**Hai-Zhou Lu 卢海舟**

CONTACT INFORMATION

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RESEARCH INTERESTS AND HIGHLIGHTS

**Theories of Condensed Matter Physics, Topological Phases of Matter, Electronic and Transport Properties of Mesoscopic Systems, Spintronics.** Recently, I use condensed matter field theoretical methods to study electronic transport, quantum phases, and optical processes in emergent materials, such as topological insulators, topological semimetals, topological superconductors, the quantum anomalous/spin Hall effects, nonlinear Hall effect, 2D materials, semiconductors with strong spin-orbit coupling etc. Several of my theoretical works have been verified and applied to relevant experiments. I have intensive collaborations with experimental groups in China and USA. Below please find highlights of my research.

1. **A new mechanism of "3D quantum Hall effect"** [28, 10, 8]

   The quantum Hall effects usually happen in 2D systems. Searching for 3D quantum Hall effect is a topic of 30-year history. We predicted a new 3D quantum Hall effect in 3D topological semimetals via the "wormhole" tunneling between the Fermi arcs via the Weyl nodes [28, 10]. Possible signatures of this new 3D quantum Hall effect have been observed in several experiments [8] [also see C. Zhang, Faxian Xiu, et al., NC 8, 1272 (2017); Uchida, Nagaosa, Tokura, Kawasaki, et al., NC 8, 2274 (2017); Schumann, Stemmer, et al., PRL 120, 016801 (2018)].

2. **Nonlinear Hall effect** [11, 9] Unconventional responses upon breaking discrete or crystal symmetries open avenues for exploring emergent physical systems and materials. By breaking inversion symmetry, a nonlinear Hall signal can be observed, even in the presence of time-reversal symmetry, quite different from the conventional Hall effects. Low-symmetry two-dimensional materials are promising candidates for the nonlinear Hall effect, but it is less known when a strong nonlinear Hall signal can be measured, in particular, its connections with the band-structure properties. By using model analysis, we find prominent nonlinear Hall signals near tilted band anticrossings and band inversions. These band signatures can be used to explain the strong nonlinear Hall effect in the recent experiments on two-dimensional WTe2 [9]. This work will be instructive not only for analyzing the transport signatures of the nonlinear Hall effect but also for exploring unconventional responses in emergent materials.

3. **Magnetoresistance of topological semimetals** [28, 26, 29, 30, 46, 45, 44, 42, 40, 41, 37, 36]:

   Topological semimetals can be regarded as 3D versions of graphene, but, unlike graphene, they carry monopoles of Berry curvature in momentum space and topologically protected Fermi arcs. We have addressed representative transport

phenomena in topological semimetals, including the weak (anti-)localization effects [46, 42, 41, 37, 33], negative magnetoresistance [44, 42, 37, 26], quantum oscillation [36], 3D quantum Hall effect [28], and the magnetoresistance in the quantum limit where only one Landau band is occupied [45, 40]. (i) We developed the theory for the weak anti-localization in Weyl semimetals [46] and weak localization in double-Weyl semimetals [41], and applied it to the first experiments on the type-I Weyl semimetal TaAs [42] and Type-II Weyl semimetal $WTe_2$ [37]. (ii) We demonstrated that the negative magnetoresistance is from the Berry curvature of the monopoles in the Dirac semimetal $Cd_3As_2$ [44] and type-II Weyl semimetal $WTe_2$ [37]. We also generalized the Berry curvature understanding to the negative magnetoresistance in topological insulators [26]. (iii) It is been widely believed that a negative magnetoresistance (MR) can serve as the signature of the chiral anomaly, but not yet observed in experiments. We clarified that the negative MR is not a signature of the chiral anomaly in the quantum limit [45], but depends on the energy dispersion and details of scattering potential. Moreover, we find a linear magnetoconductivity and minimum conductivity at zero magnetic field at half filling in a topological Weyl semimetal with long-range Gaussian potential [40]. (iv) We found an anomalous phase shift in the SdH oscillations of topological semimetals, which clarified the confusing observations in recent experiments on $Cd_3As_2$ [36]; (v) We demonstrate for the first time the Weyl fermion annhilation in the topological Weyl semimetal TaP [29]; (vi) We for the first time proposed a double-helix model for a nodal-link semimetal, in which two nodal lines of a semimetal link with each other [30].

4. **“Many-body localization" in topological insulators and semimetals** [51, 49, 46]:

   The localization behaviors have been observed in the low-temperature conductivity of topological insulators, and are attributed to a combined effect of interaction and disorder, but convincing quantitative comparison is still lacking. We establish a transport theory for interacting and disordered Dirac fermions in topological insulators [51]. We find that the interaction-induced localization depends on the dielectric constant. To modulate the dielectric constant, we introduce antidots in topological insulator $Bi_2Te_3$ thin films [49], much like the approach in photonic crystals. Then we observe a systematic change in the localization tendency with the antidot density, consistent with our theory. This collaboration of theory and experiment therefore clarifies the indispensable role of the many-body interaction in the electronic transport in topological insulators. We have generalized the theory to three-dimensional Weyl semimetals [46].

5. **Weak (anti-)localization in topological insulators** [66, 62, 61, 59, 43]:

   Weak anti-localization (WAL) is one of few signatures that verify the existence of surface Dirac fermions in topological insulators. It arises from the quantum interference corrections to the conductivity and is characterized by a negative cusp in magnetoconductivity. It has been observed in every single sample of topological insulator. A gap opened for the surface states of a topological insulator is the prerequisite for many exotic physics, such as the quantum anomalous Hall effect, Majorana fermions, etc. We show that this gap can lead to a crossover from WAL to its opposite, the weak localization (WL), as a consequence of the Berry

phase [**Lu** *et al*., PRL 107, 076801 (2011)]. The theory has immediately been verified or applied by many experimental groups, e.g., PRL 106, 166805 (2011) by Jiannong Wang's group@HKUST, PRL 108, 036805 (2012) by Yayu Wang and Qikun Xue's groups@Tsinghua; PRB 86, 205127 (2012) (Editors' suggestion) by Samarth's group@Penn State; Nano Lett. 13, 48 (2013) by K. L. Wang's group@UCLA; APS March meeting (2013) by Moodera's Group@MIT; PRB 88, 081407(R) (2013) (Editors' suggestion) by Kapitulnik's group@Stanford. Our magnetoconductivity formula paves the road towards the quantitative study of the quantum transport in topological insulators. We also find the bulk states at band edges give WL, quite different from other systems with strong spin-orbit interaction [61]. We further systematically study the WAL and WL of 2D massive Dirac fermions in the presence of scalar, magnetic, and spin-orbit scattering [59].

