

# JIMING BAO

Department of Electrical and Computer Engineering  
University of Houston  
N 308 Engineering Building 1  
Houston, TX 77204-4005

Phone: (713) 743-4456  
Fax: (713) 743-4444  
E-Mail: [jbao@uh.edu](mailto:jbao@uh.edu)  
<http://nano.ee.uh.edu>

---

## PROFESSIONAL PREPARATION

<b>Zhejiang University,</b>	Hangzhou, China	Physics	<b>B.S.</b>	1992
<b>Zhejiang University,</b>	Hangzhou, China	Physics	<b>M.S.</b>	1995
<b>University of Michigan,</b>	Ann Arbor, MI	Applied Physics	<b>Ph.D.</b>	2003
<b>Harvard University,</b>	Cambridge, MA	Applied Physics	Post Doctor	9/2003-6/2006

## APPOINTMENTS

9/2014-present Associate Professor, Department of Electrical and Computer Engineering,  
Materials Engineering Program, Department of Chemistry  
University of Houston, Houston, TX

9/2008-8/2014 Assistant Professor, Department of Electrical and Computer Engineering,  
Materials Engineering Program, Department of Chemistry  
University of Houston, Houston, TX

7/2006-8/2008 Research Associate, School of Engineering and Applied Sciences,  
Harvard University, Cambridge, MA

## SYNERGISTIC ACTIVITIES

Program Advisory Committee, the International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), Houston, 2011

Symposium Organizer, Advanced Materials for Hydrogen Energy, 247th ACS National Meeting, Dallas, TX, 2014

**Membership:** American Chemical Society (ACS), American Physical Society (APS), Optical Society of America (OSA), Materials Research Society (MRS).

## HONORS

2012 NSF CAREER Award

## PEER REVIEWED JOURNAL PUBLICATIONS

69. Yang Li, Wenlan Qiu, Fan Qin, Hui Fang, Viktor G. Hadjiev, Dmitri Litvinov, Jiming Bao, "Identification of Cobalt Oxides with Raman Scattering and Fourier Transform Infrared Spectroscopy", *The Journal of Physical Chemistry C*, accepted.

68. Ayan Maity, Linh Q. Le, Zhuan Zhu, Jiming Bao and Thomas S. Teets, "Steric and Electronic Influence of Aryl Isocyanides on the Properties of Iridium(III) Cyclometalates", *Inorganic Chemistry*, accepted.

67. Lu Tang, Feng Cao, Yang Li, Jiming Bao and Zhifeng Ren, "High performance mid-temperature selective absorber based on titanium oxides cermet deposited by direct current reactive sputtering of a single titanium target", *Journal of Applied Physics*, accepted on Jan. 9, 2016.

66. Emily Shearier, Peifu Cheng, Zhuan Zhu, Jiming Bao, Yun Hang Hu, and Feng Zhao, "Surface Defection Reduces Cytotoxicity of Zn(2-methylimidazole)<sub>2</sub> (ZIF-8) without Compromising its Drug Delivery Capacity", *RSC Adv.* **6**, 4128-4135 (2016), DOI: 10.1039/C5RA24336J.

65. Weishu liu, Jiawei Zhou, Qing Jie, Yang Li, Hee Seok Kim, Jiming Bao, Gang Chen, and Zhifeng Ren, "New insight into the material parameter B to understand the enhanced thermoelectric performance of Mg<sub>2</sub>Sn<sub>1-x-y</sub>Ge<sub>x</sub>Sb<sub>y</sub>", *Energy Environ. Sci.*, 2016, Advance Article, DOI: 10.1039/C5EE02600H, first published online Nov. 12, 2015.

64. Feng Lin, Xin Tong, Yanan Wang, Jiming Bao, Zhiming M. Wang, "Graphene oxide liquid crystals: synthesis, phase transition, rheological property, and applications in optoelectronics and display", *Nanoscale Research Letters*, **10**:435 (2015) doi:10.1186/s11671-015-1139-1.

