

Yufeng HAO

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Contact Information

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Department of Mechanical Engineering

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Education Experience

B.S. Program (09/1997-07/2001): National Training Program for Physics Researchers and Teachers, Department of Physics, Shanxi University, Taiyuan, Shanxi, China.

Ph.D. Program (09/2001-06/2006): Institute of Solid State Physics, Chinese Academy of Sciences, Hefei, China. (Including master course study in the University of Science and Technology of China for two semesters from 09/2001 to 06/2002)

Professional Experience

Research Scientist (06/2006-03/2007): Institute of Solid State Physics, Chinese Academy of Sciences, Hefei, China.

Research Fellow (03/2007-09/2010): Center for Integrated Circuit Failure Analysis and Reliability (CICFAR), Department of Electrical & Computer Engineering, National University of Singapore, Singapore.

Research Fellow (10/2010- Present): Department of Mechanical Engineering, the University of Texas at Austin, TX, USA

Research Experience & Skills

1. Growth of graphene and other 2D crystals on metal substrates by Chemical Vapor Deposition (CVD).
2. Graphene and h-BN film transfer for characterizations and devices.
3. Growth of low-dimensional Nano-materials by CVD, porous alumina membrane, etc.
4. Material Characterizations and Analysis using SEM, TEM, AFM, Raman, XRD, XPS, TOF-SIMS, etc.
5. Fabrications of nanodevices using Electron Beam Lithography, Photolithography, Reactive Ion Etching, Metal Evaporation & Sputtering, Nano-Manipulators, Focused Ion Beam microscope, etc.
6. Electrical and thermal property measurements of graphene & nanowire devices.
7. Design, installation, and maintenance of Plasma Enhanced CVD (PECVD) system.
8. Design of electrical & thermal property measurement system for nano-materials, and design of TEM sample holders for in-situ observation, measurement, and manipulation.

Publications (Citation: **1075**, H-index: **18**, updated on November 8, 2013 from *ISI Web of Science*)

2013

1. **Yufeng Hao**, M. S. Bharathi, Lei Wang, Yuanyue Liu, Hua Chen, Shu Nie, Xiaohan Wang, Harry Chou, Cheng Tan, Babak Fallahzad, H. Ramanarayan, Carl W. Magnuson, Emanuel Tutuc, Boris I. Yakobson, Kevin F. McCarty, Yong-Wei Zhang, Philip Kim, James Hone, Luigi Colombo, and Rodney S. Ruoff, The Role of Surface Oxygen in the Growth of Large Single-Crystal Graphene on Copper, *Science* 2013, 342, 720-723.
2. Richard Piner, Huifeng Li, Xianghua Kong, Li Tao, Hengxing Ji, Wi Hyoung Lee, Ji Won Suk, Jongpil Ye, **Yufeng Hao**, Carl W. Magnuson, Ariel Ismach, Deji Akinwande, and Rodney S. Ruoff, Magnetic Inductive Heating: a New Route to

Graphene. *ACS NANO* (In press)

