Huaihong Guo

May 16, 2014

Department of Physics, Tohoku University
6-3, Aoba, Aramaki, Aoba-ku,
Sendai, 980-8578, Japan
Tel: +81-22-795-5717 (office)
Fax: +81-22-795-6447

Google scholar

ResearcherID: A-9887-2014
hhguo [at] flex.phys.tohoku.ac.jp

Education

- **Dept. of Physics, Tohoku University** Sendai, Japan
  Post-doc researcher 2014-2015
  - Advisor: Prof. Riichiro Saito-sensei
  - Interest: transition metal di-chalcogenides and its optical properties
- **Institute of Metal Research, Chinese Academy of Sciences** Shenyang, China
  Doctor of Materials Physics 2009-2013
  - Advisor: Prof. Zhidong Zhang
  - Interest: electronic structure of MoS_2, thermoelectric materials, magnetism
- **Michigan State University** Lansing, MI
  Visiting Ph.D. Condensed Matter Physics 2011-05 - 2011-07
  - Advisor: Prof. David Tomanek
  - Interest: molecular dynamics study on CNT growth on silica nanoparticle
- **Liaoning University** Shenyang, China
  Master degree Atomic and molecular physics 2004-2007
  - Advisor: Prof. Yanxia Liu
  - Interest: Empirical potential construction of alloys, molecular dynamics

Research interest

My major research interest involves the first-principles study on structure, electronic structure, and novel physical properties in energy-efficient materials and the development of related numerical analysis methods.

Now I am a Postdoc working in Prof. R. Saito's Lab in Tohoku University, Sendai, Japan. Right now my project is mainly focused on *ab initio* study on the transition metal di-chalcogenides and its optical properties based on Raman spectroscopy.

Major achievements

In pursuit of my Doctoral degree, I have been working on electronic and structural properties of transition metal oxides/chalcogenides using a combination of *ab initio* Density Functional calculations with empirical classical/quantum theory. From calcium cobaltites to transitional metal chalcogenide, I have been trying to study and understand both fundamental properties and potential applications in the following topic:

(1) The potential of MoS_2 under high pressure for thermoelectric applications.
(2) Theoretical study on doping of MoS_2 for thermoelectric applications.
(3) Anisotropic thermopower in calcium cobaltites.
(4) Strain-induced magnetism in MoS_2 with atomic defects.
(5) molecular dynamics study on CNT growth on silica nanoparticle.

Publications (check ResearcherID/google-scholar for citation metrics)

1. **Huaihong Guo**, Teng Yang, Peng Tao, Yong Wang, Zhidong Zhang, *"High pressure effect on structure, electronic structure, and thermoelectric properties of MoS_2",* **J. Appl. Phys.**, 113, 013709 (2013)
2. **Huaihong Guo**, Teng Yang, Peng Tao, Zhidong Zhang, *"Theoretical study of thermoelectric properties of MoS_2",* **Chin. Phys. B**, 23(1) (2014) and **arXiv**, 1212, 3394 (2012)
3. Han Wang, **Huaihong Guo**, Yingying Dai, Dianyu Geng, Zheng Han, Da Li, Teng Yang, Song Ma,Wei Liu, and Zhidong Zhang, *"Optimal electromagnetic-wave absorption by enhanced dipole polarization in Ni /C nanocapsules".* **Appl. Phys. Lett.**, 101, 083116 (2012)
4. Guodong Tang, **Huaihong Guo**, Teng Yang, Dewei Zhang, X.N. Xu, L. Y. Wang, Z. H. Wang, H. H. Wen, Z. D. Zhang, and Y. W. Du, *"Anisotropic thermopower and magnetothermopower in a misfit-layered calcium cobaltite"*, **Appl. Phys. Lett.**, 98, 202109 (2011)
5. J. J. Jiang, H. Wang, **Huaihong Guo**, T. Yang, W. S. Tang, D. Li, S. Ma, D. Y. Geng, W. Liu, Z. D. Zhang, *"Microwave absorption properties of Ni/(C, silicides) nanocapsules",* **Nanoscale Res Lett.,** 7(1), 238 (2012)
6. Y. Q. Zhang, H. Meng, X. W. Wang, X. Wang, **Huaihong Guo**, Y. L. Zhu, T. Yang, and Z. D. Zhang, *"Angular dependent magnetoresistance with twofold and fourfold symmetries in A-type antiferromagnetic Nd0.45Sr0.55MnO3 thin film",* **Appl. Phys. Lett.**, 97, 172502 (2010).
7. Peng Tao, **Huaihong Guo**, Teng Yang, Zhidong Zhang, *"Strain-induced magnetism in MoS_2 monolayer with defects"*, **J. Appl. Phys.**, 115, 054305 (2014).

8. Peng Tao, **Huaihong Guo**, Teng Yang, Zhidong Zhang, *"Stacking stability of MoS_2 bilayer: An ab initio study"*, **Chin. Phys. B**, in press (2014).

Academic Activity

- 2009 Summer School for Advanced Functional Materials CAS
- 2010 3rd International Conference on Computational Nanoscience and New Energy Materials, Taian, China,
- 2011 1st Quantum Simulations for Material and Biological Systems Shanghai, China
- 2012 2nd Quantum Simulations for Material and Biological Systems Shanghai, China
- 2012 5th International Conference on Computational Nanoscience and New Energy Materials, Yantai, China,
- 2012 30th International Conference on Thermoelectrics, Traverse City, MI, USA
- 2013 6th International Conference on Computational Nanoscience and New Energy Materials, Harbin, China.
- 2013 ICQM-summer school: Novel electronic degrees of freedom, Beijing, China
- 2013 Joint ICTP-NSFC School and Advanced Workshop on Modern Electronic Structure Computations, Shanghai, China

Presentations

- *Anisotropic thermopower and magnetothermopower in a misfit-layered calcium cobaltite, (poster presentation)*

  - 30th International Conference on Thermoelectrics,
  - Traverse City, MI, USA, 2011

- *Doping and High pressure effect on structure, electronic structure, and thermoelectric properties of MoS_2 (oral presentation)*

  6th International Conference on Computational Nanoscience and New Energy Materials,
  - