

# CURRICULUM VITAE

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## Xiaolin ZHENG

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**CURRENT POSITION:** Associate Professor of Mechanical Engineering, Stanford University

### RESEARCH INTEREST

Xiaolin Zheng's research is in the field of combustion, nanomaterials and energy conversion. Her group has innovated a range of flame synthesis methodologies to grow binary, ternary, doped and branched metal oxide nanowires through fundamental understanding of flame chemistry and crystal growth. Her group has pioneered a sol-flame method that combines flame synthesis with sol-gel chemistry to modify existing nanowires with coatings, doping, reduction and oxidation. Applications of these flame-synthesized nanomaterials as key elements in catalytic combustion and photoelectrochemical (or solar) water-splitting devices has led to the best performance to date. Her group also investigates the ignition and combustion property of nanoenergetic materials. In addition, her group has opened up new research areas on flexible electronics by inventing new peel-and-stick methods for manufacturing flexible, light weight thin film electronics and optoelectronics.

### PROFESSIONAL PREPARATION

Tsinghua University	Thermal Engineering	B.S. & 2000
Princeton University	Mechanical & Aerospace Engineering	Ph.D. 2006
Harvard University	Chemistry & Chemical Biology	Post-doc (2006-2007)

### APPOINTMENTS

Associate Professor	Mechanical Engineering, Stanford University	09/2014 – Present
Assistant Professor	Mechanical Engineering, Stanford University	07/2007 – 08/2014

### AWARDS AND HONORS

- Resonate Award, Resnick Institute at Caltech, 2016
- Nano Letters Young Investigator Lectureship, 2015
- David Filo and Jerry Yang Scholar, 2015
- National Geographic Emerging Explorer Award, 2014
- One of the Innovators on the 100 Leading Global Thinkers, Foreign Policy Magazine, 2013
- One of the Pioneers on the TR35 Global list, MIT Technology Review, 2013
- TechConnect National Innovation Award, TechConnect-National Innovation Summit, 2013
- 3M Nontenured Faculty Grant Award, 2013 and 2014
- Presidential Early Career Awards for Scientists and Engineers, 2009
- ONR Young Investigator Program, 2008
- DARPA Young Faculty Award, 2008

- Terman Fellowship (Faculty) Award, Stanford University, 2007
- NSEC Postdoctoral Fellowship, Harvard University, 2006
- Bernard Lewis Fellowship, the Combustion Institute, 2004
- Harold W. Dodds Honorific Fellowship, Princeton University, 2004
- Amelia Earhart Fellowship, Zonta International Foundation, 2003
- Larisse Rosentweig Klein Memorial Award, Department of Mechanical & Aerospace Engineering (MAE), Princeton University, 2003
- Britt and Eli Harari Fellowship, Department of MAE, Princeton University, 2002
- Sayre Graduate Prize, Department of MAE, Princeton University, 2001
- Guggenheim Fellowship, Princeton University, 2000
- Graduation with Honor, Tsinghua University, 2000

### SELECTED PUBLICATIONS

**TOTAL PUBLICATIONS: 73; TOTAL CITATIONS: 6000+ and h-index: 32 (google scholar)**

1. "Carrot-shaped WO<sub>3</sub>/Mo:BiVO<sub>4</sub>/FeOOH/NiOOH Heterojunction Photoanode for Efficient Solar Water-splitting: 6.0 mA/cm<sup>2</sup> at 0.8 V vs. RHE", X.J. Shi, L.L. Cai, M. Ma, I. Choi, K. Zhang, J.K. Kim, K. Jong, **X.L. Zheng** and J. H. Park, *submitted*.
2. "Light-Driven BiVO<sub>4</sub>-C Fuel Cell with Simultaneous Production of H<sub>2</sub>O<sub>2</sub>", X.J. Shi, Y.R. Zhang, S. Siahrostami, J.K. Kim and X. L. Zheng, *Nature Catalysis*, under review.
3. "Ultrafast Flame Annealing of TiO<sub>2</sub> Paste for Fabricating Dye-Sensitized and Perovskite Solar Cells with Enhanced Efficiency", JK Kim, SU Chai, YJ Cho, LL Cai, Lili; SJ Kim, SW Park, JH Park, and **X. L. Zheng**, *Small*, *accepted*.
4. "Rational Nanopositioning for BiVO<sub>4</sub> Solar Water Splitting by Plasmon-induced Energy Transfer", Jung Kyu Kim\*, Xinjian Shi\*, Myung Jin Jeong, Joonsuk Park, Hyun Soo Han, Suk Hyun Kim, Yu Guo, Tony F. Heinz, Shanhui Fan, Chang-Lyul Lee, Jong Hyeok Park, and X. L. Zheng, *Advanced Functional Materials*, *accepted*.
5. "Understanding Activity Trends in Electrochemical Water Oxidation to form Hydrogen Peroxide", X.J. Shi, S. Siahrostami, G.L. Li, Y.R. Zhang, P. Chakthranont, F Studt, T. Jaramillo, J. Norskov and **X. L. Zheng**, *Nature Communication*, *accepted*.
6. "Ignition Properties of Nano- and Micron-Sized Silicon Particles", S. D. Huang, V.S. Parimi, S.L. Deng, S. Lingamneni and X. L. Zheng, *Nano Letters*, DOI: 10.1021/acs.nanolett.7b01754, (2017).
7. "Stabilizing Silicon Photocathodes by Solution-Deposited Ni-Fe Layered Double Hydroxide for Efficient H<sub>2</sub> Evolution in Alkaline Media", J. H. Zhao, L.L. Cai, L. Hong and **X. L. Zheng**, *ACS Energy Lett.*, 2 (9), 1939–1946 (2017).
8. "Electroless Deposition and Ignition Properties of Si/Fe<sub>2</sub>O<sub>3</sub> Core/Shell Nanothermite", S. D. Huang, S.L. Deng, Y. Jiang and **X. L. Zheng**, *ACS Omega*, 2 (7), 3596–3600 (2017).
9. "Three-Dimensional Hetero-Integration of Faceted GaN on Si Pillars for Efficient Light Energy Conversion Devices", D. R. Kim, C. H. Lee, I. S. Cho, H. Jang, M. S. Jeon, and **X. L. Zheng**, *ACS Nano*, 11 (7), 6853–6859, DOI: 10.1021/acsnano.7b01967 (2017).
10. "Rapid Flame Synthesis of Atomically Thin MoO<sub>3</sub> down to Monolayer Thickness for Effective Hole Doping of WSe<sub>2</sub>", L. L. Cai\*, C. J. McClellan\*, A. L. Koh, H. Li, E. Yalon, E. Pop, and **X. L. Zheng**, *Nano Letters*, 17(6), 3854-3861 (2017).

11. "Effect of Interfacial Blocking Layer Morphology on the Photoelectrochemical Water Splitting Performance of WO<sub>3</sub> Nanoflakes", S. H. Ahn\*, J.H. Zhao\*, J.H. Kim and **X. L. Zheng**, *Electrochemical Acta*, 244, 184–191 (2017). (\* These authors contributed equally)
12. "Methanol Photo-Oxidation on Rutile TiO<sub>2</sub> Nanowires: Probing Reaction Pathways on Complex Materials", A. S. Crampton, L.L. Cai, N. Janvelyan, **X. L. Zheng**, and C. M. Friend, *J. Phys. Chem. C*, DOI: 10.1021/acs.jpcc.7b01385 (2017).
13. "Electrochemical generation of sulfur vacancies in the basal plane of MoS<sub>2</sub> for hydrogen evolution", C. Tsai\*, H. Li\*, S.W. Park\*, J. Park, H. Park, J. Norskov, **X. L. Zheng** and F. Pedersen, *Nature Communications*, 8: 15113, DOI:10.1038/ncomms15113 (2017). (\* These authors contributed equally)
14. "Molybdenum disulfide catalyzed tungsten oxide for on-chip acetone sensing", H. Li, S. Ahn, S. Park, L.L. Cai, J.H. Zhao, J. He, M. Zhou, J. Park, and **X. L. Zheng**, *Appl. Phys. Lett.*, 109, 133103 (2016).
15. "One-Step Hydrothermal Deposition of Ni:FeOOH onto Photoanodes for Enhanced Water Oxidation", L.L. Cai, J. H. Zhao, H. Li, I.S. Cho, H.S. Han and **X. L. Zheng**, *ACS Energy Lett.*, 1(3), 624–632, DOI: 10.1021/acsenerylett.6b00303 (2016).
16. "Enhancing Ignition and Combustion of Micron-sized Aluminum by Adding Porous Silicon", V. S. Parimi, S.D. Huang and **X. L. Zheng**, *Proc. Combust. Inst.* 36, DOI:10.1016/j.proci.2016.06.185 (2016).
17. "Kinetic Study of Hydrogen Evolution Reaction over Strained MoS<sub>2</sub> with Sulphur-Vacancies using Scanning Electrochemical Microscopy", H. Li\*, M.S. Du\*, M. Mleczko, A.L. Koh, Y. Nishi, E. Pop, A. Bart and **X. L. Zheng**, *Journal of the American Chemical Society*, 138 (15) 5123–5129, DOI: 10.1021/jacs.6b01377 (2016). (*ACS Editor's Choice*)
18. "High Performance Ultrathin BiVO<sub>4</sub> Photoanode on Textured Substrates for Solar Water Splitting", J. H. Zhao, Y. Guo, L.L. Cai, H. Li, K. Wang, X. Ken, I.S. Cho, C. H. Lee, S. H. Fan and **X. L. Zheng**, *ACS Energy Lett.*, 1(1) 68–75, DOI: 10.1021/acsenerylett.6b00032 (2016).
19. "Quasi-ballistic Electronic Thermal Conduction in Metal Inverse Opals", M. Barako, A. Sood, C. Zhang, J. Wang, T. Kodama, M. Asheghi, X.L. Zheng, P. Braun and K. Goodson, *Nano Letters*, 16 (4), 2754–2761, DOI: 10.1021/acs.nanolett.6b00468 (2016).
20. "Activating and Optimizing MoS<sub>2</sub> Basal Planes for Hydrogen Evolution through the Formation of Strained Sulfur Vacancies", H. Li\*, C. Tsai\*, A. L. Koh, L. Cai, A. W. Contryman, A. H. Fragapane, J. Zhao, H. S. Han, H. C. Manoharan, F. Abild-Pedersen, J. K. Nørskov and **X. L. Zheng**, *Nature Materials*, 15, 48–53, Doi:10.1038/nmat4465 (2016).
21. "Enhancing Low-bias Performance of Hematite Photoanodes for Solar Water Splitting by Simultaneous Reduction of Bulk, Interface and Surface Recombination Pathways", I. S. Cho, H. S. Han, M. Logar, J. S. Park and **X. L. Zheng**, *Advanced Energy Materials*, Doi:10.1002/aenm.201501840 (2015). (**Cover Art for the December issue of 2015**).
22. "General Characterization Methods for Photoelectrochemical Cells for Solar Water Splitting", X. Shi, L. Cai, M. Ma, **X. L. Zheng** and J. H. Park, *ChemSusChem*, 8, 3192, Doi:10.1002/cssc.201500075 (2015).
23. "Highly Efficient Solar Water Splitting from Transferred TiO<sub>2</sub> Nanotube Arrays", I.S. Cho, J. Choi, K. Zhang, S.J. Kim, M.J. Jeong, L. Cai, T. Park, **X. L. Zheng** and J. H. Park, *Nano Lett.*, 15, 5709-5715 (2015).

