BIOGRAPHICAL SKETCH

HAIMEI ZHENG

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APPOINTMENTS

2010-	Staff Scientist, Materials Sciences Division, Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA
2013-	Adjunct professor, Department of Materials Science and Engineering, UC Berkeley, CA
2006-2010	Postdoc, National Center for Electron Microscopy (NCEM), LBNL & Department of Chemistry, UC Berkeley (Advisor: Prof. Paul Alivisatos)
2005-2006	Postdoc, Department of Physics & Materials Science and Engineering, UC Berkeley (Advisor: Prof. Ramamoorthy Ramesh)

EDUCATION

Ph.D. 2004, Materials Science and Engineering, University of Maryland, College Park
(Advisors: Prof. Lourdes Salamanca-Riba & Prof. Ramamoorthy Ramesh)
M.S. 1997, Materials Science and Engineering, Tianjin University

HONORS

LBNL Director's Award for Exceptional Scientific Achievement (2013)
U.S. Department of Energy Office of Science Early Career Research Award (2011)
Materials Research Society Graduate Student Gold Medal Award (2003)

SYNERGESTIC ACTIVITIES

- Reviewer of Science, Nature, Nature Materials, Nature Nanotechnology, Nature communications, JACS, Nano Lett., Scientific Reports, ACS Nano, Nanoscale, Microscopy and Microanalysis, Ultramicroscopy, Appl. Phys. Lett., J. Mater. Chem., J. Phys. Chem., Acta Materialia, Chemical Res., Annu. Rev. Phys. Chem., etc.
- Reviewer of grant proposals for government agencies, e.g. NSF, DOE, DOD and others.
- Lead guest editor of MRS Bulletin special issue on "Frontiers of In Situ Electron Microscopy" Jan. 2015.
- Meeting organizer of DOE "Future Electron Scattering & Diffraction" workshop 2014; In situ Microscopy Symposium of Microscopy & Microanalysis meeting 2014 and other meetings.
- Served as a member of user proposal review committee of NCEM, LBNL 2010-2014.
- PI of Singapore-Berkeley Research Initiative for Sustainable Energy BEARS, UC Berkeley 2013-
- Member of MRS, ACS, Microscopy of Society of America, etc.

SELECTED FIVE PUBLICATIONS (Total citation 5000+; H index 30; *Corresponding author)

1. H. G. Liao, D. Zherebetskyy, H. Xin, C. Czarnik, P. Ercius, H. Elmlund, M. Pan, L. W. Wang, H. Zheng*, "Facet development during platinum nanocube growth." ***Science*** 345, 916 (2014).
2. H. G. Liao, L. Cui, S. Whitelam, H. Zheng*, "Real time imaging Pt_3Fe nanorod growth in solution." ***Science*** 336, 1011 (2012).
3. H. Zheng*, J. B. Rivest, T. Miller, B. Sadtler, A. Lindenberg, M. F Toney, L. W. Wang, C. Kisielowski, A. P. Alivisatos, "Observation of transient structural-transformation dynamics in a Cu_2S nanorod." ***Science*** 333, 206 (2011).
4. H. Zheng, R. K. Smith, Y. W. Jun, C. Kisielowski, U. Dahmen, A. P. Alivisatos, "Observation of single colloidal platinum nanocrystal growth trajectories." ***Science*** 324, 1309 (2009).
5. H. Zheng, J. Wang, S. E. Lofland, Z. Ma, L. Mohaddes-Ardabili, T. Zhao, L. Salamanca-Riba, S. R. Shinde, S. B. Ogale, F. Bai, D. Viehland, Y. Jia, D. G. Schlom, M. Wuttig, A. Roytburd, R. Ramesh, "Multiferroic $BaTiO_3$-$CoFe_2O_4$ nanostructures." ***Science*** 303, 661 (2004).

CO-AUTHORED BOOK CHAPTERS

- "Liquid Cell Electron Microscopy" Ed. F. Ross, Cambridge University Press (2015).
- "Thin Films and Heterostructures for Oxide Electronics" Ed. S. B. Ogale, Springer (2005).