63. A. K. P. D. Savio, J. Fletcher, K. Smith, R. Iyer, J. M. Bao, F. C. Robles Hernández, "Environmentally effective photocatalyst CoO-TiO<sub>2</sub> synthesized by thermal precipitation of Co in amorphous TiO<sub>2</sub>", *Applied Catalysis B: Environmental* **182** (2016) 449–455.

62. H. Fei, J. Dong, M. J. Arellano-Jimenez, G. Ye, N. D. Kim, E. Samuel, Z. Peng, Z. Zhu, F. Qin, D. Chen, J. Bao, M. Jose-Yacamán, P. Ajayan, and J. Tour. "Atomic Cobalt on Nitrogen-Doped Graphene for Hydrogen Generation", *Nature Communications* **6**, 8668 (2015) October 2015 | doi: 10.1038/ncomms9668

61. F. Cao, D. Kraemer, L. Tang, Y. Li, A. P. Litvinchuk, J. Bao, G. Chen and Z. Ren "A high-performance spectrally-selective solar absorber based on a yttria-stabilized zirconia cermet with high-temperature stability", *Energy and Environmental Science* **8**, 3040-3048 (2015).

60. J. Yuan, J. Wu, W. J. Hardy, P. Loya, M. Lou, Y. Yang, S. Najmaei, M. Jiang, F. Qin, K. Keyshar, H. Ji, W. Gao, J. Bao, J. Kono, D. Natelson, P. M. Ajayan, and J. Lou. "Facile Synthesis of Single Crystal Vanadium Disulphide Nanosheets by Chemical Vapor Deposition for Efficient Hydrogen Evolution Reaction", *Advanced Materials*, **27**, 5605-5609 (2015).

59. Y. Lan, F. Lin, Y. Li, Y. Dias, H. Wang, Y. Liu, Z. Yang, H. Zhou, Y. Lu, J. Bao, Z. Ren, M. A. Crimp. "Gallium Nitride Porous Microtubules Self-Assembled from Wurtzite Nanorods", *Journal of Crystal Growth* **415**, 139–145 (2015).

58. Jiming Bao, "Photoelectrochemical water splitting: A new use for bandgap engineering", *Nature Nanotechnology* **10**, 19–20 (2015)