6. **Quantum spin/anomalous Hall effects in topological insulator thin films** [75, 70, 69, 65, 64, 52, 53]:

   We reveal the finite size effect in topological insulators [Zhou, **Lu**, *et al.*, PRL 101, 246807 (2008), citation: 121], derive an effective description of topological insulator thin films in terms of Dirac equations [**Lu** *et al*., PRB 81, 115407 (2010), citation: 140; Shan, **Lu**, *et al*., NJP 12, 043048 (2010), citation: 95], and give the analytical solutions to the edge [75], surface [70, 69], and bound states [64, 60] in topological insulators. We first predict the possibility of the quantum spin Hall effect (QSHE) in topological insulator thin films, which then becomes the theoretical basis for the realization of the quantum anomalous Hall effect in magnetic topological insulator thin films. Our theories have been applied to the experiments [e.g., Nature Physics 6, 584 (2010), Nature Physics 7, 840 (2011)]. Ref. [69] was selected as "best of 2010" by New Journal of Physics.

   Quantized anomalous Hall effect (QAHE) was a long-sought family member of the Hall effects. Its experimental observation was recently reported in magnetically doped topological insulator thin films [Chang *et al*., Science 340, 167 (2013)]. We reproduce the observations theoretically [**Lu**, Zhao & Shen, PRL 111, 146802 (2013)], based on an effective model we established first for the quantum spin Hall effect in topological insulator thin films[70, 69]. Our theory reveals the indispensable roles of broken structural inversion, particle-hole, and time-reversal symmetries. Also, we first studied the impurity-scattering induced (i.e., extrinsic) Hall conductivity of a topologically nontrivial band [**Lu** & Shen, PRB 88, 081304(R) (2013)], which will be helpful to understand the unexpected sign changing features observed in the experiments.

7. **Quantum transport in 2D Materials** [55, 54]

   $MoS_2$ and its family members ($WS_2$, $WSe_2$, $MoSe_2$ ...) have attracted tremendous attention from both scientific and industrial communities. Their low-energy band structure looks like "gapped" graphene. We develop the first quantum transport theory for $MoS_2$ monolayers, with the focus on its unique spin-valley coupling physics [**Lu** *et al*., PRL 110, 016806 (2013)]. We show that the spin-flip intervalley scattering can be distinguished from spin-conserving intravalley scattering, according to their weak localization and anti-localization behaviors. This allows transport measurements to probe the strength of intervalley scattering, a

crucial quantity for applications of these materials in spintronics and valleytronics. Recently, WL and WAL have observed in the experiments [Science **338**, 1193 (2012), Nature Physics **9**, 563 (2013), and ACS Nano **7**, 7077 (2013)].

8. **Theory of light-induced pure spin current** [68, 67, 63]:

   Detecting the pure spin current is challenging, because it has no measurable electric or magnetic quantity. We develop a theory of the spin photocurrent based on the symmetry and microscopic model [67]. The theory has been applied to the spin photocurrent experiment by Xiaodong Cui's group@HKU [Dai, **Lu**, *et al*., PRL 104, 246601 (2010)] [63].

9. **Using "spin bias" to manipulate nanomagnets** [72, 71, 76]:

   Spin bias is a splitting of spin-dependent chemical potentials from the spin accumulation in a nonmagnetic material. We propose to use the spin bias to manipulate magnets at nanoscales, such as quantum dot [76], magnetic molecule [72], and ferromagnetic grain [71]. Using spin bias may drastically reduce the power consumption of the quantum memory units based on these nanomagnets.

## APPOINTMENTS

**Professor** 1 October 2018 - now
**Associate Professor** 1 April 2015 - 30 September 2018
Shenzhen Institute for Quantum Science and Engineering and Department of Physics, Southern University of Science and Technology, Shenzhen, China
**Research Assistant Professor** 1 April 2012 - 31 July 2015
**Post-doctoral Fellow** 20 July 2010 - 31 March 2012
**Senior Research Assistant** 20 July 2007 - 19 July 2010
Department of Physics, The University of Hong Kong, Hong Kong, China

## EDUCATION

Ph.D. in Physics, July 2007, Institute for Advanced Study, Tsinghua University, China
Advisor: Prof. Bang-fen Zhu
B.Sc. in Physics, July 2002, Department of Physics, Lanzhou University, China.

## TEACHING

- **Quantum Mechanics II**, Undergraduate
  Autumns of 2019, 2018, 2017, 2016
- **Quantum Transport Theories**, Graduate
  Springs of 2019, 2018, 2017
- **Scientific Writing** (2-hour lecture), Graduate
  Autumns of 2019, 2018, 2017
- **Frontiers in Condensed Matter Physics** (2-hour lecture), Undergraduate
  Summers of 2017, 2016