FULL PUBLICATION LIST

1. W. Liang, X. Zhang, Y. Zan, M. Pan, C. Czarnik, K. Bustillo, J. Xu, Y. Chu, H. Zheng*, "In situ study of Fe_3Pt-Fe_2O_3 core-shell nanoparticle formation." ***J. Am. Chem. Soc.*** *137*, 14850 (2015).
2. W. Liang, X. Zhang, K. Bustillo, C. Chiu, W. Wu, J. Xu, Y. Chu, H. Zheng* "In situ study of spinel ferrite nanocrystal growth using liquid cell TEM." ***Chemistry of Materials*** *27*, 8146 (2015).
3. K. Y. Niu, T. Frolov, H. L. Xin, J. Wang, M. Asta, H. Zheng*, "Bubble nucleation and migration in a lead-Iron hydroxide core-shell nanoparticle." ***PNAS*** 112, 12928 (2015).
4. A Robertson, G. Lee, K. He, Y. Fan, C. Allen, S. Lee, H. Kim, E. Yoon, H. Zheng, A. Kirkland, J. Warner, "Partial Dislocations in Graphene and their Atomic Level Migration Dynamics" ***Nano Lett.*** 15, 5950 (2015).
5. K. Liu, C. Hsin, D. Fu, J. Suh, S. Tongay, M. Chen, Y. Sun, A. Yan, J. Park, K. M. Yu, W. Guo, A. Zettl, H. Zheng, D. C. Chrzan, J. Wu* "Self-passivation of defects: effects of high-energy particle irradiation on elastic modulus of multilayer graphene" ***Advanced Materials*** 27, 6841 (2015).
6. Z. Zeng, X. Zhang, K. Bustillo, K. Niu, C. Gammer, J. Xu, H. Zheng* "In situ study of lithiation and delithiation of MoS2 nanosheets using electrochemical liquid cell TEM." ***Nano Lett.*** 15, 5214 (2015).
7. K. Niu, S. Jung, F. Lin, F. Liang, D. Nordlund, C. C. L. McCrory, T. Weng, P. Ercius, M. Doeff, H. Zheng*, "A laser-chemical route for accessing complex hydroxides as efficient electrocatalysts for water oxidation." ***Nano Lett.*** 15, 2498 (2015).
8. Q. Lu, G. S. Hutchings, W. Yu, Y. Zhou, R. V. Forest, R. Tao, J. Rosen, B. T. Yonemoto, Z. Cao, H. Zheng, J. Q. Xiao, F. Jiao, J. G. Chen, "Highly porous non-precious bimetallic electrocatalyst for efficient hydrogen evolution." ***Nature Communications*** 6, 6567 (2015).
9. K. Niu, F. Lin, F. Liang, D. Nordlund, R. Tao, T. Weng, M. Doeff, H. Zheng*, "Structural and chemical evolution of amorphous nickel iron complex hydroxide upon lithiation/delithiation." ***Chemistry of Materials*** 27, 1583 (2015).
10. H. Zheng*, S. Meng, Y. Zhu, "Frontiers of in situ Electron Microscopy" ***MRS Bulletin*** 40, 12 (2015).
11. Z. Zeng, W. Liang, Y. H. Chu, H. Zheng* "In situ TEM study of Li-Au reaction in an electrochemical liquid cell" ***Faraday Discussions*** 176, 95 (2014).
12. H. G. Liao, D. Zherebetskyy, H. Xin, C. Czarnik, P. Ercius, H. Elmlund, M. Pan, L. W. Wang, H. Zheng*, "Facet development during platinum nanocube growth." ***Science*** 345, 916 (2014).
13. Q. Lu, G. S. Hutchings, Y. Zhou, H. L. Xin, H. Zheng, F. Jiao, "Nanostructured flexible Mg-modified LiMnPO4 matrix as high-rate cathode materials for Li-ion batteries." ***Journal of Materials Chemistry A*** 2, 6368 (2014).
14. H. Liu, W. Liang, Y. H. Chu, H. Zheng, R. Ramesh, "Self-assembled vertical heteroepitaxial nanostructures: from growth to functionalities." ***MRS Communications*** 4, 31 (2014).
15. H. L. Xin, S. Alayoglu, R. Tao, A. Genc, C. Wang, L. Kovarik, E. Stach, L -W. Wang, M. Salmeron, G. Somorjai, H. Zheng*, "Revealing the atomic restructuring of Pt-Co nanoparticles." ***Nano Lett.*** 14, 3203 (2014).
16. Z. Zeng, W. Liang, H. G. Liao, H. L. Xin, Y. H. Chu, H. Zheng*, "Visualization of electrode-electrolyte interfaces in LiPF6/EC/DEC electrolyte for lithium ion batteries via in-situ TEM." ***Nano Lett.*** 14, 1745 (2014).
17. K. Niu, H. G. Liao, H. Zheng*, "Visualization of the coalescence of Bi nanoparticles." ***Microscopy and Microanalysis*** 20, 416 (2014).
18. M. Sun+, H. Liao+, K. Niu+, H. Zheng*, "Structural and morphological evolution of lead dendrites during electrochemical migration." ***Scientific Reports*** 3, 3227 (2013).
19. H. G. Liao, K. Niu, H. Zheng*, "Observation of growth of metal nanoparticles." ***Chem. Comm.***

49, 11720 (2013).

