

# DEPARTMENT OF APPLIED PHYSICAL SCIENCES

The Department of Applied Physical Sciences combines applied science and engineering to solve real problems for North Carolina and the world through technology, innovation, and partnerships, and the preparation of knowledgeable and responsible students, citizens, and researchers. The department expands interdisciplinary research and teaching by strengthening an intellectual climate in which science is collaborative and focused on applications.

The department houses an undergraduate major in applied sciences, an undergraduate minor in applied sciences and engineering, and a doctoral graduate program in materials science. APS is also home to BeAM (<https://beam.unc.edu>) (Be A Maker), the UNC network of makerspaces.

## Minor

- Applied Sciences Major, B.S. (<https://catalog.unc.edu/undergraduate/programs-study/applied-sciences-major-bs/>)
- Applied Sciences and Engineering Minor (<https://catalog.unc.edu/undergraduate/programs-study/applied-sciences-engineering-minor/>)

## Graduate Programs

- Ph.D. in Materials Science (<https://catalog.unc.edu/graduate/schools-departments/applied-physical-sciences/#programtext>)

## Courses

- Applied Sciences (APPL) (<https://catalog.unc.edu/courses/appl/>)
- Material Science (MTSC) (<https://catalog.unc.edu/courses/mtsc/>)

For additional course information and to view sample syllabi, see the department website (<https://aps.unc.edu/coursework/>).

## Professors

**Theo J. Dingemans**, High-Performance Polymers and (Nano)composites  
**Jinsong Huang**, Perovskite Solar Cells, Photodetectors, X-ray Imaging, Radiation Detectors, Electronic Devices

**Rene Lopez (Physics and Astronomy)**, Optical Materials, Photonic Structures, Photovoltaics

**Richard Superfine**, Biological Physics, Soft Matter, Biomedical Device Technologies

## Associate Professors

**Ronit Freeman**, Development of Novel Designer Materials Using Self-Assembling Biological Components

**Daphne Klotz**, Computational Soft and Active Matter

**Nico Pegard**, Computational Optics, Imaging Systems, Optical Instrumentation and Digital Interfaces for Systems Biology and Neuroscience

## Assistant Professors

**Wubin Bai**, Bioelectronics, Soft Materials, Advanced Manufacturing, Microsystems, Electronic Materials, Photonic Materials, and Biomaterials

**Ehssan Nazockdast**, Modeling/Simulation of Biophysical Phenomena

**Youhong (Nancy) Guo**, Materials Science and Engineering, Separation Processes, Renewable Energy Harvesting and Utilization, Advanced Manufacturing

## Teaching Associate Professor

**Richard Goldberg**, Assistive Technology, Rehabilitation Engineering, Engineering Education

## Teaching Assistant Professor

**Alexis Gillmore**, Engineering Education, Epistemology, Design, Soil Biogeochemistry

## Professors of the Practice

**Dedric Carter**, Vice Chancellor, Innovation, Entrepreneurship and Economic Development and Chief Innovation Officer, Systems Applications to Technical, Business and Policy Issues with an Emphasis on the Entrepreneurial Process, Innovation and New Venture Creation

**Glenn Walters**, Instrumentation for Innovation, BeAM Design and Innovation Hub, Engineering Education

## Affiliated Faculty

**James Cahoon (Chemistry)**, Nanoparticle Synthesis and Characterization

**Praneeth Chakravarthula (Computer Science)**, Optics, Perception, Graphics, Optimization, Machine Learning

**Orlando Coronell (Environmental Sciences and Engineering)**, Wet Chemistry, Polymer Synthesis, Membrane Systems

**Greg Forest (Mathematics)**, Flow and Structure of Complex Polymeric Fluids

**Boyce Griffith (Mathematics and Biomedical Engineering)**, Cardiovascular Modeling and Simulation

**Yun Li (Genetics and Biostatistics)**, Statistical Methods and Computational Tools and Applications to Genetic Dissection of Complex Diseases

**Jianping Lu (Physics)**, Nanotechnology, Carbon Nanotube X-rays, Tomosynthesis and Computed Tomography

**Gerald Meyer (Chemistry)**, Inorganic Materials, Spectroscopy, and Electrochemistry

**Cass T. Miller (Environmental Sciences and Engineering)**, Environmental Physics, Soft Matter, Continuum Mechanics, Applied Mathematics, Computational Science

**J. Michael Ramsey (Chemistry)**, Analytical Chemistry, Microfabricated Chemical Instrumentation, Microfluidics, Nanofluidics

**Jose Rodríguez-Romaguera (Neuroscience Center)**, Neuronal Circuits, Imaging, Optogenetics

**Edward T. Samulski (Chemistry)**, Liquid Crystals and Liquid Crystal Polymers

**Alexander Tropsha (Eshelman School of Pharmacy)**, Computational Chemistry, Cheminformatics and Structural Bioinformatics

**Scott Warren (Chemistry)**, 2D Materials, Energy Storage, Solar Energy, Nanoelectronics, Supramolecular and Solid-State Chemistry for Materials Design

**Yue Wu (Physics and Astronomy)**, Water and Gas Configuration at a Nanometric Level

**Wei You (Chemistry)**, Organic and Polymer Synthesis, Organic Solar Cells, Molecular Electronics, Organic Spintronics

## Contact Information

Department of Applied Physical Sciences

Visit Program Website (<https://aps.unc.edu/undergraduate-major/>)

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**Chair**

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