



JSNN



Joint School of
Nanoscience and Nanoengineering

NanoImpacts 2026

Living Systems Across the Nanoscale
Linking Environments to Biological Functions

Joint School of Nanoscience and Nanoengineering
Greensboro, North Carolina
October 7-8, 2026



A Brief History of NanoImpacts

The Joint School of Nanoscience and Nanoengineering (JSNN) is an academic unit shared by UNC Greensboro (Department of Nanoscience) and N.C. A&T State University (Department of Nanoengineering). JSNN launched the NanoImpacts annual conference in 2020 to bring researchers, policymakers, and industry leaders together to discuss emerging topics and future directions in the field of nanotechnology. Always held around National Nanotechnology Day (October 9th), the specific theme of the conference changes every year, as summarized in the table below.

2020	The Impact of Industry 4.0 on Academia, Industry, and Society
2021	Emerging Nano-Inspired Research Technologies (ENIRT)
2022	Semiconductor Synthetic Biology (SemiSynBio) and Beyond
2023	Nanotechnology for Defense Applications and Beyond
2024	Semiconductor Materials, Devices, and the CHIPS Act
2025	Active and Adaptive Matter
2026	Living Systems Across the Nanoscale

PROGRAM

Day 1 (Wednesday, October 7th): A National Perspective

- 12:30 PM Check-in (JSNN Atrium)
- 1:00 PM Welcome and introductions
- Dr. Dan Rabinovich (JSNN Associate Dean), Dr. Samuel Oliveira (JSNN), and Dr. Tianqi Song (JSNN)
 - Dr. Masud Chowdhury (JSNN Dean)
 - Dr. Sherine Obare (UNCG Vice Chancellor for Research and Engagement)
 - Dr. Lisa Clough (NCAT Vice Chancellor for Research)
- 1:30 PM **Prof. Douglas Densmore** (Boston University): "DAMP Lab: Running an Academic Cloud Lab"
- 2:15 PM **Dr. Matthew J. Pavlovich** (Elsevier Health Sciences): "A Scientific Editor's Perspective on Biotechnology Publishing"
- 2:45 PM Intermission and networking
- 3:00 PM **Ms. Nancy V. Johnston & Dr. Tracey du Laney** (NCBiotech): "NCBiotech Funding Opportunities and Resources"
- 3:30 PM **Mr. Louis Judge** (NCInnovation): "NCInnovation: Optimizing Innovation for North Carolina"
- 4:00 PM Reception & lab tours

Day 2 (Thursday, October 8th): Fundamental and Applied Research

Morning session moderator: Prof. Samuel Oliveira (JSNN)

- 8:30 AM Check-in (JSNN Atrium)
- 9:00 AM **Prof. Lingchong You** (Department of Biomedical Engineering, Duke University): "Emerging Simplicity in Microbiome Dynamics: Insights from Machine Learning, Coarse-Grained Models, and Horizontal Gene Transfer"
- 9:45 AM **Prof. Manuel Kleiner** (Department of Plant and Microbial Biology, North Carolina State University): "Advanced Metaproteomic Approaches to Investigate Microbiome Function"
- 10:15 AM Intermission
- 10:30 AM **Prof. Tianqi Song** (Department of Nanoscience, JSNN): "Heat-rechargeable Computation in DNA Logic Circuits and Neural Networks"
- 11:00 AM **Prof. Benjamin Callahan** (Department of Population Health and Pathobiology, North Carolina State University): "When does Taxonomic Bias affect Differential Abundance Analysis based on Proportions?"
- 11:30 AM **Prof. Daniel Sprockett** (Department of Microbiology and Immunology, Wake Forest University School of Medicine): "A Shared Microbial Heritage: Tracing the Assembly, Transmission, and Evolution of Mammalian Microbiomes"
- 12:00 PM Networking lunch

Afternoon session moderator: Prof. Tianqi Song (JSNN)

- 1:30 PM **Prof. Ophelia Venturelli** (Department of Biomedical Engineering, Duke University): "From Representation to Control in Complex Ecological Networks"
- 2:00 PM **Prof. Nathan Crook** (Department of Chemical and Biomolecular Engineering, North Carolina State University): "Linking Genotype and Phenotype using Functional Metagenomic Screens"
- 2:30 PM Intermission
- 2:45 PM **Prof. Samuel Oliveira** (Department of Nanoengineering, JSNN): "Closing the AI-Hardware Loop for Predictive Artificial Microbial Communities"
- 3:15 PM **Prof. Senay Yitbarek** (Department of Biology, UNC Chapel Hill): "Eco-evolutionary Dynamics of Tripartite Interactions: How Hosts, Symbionts, and Pathogens affect Virulence Evolution"
- 3:45 PM **Prof. Adriana San Miguel** (Department of Chemical and Biomolecular Engineering, North Carolina State University): "Tiny Worms, Big Insights: Using Computer Vision to Uncover Hidden Patterns in Degenerating Neurons"
- 4:15 PM Concluding remarks:
Prof. Samuel Oliveira & Prof. Tianqi Song (JSNN)
- 4:30 PM Lab tours
- 5:00 PM Adjourn

SPEAKER SPONSORS



Thanks to all the members of the organizing committee (Ms. Nancy Brown, Ms. Jennifer Hutchens, Dr. Samuel Oliveira, Dr. Dan Rabinovich, Dr. Nafisa Sirelkhatim, and Dr. Tianqi Song) and to the many JSNN graduate student volunteers who contributed to the success of this event.