3. Xiaohan Wang, Li Tao, **Yufeng Hao**, Zhihong Liu, Shanshan Chen, Iskandar Kholmanov, Harry Chou, Cheng Tan, Nishant Jayant, Qingkai Yu, Deji Akinwande, and Rodney S. Ruoff, Direct delamination of graphene onto polyimide for plastic electronics. *Small* (In press)
4. Yaping Wu, **Yufeng Hao**, Junyong Kang, Rodney S. Ruoff, Evolvement of Grain Structures within Graphene Islands during the CVD Growth. *Advanced Materials* (In Press)
5. S. Hossein Mousavi, Iskandar Kholmanov, Kamil B. Alici, David Purtseladze, Nihal Arju, Kaya Tatar, David Y. Fozdar, Ji Won Suk, **Yufeng Hao**, Alexander B. Khanikaev, Rodney S. Ruoff, and Gennady Shvets Inductive Tuning of Fano-Resonant Metasurfaces Using Plasmonic Response of Graphene in the Mid-Infrared *Nano Lett.* 2013, 13, 1111–1117. (Times cited: 3)
6. Ji Won Suk, Wi Hyoung Lee, Jongho Lee, Harry Chou, Richard D. Piner, **Yufeng Hao**, Yerim Yeon, Deji Akinwande, and Rodney S. Ruoff, Enhancement of the Electrical Properties of Chemical Vapor Deposited-Grown Graphene by Controlling The Effects of Polymer Residue *Nano Lett.* 2013, 13, 1462-1467 (Times cited: 4)
7. Seonyoung Jegal, **Yufeng Hao**, Duhee Yoon, Rodney S Ruoff, Hoyeol Yun, Sang Wook Lee, Hyeonsik Cheong, Crystallographic orientation of early domains in CVD graphene studied by Raman spectroscopy. *Chemical Physics Letters*, 2013, 568, 146-150.
8. Adrian G. Swartz, Kathleen M. McCreary, Wei Han, Jared J. I. Wong, Patrick M. Odenthal, Hua Wen, Jen-Ru Chen, **Yufeng Hao**, Rodney S. Ruoff, Jaroslav Fabian, Roland K. Kawakami, Integrating MBE materials with graphene to Induce novel spin-based phenomena. *J. Vac. Sci. Technol. B* 31, 4, UNSP 04D105 (Times cited: 1)
9. Qingzhi Wu, Yaping Wu, **Yufeng Hao**, Jianxin Geng, Matthew Charlton, Shanshan Chen, Yujie Ren, Hengxing Ji, Huifeng Li, Danil W. Boukhvalov, Richard D. Piner, Christopher W. Bielawski, and Rodney S. Ruoff, Selective Surface Functionalization at Regions of High Local Curvature in Graphene. *Chem. Commun.* 49, 677, 2013 (Times cited: 6)
10. Cheng Gong, Herman Carlo Floresca, David Hinojos, Stephen McDonnell, Xiaoye Qin, **Yufeng Hao**, Srikar Jandhyala, Greg Mordi, Jiyoung Kim, Luigi Colombo, Rodney S. Ruoff, Moon J Kim, Kyeongjae Cho, Robert M. Wallace, and Yves J. Chabal, Rapid Selective Etching of PMMA Residues from Transferred Graphene by Carbon Dioxide *J. Phys. Chem. C*, DOI: 10.1021/jp408429v, 10 Oct 2013

2012

11. Jongho Lee, Li Tao, Kristen N. Parrish, **Yufeng Hao**, Rodney S. Ruoff, and Deji Akinwande, Multi-finger flexible graphene field effect transistors with high bendability *Appl. Phys. Lett.* 2012, 101, 252109. (Time cited: 1)
12. Sara D. Costa, Ariete Righi, Cristiano Fantini, **Yufeng Hao**, Carl Magnuson, Luigi Colombo, Rodney S. Ruoff, Marcos A. Pimenta, Resonant Raman spectroscopy of graphene grown on copper substrates, *Solid State Commun.* 152 (2012)1317-1320 (Times cited: 3)
13. Jongho Lee, Li Tao, **Yufeng Hao**, Rodney S. Ruoff, and Deji Akinwande Embedded-gate graphene transistors for high-mobility detachable flexible nanoelectronics *Appl. Phys. Lett.* 100, 152104 (2012) (Times cited: 10)
14. Babak Fallahazad, **Yufeng Hao**, Kayoung Lee, Seyoung Kim, R. S. Ruoff, and E. Tutuc, Quantum Hall effect in Bernal stacked and twisted bilayer graphene grown on Cu by chemical vapor deposition, *Physical Review B* 85 (2012) 201408 (Times cited: 4)
15. Yujie Ren, Chaofu Zhu, Weiwei Cai, Huifeng Li, **Yufeng Hao**, Yaping Wu, Shanshan Chen, Qingzhi Wu, Richard D. Piner, and Rodney S. Ruoff, An Improved Method for Transferring Graphene Grown by Chemical Vapor Deposition, *Nano* 7(2012) 1150001. (Times cited: 3)
16. Wi Hyoung Lee, Ji Won Suk, Jongho Lee, **Yufeng Hao**, Jaesung Park, Hyung Wook Ha, Shanthi Murali, Harry Chou, Deji Akinwande, Kwang S. Kim, and Rodney S. Ruoff, Simultaneous transfer and doping of CVD-grown graphene by fluoropolymer for transparent conductive films on plastic *ACS NANO* 6(2012)1284-1290. (Times cited: 13)
17. Wi Hyoung Lee, Ji Won Suk, Harry Chou, Jongho Lee, **Yufeng Hao**, Yaping Wu, Richard D. Piner, Deji Akinwande,

