

APPENDIX C
Supplement to NScD Research Proposal
for access to nanomaterials characterization at the
Center for Nanophase Materials Sciences (CNMS)

ORNL USE ONLY IPTS Proposal Number:
CNMS Proposal Number:

This appendix must accompany a NScD proposal for any project that requests access to CNMS' nanomaterials characterization facilities as part of the neutron scattering project. Only projects that meet the following conditions will be considered:

- *The primary thrust of the proposal is to generate neutron scattering results for publication;*
- *CNMS tasks directly support the success of the proposed neutron scattering experiments; and*
- *The proposal does not request synthesis of materials from CNMS (such proposals must be submitted through the CNMS call for proposals).*

Title of NScD Proposal (copied from first page of proposal):	Principal Investigator:
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CNMS Facilities Requested

Indicate below all facilities **and the number of days for each** at CNMS that will be required for this project. **NOTE: CNMS reserves the right to refuse access to any facility that is not listed on this page.** The Research Description section must describe how each of the selected facilities will be used, including estimates of the quantities of materials/samples to be synthesized or characterized and the estimated time required in each facility. Users are encouraged to contact CNMS staff for assistance in estimating the appropriate times and quantities. See <http://www.cnms.ornl.gov/capabilities/cap.shtml> for detailed descriptions of these facilities and list of contacts.

MACROMOLECULAR NANOMATERIALS

500 MHz Solution NMR Spectroscopy

Macromolecular characterization- molecular weight, spectroscopy, scattering, thermal analysis (details on web site)

Thin Film Characterization (ellipsometry, FTIR-ATR, FTIR microscopy, contact angle goniometer)

FUNCTIONAL HYBRID NANOMATERIALS

Wet/Dry Assembly of Organic/Inorganic/Hybrid Films and Devices – dual glovebox evaporator, Sonospray, 2D stamping, perovskite PV

Optical Characterization and Laser Spectroscopy – ultrafast dynamics, microRaman, PL lifetime, UV-VIS-NIR, fluorometry, PLE

Electrical/Optoelectronic Characterization in Controlled Environments – Semiconductor, R-T, AC impedance, PV and OLED efficiency

Catalysis and *Operando* Spectroscopy: gas phase, electro- and photo-chemistry

NANOMATERIALS THEORY INSTITUTE

K cpu-hours NTI Computational Cluster, capacity computing

K cpu-hours Facilitation of access to NERSC, high-performance

K cpu-hours Facilitation of access to NCCS, leadership class

days NTI staff support for experimental project

X-RAY SCATTERING

X-ray diffraction and small-angle scattering

SCANNING PROBE MICROSCOPY

Advanced SPM: air, liquid, glove box (cAFM, PFM, ESM, MFM)

AFM: topography

Magnetic Property Measurement System

Ultrahigh Vacuum 4-probe STM

Ultrahigh Vacuum AFM

Ultrahigh Vacuum STM/STS

NANOFABRICATION RESEARCH LABORATORY

FirstNano Rapid Thermal Processing Tool

Plasma Atomic Layer Deposition

General Cleanroom Use (see website for details)

Helium-Ion Milling (Zeiss Orion NanoFab)

ELECTRON & ATOM PROBE MICROSCOPY

Advanced SEM (Zeiss Merlin)

Soft Matter TEM (Zeiss Libra)

High-resolution TEM/STEM with EELS & EDS (Hitachi HF3300)

Low-voltage (60-100kV) aberration-corrected STEM/EELS (Nion U100)

300kV aberration-corrected STEM/EELS (FEI Titan S)

TEM Specimen Preparation (FIB, microtome, ion mill)

Atom Probe Tomography (LEAP 4000X HR)

FIB to prepare APT needles (FEI Nova 200)

Helium-Ion Microscopy (Zeiss Orion NanoFab)

OTHER FACILITIES- If you have identified other facilities not listed above that you want to use, you must first contact a CNMS Staff Member to discuss availability then provide their name and facility description below. CNMS cannot pay costs associated with use of other ORNL facilities.

CNMS Staff Member(s): _____ Facility Description: _____

Total number of days team members expect to work in CNMS facilities: _____

When will CNMS facilities be needed? Check all that apply: before neutron run; during neutron run; after neutron run

Did you contact a CNMS staff member to discuss the feasibility of your project? Yes No

If so, Contact Name(s): _____

Provide IPTS or CNMS proposal numbers for any related user proposals: _____

Samples and Identification of Hazards for Work at CNMS

Provide a brief description of ALL materials (samples, supplies, and equipment) that you plan to bring to CNMS. Materials and equipment that are not specifically listed here will not be allowed into CNMS. Include common name and chemical formula if applicable. Check any boxes below that apply to these materials. _____

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|---|---|---|--|
| <input type="checkbox"/> No major safety issues | <input type="checkbox"/> Corrosive Material | <input type="checkbox"/> Explosive Material | <input type="checkbox"/> Electrical/Electronic Equipment |
| <input type="checkbox"/> Flammable Material | <input type="checkbox"/> Radioactive Material | <input type="checkbox"/> Lasers | <input type="checkbox"/> Other: specify |
| <input type="checkbox"/> Carcinogenic | <input type="checkbox"/> Biohazardous | <input type="checkbox"/> Cryogenic hazard | |
| <input type="checkbox"/> Human subjects or human bodily Materials | <input type="checkbox"/> Toxic Material | <input type="checkbox"/> High Pressure | |

Description of CNMS Research- *Use the remainder of this page to describe the tasks to be performed at CNMS and explain how CNMS results would support the proposed neutron scattering experiments.*