
**NJIT 2024 Research Institutes, Centers and Laboratories Showcase
and
National Academy of Inventors (NAI)-NJIT Forum on Sustainable Societies:
Advances in Material Science and Engineering**

(Sponsored by the National Academy of Inventors (NAI) Chapter and NSF funded Center for Translational Research at NJIT)

March 21, 2024; 9.00 AM – 3.00 PM
Ballroom A/B and Gallery, Campus Center, NJIT

YouTube Video Streaming Link:
<https://www.youtube.com/watch?v=vUQDon0Z0wQ>

Abstract:

Innovations in material science and engineering are fueling vital advances in diverse sectors, including healthcare, the environment, energy, infrastructure, computing and cyber-communications. Novel building materials that make us more energy-efficient and nanomodified, more sustainable concretes and infrastructure that enhance environmental resilience, for example, are emerging as important tools to manage climate change. Innovations that gave rise to smart implants, medical devices and sensors, and lab-on-a-chip technologies are revolutionizing health care. As we look to the future, quantum materials, plasma and energetic materials that can transform into other states of matter will potentially spur new, innovative technologies for a more sustainable world with precision healthcare, fusion energy, and secure data communication and advanced computing for artificial intelligence applications. To accomplish these technology innovation and translation goals, researchers will need to form transdisciplinary partnerships with collaborators in academia, industry and policy circles. This forum will bring these groups together to discuss new ideas, assets and capabilities and ways to share them most productively. It will also showcase select institutes, centers and labs in the broad spectrum of material science and engineering from leading universities in the region.

The NAI Chapter-NJIT Forum and Research Showcase will feature:

- A Distinguished Keynote Talk by Pradeep Fulay, Program Director, Accelerating Research Translation (ART), National Science Foundation
- A Distinguished Panel Discussion on Material Science and Engineering Research for Technology Innovations Towards Addressing Global Challenges
- A Distinguished Student Panel Session on Translational Research in Material Science and Engineering
- e-Poster sessions on ongoing research at institutes, centers and specialized laboratories from leading universities in the region. The showcase will provide an open forum to discuss pathways for developing synergistic technology innovation partnerships involving material science and engineering.

Program Agenda

- 9.00 AM – 9.30 AM: Registration, Breakfast and Electronic PPT Poster Set-up
- 9.30 AM – 9.40 AM: Welcome Remarks:
Atam Dhawan, Senior Vice Provost for Research, NJIT
Teik Lim, President, NJIT
- 9.40 AM – 9.45 AM: Program Agenda and Introduction to the Distinguished Speaker
Atam Dhawan, Senior Vice Provost for Research, NJIT
- 9.45 AM – 10.20 AM: Distinguished Keynote Presentation: Pradeep Fulay, Program Director, Accelerating Research Translation (ART), National Science Foundation
- 10.20 AM – 11.30 AM: Distinguished Panel Discussion: Trends in Translational Research and Innovations in Material Science and Engineering
Judith Sheft, Executive Director, NJ CSIT
Emily A. Carter, Senior Strategic Advisor and Associate Laboratory Director for Applied Materials and Sustainability Sciences, Office of the Director, Princeton Plasma Physics Lab
Deirdre O'Carroll, Associate Professor & Graduate Program Director, Materials Science and Engineering, Rutgers University
Edward Dreizin, Director, Center for Energetics Materials, Distinguished Professor, Chemical & Materials Engineering, Associate Chair for Graduate Studies, NJIT
Christopher Snyder, Director, Director, Technology Commercialization, Stevens Institute of Technology
Govi Rao, Chief Executive Officer, Phase Change Solutions
- 11.30 AM – 12.30 PM: Distinguished Student Panel Session: Translational Research in Material Science and Engineering – Student Perspective

Haydee Pacheco, PhD Student, Material Science and Engineering,
Rutgers University
Sneha Sreekumar, PhD Student, Material Science and Engineering,
Rutgers University
Niranjan Haridas Menon, Chemical and Material Engineering, New
Jersey Institute of Technology
Purvam Gandhi, PhD Student, Chemical and Material Engineering, New
Jersey Institute of Technology