20. K. Niu, J. Park, H. Zheng*, A. P. Alivisatos, "Revealing bismuth oxide hollow nanoparticle formation by the Kirkendall effect." ***Nano Lett.*** 13, 5715 (2013).
21. H. L. Xin, K. Niu, D. H. Alsem, H. Zheng*, "In situ TEM study of catalytic nanoparticle reactions in atmospheric pressure gas environment." ***Microscopy and Microanalysis*** 19, 1558 (2013).
22. H. Zheng, B. Sadtler, C. Habenicht, B. Freitag, A. P. Alivisatos, C. Kisielowski "Controlling electron beam-induced structure modifications and cation exchange in cadmium sulfide–copper sulfide heterostructured nanorods." ***Ultramicroscopy*** 134, 207 (2013).
23. H. L. Xin, C. Dwyer, D. A. Muller, H. Zheng, P. Ercius, "Scanning confocal electron energy-loss microscopy using valence-loss signals." ***Microscopy and Microanalysis*** 19, 1036 (2013).
24. H. Zheng*, "Using molecular tweezers to move and image nanoparticles." ***Nanoscale*** 5, 4070 (2013).
25. H. G. Liao, H. Zheng*, "Liquid cell transmission electron microscopy study of platinum iron nanocrystal growth and shape evolution." ***J. Am. Chem. Soc.*** 135, 5038 (2013).
26. K. Niu, H. G. Liao, H. Zheng*, "Revealing dynamic processes of materials in liquids using liquid cell transmission electron microscopy." ***Journal of Visualized Experiments*** 70, e50122, (2012).
27. H. Schlicke, D. Ghosh, L. K. Fong, H. L. Xin, H. Zheng, A. P. Alivisatos, "Selective placement of faceted metal tips on semiconductor nanorods." ***Angew. Chem. Int. Ed.*** 52 980 (2012).
28. H. Zheng*, U. M. Mirsaidov, L. W. Wang, P. Matsudaira, "Electron beam manipulation of nanoparticles." ***Nano Lett.*** 12, 5644 (2012).
29. H. G. Liao, L. Cui, S. Whitelam, H. Zheng*, "Real time imaging Pt_3Fe nanorod growth in solution." ***Science*** 336, 1011 (2012).
30. H. L. Xin, E.A. Pach, R.E. Diaz, E. A. Stach, M. Salmeron, H.Zheng*, "Revealing correlation of valence state with nanoporous structure in cobalt catalyst nanoparticles by in situ environmental TEM." ***ACS Nano*** 6, 4241 (2012).
31. H. L. Xin, H. Zheng*, "In situ observation of oscillatory growth of bismuth nanoparticles." ***Nano Lett.*** 12, 1470 (2012).
32. H. Xin, H. Zheng, "On-column 2p bound state with topological charge +/-1 excited by an atomic-size vortex beam in an aberration-corrected scanning transmission electron microscope." ***Microscopy and Microanalysis*** 18, 711 (2012).
33. U. M. Mirsaidov, H. Zheng, D. Bhattacharya, Y. Casana, P. Matsudaira, "Direct observation of stick-slip movements of water nanodroplets induced by an electron beam." ***Proc. Natl. Acad. Sci.*** 109, 7187 (2012).
34. U. M. Mirsaidov+, H. Zheng+, Y. Casana, P. Matsudaira, "Imaging protein structure in water at 2.7 nm resolution by Transmission Electron Microscopy." ***Biophysical Journal*** 102, L15 (2012).
35. H. Zheng*, "Transmission electron microscopy imaging of structural transformation dynamics in a single nanocrystal." ***Microscopy Today*** 20, 18 (2012).
36. L. Ji+, H. L. Xin+, T. R. Kuykendall, S. Wu, H. Zheng, M. Rao, E. J. Cairns, V. Battagliac, Y. Zhang "SnS2 nanoparticle loaded graphene nanocomposites for superior energy storage." ***Phys. Chem. Chem. Phys.*** 14, 6981 (2012).
37. L. Ji, M. Rao, H. Zheng, L. Zhang, Y. Li, W. Duan, J. Guo, E. J. Cairns, and Y. Zhang, "Graphene oxide as a sulfur immobilizer in high performance lithium/sulfur cells." ***J. Am. Chem. Soc.*** 133, 18522 (2011).
38. K. Niu, H. Zheng, Z. Li, J.Yang, J. Sun, X. Du, "Laser dispersion of detonation nanodiamonds." ***Angew. Chem. Int. Ed.*** 50, 4099 (2011).
39. H. Zheng*, J. B. Rivest, T. Miller, B. Sadtler, A. Lindenberg, M. F Toney, L. W. Wang, C. Kisielowski, A. P. Alivisatos, "Observation of transient structural-transformation dynamics in a Cu_2S nanorod." ***Science*** 333, 206 (2011).
40. J. B. Rivest, S. L. Swisher, L. K. Fong, H. Zheng, A. P. Alivisatos, "Assembled monolayer

nanorod heterojunctions." ***ACS Nano*** 5, 3811 (2011).