24. "Enhancing Catalytic CO Oxidation over Co<sub>3</sub>O<sub>4</sub> Nanowires by Substituting Co<sup>2+</sup> with Cu<sup>2+</sup>", M. Zhou\*, L. L. Cai\*, M. Bajdich, M. G. Melchor, H. Li, J. He, J. Wilcox, W. Wu, A. Vojvodic, and **X. L. Zheng**, *ACS Catalysis*, 5, 4485-4491 (2015)
25. "Optoelectronic Crystal of Artificial Atoms in Strain-Textured MoS<sub>2</sub>", H. Li, A. W. Contryman, X. F. Qian, S. M. Ardakani, Y. J. Gong, X. L. Wang, J. M. Weisse, C. H. Lee, J. H. Zhao, P. M. Ajayan, J. Li, H. C. Manoharan and **X. L. Zheng**, *Nature Communications*, 6:7381 (2015).
26. "Interwoven Three-Dimensional Architecture of Cobalt Oxide Nanobrush-Graphene@Ni<sub>x</sub>Co<sub>2x</sub>(OH)<sub>6x</sub> for High-Performance Supercapacitors", Qu, L., Y. Zhao, A.M. Khan, C. Han, K.M. Hercule, M. Yan, X. Liu, W. Chen, D. Wang, Z. Cai, W. Xu, K. Zhao, **X. L. Zheng**, and L. Mai, *Nano Letters*, 15(3), 2037-2044 (2015).
27. "Laminar Flame Speeds, Counterflow Ignition, and Kinetic Modeling of the Butene Isomers", P. Zhao, W. H. Yuan, H. Y. Sun, Y. Y. Li, A. P. Kelley, **X. L. Zheng** and C. K. Law, *Proc. Combust. Inst.* 35 (1), 309-316 (2015).
28. "Transfer Printing Methods for Flexible Thin Film Solar Cells: Basic Concepts and Working Principles", C.H. Lee, D.R. Kim and **X.L. Zheng**, *ACS Nano*, 8 (9), 8746–8756 (2014).
29. "Sol-Flame Synthesis of Cobalt-doped TiO<sub>2</sub> Nanowires with Enhanced Electrocatalytic Activity for Oxygen Evolution Reaction", L. L. Cai, I. S. Cho, M. Logar, A. Mehta, C. H. Lee, P. M. Rao, Y. Z. Feng, F. Prinz and **X. L. Zheng**, *Phys. Chem. Chem. Phys.*, 16 (16), 12299-12306 (2014).
30. "Titanium Incorporation into Hematite Photoelectrodes: Theoretical Considerations and Experimental Observations", C. X. Kronawitter, I. Zegkinoglou, S. H. Shen, P. Liaod, I. S. Cho, O. Zandi, Y.S. Liu, K. Lashgari, G. Westin, J. H. Guo, F. J. Himpsel, E. A. Carter, **X. L. Zheng**, T.W. Hamann, B. E. Koel, S. S. Mao and L. Vayssieres, *Energy Environmental Science*, 7, 3100-3121, DOI:10.1039/C4EE01066C (2014).
31. "Simultaneously Efficient Light Absorption and Charge Separation in WO<sub>3</sub>/BiVO<sub>4</sub> Core/Shell Nanowire Photoanode for Photoelectrochemical Water Oxidation", P. M. Rao, L.L. Cai, C. Liu, I. S. Cho, C. H. Lee, J. M. Weisse, P. D. Yang and **X. L. Zheng**, *Nano Letters*, 14(2), 1099-1105, DOI:10.1021/nl500022z (2014).
32. "Rapid and Controllable Flame Reduction of TiO<sub>2</sub> Nanowires for Enhanced Solar Water-Splitting", I. S. Cho, M. Logar, C. H. Lee, L. L. Cai, F. Prinz and **X. L. Zheng**, *Nano Letters*, 14(1), 24-31, DOI:10.1021/nl4026902 (2013).
33. "Flash Ignition of Freestanding Porous Silicon Films: Effects of Film Thickness and Porosity", Y. Ohkura, J. M. Weisse and **X. L. Zheng**, *Nano Letters*, 13(11), 5528-5533 (2013).
34. "Peel-and-Stick: Mechanism Study for Efficient Fabrication of Flexible/Transparent Thin-film Electronics", C. H. Lee, J. H. Kim, C. Y. Zou, I. S. Cho, J. M. Weisse, W. Nemeth, Q. Wang, A. V. Duin, T. S. Kim and **X. L. Zheng**, *Scientific Reports*, Vol. 3, article number: 2917, DOI: 10.1038/srep02917 (2013).
35. "Electro-Assisted Transfer of Vertical Silicon Wire Arrays Using a Sacrificial Porous Silicon Layer", J. M. Weisse, C. H. Lee, D. R. Kim, L. L. Cai, P. M. Rao and **X. L. Zheng**, *Nano Letters*, 13 (9), 4362-4368 (2013).
36. "Morphological control of heterostructured nanowires synthesized by sol-flame method ", R. L. Luo, I. S. Cho, Y. Z. Feng, L. L. Cai, P. M. Rao and **X. L. Zheng**, *Nanoscale Research Letters*, 8:347, DOI:10.1186/1556-276X-8-347 (2013).
37. "Codoping TiO<sub>2</sub> Nanowires with (W, C) for Enhancing Photoelectrochemical Performance", I. S. Cho, C. H. Lee, Y. Z. Feng, M. Logar, P. M. Rao, L. L. Cai, D. R. Kim, R. Sinclair and

