

Hee Joon Jung



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EDUCATION / CAREER

- 2016-Current **Research Associate**, Materials Science and Eng., *Northwestern University*, Evanston, IL, USA
2013-2015 **Postdoc**, Energy/Environmental Directorate, *Pacific Northwest National Laboratory*, WA, USA
2006-2013 **Ph.D.**, Materials Science and Eng., *Stanford University*, Stanford, CA, USA
- Advisor: Prof. Robert Sinclair – Stanford MSE Professor (TEM, Crystallography)
- Co-Advisor: Prof. Fritz B. Prinz – Stanford ME/MSE Professor (ALD, Solar cell, SOFC)
- Dissertation: Structural and Electronic Characterization on Energy-related Materials using TEM
1998-2005 **Dual B.S.**, Metallurgical / Ceramic Engineering, *Yonsei University*, Seoul, Korea

ACADEMIC ACHIEVEMENTS

2 patents (US/World), 40 archival refereed journal articles, 30 conference articles, 30 talks / 8 posters, & 6 Government reports. (List at next page, **Citation: 1560 and h-index: 21, 10-index: 34 as of 2020-02-21**).

RESEARCH AREA

- 2007-present **Quantum Dot Solar Cell** with multi-stacking PbS QW/QD structure and NW-QD hybrid structure using ALD with energetic particle-assisted annealing, bandgap engineering in PbS thin films by controlling ALD cycles, and understanding of anisotropic **Quantum Confinement** in dome-shaped PbS QD using STEM-VEELS [supported by Honda, DOE]
- 2008-present **Solid Oxide Fuel Cell** materials (YSZ / BYZ / GDC / YDC) deposited by ALD / PLD and **In-situ ETEM / Ex-situ (S)TEM-EELS/EDS** analysis under purging H₂ or O₂ gases at high temperature [supported by Honda, DOE]
- 2009-2013 **2nd Generation Thin-film Solar Cell** materials analysis (ZnS, CdS, CdO, CIGS, CZTS, TiO₂, Al₂O₃, Graphene, AZO, Zn_xCd_{1-x}S, Zn_xCd_{1-x}O) using ALD [supported by DOE]
- 2013-2015 **Nuclear Fusion Energy Reactor materials** using RAFM/ODS Ferritic Alloy under **Extreme He/Neutron Irradiation at high T** [supported by DOE, ORNL, PNNL]
- 2013-present **3D/2D Hybrid Organic-Inorganic Halide Perovskite/Si Tandem Solar cell** [supported by NSF]
- 2016-present **STEM Cell growth manipulation** using Remote magnetic media control [collabo with CUHK]
- 2018-present **2D Iodide Memristor for Neuromorphic computing** [supported by DOE, NSF]

SPECIALTIES / INSTRUMENTAL EXPERIENCE

- Specialties
- QD, QW, NW and thin film fabrication using **Atomic Layer Deposition**
 - Advanced energy nano-materials (**Solar cell and SOFC**)
 - Characterization on diverse energy materials fabricated by ALD / PLD / CVD / Sputtering / Sol-Gel using **in-situ S/TEM-EELS/EDS** (Cs/Cc aberration-corrected and monochromated) & image simulation for structural, mechanical, chemical & electronic understanding

ACADEMIC & RESEARCH ACTIVITIES

Teaching Assistant (Main 6 times, Subsidiary 4 times)

- Atomic Arrangements in Solids (**Fall 2007, Fall 2008, Fall 2009, Fall 2010**)
- Nanocharacterization of Materials (**Winter 2008**)
- Nanostructure and Characterization (**Winter 2009, Winter 2010, Winter 2011**)
- Introduction to Materials Science, Nanotechnology Emphasis (**Spring 2008, spring 2009**)

Research Mentoring

- Research Experiences for Undergraduates (REU) program (Summer 2009)
- DOE outreach research program for San Jose High school teacher (Summer 2011)
- Provided TEM training/analysis to several graduates/undergraduates (2008-2013)
- TEM Lab teaching at Northwestern University (Winter/Spring 2016, Fall 2017)

Collaborations with Multiple Groups/Companies (17 Groups / 5 Companies)

Mercouri Kanatzidis group (Northwestern CheE), Yi Cui group/Alberto Salleo group/Bruce Clemens (Stanford MSE), Stacey Bent group/ Thomas Jaramillo group (Stanford CheE), Olav Solgaard group (Stanford EE), Byungha Shin group/Seung Min Hang group (KAIST MSE), Neil P. Dasgupta group (UMich ME), Laurence J. Jacobs (Georgia Tech. CEE), Junqiao Wu (UC

Berkeley MSE), Shyni Varghese (UCSD BioE), G. R. Odette group (UCSB ME/MSE), Chongmin Wang/Nigel Browning (PNNL), Honda, Oracle, Sun Microsystems, Element Six, Samsung Electronics

Official Reporting / Proposal Experience

1. Annual reports participation of DOE-EFRC Center on Nanostructuring for Efficient Energy Conversion (CNEEC) at Stanford (3 times)
2. Nuclear Fusion reactor bi-annual government reports of DOE/ER at PNNL (6 times)
3. Bi-annual reports participation of Honda (Japan) solar cell project (4 times)
4. Proposal to the *National Center for Electron Microscopy (NCEM)* at LBNL (2 times)

PUBLICATIONS

US/World Patents

1. **Irradiation assisted nucleation of quantum confinements by atomic layer deposition.**
(US Patent No.: US8551868B2, World Patent No: 2011119231, Filed: 2011/09/29)
2. **Metal Silicide Nanowire Arrays for Anti-Reflective Electrodes in Photovoltaics.**
(US Patent No.: 20130149860, World Patent No.: 2013086482, Filed: 2012/12/10).

