



DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

Neutron-Based Materials Characterization (nMat) Consortium

AGENCY: National Institute of Standards and Technology, Department of Commerce.

ACTION: Notice of Research Consortium.

SUMMARY: The National Institute of Standards and Technology (NIST), an agency of the United States Department of Commerce, announces the establishment of the Neutron-Based Materials Characterization (nMat) Consortium (Consortium). The Consortium will bring together industry, academia, and other stakeholders to identify and address measurement and standards needs related to neutron-based characterization methods for manufacturing materials.

The Consortium will support pre-competitive research to advance the development and application of neutron-based measurement techniques, expand industrial access to advanced neutron tools, and accelerate the translation of measurement science into manufacturing impact.

Consortium activities will leverage the capabilities of the NIST Center for Neutron Research (NCNR) and the Materials Science and Engineering Division (MSED).

Participation in the Consortium will require the execution of a Cooperative Research and Development Agreement (CRADA) with NIST. At NIST's discretion, entities that are not permitted to enter into CRADAs pursuant to law or other governmental constraint may be allowed to participate in the Consortium pursuant to a separate non-CRADA agreement.

DATES: The Consortium is currently accepting letters of interest for participation, and its activities will commence on April 1, 2026. NIST will accept letters of interest on an ongoing basis.

ADDRESSES: Letters of interest or requests for additional information about the Consortium may be submitted to Dr. Jonathan E. Seppala, Consortium Manager, via email to nmat@nist.gov, or by hardcopy to Materials Science and Engineering Division, National Institute of Standards and Technology, 100 Bureau Drive, Mail Stop 8542, Gaithersburg, MD 20899.

Additional information about the Consortium is available at <https://www.nist.gov/nmat>.

Organizations whose letters of interest are accepted in accordance with the process set forth in the SUPPLEMENTARY INFORMATION section of this notice will be asked to sign a consortium CRADA or similar agreement with NIST. A consortium template will be made available to qualifying applicants.

FOR FURTHER INFORMATION CONTACT: J'aime Maynard, Consortia Agreements Officer, Technology Partnerships Office, National Institute of Standards and Technology, by mail to 100 Bureau Drive, Mail Stop 2200, Gaithersburg, MD 20899, or by email to agreements@nist.gov.

SUPPLEMENTARY INFORMATION: For more than 50 years, neutron-based measurement methods have provided unique insights into material structure and properties that cannot be obtained through other techniques. Neutrons are highly sensitive to light elements, including hydrogen; they can penetrate deeply into many materials; and they possess a magnetic moment, enabling characterization of magnetic structures. These properties make neutron-based

techniques powerful tools for understanding materials across multiple length scales and under realistic processing and operating conditions.

Despite these capabilities, industrial access to neutron-based measurement techniques remains limited due to barriers including specialized expertise requirements, limited facility familiarity, and challenges in translating neutron data into actionable manufacturing insights. The nMat Consortium is intended to address these challenges by establishing a collaborative framework through which participants (Consortium Members) may leverage NIST's neutron facilities and materials expertise to advance measurement science relevant to manufacturing.

The Consortium will focus on pre-competitive research and the development of measurement methods and best practices. Initial technical areas of interest may include, but are not limited to:

- **Structural Characterization:** Application of neutron scattering techniques to analyze material structure across multiple length scales.
- **Interface Analysis:** Investigation of surfaces, interfaces, and thin films in manufactured components.
- **Stress and Defect Analysis:** Measurement of internal stresses and identification of defects in materials.
- **Process Monitoring:** Development of methods to study materials during processing or under operating conditions.
- **Magnetic Analysis:** Characterization of magnetic materials and interfaces relevant to data storage, energy conversion, and emerging technologies.

Consortium activities may utilize capabilities including Small-Angle Neutron Scattering (SANS), neutron imaging, neutron diffraction, and neutron reflectometry, complemented by materials characterization expertise within MSED.

Consortium Members may, subject to NIST approval and appropriate amendment to their CRADA, propose additional targeted research activities that complement and enhance the core Consortium research plan.

Participation Process

Eligibility to participate in the Consortium will be determined by NIST based upon the information provided by prospective participants in response to this notice. Prospective participants should submit a letter of interest to the Consortium Manager via email or hardcopy (for reference, see ADDRESSES section above). Letters of interest must not include business proprietary information. NIST will not treat submissions in response to this notice as proprietary information.

Letters of interest should include:

1. A description of the organization's experience or expertise in materials manufacturing and characterization, particularly as related to neutron-based measurement techniques; and
2. Identification of anticipated project team members and a legal point of contact for CRADA execution.

NIST will evaluate submissions to determine eligibility to participate in the Consortium.

Participation will require the execution of a CRADA or similar agreement. Participation may include financial and/or in-kind contributions consistent with the Consortium research plan. All participants legally eligible to enter into a CRADA will be bound by substantially similar terms and conditions.

NIST does not guarantee participation in the Consortium to any organization submitting a letter of interest.

Authority: 15 U.S.C. 3710a; 15 U.S.C. 272(b) and (c).

Alicia Chambers,

NIST Executive Secretariat.

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