- Kwang S. Kim, and Rodney S. Ruoff, Selective-Area Fluorination of Graphene with Fluoropolymer and Laser Irradiation, *Nano Lett.* 12(2012) 2374-2378. **(Times cited: 32)**
18. Yaping Wu, Wei Jiang, Yujie Ren, Weiwei Cai, Wihyoung Lee, Huifeng Li, Richard Piner, **Yufeng Hao**, Hengxing Ji, JunYong Kang, and Rodney S. Ruoff, Tuning the conductivity type and level of graphene with different gold configurations, *Small*, 8(2012) 3129-3136 **(Time cited:2)**
 19. Ji Won Suk, Karen Kirk, **Yufeng Hao**, Neal A. Hall, and Rodney S. Ruoff, Thermoacoustic sound generation from monolayer graphene for transparent and flexible sound sources, *Advanced Materials*, 2012, 24, 6342. **(Time cited: 5)**
 20. Yaping Wu, Harry Chou, Hengxing Ji, Qingzhi Wu, Shanshan Chen, Wei Jiang, **Yufeng Hao**, Junyong Kang, Yujie Ren, Richard D. Piner, and Rodney S. Ruoff, Growth mechanism study and controlled-synthesis of AB-stacked bilayer graphene on Cu-Ni alloy foils, *ACS NANO* 6(2012) 7731-7738 **(Times cited: 11)**
 21. Adrian G. Swartz, Patrick M. Odenthal, **Yufeng Hao**, Rodney S. Ruoff, Roland K. Kawakami, Integration of the ferromagnetic insulator EuO onto graphene, *ACS Nano* 6(2012) 10063 **(Times cited: 7)**
 22. Jongho Lee, Li Tao, Kristen N. Parrish, **Yufeng Hao**, Rodney S. Ruoff, Deji Akinwande, Highly Bendable High-mobility Graphene Field Effect Transistors with Multi-finger Embedded Gates on Flexible Substrates, *12TH IEEE CONFERENCE ON NANOTECHNOLOGY (IEEE-NANO)* Birmingham, ENGLAND, AUG 20-23, 2012.
 23. Lee, Jongho; Parrish, Kristen N; Chowdhury, Sk. Fahad; Ha, Tae-Jun; **Hao, Yufeng**; Tao, Li; Dodabalapur, Ananth; Ruoff, Rodney S.; Akinwande, Deji, State-of-the-art Graphene Transistors on Hexagonal Boron Nitride, High-k, and Polymeric Films for GHz Flexible Analog Nanoelectronics, *2012 IEEE INTERNATIONAL ELECTRON DEVICES MEETING (IEDM)* Published: 2012 (Conference: IEEE International Electron Devices Meeting (IEDM) Location: San Francisco, CA Date: DEC 10-13, 2012) **(Times Cited: 0)**

2011

24. Hengxing Ji, **Yufeng Hao**, Yujie Ren, Matthew Charlton, Wihyoung Lee, Qingzhi Wu, Huifeng Li, Yanwu Zhu, Yaping Wu, Richard Piner, and Rodney S. Ruoff, Graphene Growth Using a Solid Carbon Feedstock and Hydrogen, *ACS NANO* 5 (2011) 7656-7661. **(Times cited: 21)**
25. Ji Won Suk, Alexander Kitt, Carl W. Magnuson, **Yufeng Hao**, Samir Ahmed, Jinho An, Anna K. Swan, Bennett B. Goldberg, and Rodney S. Ruoff, Transfer of CVD-Grown Monolayer Graphene onto Arbitrary Substrates, *ACS NANO* 5 (2011) 6916-6924. **(Times cited: 80)**
26. Radosav Svetozara Pantelic, Ji Won Suk, **Yufeng Hao**, Rodney S. Ruoff, and Henning Stahlberg, Oxidative doping renders graphene hydrophilic, facilitating its use as a support in biological TEM, *Nano Letters* 11(2011)4319-4323. **(Times cited: 9)**
27. Wei Liu, Rolando Valdes Aguilar, **Yufeng Hao**, Rodney S Ruoff, N. Peter Armitage, Broadband microwave and time-domain terahertz spectroscopy of CVD grown graphene, *J. Appl. Phys.*, 110(2011) 083510 **(Times cited: 9)**