HONORS & AWARDS

2019 The National Science Fund for Distinguished Young Scholars, National Natural Science Foundation of China

2019 Cheung Kong Distinguished Professor, Ministry of Education of China

2019 Pengcheng Scholar, Shenzhen

2018 Outstanding Referee, American Physical Society

2015 Young Professionals, Recruitment Program of Global Experts (Thousand Talents Plan), China

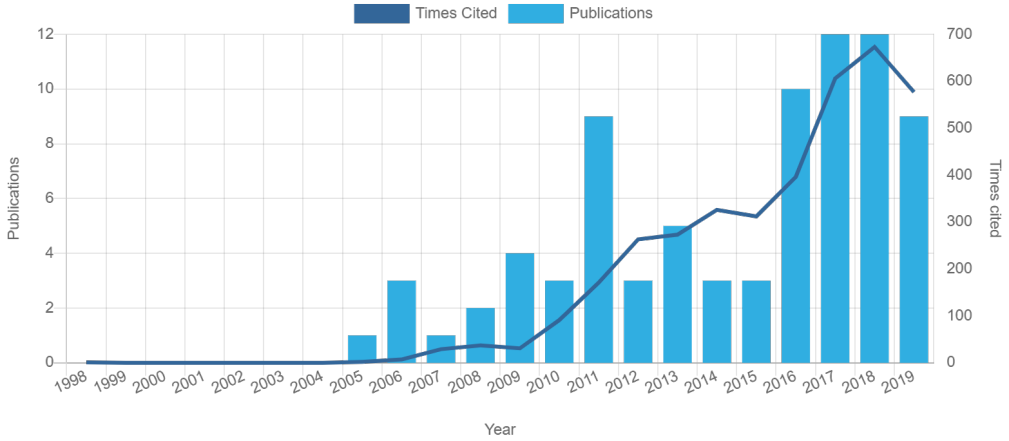
## GRANTS

| Funding Agency | Project Title (No.) | Personal Budget | Capacity | Year |
|---|---|---|---|---|
| National Natural Science Foundation of China | National Science Fund for Distinguished Young Scholars | RMB 3.5 Million | PI | 2020-2024 |
| Education Bureau, Shenzhen Municipality | Pengcheng Scholarship | RMB 1.35 Million | PI | 2019-2021 |
| Science, Technology & Innovation Commission of Shenzhen Municipality | Shenzhen Key Lab of Quantum Science and Technology (ZDSYS20170303165926217) | RMB 0.25 Million | Co-I | 2017-2019 |
| Guangdong Zhujiang Talents Project | Innovative and Entrepreneurial Research Team Program (2016ZT06D348) | RMB 1.39 Million | Core Member Ranking 5/9 | 2017-2021 |
| Ministry of Science and Technology of China | "Quantum chips based on semiconductors" National Key R & D Program (2016YFA0301700) | RMB 1 Million | Core Member Ranking 4/15 in sub-project | 2016-2020 |
| National Natural Science Foundation of China | "Theories of quantum transport in topological semimetals" General Research Grant (11574127) | RMB 0.74 Million | PI | 2016-2019 |
| Recruitment Program of Global Experts, China (Thousand Talents Plan) | Young Professionals | RMB 2 Million | PI | 2015-2017 |
| SUSTech and Shenzhen Government | Startup | RMB 6.4 Million | PI | 2015-2018 |
| Hong Kong Research Grants Council | General Research Fund "Electronic transport of Dirac fermions in emergent systems" (17303714) | HKD 900,258 | PI | 2014-2015 |
| The University of Hong Kong Seed Funding Programme for Basic Research | "Transport of Dirac fermions in topological insulators and semimetals" (201206159001) | HKD 120,000 | PI | 2012-2014 |
| Hong Kong Research Grants Council | General Research Fund "Topologically Protected In-Gap Bound States" (HKU 705111P) | HKD 650,000 | Co-I | 2011-2013 |

PUBLICATIONS

16 Physical Review Letters (4 first author, 7 corresponding author, 2 co-corres., 2 second author),
2 Nature (one for the verification of our theory [28], in the other our supporting theory has been published in PRL [11]),
1 Nature Physics (co-corresponding author),
5 Nature Communications (1 co-first author, 1 co-corresponding author),
26 Physical Review B (3 Rapid communications), 3 New Journal of Physics, 1 ACS Nano, 1 Nano Lett., 2 Scientific Reports.

| Citation | Pablons (Web of Science) | ADS@Harvard | Google Scholar |
|---|---|---|---|
| Total | 3795 | 3395 | 4584 |
| h-index | 31 | 29 | 33 |
| i10-index | 48 | 41 | 52 |




AT SUSTECH 2015-2019

† CORRESPONDIN. AUTHORS
∗ EQUAL CONTRIBUTION

1. "Anomalous thermoelectric effects of ZrTe5 in and beyond the quantum limit",
J. L. Zhang, C. M. Wang†, C. Y. Guo, X. D. Zhu, Y. Zhang, J. Y. Yang, Y. Q. Wang, Z. Qu, L. Pi, **Hai-Zhou Lu**†, M. L. Tian†,
Phys. Rev. Lett. (2019).

2. "Disorder-induced nonlinear Hall effect with time-reversal symmetry",
Z. Z. Du, C. M. Wang, **Hai-Zhou Lu**†, X. C. Xie,
Nature Communications 10, 3047 (2019).

3. "Weak localization and antilocalization in nodal-line semimetals: Dimensionality and topological effects",
Wei Chen, **Hai-Zhou Lu**, Oded Zilberberg,
Phys. Rev. Lett. 122, 196603 (2019).

4. "Decays of Majorana or Andreev oscillations induced by steplike spin-orbit coupling",
Zhan Cao, Hao Zhang, Hai-Feng Lü, Wan-Xiu He, **Hai-Zhou Lu**†, X. C. Xie,
Phys. Rev. Lett. 122, 147701 (2019).

5. "Quantum transport in topological semimetals under magnetic fields (II)",
Hai-Peng Sun and **Hai-Zhou Lu**†,
Frontiers of Physics 14, 33405 (2019).

6. "Angular dependence of the upper critical field in the high-pressure 1T' phase of MoTe2",
Y. J. Hu, Yuk Tai Chan, Kwing To Lai*, Kin On Ho, Xiaoyu Guo, Hai-Peng Sun, K. Y. Yip, Dickon H. L. Ng, **Hai-Zhou Lu**, and Swee K. Goh†,
Phys. Rev. Materials 3, 034201 (2019).

7. "Non-saturating quantum magnetization in Weyl semimetal TaAs",
Cheng-Long Zhang, C. M. Wang, Zhujun Yuan, Chi-Cheng Lee, Li Pi, Chuanying Xi, Hsin Lin, Neil Harrison, **Hai-Zhou Lu**†(co-corresponding), Jinglei Zhang†, and Shuang Jia†,
Nature Communications 10, 1028 (2019).

8. "Quantum Hall effect based on Weyl orbits in $Cd_3As_2$",
Cheng Zhang, Yi Zhang, Xiang Yuan, Shiheng Lu, Jinglei Zhang, Awadhesh Narayan, Yanwen Liu, Huiqin Zhang, Zhuoliang Ni, Ran Liu, Eun Sang Choi, Alexey Suslov, Stefano Sanvito, Li Pi, **Hai-Zhou Lu**, Andrew C. Potter, Faxian Xiu*,
Nature 565, 331 (2019).

9. "Observation of the nonlinear Hall effect under time reversal symmetric conditions",
Qiong Ma, Su-Yang Xu, Huitao Shen, David Macneill, Valla Fatemi, Andres M Mier Valdivia, Sanfeng Wu, Tay-Rong Chang, Zongzheng Du, Chuang-Han Hsu, Quinn D Gibson, Shiang Fang, Efthimios Kaxiras, Kenji Watanabe, Takashi Taniguchi, Robert J Cava, **Hai-Zhou Lu**, Hsin Lin, Liang Fu, Nuh Gedik*, Pablo Jarillo-Herrero*,
Nature 565, 337 (2019).

10. "Perspective: 3D quantum Hall effect",
**Hai-Zhou Lu**†,
National Science Review, 6, 208 (2019).

11. "Band signatures for strong nonlinear Hall effect in bilayer $WTe_2$"
Z. Z. Du, C. M. Wang, **Hai-Zhou Lu**†, and X. C. Xie,
Phys. Rev. Lett. 121, 266601 (2018).