Refereed Journals

1. "Laser-Synthesized Epitaxial Graphene", Sangwon Lee, Michael F. Toney, Wonhee Ko, Jason C. Randel, [Hee Joon Jung](#), Ko Munakata, Jesse Lu, Theodore H. Geballe, Malcolm R. Beasley, Robert Sinclair, Hari C. Manoharan, and Alberto Salleo, *ACS Nano*, **Vol. 4**, No.12, 7524-7530 (2010).
2. "Atomic Layer Deposition of CdS Films", Jonathan R. Bakke, [Hee Joon Jung](#), Jukka T. Tanskanen, Robert Sinclair, and Stacey F. Bent, *Chem. Mater.* **22**, 4669-4678 (2010).
3. "Atomic layer deposition of ZnS via in situ production of H₂S", J.R. Bakke, J.S. King, [H.J. Jung](#), R. Sinclair, S.F. Bent, *THIN SOLID FILMS*. **518**. pp. 5400-5408 (2010).
4. "Scanning Tunneling Spectroscopy of Lead Sulfide Quantum Wells Fabricated by Atomic Layer Deposition for Band Gap Engineering", Wonyoung Lee, Neil P. Dasgupta, [Hee Joon Jung](#), Jung-Rok Lee, Robert Sinclair and Fritz B. Prinz, *Nanotechnology*, **21**, 485402, 4pp. (2010).
5. "Multi-functional Tunable Optical Filter Using MEMS Spatial Light Modulator", Jae-Woong Jeong, Il Woong Jung, [Hee Joon Jung](#), Douglas M. Baney, and Olav Solgaard, *J MICROELECTROMECH S.* **Vol. 19**, No.3, 610-618 (2010).
6. "Atomic Layer Deposition of Lead Sulfide Quantum Dots on Nanowire Surfaces", Neil Dasgupta*, [Hee Joon Jung*](#), Orlando Trejo, Matthew T. McDowell, Aaron Hryciw, Mark Brongersma, Robert Sinclair and Fritz B. Prinz, *Nano Lett.*, **11 (3)**, pp 934-940 (2011). (*: **equally contributed**)
7. "Crater patterned 3-D proton conducting ceramic fuel cell architecture with ultra thin Y:BaZrO₃ electrolyte", Y.B. Kim, T.M. Gur, S. Kang, [H.J. Jung](#), R. Sinclair, F.B. Prinz, *Electrochem Commun.*, **Vol. 13**, Issue 5, pp. 403-406 (2011).
8. "Effect of crystallinity on ionic conductivity of Y-doped Barium Zirconate", Y.B. Kim, T.M. Gur, [H.J. Jung](#), S. Kang, R. Sinclair, F.B. Prinz, *Solid State Ionics*, **Vol. 198**, Issue 1, 19, 39-46 (2011).
9. "Atomic Layer Deposition of Cd_xZn_{1-x}S Films", Jonathan. R. Bakke, Jukka T. Tanskanen, [Hee Joon Jung](#), Robert Sinclair, Stacey F. Bent, *J. Mater. Chem.*, **21**, 743-751 (2011).
10. "Oxygen Surface Exchange at Grain Boundaries of Oxide Ion Conductors", Wonyoung Lee, [Hee Joon Jung](#), Min Hwan Lee, Young-Beom Kim, Joong Sun Park, Robert Sinclair, and Fritz B. Prinz, *Adv. Funct. Mater.*, **Vol. 22**, Issue 5, 965-971 (2012).

11. "Nickel Silicide Nanowire Arrays for Anti-Reflective Electrodes in Photovoltaics", Neil P. Dasgupta, Shicheng Xu, [Hee Joon Jung](#), Andrei Iancu, Rainer Fasching, Robert Sinclair, Fritz B. Prinz, *Adv. Funct. Mater.*, **Vol. 22**, Issue 17, 3650-3657 (2012).
12. "Structural and Compositional Analysis of Solid Oxide Fuel Cell Electrolytes using Spectroscopy and Transmission Electron Microscopy", Jihwan An, Young Beom Kim, [Hee Joon Jung](#), Joong Sun Park, Suk Won Cha, Turgut M. Gür and Fritz B. Prinz, *Int. J. Precis. Eng. Man.*, **Vol. 13**, Issue 7, 1273-1279 (2012).
13. "In Situ Cycle-by-Cycle Flash Annealing of Atomic Layer Deposited Materials", Michael Langston, Neil Dasgupta, [Hee Joon Jung](#), Manca Logar, Yu Huang, Robert Sinclair, Fritz Prinz, *J. Phys. Chem. C*, **116**, 45, 24177-24183 (2012).
14. "Spatial Variation of Available Electronic Excitations within Individual Quantum Dots", [Hee Joon Jung](#), Neil P. Dasgupta, Philip B. Van Stockum, Ai Leen Koh, Robert Sinclair, *Nano Lett.*, **13**, 2, 716-721 (2012).
15. "Critical-Temperature/Peierls-Stress Dependent Size Effects in Body Centered Cubic Nanopillars," Seung Min Han, Gang Feng, Joo Young Jung, [Hee Joon Jung](#), James R. Groves, William D. Nix, Yi Cui, *Applied Physics Letter*, **102**, 041910 (2013).
16. "Atomic Layer Deposition of CdO and Cd_xZn_{1-x}O Films", Jonathan. R. Bakke, Carl Hägglund, [Hee Joon Jung](#), Robert Sinclair, Stacey F. Bent, *Mater Chem Phys*, **Vol. 140**, Issues 2-3, 465-471 (2013).
17. "Atomic Scale Verification of Oxide-Ion Vacancy Distribution near a Single Grain Boundary in YSZ", Jihwan An, Joong Sun Park, Ai Leen Koh, Hark B. Lee, [Hee Joon Jung](#), Joop Schoonman, Robert Sinclair, Turgut M. Gür, and Fritz B. Prinz, *Scientific reports*, **3**, 2680 (2013).
18. "Nanotubular Array Solid Oxide Fuel Cell", Munekazu Motoyama, Cheng-Chieh Chao, Jihwan An, [Hee Joon Jung](#), Turgut M. Gür, Friedrich B. Prinz, *ACS Nano*, **8**, 1, 340-351 (2013).
19. "Doping against the Native Propensity of MoS₂: Degenerate Hole Doping by Cation Substitution", Joonki Suh, Tae-Eon Park, Der-Yuh Lin, Deyi Fu, Joonsuk Park, [Hee Joon Jung](#), Yabin Chen, Changhyun Ko, Chaun Jang, Yinghui Sun, Robert Sinclair, Joonyeon Chang, Sefaattin Tongay, and Junqiao Wu, *Nano Lett.*, **14** (12), 6976-6982 (2014).
20. "Nonlinear ultrasonic characterization of precipitation in 17-4PH stainless steel", Kathryn H. Matlack, Harrison Bradley, Sebastian Thiele, Jin-Yeon Kim, James J. Wall, [Hee Joon Jung](#), Jianmin Qu, Laurence J. Jacobs, *NDT & E International*, **71**, 8-15 (2015).
21. "Magnesium behavior and structural defects in Mg⁺ ion implanted silicon carbide", Weilin Jiang, [Hee Joon Jung](#), Libor Kovarik, Zhaoying Wang, Timothy J. Rosendaal, Zihua Zhu, Danny J. Edwards, Shenyang Hu, Charles H. Henager Jr., Richard J. Kurtz, Yongqiang Wang, *J. Nucl. Mater.*, **458**, 146-155 (2015).
22. "Diffusion of Ag, Au and Cs implants in MAX phase Ti₃SiC₂", Weilin Jiang, Charles H. Henager Jr., Tamas Varga, [Hee Joon Jung](#), Nicole R. Overman, Chonghong Zhang, and Jie Gou, *J. Nucl. Mater.*, **462**, 310-320 (2015).
23. "Hierarchical ZnO Nanowire Growth with Tunable Orientations on Versatile Substrates Using Atomic Layer Deposition Seeding", Ashley R. Bielinski, Eric Kazyak, Christian M. Schlepütz, [Hee Joon Jung](#), Kevin N. Wood and Neil P. Dasgupta, *Chem. Mater.* **27** (13), 4799-4807 (2015).
24. "Hard carbon coated nano-Si/graphite composite as a high performance anode for Li-ion batteries", S. Jeong, X. Li, J. Zheng, P. Yan, R. Cao, [H. J. Jung](#), C. Wang, J. Liu and J.G. Zhang, *J. Power Sources*, **329**, 323-329 (2016).

