



JSNN



Joint School of
Nanoscience and Nanoengineering

NanoImpacts 2025

Active and Adaptive Matter

Joint School of Nanoscience and Nanoengineering
Greensboro, North Carolina
October 9-10, 2025



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

PROGRAM

Day 1 (Thursday, October 9th): A National Perspective

- 12:30 PM Check-in (JSNN Atrium)
- 1:00 PM Welcome and introductions
- Dr. Dan Rabinovich (JSNN Associate Dean) & Dr. Suzanne Ahmed (JSNN)
 - Dr. Masud Chowdhury (JSNN Dean)
 - Dr. Sherine Obare (UNCG Vice Chancellor for Research and Engagement)
 - Dr. Melissa Hodge-Penn (NCAT Interim Vice Chancellor for Research)
- 1:30 PM **Dr. Shannon Ciston** (Molecular Foundry, Lawrence Berkeley National Laboratory): “Opportunities for Nanoscale Science at the Molecular Foundry”
- 2:00 PM **Dr. Anthony L. Dellinger** (Office of Research and Engagement, UNCG & Kepley Biosystems, Inc.): “Translational Innovation: Linking Research, Entrepreneurship, and Impact”
- 2:30 PM Intermission and networking
- 3:00 PM **Dr. Keith Whitener** (Defense Sciences Office, DARPA): “Intro to DARPA and Defense Sciences Office (DSO)”
- 3:30 PM **Dr. Sarah Sihvonon** (Syngenta): “Nano-Enabled Agricultural Innovation: From Lab Towards Field”
- 4:00 PM **Dr. Jamie Vernon** (Executive Director and CEO, Sigma Xi): “Research in Transition: The Changing Landscape of Science and Policy in America”
- 4:30 PM Reception & lab tours

Day 2 (Friday, October 10th): Fundamental and Applied Research

Morning session moderator: Prof. Suzanne Ahmed (JSNN)

- 8:30 AM Check-in (JSNN Atrium)
- 9:00 AM **Prof. Tony Jun Huang** (Department of Mechanical Engineering and Materials Science, Duke University): “Acoustofluidics: Harnessing Acoustics and Fluid Mechanics for Biomedical Innovations”
- 9:45 AM **Prof. LaShanda Korley** (Department of Materials Science and Engineering, University of Delaware): “Bio-inspired Pathways to Manipulating Architecture and Function in Polymeric Materials”
- 10:15 AM Intermission
- 10:30 AM **Prof. Daphne Klotsa** (Department of Applied Physical Sciences, UNC Chapel Hill): “Fast Meets Slow: Emergent Dynamics in Active Particle Mixtures”
- 11:00 AM **Prof. Stephen Craig** (Department of Chemistry, Duke University): “Using Chemical Activity to Create Adaptive Polymer Networks”
- 11:30 AM **Prof. Kimberly Weirich** (Department of Materials Science and Engineering, Clemson University): “Self-organization and Remodeling in Biopolymer Assemblies”
- 12:00 PM Networking lunch

Afternoon session moderator: Prof. Jerald Dumas (JSNN)

- 1:30 PM **Prof. Suzanne Ahmed** (Department of Nanoscience, JSNN): “Active Particle Design and Actuation for Enhanced Control and Functionality”
- 2:00 PM **Prof. Michael Dickey** (Department of Chemical and Biomolecular Engineering, North Carolina State University): “Liquid Metal as Active and Adaptive Matter”
- 2:30 PM Intermission
- 2:45 PM **Prof. Joseph Tracy** (Department of Materials Science and Engineering, North Carolina State University): “Magnetically and Optically Active Nanoparticles and Polymer Composites”
- 3:15 PM **Prof. Lifeng Zhang** (Department of Nanoengineering, JSNN): “A Sustainable Path to Innovative Epoxy Nanocomposites”
- 3:45 PM **Prof. Chih-kuan Tung** (Department of Physics, North Carolina A&T State University): “Studying Motile Sperm as an Experimental Active Matter System”
- 4:15 PM Concluding remarks:
Prof. Suzanne Ahmed (Department of Nanoscience, JSNN)
- 4:30 PM Lab tours
- 5:00 PM Adjourn

SPEAKER SPONSORS



Thanks to all the members of the organizing committee (Dr. Suzanne Ahmed, Ms. Nancy Brown, Ms. Allison Meridin, Dr. Dan Rabinovich, and Dr. Nafisa Sirelkhatim) and to the many JSNN graduate student volunteers who contributed to the success of this event.

SPEAKERS

Dr. Shannon Ciston is the Director of the User Program at the Molecular Foundry located at the Lawrence Berkeley National Laboratory in Berkeley, California. Prior to joining the Foundry in 2020, she was Director of Undergraduate Education in the Chemical and Biomolecular Engineering Department at UC Berkeley. She holds a Ph.D. from the Chemical and Biological Engineering Department at Northwestern University, and a B.S. from the Chemical Engineering Department at Illinois Institute of Technology.