- X. L. Zheng**, *Nature Communications*, Vol. 4, Article number: 1723, DOI: 10.1038/ncomms2729 (2013).
38. "Sol-Flame Synthesis: A General Strategy to Decorate Nanowires with Nanoparticles", Y. Z. Feng, I. S. Cho, P. M. Rao, L. L. Cai and **X. L. Zheng**, *Nano Letters*, 13 (3), 855-860, 2013 (Cover Art for the March issue of 2013).
  39. "Reducing Minimum Flash Ignition Energy of Al Microparticles by Addition of WO<sub>3</sub> Nanoparticles", Y. Ohkura, P. M. Rao, I. S. Cho and **X. L. Zheng**, *Applied Physics Letters*, 102, 043108 (2013).
  40. "Flame Synthesis of 1-D Complex Metal Oxide Nanomaterials", L. L. Cai, P. M. Rao, Y. Z. Feng and **X. L. Zheng**, *Proc. Combust. Inst.* **34**, 2229-2236 (2013).
  41. "Sol-Flame Synthesis of Hybrid Metal Oxide Nanowires", Y. Z. Feng, I. S. Cho, P. M. Rao, L. L. Cai and **X. L. Zheng**, *Proc. Combust. Inst.* **34**, 2179-2186 (2013).
  42. "Flame Synthesis of WO<sub>3</sub> Nanotubes and Nanowires for Efficient Photoelectrochemical Water-Splitting", P. M. Rao, I. S. Cho and **X. L. Zheng**, *Proc. Combust. Inst.* **34**, 2187-2195 (2013).
  43. "Peel-and-Stick: Fabricating Thin Film Solar Cells on Universal Substrates", C. H. Lee, D. R. Kim, I. S. Cho, N. William, Q. Wang and **X. L. Zheng**, *Scientific Reports*, Vol. 2, Article number: 1000, DOI: 10.1038/srep01000 (2012). (Featured by Forbes, MIT Technology Review, MRS Bulletin, Stanford News, etc.)
  44. "Shrinking and Growing: Grain Boundary Density Reduction for Efficient Polysilicon Thin-Film Solar Cells", D. R. Kim, C. H. Lee, J. M. Weisse, I. S. Cho and **X. L. Zheng**, *Nano Letters*, 12(12), 6485-6491 (2012).
  45. "Thermal Conductivity in Porous Silicon Nanowire Arrays", J. M. Weisse, A. M. Marconnet, D. R. Kim, P. M. Rao, M. A. Panzer, K. E. Goodson and **X. L. Zheng**, *Nanoscale Research Letters*, 7, 554-559 (2012).
  46. "Copper Ion Enhanced Synthesis of Nanostructured Cobalt Oxide Catalyst for Oxidation of Methane", Y. Z. Feng and **X. L. Zheng**, *ChemCatChem*, 4(10), 1551-1554 (2012) (Special issue on synthesis of nanocatalysts).
  47. "Fabrication of Flexible and Vertical Silicon Nanowire Electronics", J. M. Weisse, C. H. Lee, D. R. Kim, and **X. L. Zheng**, *Nano Letters*, 12, 3339-3343( 2012).
  48. "Branched TiO<sub>2</sub> Nanorods for Photoelectrochemical Hydrogen Production", I. S. Cho, Z.B. Chen, A. J. Forman, D. R. Kim, P. M. Rao, T. F. Jaramillo and **X. L. Zheng**, *Nano Letters*, 11 (11), 4978-4984 (2011).
  49. "Flash Ignition of Al Nanoparticles: Mechanism and Applications", Y. Ohkura, P. M. Rao, and **X. L. Zheng**, *Combustion and Flames*, 158, 2544-2548 (2011).
  50. "Fabrication of Nanowire Electronics on Nonconventional Substrates by Water-Assisted Transfer Printing Method", C. H. Lee, D. R. Kim, and **X. L. Zheng**, *Nano Letters*, 11 (8), 3435-3439 (2011). (Featured by NBC Bay Area news, Stanford Report and EE Times)
  51. "Hybrid Si Microwire and Planar Solar Cells: Passivation and Characterization", D. R. Kim, C. H. Lee, P. M. Rao, I. S. Cho and **X. L. Zheng**, *Nano Letters*, 11, 2704-2708 (2011).
  52. "Unique Magnetic Properties of Single Crystal  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> Nanowires Synthesized by Flame Vapor Deposition", P. M. Rao, and **X. L. Zheng**, *Nano Letters*, 11, 2390-2395 (2011).
  53. "Vertical Transfer of Uniform Silicon Nanowire Arrays via Crack Formation", J. M. Weisse, D. R. Kim, C. H. Lee, and **X. L. Zheng**, *Nano Letters*, 11(3), 1300-1305( 2011).
  54. "Morphology-Controlled Flame Synthesis of Single, Branched, and Flower-like alpha-MoO<sub>3</sub> Nanobelt Arrays", L. Cai, P. M. Rao, and **X. L. Zheng**, *Nano Letters*, 11 (2), 872-877(2011).

