Curriculum Vitae: Guangwen Zhou

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Education

Ph.D., December 2003, Materials Science, University of Pittsburgh, advisor: Judith C Yang
M.S., July 1996, Physics, Beijing University of Technology, China
B.S. July 1993, Physics, Xiangtan University, China

Research Focus

- Materials interactions with extreme environments (chemical and thermomechanical extremes)
- Atomistic mechanisms of surface and interface phenomena
- Dynamic *in situ* electron and scanning probe microscopies (e.g. transmission electron microscopy, scanning tunneling microscopy), x-ray and electron diffraction, and spectroscopies (e.g. X-ray photoelectron spectroscopy, Auger Electron Spectroscopy)
- Correlating *in situ* microscopy/spectroscopy/diffraction measurements with materials applications in heterogeneous catalysis, batteries, electronics devices, etc.
- Materials modeling and simulations: density-functional theory, kinetic Monte Carlo, etc.

Professional Experience

2017-present	Professor, Department of Mechanical Engineering & Materials Science and Engineering Program, co-Director, Materials Science and Engineering Program, State University of New York, Binghamton
2013-2017	Associate Professor, Department of Mechanical Engineering & Materials Science and Engineering Program, State University of New York, Binghamton
2007-2013	Assistant Professor, Department of Mechanical Engineering & Materials Science and Engineering Program, State University of New York, Binghamton
2006-2007	Research Assistant Professor, Department of Mechanical Engineering and Materials Science, University of Pittsburgh
1996-1999	Research Associate, Beijing Laboratory for Electron Microscopy, Institute of Physics, Chinese Academy of Sciences

Honors and Awards

- SUNY Chancellor's Award for Excellence in Scholarship and Creative Activities (2016)
- NSF – CAREER (2011)
- SUNY Faculty Individual Development Award (2009)
- NSF *in situ* TEM workshop fellowship (Arizona, 2006)
- Finalist of Argonne's named post-doctor fellowship (2003)
- Graduate Student Research Silver Award, Materials Research Society (Boston, 2002)
- Microscopy and Microanalysis, "*Best Materials Science Paper of 2001*", with J.C. Yang, M.D. Bharadwaj, and L. Tropi

Awards Received by my Graduate Students

- PhD student Wenhui Zhu - Best Poster Award, Microscopy and Microanalysis (2016)
- PhD student Wenhui Zhu – Presidential Scholar Award, Microscopy Society of America (2015)
- PhD student Qiyue Yin – Presidential Scholar Award, Microscopy & Microanalysis (2015)
- PhD student Qianqian Liu – Best Talk Award, Hudson Mohawk AVS Chapter (2015)
- PhD student Wenhui Zhu – 2016 Winter School Scholarship on High Resolution Electron Microscopy, Arizona State University
- PhD student Liang Li – Graduate Student Excellence Award in Research, Binghamton University (2014)
- PhD student Lu Yuan – Best Poster Award, Science-to-Technology Day, Binghamton University (2013)

Media Coverage

- "New research finds cause of alloy weakness", Binghamton News, Brookhaven Newsroom; Department of Energy, Office of Science, University News; Phys.org, Nov 30, 2017
- "Binghamton University Researchers Look to Prevent Another Flint Water Crisis", Fox 40 News, May 10, 2016; Phys.org, May 3, 2016
- "Aluminum alloy acts to inhibit corrosion", Tech Beat (Society of Tribologists and Lubrication Engineers), March, 2105
- "Microscopy reveals how atom-high steps impede oxidation of metal surfaces", Phys.org, Dec. 29, 2014; Brookhaven Newsroom; Department of Energy, Office of Science, Science Headlines.
- "Edges easy surface oxidation of metals", Chemical & Engineering News, Science & Technology Concentrates, Dec 17, 2012
- "Mechanical engineer recognized for leading the way in 'green' manufacturing process", Phys.org, June 27, 2011
- "Researcher seeks to understand corrosion", Discover-e Binghamton Research, Sept. 22, 2008

Funding History:

2007 - present: $3,802,732 (total)

On-going projects

- Department of Energy, Basic Energy Science Office, Division of Materials Science and Engineering, Synthesis and Processing Science Program, "*In situ visualization and theoretical modeling of early stages of oxidation of metals and alloys"*
  $1,326,000, 05/15/2009 – 05//14/2018, sole PI

- Department of Energy, Energy Frontier Research Centers (EFRC), "*Northeast Center for Chemical Energy Storage"*
  $12.8M, 09/01/2014 – 08/31/2018
  PI: Stan Whittingham (portion for Zhou: $600,000)

- National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), Catalysis and Biocatalysis Program, "*Collaborative research: In-situ characterization of methanol oxidation catalyzed by copper-based materials"*
  $670,000, 09/01/2013-08/31/2017
  PI: Judith C Yang (University of Pittsburgh), co-PIs: Goetz Veser (University of Pittsburgh); Guangwen Zhou (SUNY Binghamton) (portion for Zhou: $210,000)

- Pacific Northwest National Laboratory, "*Materials Synthesis and Simulations Across Scales"*

$77,000, 10/15/2016 – 10/14/2018

Funded Research: completed projects

- National Science Foundation–CAREER, "*Atomic scale study of reduction of metal oxides*", $423,718, 05/2011 – 09/2016

- National Science Foundation, Division of Civil, Mechanical, and Manufacturing (CMMI), Materials and Surface Engineering Program, "*Collaborative research: structure-property relationships of lead-free nano-solders"*
  $459,000, 09/01/2012-08/31/2017
  PI: Zhiyong Gu (UMASS Lowell); co-PIs: Sammy Shina (UMASS Lowell); Guangwen Zhou (SUNY Binghamton) (portion for Zhou: $195,000)

- National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET), Process Reaction Engineering Program, "*Making superior alumina thin film via ozone oxidation of aluminum: correlation between oxidation mechanism and nanoscale atomic structure in amorphous oxide films"*
  $330,846, 09/01/2009 – 08/31/2013, sole PI

- National Science Foundation, Division of Civil, Mechanical, and Manufacturing (CMMI), Materials and Surface Engineering Program, "*Probe nanoscale oxidation of metals under applied stress"*
  $290,361, 08/01/2008-07/31/2013, sole PI

- Argonne National Laboratory, "*Develop advanced cathode materials for lithium ion batteries"*
  $200,000, 2009-2013, sole PI

- Petroleum Research Funds, American Chemical Society, "*Methanol oxidation catalyzed by Cu-based catalysts investigated by in situ UHV-Transmission Electron Microscopy"*
  $100,000, 04/2008-10/2010
  PI: J.C. Yang (University of Pittsburgh), co-PI: Guagnwen Zhou (SUNY Binghamton) (portion for Zhou: $50,000)

- IEEC - Binghamton University, "*Enhance the Cu/EMC Interface Adhesion by Controlling the surface finish of Cu"*
  $54,307, 07/2014-12/2015

- SUNY Research Foundation Collaboration Funds, "*Collaborative research to advance scientific knowledge of the mechanism of corrosion in civil infrastructures*"
  $54,000, 12/01/2012-11/30/14
  PI: Salvatore Salamone (SUNY Buffalo), co-PI: Guangwen Zhou (SUNY Binghamton) (portion for Zhou: $27,000 + $15,000 match funds from Binghamton University

- Binghamton University - 2013 Smart Energy Transdisciplinary Area of Excellence Request for Proposals, *"Development of ultrahigh capacity lithium-ion battery anode materials"*
  $15,000, 01/2014-06/2014, Jiye Fang, Louis Piper, Guangwen Zhou (portion for Zhou: $3,500)

User Facility Proposals Awarded

- Brookhaven National Laboratory, Center for Functional Nanomaterials, "*In situ STM/XPS study of the initial oxidation of metals and alloys* ", facilities: variable temperature UHV-STM-XPS, low-energy electron microscopy (LEEM), 09/2010-08/2018

- Brookhaven National Laboratory, Center for Functional Nanomaterials, "*Understanding the role of surface oxygen on copper catalyzed graphene growth*", facilities: environmental TEM, LEEM, XPS, 09/2014-08/2016

- Brookhaven National Laboratory, Center for Functional Nanomaterials, "*Bridging the pressure gap in transient oxidation of metals and alloys*", facilities: ambient-pressure XPS, reactor-STM, 01/2013-12/2017

