NEUP Nuclear Energy University Program
U.S. Department of Energy

# Documenting the Unique Physics Properties of the UNM AGN-201M Reactor

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**Program**: Nuclear Energy – MS-NE-1

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**ABSTRACT:**

The University of New Mexico's (UNM's) Aerojet General Nucleonics Model 201 (AGN-201M) is one of four operating AGN-201M reactors in the world and provides UNM nuclear engineering students with invaluable educational resources. The overarching goal of this work is to enhance the coverage of the ICSBEP and IRPhEP benchmark libraries by developing a benchmark evaluation for the UNM AGN-201M reactor. If successful, this work will result in a new benchmark evaluation with unique reactor physics properties that is useful for validating modeling and simulation tools for advanced reactor concepts and advanced fuel production facilities. Specific aims of this work include:

1. Understanding how low-dominance ratio, HALEU-fueled systems can address gaps in the existing validation benchmark libraries;
2. Understanding the impact of uncertainty in graphite thermal scattering cross sections on graphite-moderated reactor concepts; and
3. To better understand the impact of nuclear data uncertainty on TRISO-fueled advanced reactor concepts and in TRISO fuel production facilities.

If successful, this work will produce a high-fidelity benchmark evaluation for an operating research reactor with unique reactor physics characteristics and with validation applications for HALEU systems, TRISO-fueled reactor design, and TRISO-based criticality safety analyses. A benchmark evaluation for the UNM AGN-201M will exhibit one of the lowest, if not *the* lowest, dominance ratios of any critical benchmark in the ICSBEP or IRPhEP libraries, thus expanding the coverage of these libraries into an area of unusual reactor physics properties.