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28. **Yufeng Hao**, Yingying Wang, Lei Wang, Zhenhua Ni, Ziqian Wang, Rui Wang, Chee Keong Koo, Zexiang Shen, and John T.L. Thong, Probing Layer Number and Stacking Order of Few-Layer Graphene by Raman Spectroscopy, *Small* 6(2010) 195-200. **(Times cited: 67)**
29. Huijuan Zhang, Chee-Leong Wong, **Yufeng Hao**, Rui Wang, Xiaogang Liu, Francesco Stellacci, and John T. L. Thong, Self-aligned Nanolithography by Selective Polymer Dissolution, *Nanoscale* 2(2010) 2302-2306. **(Times cited: 5)**
30. Rui Wang, **Yufeng Hao**, Ziqian Wang, Hao Gong, and John T. L. Thong, Large-Diameter Graphene Nanotube Synthesized Using Ni Nanowire Templates, *Nano Letters* 10 (2010) 4844-4850. **(Times cited: 19)**
31. Yingying Wang, Zhenhua Ni, Hailong Hu, **Yufeng Hao**, C. P. Wong, Ting Yu, John T. L. Thong, Zexiang Shen, Gold on graphene as a substrate for surface enhanced Raman scattering study, *Applied Physics Letters*, 97 (2010), 163111. **(Times cited: 16)**

2009

32. Lei Liao, Bin Yan, **Yufeng Hao**, Guozhong Xing, J. P. Liu, B. C. Zhao, Z. X. Shen, T. Wu, L. Wang, J. T. L. Thong, C. M. Li, W. Huang, T. Yu, P-type electrical, photoconductive, and anomalous ferromagnetic properties of Cu₂O nanowires, *Appl. Phys. Lett.* 94(2009) 113106. (Times cited: 29)

2008

33. Xiaoli He, Guangbing Yue, **Yufeng Hao**, Qiaoling Xu, Qing Wei, Xiaoguang Zhu, Mingguang Kong, Lide Zhang and Xing Li, Structure and magnetic properties of CoNiP nanowire arrays embedded in AAO template, *J. Cryst. Growth* 310(2008) 3579-3583. (Times cited: 4)

2007

34. J.G.Q. Ler, **Yufeng Hao**, J.T.L. Thong, Effect of sidewall modification in the determination of friction coefficient of vertically aligned carbon nanotube films using friction force microscopy, *Carbon* 45 (2007) 2737-2743. (Times cited: 10)
35. Dachi Yang, Guowen Meng, Shuyuan Zhang, **Yufeng Hao**, Xiaohong An, Qing Wei, Min Ye, Lide Zhang, Electrochemical synthesis of metal and semimetal nanotube-nanowire heterojunctions and their electronic transport properties, *Chem. Commun.* 2007, 17, 1733-1735. (Times cited: 23)
36. Qing Wei, Guowen Meng, Min Ye, Xiaohong An, **Yufeng Hao**, Lide Zhang, Hollow Micro-Spherical Architectures of Closely Packed and Radially Well-Aligned Zn₂SiO₄ Nanowires with and without ZnO Nanocrust, *J. Phys. Chem. C* 111 (2007) 1924-1928. (Times cited: 8)
37. Xueru Zhang, Y. Ding, Yong Zhang, **Yufeng Hao**, Guowen Meng, and Lide Zhang, Thermal behavior of antimony nanowire arrays embedded in anodic aluminum oxide template, *JOURNAL OF THERMAL ANALYSIS AND CALORIMETRY* 89 (2007) 493-497. (34th Annual Technical Conference of the North American Thermal Analysis Society, Location: Bowling Green, KY Date: AUG 06-09, 2006). (Times cited: 10)