- Argonne National Laboratory, Center for Nanomaterials, "*In situ STM study of the atomic mechanism of oxidation of Cu(110)*", 06/2011 – 05/2012, 06/2013 – 05/2016, facilities: variable temperature UHV-STM – Omicron system

- NSF Extreme Science and Engineering Discovery Environment (XSEDE, formerly known as Teragrid) supercomputer time allocation (2009-2016). Total allocation accumulated: ~ 5 million cpu-hours

- Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, "*Atomic scale study of the reduction of metal oxides*", 08/2013 – 07/2014, variable-temperature UHV-STM

Book Chapters

1. G.W. Zhou, Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry, ***Air formed film – Mott-Cabrera Model*** (Elsevier 2017)
2. G.W. Zhou, Judith C Yang, "*In-Situ TEM Studies of Oxidation*", ***In situ*** **Electron Microscopy, ed.** Gerhard Dehm, James M. Howe, Josef Zweck, Wiley-VCH (2012) – (selected for the book cover)
3. Z. Zhang, L.S. Chen, G.W. Zhou, "*Low Dimensional Materials and Their Microstructures Studied by High Resolution Electron Microscopy*", **Progress in Transmission Electron Microscopy I: Concepts and Techniques; II: Application in Materials Science,** ed. X.F. Zhang, and Z. Zhang, Springer, Germany (2001)

Journal Publications

1. L.F. Zou, C.M. Yang, Y.K. Lei, D. Zakharov, J.M.K. Wiezorek, D. Su, Q.Y. Yin, J. Li, Z.Y. Liu, E.A. Stach, J.C. Yang, L. Qi, G.F. Wang, G.W. Zhou, "*Facilitating dislocation nucleation through atomic segregation*", **Nature Materials** (10.1038/nmat5034, in press)
2. L.F. Zou, J. Li, D. Zakharov, E.A. Stach, G.W. Zhou, "*In situ atomic-scale imaging of the metal/oxide interfacial transformation*", **Nature Communications 8**, 307 (2017)
3. L.F. Zou, J. Li, D. Zakharov, W.A. A. Saidi, E.A. Stach, G.W. Zhou, *"Atomically visualizing elemental segregation induced surface restructuring*", **J. Phys. Chem. Lett.** 8, 6035-6040 (2017)
4. H.L. Qin, X.D. Chen, J. Li, P. Sutter, G.W. Zhou, "Atomic-step-induced local nonequilibrium effects on surface oxidation", **Journal of Physical Chemistry C 121**, 22846-22853 (2017)
5. D.X. Wu, J. Li, G.W. Zhou, "Oxygen adsorption at heterophase boundaries of the oxygenated Cu(110)", **Surface Science** 666, 28-43 (2017)

6. P. Meng, G.W. Zhou, C.L. Chen, "2D nanomaterials assembled from sequence-defined molecules", **Nano-Structures & Nano-Objects** (in press, 2017) (DOI: https://doi.org/10.1016/j.nanoso.2017.09.010)
7. L.K. Wang, C.Y. Cai, Y.C. Zhou, G.W. Zhou, "Initial-stage oxidation of Ni3Al(100) and (110): from Ab Initio thermodynamics", **Journal of Physical Chemistry C 121**, 19191-19200 (2017)
8. Y. Shu, T. Ando, Q.Y. Yin, G.W. Zhou, Z.Y. Gu, "Phase diagram and structural evolution of tin/indium (Sn/In) nanosolder particles: from a non-equilibrium state to an equilibrium state", **Nanoscale 9**, 12398 (2017)
9. H.L. Chang, C.Y. Cai, Y.G. Wang, Y.C. Zhou, L. Yang, G.W. Zhou, Calcium-rich CMAS corrosion induced microstructure development of thermal barrier coatings, **Surface and Coatings Technology** 324, 577-584 (2017)
10. Q.Q. Liu, J. Li, X. Tong, G.W. Zhou, "Enhancing Dissociative Adsorption of Water on Cu(111) via Chemisorbed Oxygen", **Journal of Physical Chemistry C 121(22)**, 12117–12126 (2017)
11. J. He, Y. Zhao, Y. Wang, J.Wang, J. Zheng, H.L. Zhang, G.W. Zhou, C.M. Wang, S. Wang, X. Ma, "A Fe5C2 nanocatalyst for the preferential synthesis of ethanol via dimethyl oxalate hydrogenation", **Chemical Communications 53**, 5376-5379 (2017)
12. Y. Shu, Q.Y. Yin, J. Benedict, G.W. Zhou, Z.Y. Gu, "One-Step Synthesis and Size Control of Tin/Indium (Sn/In) Nanowires by Surfactant-Assisted Chemical Reduction Methods in Aqueous Solutions", **Journal of Alloys and Compounds 712**, 848-856 (2017)
13. Q.Y. Yin, F. Gao, J.R. Wang, Z.Y. Gu, E.A. Stach, G.W. Zhou, "*Length-dependent melting behavior of Sn nanowires"*, ***Journal of Materials Research*** 32, 1194-1202 (2017)
14. H.L. Zhang, K. Karki, Y.Q. Huang, M.S. Whittingham, E.A. Stach, G.W. Zhou, "Atomic Insight into the Layered/Spinel Phase Transformation in Charged LiNi0.80Co0.15Al0.05O2 Cathode Particles", **Journal of Physical Chemistry C 121(3)**, 1421-1430 (2017)
15. W.H. Zhu, J. Winterstein, W.-C.Yang, L. Yuan, R. Sharma, G.W. Zhou, "In situ Atomic-Scale Probing of the Reduction Dynamics of 2-Dimensional Fe_2O_3 Nanostructures", **ACS Nano 11(1)**, 656-664 (2017)
16. Q.Y. Yin, F. Gao, J.R. Wang, Z.Y. Gu, E. Stach, G.W. Zhou, "Interface dynamics in one-dimensional nanoscale Cu/Sn diffusion couples", **Acta Materialia 125**, 136-144 (2017)
17. Q.Q. Liu, H.L. Qin, J.A. Boscoboinik, G.W. Zhou, "A comparative study of oxidation of NiAl(100) by molecular oxygen and water vapor using ambient-pressure X-ray photoelectron spectroscopy", **Langmuir 32**, 11414-11421 (2016)
18. W.T. Shan, Q.Q. Liu, J. Li, N. Cai, W.A. Saidi, G.W. Zhou, "*Hydrogen-induced atomic structure evolution of the oxygenated Cu(110) surface*", ***Journal of Chemical Physics*** (in press, 2016)
19. K. Karki, Y.Q. Huang, S. Hwang, A. Gamalski, M.S. Whittingham, G.W. Zhou, E. Stach, "*Tuning the activity of oxygen in* $LiNi_{0.8}Co_{0.15}Al_{0.05}O_2$ *(NCA) battery electrodes*", ***ACS Applied Materials & Interface*s** (in press, 2016)
20. Y.G. Wang, C.Y. Cai, L. Li, L. Yang, Y.C. Zhou, G.W. Zhou, "*Oxygen vacancy ordering induced displacements of cations in yttria-stabilized zirconia*", ***AIP Advances*** 6, 095113 (2016)
21. F. Gao, Q.Y. Yin, J.R. Wang, G.W. Zhou, Z.Y. Gu, "*Synthesis and Characterization of One-dimensional Cu-Sn Nanowire Diffusion Couples for Nanowire Assembly and Interconnection*", ***IEEE 66th Electronic Components and Technology Conference***, 2329-2334 (2016)
22. W.H. Zhu, J. Winterstein, I. Maimon, Q.Y. Yin, L. Yuan, A. Kolmogorov, R. Sharma, G.W. Zhou, "*Atomic structural evolution during the reduction of* α-Fe_2O_3 *nanowires*", ***Journal of Physical Chemistry C*** **120**, 14854-14862(2016)
23. Q. Zhu, L.F. Zou, G.W. Zhou, W.A. Saidi, J.C. Yang, "*Early and transient stages of Cu oxidation: Atomistic insights from theoretical simulations and in situ experiments*", ***Surface Science*** **652**, 98-113(2016)
24. H.W. Feng, Y.Q. Wang, C. Wang, F.Y. Diao, W.H. Zhu, P. Mu, L. Yuan, G.W. Zhou, F. Rosei, "*Defects-induced enhanced photocatalytic activities of reduced α-Fe2O3 nanoblades", **Nanotechnology 27***, 296753(2016)

