

# AMES LABORATORY'S

## ADVANCED CHARACTERIZATION CAPABILITIES

**Ames Laboratory**  
**Creating Materials and Energy Solutions**

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[www.ameslab.gov](http://www.ameslab.gov)

**Need a Measurement?** Ames Laboratory has an extensive range of unique characterization tools for materials design and discovery.

**Advanced electron beam instruments:** The Sensitive Instrument Facility is one of the quietest in the DOE complex. It houses state-of-the-art electron microscopes, focused ion-beam instrumentation, and other highly sensitive characterization tools.

**Spectroscopy:** Known for the development of atomic absorption spectroscopy and inductively coupled plasma mass spectrometry, we continue to be a world leader in instrument design. Unique capabilities include bench-top angle-resolved photoemission spectroscopy, Raman-based techniques and single molecular detection methods.

**Solid-state NMR:** We were the first to use dynamic nuclear polarization nuclear magnetic resonance for materials science and chemistry in North America. The DNP-NMR provides up to 100x signal enhancement compared to traditional NMR.

**Magnetic properties and imaging:** Using isolated electronic spins of nitrogen-vacancies, our NV-scope provides magnetic imaging with nanometer resolution and field detection down to nano-Tesla. We have extensive capabilities in AC and DC magnetometry and susceptibility.

**Thermal properties measurements:** Our unique capabilities include high-sensitivity calorimetry and ultra-high thermal analysis to 2400 K, as well as a full suite of standard calorimetry methods.

**X-ray scattering:** In-house capabilities include high-pressure, applied-magnetic fields, and temperature variations from 10 K to 1500 K. Techniques include small-angle, wide-angle, texture and reflectometry.