41. M. J. Polking, H. Zheng, R. Ramesh, A. P. Alivisatos, "Controlled synthesis and size-Dependent polarization domain structure of colloidal germanium telluride nanocrystals." ***J. Am. Chem. Soc.*** 133, 2044 (2011).
42. M. J. Polking, J. J. Urban, D. J. Milliron, H. Zheng, E. Chan, M. A. Caldwell, S. Raoux, C. Kisielowski, J. W. Ager, R. Ramesh, A. P. Alivisatos, "Size-dependent polar ordering in colloidal GeTe nanocrystals." ***Nano Lett.*** 11, 1147 (2011).
43. Y.S. Oh, S. Crane, H. Zheng, Y. H. Chu, R. Ramesh, K.H. Kim "Quantitative determination of anisotropic magnetoelectric coupling in $BiFeO_3$-$CoFe_2O_4$ nanostructures." ***Appl. Phys. Lett.*** 97, 052902 (2010).
44. H. Zheng, R. K. Smith, Y. W. Jun, C. Kisielowski, U. Dahmen, A. P. Alivisatos, "Observation of single colloidal platinum nanocrystal growth trajectories." ***Science*** 324, 1309 (2009).
45. H. Zheng, S. A. Claridge, A. M. Minor, A. P. Alivisatos, U. Dahmen, "Nanocrystal diffusion in a liquid thin film observed by in situ transmission electron microscopy" ***Nano Lett.*** 9, 2460 (2009).
46. J. Park, H. Zheng, Y. W. Jun, A. P. Alivisatos, "Hetero-epitaxial anion exchange yields single-crystalline hollow nanoparticles." ***J. Am. Chem. Soc.*** 131, 13943 (2009).
47. J. M. Luther, H. Zheng, B. Sadtler, A. P. Alivisatos, "Synthesis of PbS nanorods and other ionic nanocrystals of complex morphology by sequential cation exchange reactions." ***J. Am. Chem. Soc.*** 131, 16851 (2009).
48. W. Ma, J. Luther, H. Zheng, Y. Wu, A. P. Alivisatos, "Photovoltaic devices employing ternary PbSxSe1-x nanocrystals." ***Nano Lett.*** 9, 1699 (2009).
49. B. Sadtler, D. O. Demchenko, H. Zheng, S. M. Hughes, M. G. Merkle, U. Dahmen, L. W. Wang, A. P. Alivisatos, "Selective facet reactivity during cation exchange in cadmium sulfide nanorods." ***J. Am. Chem. Soc.*** 131, 5285 (2009).
50. J. Cao, W. Fan, H. Zheng, J. Wu, "Thermoelectric effect across the metal-Insulator domain walls in VO_2 microbeams." ***Nano Lett.*** 9, 4001 (2009).
51. J. Cao, E. Ertekin, V. Srinivasan, S. Huang, W. Fan, H. Zheng, J. W. L. Yim, D. R. Khanal, D. F. Ogletree, J. C. Grossman, J. Wu, "Strain engineering and one-dimensional organization of metal-insulator domains in single crystal VO_2 beams." ***Nature Nanotech.*** 4, 732 (2009).
52. A. Cabot, R. K. Smith, Y. Yin, H. Zheng, B. M. Reinhard, H. Liu, A. P. Alivisatos, "Sulfidation of cadmium at the nanoscale." ***ACS Nano*** 2, 1452 (2008).
53. H. Zheng, J. Kreisel, Y. H. Chu, R. Ramesh, L. Salamanca-Riba, "Heteroepitaxially enhanced magnetic anisotropy in $BaTiO_3$-$CoFe_2O_4$ nanostructures." ***Appl. Phys. Lett.*** 90, 113113, (2007).
54. F. Zavaliche, T. Zhao, H. Zheng, F. Straub, M. P. Cruz, P. L. Yang, D. Hao, R. Ramesh, "Electrically assisted magnetic recording in multiferroic nanostructures." ***Nano Lett.*** 5, 1586 (2007).
55. Y. Qi, S. M. Anlage, H. Zheng, R. Ramesh, "Local dielectric measurements of $BaTiO_3$-$CoFe_2O_4$ nanocomposites through microwave microscopy." ***Journal of Materials Research*** 22, 1193 (2007).
56. T. Zhao, A. Scholl, F. Zavaliche, H. Zheng, M. Barry, A. Doran, K. Lee, M. P. Cruz, R. Ramesh, "Nanoscale X-ray magnetic circular dichroism probing of electric-field-induced magnetic switching in multiferroic nanostructures films." ***Appl. Phys. Lett.*** 90, 123104 (2007).
57. Y. H. Chu, T. Zhao, M. P. Cruz, Q. Zhan, P. L. Yang, L. W. Martin, M. Huijben, C. H. Yang, F. Zavaliche, H. Zheng, R. Ramesh, "Ferroelectric size effects in multiferroic $BiFeO_3$ thin films." ***Appl. Phys. Lett.*** 7, 1586, (2007).
58. Q. Zhan, R. Yu, S. P. Crane, H. Zheng, C. Kisielowski, R. Ramesh, "Structure and interface chemistry of perovskite-spinel nanocomposite thin films." ***Appl. Phys. Lett.*** 89, 172902, (2006).
59. H. Zheng, F. Straub, Q. Zhan, P. L. Yang, W. K. Hsieh, F. Zavaliche, Y. H. Chu, U. Dahmen, R. Ramesh, "Self-assembled growth of $BiFeO_3$-$CoFe_2O_4$ nanostructures." ***Adv. Mater.*** 18, 2747