57. Liqun He, Jian Ye, Min Shuai, Zhuan Zhu, Xufeng Zhou, Yanan Wang, Yang Li, Zhihua Su, Haiyan Zhang, Ying Chen, Zhaoping Liu, Zhengdong Cheng and Jiming Bao, "Graphene Oxide Liquid Crystals for Reflective Display without Polarizing Optics", *Nanoscale* **7**, 1616–1622 (2015).
56. Yang Li, Zhihong Liu, Xiaoxiang Lu, Zhihua Su, Yanan Wang, Rui Liu, Dunwei Wang, Jie Jian, Joon Hwan Lee, Haiyan Wang, Qingkai Yu and Jiming Bao, "Broadband Infrared Photoluminescence in Silicon Nanowires with High Density Stacking Faults", *Nanoscale* **7**, 1601–1605 (2015).
55. Xiaodong Yu, Yang Li, Xiaofeng Gu, Jiming Bao, Huizhong Yang & Li Sun, "Laser-induced breakdown spectroscopy application in environmental monitoring of water quality: a review", *Environ Monit Assess* **186**, 8969–8980 (2014).
54. Yanan Wang, Zhihua Su, Wei Wu, Shu Nie, Xinghua Lu, Haiyan Wang, Kevin McCarty, Shin-Shem Pei, Francisco Robles-Hernandez, Viktor G. Hadjiev, Jiming Bao. "Four-fold Raman Enhancement of 2D Band in Twisted Bilayer Graphene: Evidence for Doubly Degenerate Dirac Band and Quantum Interference", *Nanotechnology* **25**, 335201 (2014).
53. J. Bao, "Recent Developments in Photocatalytic Solar Water Splitting", *Materials Today* **17**, 208-209 (2014).
52. Y. Wang, A. Kar, A. Paterson, K. Kourentzi, H. Q. Le, P. Ruchhoeft, R. C. Willson, Jiming Bao. "Transmissive Nanohole Arrays for Massively-Parallel Optical Biosensing", *ACS Photonics* **1**, 241 (2014)
51. Wei Li, Bigeng Chen, Chao Meng, Wei Fang, Yao Xiao, Xiyuan Li, Zhifang Hu, Yingxin Xu, Limin Tong, Hongqing Wang, Weitao Liu, Jiming Bao,; Yuen Shen, "Ultrafast all-optical graphene modulator", *Nano Lett.* **14**, 955 (2014)
50. Longb Liao, Qihui Zhang, Zhihua Su, Zhongzheng Zhao, Xiaoxiang Lu, Dongguang Wei, Guoying Feng, Qingkai Yu, Xiaojun Cai, Jimin Zhao, Zhifeng Ren, Hui Fang, Francisco Robles-Hernandez, Steven Baldelli and Jiming Bao, "Efficient solar water-splitting using a nanocrystalline CoO photocatalyst" *Nature Nanotechnology* **9**, 69 (2014).
49. Y. Wang, Z. Su, W. Wu, S. Nie, N. Xie, H. Gong, Y. Guo, J. H. Lee, S. Xing, X. Lu, H. Wang, X. Lu, K. McCarty, S. Pei, F. Robles-Hernandez, V. G. Hadjiev, and J. Bao. "Resonance Raman Spectroscopy of G-Line and Folded Phonons in Twisted Bilayer Graphene with Large Rotation Angles", *Applied Physics Letters* **103**, 123101 (2013)
48. Peng Peng, Zhihua Su, Zhihong Liu, Qingkai Yu, Zhengdong Cheng and Jiming Bao, "Nanowire Thermometers", *Nanoscale* **5**, 9532-9535 (2013).
47. Yucheng Lan, Hui Wang, Feng Lin, Yalin Lu, Yang Li, Yuan Liu, Jiming Bao, Zhifeng Ren, Martin A. Crimp, "Nanoporous gallium nitride square microtubes", *Journal of Materials Science* **48**, 7703–7707 (2013)
46. S. Xing, W. Wu, Y. Wang, J. Bao, S. S. Pei. "Kinetic Study of Graphene Growth: Temperature Perspective on growth rate and film thickness by chemical vapor deposition", *Chemical Physics Letters* **580**, 62 (2013).

