

## Yanwen Zhang

Materials Science & Technology Division  
Oak Ridge National Laboratory  
1 Bethel Valley Rd., Oak Ridge, TN 37831

Director, EDDE, Distinguished R&D Staff  
Zhangy1@ornl.gov  
(865) 574-8518

### Education/Training:

Beijing Normal University, China	B.E.	1990	Solid State Physics
Beijing Normal University, China	M.S.	1993	Materials Science and Engineering
Lund Institute of Technology, Sweden	Ph.D.	1998	Nuclear Physics
Beijing Normal University, China	Ph.D.	1999	Materials Science and Engineering
Uppsala University, Sweden	Postdoc	1999-2000	Ion Beam Physics

### Professional Experience:

- 2010-present *Research Staff, Materials Science and Technology Division, Oak Ridge National Laboratory (ORNL), and Associate Professor, Department of Materials Science and Engineering, University of Tennessee (UT).*  
Director, Energy Frontier Research Center (EFRC) on Energy Dissipation to Defect Evolution (EDDE), developing a fundamental understanding of energy dissipation mechanisms in materials under irradiation. Deputy Director of the UT-ORNL Ion Beam Materials Laboratory, responsible for training of students and postdoc researchers in addition to management of routine operations. Research focusing on a broad range of topics in both theoretical and experimental aspects of interaction of ions and electrons with materials and how these interactions can be applied to the analysis and modification of materials, as well as the detection and characterization of charged particles.
- 2003-2010 *Staff Scientist / Senior Research Scientist, Pacific Northwest National Laboratory (PNNL).* PI and Co-PI on fundamental research projects in the fields of ion-beam physics and radiation physics with focus on radiation effects, ionization-induced recrystallization, electronic stopping in solids, radiation detection, and nanoscale defect/interface engineering.
- 2000-2003 *Assistant Professor, Division of Ion Physics, Uppsala University, Sweden.*

### Professional Activities, Honors, Awards:

- Co-organizer for symposiums: MRS Fall meetings on *Materials Research Needs to Advance Nuclear Energy* in 2009, *Advances in Materials for Nuclear Energy* in 2012, and *Defects and Radiation Effects in Advanced Materials* in 2014; EMRS Spring meeting on *Defect-induced effects in nanomaterials* in 2016. Symposiums and session organizer for the *International Conference on the Application of Accelerators in Research and Industry* in 2006, 2008, 2012 and 2014. Chair and co-organizer for the 16<sup>th</sup> International Conference on *Radiation Effects in Insulators* and the Summer School on *Materials Challenges for Advanced Nuclear Energy Systems* (2011) in Beijing, China.
- Recipient of the 2005 Presidential Early Career Award for Scientists and Engineers (PECASE) and recipient of the 2005 DOE Office of Science Early Career Scientist and Engineer Award.
- ORNL Significant Event (SEA) Awards in 2014, PNNL EMSL Director Award in 2006.
- Co-editor of book *Ion Beams in Nanoscience and Technology*, Whitlow, H. J., Hellborg, R., and Zhang, Y., (Editors), Springer Verlag, Berlin, 2009.
- Reviewer for scientific journals and of proposals for US and international funding agencies.

**Selected Publications** (over 250 refereed journal articles and conference proceedings including 68 as lead author; over 50 invited presentations):