12. "Theory for the negative longitudinal magnetoresistance in the quantum limit of Kramers Weyl semimetals",
Bo Wan, Frank Schindler, Ke Wang, Kai Wu, Xiangang Wan, Titus Neupert, and **Hai-Zhou Lu**†,
J. Phys.: Condens. Matter 30, 505501 (2018).

13. "Reversible and nonvolatile manipulation of the electronic transport properties of topological insulators by ferroelectric polarization switching",
Xu-Wen Zhao, Si-Ning Dong, Guan-Yin Gao, Zhi-Xue Xu, Meng Xu, Jian-Min Yan, Wei-Yao Zhao, Yu-Kuai Liu†, Shu-Ying Yan, Jin-Xing Zhang, Yu Wang†, **Hai-Zhou Lu**, Xiao-Guang Li, JK Furdyna, Hao-Su Luo, Ren-Kui Zheng†,
npj Quantum Materials 3, 52 (2018).

14. "Confined-path interference suppressed quantum correction on weak antilocalization effect in a BiSbTeSe2 topological insulator",

Lai-Xiang Qin, Xin-Chen Pan, Feng-Qi Song, Liang Zhang, Zhang-Hao Sun, Ming-Qiang Li, Peng Gao, Ben-Chuan Lin, Shiu-Ming Huang, Rui Zhu, Jun Xu, Fang Lin, **Hai-Zhou Lu**, Dapeng Yu, Zhi-Min Liao†,
Appl. Phys. Lett. 112, 032102 (2018).

15. [Book chapter] "Weyl Semimetals",
Bo Wan, **Hai-Zhou Lu**, Xiangang Wan,
Topology in Magnetism, 239-265 (Springer, Cham, 2018), Springer Series in Solid-State Sciences, vol 192.

16. "Gate-tunable weak antilocalization in a few-layer InSe",
Junwen Zeng, Shi-Jun Liang, Anyuan Gao, Yu Wang, Chen Pan, Chenchen Wu, Erfu Liu, Lili Zhang, Tianjun Cao, Xiaowei Liu, Yajun Fu, Yiping Wang, Kenji Watanabe, Takashi Taniguchi, **Haizhou Lu**, Feng Miao†,
Phys. Rev. B 98, 125414 (2018).

17. "Effect of the screened Coulomb disorder on magneto-transport in Weyl semimetals",
Xuan-Ting Ji, **Hai-Zhou Lu**, Zhen-Gang Zhu, Gang Su,
J. Appl. Phys. 123, 203901 (2018).

18. "Elastic pseudospin transport for integratable topological phononic circuits",
Si-Yuan Yu, Cheng He, Zhen Wang, Fu-Kang Liu, Xiao-Chen Sun, Zheng Li, **Hai-Zhou Lu**, Ming-Hui Lu†, Xiao-Ping Liu†, and Yan-Feng Chen†
Nature Commnications 9, 3072 (2018).
IF: 12.124.

19. "Forbidden backscattering and resistance minimum in the quantum limit as a signature of topological insulators",
Yiyuan Chen, **Hai-Zhou Lu**†(corresponding), and X. C. Xie
Phys. Rev. Lett. 121, 036602 (2018).
IF: 8.462.

20. "Rules for phase shifts of quantum oscillations in topological nodal-line semimetals",
Cequn Li, C. M. Wang, Bo Wan, Xiangang Wan, **Hai-Zhou Lu**†(corresponding), and X. C. Xie
Phys. Rev. Lett. 120, 146602 (2018).
IF: 8.462.

21. "Magnetoresistance Anomaly in Topological Kondo Insulator $SmB_6$ Nanowires with Strong Surface Magnetism",
Xingshuai He, Haibo Gan, Zongzheng Du, Bicong Ye, Liang Zhou, Yuan Tian, Shaozhi Deng, Guoping Guo, **Haizhou Lu**, Fei Liu,† and Hongtao He†
Advanced Science 1700753 (2018).
IF: 12.441 (2018).

22. "Towards the manipulation of topological states of matter: A perspective from electron transport",
Cheng Zhang, Hai-Zhou Lu, Shun-Qing Shen, Yong P. Chen, and Faxian Xiu†

Science Bulletin 63, 580 (2018).
IF: 4.136 (2017).

23. "Theory for the negative longitudinal magnetoresistance in the quantum limit of Kramers Weyl semimetals",
Bo Wan, Frank Schindler, Ke Wang, Xiangang Wan, Titus Neupert, and **Hai-Zhou Lu**†(corresponding),
submitted.

24. "Topological Landau lattice",
Y. X. Zhao†, Y. Lu, and **Hai-Zhou Lu**†(co-corresponding),
arXiv:1706.09783.

25. "Towards the manipulation of topological states of matter: A perspective from electron transport",
Cheng Zhang, **Hai-Zhou Lu**, Shun-Qing Shen, Yong P. Chen, and Faxian Xiu†,
Science Bulletin (2018).

26. "Negative magnetoresistance without chiral anomaly in topological insulators",
Xin Dai, Z. Z. Du, and **Hai-Zhou Lu**† (corresponding),
Phys. Rev. Lett. 119, 166601 (2017). (Citation 2. Web of Science).
IF: 8.462.

27. "Interplay between topological surface states and superconductivity in $SmB_6$/NbN tunnel junctions",
Zhu Lin, Yong Zhou, Ling-Jian Kong, Dongsheng Tang, **Hai-Zhou Lu**, Shiu-Ming Huang, Rui Zhu, Jun Xu, Fang Lin, Jianbo Wang, Zhi-Min Liao†, and Dapeng Yu,
Phys. Rev. B 96, 165408 (2017). (Citation 0. Web of Science).
IF: 3.836.

28. "3D quantum Hall effect of Fermi arcs in topological semimetals ",
C. M. Wang, Hai-Peng Sun, **Hai-Zhou Lu**† (corresponding), and X. C. Xie,
Phys. Rev. Lett. 109, 136806 (2017) (Citation 4. Web of Science).
IF: 8.462.

29. "Magnetic tunneling induced Weyl node annihilation in TaP",
Cheng-Long Zhang, Su-Yang Xu, C. M. Wang, Ziquan Lin, Z. Z. Du, Cheng Guo, Chi-Cheng Lee, Hong Lu, Yiyang Feng, Shin-Ming Huang, Chuang-Han Hsu, Haiwen Liu, Hsin Lin, Liang Li, Chi Zhang, Jinglei Zhang, Xin-Cheng Xie, Titus Neupert, M. Zahid Hasan, **Hai-Zhou Lu**† (co-corresponding), Junfeng Wang†, and Shuang Jia†,
Nature Phys. 13, 979 (2017) (Citation 28, ADS/ABS; Citation 7, Web of Science).
IF: 22.806.