25. "Can Cr(III) substitute for Al(III) in the structure of Boehmite?", Chatterjee S, M. A. Conroy, F. N. Smith, [H. J. Jung](#), Z. Wang, R. A. Peterson, A. Huq, D. G. Burt, E. S. Ilton, and E. C. Buck, *RSC Advances*, **6** (109), 107628-107637 (2016).
26. "Structural and chemical evolution in neutron irradiated and helium-injected ferritic ODS PM2000 alloy", [H. J. Jung](#), D. J. Edwards, R. J. Kurtz, T. Yamamoto, Yuan Wu and G. Robert Odette, *J. Nucl. Mater.*, **462**, 310-320 (2017).
27. "Remote Control of Multimodal Nanoscale Ligand Oscillations Regulates Stem Cell Adhesion and Differentiation", Heemin Kang, Dexter Siu Hong Wong, Xiaohui Yan, [Hee Joon Jung](#), Sungkyu Kim, Sien Lin, Kongchang Wei, Gang Li, Vinayak P. Dravid and Liming Bian, *ACS Nano*, **11** (10), 9636-9649 (2017).
28. "Remote manipulation of ligand nano-oscillations regulates adhesion and polarization of macrophages in vivo", Heemin Kang, Sungkyu Kim, Dexter Siu Hong Wong, [Hee Joon Jung](#), Sien Lin, Kaijie Zou, Rui Li, Gang Li, Vinayak P Dravid and Liming Bian, *Nano letters*, **17** (10), 6415-6427 (2017).
29. "Precipitates and voids in cubic silicon carbide implanted with 25Mg⁺ ions", Weilin Jiang, Steven R Spurgeon, Jia Liu, Daniel K Schreiber, [Hee Joon Jung](#), Arun Devaraj, Danny J. Edwards, Charles H Henager Jr., Richard J Kurtz and Yongqiang Wang, *J. Nucl. Mater.*, **498**, 321-331 (2018).
30. "Unique [Mn₆Bi₅]⁻ Nanowires in KMn₆Bi₅: A Quasi-One-Dimensional Antiferromagnetic Metal", Jin-Ke Bao, Zhang-Tu Tang, [Hee Joon Jung](#), Ji-Yong Liu, Yi Liu, Lin Li, Yu-Ke Li, Zhu-An Xu, Chun-Mu Feng, Haijie Chen, Duck Young Chung, Vinayak P Dravid, Guang-Han Cao and Mercouri G Kanatzidis, *J. Am. Chem. Soc.*, **140** (12) 4391-4400 (2018).
31. "Remote Control of Heterodimeric Magnetic Nanoswitch Regulates the Adhesion and Differentiation of Stem Cells", Heemin Kang*, [Hee Joon Jung*](#), Dexter Siu Hong Wong, Sung Kyu Kim, Sien Lin, Kai Fung Chan, Li Zhang, Gang Li, Vinayak P Dravid and Liming Bian, *J. Am. Chem. Soc.*, **140** (18), 5909-5913 (2018).
(*: equally contributed)
32. "High spectral resolution of gamma-rays at room temperature by perovskite CsPbBr₃ single crystals", Yihui He, Liviu Matei, [Hee Joon Jung](#), Kyle M McCall, Michelle Chen, Constantinos C. Stoumpos, Zhifu Liu, John A. Peters, Duck Young Chung, Bruce W. Wessels, Michael R. Wasielewski, Vinayak P. Dravid, Arnold Burger and Mercouri G. Kanatzidis, *Nat. Commun.*, **9** (1), 1609 (2018).
33. "Magnetic Manipulation of Reversible Nanocaging Controls In Vivo Adhesion and Polarization of Macrophages", Heemin Kang, [Hee Joon Jung](#), Sung Kyu Kim, Dexter Siu Hong Wong, Sien Lin, Gang Li, Vinayak P Dravid and Liming Bian, *ACS Nano*, **12** (6), 5978-5994 (2018).
34. "Nanoparticle@MoS₂ Core-Shell Architecture: Role of the Core Material", Jennifer G. DiStefano, Yuan Li, [Hee Joon Jung](#), Shiqiang Hao, Akshay A. Murthy, Xiaomi Zhang, Chris Wolverton and Vinayak P. Dravid, *Chem. Mater.*, **30** (14), 4675-4682 (2018).
35. "In Situ Observation of Resistive Switching in an Asymmetric Graphene Oxide Bilayer Structure", Sungkyu Kim, [Hee Joon Jung](#), Jong Chan Kim, Kyung-Sun Lee, Sung Soo Park, Vinayak P Dravid, Kai He and Hu Young Jeong, *ACS Nano*, **12** (7), 7335-7342 (2018).
36. "Stability of Halide Perovskite Solar Cell Devices: In Situ Observation of Oxygen Diffusion under Biasing", [Hee Joon Jung](#), Daehan Kim, Sungkyu Kim, Joonsuk Park, Vinayak P. Dravid and Byungha Shin, *Adv. Mater.*, **30**, 1802769 (2018).
37. "An In Situ Reversible Heterodimeric Nanoswitch Controlled by Metal-Ion-Ligand Coordination Regulates the Mechanosensing and Differentiation of Stem Cells", Heemin Kang, Kunyu Zhang, [Hee Joon Jung](#), Boguang Yang, Xiaoyu Chen, Qi Pan, Rui Li, Xiayi Xu, Gang Li, Vinayak P. Dravid and Liming Bian, *Adv. Mater.*, **30**, 1803591 (2018).

