NJIT

New Jersey Institute of Technology

# CORE FACILITIES

**New Jersay Institute of Technology has more than 60 research labs and centers. Comprised of core and transdisciplinary basic, applied and translational research interests, the five clusters in NJIT research enterprise include:**

- **Bioscience and Bioengineering**
- **Data Science and Management**
- **Environment and Sustainability**
- **Material Science and Engineering**
- **Robotics and Machine Intelligence**

# NJIT Research Centers

## Otto H. York Center for Environmental Engineering and Science (YCEES)

Somenath Mitra | somenath.mitra@njit.edu

*The York Center offers core laboratory facilities as a resource for the university and for contract research. It has diversified into many other areas with research projects in nanotechnology, drug delivery, particle engineering, microfluidics, membrane science, environmental science and engineering, and biomedical engineering.*

https://centers.njit.edu/york/index.php

Agilent 6470 Triple Quadrupole LC/MS system at York Center

Microfabrication Innovation Center cleanroom

## Microfabrication Innovation Center (MIC)

Xiaotian Wang | xiaotian.wang@njit.edu

*The NJIT Microfabrication Innovation Center provides cutting edge nanofabrication and characterization facilities for research in fields ranging from bio-sensing, drug delivery to microfluidics and MEMS fabrication. The multi-user cleanroom is divided into ISO 6 and ISO 7 space, with the capability of photolithography, laser writing, material deposition, wet/dry etching, metrology measurement as well as cell-based assays and biomarker assays.*

https://microfabrication.njit.edu

## The NJIT Makerspace

Justin Suriano | justin.suriano@njit.edu

*The NJIT's Makerspace creates the ecosystem for students to participate in the innovation, invention, and product realization processes that American industry depends on, as well as assign space for public and private partnerships to emerge–offering access to an array of state-of-the-art equipment for design, prototyping, testing, and research.*

https://www.njitmakerspace.com/

The NJIT Makerspace

## Center for Injury Biomechanics, Materials, and Medicine (CIBM3)

Namas Chandra | namas.chandra@njit.edu

*The NJIT CIBM3 focuses on helping soldiers, athletes and civilians by understanding why and how blasts and blunt trauma causes injury.*

https://centers.njit.edu/cibm3/home/

## New Jersey Center for Engineered Particulates (NJCEP)

Rajesh Davé | dave@njit.edu

*NJCEP performs a unique blend of fundamental and applied research to develop predictable, environmentally conscious manufacturing processes and profitable applications for value-added powder materials having tailored surface or bulk properties.*

https://centers.njit.edu/njcep/

## Institute for Brain and Neuroscience Research (IBNR)

Namas Chandra | namas.chandra@njit.edu

*IBNR promotes research and training in neuroscience and neural engineering, and provides the overall contact point for neuroscience initiatives at NJIT.*

https://ibnr.njit.edu/

## CNBM New Energy Materials Research Center

Ken Chin | CHIN@njit.edu

*The CNBM focuses on improving the applications of CdTe semiconductor materials for use in thin-film solar modules.*

https://physics.njit.edu/research/cnbm

## Center for Solar-Terrestrial Research (CSTR)

Andrew Gerrard | gerrard@njit.edu

*The Center for Solar-Terrestrial Research (CSTR) at NJIT is an international leader in ground- and space-based solar and terrestrial physics, with interest in understanding the effects of the Sun on the geospace environment. CSTR operates the Big Bear Solar Observatory (BBSO) and Owens Valley Solar Array (OVSA) in CA, the Jeffer Observatory at Jenny Jump State Forrest in NJ, and the Automated Geophysical Observatories (AGOs) distributed across the Antarctic iceshelf.*

https://centers.njit.edu/cstr/

## Center for Building Knowledge (CBK)

Deane Evans | EVANS@njit.edu

*The CBK dedicated to generating new knowledge to improve the built environment and enhance the planning, design, construction, and operation of facilities. CBK's mission is to help individuals and communities make better-informed decisions about the performance, sustainability, and resilience of buildings nationwide.*

https://centers.njit.edu/cbk/

Big Bear Solar Observatory (BBSO) operated by NJIT CSTR

## Center for Natural Resources (CNR)

Michel Boufadel | boufadel@njit.edu

*The center's specialties include assessment and remediation studies of pollution in natural settings, and evaluation of natural resources for potential production of energy, especially the production of renewable energy. The Center for Natural Resources conducts studies ranging from the microscopic scale to the landscape scale, and utilizes advanced networks of sensors.*

https://centers.njit.edu/nrdp/index.php

## Electronic Imaging Center

Haim Grebel | haim.grebel@njit.edu

*The Electronic Imaging Center is an interdisciplinary center focused on nanotechnology, spectral analysis with subwavelength structures and energy. Nanotechnology is a field dealing with underlined phenomena at the nanoscale. It covers diverse phenomena that encompass molecular/biological interactions, interfacial science, as well as bulk and surface properties. The field is fast expanding into agriculture, energy and pharmaceutical industries.*