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38. **Yufeng Hao**, Guowen Meng, Ye Zhou, Mingguang Kong, Min Ye, Qing Wei, Lide Zhang, Tuning the architecture of MgO nanostructures by chemical vapor transport and condensation, *Nanotechnology* 17(2006) 5006-5012. (Times cited: 24)
39. **Yufeng Hao**, Guowen Meng, Zhong Lin Wang, Changhui Ye, Lide Zhang, Periodically twinned nanowires and polytypic nanobelts of ZnS: the role of mass diffusion in Vapor-Liquid-Solid growth, *Nano Lett.* 6 (2006) 1650-1655. (Times cited: 144)
40. Guosheng Cheng, Eric Stern, Stan Guthrie, Mark A. Reed, Robert Klie, **Yufeng Hao**, Guowen Meng, Lide Zhang, Indium oxide nanostructures, *Appl. Phys. A: Materials Science & Processing* 85(2006) 233-240. (Times cited: 30)
41. Qing Wei, Guowen Meng, Xiaohong An, **Yufeng Hao**, Lide Zhang, Synthesis and photoluminescence of aligned straight silica nanowires on Si substrate, *Solid State Commun.* 138(2006) 325-330. (Times cited: 17)

2005

42. **Yufeng Hao**, Guowen Meng, Changhui Ye, Xueru Zhang, Lide Zhang, Kinetics-driven growth of orthogonally branched single-crystalline magnesium oxide nanostructures, *J. Phys. Chem. B* 109 (2005) 11204-11208. (Times cited: 66)
43. **Yufeng Hao**, Guowen Meng, Changhui Ye, Lide Zhang, Controlled synthesis of In₂O₃ octahedrons and nanowires, *Cryst. Growth Des.* 5(2005) 1617-1621. (Times cited: 108)
44. **Yufeng Hao**, Guowen Meng, Changhui Ye, Lide Zhang, Reversible blue light emission from self-assembled silica nanocords, *Appl. Phys. Lett.* 87(2005) 033106. (Times cited: 25)

45. Changhui Ye, Xiaosheng Fang, **Yufeng Hao**, Xuemei Teng, Lide Zhang, Zinc oxide nanostructures: morphology derivation and evolution, *J. Phys. Chem. B* 109(2005) 19758-19765. (Times cited: 133)
46. Xiaohong An, Guowen Meng, Qing Wei, Xueru Zhang, **Yufeng Hao**, Lide Zhang, Synthesis and photoluminescence of SnO₂/SiO₂ microrings, *Adv. Mater.* 17(2005) 1781-1784. (Times cited: 19)
47. Xueru Zhang, **Yufeng Hao**, Guowen Meng, Lide Zhang, Fabrication of Highly ordered InSb nanowire arrays by electrodeposition in porous anodic alumina membranes, *J. Electrochem. Soc.* 152(2005) C664-C668. (Times cited: 40)
48. Qing Wei, Guowen Meng, Xiaohong An, **Yufeng Hao**, Lide Zhang, Temperature-controlled growth of ZnO nanostructures: branched nanobelts and wide nanosheets, *Nanotechnology* 16(2005) 2561-2566. (Times cited: 27)

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49. Shuhui Sun, Guowen Meng, Mingang Zhang, **Yufeng Hao**, Xueru Zhang, Lide Zhang, Microscopy study of the growth process and structural features of closely packed silica nanowires, *J. Phys. Chem. B* 107(2003) 13029-13032. (Times cited: 27)

Book Chapters

1. Guowen Meng, and **Yufeng Hao**, Controlled synthesis of novel architectures consisting of one-dimensional nanostructures by vapor routes, *American Scientific publisher encyclopedia of nanoscience and nanotechnology* edited by H. S. Nalwa, Volume 12, 2011.

