



# AMES LABORATORY'S ADVANCED SYNTHESIS CAPABILITIES

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

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**Need a Material?** The Ames Laboratory has the nation's most comprehensive facilities for advanced materials synthesis. We enable science through our synthesis capabilities and new innovations in the science of synthesis.

**Alloy synthesis:** Alloys never before made or difficult to prepare are our specialty. From casting to inert solid-state synthesis to thin-film deposition, we can do it all. Our capabilities include synthesis under inert conditions, mechano-chemical milling and spark erosion synthesis.

**Structured material and chemical synthesis:** We have developed novel DNA-templated nanoparticle, structured mesoporous catalytic, inorganic chemical, and thin-film composite synthesis methods. Materials for near net shape engineering applications are a specialty.

**Powder production:** Our research in powder synthesis has led to new methods for gas atomization of powders with controlled size distributions and composition, crucial for major advances in additive manufacturing.

**Single crystal growth:** Uncommon capabilities include single-crystal growth from light, volatile and reactive materials, in addition to our capabilities and expertise in growing large crystals of numerous alloys to meet specific research needs.

**Metal purification:** For research materials, purity matters. Alkali, alkaline-earth and rare-earth element purification are specialties. For rare earths, we reach 99.996% rare-earth purity — the purest in the world.