30. "Topological semimetals with a double-helix nodal link (Topological Hopf-link semimetal)",
Wei Chen, **Hai-Zhou Lu**, Jing-Min Hou†,
Phys. Rev. B 96, 041102(R) (2017) (Citation 17, Web of Science; 31, ADS/ABS).
IF: 3.836.

31. "Spin-polarized surface state transport in a topological Kondo insulator $SmB_6$ nanowire",
Lingjian Kong, Yong Zhou, Song Liu, Zhu Lin, Liang Zhang, Fang Lin, Dongsheng Tang, Han-Chun Wu, Junfeng Liu, **Hai-Zhou Lu**, Rui Zhu, Jun Xu, Zhi-Min Liao†, and Dapeng Yu,
Phys. Rev. B 95, 235410 (2017) (Citation 7. Web of Science).
IF: 3.836.

32. "Thickness-tuned transition of band topology in $ZrTe_5$ nanosheets",
Jianwei Lu, Guolin Zheng, Xiangde Zhu, Wei Ning, Hongwei Zhang, Yuyan Han, Jiyong Yang, Haifeng Du, Kun Yang, **Haizhou Lu**, Yuheng Zhang, Mingliang Tian,
Phys. Rev. B 95, 125135 (2017). (Citation 2. Web of Science).
IF: 3.836.

33. "Tunable positive to negative magnetoresistance in atomically thin $WTe_2$",
Enze Zhang, Rui Chen, Ce Huang, Jihai Yu, Kaitai Zhang, Weiyi Wang, Shanshan Liu, Jiwei Ling, Xiangang Wan, **Hai-Zhou Lu**, and Faxian Xiu†,
Nano Lett. 17, 878 (2017) (Citation 13. Web of Science).
IF:12.712.

34. "Quantum transport in topological semimetals under magnetic fields",
**Hai-Zhou Lu**† and Shun-Qing Shen,
Front. Phys. 12, 127201 (2017) (Invited review. Citation: 8. Web of Science).
IF: 2.579.

35. "Weak antilocalization and interaction-induced localization of Dirac and Weyl Fermions in topological insulators and semimetals",
**Hai-Zhou Lu** and Shun-Qing Shen,
Chin. Phys. B 25, 117202 (2016) (Invited review. Citation 5. Web of Science).
IF: 1.223.

36. "Anomalous Phase Shift of Quantum Oscillations in 3D Topological Semimetals",
C. M. Wang, **Hai-Zhou Lu**† (Corresponding), and Shun-Qing Shen,
Phys. Rev. Lett. 117, 077201 (2016) (Citation: 14. Web of Science).
IF: 8.462.

37. "Gate-Tunable Negative Longitudinal Magnetoresistence in the Predicated Type-II Weyl Semimetal $WTe_2$",
Yaojia Wang*, Erfu Liu*, Huimei Liu, Yiming Pan, Longqiang Zhang, Junwen Zeng, Yajun Fu, Miao Wang, Kang Xu, Zhong Huang, Zhenlin Wang, **Hai-Zhou Lu**, Dingyu Xing, Baigeng Wang†, Xiangang Wan†, and Feng Miao†,
Nature Communications 7, 13142 (2016) (Citation: 38. Web of Science).
IF: 12.124.

38. "Unraveling the Influence of Metal Substrates on Graphene Nucleation from First-Principles Study",
Lixiang Zhong, Jia Li, Yuanchang Li, **Haizhou Lu**, Hongda Du, Lin Gan, Chengjun Xu, Sum Wai Chiang, and Feiyu Kang,

J. Phys. Chem. C 120, 23239 (2016). (Citation: 3. Web of Science).
IF: 4.536.

39. "Enhanced current noise correlations in a Coulomb-Majorana device",
Hai-Feng Lv, **Hai-Zhou Lu**† (Corresponding), and Shun-Qing Shen,
Phys. Rev. B 93, 245418 (2016) (Citation 2. Web of Science).
IF: 3.836.

40. "Linear magnetoconductivity in an intrinsic topological Weyl semimetal",
Song-Bo Zhang*, **Hai-Zhou Lu*** (Equal contribution), and Shun-Qing Shen,
New J. Phys. 18, 053039 (2016) (Citation: 21. Web of Science).
IF: 3.786.

41. "Detecting monopole charge in Weyl semimetals via quantum interference transport",
Xin Dai, **Hai-Zhou Lu**† (Corresponding), Shun-Qing Shen, and Hong Yao†,
Phys. Rev. B 93, 161110(R) (2016) (Citation 13. Web of Science).
IF: 3.836.

42. "Signatures of the Adler-Bell-Jackiw chiral anomaly in a Weyl Fermion semimetal",
C. L. Zhang*, S. Y. Xu* I. Belopolski*, Z. Yuan*, Z. Lin, B. Tong, G. Bian, N. Alidoust, C. C. Lee, S. M. Huang, T. R. Chang, G. Chang, C. H. Hsu, H. T. Jeng, M. Neupane, D. S. Sanchez, H. Zheng, J. Wang, H. Lin, C. Zhang, **H. Z. Lu**, S. Q. Shen, T. Neupert, M. Z. Hasan†, and S. Jia†,
Nature Communications **7**, 10735 (2016) (Citation: 159. Web of Science).
IF: 12.124.

43. "Weak localization effect in topological insulator micro flakes grown on insulating ferrimagnet $BaFe_{12}O_{19}$",
Guolin Zheng*, Ning Wang*, Jiyong Yang, Weike Wang, Haifeng Du, Wei Ning, Zhaorong Yang, **Hai-Zhou Lu**† (Corresponding), Yuheng Zhang, and Mingliang Tian†,
Scientific Reports **6**, 21334 (2016) (Citation: 4. Web of Science).
IF: 4.259

44. "Negative Magnetoresistance in Dirac Semimetal $Cd_3As_2$",
Hui Li,* Hongtao He,* **Hai-Zhou Lu*** (Equal contribution), Huachen Zhang, Hongchao Liu, Rong Ma, Zhiyong Fan, Shun-Qing Shen†, Jiannong Wang†,
Nature Communications **6**, 10301 (2016) (Citation: 89. Web of Science).
IF: 12.124.

