

Curriculum Vitae

Jian-Hao Chen

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Education

- Ph.D. in Physics, University of Maryland, College Park, MD August, 2009
Thesis: Diffusive Charge Transport in Graphene
Advisor: Prof. Ellen D. Williams
- B.S. in Physics, Zhejiang University, Hangzhou, China July, 2004

Professional Experience

Associate Professor,

International Center for Quantum Materials, School of Physics
Peking University, Beijing, China

2013-

Postdoctoral research associate,

University of California at Berkeley, Berkeley, CA, and
Lawrence Berkeley National Laboratory, Berkeley, CA

2010-2013

Postdoctoral research associate, University of Maryland, College Park, MD

2009-2010

Research Interest

Explore new physics and new functionality of low dimensional electronic materials by controllably tuning disorders, functional groups and their interactions with the charge and spin carriers of the materials while probing their electronic transport properties *in-situ*. A wide range of materials, including but not limited to, graphene, topological insulator thin films and ultra thin transition metal dichalcogenides, are suitable for such *in-situ* manipulation and electronic transport studies.

Instrumentation Plan

The true UHV magneto-electrical transport measurement systems

System I Specs (completed): All-dry system; sample in UHV; temperature range from 10K to 450K; magnetic field of up to 9T, with tunable sample-magnetic field angle; multiple *in-situ* surface manipulation schemes on electrically addressed samples.

System II Specs (UHV part completed): sample in UHV; temperature range from 0.32K to 450K; magnetic field of up to 14T, with tunable sample-magnetic field angle; multiple *in-situ* surface manipulation schemes on electrically addressed samples from 4K to 450K.

Publications (Total Number of Citations: >4300, see: <http://www.researcherid.com/rid/C-6983-2009>)

Invited Book Chapter

- **Jian-Hao Chen***, **Chapter 2: Electrical Transport in Graphene: Carrier Scattering by Impurities and Phonons, “2D Materials: Properties and Devices”**, Cambridge University Press, proof submitted (2017)

Research Articles

19. Xin Liu*, Zhiran Zhang, Chaoyi Cai, Shibing Tian, Satya Kushwaha, Hong Lu, Takashi Taniguchi, Kenji Watanabe, Robert J Cava, Shuang Jia* and **Jian-Hao Chen***, “**Gate tunable magneto-resistance of ultra-thin W Te₂ devices**”, 2D Materials accepted (2017)
18. Shibing Tian, Pengjie Wang, Xin Liu, Junbo Zhu, Hailong Fu, Takashi Taniguchi, Kenji Watanabe, **Jian-Hao Chen*** and Xi Lin*, “**Nonlinear transport of graphene in the quantum Hall regime**”, 2D Materials 4, 015003 (2016)
17. F. Zheng, C. Cai, S. Ge, X. Zhang, X. Liu, H. Lu, Y. Zhang, J. Qiu, T. Taniguchi, K. Watanabe, S. Jia, J. Qi, **J.-H. Chen***, D. Sun*, J. Feng*, “**On the Quantum Spin Hall Gap of Monolayer 1T'-WTe₂**”, Advanced Materials 28, 4845 (2016) **Times Cited: 6**
16. J. Hellerstedt, M. Edmonds, **J. H. Chen**, W. G. Cullen, C. X. Zheng, and Michael S. Fuhrer, “**Thickness and growth-condition dependence of in-situ mobility and carrier density of epitaxial thin-film Bi₂Se₃**”, Appl. Phys. Lett. 105, 173506 (2014) **Times Cited: 5**
15. **J. -H. Chen**, G. Autès, N. Alem, F. Gargiulo, A. Gautam, M. Linck, C. Kisielowski, O. V. Yazyev, S. G. Louie and A. Zettl, “**Growth of a Linear Defect in Graphene for Gate-Tunable Valley Filtering**”, Physical Review B 89, 121407(R) (2014) **Times Cited: 38**
14. Peter Bai, Joseph Kao, **Jian-Hao Chen**, William Mickelson, Alex Zettl, Ting Xu, “**Nanostructures on Graphene using Supramolecule and Supramolecular Nanocomposites**”, Nanoscale 6, 4503 (2014) **Times Cited: 2**
13. A. Gibb, N. Alem, **J.-H. Chen**, K. Erickson, J. Ciston, A. Gautam, M. Linck, A. Zettl, “**Atomic Resolution Imaging of Grain Boundary Defects in Monolayer Chemical Vapor Deposition-Grown Hexagonal Boron Nitride**”, Journal of the American Chemical Society 135, 6758(2013) **Times Cited: 63**
12. **J. -H. Chen**, L. Li, W. G. Cullen, E. D. Williams, M. S. Fuhrer, “**Origin of logarithmic resistance correction in graphene Reply**”, Nature Physics 8, 353(2012) **Times Cited: 9**
11. **J. -H. Chen**, L. Li, W. G. Cullen, E. D. Williams, M. S. Fuhrer, “**Tunable Kondo Effect in Graphene with Defects**”, Nature Physics 7, 535(2011) **Times Cited: 169**