25. Y.Q. Huang, N.A. Chernova, Q.Y. Yin, Q. Wang, N.F. Quackenbush, M. Leskes, J. Fang, F. Omenya, R. Zhang, M.J. Wahila, L.F.J. Piper, G.W. Zhou, C.P. Grey, M.S. Whittingham, *"What Happens to LiMnPO4 upon Chemical Delithiation*?", ***Inorganic Chemistry 55***, 4335-4343(2016)

26. L.L. Luo, L.F. Zou, D.K. Schreiber, D.R. Baer, M.J. Olszta, S.M. Bruemmer, G.W. Zhou, C.M. Wang, "*In situ atomic scale visualization of surface kinetics driven dynamics of oxide growth on Ni-Cr surface*", ***Chemical Communications*** **52**, 3300-3303(2016)

27. J. Li, G.F. Wang, G.W. Zhou, "*Surface segregation phenomena in extended and nanoparticle surfaces of Cu-Au alloys*", ***Surface Science*** **649**, 39-45(2016)

28. J. Li, G.W. Zhou, "*Density functional theory study of O-H and C-H Bond Scission of methanol catalyzed by a chemisorbed oxygen layer on Cu(111)*", ***Surface Science*** **646**, 288-297(2016)

29. L.L. Luo, L.F. Zou, D.K. Schreiber, D.R. Baer, S.M. Bruemmer, G.W. Zhou, C.M. Wang, "*In-situ transmission electron microscopy study of surface oxidation for Ni-10Cr and Ni-20Cr alloys*", ***Scripta Materialia*** **114**, 129-132(2016)

30. C.Y. Cai, S. Chang, Y.C. Zhou, L. Yang, G.W. Zhou, Y.G. Wang, "*Microstructure characteristics of EB-PVD YSZ thermal barrier coatings corroded by molten volcanic ash*", ***Surface and Coatings Technology*** **286**, 49-56 (2016)

31. C. Wang, Y.Q. Wang, X.H. Liu, H.W. Yang, J.R. Sun, L. Yuan, G.W. Zhou, F. Rosei, "*Structure versus properties in α-Fe_2O_3 nanowires and nanoblades"*, ***Nanotechnology*** **27**, 035702 (2016)

32. Q.Q. Liu, X. Tong, G.W. Zhou, "*H_2O dissociation induced aluminum oxide growth on oxidized Al(111) surfaces*", ***Langmuir*** **31**, 13117-13126 (2015)

33. L. Yuan, X.M. Chen, S. Maganty, J. Cho, C.H. Ke, G.W. Zhou, "*Enhancing copper and its oxide interfacial adhesion by using sandblasted copper surfaces*", ***Applied Surface Science*** 357, 2160-2168 (2015)

34. H.L. Qin, X.D. Chen, L. Li, P. Sutter, G.W. Zhou, "*Oxidation-driven surface dynamics on NiAl(100)*", ***Proceeding of the National Academy of Sciences*** **112 (2)**, E103-109 (2015)

35. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "*Atomic-scale characterization of the reduction of a-Fe_2O_3 nanowires*", ***Microscopy and Microanalysis*** 21 (S3), 995-996 (2015)

36. Q.Y. Yin, F. Gao, Z.Y. Gu, G.W. Zhou, "*In-situ visualization of the metallurgical soldering reaction in the nanoscale Cu-Sn diffusion couples*", ***Nanoscale*** **7**, 4984-4994 (2015)

37. J. Li, L. Li, G.W. Zhou, "*Oxygen adsorption at the domain boundaries in Cu(110)-(2×1)-O chemisorbed layer*", ***Journal of Chemical Physics*** **142**, 084701 (2015)

38. L.L. Luo, Y.H. Kang, J. C Yang, G.W. Zhou, "*The nucleation and growth of oxide islands during the initial-stage oxidation of Cu-Pt(100) surfaces*", ***Journal of Applied Physics 117***, 065305 (2015)

39. D.P. Wang, I. Belharouak, L.H Ortega, X.F. Zhang, R. Xu, D.H. Zhou, G.W. Zhou, K. Amine, "*Synthesis of high capacity cathodes for lithium-ion batteries by morphology-tailored hydroxide Co-precipitation*", ***Journal of Power Sources*** **274**, 451-457 (2015)

40. L. Li, L.L. Luo, J. Ciston, W.A. Saidi, E.A. Stach, J.C. Yang, G.W. Zhou, "*Surface-step-induced oscillatory oxide growth", **Physical Review Letters 113***, 136104 (2014)

41. L. Li, N. Cai, W.A. Saidi, G.W. Zhou, "*Role of oxygen in Cu(110) surface restructuring in the vicinity of step edges*", ***Chemical Physical Letters*** **613**, 64-69 (2014)

42. L. Li, Q.Q. Liu, J. Li, W.A. Saidi, G.W. Zhou, "*Kinetic barriers of the phase transition in the oxygen chemisorbed Cu(110)-(2x1)-O as a function of oxygen coverage*", ***Journal of Physical Chemistry C*** **118**, 20858-20866 (2014)

43. H.L. Qin, P. Sutter, G.W. Zhou, "*The Crystallization of amorphous aluminum oxide thin film grown on NiAl(100)*", ***Journal of American Ceramic Society*** **97**, 2762-2769 (2014)

44. C. Wang, Y.Q. Wang, X.H. Liu, F.Y. Diao, L. Yuan, G.W. Zhou*, "Novel hybrid nanocomposites of polyhedral Cu_2O nanoparticles/CuO nanowires with enhanced photoactivity", **Physical Chemistry Chemical Physics*** 16, 17487-17492 (2014)

45. L. Yuan, A.G. Van Der Geest, W.H. Zhu, Q.Y. Yin, L. Li, A. Kolmogorov, G.W. Zhou, "*Reduction of CuO nanowires confined by a nano test tube*", ***RSC Advances*** **4**, 30259-30266 (2014)

46. Q.Q. Liu, N. Cai, L. Li, W.A. Al-Saidi, G.W. Zhou, "*Oxygen chemisorption induced surface phase transition on Cu(110)*", ***Surface Science*** **624**, 75-84 (2014)

47. L.L. Luo, Y.H. Kang, J.C. Yang, D. Su, E.A. Stach and G.W. Zhou, "*Comparative study of the alloying effect on the initial oxidation of Cu-Au(100) and Cu-Pt(100)*", ***Applied Physics Letters*** **104**, 121601 (2014)

48. Y.Q. Wang, C. Wang, L. Yuan, R.S. Cai, C.Y. Li, X.H. Liu, G.W. Zhou, "*Naturally-occurred coincidence-site-lattice twist boundaries in bicrystalline α-Fe_2O_3 nanoblades*", ***Journal of Physical Chemistry C*** **118**, 5796-5801 (2014)

49. N. Cai, Q.Q. Liu, X. Tong, G.W. Zhou, "*X-ray photoelectron spectroscopic study of the passivation of NiAl(100) surface by water vapor*", ***Langmuir*** **30**, 774-783 (2014)

50. L. Yuan, C. Wang, R.S. Cai, Y.Q. Wang, G.W. Zhou, "*Temperature-dependent growth mechanism and microstructure of ZnO nanostructures grown from thermal oxidation of zinc*", ***Journal of Crystal Growth*** **390**, 101-108 (2014)

51. D.J. Clark, L. Yuan, C.O. Otieno, G.W. Zhou, J.I. Jang, "*Impurity and morphological dependence on photoluminescence and enhanced impurity-induced two-photon absorption in ZnO*", ***Solid State Communications*** **181**, 9-14 (2014)

52. L. Yuan, Q.Y. Yin, Y.Q. Wang, G.W. Zhou, "*CuO reduction induced formation of CuO/Cu_2O hierarchical hybrid oxides*", ***Chemical Physics Letters*** **590**, 92-96 (2013)