45. "High-field magnetoconductivity of topological semimetals with short-range potential",
**Hai-Zhou Lu**, Song-Bo Zhang, and Shun-Qing Shen,
Phys. Rev. B **92**, 045203 (2015) (Citation: 32. Web of Science).
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47. "Edge states and integer quantum Hall effect in topological insulator thin films",
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BEFORE SUSTECH 2005-2015

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49. "Tunable interaction-induced localization in topological insulator $Bi_2Te_3$ thin films",
Hong-Chao Liu*, **Hai-Zhou Lu***, Hong-Tao He, Bai-Kui Li, Shi-Guang Liu, Qing Lin He, Gan Wang, Iam-Keong Sou, Shun-Qing Shen†, and Jiannong Wang† (* Equal contribution. † Corresponding authors),
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50. "Weak localization and weak anti-localization in topological insulators",
**Hai-Zhou Lu** and Shun-Qing Shen,
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51. "Finite-temperature conductivity and magnetoconductivity of topological insulators",
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52. "Quantum transport in magnetic topological insulator thin films",
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53. "Extrinsic anomalous Hall conductivity of a topologically nontrivial conduction band",
**Hai-Zhou Lu** and Shun-Qing Shen,
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54. "Spin Hall effect in spin-valley coupled monolayers of transition metal dichalcogenides",
Wen-Yu Shan, **Hai-Zhou Lu**, and Di Xiao,
Phys. Rev. B **88**, 125301 (2013) (Citation: 31. Web of Science).
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55. "Intervalley scattering and localization behaviors of spin-valley coupled Dirac fermions",
**Hai-Zhou Lu**, Wang Yao, Di Xiao, and Shun-Qing Shen,
Phys. Rev. Lett. **110**, 016806 (2013) (Citation: 70. Web of Science).
IF: 8.462.

56. "Quantum impurity in the bulk of topological insulator",
Hai-Feng Lü, **Hai-Zhou Lu**, Shun-Qing Shen, and Tai-Kai Ng,
Phys. Rev. B **87**, 195122 (2013) (Citation: 10. Web of Science).
IF: 3.836.

57. "Anomalous anisotropic magnetoresistance in topological insulator films",
Jian Wang, et.al.,
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58. "Nonlocal noise cross-correlation mediated by entangled Majorana fermions",
Hai-Feng Lü, **Hai-Zhou Lu**, and Shun-Qing Shen,
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59. "Spin-orbit scattering in quantum diffusion of massive Dirac fermions",
Wen-Yu Shan, **Hai-Zhou Lu**$^*$ and Shun-Qing Shen,
Phys. Rev. B **86**, 125303 (2012) (Citation: 12. Web of Science).
IF: 3.836.

60. "Non-magnetic impurities and in-gap bound states in topological insulators",
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61. "Weak localization of bulk channels in topological insulator thin films",
**Hai-Zhou Lu** and Shun-Qing Shen,
Phys. Rev. B **84**, 125138 (2011). (Citation: 91. Web of Science.)
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62. "Competition between weak localization and antilocalization in topological surface states",
**Hai-Zhou Lu**, Junren Shi, and Shun-Qing Shen,
Phys. Rev. Lett. **107**, 076801 (2011). (Citation: 142. Web of Science.)
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63. "Quadratic magnetic field dependence of magneto-electric photocurrent",
Junfeng Dai, **Hai-Zhou Lu**, Shun-Qing Shen, Fu-Chun Zhang, and Xiaodong Cui,
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64. "Vacancy-induced bound states in topological insulators",
Wen-Yu Shan, Jie Lu, **Hai-Zhou Lu**, and Shun-Qing Shen,
Phys. Rev. B **84**, 035307 (2011). (Citation: 34. Web of Science.)
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65. "Topological insulator and the Dirac equation",
Shun-Qing Shen, Wen-Yu Shan, **Hai-Zhou Lu**,
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66. "Impurity effect on weak anti-localization in the topological insulator $Bi_2Te_3$",
Hong-Tao He, Gan Wang, Tao Zhang, Iam-Keong Sou, George K. L. Wong, Jian-Nong Wang, **Hai-Zhou Lu**, Shun-Qing Shen, and Fu-Chun Zhang,
Phys. Rev. Lett. **106**, 166805 (2011). (Citation: 223. Web of Science.)
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67. "Theory of magnetoelectric photocurrent generated by direct interband transitions in a semiconductor quantum well",
**Hai-Zhou Lu**, Bin Zhou, Fu-Chun Zhang, and Shun-Qing Shen,
Phys. Rev. B **83**, 125320 (2011). (Citation: 3. Web of Science.)
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68. "Magneto-electric photocurrent generated by direct inter-band transitions in InGaAs/InAlAs two-dimensional electron gas",
Junfeng Dai, **Hai-Zhou Lu**† (Corresponding), C. L. Yang, Shun-Qing Shen, Fu-Chun Zhang, and Xiaodong Cui†,
Phys. Rev. Lett. **104**, 246601 (2010). (Citation: 10. Web of Science.)
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69. "Effective continuous model for surface states and thin films of three dimensional topological insulators",
Wen-Yu Shan, **Hai-Zhou Lu**, Shun-Qing Shen,
New J. Phys. **12**, 043048 (2010). (Citation: 191. Web of Science. One of "best of 2010" selected by the journal.)
IF: 3.786.

70. "Massive Dirac fermions and spin physics in an ultrathin film of topological insulator",
**Hai-Zhou Lu**, Wen-Yu Shan, Wang Yao, Qian Niu, Shun-Qing Shen,
Phys. Rev. B **81**, 115407 (2010). (Citation: 291. Web of Science.)
IF: 3.836.

71. "Detecting and switching magnetization of Stoner nanograin in non-local spin valve",
**Hai-Zhou Lu** and Shun-Qing Shen,
Phys. Rev. B **80**, 094401 (2009). (Citation: 7. Web of Science.)
IF: 3.836.

72. "Spin-bias driven magnetization reversal and nondestructive detection in a single molecular magnet",
**Hai-Zhou Lu**, Bin Zhou, and Shun-Qing Shen,
Phys. Rev. B **79**, 174419 (2009). (Citation: 48. Web of Science.)
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73. "Quantum blockade and loop current induced by a single lattice defect in graphene nanoribbons",

Jie-Yun Yan, Ping Zhang, Bo Sun, **Hai-Zhou Lu**, Zhigang Wang, Suqing Duan, Xian-Geng Zhao,
Phys. Rev. B **79**, 115403 (2009). (Citation: 35. Web of Science.)
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74. "Generation and detection of spin current in the three-terminal quantum dot", Rong Lü, **Hai-Zhou Lu**, Xi Dai, and Jiangping Hu,
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75. "Finite size effects on helical edge states in a quantum spin-Hall system", Bin Zhou, **Hai-Zhou Lu**, Rui-Lin Chu, Shun-Qing Shen, and Qian Niu,
Phys. Rev. Lett. **101**, 246807 (2008). (Citation: 251. Web of Science.)
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76. "Using spin bias to manipulate and measure spin in quantum dots", **Hai-Zhou Lu** and Shun-Qing Shen,
Phys. Rev. B **77**, 235309 (2008). (Citation: 37. Web of Science.)
IF: 3.836.

