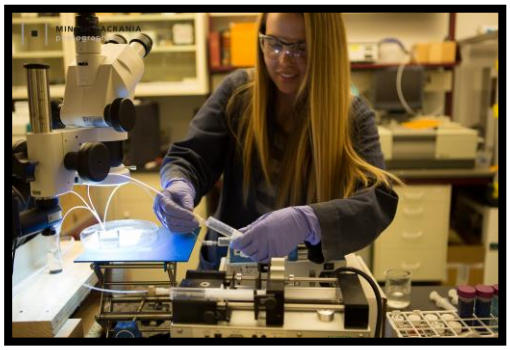
Fall 2017 CINT

Call for User Proposals



The Center for Integrated Nanotechnologies (CINT) is a Department of Energy, Office of Science Nanoscale Science Research Center (NSRC) jointly operated by Los Alamos and Sandia National Laboratories. As a National user facility, CINT provides access to its staff and capabilities for nanoscale science research at no fee to approved users for non-proprietary research. Proprietary research may be conducted under a full-cost recovery agreement.

Who can be a CINT User – Individuals and teams from industry, academia, and government institutions are invited to submit proposals to conduct research at CINT. Foreign National users can work at CINT if their visit is planned with sufficient lead-time.

What is available – CINT offers world-leading capabilities to create, characterize, and understand nanoscale materials in increasingly complex integrated environments. This comprehensive suite of capabilities includes the technical expertise, instrumentation and software necessary to address important nanoscience integration problems and obtain high-impact research results. Prospective users should visit the capabilities page on the CINT website (http://cint.lanl.gov/capabilities/index.php) for a brief description of the Synthesis, Fabrication, Characterization and Theory/Simulation capabilities. To view a list of capabilities at CINT and all of the NSRCs, please visit the new NSRC portal.

How to apply – Access to one or more capabilities at the CINT Core and/or Gateway Facilities is obtained by submitting a CINT User Proposal. This is a concise statement of research that you desire to perform at CINT. Visit our website step-by-step guide to preparing a CINT User Proposal.

Proposal Template – Proposal submissions are required to use our proposal template**.** Proposals submitted that do not follow the approved template will not be considered for review. CINT user proposals are evaluated by external reviewers based on six specific proposal elements. Proposals lacking any of that information will be at a competitive disadvantage for access to CINT.

All CINT User proposals are expected to explicitly contain the following six elements within the 2-page limit:

1. What is (are) the main scientific question(s) being addressed in this user project including the connection to nanoscience? (Suggested length – 200 words)
2. Briefly describe the state of research in this area and how your work is advancing the field. (Suggested length – 150 words)
3. What is (are) the expected impact(s) of this user project? (Suggested length – 150 words)
4. What specific work will be performed at the user's institution in preparation for, or in support of, the proposed CINT work? (e.g., sample preparation, complementary characterization, calculations)
5. What specific tasks will be performed by the user(s) in conjunction with CINT? For each task, include task duration, expected task outcome, requested instrument(s) and CINT staff engagement. (This should be the longest and most detailed section.)
6. Key References.

Visit our website step-by-step guide to preparing a CINT User Proposal.

Proposal Selection – Proposals will be internally screened for safety/feasibility and prioritized by an external review panel based upon scientific merit and suitability for CINT. Approved proposals will have an 18-month duration. An executed user agreement between CINT and the user institution(s) must be in place prior to starting the approved project. For no-fee access, the project results must be published in peer-reviewed technical publications in order to comply with the DOE Office of Science user facilities directive.

Leveraged Capabilities – In addition to CINT capabilities, prospective users may also request access to a variety of world-class leveraged capabilities hosted at Los Alamos and Sandia National Laboratories. These capabilities include selected ion beam assisted synthesis and characterization techniques, modeling and simulation tools using high performance computing and joint proposals with the National High Field Magnet Laboratory.

Scientific expertise at CINT – A distinguishing characteristic of the DOE/SC nanoscience user facilities is the availability of scientific expertise along with hardware/software techniques that enables nanoscience researchers to understand, predict, and realize unprecedented functionalities in materials. CINT expertise is available in these four scientific thrust areas:

- **Nanoscale Electronics and Mechanics**: This thrust focuses on understanding and controlling the electronic and mechanical properties of nanoscale materials and their integration into nanosystems. Research activities include electronic, thermal and structural properties of nanowires and nanowire heterostructures, Si/Ge nanowire synthesis, elastic and fracture properties of nanoporous and heterogeneous nanoscale materials, high-mobility 2D GaAs based materials and interactions of low dimensional systems, quantum computing in silicon or GaAs based semiconductors, coupled mechanical systems, coupling of mechanical and electronic properties, nanomanipulation and integration of nanowires, and investigation of materials interface properties. This research is supported by an effort in high resolution electron beam lithography and nanofabrication.
- **Nanophotonics and Optical Nanomaterials**: This thrust addresses the overall scientific challenge of understanding and controlling fundamental photonic, electronic and magnetic interactions in nanostructured optical materials fabricated using both chemical and physical syntheses. Research topics include metamaterials, (nano) plasmonics, photonic bandgap materials, excited state carrier dynamics in nanomaterials, colloidal synthesis of semiconductor, noble metal and magnetic-metal nanostructures having controlled shape (anisotropy) and surface chemistry (reactivity), as well as hybrid, multifunctional (e.g., magneto-optical, electro-optical, and multi-ferroic) nanomaterials comprising semiconductors and metals. “Bottom-up” assembly approaches, polymer-assisted thin-film growth techniques, pulsed laser deposition, and lithographic methods are commonly employed tools.
- **Soft, Biological and Composite Nanomaterials:** This thrust focuses on solution-based, "bottom-up" approaches for development of integrated nanomaterials. Synthesis, assembly, and characterization of soft or biological components and the integration of these components across multiple length scales to form functional architectures are of interest. High-level topics include the intersection of materials science with biology, the interfacial science of soft and composite materials, active- and self-assembly methods, interaction of nanomaterials with membranes and other reconfigurable matrices, soft/hard/bio composite materials, systems integration, and advanced characterization techniques.
- **Theory and Simulation of Nanoscale Phenomena:** This thrust focuses on the understanding of the fundamental nanoscale phenomena that underlie integrated nanomaterials. Classical and quantum methods are applied to determine the properties and structure of nanoscale materials and systems. Topic areas of specific interest include molecular electronics, electronic inhomogeneity, local and ultrafast spectroscopy, interfacial interactions on the nanoscale, interactions between nanoparticles and self-assembly of nanoparticles.

User Proposal Submission:

https://cint.sandia.gov/

Website available: September 1, 2017
Submission Deadline: September 30, 2017