Melanie Kirkham

One Bethel Valley Rd.
P.O. Box 2008, MS-6460
Oak Ridge, TN 37831-6460

(615) 420-0202
kirkhammj@ornl.gov

Education

Georgia Institute of Technology Atlanta, GA
Ph.D. in Materials Science and Engineering, December 2009
Co-Advisors: Dr. Robert L. Snyder and Dr. Zhong Lin Wang
Dissertation: "The Role of the Catalyst in the Growth of One-Dimensional Nanostructures"
Minor in Microbiology

University of Tennessee Knoxville, TN
M.S. in Materials Science and Engineering, May 2005
Advisor: Dr. Claudia J. Rawn
Thesis: "Investigation of a Structural Inversion of Pure and MgO- Plus TiO_2-Substituted Hexacelsian"
B.S. in Materials Science and Engineering, December 2002
Overall GPA: 3.99/4.00

University of Wales Swansea, United Kingdom
Exchange Program, September 2000 – June 2001
Overall GPA: 4.0/4.0

Experience

Oak Ridge National Laboratory Oak Ridge, TN
Scientific Associate, November 2012 – present
- Analyze materials with neutron scattering techniques, including intermetallic thermoelectric materials
- Guide users in data collection and analysis on POWEN Powder Diffractometer at Spallation Neutron Source
- Train users in safety and beamline procedures
- Ensure safe and efficient operations at POWGEN beamline
- Manage operations and maintenance budget for the beamline
- Oversee and facilitate upgrades in beamline capabilities

Postdoctoral Research Associate, January 2010 – November 2012
- Characterized materials for energy applications, including Li-ion battery electrode materials, solid oxide fuel cell materials and thermoelectric materials, including skutterudites, clathrates and intermetallics, with ambient and non-ambient X-ray diffraction
- Guided and collaborated with users from industry, universities and national laboratories to collect and analyze X-ray diffraction data and to present results through conferences and journals
- Designed custom accessory for diffractometer furnace to allow *in-situ* X-ray diffraction from polymer and carbon fibers under tension at elevated temperatures
- Responsible for user training, instrument maintenance and calibration

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Georgia Institute of Technology Atlanta, GA
Graduate Research Assistant, August 2005 – December 2009
- Synthesized nanostructures using catalyzed and non-catalyzed methods
- Characterized nanostructures with X-ray diffraction and electron microscopy
- Temporarily responsible for X-ray lab, including user training and maintenance for three diffractometers
- Assisted with multiple classes, including teaching lab sessions for materials characterization and X-ray scattering courses

Oak Ridge National Laboratory Oak Ridge, TN
Postmaster Research Associate, May – August 2005
- Conducted powder XRD experiments on bacterially-reduced, substituted magnetite nanoparticles

University of Tennessee Knoxville, TN
Graduate Research Assistant, January 2003 – May 2005
- Synthesized ceramics via solid-state and sol-gel methods
- Conducted powder X-ray diffraction experiments on oxides
- Taught practical section of Materials Camp for high-school students
- Taught practical section of "Introduction to Mat. Sci. and Eng."

Undergraduate Research Assistant, January – September 2002
- Assisted in multiple research projects, including ultra-high cycle fatigue and bulk metallic glasses.

Honors
- NSF Nanotech Workshop Graduate Student Award
- Presidential Fellowship, Georgia Tech
- Outstanding Junior and Senior, MSE Department, UTK

Professional Affiliations
- ASM, International: National Org. – Emerging Professionals Comm. (2012-)
  Oak Ridge Chapter – Chair (2013-2014), Secretary (2012-2013) and Registration Chair (2010-2012)
  UTK Student Chapter – Treasurer (2002-2003)
- Materials Research Society
- American Crystallographic Association
- Tau Beta Pi Engineering Honor Society

Expertise
- Materials for energy-related applications, including batteries and thermoelectrics
- One-dimensional nanomaterials
- Neutron powder diffraction
- Thin film and powder X-ray diffraction
- Texture and *in-situ* high temperature XRD measurements
- Rietveld refinement and *ab initio* structure determination from powder data
- Size/strain and lattice parameter analysis
- Jade, PANalytical suite and GSAS computer programs