Dr. Anthony Dellinger, a scientist, entrepreneur, and inventor, is President, Co-Founder & Chief Scientist of Kepley BioSystems, Inc., a company that develops nanotechnology applications in the life sciences, an Adjunct Professor in the Dept. of Nanoscience at the JSNN, and Interim Associate Director of UNCG's Office of Research and Engagement. He received a B.S. degree in Forensic Biology from Virginia Commonwealth University (2006) and a Ph.D. in Nanoscience from the JSNN (2014).



Dr. Keith Whitener joined DARPA as a program manager in the Defense Sciences Office in September 2023. His interests include catalysis, photochemistry and spectroscopy, and the chemistry and physics of novel classes of materials, with applications ranging from energy and logistics to sensing and health. He received a B.S. degree in Chemistry from UNC Chapel Hill, a Ph.D. in Chemical Physics from Yale University, and conducted postdoctoral research in polymer synthesis and catalysis at the University of Colorado at Boulder.



Dr. Sarah Sihvonen is a Senior Staff Analytical Scientist at Syngenta Crop Protection, where she specializes in developing innovative methodologies for characterizing crop protection products and evaluating their performance. With a Ph.D. in Chemistry from Penn State University and nine years of industry experience, she has established expertise in analyzing pesticide formulations, earning her the 2024 Syngenta CP Patent Prize for Enforcement Methods, and she develops ways to modify the environmental fate of agricultural products.



Dr. Jamie Vernon is Executive Director and CEO at Sigma Xi, The Scientific Research Honor Society and publisher of *American Scientist*. From 2014 to 2017, he served as Sigma Xi's director of science communications and publications and editor-in-chief of *American Scientist*. A molecular biologist by training (UT Austin, Ph.D. '09), he spent more than a decade developing genetic engineering tools and working in the biomedical field before making a career transition to science policy and communication. He is currently dedicated to promoting excellence in science and engineering and strengthening public trust in the research enterprise.



Prof. Tony Jun Huang is the William Bevan Distinguished Professor of Mechanical Engineering and Materials Science at Duke University. He received his Ph.D. in Mechanical and Aerospace Engineering from the University of California, Los Angeles (UCLA) in 2005. His research focuses on acoustofluidics, optofluidics, and micro/nano systems for biomedical diagnostics and therapeutics, as documented in more than 300 peer-reviewed journal articles (h-index = 104) and 32 issued or pending patents.



Prof. LaShanda T. J. Korley is a Distinguished Professor in the Departments of Materials Science & Engineering and Chemical & Biomolecular Engineering at the University of Delaware. She is the Director of the Center for Plastics Innovation funded by the Department of Energy's EFRC program. She received B.S. degrees in Chemistry & Engineering from Clark Atlanta University, a B.S. in Chemical Engineering from Georgia Tech (1999) and a Ph.D. from MIT in 2005. Her research focuses in bio-inspired polymeric materials, plastics recycling, and related areas.



Prof. Daphne Klotsa, an Associate Professor in the Department of Applied Physical Sciences at UNC Chapel Hill, received B.Sc. and M.Sc. degrees in Physics from the University of Warwick (UK) and a Ph.D. in Physics from the University of Nottingham. Following postdoctoral work at the Universities of Bath, Michigan, and Cambridge, she joined UNC-CH in 2015. Her research is focused on computational studies on active matter aimed at bridging the gap between emergent phenomena, smart materials, and robot swarming.



Prof. Stephen (Steve) Craig received his undergraduate degrees (B.S. in Chemistry, A.B. in Math) from Duke in 1991. After a year at Cambridge (M. Phil.), he began doctoral work at Stanford, where he received his Ph.D. in 1997. Following his Ph.D., he took a position as a Research Chemist in DuPont Central Research until early 1999, when he moved to a postdoctoral position at The Scripps Research Institute. In 2000, he joined the Department of Chemistry at Duke, where he is now William T. Miller Professor of Chemistry.



Prof. Kimberly (Kim) Weirich is an interdisciplinary researcher in experimental soft matter and biological materials, with a focus on self-organization and unusual mechanics in soft materials inspired by biology. She joined the Dept. of Materials Science and Engineering at Clemson University in 2020 and is a Clemson University School of Health Research Faculty Scholar. She has a Ph.D. in Biomolecular Science and Engineering and undergraduate degrees in Physics and Linguistics, all from the University of California, Santa Barbara.



