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## MATERIALS CHARACTERIZATION VIA THE SHARED RESEARCH EQUIPMENT USER FACILITY AND PROGRAM

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State-of-the-art microcharacterization is often critical in solving challenging materials problems, but researchers may not have access within their own institution to the required specialized capabilities. The DOE User Facilities help to address this need. The Shared Research Equipment (SHaRE) User Facility (<http://www.ornl.gov/share>) at Oak Ridge National Laboratory includes a variety of advanced electron microscopes with capabilities such as energy-filtered transmission electron microscopy (EFTEM), energy-dispersive X-ray spectrometry (EDXS), electron energy-loss spectrometry (EELS), spectrum imaging, low-voltage scanning electron microscopy (SEM), orientation imaging microscopy (OIM), and texture mapping. The large microanalysis data sets are commonly analyzed by advanced statistical methods. Special holders are available for in situ deformation and annealing studies. Extensive specimen preparation methods (e.g., electropolishing, ion milling, focused ion beam milling) are available.

Other complementary characterization capabilities available within the SHaRE Facility include atom probe field-ion microscopy (APFIM) and atom probe tomography (APT) for atomic-resolution elemental analysis in three dimensions, and mechanical properties microanalysis (nanoindenters). The expertise of the SHaRE Facility staff is a significant resource available to collaborative projects involving external researchers from academia, industry, other federal laboratories, and foreign institutions. Access is administered through the SHaRE User Program on the basis of a short research proposal. Except for proprietary research, there is no cost to the user. Grants are available to help defray costs of travel and accommodations for researchers from accredited U.S. universities. Examples of how the advanced analytical capabilities of the SHaRE facility have been used to address specific materials problems, and how access to the facility is obtained, will be presented.

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