53. G.W. Zhou, L.L. Luo, L. Li, J. Ciston, E.A. Stach, W.A. Saidi, J.C. Yang, "*In situ atomic visualization of oxide islanding during oxidation of Cu surfaces*", ***Chemical Communications*** **49**, 10862-10864 (2013)

54. N. Cai, H.L. Qin, T. Xiao, G.W. Zhou, "Growth of ultrathin amorphous alumina film during the oxidation of NiAl(100)", ***Surface Science*** **618**, 20-26 (2013)

55. H.L. Qin, G.W. Zhou, "*The formation double-row oxide stripes during the initial-oxidation of NiAl(100)*", ***Journal of Applied Physics*** **114**, 083513 (2013)

56. Y.Q. Wang, M.H. Zhang, Q. Shao, L. Yuan, G.W. Zhou, "*Mechanism of the oxidation of iron*", ***Advanced Materials Research 709***, 106 (2013)

57. L. Yuan, R.S. Cai, J.I. Jang, W.H. Zhu, C. Wang, Y.Q. Wang, G.W. Zhou, "*Morphological transformation of hematite nanostructures during the oxidation of iron*", ***Nanoscale*** **5**, 7581-7588 (2013)

58. L. Yuan, C. Wang, R.S. Cai, Y.Q. Wang, G.W. Zhou, "*Spontaneous ZnO nanowire formation during the oxidation of Cu-Zn alloy*", **Journal of Applied Physics 114**, 023512 (2013)

59. L. Li, G.W. Zhou, "*Oxygen subsurface adsorption on the Cu(110)-c(6×2) surface", **Surface Science*** **615**, 67-74 (2013)

60. Y.H. Kang, L.L. Luo, X. Tong, D.E. Starr, G.W. Zhou, J.C. Yang, "*Transient Oxidation of Cu-5at.%Ni(001)- Temperature-dependent sequential oxide formation*", ***Oxidation of Metals*** **79**, 303 (2013)

61. R.S. Cai, S. Lei, X.H. Liu, Y.Q. Wang, L. Yuan, G.W. Zhou, "*A new modulated structure in α-Fe_2O_3 nanowires*", ***Chin. Phys. B 22***, 107401 (2013)

62. D.P. Wang, I. Belharouak, G.W. Zhou, K. Amine, "*Synthesis of Lithium and Manganese-Rich Cathode Materials Via an Oxalate Co-precipitation Method*", ***Journal of the Electrochemical Society 160***, A3108 (2013)

63. D.P. Wang, I. Belharouak, G.W. Zhou, K. Amine, "*Nanoarchitecture Multi-Structural Cathode Materials for High Capacity Lithium Batteries*", ***Advanced Functional Materials 23,*** 1070-1075 (2013)

64. N. Cai, G.W. Zhou, K. Müller, D.E. Starr, "*Comparative study of the passivity of Al(111) by molecular oxygen and water vapor", **Journal of Physical Chemistry C*** **117**, 172 (2013)

65. W.A. Al-Saidi, M.Y. Lee, L. Li, G.W. Zhou, A.J.H. McGaughey, "*Ab initio atomistic thermodynamics study of the early stages of Cu(100) oxidation*", ***Physical Review B*** **86**, 245429 (2012)

66. G.W. Zhou, L.L. Luo, L. Li, J. Ciston, E. Stach, J.C. Yang, "*Step edge induced oxide growth during the oxidation of Cu(100)*" ***Physical Review Letters 109***, 235502 (2012)

67. L. Yuan, G.W. Zhou, "*Suppression of ZnO nanowire formation in high temperature oxidation by sandblasting brass*", ***Materials Focus 1***, 222-228 (2012)

68. M. Gu, I. Belharouak, A. Genc, D.P. Wang, Z.G. Wang, K. Amine, F. Gao, G.W. Zhou, S. Thevuthasan, D.R. Baer, J.G. Zhang, N.D. Browning, J. Liu, and C.M. Wang, "*The role of Ni diffusion in controlling cathode surface structure and the performance of Li-ion batteries*", ***Nano Letters*** **12**, 5186(2012)

69. M. Gu, D.P. Wang, G.W. Zhou, I. Belharouak, J.-G. Zhang, K. Amine, S. Thevuthasan, D.R. Baer, J. Liu, N.D. Browning, C.M. Wang "*Atomic Level Direct Imaging of Cation ordering and phase separation in* $Li_{1.2}Ni_{0.2}Mn_{0.6}O_2$ *nanoflakes*", ***Microscopy and Microanalysis*** **18**, 1408-1409 (2012)

70. L. Yuan, G.W. Zhou, "The *growth of one-dimensional oxide nanowires by thermal oxidation of metals*", ***International Journal of Nano Science, Nano Engineering and Nanotechnology 4,*** 1-22 (2012) (review article)

71. N. Cai, G.W. Zhou, K. Müller, D.E. Starr, "*Temperature and pressure dependent Mott potentials and their influence on self-limiting oxide film growth*", ***Applied Physics Letters*** **101**, 171605(2012)

72. L.L. Luo, Y.H. Kang, J.C. Yang, G.W. Zhou, "*Effect of oxygen gas pressure on the orientations of* Cu_2O *nuclei during the oxidation of Cu(100), (110) and (111)*", ***Surface Science*** **606**, 1790-1797(2012)

73. F. Gao, Z.Y. Liu, G.W. Zhou, J. Yang, Z.Y. Gu, *"Fast diffusion and void formation in two-segment copper-tin lead-free nanowire system with one-dimensional confinement"*, ***Science of Advanced Materials*** **4**, 881-887 (2012)

74. L.L. Luo, Y.H. Kang, J.C. Yang, G.W. Zhou, "*Influence of the surface morphology on the early stages of Cu oxidation*", ***Applied Surface Science*** **259**, 791-798 (2012)

75. L.L. Luo, L. Li, J. Ciston, E.A. Stach, J.C. Yang, G.W. Zhou, "*Atomic-scale visualization of the oxidation of Cu surfaces via in situ environmental TEM*", **Microscopy and Microanalysis 18**, 1122-1123 (2012)

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Invited Seminars

1. Dalian Institute of Chemical Physics, *In situ atomic-scale visualization of oxidation of metals* (07/2016)
2. National Institute of Standards and Technology (NIST), *In-situ microscopy and spectroscopy study of the oxidation of metals and alloys* (02/2014)
3. Chemistry, Physics and Engineering Department, Biola University, *In situ* atomic-scale observations of the oxidation of metals (10/2013)
4. Center for Functional Materials, Brookhaven National Laboratory, "*In-situ microscopy and spectroscopy study of the oxidation of metals and alloys*" (09/2013)
5. Lawrence Berkeley National Laboratory, "*In situ visualization and theoretical modeling of the early-stage oxidation of metals*" (06/2013)
6. Pacific Northwest National Laboratory, "*In situ visualization and theoretical modeling of the early-stage oxidation of metals*" (06/2013)
7. Physics Department, Binghamton University, *In situ visualization and theoretical modeling of the early-stage oxidation of metals*" (05/2013)
8. Materials Science & Engineering, Rensselaer Polytechnic Institute, "*Atomistic study of the initial oxidation of metals and alloys***"** (10/2012)
9. Xiangtan University, "*In situ visualization and theoretical modeling of the early-stage oxidation of metals*" (06/2012)
10. Qingdao University, "*Coordinated experimental and theoretical study of the early stages of oxidation of metals*" (06/12)
11. The Integrated Electronics Engineering Center (IEEC), Technical Advisory Boards meeting*, "In situ study of the stability of materials under harsh environments"* (03/2012)
12. Mechanical Engineering Department, University of Massachusetts at Amherst, "*In situ TEM study of nanoscale oxidation of metals and alloys*" (04/2011)
13. Materials Science and Engineering, Pennsylvania State University, "*Dynamic in situ TEM Visualization of Nanoscale Oxidation of Metals and Alloys***"** (03/2011)
14. Peking University, "*Nanoscale oxidation of metals and alloys*" (07/2010)
15. Wuhan University, "*In situ study of early-stage oxidation of metal surfaces*" (06/2010)
16. University of Massachusetts at Lowell, "*In situ* study of nanoscale oxidation of metals (12/2009)
17. Argonne National Laboratory, "*In situ* TEM visualization of nanoscale oxidation of metals and alloys' (05/2009)
18. Physics colloquium, Binghamton University, "*Dynamic in-situ studies of surface oxidation of metals*" (02/2008)
19. University of Louisville, "*Understanding nanoscale surface oxidation via real time electron microscopy and x-ray scattering*" (03/2006)
20. University of Connecticut, "*In-situ studies of nanoscale surface oxidation"* (06/2006)
21. Argonne National Laboratory, "*Dynamics of Cu oxidation investigated by in situ TEM*" (05/2003)