38. “MoS₂-capped Cu_xS nanocrystals: a new heterostructured geometry of transition metal dichalcogenides for broadband optoelectronics”, Yuan Li, Akshay A. Murthy, Jennifer G. DiStefano, [Hee Joon Jung](#), Shiqiang Hao, Cesar J. Villa, Chris Wolverton, Xinqi Chen, Vinayak P. Dravid, *Mater. Horiz.*, **6** (3), 587-594 (2019).
39. “Self-passivation of 2D Ruddlesden–Popper perovskite by polytypic surface PbI₂ encapsulation”, [Hee Joon Jung](#), Constantinos Stompus, Mercouri G. Kanatzidis and Vinayak P. Dravid, *Nano Letters*, **19** (9), 6109-6117 (2019).
40. “Unconventional Defects in Quasi-One-Dimensional Structures”, [Hee Joon Jung](#), Jin-Ke Bao, Duck Young Chung, Mercouri G. Kanatzidis and Vinayak P. Dravid, *Nano Letters*, **19** (10), 7476-7486 (2019).
41. “26.7% perovskite/Si tandem cells enabled by efficient and stable wide bandgap perovskite via anion-engineered two-dimensional additives”, Daehan Kim*, [Hee Joon Jung*](#), Ik Jae Park*, Bryon W. Larson, Sean P. Dunfield, Chuanxiao Xiao, Jekyung Kim, Jinhui Tong, Passarut Boonmongkolras, Su Geun Ji, Fei Zhang, Seong Ryul Pae, Minkyu Kim, Vinayak Dravid, Joseph J. Berry, Jin Young Kim, Kai Zhu, Dong Hoe Kim, and Byungha Shin, under review. (* equally contributed)
42. “Ion migration and Memristor-like Behavior in Nanoscale Separated 2D (PbI₂)_{1-x}(BiI₃)_x Iodides”, Grant C. B. Alexander, [Hee Joon Jung](#), Patrick W. Krantz, Giancarlo Trimarchi, Kyle M. McCall, Sam Davis, Yaobin Xu, Bruce W. Wessels, Vinayak P. Dravid, Venkat Chandrasekar and Mercouri G. Kanatzidis, under review.
43. “*In-situ* Environmental STEM-EELS Characterization under H₂ at 700 °C on Enhanced Electrochemical Activity at Grain Boundaries of Ytria-Doped Ceria Fuel Cell Electrode”, [Hee Joon Jung](#), Joong Sun Park, Jihwan An, Ai Leen Koh, Wonyoung Lee, Turgut M. Gür, Robert Sinclair and Fritz B. Prinz, in preparation.
44. “In-situ observation of filament formation in 2D (PbI₂)_{1-x}(BiI₃)_x Iodides Memristor”, [Hee Joon Jung](#), Grant C. B. Alexander, Akshay A. Murthy, Mercouri G. Kanatzidis and Vinayak P. Dravid, under review.

Conference articles (proceedings, transaction or abstract)

1. “In Situ and High Resolution TEM Studies of Nano-scale Materials”, R Sinclair, AL Koh, P Kempen and [HJ Jung](#), *Microsc. Microanal.*, **15** (Suppl. 2), pp 1200-1201 (2009).
2. “TEM Study on PbS Quantum Dots Made by Atomic Layer Deposition and Their Behavior Under E-beam Irradiation”, [Hee Joon Jung](#), Neil P. Dasgupta, Fritz B. Prinz and Robert Sinclair, *Microsc. Microanal.* **16** (Suppl 2), pp 1376-1377 (2010).
3. “Local Charge Distribution Near Grain Boundaries of Nanocrystalline GDC”, Wonyoung Lee, Minhwan Lee, [Hee Joon Jung](#) and Fritz Prinz, Abstract 724, 217th ECS Meeting (2010)
4. “Effects of Deposition Temperature on Electrochemical Properties in Atomic Layer Deposited Electrolytes”, Cheng-Chieh Chao, [Hee Joon Jung](#) and Fritz Prinz, Abstract 257, 218th ECS Meeting (2010).
5. “Laser-assisted Synthesis of Epitaxial Graphene on SiC”, Sangwon Lee, Michael F. Toney, Wonhee Ko, [Hee Joon Jung](#), Hari C. Manoharan, Robert Sinclair and Alberto Salleo, 2010 spring MRS abstract (2010).
6. “Conformal Coating of Size-Controlled Lead Sulfide Quantum Dots by Atomic Layer Deposition and Irradiation”, [Hee Joon Jung](#), Neil Dasgupta, Orlando Trejo, Matthew T. McDowell, Aaron Hryciw, Mark Brongersma, Fritz B. Prinz and Robert Sinclair, 2010 fall MRS abstract (2010).
7. “Graded and alloyed II-VI semiconductors for photovoltaic buffer layers grown by atomic layer deposition (ALD)”, Jonathan R. Bakke, Carl Hägglund, [Hee Joon Jung](#), Robert Sinclair, and Stacey F. Bent, Photovoltaic Specialists Conference (PVSC), 2011 37th IEEE Proceedings (2011, DOI: [10.1109/PVSC.2011.6186503](https://doi.org/10.1109/PVSC.2011.6186503)).