https://centers.njit.edu/imaging/welcome/

## Center for Rehabilitation Robotics

Sergei Adamovich | adamovic@njit.edu

*The center focuses on enhancing mobility and manipulation of individuals with disabilities*

https://centers.njit.edu/rehabilitation/

## Center for Big Data (CBD)

Chase Q Wu | chase.q.wu@njit.edu

*The CBD features focused research to investigate, develop, and apply cutting-edge technologies to address unprecedented challenges in big data with high Volume, high Velocity, high Variety, and high Veracity, in order to create high Value.*

https://research.njit.edu/bigdata/

## Cybersecurity Research Center

Kurt Rohloff | rohloff@njit.edu

*The NJIT Cybersecurity Research Center seeks to address ongoing and long-term future needs to research new methods for understanding how the systems such as communication networks, handheld computers, cloud computing environments and embedded computing technologies can be compromised and fail, how to design cyber systems so they are secure, and how to improve or fix the cyber infrastructure that has already been deployed.*

https://centers.njit.edu/cybersecurity/

## Center for Computational Heliophysics (CCH)

Alexander Kosovichev | alexander.g.kosovichev@njit.edu

*The Center focuses on new innovative approaches, including development of intelligent databases, automatic feature identification and classification, realistic numeric simulations based on first physics principles, and observational data modeling.*

https://centers.njit.edu/cch/welcome-center-computational-heliophysics/

## Center for Wireless Information Processing (CWiP)

Alexander M. Haimovich| haimovic@njit.edu

*CWiP focuses on becoming the focal point in the Department of Electrical and Computer Engineering for all research and teaching activities in the areas of wireless communications and signal processing.*

https://centers.njit.edu/cwcspr/

## Membrane Science, Engineering and Technology (MAST) Center

Kamalesh Sirkar | sirkar@njit.edu

*MAST is An NSF and university cooperative research center. The Center's fundamental and applied research has led to major advancements in materials and processes membrane fundamentals, biopharmaceutical processing, water purification, and chemical separations.*

https://www.mastcenter.org/

# Selected NJIT Research Labs

## STG Laboratory of Neuron and Circuit Dynamics

Farzan Nadim | farzan@njit.edu

*The lab uses both experimental and theoretical approaches to study the neurophysiology of a small central pattern generating circuit in lobsters and crabs, the Stomatogastric Ganglion (STG). Central Pattern Generators (CPGs) are networks of nerve cells in the central nervous system that generate the basic patterned electrical activity underlying most rhythmic behaviors like walking and breathing in all animals.*

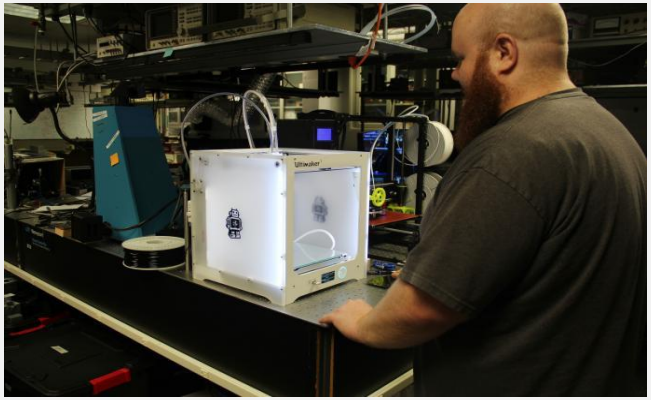
https://centers.njit.edu/stglab/welcome-stg-lab/

## NJIT Additive Manufacturing Lab

John F. Federici | john.f.federici@njit.edu

*The NJIT AddLab specializes in innovation using modern additive manufacturing techniques. Additive manufacturing has changed the way things are produced, bringing down the cost of prototyping, and allowing for novel designs and devices never before possible.*

https://centers.njit.edu/addlab/



NJIT Additive Manufacturing Lab

## Advanced Biomaterials Translation Laboratory (KumarLab)

Vivek Kumar | vak@njit.edu

*KumarLab is interested in the intersection of materials, medicine and engineering. The lab seeks to develop technologies, educate entrepreneurs and train translational scientists using peptide chemistry, biomaterials engineering, medical device manufacturing and (biomedical) translational entrepreneurship.*

https://kumarlab.multiscreensite.com/

## BioDynamics Lab

Xianlian Alex Zhou | alexzhou@njit.edu

*The BioDynamics Group at NJIT is focused on computational biomechanics and bioengineering, wearable robotics and exoskeletons, digital human modeling, and personalized medicine.*

https://web.njit.edu/~alexzhou/

## Fluid Locomotion Laboratory

Brooke Flammang | flammang@njit.edu

*The lab uses integrative approaches to address the physical basis of behavior in an evolutionary comparative context, investigating the ways in which organisms interact with their environment and drive the evolutionary selection of morphology and function.*

https://web.njit.edu/~flammang/index.html

## Fortune Laboratory Industries

Eric Fortune | eric.fortune@njit.edu

*The lab focuses on studing the interactions between sensory and motor systems that generate and control animal behavior.*

