

## Stephen Jesse, PhD

Senior Research Scientist

The Center for Nanophase Materials Sciences

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### Research Interests:

Direct, study, and utilize atomic scale transformations to enhance understanding of material behavior and to create new devices based on emerging novel functionalities; Large scale data analytics of high-dimensional, multi-spectral information for functional imaging; Technique development using advanced data acquisition, feedback, and control for scanning probe and electron/ion microscopies.

### Education:

Ph.D. 2004	University of Tennessee	Materials Science
M.S. 2000	University of Tennessee	Mechanical Engineering
B.S. 1996	University of Tennessee	Mechanical Engineering

### Professional Experience:

2018 – Present	Senior Scientist, Center for Nanophase Materials Sciences and PI of FWP in Quantum Information Sciences, Oak Ridge National Laboratory
2014 – 2018	Senior Scientist, Leader of the Directed Nanoscale Transformations Theme, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
2008 – 2014	R&D Staff Scientist, Scanning Probe Microscopy Group Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
2004 – 2008	Postdoctoral Research Associate, Scanning Probe Microscopy Group Center for Nanophase Materials Sciences, Oak Ridge National Laboratory

### Honors, Awards:

2018	R&D100 Award: The Atomic Forge
2016	R&D100 Award: G-mode Microscopy
2016	Microscopy Today Innovation Award: G-Mode
2016	ORNL Significant Event award for BEAM project
2015	ORNL Significant Event award for Electron Microscopy Control (SENS)
2014	UT-Battelle Technology Commercialization Award
2012	American Ceramic Society Ceramographic Competition Awards
2011	UT-Battelle Scientific Research Team Award: Electrochemical Strain Microscopy
2011	Microscopy Today Innovation Award: Electrochemical Strain Microscopy
2010	Roland B. Snow Award, American Ceramics Society: Electrochemical Strain Microscopy
2010	R&D 100 Award for “Z-therm Modulated Thermal Analysis”
2010	Microscopy Today Innovation Award: Band Excitation

- 2008 Southeast FLC Excellence in Technology Transfer
- 2008 Materials Research Society Best Poster Award
- 2008 R&D 100, "Band Excitation Method for Scanning Probe Microscopy"
- 2008 Cosslett Award, best invited paper, Microscopy & MicroAnalysis Conference
- 2006 ORNL Director's Award, Outstanding Team Achievement in Science and Technology

### Patents

1 patent prepared, 1 patent submitted, 10 patents issued:

- 10400351: Bulk nanofabrication with single atomic plane precision via atomic-level sculpting
- 9,612,257: Full Information Acquisition in Scanning Probe Microscopy and Spectroscopy
- 9,541,576: Electrochemical Force Microscopy
- 8,719,961: Real Space Mapping of Ionic Diffusion and Electrochemical Activity in Energy Storage and Conversion Materials
- 8,752,211: Real Space Mapping of Oxygen Vacancy Diffusion and Electrochemical Transformations by Hysteretic Current Reversal Curve Measurements
- 8,540,542: Transparent Conductive Nano-Composites
- 8,484,759: Spatially Resolved Quantitative Mapping of Thermomechanical Properties and Phase Transition Temperatures Using Scanning Probe Microscopy
- 8,384,020: Spatially Resolved Thermal Desorption/Ionization Coupled with Mass Spectrometry
- 7,775,086: Band Excitation Method Applicable to Scanning Probe Microscopy
- 7,491,934: SEM Technique for Imaging and Measuring Electronic Transport in Nanocomposites Based on Electric Field Induced Contrast

### Professional Activities

President of a start-up company to commercialize technology I develop  
Chair Elect: American Physical Society Group on Instrumentation and Measurement Science  
Member of: Materials Research Society, AVS, APS  
2011, 2012 Lead organizer for two MRS symposia focused on SPM microscopy  
Workshops in advanced data analysis: Microscopy and Microanalysis 2017, 2018, Big Data Analysis workshop at ORNL, 2018, Materials Research Society Fall 2017, MRS webinar on atomic level manipulation.  
PhD Thesis Committee Member

### Publications

Author of >300 articles in refereed journals, H-index = 60 (google scholar)  
Including: 16 Nature family, 27 ACS Nano, 9 Advanced Materials, 10 Advanced Functional Materials, 10 Nano Letters, 8 PRL, 2 PNAS, 1 Science  
Full List: <https://scholar.google.com/citations?user=uiTAx2cAAAAJ&hl=en>