(2006).

60. H. Zheng, Q. Zhan, F. Zavaliche, M. Sherburne, F. Straub, M. P. Cruz, L. Q. Chen, U. Dahmen, R. Ramesh, "Controlling self-assembled perovskite-spinel nanostructures." ***Nano Lett.*** 6, 1401 (2006).
61. F. Zavaliche, H. Zheng, L. Mohaddes-Ardabili, S. Y. Yang, Q. Zhan, P. Shafer, E. Reilly, R. Chopdekar, Y. Jia, P. Wright, D. G. Schlom, Y. Suzuki and R. Ramesh, "Electric field-induced magnetization switching in epitaxial columnar nanostructures." ***Nano Lett.*** 5, 1793 (2005).
62. L. Mohaddes-Ardabili, H. Zheng, Q. Zhan, R. Ramesh, S. Y. Yang, L. Salamanca-Riba, M. Wuttig, S. Ogale, X. Pan, "Size and shape evolution of embedded single-crystal alpha-Fe nanowires." ***Appl. Phys. Lett.*** 87, 203110 (2005).
63. T. Zhao, S. R. Shinde, S. B. Ogale, H. Zheng, T. Venkatesan, R. Ramesh, S. Das Sarma, "Electric field effect in diluted magnetic insulator anatase Co:TiO_2." ***Phys. Rev. Lett.*** 94, 126601 (2005).
64. H. Zheng, J. Wang, L. Mohaddes-Ardabili, D. G. Schlom, M. Wuttig, L. Salamanca-Riba, R. Ramesh, "Three-dimensional heteroepitaxy in self-assembled $BaTiO_3$-$CoFe_2O_4$ nanostructures." ***Appl. Phys. Lett.*** 85, 2035 (2004).
65. H. Zheng, J. Wang, S. E. Lofland, Z. Ma, L. Mohaddes-Ardabili, T. Zhao, L. Salamanca-Riba, S. R. Shinde, S. B. Ogale, F. Bai, D. Viehland, Y. Jia, D. G. Schlom, M. Wuttig, A. Roytburd, R. Ramesh, "Multiferroic $BaTiO_3$-$CoFe_2O_4$ nanostructures." ***Science*** 303, 661 (2004).
66. L. Mohaddes-Ardabili, H. Zheng, S. G. Ogale, B. Hannoyer, W. Tian, J. Wang, S. E. Lofland, S. R. Shinde, T. Zhao, Y. Jia, L. Salamanca-Riba, D. G. Schlom, M. Wuttig, R. Ramesh, "Self-assembled single-crystal ferromagnetic iron nanowires formed by decomposition." ***Nature Mater.*** 3, 533 (2004).
67. J. Wang, H. Zheng, Z. Ma, S. Prasertchoung, M. Wuttig, R. Droopad, J. Yu, K. Eisenbeiser, R. Ramesh, "Epitaxial $BiFeO_3$ thin films on Si." Appl. Phys. Lett. 85, 2574 (2004).
68. F. Bai, H. Zheng, H. Cao, L. E. Cross, R. Ramesh, J. Li, D. Viehland, "Epitaxially induced high temperature (T>900 K) cubic-tetragonal structural phase transition in $BaTiO_3$ thin films." ***Appl. Phys. Lett.*** 85, 4109 (2004).
69. S. R. Shinde, S. B. Ogale, J. S. Higgins, H. Zheng, R. Ramesh, R. L. Greene, T. Venkatesan, "Co-occurrence of superparamagnetism and anomalous Hall effect in highly reduced cobalt-doped rutile TiO2-delta films." ***Phys. Rev. Lett.*** 92, 166601 (2004).
70. A. Tselev, C. M. Brooks, S. M. Anlage, H. Zheng, L. Salamanca-Riba, R. Ramesh, M. A. Subramanian, "Evidence for power-law frequency dependence of intrinsic dielectric response in the $CaCu_3Ti_4O_{12}$." ***Phys. Rev. B*** 70, 144101 (2004).
71. V. Nagarajan, S. Prasertchoung, T. Zhao, H. Zheng, J. Ouyang, R. Ramesh, W. Tian, X. Q. Pan, D. M. Kim, C. B. Eom, H. Kohlstedt, R. Waser, "Size effects in ultrathin epitaxial ferroelectric heterostructures." ***Appl. Phys. Lett.*** 84, 5225 (2004).
72. S. R. Shinde, S. B. Ogale, J. Higgins, R. J. Choudhary, V. N. Kulkarni, T. Venkatesan, H. Zheng, R. Ramesh, A. V. Pogrebnyakov, S. Y. Xu, Qi Li, X. Xi, J. M. Redwing, D. Kanjilal, "Modification of critical current density of MgB_2 films irradiated with 200 MeV Ag ions." Appl. Phys. Lett. 84, 2352 (2004).
73. B. M. Kim, T. Brintlinger, E. Cobas, M. S. Fuhrer, H. Zheng, Z. Yu, R. Droopad, J. Ramdani, K. Eisenbeiser, "High-performance carbon nanotube transistors on $SrTiO_3$/Si substrates." ***Appl. Phys. Lett.*** 84, 1946 (2004).
74. H. Zheng, L. Salamanca-Riba, R. Ramesh, H. Li, "Suppression of antiphase domain boundary formation in $Ba_{0.5}Sr_{0.5}TiO_3$ films grown on vicinal MgO substrates." ***Appl. Phys. Lett.*** 85, 2905 (2004).
75. J. Wang, J. B. Neaton, H. Zheng, V. Nagarajan, S. B. Ogale, B. Liu, D. Viehland, V. Vaithyanathan, D. G. Schlom, U. V. Waghmare, N. A. Spaldin, K. M. Rabe, M. Wuttig, R. Ramesh, "Epitaxial $BiFeO_3$ multiferroic thin film heterostructures." ***Science*** 299, 1719 (2003).
76. H. Li, H. Zheng, L. Salamanca-Riba, R. Ramesh, I. Naumov, K. Rabe, "Origin of antiphase