55. "Methane Oxidation Over Catalytic Copper Oxides Nanowires", Y. Z. Feng, P. M. Rao, D. R. Kim and **X. L. Zheng**, *Proc. Combust. Inst.* 33, 3169-3175 (2011).
56. "Flame Synthesis of Tungsten Oxide Nanostructures on Diverse Substrates", P. M. Rao and **X. L. Zheng**, *Proc. Combust. Inst.* 33, 1891-1898 (2011).
57. "Synthesis and Ignition of Energetic CuO/Al Core/Shell Nanowires", Y. Ohkura, S. Y. Liu, P. M. Rao and **X. L. Zheng**, *Proc. Combust. Inst.* 33, 1909-1915 (2011).
58. "Fabricating Nanowire Devices on Diverse Substrates by Simple Transfer-Printing Methods", C. H. Lee, D. R. Kim and **X. L. Zheng**, *Proceedings of the National Academy of Sciences*, 107, 9950-9955 (2010).
59. "Orientation-Controlled Alignment of Axially Modulated pn Silicon Nanowires", C. H. Lee, D. R. Kim, and **X. L. Zheng**, *Nano Letters*, 10(12), 5116-5122 (2010).
60. "Plasma-Enhanced Catalytic CuO Nanowires for CO Oxidation", Y. Z. Feng, and **X. L. Zheng**, *Nano Letters*, 10 (11), 4762-4766 (2010).
61. "Direct Growth of Nanowire Logic Gates and Photovoltaic Devices", D. R. Kim, C. H. Lee and **X. L. Zheng**, *Nano Letters*, 10 (3), 1050-1054 (2010).
62. "Characterization of the Wettability of Thin Nanostructured Films in the Presence of Evaporation", A. Rogacs, J. E. Steinbrenner, J. A. Rowlette, J. M. Weisse, **X. L. Zheng**, and K. E. Goodson, *Journal of Colloid and Interface Science*, 349, 354-360 (2010).
63. "Rapid Catalyst-Free Flame Synthesis of Dense, Aligned  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> Nanoflakes and CuO Nanoneedle Arrays", P. M. Rao and **X. L. Zheng**, *Nano Letters*, 9 (8), 3001-3006 (2009).
64. "Probing Flow Velocity with Silicon Nanowire Sensors", D. R. Kim, C. H. Lee and **X. L. Zheng**, *Nano Letters*, 9, 1984-1988 (2009).
65. "Numerical Characterization and Optimization of the Microfluidics for Nanowire Biosensors", D. R. Kim and **X. L. Zheng**, *Nano Letters*, 8, 3233-3237 (2008).
66. "Single and Tandem Axial p-i-n Nanowire Photovoltaic Devices", T. J. Kempa, B.Z. Tian, D. R. Kim, J. Hu, **X. L. Zheng** and C. M. Lieber, *Nano Letters*, 8, 3456-3460 (2008).
67. "Coaxial Silicon Nanowires as Solar Cells and Nanoelectronic Power Sources", B. Z. Tian\*, **X. L. Zheng**\*, T. J. Kempa, Y. Fang, N. F. Yu, G. H. Yu, J. L. Huang and C. M. Lieber, *Nature* 449, 885-890 (2007). (\* These authors contributed equally)
68. "Experimental Counterflow Ignition Temperatures and Reaction Mechanisms of 1, 3-Butadiene", **X. L. Zheng**, T. L. Lu and C. K. Law, *Proc. Combust. Inst.* 31, 367-375 (2007).
69. "Thermochemical and Kinetic Analyses on Oxidation of Isobutenyl Radical and 2-Hydroperoxymethyl-2-Propenyl Radical", **X. L. Zheng**, H. J. Sun and C. K. Law, *J. Phys. Chem. A* 109, 9044-9054 (2005).
70. "Non-premixed Ignition of H<sub>2</sub>/Air in a Mixing Layer with a Vortex", **X. L. Zheng**, J. Yuan and C. K. Law, *Proc. Combust. Inst.* 30, 415-421 (2005).
71. "Experimental Determination of Counterflow Ignition Temperatures and Laminar Flame Speeds of C<sub>2</sub>-C<sub>3</sub> Hydrocarbons at Atmospheric and Elevated pressures", G. Jomaas, **X. L. Zheng**, D. L. Zhu and C. K. Law, *Proc. Combust. Inst.* 30, 193-200 (2005).
72. "Experimental and Computational Study of Non-premixed Ignition of Dimethyl Ether in Counterflow", **X. L. Zheng**, T. F. Lu, C. K. Law, C. K. Westbrook and H. J. Curran, *Proc. Combust. Inst.* 30, 1101-1109 (2005).
73. "Ignition of Premixed Hydrogen/Air by Heated Counterflow under Reduced and Elevated Pressures", **X. L. Zheng** and C. K. Law, *Combust. Flame* 136 (1-2), 168-179 (2004).
74. "Ignition of Premixed Hydrogen/Air by Heated Counterflow", **X. L. Zheng**, J. D. Blouch, D. L. Zhu, T. G. Kreutz and C. K. Law, *Proc. Combust. Inst.* 29, 1637-1644 (2002).