77. "Fano effect through parallel-coupled double Coulomb islands", **Haizhou Lu**, Rong Lü, and Bang-fen Zhu,
J. Phys.: Condens. Matt. **18**, 8961 (2006). (Citation: 47. Web of Science.)
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78. "Phonon-assisted Kondo effect in a single-molecule transistor out of equilibrium", Zuo-Zi, Chen, **Haizhou Lu**, Rong Lü, and Bang-fen Zhu,
J. Phys.: Condens. Matt. **18**, 5435 (2006), 18, 5435 (2006). (Citation: 29. Web of Science.)
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79. "Tunable Fano effect in parallel-coupled double quantum dot System", **Haizhou Lu**, Rong Lü and Bang-fen Zhu,
Phys. Rev. B **71**, 235320 (2005). (Citation: 131. Web of Science.)
IF: 3.836.

## Conferences and Talks

1. Invited talk "3D quantum Hall effect", ETH Zurich, April 5, 2019.
2. Invited talk "Nonlinear Hall effect", Peking University, March 27, 2019.
3. Invited talk "3D quantum Hall effect", Zhejiang University, March 15, 2019.
4. Invited talk "Nonlinear Hall effect", Nanjing University, February 25, 2019.
5. Invited talk "3D quantum Hall effect", The annual meeting of high magnetic field center, Wuhan, Jan 18-20, 2019.
6. Invited talk "3D quantum Hall effect", Southern Physics Forum - Condensed Matter and Quantum Physics, Shenzhen, Jan 11-13, 2019.
7. Invited talk "3D quantum Hall effect", High magnetic field lab, Hefei, Dec 17, 2018.
8. Invited talk "3D quantum Hall effect", Shanghai Jiaotong University, Shanghai, Dec 13, 2018.
9. Invited talk "3D quantum Hall effect", Changjiang Scholar Forum, Fudan University, Shanghai, Oct 13, 2018.
10. Invited talk "3D quantum Hall effect", Xi'an Jiaotong University, Xi'an, Sep 30, 2018.
11. Talk "Quantum transport in Topological semimetals", 34th International Conference on the Physics of Semiconductors (ICPS2018), Montpellier, France, July 29 - August 3, 2018.
12. Invited talk "3D quantum Hall effect", The 20th national conference on condensed matter theory and statistical physics, Chengdu, July 12-15, 2018.
13. Invited talk "3D quantum Hall effect", The 4th national conference on condensed matter physics, Shanghai, July 5-8, 2018.
14. Invited talk "Rules for phase shifts of quantum oscillations in topological nodal-line semimetals", The 2nd Workshop on topological matter, Tiammu Lake, May 27-29, 2018.
15. Invited talk "Quantum transport in topological semimetals", School of Physics, Nanjing University, May 26, 2018.
16. Invited talk "Quantum transport in topological semimetals", School of Physics, Beijing Institute of Technology, April 23, 2018.
17. Invited talk "3D quantum Hall effect in topological semimetals", Department of Physics, Tsinghua University, March 12, 2018.
18. Session chair "Session P14: Topological Materials - Theory and computation", APS March Meeting, March 5-9, 2018.
19. Session chair and Invited talk "Quantum Transport in Topological semimetals", ICONN-2018, University of Wollongong, Australia, Jan 29-Feb 2, 2018.

20. Invited talk "Quantum transport in topological semimetals", Department of Physics, Chinese University of Hong Kong, Jan 20, 2018.

21. Invited talk "Quantum transport in topological semimetals", Workshop on computational physics, Institute of Physics, Chinese Academy of Sciences, Fuzhou, December 2, 2017.

22. Invited talk "3D quantum Hall effect in topological semimetals", Institute of Physics, Beijing, September 29, 2017.

23. Invited talk "Anomalous phase shift of quantum oscillations and 3D quantum Hall effect in 3D topological semimetals", Advanced many-body and statistical methods in mesoscopic systems III, Busteni, Romania, September 4-8, 2017.

24. Invited talk "Anomalous phase shift of quantum oscillations in 3D topological semimetals", 21st National Conference on Semiconductor Physics, Nanjing University, China, July 21, 2017.

25. Invited talk "Anomalous phase shift of quantum oscillations in 3D topological semimetals", Institute for Advanced Study, Tsinghua University, Beijing, China, June 30, 2017.

26. Invited talk "Anomalous phase shift of quantum oscillations in 3D topological semimetals", 3rd Conference on Condensed Matter Physics, Shanghai, China, June 25, 2017.

27. Invited talk "Anomalous phase shift of quantum oscillations in 3D topological semimetals", Dali, China, May 20, 2017.

28. Invited talk "Quantum Transport in Topological semimetals", School of Physics, Wuhan University, China, Mar 17, 2017.

29. Invited talk "Quantum Transport in Topological semimetals", Victoria University of Wellington, New Zealand, Jan 13, 2017.

30. Invited talk "Quantum Transport in Topological semimetals", Department of Physics, Chinese University of Hong Kong, Hong Kong, China, Aug 15, 2016.

31. Contributed talk: "Magnetoconductivity of topological semimetals in the quantum limit", 33rd International Conference on the Physics of Semiconductors (ICPS2016), Beijing, China, July 31-August 5, 2016.

32. Contributed talk: "Theory of weak (anti-)localization in topological semimetals", 33rd International Conference on the Physics of Semiconductors (ICPS2016), Beijing, China, July 31-August 5, 2016.

33. Invited talk: "Theories of quantum transport in topological semimetals", The 2nd national conference on condensed matter physics, Nanjing, China, July 20-22, 2016.

34. Invited talk: "Monopole charge in quantum transport of topological semimetals", The 19th national conference on condensed matter theory and statistical physics, Xiangtan, China, July 15-18, 2016.

35. Invited talk: "Berry phase and monopole charge in quantum transport of topological semimetals", EEMD2016, University of Science and Technology of China, Hefei, China, July 9-11, 2016.

36. Invited talk: "Quantum transport in topological semimetals", School of Physics, University of New South Wales, Sydney, Australia, May 26, 2016.

37. Invited talk: "Quantum transport in topological semimetals", University of Science and Technology of China, Hefei, China, May 12, 2016.

38. Invited talk: "Quantum transport in topological semimetals", Huazhong University of Science and Technology, Wuhan, China, Apr 8, 2016.