Invited and Contributed Conference Presentations

1. G.W. Zhou, "*In-situ operando electron microscopy study of lithium ion batteries",* **Microscopy and Microanalysis**, St. Louis, MO, Aug., 2017 (**invited**)
2. G.W. Zhou, "*Oxidation driven surface dynamics on NiAl(100)",* **Northeast Regional Meeting**, **American Chemical Society**, Binghamton, NY, Oct., 2016 (**invited**)
3. G.W. Zhou, "*Catalytically active phase of methanol oxidation over Cu-based catalysts",* **252nd American Chemical Society National Meeting & Exposition**, Philadelphia, PA, Aug., 2016 (**invited**)
4. K. Karki, Y. Huang, S. Whittingham, E. Stach, F. Wang, G.W. Zhou, "*In-situ studies of advanced battery materials*", **25th International Materials Research Congress**, Cancun, Mexicon, Aug. 2016 (**invited**)
5. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "*In situ Atomic-Scale Visualization of CuO Nanowire Growth*", **Microscopy and Microanalysis**, Columbus, OH, Aug., 2016
6. K. Karki, Y. Huang, S. Whittingham, E. Stach, G.W. Zhou, "*ETEM Study of Oxygen Activity in* $LiNi_{0.8}Co_{0.15}Al_{0.05}O_2$ *(NCA) Cathode Materials at Various States of Charge*", **Microscopy and Microanalysis**, Columbus, OH, Aug., 2016
7. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "*In situ Atomic-Scale Visualization of CuO Nanowire Growth*", **Microscopy and Microanalysis**, Columbus, OH, Aug., 2016
8. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "*Initial stages of Reduction of* α-Fe_2O_3 *Nanoblades*", **Microscopy and Microanalysis**, Columbus, OH, Aug., 2016
9. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "The Growth of Catalyst-free NiO Nanowires", **Microscopy and Microanalysis**, Columbus, OH, Aug., 2016
10. G.W. Zhou, "*In-situ atomic-scale visualization of the oxidation of metals and alloys*", **Department of Energy, Synthesis and Processing Science Program Meeting**, Gaithersburg, MD, Nov., 2015 (**invited**)
11. G.W. Zhou, "*Dynamic in-situ atomic-scale imaging of the oxidation of metals*", **Microscopy and Microanalysis**, Portland, OR, Sept., 2015 (**invited**)
12. G.W. Zhou, "*In-situ atomic-scale visualization of the oxidation of metals",* **International workshop on materials behavior at the nanoscale and microscale"**, Xi'an, June, 2015 (**invited**)
13. W.H. Zhu, J.P. Winterstein, R. Sharma, G.W. Zhou, "*Atomic-Scale Characterization of the Reduction of a-*Fe_2O_3 *Nanowires"*, **Microscopy and Microanalysis**, Portland, OR, Sept., 2015
14. Q.Y. Yin, F. Gao, Z.Y. Gu, E.A. Stach, G.W. Zhou, "*In Situ Visualization of Metallurgical Reactions in Nanoscale Cu/Sn Diffusion Couples*", **Microscopy and Microanalysis**, Portland, OR, Sept., 2015
15. H.L. Qin, X.D. Chen, P. Sutter, G.W. Zhou, "*In-situ imaging of the interaction of oxide film growth with surface steps on NiAl(100)*", **American Vacuum Society,** 61th Annual International Symposium and Exhibition", Baltimore, MD, Nov., 2014
16. Q.Q. Liu, X. Tong, G.W. Zhou, "*XPS study of the dissociation of water vapor on pre-oxidized Al(111) and Cu(111) surfaces*", **American Vacuum Society,** 61th Annual International Symposium and Exhibition", Baltimore, MD, Nov. 2014
17. L. Li, L.L. Luo, J. Ciston, W.A. Saidi, E.A. Stach, J.C. Yang, G.W. Zhou, "*Surface-step-induced oscillatory oxide growth*", **Materials Research Society, Boston**, MA, Dec. 2014
18. W.H. Zhu, Q.Y. Yin, L. Yuan, G.W. Zhou, "In-situ TEM study of the reduction of nanostructured iron oxides", **Materials Research Society, Boston**, MA, Dec. 2014
19. L. Li, W.A. Saidi, G.W. Zhou, "*Density Functional and Kinetic Monte Carlo Studies of Chemisorptions-Induced Surface Phase Transitions on Cu(110)*", **Materials Research Society***,* Boston, MA, Dec. 2013
20. Q.Y. Yin, F. Gao, Z.Y. Gu, G.W. Zhou, "*Solderability of lead-free nano joints on Tin-Copper nanowires"*, **Materials Research Society***,* Boston, MA, Dec. 2013

21. L. Yuan, R.S. Cai, J.I. Jang, W.H. Zhu, C. Wang, Y.Q. Wang, G.W. Zhou. "*Morphological Transformation of Hematite Nanostructures by Sandblasting*", **Materials Research Society***,* Boston, MA, Dec. 2013
22. F. Gao, Q.Y. Yin, G.W. Zhou, Z.Y. Gu, "*Advanced Multifunctional Nanowires for Nanoelectronics Assembly and Nano-Soldering*", **Materials Research Society***,* Boston, MA, Dec. 2013
23. H.L. Qin, P. Sutter, G.W. Zhou, "*The Oxide Structure and Growth Dynamics of NiAl(100) Studied with Scanning Tunneling Microscopy and Low Energy Electron Microscopy*", **Materials Research Society***,* Boston, MA, Dec. 2013
24. G.W. Zhou, "*In-situ atomic-scale observations of the oxidation of metals*", **American Vacuum Society,** 60th Annual International Symposium and Exhibition", Long Beach, CA, Oct. 2013 (invited)
25. N. Cai, G.W. Zhou, K. Muller, D.E. Starr, "*Temperature and pressure dependent Mott potentials and their influence on self-limiting oxide film growth*", **Materials Research Society***,* Boston, MA, Dec. 2012
26. L Yuan, G.W. Zhou, "*The growth of Oxide Nanostructures by Thermal Oxidation of Metals*"**, Materials Research Society***,* Boston, MA, Dec. 2012
27. L.L Luo, Y.H. Kang, J.C. Yang, G.W. Zhou, "*In situ UHV TEM Study of Early Stages Oxidation of Cu-Pt Alloy*", **Materials Research Society***,* Boston, MA, Dec. 2012
28. L. Li, N. Cai, W.A. Al-Saidi, G.W. Zhou, "*Computational studies of chemisorptions-induced surface phase transitions on Cu(110)*", **Materials Research Society***,* Boston, MA, Dec. 2012
29. Q.Q. Liu, L. Li, G.W. Zhou, "*Investigation of the reduction of copper oxide by in-situ UHV-scanning tunneling microscopy*", **Materials Research Society***,* Boston, MA, Dec. 2012
30. M. Gu, I. Belharouak, A. Genc, Z.G. Wang, D.P. Wang, K. Amine, F. Gao, G.W. Zhou, S. Thevuthasan, J.-G. Zhang, N.D. Browning, J. Liu, C.M. Wang, Structure, Cation Segregation and Phase Transformation of Layered $Li_{1.2}Ni_{0.2}Mn_{0.6}O_2$ Cathode in Li-ion Batteries, **Materials Research Society***,* Boston, MA, Dec. 2012
31. L.L. Luo, L. Li, J. Ciston, E.A. Stach, J.C. Yang, G.W. Zhou, "*Atomic-scale visualization of the oxidation of Cu surfaces via in situ environmental TEM*", **Microscopy and Microanalysis Meeting**, Phoenix, AZ, July 2012.
32. I. Belharouak, D. Wang, G.W. Zhou, and K. Amine, "*Concentric Ring Architected Cathode Materials for Lithium Batteries*", **221st Electrochemical Chemistry Society**, Seattle, May 2012
33. J.C. Yang, Y.H. Kang, L.L. Luo, J. Ciston, E. Stach, G.W. Zhou, "*TEM Studies of the Initial Oxidation stage of Cu and Cu Alloy Thin Films*", **American Physical Society** March Meeting, Boston, MA, 2012
34. G.W. Zhou, "*In situ atomic visualization of the oxidation of metals*", **Department of Energy Investigators meeting,** Washington DC**,** Sept., 2011 (invited)
35. D. Wang, I. Belharouak, G. Koenig Jr., G.W. Zhou, and K. Amine, "*Growth Mechanism of $Ni_{0.3}Mn_{0.7}CO_3$ Precursor with Continuous Stirred Tank Reactor (CSTR) for High Capacity Cathodes*", **220th Electrochemical Chemistry Society** Boston, MA, Oct., 2011
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37. Na Cai, G.W. Zhou, K. Muller, D.E. Starr, "*Tuning the limiting-thickness of a thin oxide layer on Al (111) with oxygen gas pressure*", **Materials Research Society***,* Boston, MA, Dec. 2011
38. L Yuan, G.W. Zhou, "*Driving force and growth mechanism for spontaneous oxide nanowire formation during the oxidation of metals*", **Materials Research Society***,* Boston, MA, Dec. 2011
39. L. Liang, M. Xi, Y.F. Shi, G.W. Zhou, "*Precursor to the bulk oxide formation during the oxidation of Cu(100)*", **Materials Research Society***,* Boston, MA, Dec. 2011
40. L.L Luo, Y.H. Kang, Z.Y. Liu, J.C. Yang, G.W. Zhou, "*Self-assembly of oxide nanostructures via controlled nanoscale oxidation of metals*", **Materials Research Society***,* Boston, MA, Dec. 2011