1. Y. Zhang, G. M. Stocks, K. Jin, C. Lu, H. Bei, B. C. Sales, L. Wang, L. K. Béland, R. E. Stoller, G. D. Samolyuk, M. Caro, A. Caro, and W. J. Weber, "Influence of chemical disorder on energy dissipation and defect evolution in nickel and Ni-based concentrated solid-solution alloys," *Nat. Commun.* **6**, 8736 (2015).
2. Y. Zhang, R. Sachan, O. H. Pakarinen, M. F. Chisholm, P. Liu, H. Xue, and W. J. Weber, "Ionization-induced annealing of pre-existing defects in silicon carbide," *Nat. Commun.* **6**, 8049 (2015).
3. Y. Zhang, A. Debelle, A. Boule, P. Kluth, and F. Tuomisto, "Advanced Techniques for Characterization of Ion Beam Modified Materials," *Curr. Opin. Solid State Mater. Sci.* **19** [1]: 19-28 (2015).
4. W. J. Weber, D. M. Duffy, L. Thomé and Y. Zhang, "The role of electronic energy loss in ion beam modification of materials," *Curr. Opin. Solid State Mater. Sci.* **19** [1]: 1-11 (2015).
5. Y. Zhang, D. S. Aidhy, T. Varga, S. Moll, P. D. Edmondson, F. Namavar, K. Jin, C. N. Ostrouchov, and W. J. Weber, "The effect of electronic energy loss on irradiation-induced grain growth in nanocrystalline oxides," *Phys. Chem. Chem. Phys.* **16**, 8051–8059 (2014).
6. Y. Zhang, M. L. Crespillo, H. Xue, K. Jin, C.-H. Chen, C. L. Fontana, J. T. Graham, and W. J. Weber, "New Ion Beam Materials Laboratory for Materials Modification and Irradiation Effects Research," *Nucl. Instrum. Methods Phys. Res., Sect. B* **338**, 19–30 (2014).
7. Z. Tang, M. C. Gao, H. Diao, T. Yang, J. Liu, T. Zuo, Y. Zhang, Z. Lu, Y. Cheng, Y. Zhang, K. A. Dahmen, P. K. Liaw, and T. Egami, "Aluminum Alloying Effects on Lattice Types, Microstructures and Mechanical Behavior of High-Entropy Alloys Systems," *JOM* **65**, No. 12, 1848–1858 (2013).
8. Y. Zhang, M. Ishimaru, T. Varga, T. Oda, C. Hardiman, H. Xue, Y. Katoh, S. Shannon, and W. J. Weber, "Nanoscale Engineering of Radiation Tolerant Silicon Carbide," *Phys Chem Chem Phys* **14**, 13429 (2012).
9. C. M. Parish, P. D. Edmondson, Y. Zhang, and M. K. Miller, "Direct observation of ion-irradiation-induced chemical mixing," *J. Nucl. Mater.* **418**, 106–109 (2011).
10. M. K. Miller and Y. Zhang, "Fabrication and Characterization of APT Specimens from High Dose Heavy Ion Irradiated Materials," *Ultramicroscopy* **111**, 672–675 (2011).

**Collaborators from other Institutions** (past 48 months):

N. Chaâbane, C. Meis, CEA, INSTN, Unité d'Enseignement Pratique des Techniques du Nucléaire, F-91191 Gif-sur-Yvette, France; Y. Chang, Univ. of Science and Technology Beijing, China; A. Debelle, F. Garrido, L. Thomé, Centre de Spectrométrie Nucléaire et de Spectrométrie de Masse, CNRS-IN2P3-Université Paris-Sud; R. Devanathan, F. Gao, W. Jiang, V. Shutthanandan, S. Thevuthasan, T. Varga, Z. Zhu, Pacific Northwest National Laboratory; S. Shannon, North Carolina State Univ.; R.C. Ewing, Stanford Univ.; D.A. Grove, Luxel Corp.; A. Hallén, Uppsala Univ., Sweden; M. Ishimaru, Osaka Univ., Japan; J. Lian, Rensselaer Polytechnic Institute; J. Jagielski, A. Turos, L. Nowicki, Institute for Electronic Materials Technology, Poland; Marcel Toulemonde, CIMAP, France; X. Wang, Shandong Univ., China; J. Xue, Peking Univ., China

**Graduate and Postdoctoral Advisors:**

Ph.D. Advisor: H. J. Whitlow, Institut des Microtechnologies Appliquées Arc Haute Ecole Arc Ingénierie, Switzerland; T. Zhang, Beijing Normal University, China  
 Postdoctoral Sponsor: G. Possnert, Uppsala University, Sweden

**Thesis Advisor and Postgraduate-Scholar Sponsor** (past 60 months):

Ke Jin (ORNL); Haizhou Xue and Benjamin Aaron Petersen (University of Tennessee); Chune Lan, Weimin Zhang and Yuan Gao (Peking University); Peng Liu (Shandong University); Yongqin Chang (Univ. of Science and Technology Beijing, China); Chaozhuo Liu (China University of Petroleum, China)

Total number of graduate students advised: 7

Total number of postdoctoral scholars sponsored: 5