domain boundaries and their effect on the dielectric constant of $Ba_{0.5}Sr_{0.5}TiO_3$ films grown on MgO substrates." ***Appl. Phys. Lett.*** 81, 4398 (2002).

INVITED TALKS AND CONFERENCE PRESENTATIONS (2011-)

1. "Liquid cell TEM study of materials transforms and solid-liquid interfaces" Symposium on Advanced In Situ Electron Microscopy, Tohoku University, Dec. 8-9 (2015). (invited talk)
2. "Growth of transition metal oxide nanoparticles using liquid cell TEM" MRS Fall, Boston Nov.29-Dec.4 (2015). (invited talk)
3. "Real Time Imaging of Materials Transformations in Liquids" FEMMS, September 13-18 (2015). (invited talk)
4. "Real Time Imaging of Materials Transformations in Liquids" Microscopy and Microanalysis PreMeeting Congress, Oregon, August 2 (2015). (invited talk)
5. "Growth of Nanomaterials in Solution under Liquid Cell Electron Microscopy and Electron Beam Effects" Microscopy and Microanalysis Annual Meeting, Oregon, August 2-6 (2015). (invited talk)
6. "Real time imaging of materials transformations in liquids" Department of Chemical Engineering and Materials Science, UC Davis, June 2 (2015). (invited talk)
7. "Real time imaging of materials transformations in liquids" APS user meeting, ANL, May 13 (2015). (invited talk)
8. "Real time imaging of materials structural dynamics in liquids at the atomic level" CaSTL Retreat, UC Irvine, May 2 (2015). (invited talk)
9. "In situ study of materials transformations at the atomic level" JCAP, Caltech, April 20 (2015). (invited talk)
10. "In situ study of materials transformations at the atomic level" Nanoengineering Department, UCSD, April 15 (2015). (invited talk)
11. "Revealing unseen materials dynamics at the atomic level" Department of Materials Science and Engineering, MIT, March 19 (2015). (invited talk)
12. "In situ study of nanostructure evolution at electrode-electrolyte interfaces in Li-S batteries" TMS meeting, Orlando FL, March 17 (2015). (invited talk)
13. "Imaging of electrode-liquid electrolyte interfaces at the atomic level" The Electrochemical Society, San Francisco Section Seminar, March 3 (2015). (invited talk)
14. "Revealing unseen materials dynamics at the atomic level" Department of Physics, Arizona State University, Feb. 20 (2015). (invited talk)
15. "Revealing unseen materials dynamics at the atomic level" Department of Materials Science and Engineering, Stanford University, Jan. 14 (2015). (invited talk)
16. "Real time imaging through liquids using transmission electron microscopy" MRS Fall, Boston MA, Nov.30-Dec.5 (2014). (invited talk)
17. "Nanocrystal shape evolution during growth" 61st AVS, Baltimore MD, Nov 9-14 (2014). (invited talk)
18. "In Situ liquid cell TEM study of nanocrystal growth and beyond", Xiamen University, China Oct. 30 (2014). (invited talk)
19. "The study of electrode and liquid electrolyte interfaces by in situ electrochemical liquid cell TEM: applications in batteries" Faraday Discussions, Oct. 27-29 Xiamen, China (2014).
20. "The study of nanocrystal growth and liquid-solid interfaces using in situ liquid cell transmission electron microscopy" Naval Research Laboratory, Washington D.C., Oct. 24 (2014). (invited talk)
21. "Shape evolution of nanocrystals during growth" Department of Chemistry, University of Chicago, IL Oct. 17 (2014) (invited talk)
22. "Nanocrystal shape evolution during growth" ACS 248th National Meeting, San Francisco, Aug. 10-15 (2014). (invited talk)

23. “In-situ electrochemical liquid cell TEM visualization of electrode-electrolyte interfaces” Microscopy & Microanalysis meeting, Hartford, Connecticut, August 3-7 (2014). (invited talk)