Patents

1. Self-Assembled Silica Nanoropes with Reversible Blue Light Emission.
Yufeng Hao, Guowen Meng, Lide Zhang.
No.: 200510040050.3 (China)
2. Bismuth step-shaped nanowire heterojunctions.
Yongtao Tian, Guowen Meng, Xiaohong An, **Yufeng Hao**, Qing Wei, Dachi Yang, Fangming Han,
No.: 200510039253.0 (China)
3. Hollow Micro-spheres of Closely Packed and Radially Well-Aligned Zn₂SiO₄ Nanowires with and without ZnO Crust.
Qing Wei, Guowen Meng, Xiaohong An, **Yufeng Hao**, Lide Zhang,
No.: 200610040422.7 (China)
4. Graphene single crystal growth by a surface conditioning process
Luigi Colombo, **Yufeng Hao**, and Rodney S. Ruoff
Application in progress (USA)

Referee Works for Scientific Journals

**Nature Communications* **Nano Letters* **ACS NANO* **Advanced Materials* **Advanced Functional Materials*
 **Energy & Environmental Science* **Applied Physical Letters* **Carbon* **Journal of Physical Chemistry* **Journal of Materials Chemistry A/C*
 **Nano Research* **Crystal Growth & Design* **Optics Express* **Journal of Applied Physics*
 **Nanotechnology* **Journal of Materials Research* **Journal of Nano Research* **Physics Letters A* **Materials Research Initiative*
 **Materials Letters* **Materials Research Bulletin* **Journal of Physics D: Applied Physics* **Journal of Vacuum Science & Technology B* **IEEE Transactions on Nanotechnology*

Presentations & Talks

1. Morphology-Controlled Synthesis of Indium Oxide Nanostructures and Their Photoluminescence Properties
Yufeng Hao, Guowen Meng, Lide Zhang
China International Conference on Nanoscience & Technology (CHINA NANO 2005), Beijing, June 9-11, 2005

2. Silica Nanocords with Reversible Blue Light Emission
Yufeng Hao, Guowen Meng, Lide Zhang
2005 Doctoral Forum of China, Shanghai, Oct 15-18, 2005
3. Probing layer number and stacking order of few-layer graphene by Raman spectroscopy and electrical transport measurements
Yufeng Hao, John T.L. Thong
Materials Research Society (MRS) Spring Meeting, San Francisco, USA, April 5-9, 2010
4. Clean graphene electrical devices by stencil mask lithography
Yufeng Hao, Lei Wang, and John T.L. Thong
Materials Research Society (MRS) Spring Meeting, San Francisco, USA, April 5-9, 2010
5. CVD Graphene Growth on Copper
Xuesong Li, **Yufeng Hao**, Carl W. Magnuson, Luigi Colombo, and Rodney S. Ruoff
The Seventh International Nanotechnology Conference on Communication and Cooperation (INC7), Albany, New York, May 16-19, 2011
6. Chemical Vapor Deposition of Graphene and Hexagonal Boron Nitride
Yufeng Hao, Ariel Ismach, Carl Magnuson, Luigi Colombo, and Rodney S. Ruoff
NRI SWAN Center Annual Review, Austin, Texas, September 14-15, 2011
7. Chemical Vapor Deposition of Graphene and Chemically derived Graphene
Yufeng Hao (Plenary Speaker) and Rodney S. Ruoff
New Diamond and Nano Carbons Conference May 20-24, 2012 (NDNC2012) San Juan, Puerto Rico
8. Growth and Characterization of high quality Graphene and its bilayer
Yufeng Hao, Lei Wang, Babak Fallahazad, Emanuel Tutuc, Philip Kim, James Hone, Luigi Colombo, Rodney S. Ruoff
NRI SWAN Center Annual Review, Austin, Texas, September 13-14, 2012
9. Growth and Characterizations of High Quality Monolayer and Bilayer Graphene
Yufeng Hao, Lei Wang, Shu Nie, Babak Fallahazad, Zachary Robinson, Carl A. Ventrice Jr, James Hone, Philip Kim, Emanuel Tutuc, Kevin F. McCarty, Luigi Colombo, and Rodney S. Ruoff
Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA, USA, November 25-30, 2012