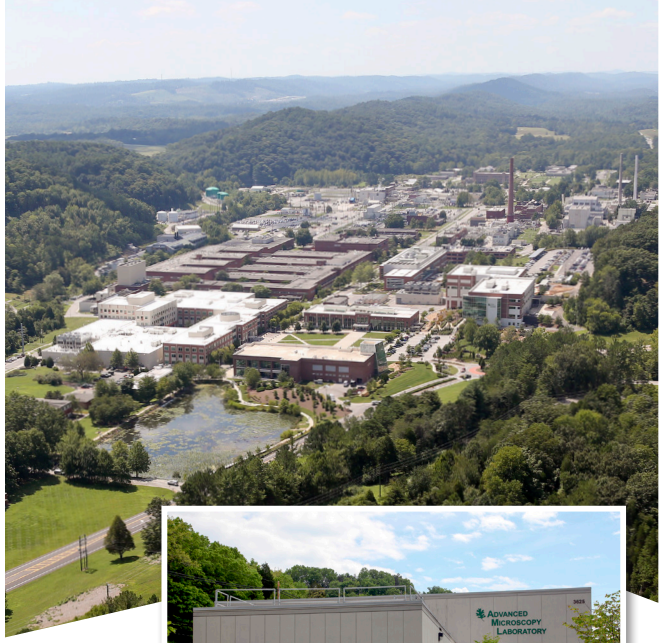

ORNL, the US Department of Energy's (DOE's) largest science and energy national laboratory, is a world leader in research that supports the development of advanced materials, with the nation's most comprehensive materials research program and core strengths in materials synthesis, characterization, and theory.

Materials Research at the MCC

- Electrocatalysts
- Catalyst Supports
- Ionomer/Membranes
- Catalyst Layers/ Electrodes
- Membrane Electrode Assemblies
- Gas Diffusion Layers
- Microporous Layers
- Bipolar Plates
- Composites/Alloys
- Hydrogen Storage Materials

More information

To access MCC capabilities

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To initiate a co-funded CRADA

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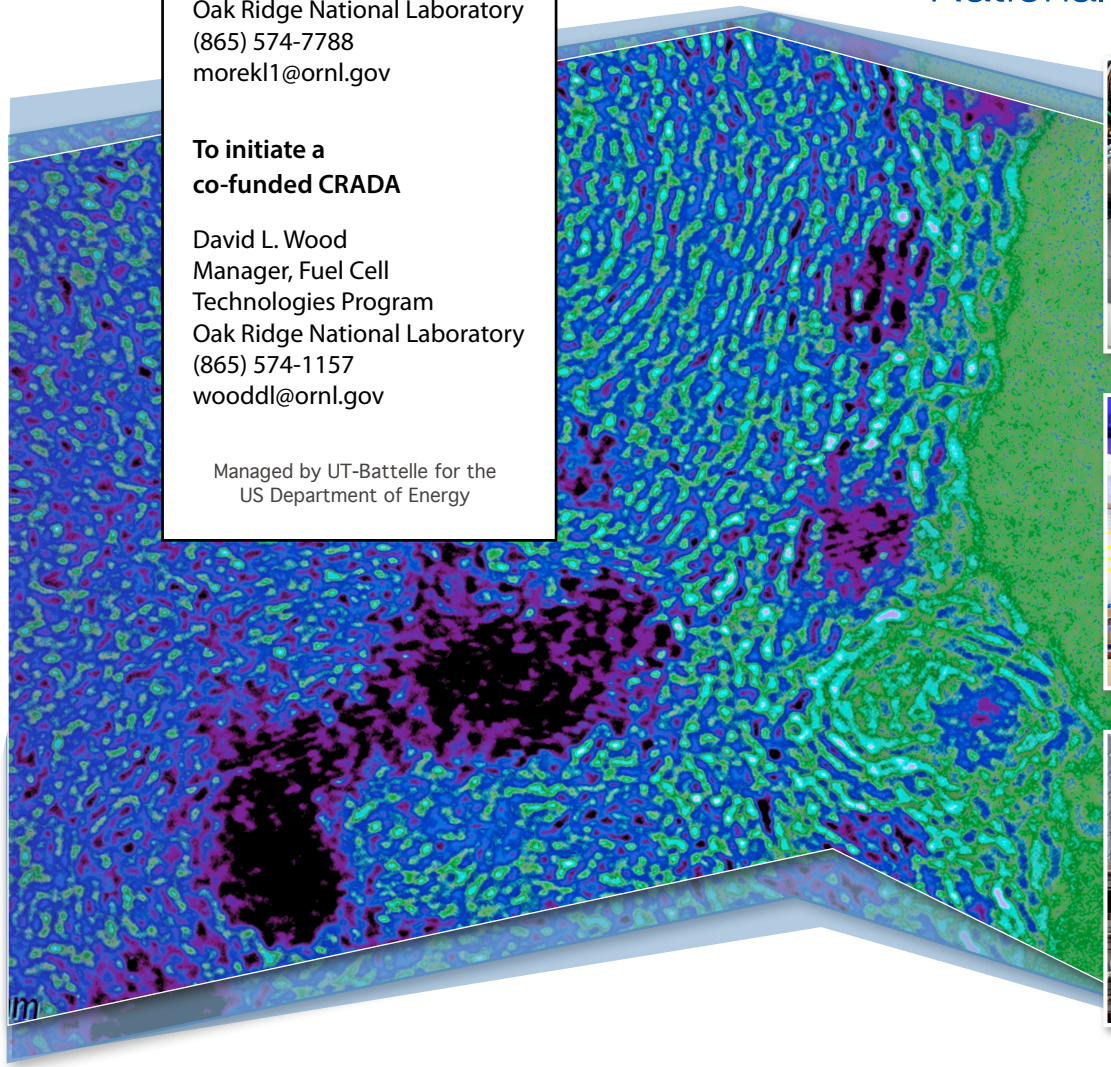
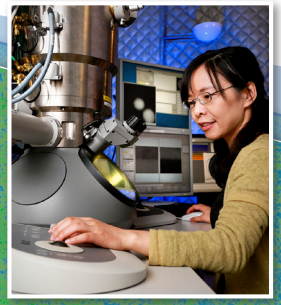
Managed by UT-Battelle for the US Department of Energy

