

Phase II CREST Center for Interface Design and Engineered Assembly of Low-dimensional Systems (IDEALS II)

IDEALS addresses the national need for “accelerating the pace of discovery and deployment of advanced material systems” as stated in the Materials Genome Initiative (www.whitehouse.gov/mgi).

A diverse interdisciplinary team of researchers with complementary interests has come together to discover and design materials with new and enhanced functionalities that culminate from the control of the salient properties of surfaces, interfaces and defects in self-assembled nanomaterials; and to further technology, energy and health applications. IDEALS scientists and engineers at CCNY with partners at Lehman College, Brooklyn College, the CUNY Advanced Science Research Center, the University of Puerto Rico at Mayaguez, and Virginia Tech employ experimental, analytical and numerical modelling tools to design and discover complex novel materials, investigate new physical phenomena, and integrate education and research to train the leaders of tomorrow.

Research Areas

✓ Emergent Quantum Materials and Functions

- Magnetic topological insulators
- Twisted bilayers and other geometries
- Novel semiconductor platforms for solid-state quantum technologies

✓ Bio-inspired Re-Configurable Materials to Scale

- Re-Configurable Materials for Light Harvesting
- Medical Diagnostics and Cancer Therapy
- Sustainability and Environmental Rehabilitation

✓ Frontiers of Photonics: Materials Phenomena and Devices

- Topological Photonics and Entangled Photons
- Photonic Phenomena in Hybrid Materials and their Interfaces
- Semiconductor nanostructures for next-generation photonic devices

RESEARCH EXPERIENCE FOR UNDERGRADUATES

- \$6,000 summer stipend
- On campus housing for non-NYC residents
- Hands on research in state-of-the-art facilities
- Workshops, recreational activities, and other activities
- Wonderful location in New York City

REU Eligibility

- Must be U.S. citizens or permanent residents
- Must be enrolled in a bachelor's degree in chemistry, physics, materials science or engineering.
- African Americans, Latinos, Native Americans and women are strongly encouraged to apply

GRADUATE RESEARCH FELLOWSHIPS

- \$38,000 annual stipend
- Full tuition waiver
- Comprehensive health insurance
- Interdisciplinary research
- Global research collaborations

GRF Eligibility

- Must be U.S. citizens or permanent residents
- Must be admitted to the CUNY Ph.D. program in chemistry, physics or engineering
- African Americans, Latinos, Native Americans and women are strongly encouraged to apply

Contact

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The City College
of New York

The City College of New York (CCNY), the oldest college of the City University of New York (CUNY), is a comprehensive teaching, research and service institution dedicated to access and excellence in undergraduate and graduate education.

CCNY and the CUNY Graduate Center jointly award Ph.D. degrees in biology, biochemistry, chemistry and physics. The Grove School of Engineering at CCNY also grants the Ph.D. in five engineering disciplines. CCNY is the alma mater of nine Nobel Laureates in physics, chemistry and economics.



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IDEALS was established with an award of \$5 million over five years from the National Science Foundation. It was renewed as Phase II with another award of \$5 million over five years.

Faculty Participants

- Elizabeth Biddinger, Chem. Eng., CCNY
- Adam Braunschweig, Nanoscience, CUNY-ASRC
- Ubaldo M. Cordova, Chem. Eng., UPRM
- Alexander Couzis, Chem. Eng., CCNY
- Roger Dorsinville, Elec. Eng., CUNY
- Dorthe Eisele, Chemistry, CCNY
- Johannes Flick, Physics, CCNY
- Swapna K. Gayen, Physics, CCNY
- Pouyan Ghaemi, Physics, CCNY
- Nicolas Giovambattista, Physics, BC
- Alexander Khanikaev, Elec. Eng., CCNY
- Ilona Kretzschmar, Chem. Eng., CCNY
- Lia Krusin-Elbaum, Physics, CCNY
- John R. Lombardi, Chemistry, CCNY
- Gustavo Lopez, Chemistry, LC
- Donna McGregor, Chemistry, LC
- Vinod Menon, Physics, CCNY
- Carlos Meriles, Physics, CCNY
- Stephen O'Brien, Chemistry, CCNY
- Kyungwha Park, Physics, VT
- Matthew Sfeir, Photonics, CUNY-ASRC
- Aidong Shen, Elec. Eng., CCNY
- Maria C. Tamargo, Chemistry, CCNY
- Raymond Tu, Chem. Eng., CCNY
- Rein Ulijn, Nanoscience, CUNY-ASRC

Leadership

MARIA C. TAMARGO is the Director and Principal Investigator of the Center. She is joined by co-principal investigators Swapna Gayen, Lia Krusin-Elbaum, Ilona Kretzschmar and Donna McGregor.



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Idealscrest.org