45. R. He, T. Chung, C. Delaney, C. Keiser, L. A. Jauregui, P. M. Shand, C. C. Chancey, Y. Wang, J. Bao, and Y. P. Chen. "Observation of Low Energy Raman Modes in Twisted Bilayer Graphene", *Nano Lett.* **13**, 3594–3601 (2013)
44. N. Xie, H. Gong, Z. Zhou, X. Guo, S. Yan, Q. Sun, S. Xing, W. Wu, S. S. Pei, J. Bao, X. Shan, Y. Guo, X. Lu. "Visualization of a Maze-Like Reconstruction of Graphene on a Copper Surface at the Atomic Scale" *Chin. Phys. Lett.* **30**, 056802 (2013).
43. W. Wu, D. De, S. C. Chang, Y. Wang, H. Peng, J. Bao, S. S. Pei. "High mobility and high on/off ratio field-effect transistors based on chemical vapor deposited single-crystal MoS<sub>2</sub> grains", *Applied Physics Letters* **102**, 142106 (2013).
42. Z. Su, J. Gan, Q. K. Yu, Q. H. Zhang, Z. H. Liu, and J. M. Bao, "High-resolution fiber optic temperature sensors using nonlinear spectral curve fitting technique", *Review Of Scientific Instruments* **84**, 045002 (2013).
41. Jonathan A. Fan, Kui Bao, Li Sun, Jiming Bao, Vinothan N Manoharan, Peter Nordlander, and Federico Capasso, "Plasmonic Mode Engineering with Templated Self-Assembled Nanoclusters", *Nano Letters* **12**, 5318-5324 (2012).
40. Shu Nie, Wei Wu, Shirui Xing, Qingkai Yu, Jiming Bao, Shin-shem Pei, and Kevi F. McCarty, "Growth from Below: Bilayer Graphene on Copper by Chemical Vapor Deposition", *New Journal of Physics* **14**, 093028 (2012).
39. Jonathan A. Fan, Kui Bao, J. Britt Lassiter, Jiming Bao, Naomi J. Halas, Peter Nordlander, and Federico Capasso, "Near-normal incidence dark-field microscopy: applications to nanoplasmonic spectroscopy", *Nano Letters* **12**, 2817-2821 (2012).
38. W Wu, Q K Yu, P Peng, Z H Liu, J M Bao and S S Pei, "Control of thickness uniformity and grain size in graphene films for transparent conductive electrodes", *Nanotechnology* **23**, 035603 (2012).
37. J. A. Fan, Y. He, K. Bao, C. Wu, Jiming Bao, N. B. Schade, V. N. Manoharan, G. Shvets, P. Nordlander, D. R. Liu, and F. Capasso, "DNA-Enabled Self-Assembly of Plasmonic Nanoclusters", *Nano Lett.* **11**, 4859 (2011)
36. W. Wu, L. A. Jauregui, Z. Su, Z. Liu, Jiming Bao, Y. P. Chen, Q. Yu, "Graphene: Growth of Single Crystal Graphene Arrays by Locally Controlling Nucleation on Polycrystalline Cu Using Chemical Vapor Deposition", *Adv. Mater.* **23**, 4898 (2011)
35. S. Baldelli, Jiming Bao, W. Wu, S.S. Pei, "Sum frequency generation study on the orientation of room - temperature ionic liquid at the graphene - ionic liquid interface", *Chem. Phys. Lett.* **516**, 171-173 (2011)
34. F. X. Gu, L. Zhang, H. K. Yu, W. Fang, Jiming Bao, L. M. Tong, "Large defect-induced sub-bandgap photoresponse in semiconductor nanowires via waveguiding excitation", *Nanotechnology* **22**, 425201 (2011)
33. Jiming Bao, Ilan Shalish, Zhihua Su, Ron Gurwitz, Federico Capasso, Xiaowei Wang and Zhifeng Ren, "Photoinduced oxygen release and persistent photoconductivity in ZnO nanowires", *Nanoscale Research Letters* **6**, 404 (2011).
32. Qingkai Yu, Luis A. Jauregui, Wei Wu, Robert Colby, Jifa Tian, Zhihua Su, Helin Cao, Zhihong Liu, Deepak Pandey, Dongguang Wei, Ting Fung Chung, Peng Peng, Nathan P. Guisinger, Eric A.

Stach, Jiming Bao, Shin-Shem Pei and Yong P. Chen, "Control and characterization of individual grains and grain boundaries in graphene grown by chemical vapour deposition", *Nature Materials*, **10**, 443 (2011).

**31.** Jonathan Fan, Kui Bao, Chihhui Wu, Jiming Bao, Rizia Bardhan, Naomi Halas, Vinothan N. Manoharan, Gennady Shvets, Peter Nordlander and Federico Capasso, "Fano-Like Interference in Self-Assembled Plasmonic Quadrumer Clusters", *Nano Letters* **10**, 4680-4685 (2010).

**30.** Zhihong Liu, Xiaoxiang Lu, Peng Peng, Wei Wu, Steven Pei, Qingkai Yu and Jiming Bao, "Room-temperature Tunable Fano Resonance by Chemical Doping in Few-layer Graphene Synthesized by Chemical Vapor Deposition", *Physical Review B* **82**, 155435 (2010).

**29.** Wei Wu, Zhihong Liu, Jie Lian, Jiming Bao, Qingkai Yu, Shin-Shem Pei, "Tetragonal Tungsten Oxide Nanobelts Synthesized by Chemical Vapor Deposition", *Journal of Crystal Growth*, **312**, 3147-3150, 2010

**28.** Wei Wu, Zhihong Liu, Luis A. Jauregui, Qingkai Yu, Rajeev Pillai, Helin Cao, Jiming Bao, Yong P. Chen, Shin-Shem Pei, "Wafer-scale Synthesis of Graphene by Chemical Vapor Deposition and its Application in Hydrogen Sensing", *Sensors & Actuators B-Chemical* **150**, 296 (2010).