41. D.P. Wang, I. Belharouak, G.M. Koenig, G.W. Zhou, K. Amine, "*Growth mechanism of $Ni_{0.3}Mn_{0.7}CO_3$ precursor for high capacity Li-ion battery cathodes*", **Materials Research Society**, Boston, MA, Dec. 2011
42. Na Cai, G.W. Zhou, K. Muller, D.E. Starr, "*Tuning the limiting-thickness of a thin oxide layer on Al (111) with oxygen gas pressure*", **Gordon Conference – High temperature corrosion**, Colby-Sawyer College. NH, July 24-29, 2011
43. JC Yang, Y Kang, L Luo, C Fleck, M Lee, A McGaughey, JA Eastman , G.W. Zhou, "*The surface kinetics of the initial oxidation stages of Cu and Cu alloys*", **Microscopy and Microanalysis Meeting,** Portland, Oregon, Aug. 2010 (**Invited**)
44. Langli Luo, Yihong Kang, Zhenyu Liu, Judith C. Yang and Guangwen Zhou, "*Effect of oxygen pressure on the initial oxidation behavior of Cu and Cu-Au alloys*", **Materials Research Society**, Boston, MA, Dec. 2010.
45. Yihong Kang, Langli Luo, Matthew France, Guangwen Zhou, and Judith C. Yang, "*In-situ studies of the initial stage of Cu-Ni alloy oxidation*", **Materials Research Society**, Boston, MA, Dec. 2010.
46. G.W. Zhou, "*Metal-oxide interface at the nanoscale*", **Materials Research Society**, Boston, MA, Dec. 2009.
47. G.W. Zhou, "*TEM study of interfaces during Cu_2O island growth*", **Microscopy and Microanalysis Meeting**, Richmond, VA, July 2009.
48. G.W. Zhou, C.H. Ke, J.C. Yang, J.H. Pearson, J.A. Eastman, "*Stress development and relaxation during early stages of oxidation of metals and alloys*", **American Physical Society** March Meeting, Pittsburgh, PA, 2009
49. S. Ziemack, L. Sun, J.C. Yang, J.A. Eastman, G.W. Zhou, "*The surface dynamics of the initial oxidation behavior of CuNi alloys",* **American Physical Society** March Meeting, Pittsburgh, 2009
50. G.W. Zhou, W.Y. Dai, J.C. Yang, "*Reduction of Oxide islands on metal surfaces'*, Fall'08 **Materials Research Society**, Boston, Dec. 2008
51. G.W. Zhou, W.Y. Dai, J.C. Yang, "*In situ TEM investigation of reduction of oxide islands on Cu(100) surfaces*', **Materials Science & Technology Meeting**, Pittsburgh, 2008
52. G.W. Zhou, Xidong Chen, Judith C. Yang, "*Fractal aspects related to the oxidation of Cu(111)*", **Materials Research Society Symposium**, Fall meeting, Boston, 2007
53. G.W. Zhou, Judith C Yang, Jeffery A Eastman, John E Pearson, "*Thermodynamic selection of nanoscale morphology of oxide islands investigated by in-situ UHV-TEM*", **Materials Research Society Symposium**, Fall meeting, Boston, 2007
54. G.W. Zhou, J.A. Eastman, R.C. Birtcher, P. M. Baldo, J.E. Pearson, L.J. Thompson, L. Wang, J.C. Yang, "*In-situ TEM investigation of nanoscale oxidation of (001)Cu-Au alloys*", **Microscopy and Microanalysis '06, Chicago**, IL, August, 2006
55. G.W. Zhou, D.D. Fong, P. Baldo, J.E. Pearson, L.J. Thompson, J.A. Eastman, "*Anomalous scaling of Cu surfaces under oxidation*", **Materials Research Society**, Boston, MA, December 2005
56. D.D. Fong, J.A. Eastman, P.H. Fuoss, G.W. Zhou, P.M. Baldo, L.J. Thompson, "*In situ synchrotron x-ray studies of CO oxidation by Au/TiO_2*", **Fall '05 Materials Research Society**, Boston, MA, December 2005
57. G.W. Zhou, "*In situ TEM investigation of early-stages of metal oxidation*", **Spring'05 Materials Research Society**, San Francisco, CA, April 2005 **(invited)**
58. D.D. Fong, G.W. Zhou, P.H. Fuoss, P.M. Baldo L.J. Thompson, L.E. Rehn, and J.A. Eastman, "*In Situ Synchrotron X-Ray Studies of Cu(001) Oxidation*", Dynamics of surface and interface processes workshop, Argonne, August, 2005 **(invited)**
59. J.A. Eastman, D.D. Fong, P.H. Fuoss, P.M. Baldo, L.J. Thompson, G.W. Zhou, L.E. Rehn, "*In-situ synchrotron X-ray studies of nanostructured heterogeneous catalysts for energy and environmental applications*", ***ECI conference,*** *September 2005, Castelvecchio Pascoli, Italy*
60. P. H. Fuoss, J.A. Eastman, G.W. Zhou, L.E. Rehn, P.M. Baldo, L.J. Thompson, D.D. Fong, "*In-situ studies of the oxidation of strained, coherent Cu(100) films*", **Spring'05 Materials Research Society**, San Francisco, CA, April 2005 **(invited)**