8. "Proton Conduction in Epitaxial and Polycrystalline Yttrium-doped Barium Zirconate Thin Films", Young Beom Kim, Turgut M. Gür, [Hee-Joon Jung](#), Sangkyun Kang, and Fritz B. Prinz, Abstract 271, 219th ECS Meeting, The Electrochemical Society, ECS Meeting Abstracts (2011).
9. "3-Dimensional Proton Conducting Ceramic Fuel Cell Architecture Using Nanosphere Patterning", YB Kim, TM Gür, S Kang, [HJ Jung](#), FB Prinz, Abstract 633, 219th ECS Meeting, ECS Meeting Abstracts (2011)
10. "Local Bandgap Change Measurement within a Dome-shaped PbS Quantum Dot Using STEM-VEELS", [H.J. Jung](#), N.P. Dasgupta, A.L. Koh, P. Van Stockum, M.C. Langston, V. Radmilovic, F.B. Prinz, 2011 fall MRS Abstract (2011).
11. "Nickel Silicide Nanowire Arrays for Anti-reflective Electrodes in Photovoltaics", Neil P. Dasgupta, Shicheng Xu, [Hee Joon Jung](#), Andrei Iancu, Rainer Fasching, Robert Sinclair, Fritz B. Prinz, 2012 spring MRS Abstract (2012).
12. "Shape-Induced Bandgap Variations Within a Single Quantum Dot", [Hee Joon Jung](#), Neil P. Dasgupta, Philip B. Van Stockum, Ai Leen Koh, Robert Sinclair and Fritz B. Prinz, 2012 fall MRS Abstract (2012).
13. "Atomic Resolution Imaging of Oxygen Columns in Oxide Ion Conductor Using HRTEM", Jihwan An, Ai Leen Koh, Joong Sun Park, [Hee Joon Jung](#), Turgut M. Gür and Fritz B. Prinz, Abstract 1893, Honolulu PRiME 2012 ECS Meeting Abstracts (2012).
14. "Critical-Temperature/Peierls-Stress Dependent Size Effects in Body Centered Cubic Nanopillars", Seung Min Han, Gang Feng, Joo Young Jung, [Hee Joon Jung](#), James R. Groves, William D. Nix, Yi Cui, 2013 ECI Conference (Nanomechanical Testing in Materials Research and Development IV) Abstract (2013).
15. "TEM Characterization of He Effects in First-Wall Structural Materials Under Fusion Relevant Conditions" Bo Yao, Richard J. Kurtz, Danny J. Edwards, Alicia G. Certain, [Hee Joon Jung](#), Robert G. Odette, Takuya Yamamoto, 16th International Conference on Fusion Reactor Materials (ICFRM) Abstract (2013).
16. "Spatial Variation of Available Electronic Excitations Within Individual Quantum Dots", N.P. Dasgupta, [H.J. Jung](#), P.B. Van Stockum, A.L. Koh, Robert Sinclair, F.B. Prinz, 2013 fall MRS abstract (2013).
- 17 "Co-nucleation of Dislocation Loops and He Bubbles in Neutron Irradiated Ferritic Alloys", Dan Edwards, [Hee Joon Jung](#), Rick Kurtz, G. Robert Odette, Takuya Yamamoto, Bo Yao", 2014 TMS San Diego abstract (2014).
18. "He Irradiation Effects in Oxide-Dispersion-Strengthened (ODS) Ferritic Alloy Under Fusion Relevant Conditions" [Hee Joon Jung](#), Dan Edwards, Alicia Certain, Takuya Yamamoto, G. Robert Odette and Richard Kurtz, 2014 spring MRS abstract (2014).
19. "Recent Applications of an Aberration-Corrected ARM 200cF at PNNL", [Hee Joon Jung](#), Danny Edwards, Matthew J. Olszta, Weilin Jiang, Rick Kurtz, Charles H. Henager, Robert G. Odette, Joonki Suh, Junqiao Wu, Joonsuk Park, Robert Sinclair, Heemin Kang, Shyni Varghese, 2014 AVS joint with PREMIER abstract (2014).
20. "Progress on Understanding Helium--Displacement Damage Interaction Effects on Void Swelling in Tempered Martensitic Steels" G. Robert Odette, , Takuya Yamamoto, Yuan Wu, Peter B Wells, Stephan Kraemer, [Hee Joon Jung](#), Danny J. Edwards and Richard Kurtz, TMS 2015 144th Orlando abstract (2015).
21. "Simultaneous He/neutron Irradiation Effects On Oxide-Dispersion-Strengthened (ODS) Ferritic Alloy", [Hee Joon Jung](#), Danny J. Edwards, Alicia Certain, Richard Kurtz, Takuya Yamamoto, Yuan Wu and G. Robert Odette, 17th International Conference on Fusion Reactor Materials (ICFRM) Abstract (2015).
22. "Improving Fracture Toughness of 9cr and 14cr Nanostructured Ferritic Alloys", Thak Sang Byun , D. T. Hoelzer, [Hee Joon Jung](#), Jeoung Han Kim, Stuart A. Maloy, 17th International Conference on Fusion Reactor Materials (ICFRM) Abstract (2015).

23. “Magnesium Behavior and Microstructural Features in Mg Ion Implanted Silicon Carbide”, Weilin Jiang, [Hee Joon Jung](#), Libor Kovarik, Zhaoying Wang, Timothy J. Roosendaal, Zihua Zhu, Danny J. Edwards, Shenyang Hu, Charles H. Henager Jr., Richard J. Kurtz, Yongqiang Wang, 17th International Conference on Fusion Reactor Materials (ICFRM) Abstract (2015).
24. “In Situ He Injection and Dual Ion Irradiation Studies of Reduced Activation Tempered Martensitic Steels and Nanostructured Ferritic Alloys”, G. Robert Odette, , Takuya Yamamoto, Yuan Wu, Danny J. Edwards, [Hee Joon Jung](#), Richard Kurtz, Peter B Wells, Stephan Kraemer, Hee Joon Jung, Kiyohiro Yabuuchi, Sosuke Kondo, Akihiko Kimura, 17th International Conference on Fusion Reactor Materials (ICFRM) Abstract (2015).
25. “Correlative Imaging and Spectroscopy of Particles in Liquid”, Xiao-Ying Yu, Xiao Sui, Tyler Troy, Bruce Arey, Biswajit Bandyopadhyay, [Hee Joon Jung](#), Libor Kovarik, Musa Ahmed and Zihua Zhu, *Microsc. Microanal. Abstrct* (2016).
26. “Operando Injection of Oxygen Ions to Organometal Halide Perovskite (CH₃NH₃PbI₃) under In-Situ Electrical Biasing STEM-EELS”, [Hee Joon Jung](#), Daehan Kim, Sungkyu Kim, Byungha Shin, Vinayak P. Dravid, *Microsc. Microanal.* **23** (Suppl 1), pp 1976-1977 (2017).
27. “Dynamic Surface Reconstruction of 2D Ruddlesden-Popper Halide Perovskite under e-Beam Irradiation”, [Hee Joon Jung](#), Constantinos C. Stoumpos, Mercouri G. Kanatzidis, Vinayak P. Dravid, *Microsc. Microanal.* **24** (Suppl 1), pp 1490-1491 (2018).
28. “Role of Anomalous Channeling on HAADF in a Quasi-ID KMn₆Bi₅ Structure”, [Hee Joon Jung](#), Jin-Ke Bao, Duck Young Chung, Mercouri G. Kanatzidis, Vinayak P. Dravid, *Microsc. Microanal.* **24** (Suppl 1), pp 1704-1705 (2018).
29. “Memristor Behavior, Novel Electronic Properties, and Structural Secrecy in (PbI₂)_n(BiI₃)_m Mixtures”, Grant C. B. Alexander, [Hee Joon Jung](#), Patrick Krantz, Giancarlo Trimarchi, Kyle M. McCall, Bruce W. Wessels, Vinayak P. Dravid, Venkat Chandrasekar & Mercouri G. Kanatzidis, 2018 fall MRS abstract (2018).
30. “Identification of Anion Sites in BiCuXO (X= Se, S) Heteroanionic Materials”, Chi Zhang, [Hee Joon Jung](#), Xiaobing Hu, Roberto dos Reis, Akshay Murthy, Kenneth R Poeppelmeier, Vinayak P Dravid, *Microsc. Microanal.* **25** (Suppl 2), pp 2106-2107 (2019).

