*The Irradiated Materials Characterization Laboratory (IMCL), located at Idaho National Laboratory's Materials and Fuels Complex, will house many new capabilities to support the nuclear energy research mission.*

# Irradiated Materials Characterization Laboratory

The Irradiated Materials Characterization Laboratory (IMCL) is the newest nuclear energy research facility at Idaho National Laboratory's Materials and Fuels Complex. This unique, 12,000-square-foot facility incorporates many features designed to allow researchers to safely and efficiently prepare irradiated fuel and material samples for microstructural-level investigations.

The many advanced capabilities slated for installation in IMCL's reconfigurable 8,000-square-foot research area will help INL continue research that is providing a deeper understanding of fuel performance and behavior than ever before. Combined with INL's advanced computer modeling techniques, this microstructural understanding will help enable safer, more efficient fuel designs, and it will offer the potential to reduce the time needed for fuel development and licensing.

IMCL's design incorporates vibration, environmental, and radiological isolation that enable advanced microscopy techniques requiring extremely sensitive equipment. The

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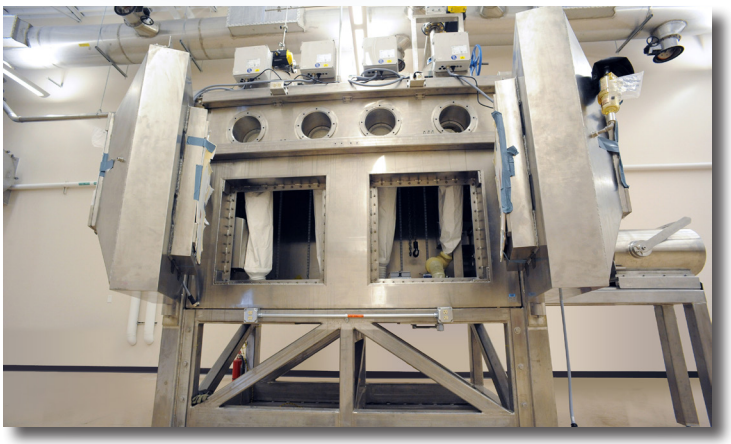

***The Shielded Sample Preparation Area hot cell is undergoing final testing prior to starting hot operation in IMCL.***

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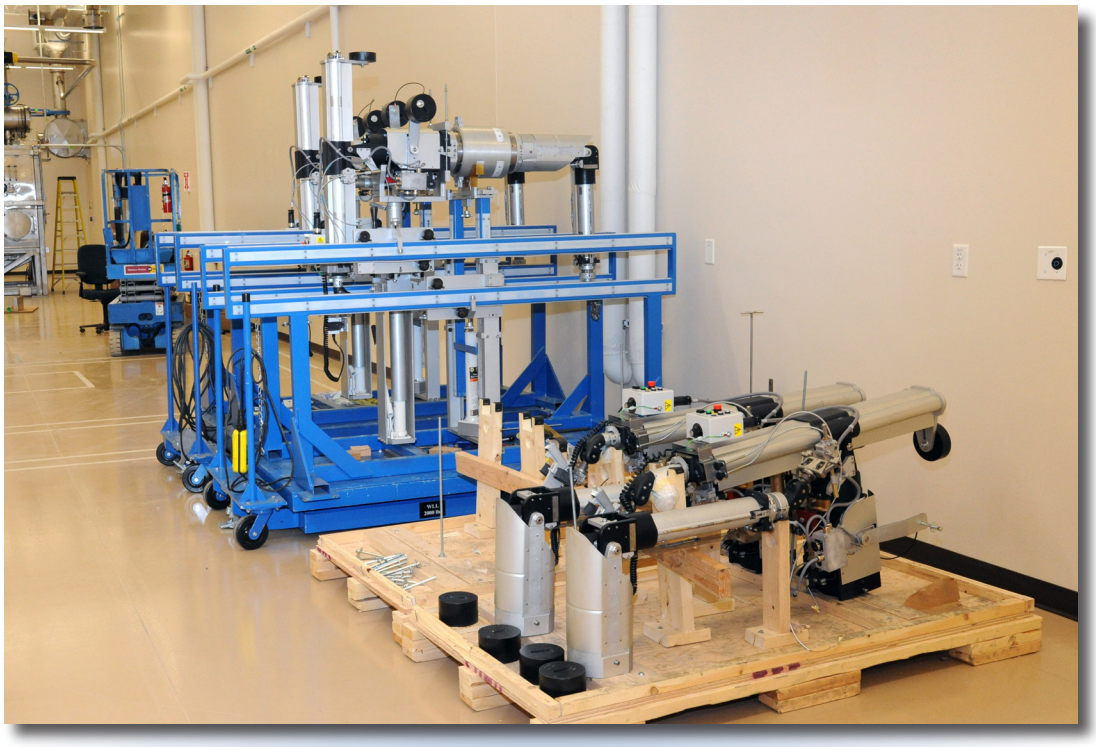

*Remote-handling manipulators await installation in the new SSPA hot cell.*

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facility will enhance INL's post-irradiation examination capabilities and fill the widest possible range of research needs, in keeping with a user facility concept.

Multiple connection points will allow users to install needed research equipment with the appropriate levels of vibration isolation, shielding and ventilation control. This flexibility will allow research programs to configure IMCL research space to suit their needs. When their work is completed, research equipment can be removed to be replaced by different equipment for use by other programs. In addition, IMCL will provide the ability to test and develop prototypes of new tools and equipment for use in radiologically shielded environments.

IMCL includes a shipping bay, high-efficiency particulate air-filtered ventilation and monitored exhaust stack. The first equipment moved into IMCL is the Shielded Sample Preparation Area (SSPA) hot cell. The SSPA will serve as a starting point to prepare samples for examination in electron microscopes and other research equipment scheduled for installation into IMCL.

### *Key capabilities slated for IMCL*

- Shielded hot cell for sample preparation
- Glovebox and hood for sample preparation and facility support
- Electron Probe MicroAnalyzer
- Focused Ion Beam
- Transmission and Scanning Electron Microscopes
- Micro X-ray Diffractometer
- Mechanical properties test equipment

**For more information**

***Joseph Campbell***
*(208) 526-7785*
*joseph.campbell@inl.gov*

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