 Highly Cited Paper

10. W. G. Cullen, M. Yamamoto, K. M. Burson, **J. -H. Chen**, C. Jang, L. Li, M. S. Fuhrer, E. D. Williams, “**High-fidelity conformation of graphene to SiO₂ topographic features**”, Physical Review Letters **105**, 215504 (2010) **Times Cited: 68**
9. J. Katoch, **J. -H. Chen**, R. Tsuchikawa, C. W. Smith, E. R. Mucciolo, and M. Ishigami, “**Uncovering the Dominant Scatterer in Graphene Sheets on SiO₂**”, Physical Review B **82**, 081417(R) (2010) (Editor’s Suggestion) **Times Cited: 33**
8. S. Xiao, **J. -H. Chen**, S. Adams, E. D. Williams, M. S. Fuhrer, “**Charged Impurity Scattering in Bilayer Graphene**”, Physical Review B **82**, 041406(R) (2010) **Times Cited: 54**
7. **J. -H. Chen**, W. G. Cullen, C. Jang, M. S. Fuhrer, E. D. Williams, “**Defect Scattering in Graphene**”, Physical Review Letters **102**, 236805 (2009) **Times Cited: 304**

 Highly Cited Paper

6. C. Jang, S. Adam, **J. -H. Chen**, E. D. Williams, S. Das Sarma, M. S. Fuhrer, “**Tuning the Effective Fine Structure Constant in Graphene**”, Physical Review Letters **101**, 146805 (2008) **Times Cited: 222**  Highly Cited Paper
5. **J. -H. Chen**, C. Jang, S. Xiao, M. Ishigami, M. S. Fuhrer, “**Intrinsic and Extrinsic Performance Limits of Graphene Devices on SiO₂**”, Nature Nanotechnology **3**, 206 (2008) **Times Cited: 1359**  Highly Cited Paper
 - “**Graphene could be the new silicon**”, Scientific American News Blog, March 31, 2008.
 - “**Is Graphene the new silicon?**”, NSF Press Release 08-048, March 27, 2008.
 - “**Carbon could enable fastest chips**”, by Colin Johnson, EE Times, March 25, 2008.
4. **J. -H. Chen**, C. Jang, S. Adam, M. S. Fuhrer, E. D. Williams, M. Ishigami, “**Charged Impurity Scattering in Graphene**”, Nature Physics **4**, 377 (2008) **Times Cited: 810**

 Highly Cited Paper

3. **J. -H. Chen**, M. Ishigami, C. Jang, D. R. Hines, M. S. Fuhrer, E. D. Williams, “**Printed Graphene Circuits**”, Advanced Materials **19**, 3623 (2007) **Times Cited: 123**
2. M. Ishigami, **J. -H. Chen**, W. G. Cullen, M. S. Fuhrer, E. D. Williams, “**Atomic Structure of Graphene on SiO₂**”, Nano Letters **7**, 1643 (2007) **Times Cited: 906**

 Highly Cited Paper

- “**Clean Up on Graphene**”, Editor's Choice, Science **316**, 1543, June 15, 2007.

- “**Graphene: What lies beneath**”, Research Highlights, Nature Nanotechnology, May 25, 2007.
(doi:10.1038/nnano.2007.183)

1. M. Ishigami, **J. -H. Chen**, E. D. Williams, D. Tobias, Y. F. Chen, M. S. Fuhrer,
“**Hooge’s Constant for Carbon Nanotube FETs**”, Applied Physics Letters **88**, 203116 (2006)
Times Cited: 66

Conference Proceedings

3. Hellerstedt, J; **J. -H. Chen**; Kim, D; Cullen, WG; Zheng, C. X.; Fuhrer, MS, **In situ monitoring of resistivity and carrier concentration during molecular beam epitaxy of topological insulator Bi₂Se₃**, MICRO/NANO MATERIALS, DEVICES, AND SYSTEMS, Proceedings of SPIE, 2013, 8923 (DOI: 10.1117/12.2033659) **Times Cited: 1**
2. **J. -H. Chen**, C. Jang, M. Ishigami, S.Xiao, W. G. Cullen, E. D. Williams, M. S. Fuhrer,
“**Diffusive Charge Transport in Graphene on SiO₂**”, Solid State Communications **149**, 1080 (2009)
(Proceedings of 2009 Graphene Week) **Times Cited: 62**
1. D. R. Hines, A. E. Southard, A. Tunnell, V. Sangwan, T. Moore, **J.-H. Chen**, M. S. Fuhrer, E. D. Williams,
“**Transfer printing as a method for fabricating hybrid devices on flexible substrates**”, Proceedings of SPIE **6658**, Organic Field-Effect Transistors VI (2007) **Times Cited: 2**