61. L. Wang, G.W. Zhou, J.A. Eastman, J.C. Yang, "*Energetics and kinetics of Cu-Au alloy oxidation studied by in-situ UHV-TEM*", **Materials Research Society**, San Francisco, CA, April 2005
62. J.C. Yang, GW. Zhou, L. Wang, J.A. Eastman, "*The initial oxidation mechanisms of Cu and Cu-Au by in-situ TEM*", **American Physical Society,** March Meeting, Indianapolis, Los Angles, CA, 2005.
63. D.D Fong, J.A. Eastman, P.H. Fuoss, G.W. Zhou, L.E. Rehn, P.M. Baldo, and L.J. Thompson, "*In-situ studies of reversible hydriding in palladium thin films*", **Spring'05 Materials Research Society**, San Francisco, CA, April 2005
64. G.W. Zhou, L. Wang, J. C. Yang, P. Baldo, J.E. Pearson, J.A. Eastman, "*Dendritc oxide growth via surface oxidation*", **Fall '04 Materials Research Society,** Boston, MA, December, 2004.
65. J.A. Eastman, P.H. Fuoss, G.W. Zhou, L.E. Rehn, P.M. Baldo, L.J. Thompson, D.D. Fong, "*In-situ studies of Cu_2O nano-island formation on Cu(001)*", **Fall'04 Materials Research Society**, Boston, MA, December 2004
66. G.W. Zhou, J. C. Yang, "*Surface Modifications by Nano-oxidation*", **Fall'03 Materials Research Society Symposium,** Boston, MA, December, 2003.
67. G.W. Zhou, J. C. Yang, " *Surface Modifications: Reduction of oxide islands on metal surfaces investigated by In situ TEM*", **Microscopy and Microanalysis'03,** San Antonia, TX, August, 2003.
68. G.W. Zhou, J. C. Yang, "*Initial oxidation of Cu(110) film investigated by in situ UHV-TEM*", **Spring'03 Materials Research Society Symposium,** San Francisco, CA, April, 2003 (**invited**).
69. G.W. Zhou, J. C. Yang, "*Nano-oxidation of Cu film investigated by in situ UHV-TEM*", American Physical Society, March Meeting, Austin, TX, 2003
70. G.W. Zhou, J. C. Yang, "*Quantitative V-L-S growth model and experiments of Fe catalyzed Si nanowire formation*", **Fall '02 Materials Research Society,** Boston, MA, December, 2002.
71. G.W. Zhou, J. C. Yang, "*Initial oxidation kinetics of copper thin films as investigated by in situ UHV-TEM*", **Microscopy and Microanalysis '02,** Quebec, Canada, August, 2002.
72. G.W. Zhou**,** J. C. Yang, "*Quasi-one dimensional nanostructures of Cu_2O on Cu(100)*", **American Physical Society,** March Meeting, Indianapolis, IN, 2002.
73. G.W. Zhou, J. C. Yang, "*The formation of assembled Cu_2O nanostructures investigated by in situ UHV-TEM*", **Fall '01 Materials Research Society Symposium,** Boston, MA, December, 2001
74. G.W. Zhou, M. Bharadwaj, J. C. Yang, "*Initial oxidation kinetics of Copper(110) thin films as investigated by in situ UHV-TEM*", **Microscopy and Microanalysis,** Long Beach, CA, Aug., 2001
75. G.W. Zhou, J. C. Yang, "*Initial oxidation stages of Cu as investigated by in-situ UHV-TEM*", **Spring '01 Materials Research Society Symposium,** San Francisco, CA, April, 2001.
76. G.W. Zhou, J. C. Yang, "*The improved passivation of aluminum and structure of amorphous alumina formed on aluminum during oxidation in various environments*", **Microscopy and Microanalysis'00**, Philadelphia, PA, August, 2000.

Teaching

Undergraduate-level courses
Materials Science (Fall 2017)
Thermodynamics (Fall 2009, 2010, 2011, 2012, 2013)
Materials Selection in Engineering Design (Spring 2015, 2016)

Graduate-level courses
Transmission Electron Microscopy (Spring 2008, 2009, 2010, 2011, 2012, 2013, 2016)
Crystallography and Diffraction (Fall 2008, 2009, 2010, 2011, 2012, 2013, 2015, 2016)
Special Topics in Nanoscience and Nanotechnology (Fall 2007)

Advising

Visiting Scholar

Canying Cai (Jan. 2014 - Dec. 2015), Department of Physics, Xiangtan University

Post-doctoral Advising
Dongdong Xiao (2017 – present): In-situ liquid cell TEM of battery materials
Khim Karki (2014 – present): In-situ TEM study of battery materials
Hailang Qin (2012 – 2014): SPM study of the early-stage oxidation of NiAl alloys
Congkang Xu (2009 – 2010): Methanol oxidation over copper containing catalysts

Graduate Advising

Current Graduate Students
Kuo Liu, MS student, 2016 – present
Zhilu Liang, PhD student, 2017 – present
Xianhu Sun, PhD student, 2017 – present
Xiaobo Chen, PhD student, 2017 – present
Jianyu Wang, PhD student, 2017 – present
Hanlei Zhang, PhD student, 2015 – present
Chaoran Li, PhD student, 2014 – present
Dongxiang Wu, PhD student, 2014 – present
Peng Mu, PhD student, 2013 – present
Lianfeng Zou, PhD student, 2012 – present
Qiyue Yin, PhD student, 2012 – present
Jonathan Li, PhD student, 2012 – present
Qianqian Liu, PhD student, 2011 – present
Yaguang Zhu, PhD student, 2016 – present

Defended PhD theses:

Lianfeng Zou, 09/2012 – 05/2017 (present employer: Pacific Northwest National Laboratory)
PhD thesis: Atomistic study of the surface and interface dynamics

Qiyue Yin, 09/2012 – 07/2017 (present employer: EAG Laboratories)
PhD thesis: Fundamental properties of nanoscale Cu/Sn diffusion couples

Wenhui Zhu, 09/2012 – 12/2016 (present employer: Ford Motor)
PhD thesis: *In-situ atomic-scale probing of the oxidation of metals and reduction of metal oxides*

Qianqian Liu, 09/2011 – 12/1026
PhD thesis: SPM study of surface oxidation of Cu and Al

Liang Li, 09/2009 – 05/2015 (present employer: Argonne National Laboratory)
PhD thesis: *Atomistic modeling of the oxidation of Cu surfaces*

Lu Yuan, 09/2009 – 04/2014 (present employer: Globalfoundries)
PhD thesis: *The growth of one-dimensional oxide nanostructures by thermal oxidation of metals*

Langli Luo, 09/2008 –11/2012 (present employer: Pacific Northwestern National Laboratory)
PhD Thesis: *Morphological and kinetic study of the initial-stage oxidation of copper and copper alloys by in-situ TEM*

Dapeng Wang, 01/2008 – 05/2012 (present employer: Apple)

PhD Thesis: *Li- and Mn- rich composite cathode materials for lithium ion batteries*

Na Cai, 09/2008 – 07/2012 (present employer: Globalfoundries)
PhD Thesis: *Oxidation of Al and Cu: from oxygen surface chemisorption to the growth of continuous oxide films*

Defended MS theses:

Weitao Shan, 09/2014 – 06/2016
MS Thesis: *Theoretical study of hydrogen-induced atomic structure evolution of the oxygen-chemisorbed Cu(110) surface*

Dongxiang Wu, 09/2014 – 06/2016
MS Thesis: *DFT study of oxygen adsorption at domain boundaries formed by the oxygen chemisorption induced surface phase transition on Cu(110)*

Daizhao Li, 09/2011-08/2013
MS Thesis: *Density-functional theory investigation of oxygen chemisorption on stepped copper surfaces*

Ming-Young Jang, 09/2012-08/2013
MS Thesis: *Electron microscopy study of the corrosion of prestressing strands*

Yanchang Li, 09/2010 –07/2012
Thesis: *Effect of partial oxidation of methanol on surface morphology and structure of copper based nano-catalysts*

Rediola Mema, 09/2009-05/2011
MS Thesis: *Effect of surface stress and morphology modification on cupric oxide nnaowire growth in the thermal oxidation of Cu*

Ph.D. thesis committees

Jong Hyun Shim (2013 -): *Development of ceramic thin-films by low temperature solution processing*
Abhishek Nandur (2012 -): *CZTS solar absorber by Pulsed laser deposition*
Bohua Wen (2012-2014): *Molybdenum phosphate cathode materials for lithium-ion batteries*
Siyuan Ma (2011 - 2015): *Low temperature plasma sintering Ag nanoparticles*
Jin Fang (2011 - present): *LiFePO4 electrode material for lithium ion battery*
Zhaoyong Sun, PhD (2010): *Synthesis and self-assembly of In2O3-based nanocrystals*
Ruigang Zhang, PhD (2011): *Synthesis and characterization of novel electrode materials for lithium ion batteries*
Zheng Li, Ph.D (2011): *Layered oxides ($Li_{1+x}M_{1-x}O_2$ (M = Ni, Mn, Co, Al) as cathode materials for rechargeable lithium ion batteries*
Hui Zhou, PhD (2012): *Pyrophosphates novel cathode materials for lithium batteries*
Liwei Huang, PhD (2012): *Sintering metal nanoparticles films*
Harry Schoeller, PhD (2011): *High temperature mechanical behavior of Pb and Sn solder alloys*