Prof. Suzanne Ahmed is an Assistant Professor in the Department of Nanoscience at the Joint School of Nanoscience and Nanoengineering. Prior to joining JSNN, she was a postdoctoral research fellow at Harvard University. She received her Ph.D. in Chemistry from Penn State University, her M.S. from UC Berkeley, and her B.Sc. from UC Riverside. Her research focuses on the study of microscale and nanoscale robotics with applications in biomedicine, sensing, and environmental remediation.



Prof. Michael Dickey received a B.S. in Chemical Engineering from Georgia Tech (1999) and a Ph.D. from the University of Texas (2006), followed by postdoctoral work with Prof. George Whitesides at Harvard University (2006-08). He is currently the Camille and Henry Dreyfus Professor in the Department of Chemical & Biomolecular Engineering at NC State University. His research interests include soft matter (liquid metals, gels, polymers) for soft and stretchable devices (electronics, energy harvesters, textiles, and soft robotics).



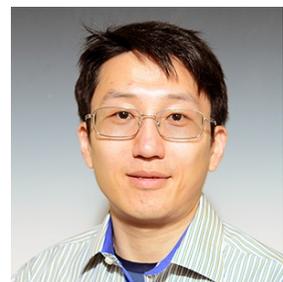
Prof. Joseph (Joe) Tracy is in the Department of Materials Science and Engineering at North Carolina State University (NCSU). He received his Ph.D. in Chemistry from the Massachusetts Institute of Technology and conducted postdoctoral research in Chemistry at UNC Chapel Hill before joining NCSU in 2007. His research interests encompass the synthesis, characterization, and self-assembly of noble metal, magnetic, and multifunctional nanoparticles and their applications in soft robotics, sensors, and medicine.



Prof. Lifeng Zhang received B.S. and M.S. degrees in Polymer Materials Science and Engineering from Xi'an Jiaotong University (1994) and Beijing Institute of Technology (1997), respectively. He subsequently earned a Ph.D. in Fiber & Polymer Science and Engineering from UC Davis (2006). Following work as a research scientist at the South Dakota School of Mines & Technology, he joined JSNN in 2012, where his research interests focus on engineered materials, environmental sustainability, clean water, sensors, and energy storage.



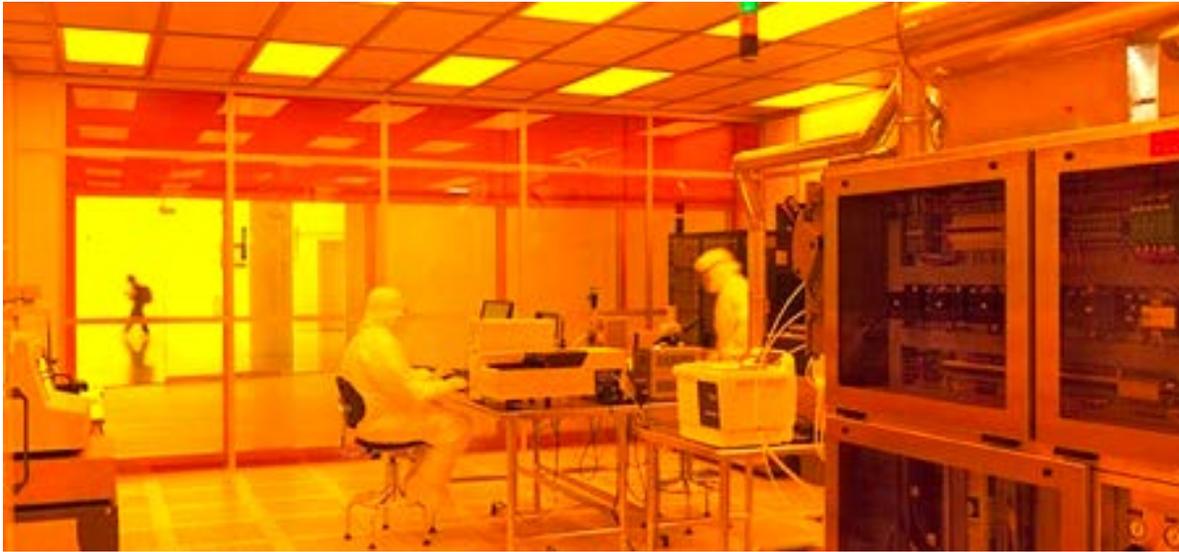
Prof. Chih-kuan Tung, an Associate Professor at NC A&T State University, grew up in Taiwan and received his B.S. and Ph.D. degrees in physics from National Taiwan University and Princeton University, respectively. After postdoctoral work at Hong Kong University of Science and Technology, the University of Pittsburgh, and Cornell University, he joined NCAT in 2016. His research interests include biological physics, microfluidic *in vitro* models for biological systems, soft and active matter, and mammalian sperm motility.



We'll see you again next year!

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