

NANO EARTH

The Virginia Tech Center for Earth and Environmental Nanotechnology Infrastructure, or NanoEarth – one of sixteen user facilities across the United States comprising the NSF-funded National Nanotechnology Coordinated Infrastructure (NNCI) network – is the only NNCI user-facility dedicated exclusively to leading edge research in Earth and environmental nanoscience and technology.

NanoEarth is the leading destination for earth and environmental nanoscience discovery. We serve the scientists and engineers solving our greatest Earth science and environmental challenges.

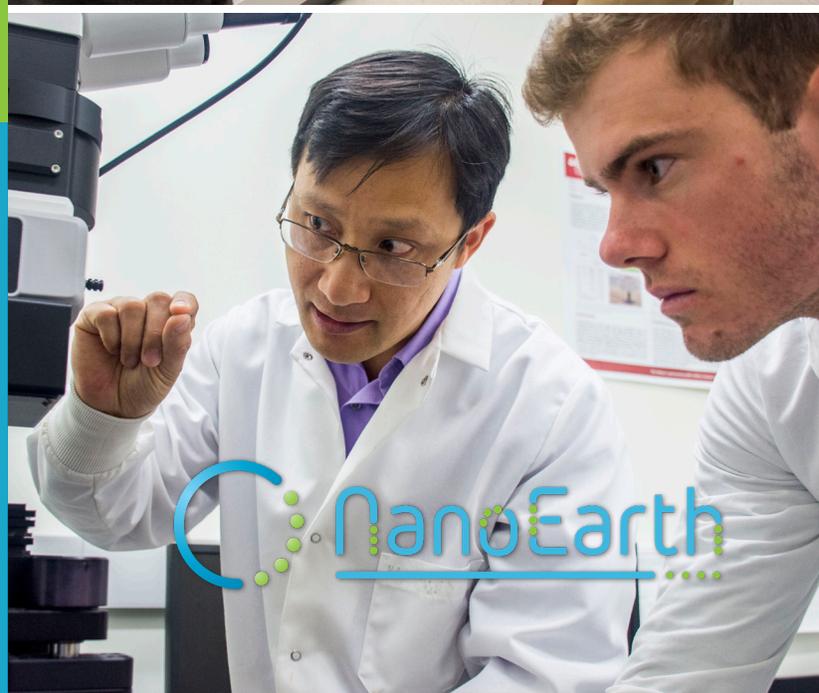
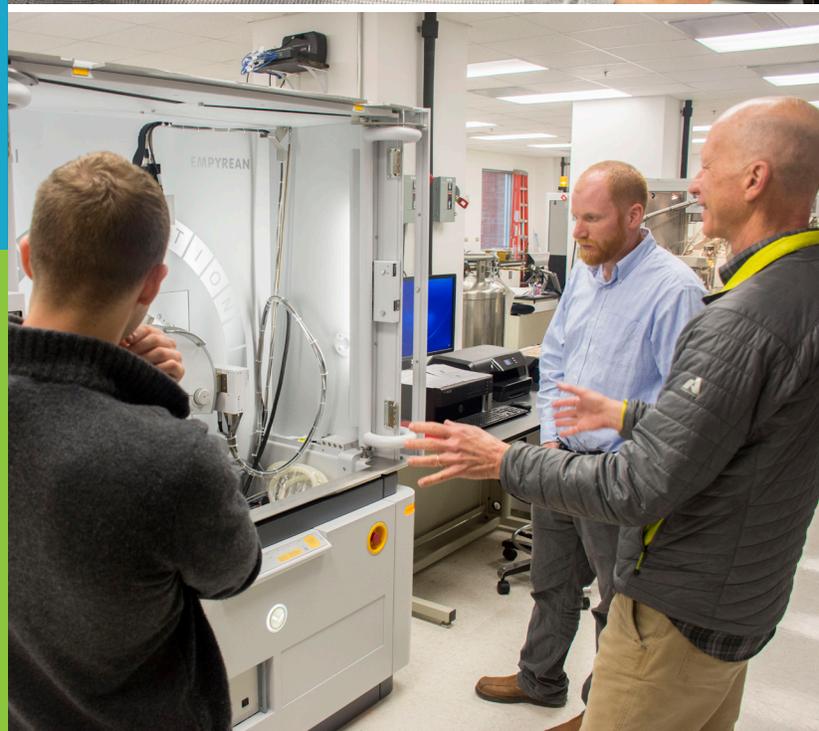
NanoEarth supports researchers across academia, government, and industry to enable critical discoveries at the nanoscale. We provide the advanced tools and expertise to guide nanotechnology research and propel environmental solutions.

FOCUS AREAS

Geosciences
Geochemistry
Biogeochemistry
Soil science
Aerosol science and engineering
Environmental engineering and science
Environmental chemistry
Environmental microbiology
and other crosscutting themes

We welcome all interested users. Expertise in nanoscience and technology, or any of the instrumentation, is not required.

For more information visit
www.nanoearth.org



Earth and Environmental Nanoscience and Technology

The science and engineering of materials at the nanoscale has revolutionized fields like water treatment, energy, medicine, personal electronics, and national security. It has also deepened our understanding of the Earth and our relationship with the environment.

Nanomaterials – naturally occurring, incidental, and/or engineered – are found throughout all soils and rocks, sediments and surface waters, the oceans, and the atmosphere. Therefore, they are truly ubiquitous, and they play key roles in controlling and modifying the Earth system. Nanomaterials influence human and environmental health including in ways that are still not fully understood.

Earth and environmental nanoscience and technology can answer questions like: How does mineral surface chemistry at the nanoscale affect biogeochemical cycling of the elements? How and why do the properties of nanoparticles differ, sometimes dramatically, from their bulk equivalent material? How do airborne nanoparticles interact with our respiratory system? What happens to the engineered nanoparticles in consumer products as they move, by design or inadvertently, through the built environment, or into the natural environment?

This research, and so much more, is now accessible to users around the world through NanoEarth.



NANO EARTH OFFERS DIVERSE FACILITIES, LABORATORIES AND INSTRUMENTATION:

Nanosynthesis, reactivity, and sample preparation labs
Bioculturing, growth, and reactor facilities
Aerosol generation and reactivity chambers
Field expertise, nano methods, and many nanoscience tools
Electron, x-ray, ion and photon beam, and benchtop instrumentation for techniques including:

- Transmission electron microscopy
- Scanning electron microscopy
- Dual-beam focused ion beam
- Secondary ion mass spectrometry
- X-ray photoelectron spectroscopy
- X-ray diffraction
- Raman/atomic force microscopy
- Atomic force microscopy
- UV-Vis-Near-infrared spectroscopy
- Brunauer, Emmett, Teller surface area analysis
- Dynamic light scattering
- Advanced light microscopy
- Ultrafiltration

Multicultural and Underrepresented Nanoscience Initiative (MUNI)

MUNI is a NanoEarth signature initiative, striving to provide an opportunity for inspiring underrepresented minorities to pursue nanoscience degrees and careers. In 2021, the NSF reported only 16% of underrepresented minorities in STEM occupations had bachelor degrees. MUNI provides funding, access, and training opportunities on state-of-the-art nanoscience-relevant instrumentation, as well as nano-synthesis and processing laboratories, for underrepresented professionals and students. For students, MUNI serves all academic levels, from K-12, to community college students, to students in four-year programs and even graduate school.



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**INSTITUTE FOR CRITICAL TECHNOLOGY
AND APPLIED SCIENCE**
VIRGINIA TECH.