**27.** Zhihong Liu, Jiandong Huang Pooran C. Joshi Apostolos T. Voutsas, John Hartzell, Federico Capasso and Jiming Bao, "Polarity-controlled visible/infrared electroluminescence in Si-nanocrystal/Si light-emitting devices", *Applied Physics Letters*, **97**, 071112 (2010).

**26.** Yu Yang, Jiming Bao, Chong Wang and Michael J. Aziz, "Sub-bandgap luminescence centers in silicon created by self-ion implantation and thermal annealing", *Journal of Applied Physics* **107**, 123109 (2010).

**25.** J. Fan, C. Wu, K. Bao, J.M. Bao, R. Bardhan, N. Halas, V. Manoharan, P. Nordlander, G. Shvets, F. Capasso, "Self-Assembled Plasmonic Nanoparticle Clusters", *Science*, **328**, 1135 (2010).

**24.** V. Lee, C. Park, C. Jaye, D. Fischer, Q. Yu, W. Wu, Z. Liu, J.M. Bao, S. Pei, C. Smith, P. Lysaght, S. Banerjee, "Substrate Hybridization and Rippling of Graphene Evidenced by Near-Edge X-ray Absorption Fine Structure Spectroscopy", *Journal of Physical Chemistry Letters* **1**, 1247 (2010).

**23.** H. Cao, Q. Yu, L. Jauregui, J. Tian, W. Wu, Z. Liu, R. Jalilian, D. Benjamin, Z. Jiang, J.M. Bao, S.S. Pei, Y. Chen, "Electronic transport in chemical vapor deposited graphene synthesized on Cu: Quantum Hall effect and weak localization", *Applied Physics Letters* **96**, 122106 (2010).

**22.** Xin Guo, Min Qiu, Jiming Bao, Benjamin J. Wiley, Qing Yang, Xining Zhang, Yaoguang Ma, Huakang Yu, and Limin Tong, "Direct Coupling of Plasmonic and Photonic Nanowires for Hybrid Nanophotonic Components and Circuits", *Nano Letters* **12**, 4515 (2009).

**21.** Jiming Bao, David C. Bell, Federico Capasso, Natasha Erdman, Dongguang Wei, Linus Fröberg, Thomas Mårtensson and Lars Samuelson, "Nanowire induced wurtzite InAs thin-film on zinc-blende InAs substrate", *Advanced Materials* **21**, 3654 (2009).

**20.** I. Shalish, G. Seryogin, W. Yi, Jiming Bao, M.A Zimmler, D.C. Bell, F. Capasso, V. Narayanamurti, "Epitaxial catalyst-free growth of InN nanorods on c-plane sapphire", *Nanoscale Research Letters*, **4**, 532 (2009).

**19.** E. Smythe, M. Dickey, Jiming Bao, G. Whitesides and Federico Capasso, "Optical Antenna Arrays on a Fiber Facet for *In Situ* Surface Enhanced Raman Scattering Detection", *Nano Letters*, **9**, 1132 (2009).

