

# Jeremy Todd Busby

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Division Director

Materials Science and Technology Division  
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## Professional Experience and Education

- Division Director for Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN  
September 2015 – Present
- Group Leader for Nuclear Fuels and Materials Group, Oak Ridge National Laboratory, Oak Ridge, TN  
April 2013 – September 2015
- Group Leader for LWRS Group, Oak Ridge National Laboratory, Oak Ridge, TN  
April 2013 – September 2015
- Adjunct Assistant Professor of Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI  
November 2004 – September 2015
- Assistant Research Scientist in Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI  
January 2001 - November 2004
- Ph.D. in Nuclear Engineering: University of Michigan, Ann Arbor, MI  
December 2000
- Masters of Science in Nuclear Engineering: University of Michigan, Ann Arbor, MI  
December 1998
- Bachelor of Science in Nuclear Engineering: Kansas State University, Manhattan, KS  
Cum Laude,  
December 1998

## Awards and Honors

- *Presidential Early Career Award for Science and Engineering, 2010*
  - For “excellence in research leading to the development of high performance cast stainless steels, a critical part of the U.S. Contributions to ITER project, and for mentoring of students both as an Adjunct Assistant Professor at the University of Michigan and at ORNL.”

- *Secretary of Energy Achievement Award, 2011*
  - “For contributions to DOE's response to the earthquake and subsequent tsunami in Japan on March 11.”
- *ORNL Early Career Award for Engineering Accomplishment, 2007*
  - For “excellence in engineering materials research and development of high-performance cast stainless steels for critical application in ITER”
- *ORNL Significant Event Award, 2007*
  - For “achievement in development of improved cast stainless steels”
- *ANS Landis Young Member Achievement Award, 2006*
  - For “developing post-irradiation annealing as a recognized method for understanding IASCC and other irradiation-induced degradation processes”
- *Literary Award, ANS Materials Science and Technology Division, 2002*

## **Research Interests**

Radiation-induced degradation in nuclear structural materials, radiation-induced segregation, embrittlement, radiation-induced phase transformations, stress corrosion cracking, development of advanced reactor materials, advanced characterization techniques, small specimen testing, and development of novel testing methods.

## **Recent Research Experience (previous five years)**

- Technical Lead and Program Manager for Materials Aging and Degradation Pathway for Light Water Reactor Sustainability Program, 4/08 to present
  - Manage and lead national \$10M+/year research effort
  - Coordinate research at 5 US national laboratories and 12 US universities
  - Support and develop multinational collaborations
  - Principal Investigator on three research tasks
- Technical Lead (national) for DOE-NE Reactor Materials Cross-Cut, 8/09 to present
  - Manage and lead national coordination of nuclear material programs
  - Develop and support annual open funding opportunity and call for proposals
  - Principal Investigator on two research tasks
- Technical Lead and Program Manager (national) for AFCI/ARC Advanced Structural Materials Program, 4/07 to 9/11
  - Manage and lead national \$3M+/year research effort
  - Coordinate research at 3 US national laboratories and 2 US universities
  - Principal Investigator on three research tasks
- Technical Lead and Program Manager for US-ITER Cast Stainless Steel Development Program (First-Wall), 8/06 to 12/08
- Principal Investigator for Activated Corrosion Product Modeling for US-ITER Program (Cooling System), 9/07 to 12/08
- Reactor Materials Lead for NASA-DOE Space-Fission Power System Program, 1/07 to 3/08

## Publications

- H-index = 17 with over 100 citations per year since 2011 and over 200 citations in 2014
- Total of 98 authored or co-authored peer-reviewed publications (four are currently under review) with 28 as lead author
- Total of 85 peer-reviewed technical and programmatic reports (five are currently under review) with 39 as lead author
- Over 80 invited talks, presentations, seminars, and lectures