Proposal and Awards

- **J. -H. Chen**, “**An In-Situ Electrical Transport Measurement System in Ultra-high Vacuum Environment**”, Special Grant for Basic Research Instrumentation, National Natural Science Foundation of China (research funds **2.7 Million RMB**) (2013)
- **J. -H. Chen**, “**In-Situ Electrical Transport Measurement of Low-Dimensional Materials and their Nanostructures**”, “Mian Shang” Program, National Natural Science Foundation of China (research funds **890k RMB**) (2013)
- **J. -H. Chen** participated, “**Research of Quantum transport and topological states in novel low-dimensional systems**”, National Program on Key Basic Research Project (973 Program), the Chinese Ministry of Science and Technology (total grant **22M RMB**) (2013)
- **J. -H. Chen**, “**1000-Talents Young Scholar Program**” award, the Chinese Central Organization Department, CCCPC (research funds **3 Million RMB**) (2012)
- **J. -H. Chen** participated, “**Manipulation of internal degree of freedom of quasiparticles in novel electronic materials**”, National Program on Key Basic Research Project (973 Program), the Chinese Ministry of Science and Technology (total grant **26M RMB**) (2012)
- **J. -H. Chen** and Alex Zettl, “**Atomic Scale Imaging of Lattice Dynamics of Graphene under Electrical Bias**”, User Proposal #1526, National Center for Electron Microscopy, Lawrence Berkeley National Laboratory (2010)

Presentations

Invited Presentations

- International School on Topological Science and Topological Matters, Kyoto University, Kyoto, Japan (February 13, 2017)
- Department of Physics, Zhejiang University, Hangzhou (December 9, 2016)
- 4th International Forum for Young Scholars, University of Electronic Science and Technology of China, Chengdu (November 24, 2016)
- Workshop on Recent Progress in Spintronics of 2D Materials, Hsinchu, Taiwan (November 12, 2016)
- 22nd Chinese Institute of Electronics Young Scholar Summit, Beijing (November 5, 2016)
- Department of Physics, Nanyang Technological University, Singapore (October 28, 2016)
- 6th International Nano Science and Technology Congress, Singapore, (October 27, 2016)
- Department of Physics, National University of Singapore, Singapore (October 26, 2016)
- 6th Graphene Materials and Device Conference, Nanchang (October 21, 2016)
- PKU-Rice University Joint Workshop, Beijing (October 11, 2016)
- Beijing Normal University, Beijing (September 26, 2016)
- Institute of Metal Research, Chinese Academy of Science, Shenyang (September, 2016)
- The Chinese Vacuum Society Meeting, Kunming (August 11, 2016)
- Department of Physics, Nanjing University, Nanjing, China (July 22, 2016)
- 2nd Condensed Matter Physics Conference, Nanjing (July 20, 2016)
- Summit Forum for Quantum Materials and Quantum Computation, Shenzhen (July 12, 2016)
- 2nd International Symposium on Device and Application of Two dimensional Materials, Shanghai (June 30, 2016)
- Department of Physics, University of Science and Technology, Hefei (June 22, 2016)
- The 6th Joint ICQs Annual Workshop On Novel Quantum Physics at Interfaces and 2D Materials, Beijing, China (June 12, 2016)
- Department of Physics, Nanjing University, Nanjing, China (January, 2016)
- Southern Physics Forum 2015-Topological Matter and Quantum Materials, Shenzhen, China (November, 2015)
- The fifth Chinese Forum for the Young Scientists in Condensed Matter Physics, Jinan, China (November, 2015)
- Institute of Physics, Chinese Academy of Science, Beijing, China (October, 2015)
- International Max Planck Research School for Condensed Matter Science, Stuttgart, Germany (July, 2015)
- Department of Physics, University of Texas at Austin, Austin, Texas, USA (February, 2015)