Conference (Meeting) presentation/poster (including co-authored), and invited talk/seminar

1. 2009 Microscopy and Microanalysis conference talk: R. Sinclair, A.L. Koh, P. Kempen and [H.J. Jung](#), “In Situ and High Resolution TEM Studies of Nano-scale Materials”. Microscopy and Microanalysis 2009 in Richmond, Virginia, USA, July 26-30, 2009.
2. 2009 AVS 9th International Conference talk on Atomic Layer Deposition: Neil P. Dasgupta, Wonyoung Lee, [Hee Joon Jung](#), and Fritz B. Prinz, “Bandgap Engineering in Lead Sulfide Quantum Wells by ALD”, 2009, AVS 9th International Conference on Atomic Layer Deposition, Monterey, CA, July 19-22, 2009.
3. 2010 Stanford CNEEC talk: [Hee Joon Jung](#), Fritz Prinz and Robert Sinclair, “TEM Studies on Nano Structure Materials for Energy Applications”, Center on Nanostructuring for Efficient Energy Conversion meeting, Stanford, CA, March 8, 2010.
4. 2010 ACS lecture talk: J.R. Bakke, [H.J. Jung](#), J.S. King, R. Sinclair, and S.F. Bent, “Deposition of ZnS and CdS for graded CIGS buffer layers via ALD,” American Chemical Society, San Francisco, CA, March 2010.
5. 2010 MRS talk: Sangwon Lee, Michael F. Toney, Wonhee Ko, [Hee Joon Jung](#), Hari C. Manoharan, Robert Sinclair and Alberto Salleo, “Laser-assisted Synthesis of Epitaxial Graphene on SiC”, 2010 spring MRS, San Francisco, April 5-9, 2010.

6. 2010 ECS talk: Wonyoung Lee, Minhwan Lee, [Hee Joon Jung](#) and Fritz B. Prinz, “Local Charge Distribution near Grain Boundaries of Nanocrystalline GDC” 2010 217th Electrochemical Society talk abstract, Vancouver, Canada, April 25-30, 2010.
7. 2010 Microscopy and Microanalysis conference talk: [Hee Joon Jung](#), Neil P. Dasgupta, Fritz B. Prinz and Robert Sinclair, “TEM Study on PbS Quantum Dots Made by Atomic Layer Deposition and Their Behavior Under E-beam Irradiation”, Microscopy and Microanalysis 2010 in Portland, Oregon, USA, Aug 1-5, 2010.
8. 2010 SPIE invited talk: Sangwon Lee, Michael F. Toney, Wonhee Ko, [Hee Joon Jung](#), Hari C. Manoharan, Robert Sinclair and Alberto Salleo, “Synthesis of epitaxial graphene using laser decomposition of SiC”, 2010 SPIE, San Diego, August 3-5, 2010
9. 2010 AVS 10th International Conference talk on Atomic Layer Deposition: Neil P. Dasgupta, [Hee Joon Jung](#), Orlando Trejo, Robert Sinclair, and Fritz B. Prinz, “Nucleation of PbS Quantum Dots by ALD”, 2010 AVS 10th International Conference on Atomic Layer Deposition, Seoul, South Korea, June 2010.
10. 2010 AVS 10th International Conference talk on Atomic Layer Deposition: W. Lee, N. P. Dasgupta, [H. J. Jung](#), J.-R. Lee and F. B. Prinz, “Scanning Tunneling Spectroscopy of Lead Sulfide Quantum Wells for Bandgap Engineering”, Seoul, South Korea, June 2010.
11. 2010 ECS talk: Cheng-Chieh Chao, [Hee Joon Jung](#), Fritz B. Prinz, “Effects of Deposition Temperature on Electrochemical Properties in Atomic Layer Deposited Electrolytes”, 2010 fall ECS, Las Vegas, October 10-15, 2010.
12. 2010 CNEEC External Advisory Board Meeting poster: [Hee Joon Jung](#), Neil Dasgupta, Orlando Trejo, Matthew T. McDowell, Aaron Hryciw, Mark Brongersma, Fritz B. Prinz and Robert Sinclair, “Conformal Deposition of Size-Controlled Lead Sulfide Quantum Dots by Atomic Layer Deposition and e-beam Irradiation”, Center on Nanostructuring for Efficient Energy Conversion meeting at Stanford, Nov 2, 2010.
13. 2010 Stanford CNEEC talk: [Hee Joon Jung](#), Neil Dasgupta, Wonyoung Lee, Tim Holm, Mike Langston, Young-Beom Kim, Turgut Gur, Fritz B. Prinz and Robert Sinclair, “TEM, EFTEM (Energy-Filtered), and STEM-EELS / EDS Studies on Energy-related Materials”, Center on Nanostructuring for Efficient Energy Conversion meeting, Stanford, CA, Nov 15, 2010.
14. 2010 MRS Boston talk: [Hee Joon Jung](#), Neil Dasgupta, Orlando Trejo, Matthew T. McDowell, Aaron Hryciw, Mark Brongersma, Fritz B. Prinz and Robert Sinclair, “Conformal Coating of Size-Controlled Lead Sulfide Quantum Dots by Atomic Layer Deposition and Irradiation”, 2010 fall MRS, Boston, Nov 29 - Dec 3, 2010.
15. 2011 Department of Energy’s Office of Science Energy Frontier Research Centers Summit and Forum (Science for Our Nation’s Energy Future) poster: [Hee Joon Jung](#), “Conformal coating of size-controlled Lead Sulfide Quantum Dots by Atomic Layer Deposition and Irradiation”, Washington D.C., May 24-28, 2011.
16. 2011 219th ECS talk: Young Beom Kim, Turgut M. Gür, [Hee-Joon Jung](#), Sangkyun Kang, and Fritz B. Prinz, “Proton Conduction in Epitaxial and Polycrystalline Yttrium-doped Barium Zirconate Thin Films”, 219th ECS Meeting, Montreal, QC, Canada, May 1-6, 2011.
17. 2011 37th IEEE Proceedings, Photovoltaic Specialists Conference (PVSC), “Graded and alloyed II-VI semiconductors for photovoltaic buffer layers grown by atomic layer deposition (ALD)”, Jonathan R. Bakke, Carl Hägglund, [Hee Joon Jung](#), Robert Sinclair, and Stacey F. Bent, Seattle, WA, June 19-24, 2011.
18. 2011 MRS Boston poster: [H.J. Jung](#), N.P. Dasgupta, A.L. Koh, P. Van Stockum, M.C. Langston, V. Radmilovic, F.B. Prinz and R. Sinclair, “Local Bandgap Change Measurement within a Dome-shaped PbS Quantum Dot Using STEM-VEELS”, 2011 fall MRS, Boston, Nov 28 - Dec 2, 2011.