### INVITED TALKS (TOTAL: 70+)

1. “Light-driven Fuel Cell with Simultaneous Production of  $H_2O_2$ ”, 2018 Renewable Energy: Solar Fuels Gordon Research Conference, Jan. 30, 2018
2. “Light-driven Fuel Cell with Simultaneous Production of  $H_2O_2$ ”, Future Energy Research at Stanford – Innovators to Watch, GCEP Research Symposium “Advancing Energy Research – GCEP and Beyond”, Stanford University, October 17-18, 2017.
3. 2018 Renewable Energy: Solar Fuels Gordon Research Conference, Jan. 30, 2018
4. “Activating Basal Plane of  $MoS_2$  for Hydrogen Evolution Reaction through Sulfur Vacancy, Doping and Strain”, Keynote lecture at 5th international workshop on Nanotechnology, Renewable Energy & Sustainability (NRES), Xi'an, China, Sep. 25, 2017
5. “Synthesis and Ignition of Energetic Materials”, Xian Jiaotong University, China, Sep. 23, 2017
6. “Synthesis and Ignition of Energetic Materials”, Department of Mechanical Engineering, Purdue University, Aug. 31, 2017
7. “Engineering Nanomaterials for Energy Conversion”, IEEE San Francisco Bay Area Nanotechnology Council, Santa Clara, CA, June 20, 2017
8. “Tuning Physicochemical Properties of  $MoS_2$  By Mechanical Strain”, 12<sup>th</sup> Sino-US Nano Forum, Beijing, China, May 28, 2017
9. “Tuning Properties of  $MoS_2$  by Mechanical Strain”, IEEE-NEMS, UCLA, CA, April 9, 2017
10. “Engineering Nanomaterials for Energy Conversion”, the 253rd ACS National Meeting in San Francisco, CA, April 2, 2017
11. “Hybrid Al/Porous Si as High Performance Energetic Materials”, ONR Experimental and Diagnostic Collaborative Exchange Meeting, Argonne National Lab, March 7, 2017
12. “Engineering Nanomaterials for Energy Conversion”, Department of Mechanical Engineering, National Chiao Tung University, Taiwan, Nov. 21, 2016
13. “Engineering Nanomaterials for Energy Conversion”, Department of Aeronautic and Astronautic, National Chen-Kung University, Taiwan, Nov. 23, 2016
14. “Engineering Nanomaterials for Energy Conversion”, Department of Mechanical and Electromechanical Engineering, National Sun Yat-Sen University, Taiwan, Nov. 24, 2016
15. “Engineering Nanomaterials for Energy Conversion: From Flame Synthesis to Water Splitting”, the Resnick Young Investigators Symposium, Caltech, Sep. 12, 2016
16. “Activating and Optimizing  $MoS_2$  Basal Planes for Hydrogen Evolution through Formation of Strained Sulphur Vacancies”, Fusion Conference on Molecules and Materials for Artificial Photosynthesis Conference, Cancun, Mexico, Feb. 25-28, 2016
17. “Bridging combustion and nanotechnology”, University of Houston, Mechanical Engineering, Oct. 1, 2015
18. “Bridging combustion and nanotechnology”, 2015 ACS Nano Letter Young Investigator Lecture, Boston, MA, August 18, 2015
19. “Rapid flame processing of metal oxides photoanodes for enhanced solar water-splitting”, 2015 SPIE Optics + Photonics for Sustainable Energy, San Diego, CA, August 12, 2015
20. “Transfer Printing Methods for Fabricating Nanowire Devices on Diverse Substrates”, 2015 SPIE DDS Meeting, Session on Flexible, Stretchable, Transient Electronics-What’s Next? Baltimore, MD, April 20, 2015
21. 2014 MRS Fall Meeting, Symposium V on Sustainable Solar Energy Conversion Using Earth-Abundant Materials, Boston, USA, Dec. 2, 2014
22. 2014 Energy@Stanford&SLAC Conference, Sep. 9, 2014