- 12.30 PM – 1.00 PM: Lunch and Networking
- 1.00 PM – 3.00 PM: NJIT-Rutgers-Princeton-Rowan-Stevens Centers and Laboratories Showcase in Material Science and Engineering: Networking and Electronic Poster Session
- 2.45 PM – 3.00 PM: Concluding Remarks
-

Biographical Sketches of Speakers and Panelists

Distinguished Keynote Speaker



[Pradeep Fulay](#) is the lead Program Director for the Accelerating Research Translation (ART) program in the Technology, Innovation, and Partnerships (TIP) Directorate at NSF. He is also the lead for the Quantum Technology and Persons with Disabilities (PWD) tracks in the Convergence Accelerator program in TIP Directorate. Pradeep is an internationally renowned researcher and educator with significant leadership experience in building, interdisciplinary, convergent research fueled by strong, creative, and sustainable partnerships with industry, non-profits, and government agencies. He is also a skilled research administrator with deep knowledge of such issues as acceleration of research translation, leading large, complex, and interdisciplinary teams, intellectual property generation, management, as well export control, and responsible conduct of research. Dr. Fulay earned his undergraduate (B.Tech) and graduate (M.Tech) degrees from Indian Institute of Technology (IIT) Bombay. He then earned his Ph.D. in Materials Science and Engineering from University of Arizona, Tucson in 1989. From 1989-2012 he served as a tenured professor in Swanson School of Engineering at University of Pittsburgh, in Pittsburgh, Pennsylvania. His research contributions in the areas of chemical synthesis of advanced electronic and magnetic materials are internationally recognized. Pradeep is an elected Fellow of the American Ceramic Society. He has authored three textbooks in the area of materials science and engineering and these have been translated in many languages. Dr. Fulay served as a Program Director in the Electrical, Cyber and Communication Systems (ECCS) division from 2008-2011. During his tenure in ECCS, he helped transform the Electronic, Magnetic, and Photonic devices

(EPMD) program from conventional silicon based devices to those that are based on organic, flexible, and hybrid devices for applications in alternative energy technologies, sensors, and sustainability. He led the development of BioFlex, an Emerging Frontiers of Research and Innovation (EFRI) program, aimed at applications of printed, flexible devices based on organic electronics for in-vivo and ex-vivo applications related to healthcare.

Distinguished Panel



[Judith Sheft](#) is the Executive Director of the New Jersey Commission of Science, Innovation and Technology. The Commission's mission is to accelerate economic development in New Jersey through science, innovation and technology including stimulating academic-industrial collaboration and encouraging and supporting entrepreneurs and inventors. Previously she was involved with regional economic and cluster development having responsibilities at the New Jersey Innovation Institute @ NJIT for the HealthIT Connections entrepreneurial cluster development program, the NJIT I-Corps Site and the Procurement Technical Assistance Center. Ms Sheft has

been engaged with technology /IP innovation and commercialization efforts working with faculty and students to create startup companies and establishing licensing relationships with corporate partners. She advised external startups at NJIT's high technology / life sciences business accelerator/incubator. She is on the Board of Advisors to the NJIT Murray Women's Center and serves as a mentor and coach to students and faculty. She is a member of the NJ – Israel Commission and serves on the Board of Greater Newark Enterprise Corporation, StartUp Newark, Women's Center for Entrepreneurship Corporation, Einstein's Alley, SheTek and NJEDA Technology Advisory Board, working to assist early stage tech and life sciences entrepreneurs foster regional economic growth. She was a co-chair of Governor Murphy's transition advisory committee for Technology Government and Innovation (2017).



[Dr. Emily A. Carter](#) is the Gerhard R. Andlinger Professor in Energy and the Environment and Professor of Mechanical and Aerospace Engineering, the Andlinger Center for Energy and the Environment, and Applied and Computational Mathematics at Princeton University. She is also Senior Strategic Advisor and Associate Laboratory Director for Applied Materials and Sustainability Sciences, and a member of the executive management team at the Princeton Plasma Physics Laboratory (PPPL), a Department of Energy national lab. Since joining PPPL in 2022, Dr. Carter has been working to

diversify the laboratory's research portfolio to include the science of electromanufacturing and solar radiation management. Her portfolio expanded to include microelectronics and quantum information science in 2023. A physical chemist by training, Dr. Carter began her independent academic career at UCLA in 1988, rising through the chemistry and biochemistry faculty ranks before moving to Princeton University in 2004. She spent the next 15 years at Princeton University as a jointly appointed faculty member in mechanical and aerospace engineering, and applied and computational mathematics. Dr. Carter was also the Founding Director of Princeton's Andlinger Center for Energy and the Environment from 2010 to 2016 before being appointed Princeton's Dean of the School of Engineering and Applied Science in 2016. Dr. Carter was recruited back to