19. 2012 MRS San Francisco talk: Neil P. Dasgupta, Shicheng Xu, [Hee Joon Jung](#), Andrei Iancu, Rainer Fasching, Robert Sinclair, Fritz B. Prinz, “Nickel Silicide Nanowire Arrays for Anti-Reflective Electrodes in Photovoltaics”, 2012 spring MRS, San Francisco, April 9-13, 2012.
20. 2012 ECS PRiME Meeting talk: Jihwan An, Ai Leen Koh, Joong Sun Park, [Hee Joon Jung](#), Turgut M. Gür and Fritz B. Prinz, “Atomic Resolution Imaging of Oxygen Columns in Oxide Ion Conductor Using HRTEM”, Honolulu, HI, October 7-12, 2012.
21. 2013 ECI Conference talk (Nanomechanical Testing in Materials Research and Development IV): Seung Min Han, Gang Feng, Joo Young Jung, [Hee Joon Jung](#), James R. Groves, William D. Nix, Yi Cui, “Critical-Temperature/Peierls-Stress Dependent Size Effects in Body Centered Cubic Nanopillars”, Olhão, Algarve, Portugal, October 6-11, 2013.
22. 2013 16th International Conference on Fusion Reactor Materials (ICFRM) talk: Bo Yao, Richard J. Kurtz, Danny J. Edwards, Alicia G. Certain, [Hee Joon Jung](#), Robert G. Odette, Takuya Yamamoto, “TEM Characterization of He Effects in First-Wall Structural Materials Under Fusion Relevant Conditions”, Beijing, China, October 20-26, 2013.
23. 2013 MRS Boston poster: N.P. Dasgupta, [H.J. Jung](#), P.B. Van Stockum, A.L. Koh, Robert Sinclair, F.B. Prinz, “Spatial Variation of Available Electronic Excitations Within Individual Quantum Dots”, 2013 fall MRS, Boston, December 1-6, 2013.
24. 2014 TMS San Diego poster: Dan Edwards, [Hee Joon Jung](#), Rick Kurtz, G. Robert Odette, Takuya Yamamoto, Bo Yao, “Co-nucleation of Dislocation Loops and He Bubbles in Neutron Irradiated Ferritic Alloys”, San Diego, CA, February 16-20, 2014.
25. 2014 MRS spring talk: [Hee Joon Jung](#), Dan Edwards, Alicia Certain, Takuya Yamamoto, G. Robert Odette and Richard Kurtz, “He Irradiation Effects in Oxide-Dispersion-Strengthened (ODS) Ferritic Alloy Under Fusion Relevant Conditions”, 2014 spring MRS, San Francisco, April 21-25, 2014.
26. 2014 AVS joint with PREMIER poster: [Hee Joon Jung](#), Danny Edwards, Matthew J. Olszta, Weilin Jiang, Rick Kurtz, Charles H. Henager, Robert G. Odette, Joonki Suh, Junqiao Wu, Joonsuk Park, Robert Sinclair, Heemin Kang, Shyni Varghese, “Recent Applications of an Aberration-Corrected ARM 200cF at PNNL”, 2014 AVS joint with PREMIER, Richland, WA, September 16-19, 2014.
27. 2014 KAIST university MSE Fall Colloquium invited talk: [Hee Joon Jung](#), “Shape-induced local bandgap variation within a single dome-shaped PbS QD”, Deajon, South Korea, September 23, 2014.
28. 2014 Yonsei university MSE special seminar invited talk: [Hee Joon Jung](#), “Shape-induced local bandgap variation within a single dome-shaped PbS QD”, Seoul, South Korea, September 27, 2014.
29. 2014 Yonsei university Songdo international campus special seminar invited talk: [Hee Joon Jung](#), “Shape-induced local bandgap variation within a single dome-shaped PbS QD”, Incheon, South Korea, September 30, 2014.
30. 2015 Electron Microscopy for Biological, Environmental, and Energy Research (EMBEER) poster: “An In-situ Investigation of γ -AlOOH Dissolution under High pH Conditions”, Edgar C. Buck, Eugene S. Ilton, Frannie N. Smith, [Hee Joon Jung](#), Eric Jensen, Dev Chatterjee, Chong M. Wang, Reid A. Peterson, Pacific Northwest National Lab, Richland, Washington, USA, July 27, 2015.
31. 2015 KAIST university MSE special seminar invited talk: [Hee Joon Jung](#), “TEM Studies on Energy Conversion Materials”, Deajon, South Korea, October 5, 2015.
32. 2016 Microscopy and Microanalysis conference talk: Xiao-Ying Yu, Bruce Arey, [Hee Joon Jung](#), Libor Kovarik, Zihua Zhu, Juan Yao, Jiachao Yu, Xiao Sui, Tyler Troy, Biswajit Bandyopadhyay, Musa Ahmed, “Correlative Imaging and Spectroscopy of Particles in Liquid”, Ohio, Columbus, USA, July 25, 2016