https://web.njit.edu/~efortune/index.html/

## Laboratory of Nanomedicine and Healthcare Biomaterials

Xiaoyang Xu | xiaoyang@njit.edu

*Utilizing chemistry, materials science and engineering techniques to explore the interface of biomaterials and medicine and address fundamental questions in the two cross-disciplinary fields. Developing synthetic biomaterials and processing techniques to fabricate hydrogels and scaffolds for use in drug delivery and tissue engineering.*

https://centers.njit.edu/nhblab/research/

## Vision and Neural Engineering Laboratory

Tara L Alvarez | tara.l.alvarez@njit.edu

*The lab is the first to quantify how vision rehabilitation evokes neuroplasticity for people with convergence insufficiency. The team conducts a study and quantified changes from vision rehabilitation through improvements in oculomotor behavior and functional MRI.*

https://centers.njit.edu/vision/

## Computer Assisted Tissue Engineering and Blood System Biology Laboratory

Roman S. Voronov | rvoronov@njit.edu

*The lab's research area covers Computer-Assisted Tissue Engineering, Predictive Modeling and Control of Cell Behavior. The lab is also heavily involved with Soft Lithography, Hardware Automation, Super-Resolution Microscopy, Computer Vision and Machine Learning.*

http://cell.engineering/

## Instructive Biomaterials and Additive Manufacturing Laboratory (IBAM-Lab)

Murat Guvendiren | muratg@njit.edu

*IBAM-Lab focuses on developing novel polymeric (bio)materials and advanced additive (bio)manufacturing approaches to fabricate functional tissue constructs.*

https://guvendirenlab.njit.edu/index.html

## Chen Analytical Chemistry Research Lab

Hao Chen | hao.chen.2@njit.edu

*The Chen Research Lab is working on mass spectrometry for solving probelms in chemical, biological, environmental and forensic science. The research focuses on electrochemical mass spectrometry.*

https://centers.njit.edu/chenlab/welcome-chen-research-lab/

## Nano-Optoelectronic Materials and Devices Laboratory

Hieu Pham Trung Nguyen | hieu.p.nguyen@njit.edu

*The lab focuses on developing high-performance nanophotonic devices using nanostructures and their applications in a variety of areas, including light-emitting diodes, laser diodes, solar cells, as well as in solar-fuel ce. Research expertises cover the epitaxial growth, device fabrication and characterization of III-V based self-organized nanostructure materials grown by molecular beam epitaxy.*

https://web.njit.edu/~hpnguyen/index.html

## Laboratory for the Mechanics of Advanced materials

Shawn A. Chester | shawn.a.chester@njit.edu

*The lab focuses on understanding interesting and exciting phenomena in solid mechanics and multi-physics material behavior.*

https://web.njit.edu/~sac3/Home.html

## Swarm Lab

Simon Garnier | garnier@njit.edu

*The lab studies the mechanisms underlying the coordination of large animal groups, such as ant colonies or human crowds, and their applications to complex problems such the organization of pedestrian traffic or the control of robotic swarms.*

https://www.theswarmlab.com/#team

## Nanoelectronic Materials and Devices Lab

Dong-Kyun Ko | dong.k.ko@njit.edu

*The Lab focuses on the discovery of new nanomaterials, the design of novel high-performance device architectures, and the experimental demonstration of device prototypes. The lab's particular interest is in colloidal quantum dot-based devices.*

https://web.njit.edu/~dkko/index.html

## Opto &Nano and Microfluidics Laboratory

Sagnik Basuray | sagnik.basuray@njit.edu

*The lab's research efforts are to establish a synergy between novel nanostructures, optics (plasmonics and photonics), biology and electro-kinetics (microfluidics and nanofluidics) and integrate them to develop transformative and disruptive new technologies using cost-effective tools.*

http://basurayresearchlab.com/

## Sustainable Environmental Nanotechnology and Nanointerfaces Laboratory

Wen Zhang | wen.zhang@njit.edu

*The research area covers nanomaterials, harnessing renewable energy and pollutant degradation, microalgae harvesting and removal, and emerging contaminant removal.*

http://www.wenresearch.com/home.html

## Advanced Energy Systems and Microdevices Laboratory

Eon Soo Lee | eonsoo.lee@njit.edu

*The lab is actively researching on new energy technologies in electrochemical energy conversion systems and microscale fluids and thermal devices in various energy and biomedical applications.*

https://www.lee-research.org/

## Analytical Chemistry & Nanotechnology Laboratory

Somenath Mitra | mitra@njit.edu

*The lab's research focus are in the field of Analytical Chemistry, Nanotechnology and Smart Active Coatings.*

https://web.njit.edu/~mitra/index.html

## Social Interaction Lab

Yvette Wohn | wohn@njit.edu

*The Lab focuses on developing novel technologies for positive social interaction and try to understand how people use social technologies, such as social media, mobile phones, and multiplayer games.*

https://socialinteractionlab.com/

## Big Data Analytics Lab (BDaL)

Senjuti Basu Roy | senjutib@njit.edu

*The lab focuses on large-scale data analytics problems that arise in different application domains and disciplines.*

https://centers.njit.edu/bdal/node/65/

https://centers.njit.edu/