UCLA in 2019 as its Executive Vice Chancellor and Provost, and as Distinguished Professor of Chemical and Biomolecular Engineering. Dr. Carter maintains an active research presence, developing and applying quantum mechanical simulation techniques to enable discovery and design of materials for sustainable production of fuels, chemicals, and materials. Her research is supported by grants from the U.S. Department of Defense and the Department of Energy, as well as Princeton University. The author of over 450 publications and patents, Dr. Carter has delivered nearly 600 invited and plenary lectures worldwide and serves on advisory boards spanning a wide range of disciplines. She is the recipient of numerous honors, including election to the U.S. National Academy of Sciences, the American Academy of Arts and Sciences, U.S. National Academy of Inventors, the U.S. National Academy of Engineering, and the European Academy of Sciences. Dr. Carter earned a B.S. in Chemistry from UC Berkeley in 1982 and a Ph.D. in Physical Chemistry from Caltech in 1987, followed by a brief postdoc at the University of Colorado, Boulder.



[Dr. Deirdre O'Carroll](#) is an Associate Professor in the Departments of Materials Science & Engineering and Chemistry & Chemical Biology at Rutgers University. She obtained her B.E. in Electrical Engineering in 2002, and a PhD in Microelectronics in 2008 at University College Cork and the Tyndall National Institute, Ireland. Prior to joining Rutgers in 2011, she conducted postdoctoral research in plasmonics at California Institute of Technology in the US and at the University of Strasbourg and CNRS in France. She has published more than 80 papers and 3 patents in the areas of nanophotonics, thin-film optoelectronic materials, nanofabrication and metasurfaces. She is a recipient of a Marie Curie International Fellowship (2009), National Science Foundation CAREER Award (2016), an ACS Young Investigator Award in Polymer Material Science and Engineering (2017) and a SFI Future Research Leaders Award (2018). She also serves as an associate editor for the journal ACS Applied Optical Materials and as a member of the editorial advisory board for APL Photonics.



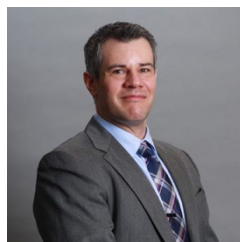
[Dr. Edward L. Dreizin](#) is a Distinguished Professor and Associate Chair for Graduate Studies in the Otto H. York Department of Chemical and Materials Engineering at New Jersey Institute of Technology (NJIT). He received his M.S. in molecular physics and Ph.D. in applied physics from Odessa State University, Ukraine, in 1985 and 1992, respectively. He immigrated to the U.S. in 1992 and worked as a Research Scientist at AeroChem Research Labs, Princeton, N.J. from 1993 until 1999. He joined the faculty at New Jersey Institute of Technology in 1999. Prof. Dreizin was the recipient of the Excellence in Research Award from Newark College of Engineering (NCE) in 2012 and 2017; he also received the NCE Excellence in Teaching Award for graduate instruction in 2015. Dr. Dreizin has authored and co-authored more than 250 peer-reviewed journal papers, several book chapters and holds four patents. He serves as an associate editor for the International Journal of Energetic Materials and Chemical Propulsion, as a Member of the International Editorial Council for Combustion Explosions and Shockwaves, and as a Member of the Editorial Board for the International Journal of Self-Propagating High-Temperature Synthesis. He served as the editor for the 2012 Volume of the Materials Research Society Proceedings, entitled Properties, Processing, and Applications of Reactive Materials. He has given invited lectures in China, Singapore, Russia,

Italy, Canada, as well as at multiple U.S. universities, companies and government laboratories. Dreizin's research is mostly in the areas of reactive materials and metal combustion. Over the years, his work applied materials science concepts to explore, understand and improve processes of metal combustion, important for the development of advanced propellants, explosives and pyrotechnics.