- Institute of Physics, Chinese Academy of Science, Beijing, China (November, 2014)
- Department of Physics, University of Maryland, College Park, Maryland, USA (October, 2014)
- The 4th ICQs Conference on Spintronics , Beijing, China (June, 2014)
- The 7th Sino-German Frontiers of Science Symposium, Kunming, China (March, 2014)
- Department of Physics, University of Texas at Austin, Austin, Texas, USA (March, 2014)
- Department of Physics, Australian National University, Canberra, Australia (November, 2013)
- Department of Physics, University of Queensland, Brisbane, Australia (November, 2013)
- Department of Physics, Fudan University, Shanghai, China (November, 2013)
- 59th AVS International Symposium and Exhibition, Tampa, Florida, USA (October, 2012)
- The Chinese Physical Society Fall Annual Meeting, Guangzhou, China (August, 2012)
- 26th International Conference on Low Temperature Physics, Beijing, China (August, 2011)
- Department of Physics, University of California at Berkeley, Berkeley, California, USA (July, 2010)
- Department of Physics, University of California at Riverside, Riverside, California, USA (July, 2010)
- Department of Physics, Harvard University, Cambridge, Massachusetts, USA (May, 2010)
- Department of Chemistry and Chemical Biology, Harvard University, Cambridge, Massachusetts (April, 2010)
- Department of Physics, Pennsylvania State University, State College, Pennsylvania, USA (April, 2010)
- Materials Research Society Spring Meeting, San Francisco, California, USA (April, 2010)
- Department of Physics, Stanford University, Stanford, California, USA (April, 2010)
- IBM Almaden Research Center, San Jose, California, USA (April, 2010)
- Department of Physics, Massachusetts Institute of Technology, Cambridge, Massachusetts (November, 2009)
- IBM Watson Research Center, Yorktown Heights, New York, USA (May, 2009)
- American Physical Society March Meeting, Pittsburgh, Pennsylvania, USA (March, 2009)

Contributed Presentations

- **“Tunable Kondo Effect in Graphene with Defects”**
Graphene Week, University of Maryland, College Park, Maryland (April, 2010)
- **“Kondo Effect in Graphene”**
American Physical Society March Meeting, Portland, Oregon (March, 2010)
- **“Defect Scattering in Graphene”**
American Vacuum Society 56th International Symposium, San Jose, California (November, 2009)
- **“Charged impurities slow down electrons in Graphene”**
68th Physical Electronics Conference, Riverside, California (June, 2008)
- **“Intrinsic and Extrinsic Performance Limits of Graphene Devices on SiO₂”**

American Physical Society March Meeting, New Orleans, Louisiana (March, 2008)

- **“Graphene Devices on Flexible Substrate”**

American Physical Society March Meeting, Denver, Colorado (March, 2007)

- **“Environmental effect on Carbon Nanotube Field Effect Transistors”**,

American Physical Society March Meeting, Baltimore, Maryland (March, 2006)

Other Awards and Honors

- **Member, Sigma Xi** 2010
Sigma Xi, the Scientific Research Society, North Carolina, United States
- **Departmental Fellowship** 2004-2006
Department of Physics, University of Maryland, United States
- **Exchange Student Scholarship** 2003
The University of Hong Kong and Zhejiang University, Hangzhou, China
- **University Prize Scholarships** (three consecutive years) 2000-2003
Zhejiang University, Hangzhou, China
- **Freshman Prize Scholarship** 2000
Zhejiang University, Hangzhou, China
- **Member, Chu Kochen Honors College** (top 3% out of 3500 STEM students) 2000-2004
Zhejiang University, Hangzhou, China
- **First Prize, National High School Student Olympic Competition in Chemistry** 1999
Guangdong, China

Synergetic Activities

- **Guest Editor**, Journal of NanoMaterials since 2015
- **Referee**, IEEE journals since 2011
- **Referee**, Wiley-VCH journals since 2010
- **Referee**, American Physical Society (APS) journals since 2009
- **Referee**, Institute of Physics (IOP) journals since 2009
- **Judge**, Science Fair, Ernest Just Middle School, Mitcheville, MD 2009
- **Mentor** (four consecutive years), Annual MRSEC-AIP Student Science Conference 2007-2010
The American Center for Physics, College Park, MD, and
The Materials Research Science and Engineering Center, University of Maryland, College Park, MD
- **Advisor**, Research Experiences for Undergraduates Summer Program 2008

- University of Maryland, College Park, MD
- **Committee Member**, Graduate Student Government 2007-2008
University of Maryland, College Park, MD
 - **Volunteer**, Maryland Day, University of Maryland, College Park, MD 2005, 2008
 - **Founder and Vice President**, Hong Kong and Cantonese Student Association 2005- 2006
University of Maryland, College Park, MD
 - **Teaching Assistant**, Introduction to Electrodynamics 2005
University of Maryland, College Park, MD
 - **Teaching Assistant**, Principles of Modern Physics 2004
University of Maryland, College Park, MD

**Citation numbers according to ISI Web of Science as of Feb. 16, 2017*