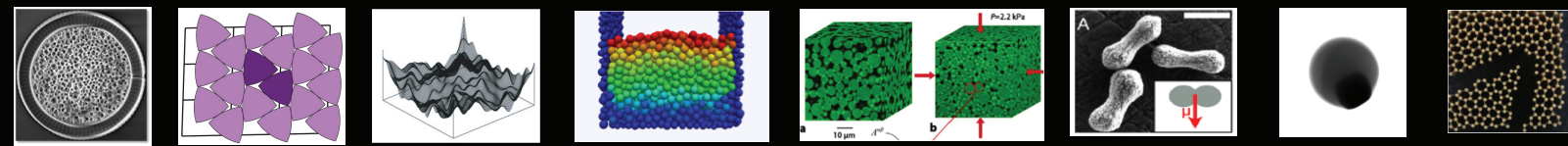


NYU

Exploring Organization and Assembly of Materials from the Molecular to the Macroscopic



New York University

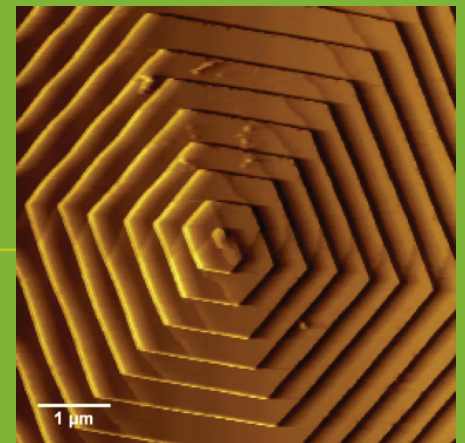
The goals of the NYUMRSEC are to perform world-class research that cannot be performed by individual investigators alone, instill its interdisciplinary culture in graduate students and postdocs for thriving careers, and cultivate excitement in STEM among young scientists and engineers.

The Molecular Crystal Growth Mechanisms group investigates the fundamental science of molecular crystal growth, which is vital for pharmaceuticals, organic electronics, and other technologies. While atomic crystal growth is highly developed, understanding even the most basic elements of molecular crystal growth is lacking. The research team combines world-class expertise in theoretical modeling, computer simulation, and experiment to develop predictive models of crystal structure and free energy, and to investigate nucleation, growth kinetics, dislocation formation, and the reaction mechanisms of crystal formation.

Driven and Active Matter investigates new principles for organizing granular materials. The research team explores external and internal drives in granular and active materials, seeks to optimize material properties such as packing density, material strength and optical reflectivity, and to develop active materials such as optically reconfigurable colloids and active extensible viscoelastic liquids.

HIGHLIGHTS...

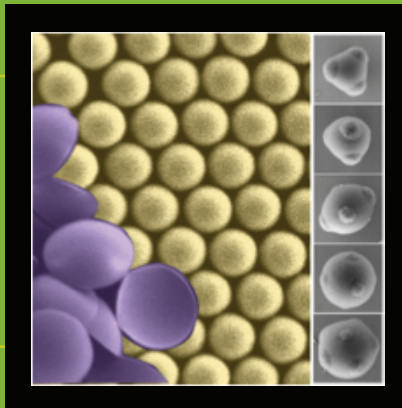
Dislocation generation and structure - Dislocations enable growth at low driving force and control plasticity



DIRECTOR Marcus Weck
www.mrsec.as.nyu.edu

MORE HIGHLIGHTS . . .

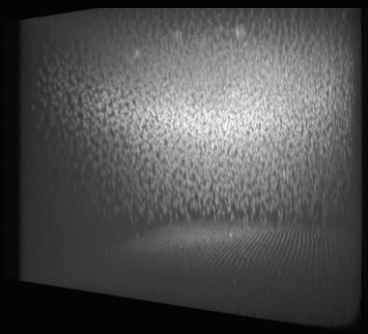
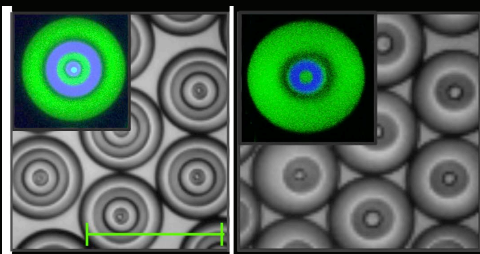
DNA-coated colloids serve as platforms for the self-assembly of programmed heterogeneous microstructures ranging from close-packed crystals to 3D open lattices.



The organizational structure of the NYU MRSEC is designed to cultivate an environment that fosters innovation, transfer, and educational advances in critical and emerging areas of materials research and education.

Michael D. Ward, NYU-MRSEC

Emulsion with multiple layers of oil and water form spontaneously as a result of confined phase separation inside the droplets.



NYU MRSEC DIVERSE EDUCATION AND PARTNERSHIPS...

- **Biobus/Biobase** hands-on materials science curriculum used for Teacher Cross-Training with MRSEC faculty, post-docs, and NYC public school teachers.
- **Science Video Vignettes** designed to convey science to young people and the general public through whimsical, but informative and technically accurate
- **Scientific Frontiers Program** hosting more than 1800 K-12 students for on-site laboratory fun, but with content-based exercises exportable to the classroom, ranging from Elephant Toothpaste to the The Science of Milk. The participants reflected the composition of the diverse NYC school system.
- The impact of the Center will reach beyond its borders through a robust network of national and international collaborators. Numerous partnerships with industries, coupled with entrepreneurial activities, will ensure the translation of knowledge and discoveries to the commercial sector.

OUTREACH

More information about the workshops, internships, partnerships, and educational opportunities are available at www.mrsec.as.nyu.edu