## Selected Publication Highlights

- J.T. Busby, P.J. Maziasz, A.F. Rowcliffe, M. Santella, and M. Sokolov, "Development of High Performance Cast Stainless Steels for Shield Module Applications," *J. Nucl. Mater.* Vol. **417**, 2011, p. 866-869.
- J.T. Busby, "Economic benefits of advanced materials in nuclear power systems," *J. Nucl. Mater.*, vol. **392**, 2 (2009), p. 301-306.
- E.A. Kenik and J.T. Busby, "Radiation-induced degradation of stainless steel light water reactor internals," *Mat. Science and Engineering R-Reports*, **73**, Issue 7-8 (2012), 67-83.
- J.T. Busby, G.S. Was, and E.A. Kenik, "Isolation of the Role of Radiation-Induced Segregation in Irradiation-Assisted Stress Corrosion Cracking of Proton-Irradiated Austenitic Stainless Steels," *J. Nucl. Mater.* **302** (2002) 20-40.
- S.J. Zinkle and J.T. Busby, "Structural materials for fission & fusion energy," *Materials Today*, **12**, Issue 11 (2009) 12-19.
- J.T. Busby, K.J. Leonard, and S.J. Zinkle, "Radiation-Damage in Molybdenum-Rhenium Alloys for Space Reactor Applications," *J. Nucl. Mater.*, Vol **366**, 3 (2007) 388.
- J.T. Busby, M.C. Hash, and G.S. Was, "The Relationship Between Hardness and Yield Stress in Irradiated Austenitic and Ferritic Steels," *J. Nucl. Mater.* Vol. **336**, 2-3 (2005), 267-278.
- "US Beats Britain to Fusion Super Steel," reported J. Mick, *Daily Tech*, Oct. 28, 2008.
  - More than 30 other publications of this study around the world

## Professional Activities and Service

- Dean of Modeling, Experiment and Validation (MeV) Summer School, 2009-present
- Chair of 2012 MeV Summer School on Nuclear Materials, 2011- 2012
- American Nuclear Society
- ANS Materials Science and Technology Division Executive Committee, 2004-present
- ANS Materials Science and Technology Division Chair, 2010-2011
- ANS Materials Science and Technology Division Vice Chair, 2009-2010
- ANS Materials Science and Technology Division Secretary/Treasurer, 2008-2009
- ANS Accelerator Applications Division Executive Committee, 2009-present
- The Minerals, Metals & Materials Society
- TMS Nuclear Materials Executive Committee, 2003-present

- Assistant Technical Program Chair for 13<sup>th</sup> International Symposium on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors, 2005-2007
- Technical Program Chair for 14<sup>th</sup> International Symposium on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors, 2007-2009
- General Program Chair for 15<sup>th</sup> International Symposium on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors, 2009-2011
- ASTM Editorial Board Member for 23<sup>rd</sup> ASTM Radiation Effects on Materials Conference, 2007
- Co-Chair for 22<sup>nd</sup> ASTM Radiation Effects on Materials Conference, 2003-2004
- Co-Chair for 23<sup>rd</sup> ASTM Radiation Effects on Materials Conference, 2005-2006
- Chair for 24<sup>th</sup> ASTM Radiation Effects on Materials Conference, 2007-2008
- Co-organizer for TMS 2010 Annual Meeting Special Session: Nuclear Energy Policies and Processes
- Co-organizer for Microscopy and Microanalysis 2010 Symposium on “Structural and Chemical Analysis of Materials in the Nuclear Power Industry”
- International Scientific Program Committee for IAEA International Conference on Fast Reactors and Closed Fuel Cycle, 2007-2009
- International Scientific Program Committee for Joint IAEA-EC Topical meeting on Development of New Structural Materials for Advanced Fission and Fusion Reactor Systems
- Member of Organization for Economic Cooperation and Development, Nuclear Energy Agency (OECD-NEA) Expert Group on Innovative Structural Materials, 2008-present

## **Teaching and Mentoring**

- Adjunct Assistant Professor of Nuclear Engineering and Radiological Sciences, University of Michigan
  - Developed and co-taught graduate level course (NERS 522: Radiation Materials Science II: Mechanical and Environmental Effects of Irradiation) in Winter 2009, Winter 2011, and Winter 2013 Terms
  - Served on PhD committee for Kale Stephenson (2011 to present)
  - Provided financial support and advice for 4 graduate students
- Recent mentoring (last three years)
  - University of Michigan: 1 undergraduate student, 5 graduate students and 1 post-doctoral researcher
  - University of Wisconsin: 2 graduate students and 1 post-doctoral researcher
  - University of Illinois: 1 graduate student
  - Ohio State University: 1 undergraduate student
  - Idaho State University: 1 graduate student
  - Penn State University: 1 graduate student and 1 post-doctoral researcher
  - University of Tennessee: 1 undergraduate student
  - University of California-Berkley: 2 graduate student and 1 post-doctoral researcher
- Assistant Scout Master: Boy Scouts, Troop 555, Knoxville TN (2011 to present)
- Technical Mentor: Hardin Valley Academy FIRST Robotics team (2014 to present)