18. N. Yu, A. Belyanin, Jiming Bao, F. Capasso, "Controlled modification of Erbium lifetime by near-field coupling to metallic films", *New Journal of Physics*, **11**, 15003 (2009)
17. M. Zimmmer, Jiming Bao, F. Capasso, S. Müller and C. Ronning, "Laser Action in Nanowires: Observation of the Transition from Amplified Spontaneous Emission to Laser Oscillation", *App. Phys. Lett.* **93**, 51101 (2008).
16. B. Wiley, D. Lipomi, Jiming Bao, F. Capasso, G. Whitesides, "Fabrication of Surface Plasmon Resonators by Nanoskiving Single-Crystalline Gold Microplates", *Nano Letters*, **8**, 3023 (2008).
15. Jiming Bao, D. Bell, F. Capasso, T. Mårtensson, J. B. Wagner, J. Trägårdh and L. Samuelson, "Optical Properties of Rotationally Twinned InP Nanowire Heterostructures", *Nano Letters*, **8**, 836 (2008).
14. Jiming Bao, N. Yu, F. Capasso, M. Troccoli, T. Mates and A. Belyanin. "Controlled Modification of Erbium Lifetime in Silicon Dioxide with Metallic Overlayers", *App. Phys. Lett.* **91**, 131103 (2007).
13. M. A. Zimmmer, Jiming Bao, I. Shalish, W. Yi, V. Narayanamurti and F. Capasso. "A two-colour Heterojunction Unipolar Nanowire Light-emitting Diode by Tunnel Injection", *Nanotechnology* **18**, 395201 (2007)
12. Q. Xu, Jiming Bao, R. M. Rioux, R. Perez-Castillejos, F. Capasso and G. M. Whitesides. "Optical Properties of Large-area Metallic Nanostructures Fabricated by Nanoskiving", *Nano Lett.* **7**, 2800 (2007).
11. M. A. Zimmmer, Jiming Bao, I. Shalish, W. Yi, J. Yoon, V. Narayanamurti and F. Capasso. "Electroluminescence from Single Nanowires by Tunnel Injection: an Experimental Study", *Nanotechnology* **18**, 235205 (2007).
10. Jiming Bao, M. Tabbal, T. Kim, S. Charnvanichborikarn, J. S. Williams, M. J. Aziz and F. Capasso. "Point Defect Engineered Si Sub-bandgap Light-emitting Diode", *Opt. Exp.* **15**, 6727 (2007).
9. Jiming Bao, M.A. Zimmmer, F. Capasso, X. Wang and Z.F. Ren. "Broadband ZnO Single-Nanowire Light-Emitting Diode", *Nano Lett.* **6**, 1719 (2006).
8. Q. Xu, Jiming Bao, F. Capasso and G. M. Whitesides. "Surface Plasmon Resonances of Free-Standing Gold Nanowires Fabricated by Nanoskiving", *Angew. Chem. Int. Ed.* **45**, 3631, (2006).
7. C. J. Barrelet, Jiming Bao, M. Loncar, H-G Park, F. Capasso and C. M. Lieber. "Hybrid Single-Nanowire Photonic Crystal and Microresonator Structure", *Nano Lett.* **6**, 11 (2006).
6. J. K. Wahlstrand, P. Jacobs, Jiming Bao, R. Merlin, K. W. West and L. N. Pfeiffer. "Impulsive Excitation of Cyclotron Oscillations in a Two-dimensional Electron Gas", *Solid State Comm.*, **135**, 574 (2005).
5. Jiming Bao, A. V. Bragas, J. K Furdyna and R. Merlin. "Control of Spin Dynamics with Laser Pulses: Generation of Entangled States of Donor-bound Electrons in a Cd<sub>1-x</sub>Mn<sub>x</sub>Te Quantum Well", *Phys. Rev. B*, **71**, 45314 (2005).
4. Jiming Bao, L. N. Pfeiffer, K. W. West and R. Merlin. "Ultrafast Dynamic Control of Spin and Charge Density Oscillations in a GaAs Quantum Well", *Phys. Rev. Lett.* **92**, 236601 (2004).
3. Jiming Bao, A. V. Bragas, J. K. Furdyna and R. Merlin. "Optically Induced Multispin Entanglement in a Semiconductor Quantum Well", *Nature Materials*. **2**, 175 (2003).
2. Jiming Bao, A. V. Bragas, J. K. Furdyna and R. Merlin. "Spin-entangled State Created by Optical Pulses", *Solid State Comm.*, **127**, 771 (2003).

1. J. B. Xu, Jiming Bao and X. Gao. "Path Integral Approach to the Time-dependent Quadratic Hamiltonian and Coherent States", *Can. J. Phys.* **70**, 637 (1992).

**GRADUATE ADVISOR:** Roberto Merlin, University of Michigan, Ann Arbor, MI

**POSTDOCTORAL ADVISOR:** Federico Capasso, Harvard University, Cambridge, MA