MCC Materials Characterization Core at Oak Ridge National Laboratory



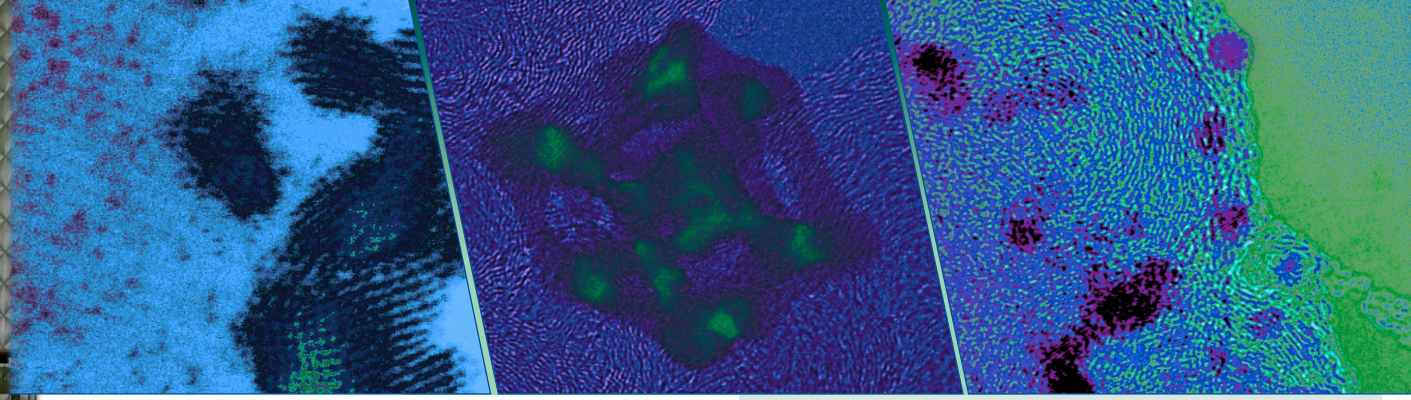


U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy
FUEL CELL TECHNOLOGIES OFFICE

OAK RIDGE National Laboratory

ORNL 2016-G01401/cae

World-Class Scientific Facilities and Capabilities



Oak Ridge National Laboratory's (ORNL's) Materials Characterization Core (MCC) offers a broad range of state-of-the-art microscopy, spectroscopy, and other characterization techniques and services to provide insight into the structure and composition of materials at the atomic level.

Scanning Transmission Electron Microscopy (STEM) Imaging and Spectroscopy

- Electron Energy Loss Spectroscopy
- Energy Dispersive Spectroscopy (EDS)
- 3D Electron Tomography
- Aberration-correction
- Specialized *in situ* methods

Scanning Electron Microscopy (SEM)

- EDS
- Electron Beam Induced Current
- Electron Backscatter Diffraction

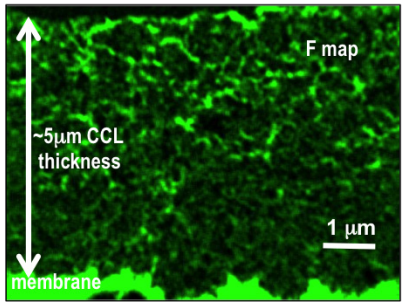
Dual-Beam Focused Ion Beam (FIB-SEM)

X-Ray Photoelectron Spectroscopy

Electron Probe Microanalysis

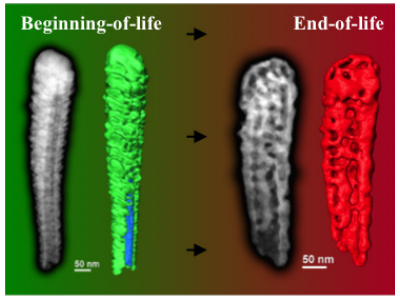
Time-of-Flight Secondary Ion Mass Spectroscopy (TOF-SIMS)

Multimodal Characterization from the µm-Scale to Single-Å-Level



Ionomer distribution mapping via EDS across catalyst layer thickness

Morphological changes observed for Pt-alloy nanostructured thin film (NSTF) catalysts after aging



Unique MCC Capabilities Benefit Research Organizations

- **Access to unique microscopy tools**
- **Access to staff expertise in advanced microscopy and characterization of fuel cell materials**

Cost-Share Opportunity to Access the MCC

DOE's Fuel Cell Technologies Office (FCTO) will provide a 50% cost share to 10 organizations seeking to collaborate with the MCC during FY17 (October 1, 2016 – September 30, 2017)

The opportunity will support projects with total values up to $50,000, including partner contributions

ORNL staff scientists will collaborate directly with partners on DOE-FCTO mission-aligned projects

Partnerships implemented via a streamlined short-form CRADA

To accelerate agreement implementation, CRADA terms must be accepted without modification