23. 2014 ACS Spring Meeting, Symposium on Catalysis for Solar-to-Fuel Conversion, San Francisco, CA, August 11, 2014.
24. 2014 National Geographic Explorers Symposium, Washington, DC, June 11, 2014.
25. 2014 MRS Spring Meeting, Symposium D on Materials for Photoelectrochemical and Photocatalytic Solar Energy Harvesting and Storage, San Francisco, USA, April 22, 2014
26. 2014 MRS Spring Meeting, Symposium UU on Semiconductor Nanowires: Synthesis, Property, and Applications, San Francisco, USA, April 24, 2014
27. Princeton University, Mechanical & Aerospace Engineering, December 6, 2013
28. 2013 Electrochemical Society Fall Meeting, Symposium on Solar Energy Conversion and Utilization, San Francisco, CA, October 27- November 1, 2013.
29. California Institute of Technology, Department of Civil & Mechanical, Oct. 31, 2013
30. 2013 EmTech MIT Conference, Cambridge, MA, Oct. 9-11, 2013
31. University of California, Berkeley, Nano Seminar, Sep. 20, 2013.
32. 2013 ACS Fall Meeting, Symposium on Solar Energy Conversion and Utilization, Indianapolis, Indiana, September 8-12, 2013.
33. 2013 ACS Fall Meeting, Symposium on Nanotechnology Applications in Energy, Indianapolis, Indiana, September 8-12, 2013.
34. The 19th American Conference on Crystal Growth and Epitaxy, Keystone, Colorado, July 21-26, 2013.
35. The 3<sup>rd</sup> Sungkyun International Solar Forum (SISF 2013), Sungkyunkwan University, June 30-July 2, 2013.
36. Workshop for World Class University Program, Seoul National University, June 27 and 28, 2013
37. Stanford Center for Integrated Systems, Roundtable Presentation, May 13, 2013
38. University of California, Los Angeles, Material Science and Engineering, May 3, 2013
39. 2013 Spring Convention and Expo for the Adhesive and Sealant Council, Atlanta, GA, April 22, 2013
40. 2013 MRS Spring Meeting, Symposium Z on Nanotechnology & Sustainability, San Francisco, USA, April 3, 2013
41. University of Connecticut, Mechanical Engineering, March 29, 2013
42. Rutgers University, Mechanical and Aerospace Engineering, March 27, 2013
43. Pennsylvania State University, Mechanical and Nuclear Engineering, March 26, 2013
44. University of Wisconsin, Madison, Materials Science Program, March 14, 2013
45. International Workshop on Photon Tools for Combustion and Energy Conversion, Argonne National Laboratory, March 3 – 6, 2013
46. Massachusetts Institute of Technology, Micro-Nano Seminar, Feb. 20, 2013
47. Cornell University, Sibley School of Mechanical and Aerospace Engineering, Feb. 19, 2013
48. University of California, Berkeley, Berkeley Sensor & Actuator Center Seminar Series, Dec. 11, 2012
49. The 19<sup>th</sup> International Display Workshops, Kyoto, Japan, December 4-7, 2012
50. Yale University, Mechanical Engineering, Nov. 7, 2012
51. University of Illinois at Urbana-Champaign, Mechanical and Industrial Engineering, October 23, 2012
52. 2012 ECS Fall Meeting, Symposium E7 on Low-Dimensional Nanoscale Electronic and Photonic Devices, Hawaii, USA, October 7, 2012
53. University of Michigan, Ann Arbor, Mechanical Engineering, September 25, 2012



54. Stanford Center for Integrated Systems, Roundtable Presentation, May 22, 2012
55. First International Conference on Advanced Materials, Energy and Environment, Toledo, Ohio, May 10-11, 2012
56. Stanford University, Material Science and Engineering Colloquium, April 27, 2012
57. 2012 MRS Spring Meeting, Symposium AA on Inorganic nanowire and nanotubes-synthesis, properties and device applications, San Francisco, USA, April 13, 2012
58. Purdue University, School of Aeronautics and Astronautics, March 29, 2012
59. The Fourth International Conference on One-dimensional Nanomaterials, Beijing, China, Dec. 9, 2011
60. International Conference on Advanced Materials and Devices, Jeju Island, South Korean, Dec. 7, 2011
61. University of California, Berkeley, Solid State Technology and Devices Seminar, Oct. 14, 2011
62. Stanford Center for Integrated Systems, Roundtable Presentation, May 17, 2011
63. Princeton University, Mechanical & Aerospace Engineering, May 14, 2010
64. Massachusetts Institute of Technology, Mechanical Engineering, March 18, 2010
65. Nanoepitaxy Conference SPIE NanoEngineering, Aug. 3, 2009
66. Stanford University, Material Science and Engineering Colloquium, 2009
67. University of California, Berkeley, BNNI Nano Seminar Series, May 1, 2009
68. Agilent Technologies, Inc., Santa Clara, CA, 2008
69. Stanford University, Mechanical Engineering, 2005
70. Purdue University, Mechanical Engineering, 2005
71. University of California, Irvine, Mechanical and Aerospace Engineering, 2005
72. University of Illinois at Urbana-Champaign, Mechanical and Industrial Engineering, 2005
73. University of Notre Dame, Aerospace and Mechanical Engineering, 2005
74. Sandia National Laboratories, Combustion Research Facility, 2005

