

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Dedicated Infrastructure for In Situ Characterization of Structural Materials – Stony Brook University**

**SECTION B. Project Description**

Stony Brook University (SBU) proposes to acquire instrumentation to provide dedicated sample preparation, and multipurpose in situ heating and mechanical deformation stages for the characterization of structural materials including neutron irradiated steels and ceramics. A commercial sample preparation package (EXpressLOTM G2 system) designed for lift out, manipulation and mounting small specimens prepared via focused ion beam milling will be utilized to prepare radioactive specimens for subsequent structural characterization utilizing electron, X-ray and optical probes housed within the EMREL. In situ equipment proposed here includes a high-temperature Linkam heating stage with an operation range of room temperature to 1500 °C (in vacuum, or flowing gas); and a Linkam low-to-medium temperature modular force stage (-196 - 350 °C) designed to characterize the mechanical properties (tensile/compression and creep). Both stages will accept specimens prepared via the EXpressLOTM G2 system and are equipped with large transparent windows to enable in situ optical microscopy and Raman micro-spectroscopy characterization while heating/mechanical deformation. The sample preparation equipment and in situ stages will be located within the  $\beta$ - $\gamma$ -Be wing of SBU's Engineered Microstructures and Radiation Effects Laboratory (EMREL), which is specifically designed for the processing, metallography, and routine testing of radioactive and beryllium-containing materials. The equipment will be made available to members (including students) of the SBU Irradiation Materials Sciences (IMS) group, SBU researchers, and the Nuclear Science User Facilities (NSUF) community.

**SECTION C. Environmental Aspects / Potential Sources of Impact**

The university has procedures in place to handle any waste that will be generated through this project. The action would not create additional environmental impacts above those already occurring at the university.

**SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s):** Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B1.31 Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

Justification: The activity consists of the procurement, installation, and testing of equipment to provide unique sample preparation and advanced microstructural information in the form of microstructural and crystallographic information from polycrystalline samples to improve understanding of nuclear and hazardous materials.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act)  Yes  No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 07/23/2021.