SPEAKERS

Dr. Douglas (Doug) Densmore, a Professor in the Dept. of Electrical and Computer Engineering at Boston University, has research interests in synthetic biology, microfluidics, digital logic design, computer architecture, and electronic design automation (EDA). He is the director of the Cross-disciplinary Integration of Design Automation Research (CIDAR) group at BU, founder of the “Design, Automation, Manufacturing, and Processes (DAMP) Lab, and co-founder of three start-up companies in the Boston area (Lattice Automation, Asimov, and Biosens8).



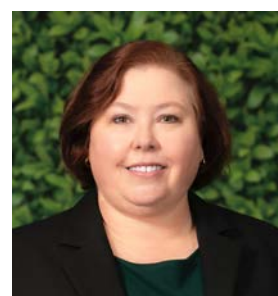
Dr. Matthew (Matt) Pavlovich is the editor of *Trends in Biotechnology*, a Cell Press journal that publishes innovative applications of biology as useful technologies. He earned his B.S. degree in chemical engineering from the Georgia Institute of Technology and his Ph.D. in chemical engineering from the University of California at Berkeley. Matt has been with Cell Press since 2016 and has also worked in secondments as the product manager for Multi-Journal Submission and as the acting editor-in-chief of STAR Protocols.



Ms. Nancy V. Johnston, Executive Director of the Piedmont Triad Office for the North Carolina Biotechnology Center (NCBiotech), works to link companies, researchers, and communities with the resources needed to drive innovation, workforce development, and job creation. She has more than 20 years of experience spanning industry, academia, and nonprofit sectors. Most recently, she led a collaborative effort with her regional advisors to host Triad BioNight, bringing together more than 400 life sciences leaders from academia, industry, and entrepreneurship, including attendees from JSNN, UNCG and NC A&T.



Dr. Tracey du Laney, Vice President, Science and Technology Development at the North Carolina Biotechnology Center, is responsible for managing and administering NCBiotech’s research grant funding programs designed to advance promising scientific discoveries and technologies developed in N.C. colleges, universities, and non-profit institutions towards commercialization. She holds a B.S.E. in Biomedical Engineering from Duke University, an M.S. in Biomedical Engineering from the University of Texas at Austin and a Ph.D. in Biochemical Engineering from Duke University.



Mr. Louis Judge, Senior Director of the Piedmont Regional Innovation Network at NCInnovation, leads regional efforts to advance innovation, entrepreneurship, and technology commercialization. With over 20 years of experience in economic development, technology transfer, and workforce development, he previously served as Associate Vice President of Corporate Education and Economic Development at Alamance Community College and spent 13 years at North Carolina A&T State University in technology transfer and licensing. He holds an MBA and is a Six Sigma Black Belt from Winston-Salem State University.



Dr. Lingchong You is the James L. Meriam Distinguished Professor of Biomedical Engineering at Duke University, Director of the Duke Center for Quantitative Biodesign, and Director of Graduate Studies in Biomedical Engineering. His lab (youlab.bio) combines mathematical modeling, machine learning, and quantitative experiments to uncover principles governing microbial community dynamics and to apply these principles in engineering and medicine. Dr. You is a Fellow of the American Institute for Medical and Biological Engineering (2019).



Dr. Manuel Kleiner is an Associate Professor at North Carolina State University in the Faculty Excellence Cluster for Microbiomes and Complex Microbiomes. He leads an interdisciplinary research program that combines microbiology, analytical chemistry, molecular biology, and biochemistry to investigate metabolic and physiological interactions in microbiomes. He obtained a Diplom in Biology from the University of Greifswald (2008) and a Ph.D. in Microbiology from the Max Planck Institute for Marine Microbiology in Bremen, Germany.



Dr. Tianqi Song is an Assistant Professor in the Department of Nanoscience at the Joint School of Nanoscience and Nanoengineering (JSNN), University of North Carolina Greensboro. He earned his Ph.D. in Computer Science from Duke University, specializing in molecular programming, and did postdoctoral research at Caltech. His lab builds DNA-based molecular circuits for molecular learning and sensing. His work has been published in *Nature*, *Nature Nanotechnology*, and *JACS*.



Dr. Benjamin (Ben) Callahan, an Associate Professor in the Department of Population Health and Pathobiology at North Carolina State University, leads a research team focused on better understanding various microbiomes. He develops new statistical and bioinformatic methods to better characterize microbial communities from high-throughput biological data, and uses those methods to study various interesting problems, for example the relationship between the maternal microbiome and preterm birth.