## PATENTS

1. Y. Ohkura and X. L. Zheng, "Distributed Ignition Of Fuels Using Nanoparticles," US 2012-051931.
2. C. H. Lee, D. R. Kim, and X. L. Zheng, "Environmentally-Assisted Technique for Transferring Devices onto Non-Conventional Substrates," Patent application (13/791,214).
3. J. M. Weisse and X. L. Zheng, "Electro-Assisted Transfer and Fabrication of Wire Arrays," Provisional patent application (61/864,364).
4. Y. Ohkura and X. L. Zheng, "Optical Ignition of Fuels," Provisional patent application (61/773,953).
5. Y. Z. Feng, I. S. Cho and X. L. Zheng, "A General and Effective Sol-Flame Method to Dope Nanowires and Thin Films," Provisional patent application (61/806,728).
6. P. M. Rao and X. L. Zheng, "Rapid, Atmospheric, Catalyst-Free Flame Synthesis of Aligned Metal Oxide Nanostructures on Diverse Substrates," in provision.

## PROFESSIONAL SERVICE

1. Organizer of Symposium on "Nanomaterials - Processing and Manufacturing" for the 2017 MRS Fall Meeting in Boston, USA

2. Colloquium Co-chairs for the colloquium entitled “Soot, PAH; Nanomolecules and Material Synthesis” for the 36<sup>th</sup> International Combustion Symposium, 2016
3. Evaluation committee for International Combustion Institute Summer School, 2014, 2015.
4. Evaluation committee for Bernard Lewis Fellowship Committee for Combustion Institute, 2014, 2015
5. Serve as a Judge for MIT TR35, 2015
6. DOE proposal review, 2015
7. Discussion leader for 2015 Gordon Research Conference on Nanomaterials for Applications in Energy Technology
8. Organizing a Symposium on Combustion Synthesis of Functional Nanomaterials of the 2014 MRS Fall Meeting in Boston, USA
9. Colloquium Co-chairs for the colloquium entitled “Heterogeneous Combustion and Materials Synthesis” for the 35<sup>th</sup> International Combustion Symposium
10. Organizing Symposium Y on Combustion Synthesis of Functional Nanomaterials of the 2012 MRS Fall Meeting in Boston, USA
11. Journal reviewer for Nature Materials, ACS Nano, Combustion and Flame, Nano Letters, Nanoscale and Microscale Thermophysical Engineering, and Journal of the Royal Society Interface, Proceedings of the Combustion Institute, Material Chemistry
12. Participated in NSF review panels
13. Member of the Combustion Institute, American Chemistry Society and Materials Research Society

## CURRENT MEMBERS

### Graduate Students

1. Jiheng Zhao (expected 2018)
2. Sidi Huang (expected 2019)
3. Sangwook Park (expected 2019)
4. Xinjian Shi (expected 2020)
5. Ben Ben Levy-Wendt (expected 2020)
6. Yue Jiang (expected 2021)

### Postdocs

1. Dr. Sili Deng (She has accepted an Assistant Professor position at MIT ME)
2. Dr. JungKyu Kim

## ALUMNI

### Former Ph.D. Students

3. Dr. Lili Cai (2016), Postdoc, Material Science & Engineering, Stanford University
4. Dr. Pratap M. Rao (2013), Assistant Professor, Mechanical Engineering, Worcester Polytechnic Institute
5. Dr. Chi Hwan Lee (2013), Assistant Professor, Purdue University
6. Dr. Yuma Ohkura (2013), Product Engineer, Lam Research
7. Dr. Jeffrey M. Weisse (2013), Manager, Alphabet Energy
8. Dr. Yunzhe Feng (2012), Process Engineer, Applied Materials

9. Dr. Dong Rip Kim (2011), Assistant Professor, Mechanical Engineering, Hanyang University, South Korea

Former Postdocs

1. Dr. Hong Li, Assistant Professor, Mechanical Engineering, Nanyang Technological University, Singapore
2. Dr. In Sun Cho, Assistant Professor, Materials Science & Engineering, Adou University, South Korea
3. Dr. Venkata Sharat Parimi, Engineer, Applied Materials
4. Dr. Sung Hoon Ahn, Postdoc Fellow, UT Austin

Former M.S. Students

1. Mr. Runlai Luo (2014), Kinestral Technology
2. Mr. Shih-Yu Andrew Liu (2010), Applied Materials
3. Mr. Charles Avila (2008), Toyota