

THE AMES LABORATORY'S ADVANCED CHARACTERIZATION CAPABILITIES

The Ames Laboratory Creating Materials and Energy Solutions

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

Advanced electron beam instruments: Opening summer 2015, the Sensitive Instrument Facility will be one of the quietest in the DOE complex. It will house 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: In 2014, we added dynamic nuclear polarization to our extensive nuclear magnetic resonance capabilities. The DNP-NMR provides up to 100x signal enhancement compared to traditional NMR and is the first to be used for materials science and chemistry in North America.

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.



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U.S. DEPARTMENT OF ENERGY