[Govi Rao](#): Govi has over 25 years of experience globally, across several industries, including specialty chemicals, coatings, building materials, lighting, energy and the rapidly evolving IoT space. As co-founder and Managing Partner of Carbon Group Global (CGG), Govi is currently leading CGG's vision to scale transformational solutions, specifically to address education, total resiliency of women and resource efficiency. Prior to CGG, Govi was the President and Chief Executive Officer of Noveda Technologies, a pioneer in water and energy management solutions, based in Bridgewater,

NJ. In 2007, Govi was instrumental in envisioning and pioneering one of the earliest LED lighting solutions providers, Lighting Science Group Corporation as the Chairman & CEO. Previously, Govi was Vice President and General Manager of the Philips Solid State Lighting business in North America. He also held several leadership roles at Philips, including Vice President of Business Creation & Brand, where he was responsible for product management, strategic marketing, branding and sustainability. Prior to joining Philips, Govi spent over a decade with specialty chemicals leader Rohm and Haas Company (now part of Dow Chemicals) in various leadership roles across a range of businesses and geographies. In addition to his experience with a wide business portfolio, Govi has extensive functional expertise that includes strategic planning, business innovation, product management, marketing, operations, leadership development and general management. Widely traveled across Asia, Europe and the Americas, Govi has a keen sense of value creation in emerging markets and technologies, grounded on the principles of sustainability. Govi has built winning teams that achieved extraordinary goals in start-ups as well as mature businesses – pioneering and inspiring profitable and sustainable growth. Govi serves on several boards including the Undergraduate Research and Innovation at NJIT and the department of Chemistry and Chemical Biology at Rutgers University. Govi also serves as an advisor to Hellothinkster, an AI based educational technology company. Govi is active in discussions with various Governments, NGOs and investment groups to drive market adoption of social impact solutions and is a contributing author of the Sustainable Enterprise Fieldbook (AMACOM 2008). Govi has testified to the U.S House of Representatives on IP and Innovation.



[Christopher Snyder](#) has more than the sixteen years of experience in moving technologies from the lab to commercial success. He has done so in the context of large corporate business development, small businesses, and university technology transfer offices. Along the way Chris has negotiated dozens of license and development agreements, advised and developed market strategy for start-ups, and worked with industry stakeholders to identify product/market fit for numerous technologies.

Distinguished Student Panel



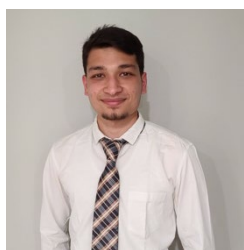
Haydee Pacheco is a PhD candidate in Materials Science at Rutgers University, working in optoelectronics. She has a Master of Science degree in Materials Science and Engineering from Stanford University and a Bachelor of Science degree in Nanotechnology and Molecular Engineering from Fundación Universidad de las Américas Puebla. Her core competencies include materials science, nanofabrication, optoelectronics, organic electronics, and research and development.



Sneha Sreekumar is a Ph.D. Candidate in the Department of Chemistry & Chemical Biology at Rutgers University since 2019. She obtained her MSc in Chemistry in 2019 from University of Hyderabad, India. Her research topics include thin film optoelectronics, OLED fabrication, plasmonics and nanophotonics.



Niranjana Haridas Menon obtained his Master of Science in Physics from Amrita Vishwa Vidyapeetham, India. He is pursuing a Ph.D. in Materials Engineering at the New Jersey Institute of Technology. His doctoral research centers around exploring the influence of porosity on the sensitivity and selectivity of packed microfluidic-based sensors for the development of novel biological and chemical sensors. In addition to his academic pursuits, Niranjana collaborates with Dr. Sagnik Basuray at the Basuray Lab to translate their research into practical, low-cost Point-of-Care sensors, demonstrating a commitment to bridging the gap between research and community.



Purvam Gandhi is currently pursuing his Ph.D. in the Chemical and Materials Engineering (CME) Department at the New Jersey Institute of Technology (NJIT) and is in his fourth year of the program. He holds an MS degree in Chemical Engineering from NJIT. Purvam's research focuses on enhancing the ignition and combustion characteristics of various gas-generating reactive materials. He designs and manufactures new materials and studies the correlations between their composition, morphology and reactivity. Purvam received the Otto H. York Graduate Early Publication Award in 2023. Additionally, he received the Graduate Service Award from the CME Department (2013).