Undergraduate Advising

2015 - 2016 Capstone Design: ***Battery powered go-kart***

John M Stefanidis (ME), William Robert Paulson (ME), Antony Walton Haines (ME), Chase Thomas Bouchard (EE), Ben A Barone (EE)

2013 - 2014 Capstone Design: ***Designing and building a gas handling system for dosing mixed gases in ultra-high vacuum chambers with controllable partial pressures***
Dylan Nacht (ME), Logan Nelsen (ME), Michael Bronson (EE), Wenhao Liu (EE)

2012 - 2013 Capstone Design: **Design a non-magnetic heater support for an STM sample holder and an *electrochemical tip etching system***
Kevin A Gorman (ME), Chris H Maiorana (ME), Aaron Stewart (ME)

2011 - 2012 Capstone Design: ***ASME Student Design Competition: Energy Relay***
Swastisharan Dey (ME), João Trevisan (ME), Brittney Kovary (ME), Sean Rask (ME)

2010 - 2011 Capstone Design: ***Educational Product to Introduce Engineering to K-12 Project***
Megan D. Kloner (ME), Andrew S. Vargason (ME), Alex Concepcion (ME), Stephen Avondolio (ME), Cody Conden, Joji George (ME)

2009 - 2010 Capstone Design: **Design a small stress device**
Maura Cahill (ME), Glenn Rosner (ME), Yoshikuni Hasegawa (ME)

Capstone Design: ***Development of a virtual transmission electron microscope***
Emel Yildiz (Computer Science)

2008 - 2009 Capstone Design: ***Copper crystal stress mechanism***
Frank Roehrl (ME), Rediola Mema (ME)

2008 - 2009 Capstone Design: ***Development of a virtual Transmission Electron Microscope***
Ezgi Gozen (Computer Science), Duygu Uygur (Computer Science)

Professional Activities

- Brookhaven National Laboratory, Center for Functional Materials, user proposal review committee (2013-2018)
- Co-editor, Advances in Spectroscopy and Imaging of Surfaces and Nanostructures, Materials Research Society Proceedings, Volume 318, 2011 (Cambridge University Press)
- Conference Organization:
  "*In Situ Electron Microscopy in gases and liquids*" symposium (co-organizers: Libor Kovarik, Raymond R Unocic), Microscopy and Microanalysis, August, 2017
  "*Advanced Imaging Techniques for In-Situ studies*" symposium (co-organizers: Renu Sharma, Jing Tao, Daniel Bahena Uribe), XXV International Materials Research Congress (IMRC) 2016 (Cancun, Mexico)
  "*In situ Microscopy Focus Topic*" symposium (co-organizers: John Cumings, Judith C Yang, Alan McGaughey), American Vacuum Society (AVS) 58th Annual International Symposium and Exhibition", Nov. 2011 (Nashville, Tennessee)
  "*Advanced Imaging and Scattering Techniques for in situ Studies*" symposium (co-organizers: John Cumings, Dillon Fong, Jianyu Huang), Materials Research Society Meeting, Fall 2010 (Boston)
- Symposium chairs:
  Materials Science &Technology Conference 2008
  "*Electron Microscopy and Electron Diffraction: Development and Applications*"
  "*Interfaces and Defects in Functional Oxides*"

American Vacuum Society (AVS) 59th Annual International Symposium and Exhibition", Nov. 2013 (Long Beach, CA)
"*In situ electron microscopy and spectroscopy*"

- National Effective Teaching Institute (NETI) workshop (Austin, TX, June 2009)
- Proposal review panels, National Science Foundation; Basic Energy Science, Department of Energy (regular proposals and proposals for DOE Early-Career Research Program)
- Editorial board: International Journal of Nano Science, Nano Engineering and Nanotechnology
- Journal reviewer*:*
  Nature Communications; *Physical Review Letters; Nano Letters; Physical Review B; ACS Nano; Journal of the American Chemical Society; Scientific Report; Nanoscale; Applied Physics Letters; Surface Science; Journal of Applied Physics; Chemical Physical Letters; Journal of Chemical Physics; Physical Chemistry Chemical Physics*; *Philosophical Magazine B; Journal of Materials Research; Applied Surface Science; Journal of Nanoparticle Research; Crystal Growth and Design; Materials Science & Engineering; Journal of Crystal Growth; Thin Solid Films; Physica Status Solidi; Journal of Electronic Materials; Materials Letters; Carbon; Surface and Coating Technology; Journal of Materials Science; Oxidation of Metals; Materials Chemistry and Physics; ACS Applied Materials & Interfaces; Journal of Physical Chemistry C; Journal of Adhesion Science and Technology; etc.*
- Society memberships
  Materials Research Society; Microscopy Society of America; American Physical Society; The Minerals, Metals & Materials (TMS); American Vacuum Society

Department and School Committees

2016-2018 Chair, Research Committee, Watson School of Engineering and Applied Science
2016-2017 Chair, Space Committee, Mechanical Engineering Department
2015-2016 Chair, Research Committee, Watson School of Engineering and Applied Science
2005-2017 Member, Graduate Committee, Mechanical Engineering Department
2013-2014 Member, Research Committee, Watson School of Engineering and Applied Science
2013-2014 Chair, Seminar Committee, Mechanical Engineering Department
2007-2014 Member, Graduate Committee, Mechanical Engineering Department
2008-2009 Member, Computer/Web committee, Mechanical Engineering Department

University Committees

2016-2017 Member, Smart Energy Transdisciplinary Areas of Excellence Committee

Research Collaboration

Argonne National Laboratory
- Khalil Amine (Group Leader, Battery Technology Department)
- Ilias Belharouak (Staff Scientist, Battery Technology Department)

Binghamton University
- Junghyun Choi (Professor, Department of Mechanical Engineering)
- Changhong Ke (Associate Professor, Department of Mechanical Engineering)
- Jiye Fang (Associate Professor, Department of Chemistry)
- Joon Jang (Assistant Professor, Department of Physics)
- Aleksey Kolmogorov (Assistant Professor, Department of Physics)
- Louis Piper (Assistant Professor, Department of Physics)
- M Stanley Whittingham (Professor, Department of Chemistry)
- CJ Zhong (Professor, Department of Chemistry)

University of Cambridge, UK
- Stephan Hofman (Associate Professor, Department of Engineering)

Brookhaven National Laboratory
- Eric Stach (Group Leader, Electron Microscopy Group)
- Dong Su (Staff Scientist, Electron Microscopy Group)
- Peter Sutter (Group Leader, Interfacial Science and Catalysis)
- Xiao Tong (Staff Scientist, Interfacial Science and Catalysis)
- Jurek Sadowski (Staff Scientist, Interfacial Science and Catalysis)

Carnegie Mellon University
- Alan JH McGaughey (Associate Professor, Department of Mechanical Engineering)

Helmholtz-Zentrum Berlin für Materialien und Energie Gmb, Germany
- David Starr

Lawrence Berkeley National Laboratory
- Jim Ciston (Senior Staff Scientist, National Center for Electron Microscopy)

National Institute of Standards and Technology
- Renu Sharma (Project leader, Electron Microscopy)

Pacific Northwest National Laboratory
- Chongmin Wang (Senior Research Scientist, Interfacial & Nanoscale Science Facility)

Qingdao University, China
- Yiqian Wang (Professor, Department of Physics)

Rensselaer Polytechnic Institute
- Yunfeng Shi (Associate Professor, Department of Materials Science and Engineering)
- Liping Huang (Associate Professor, Department of Materials Science and Engineering)

SUNY Buffalo
- Peihong Zhang (Associate Professor, Department of Physics)

University of Groningen, Zernike Institute for Advanced Materials, Netherlands
- Kathrin Mueller

University of Massachusetts, Lowell
- Zhiyong Gu (Associate Professor, Department of Chemical Engineering)

University of Pittsburgh
- Judith C Yang (Professor, Department of Chemical and Petroleum Engineering)
- Wissam A. Al-Saidi (Research Professor, Department of Chemical and Petroleum engineering)
- Guofeng Wang (Associate Professor, Department of Mechanical Engineering and Materials Science)

West Virginia University
- Nick Wu (Associate Professor, Department of Mechanical and Aerospace Engineering)