24. “Synthesis of novel catalysts and in situ characterization using environmental TEM” CARA Heterogenous Catalysis Workshop, University of California, Berkeley, July 2 (2014). (invited talk)
25. “In-situ transmission electron microscopy study of nanocrystal shape evolution during growth” Gordon Research Conference Noble Metal Nanoparticles, Mount Holyoke College South Hadley, MA, June 15-20 (2014). (invited talk)
26. “Transmission electron microscopy: advances and opportunities” ACerS-NSF Ceramic PI Workshop, Jun 17-18 (2014). (invited talk)
27. “In-situ transmission electron microscopy studies of growth processes in liquids” In-situ microscopy and spectroscopy techniques for electrochemical processes, McMaster University, Halmilton, Canada, May 22 -23 (2014). (invited talk)
28. “Real Time Imaging of Growth, Interaction and Shape Evolution of Nanocrystals in Liquids” MRS Spring, San Francisco, April 21-25 (2014). (invited talk)
29. “In situ environmental transmission electron microscopy of materials and processes for energy applications” SinBeRise workshop, Singapore, March 27-28 (2014). (invited talk)
30. “Real time imaging of nanocrystal growth using liquid cell TEM” & “Electrode-electrolyte interfaces visualized using in-situ electrochemical liquid cell TEM” KAUST, Thuwal, Saudi Arabia, March 22-23 (2014). (invited talks)
31. “Visualization of interfaces between electrode and liquid electrolyte by in-situ TEM: applications in energy storage” ACS 247th National Meeting, Dallas, TX, March 16-20 (2014). (invited talk)
32. “Revealing unseen materials dynamics in liquids or gases by in situ electron microscopy”, Department of Physics and Department Materials Science and Engineering, National Chiao Tung University, Taiwan, Jan. 20 (2014). (invited talk)
33. “Revealing unseen materials dynamics in liquids or gases by in situ electron microscopy”, Department of Materials Science and Engineering, University of Pennsylvania, Nov 21 (2013). (invited talk)
34. “Nanoscale liquids versus solids observed by liquid cell transmission electron microscopy” 1st Nanoscale Fluid Mechanics and Interfacial Water Workshop, Singapore, Nov. 12-13 (2013). (invited talk)
35. “Revealing atomic restructuring of Co-Pt nanoparticles” AICHE Annual Meeting, San Francisco, Nov. 8 (2013). (invited talk)
36. “Revealing unseen materials dynamics in liquids or gases by in situ electron microscopy”, Pacific Northwest National Laboratory, Richland, WA, Oct. 17 (2013). (invited talk)
37. “Revealing unseen materials dynamics in liquids” In Situ TEM Workshop, XiAn, China, June 11-14 (2013). (invited talk)
38. “Nucleation & growth of nanocrystals” XiAn Jiao Tong University, China, Jun. 11 (2013). (invited talk)
39. “Revealing unseen materials dynamics in liquids” Zhejiang University, China, June 10 (2013). (invited talk)
40. “In situ study of materials synthesis and materials transformations”, Department of Materials Science and Engineering, University of California, Berkeley, March 12 (2013). (invited talk)
41. “In situ transmission electron microscopy: revealing unseen materials dynamics in liquids or gases”, Department of Materials Science and Engineering, University of California, Irvine, March 1 (2013). (invited talk)
42. “Real time imaging of materials transformation in liquid or gas environment”, Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, New York, Dec. 11 (2012). (invited talk)
43. “Real time imaging of growth and transformation dynamics of nanocrystals” Conference on In Situ and Correlative Electron Microscopy (CISCEM), Saarbrücken, Germany, Nov. 6-7 (2012).