Dr. Daniel (Dan) Sprockett is an Assistant Professor in the Department of Microbiology and Immunology at Wake Forest University School of Medicine, where he leads a research program applying ecological and evolutionary theory to diverse experimental and natural systems, including efforts to understand how microbial communities assemble in early life, transmit between individuals and host species, and adapt to novel host environments, with the goal of identifying strategies for steering microbial communities toward health-promoting states.



Dr. Ophelia Venturelli, an Associate Professor of Biomedical Engineering at Duke University, aims to understand and engineer microbiomes using systems and synthetic biology for applications spanning human health, agriculture and bioprocessing. She received her Ph.D. in Biochemistry and Biophysics in 2013 from Caltech, conducted postdoctoral work at UC Berkeley, and has been recognized with several awards, including the Army Research Office Young Investigator Award (2017) and the ACS Synthetic Biology Young Investigator Award (2023).



Dr. Nathan Crook, an Associate Professor in the Department of Chemical and Biomolecular Engineering at North Carolina State University, studies the intersection between microbial ecology and synthetic biology, especially as related to developing new tools for engineering microbes. He received a B.S. degree in chemical engineering from Caltech (2009), his Ph.D. degree in chemical engineering from UT Austin in 2014 and did postdoctoral studies through 2017 in pathology and immunology at Washington University in Saint Louis.



Dr. Samuel (Sam) Oliveira is an Assistant Professor of Nanoengineering at the Joint School of Nanoscience and Nanoengineering at North Carolina A&T State University, where he leads a team that integrates microfluidics, synthetic biology, live-cell imaging, computational modeling, and AI to study microbial communication and collective behavior. He received a B.Eng. from Sao Paulo State University (Brazil), a Ph.D. in Biomedical Sciences and Engineering from Tampere University (Finland), and he is co-founder and Director of R&D at Doroth, a biotechnology company in Piracicaba, Brazil (<http://doroth.com.br>).



Dr. Senay Yitbarek is an Assistant Professor in the Department of Biology at UNC Chapel Hill. His lab studies the evolutionary ecology of host-symbiosis. He earned his undergraduate degree from the University of California, Berkeley (2008) and his Ph.D. in Ecology and Evolutionary Biology from the University of Michigan in Ann Arbor (2016). He returned to UC Berkeley as an NSF and USDA postdoctoral fellow before joining UNC Chapel Hill in 2020.



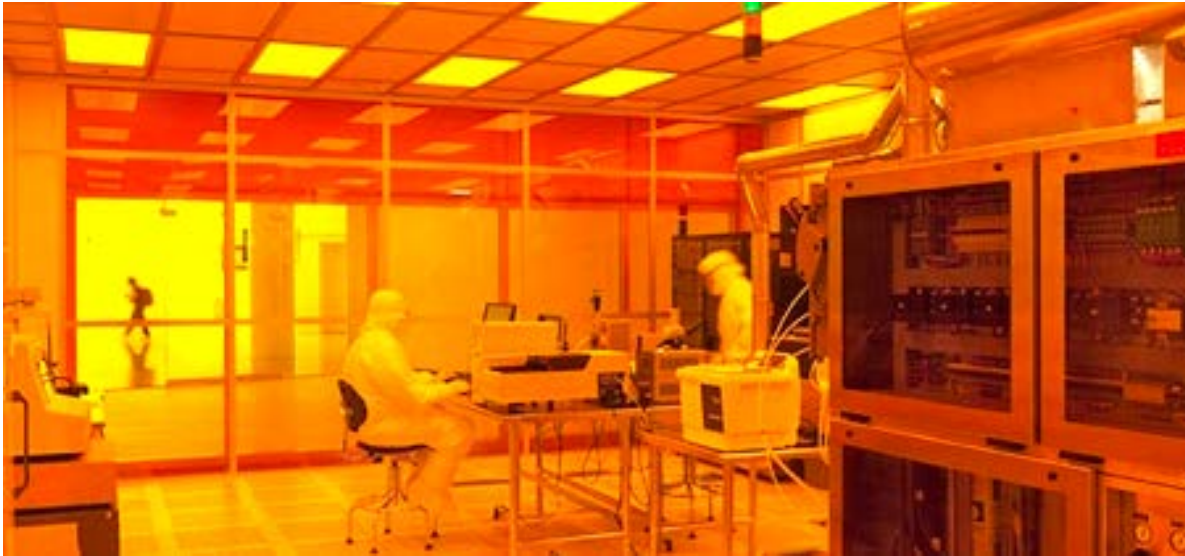
Prof. Adriana San Miguel is an Associate Professor and Director of Graduate Programs in the Department of Chemical and Biomolecular Engineering at North Carolina State University. Originally from Mexico, she earned her bachelor's degree from the Monterrey Institute of Technology. After working in the cement and water treatment industries, she completed her Ph.D. at Georgia Tech. Following postdoctoral training at Georgia Tech and the Dana-Farber Cancer Institute, she joined the faculty at NC State in 2016. Her research program focuses on using engineering and systems approaches to understand fundamental biological processes in living organisms, particularly the model organism *Caenorhabditis elegans*.



We'll see you again next year!

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October 6-7, 2027



<https://jsnn.ncat.uncg.edu>