and neuro conditions, also including data science via analysis of COVID-19 on CT and chest radiographs through MIDRC.

Matthew Kupinski mkupinski@optics.arizona.edu
College of Optical Sciences, University of Arizona
I have worked and published on topics including modeling of imaging systems, image reconstruction, computation of ideal-observer performance, development of adaptive imaging, and assessment of imaging hardware using task-based metrics of image quality.

Kyle Myers drkylejmyers@gmail.com
Puente Solutions LLC
The development of statistically efficient methods for estimating task-based measures of imaging system performance (hardware or software, including AI/ML algorithms); ideal performance via Bayesian decision theory or methods for predicting human performance (model observers).

Brian Pogue bpogue@wisc.edu
Medical Physics, University of Wisconsin - Madison
I am interested in the interface between x-ray and optical imaging and therapy, maximizing the strengths of both for deep tissue, clinically translatable, bio sensing in vivo.

Bradley Smith smith.115@nd.edu
Chemistry & Biochemistry, University of Notre Dame
Fluorescent molecular probes for bioimaging

Guests

Sam Buck
The Peter and Carmen Lucia Buck Foundation
In my capacity with PCLB, I'm interested in understanding models which allow investigators to work with maximum scientific flexibility. My research focus, outside of PCLB, lies in the application of non-stationary signal analysis to psychiatric functional MRI.

Daren Ginete dginete@sciphil.org
Science Philanthropy Alliance

Stephen Jett sjett@chanzuckerberg.com
Imaging Program, Chan Zuckerberg Initiative
Supporting the development of cool new imaging technologies that will help cure, prevent or manage all diseases by the end of the century, supporting diversity in all aspects of science.

Kate Neifeld KateN@pclbfoundation.org
Science Research, The Peter and Carmen Lucia Buck Foundation
As part of ongoing work to deepen The PCLB Foundation's investment in Science Research, I am interested in witnessing Scialog's collaborative and innovative environment firsthand.

Kumar Utkarsh
KumarUtkarsh2025@u.northwestern.edu
Engineering Sciences and Applied Mathematics, Northwestern University
As a researcher interested in building various mathematical models, my research interests focus on developing and applying mathematical tools and techniques to analyze complex systems and phenomena.

Emma Zajdela emmazajdela@u.northwestern.edu
Engineering Sciences and Applied Mathematics, Northwestern University
My research focuses on developing mathematical models validated with data to understand complex social phenomena. I have worked on topics ranging from mathematics of poker, autonomous vehicles, scientific collaboration at conferences, fashion trends, and synchronization.

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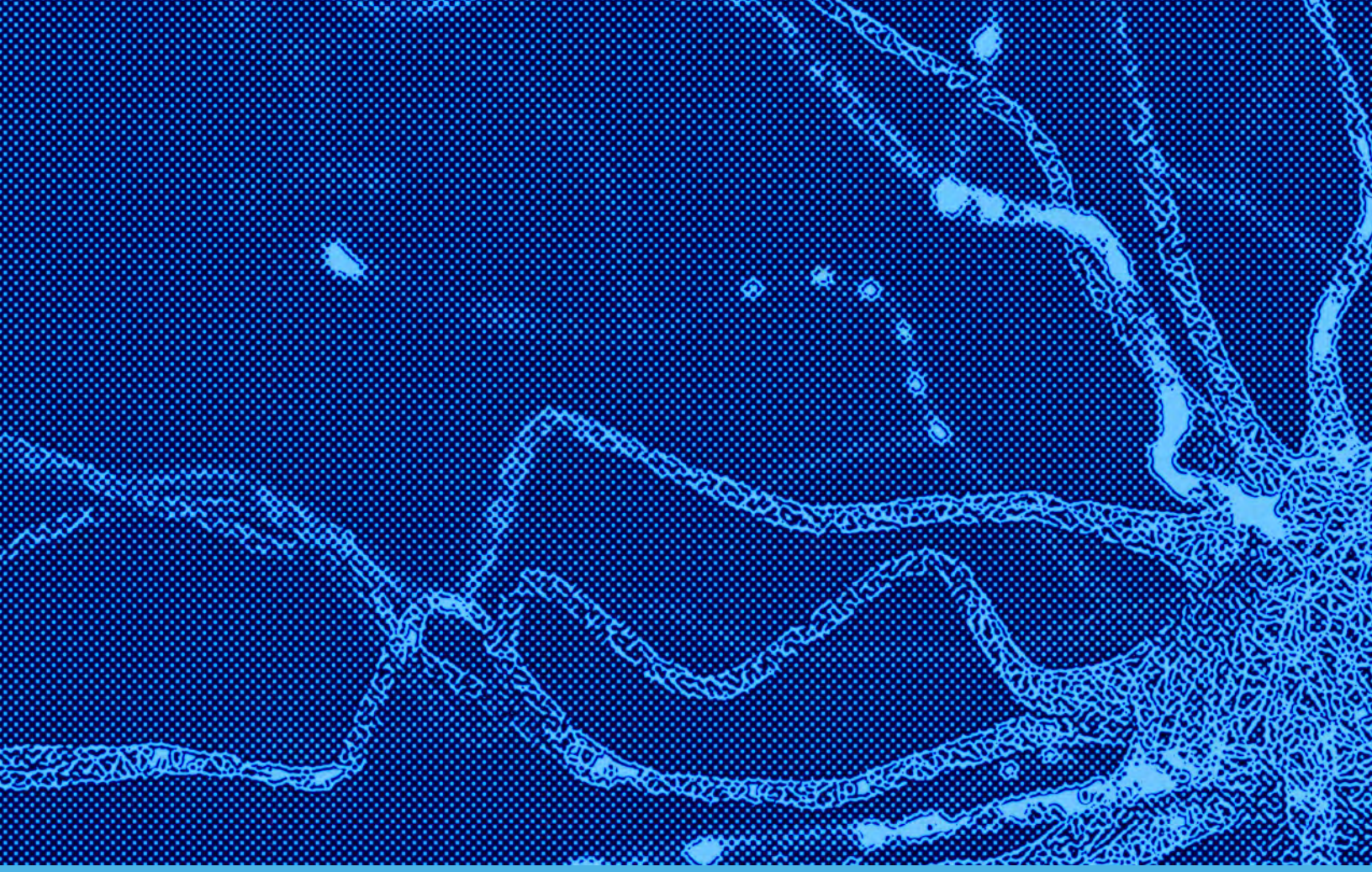

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