(invited talk)

44. “Real time imaging of materials transformation in liquid” Workshop on In Situ Microscopy: State-of-the-Art Capability for Nanometric Observation and Manipulation, Singapore, Nov. 5-6 (2012). (invited talk)
45. “Materials transformation in liquid or gas environment” Department of Materials Science and Engineering, University of California, Berkeley, Oct. 25 (2012). (invited talk)
46. “Real time TEM imaging of materials transformations in liquid or gas environments” Electron and Scanning Probe Microscopies Principal Investigators’ Meeting, Gaithersburg, MD, Sept. 9-12 (2012). (invited talk)
47. “Nanocrystal growth and transformations by in situ TEM through liquids” International Symposium on Materials for Enabling Nanodevices, Univerisity of California, Los Angeles, CA Aug. 27-29 (2012). (invited talk)
48. “Imaging of Pt3Fe nanowire growth in liquids by in situ TEM”, Microscopy & Microanalysis Meeting, Phoenix, AZ, Jul. 29-Aug. 2 (2012). (invited talk)
49. “Real time TEM imaging of materials transformations in liquids” NCEM Review Aug. 23 (2012). (invited talk)
50. “Materials transformation in liquids or gases”, Seminar in Department of Materials Science and Engineering, Chongqing University, China, Jul. 20 (2012). (invited talk)
51. “Real time imaging of colloidal Pt3Fe nanorod growth by nanoparticle attachment”, Seminar in Materials Science and Engineering, Beijing Science and Technology University, China, Jun. 18 (2012). (invited talk)
52. “Real time imaging of colloidal Pt3Fe nanorod growth by nanoparticle attachment”, International Workshop on In Situ Electron Microscopy in Advanced Materials Research, XiAn, China, Jun. 12-15 (2012). (invited talk)
53. “Real time TEM imaging of nanocrystal growth and transformations”, Seminar in Department of Materials Science and Engineering, University of California, Los Angeles, CA, May 11 (2012). (invited talk)
54. “Imaging of Pt3Fe nanowire growth in liquids by in situ TEM”, Microscopy & Microanalysis Meeting, Phoenix, AZ, Jul. 29-Aug. 2 (2012).
55. “Real time TEM imaging nanocrystal growth in liquids”, Operando Characterization of Energy Systems Workshop at APS User Meeting Argonne National Laboratory, Argonne, IL, May 7-9 (2012). (invited talk)
56. “Nucleation and growth of colloidal nanocrystals” in the Lecture Series of “Introduction to nanoscience and nanotechnology”, Department of Materials Science and Engineering, University of California, Berkeley, CA, Feb. 2 (2012). (invited lecture)
57. “Growth of PtFe nanostructures observed by in situ liquid cell transmission electron microscopy”, MRS Fall Meeting, Boston, MA, Nov. 29-Dec. 1 (2011).
58. “Real time imaging of growth and structural dynamics of nanocrystals”, Seminar in Department of Materials Sciences and Engineering, Qinghua University, Beijing, China, Sept. 29 (2011). (invited talk)
59. “Real time imaging of growth and structural dynamics of nanocrystals”, Seminar in College of Materials Sciences, XiAn Jiao Tong University, XiAn, China, Sept. 23 (2011). (invited talk)
60. “Real time imaging of growth and structural dynamics of nanocrystals”, Lawrence Berkeley National Laboratory, Berkeley, CA, Sept. 15 (2011). (invited talk)
61. “Real time imaging of growth and structural dynamics of nanocrystals”, Nanosciences and Nanoengineering Institute, University of California, Berkeley, CA, Sept. 9 (2011). (invited talk)
62. “Observation of dynamic structural transformations in a copper sulfide nanorod by TEM”, Microscopy & Microanalysis Meeting, Nashville, TN, Aug. 7-11 (2011).