39. Invited talk: "Quantum transport in topological semimetals", Hubei University, Wuhan, China, Apr 7, 2016.

40. Invited talk: "Weak antilocalization in topological semimetals", Southern Physics Forum 2015 - Topological matters and quantum materials, Shenzhen, China, Nov 30, 2015.

41. Invited talk: "Quantum transport in topological semimetals", Department of Physics, Nanjing University of Aeronautics and Astronautics, China, Oct 19, 2015.

42. Invited talk: "Quantum transport in topological semimetals", Department of Physics, Nanjing University, China, Oct 16, 2015.

43. Invited talk: "Quantum transport in topological semimetals", The 1st national conference on condensed matter physics, Tsinghua University, China, July 15-17, 2015.

44. Invited talk: "Quantum transport in topological insulators, TMDs, and topological semimetals ", Mini-Workshop on 2D Materials, Department of Physics, The University of Hong Kong, May 28, 2015.

45. Invited talk: "Localization of surface Dirac fermions in topological insulators", The 1st International Conference on Two-Dimensional Layered Materials, Hangzhou, China, Oct 12-15, 2014.

46. Invited talk: "From the finite-size effect in topological insulator to the quantized anomalous Hall effect", The 13th National Conference on theories of magnetism, Baotou, Inner mongolia, China, Aug 15-17, 2014.

47. Seminar: "Quantum transport in topological insulators: weak anti-localization and electron-electron interaction", Institute for advanced study, Tsinghua University, Beijing, China, Mar 26, 2014.

48. Seminar: "Quantum transport in topological insulators: weak anti-localization and electron-electron interaction", University of Chinese academy of sciences, Beijing, China, Mar 25, 2014.

49. Seminar: "Quantum transport in topological insulators: weak anti-localization and electron-electron interaction", Institute of Physics, Chinese academy of sciences, Beijing, China, Mar 24, 2014.

50. Seminar: "Quantum transport in topological insulators: weak anti-localization and electron-electron interaction", Department of Physics, Renmin University, Beijing, China, Mar 19, 2014.

51. Seminar: "Quantum transport in topological insulators: weak anti-localization and electron-electron interaction", Institute of semiconductors, Chinese academy of sciences, Beijing, China, Mar 18, 2014.

52. Seminar "Quantum Transport in Topological Insulators: Weak Anti-localization and Electron-electron Interaction", Department of Physics, Chinese University of Hong Kong, Hong Kong, China, Mar 11, 2014.

53. Colloquium: "Journey to the Quantized Anomalous Hall Effect", Department of Physics, Chinese University of Hong Kong, Hong Kong, China, Mar 10, 2014.

54. Seminar: "Quantum transport of Dirac fermions in topological insulators and $MoS_2$", International center for quantum materials, Peking University, Beijing, China, Jan 9, 2014.

55. Invited talk: "Finite-temperature conductivity and magnetoconductivity of topological insulators", Hong Kong Forum of Physics 2013: Novel Quantum Systems, The University of Hong Kong, Hong Kong, China, Dec 12-14, 2013.

56. Invited talk: "Weak localization and antilocalization in topological insulators and $MoS_2$", Symposium on emergent two-dimensional layered materials, Zhejiang University, Hangzhou, China, Sep 27-28, 2013.

57. Invited talk: "Weak localization and antilocalization in topological insulators and $MoS_2$", The conference "Flatlands Beyond Graphene", Jacobs University, Bremen, Germany, June 17-21, 2013.

58. Invited talk: "Weak anti-localization and localization in topological insulators and multi-valley massive Dirac fermion systems", EMN West 2013, Houston, TX, USA, January 7-10, 2013.

59. Talk: "Spin-orbit scattering in quantum diffusion of massive Dirac fermions". Workshop: Topological states in quantum matters, Qingdao, China, July 2-6, 2012.

60. Invited talk: "Competition between weak localization and antilocalization in topological surface states". Workshop: Topological Insulator and Topological Superconductor, Kavli Institute for Theoretical Physics China at the Chinese Academy of Sciences, August 25, 2011.

61. Invited talk: "Competing weak anti-localization and weak localization in topological surface states". The 3rd International Workshop on Quantum Condensation, Hong Kong University of Science and Technology, July 9, 2011.

62. Talk: "Thin Film of Topological Insulator". The 3rd Scienceweb GCOE International Symposium, Tohoku University, February 17-19, 2011.

63. Plenary talk: "Using spin bias to manipulate and detect magnetization at nanoscales". 10th National conference on magnetism theories, Hangzhou, China, 2009.8.26-29.

64. Talk: "Spin-bias driven magnetization reversal and nondestructive detection in a single molecular magnet". Mini-workshop on Selected topics in condensed matter theories, The university of Hong Kong, 2009.3.11.

65. Talk: "Using electrodes with spin-dependent splitting of chemical potentials to manipulate and monitor a single spin in quantum dots". Program of Condensed matter group meeting, Center for theoretical and computational physics, Chinese university of Hong Kong, 2008.1.31.

66. Invited talk: "Which-way effect in phonon-assisted electron tunneling through quantum dots". National conference on semiconductors, Lanzhou, China, 2007.9.7-13.

67. Talk: "Low-Temperature Nonequilibrium Transport through Single-Molecule-Transistor Systems as Which-way Effect Detector". 14th national conference on condensed matter theory and statistical physics, Guang Zhou, China, 2006.11.11-13.

68. Workshop on Spin-orbit coupling and Spin Hall effect, Lijiang, China, 2006.8.28-31.

69. Poster: "Fano effect in the Coulomb Blockade Regime for a Parallel-coupled Double Quantum Dot System". The 16th International Conference on Electronic Properties of Two-Dimensional Systems, Albuquerque, New Mexico, 2005.7.10-15.

70. Poster: "Controlling Fano effect in parallel-coupled double quantum dot system by electrostatic and magnetic approaches". 4th conference of Overseas Chinese physics association, Shanghai, 2004.6.28-7.1.

## SERVICES

- Referee for Journals
  Physical Review Letters, Physical Review B, Physical Review X, Physical Review Applied, Europhysics Letters, Journal of Physics: Condensed matter, Applied Physics Letters, Solid State Communications, AIP Advance, Nature Communications, Scientific Reports, Advanced Materials, Science Advances.
- Referee for Grants
  National Science Foundation of China (Physics Division I)
  Icelandic Research Fund.
- Program committee. The 1st international conference on two-dimensional layered materials (IC2DLM), October 13-15, 2014, Hangzhou, China.
- Organizing committee. Southern Physics Forum 2016, Nov 28-30, 2015, Shenzhen, China.
- External referee for graduate student thesis. Graduate school of Chinese University of Hong Kong, Hong Kong.