33. 2017 Microscopy and Microanalysis conference talk: [Hee Joon Jung](#), Daehan Kim, Sungkyu Kim, Byungha Shin, Vinayak P Dravid, “Operando Injection of Oxygen Ions to Organometal Halide Perovskite ($\text{CH}_3\text{NH}_3\text{PbI}_3$) under In-Situ Electrical Biasing STEM-EELS”, Ohio, Columbus, USA, July 25, 2017.
34. 2018 Microscopy and Microanalysis conference talk: [Hee Joon Jung](#), Constantinos C. Stoumpos, Mercuri G. Kanatzidis, Vinayak P. Dravid, “Dynamic Surface Reconstruction of 2D Ruddlesden-Popper Halide Perovskite under e-Beam Irradiation”, Baltimore, Maryland, USA, August 7, 2018.
35. 2018 Microscopy and Microanalysis conference talk: [Hee Joon Jung](#), Jin-Ke Bao, Duck Young Chung, Mercuri G Kanatzidis, Vinayak P Dravid, “Role of Anomalous Channeling on HAADF in a Quasi-ID KMn_6Bi_5 Structure”, Baltimore, Maryland, USA, Aug 9, 2018.
36. 2018 MRS Fall talk: Grant C. B. Alexander, [Hee Joon Jung](#), Patrick Krantz, Giancarlo Trimarchi, Kyle M. McCall, Bruce W. Wessels, Vinayak P. Dravid, Venkat Chandrasekar & Mercuri G. Kanatzidis “Memristor Behavior, Novel Electronic Properties, and Structural Secrecy in $(\text{PbI}_2)_n(\text{BiI}_3)_m$ Mixtures”, Boston, USA, 2018.
37. 2019 Microscopy and Microanalysis conference Poster: Chi Zhang, [Hee Joon Jung](#), Xiaobing Hu, Roberto dos Reis, Akshay Murthy, Kenneth R Poepelmeier, Vinayak P Dravid, “Identification of Anion Sites in BiCuXO (X= Se, S) Heteroanionic Materials”, Portland, Oregon, USA, August 7, 2019.
38. 2019 KAIST university MSE special seminar invited talk: [Hee Joon Jung](#), “TEM Studies on Energy Conversion Materials”, Deajon, South Korea, June 26, 2019.

DOE government reports (Book Chapters)

1. [H. J. Jung](#), D. J. Edwards, R. J. Kurtz, G. R. Odette, and T. Yamamoto, “TEM CHARACTERIZATION OF A SIMULTANEOUSLY NEUTRON-IRRADIATED AND HELIUM-INJECTED PM2000 ODS ALLOY”, Book Chapter 2.3 in Fusion Materials DOE Report, vol. 54; *DOE/ER-0313/54*, pp. 31-41, June 30, 2013. Oak Ridge National Laboratory, Oak Ridge, TN.
2. [H. J. Jung](#), D. J. Edwards, B. Yao, R. J. Kurtz, G. R. Odette, T. Yamamoto, Y. Wu., “ANALYTICAL TEM CHARACTERIZATION OF MODIFIED F82H and 14YW UNDER SIMULTANEOUS HELIUM AND NEUTRON IRRADIATION COMPARED TO ONLY NEUTRONS AT 500 °C”, Book Chapter 1.4 in Fusion Materials DOE Report, vol. 56; *DOE/ER-0313/56*, pp. 19-30, June 30, 2014. Oak Ridge National Laboratory, Oak Ridge, TN.
3. W. Jiang, D. J. Edwards, [H. J. Jung](#), Z. Wang, Z. Zhu, T. J. Rosendaal, S. Hu, C. H. Henager, Jr., R. J. Kurtz, and Y. Wang, “DIFFUSION OF MAGNESIUM AND MICROSTRUCTURES IN Mg^+ IMPLANTED SILICON CARBIDE”, Book Chapter 3.3 in Fusion Materials DOE Report, vol. 56; *DOE/ER-0313/56*, pp. 103-108, June 30, 2014. Oak Ridge National Laboratory, Oak Ridge, TN.
4. [H. J. Jung](#), D. J. Edwards, B. Yao, R. J. Kurtz, G. R. Odette, Y. Wu, T. Yamamoto, “TEM CHARACTERIZATION OF 14YWT AND 12YWT ODS FERRITIC ALLOY NEUTRON IRRADIATED AT 500°C USING IN-SITU HELIUM INJECTION”, Book Chapter 2.2 in Fusion Materials DOE Report, vol. 57; *DOE/ER-0313/57*, pp. 21-28, December 31, 2014. Oak Ridge National Laboratory, Oak Ridge, TN.
5. Weilin Jiang, [Hee Joon Jung](#), Libor Kovarik, Zhaoying Wang, Timothy J. Rosendaal, Zihua Zhu, Danny J. Edwards, Shenyang Hu, Charles H. Henager Jr., Richard J. Kurtz, Yongqiang Wang, “MAGNESIUM PRECIPITATION AND DIFFUSION IN Mg^+ ION IMPLANTED SILICON CARBIDE”, Book Chapter 3.3 in Fusion Materials DOE Report, vol. 57; *DOE/ER-0313/57*, pp. 85-86, December 31, 2014. Oak Ridge National Laboratory, Oak Ridge, TN.

6. [H. J. Jung](#), D. J. Edwards, B. Yao, R. J. Kurtz, G. R. Odette, Y. Wu, T. Yamamoto, "MICROSTRUCTURAL SUMMARY OF ODS FERRITIC ALLOYS (14YW, 14YWT, 12YWT, MA957FR, PM2000) AND RAFM STEELS (F82H MOD.3-CW, EUROFER97) FROM JP27 IN-SITU HE INJECTION (ISHI) EXPERIMENT AT 500 °C", Book Chapter 2.5 in Fusion Materials DOE Report, vol. 58; *DOE/ER-0313/58*, pp. 48-54, June 30, 2015. Oak Ridge National Laboratory, Oak Ridge, TN.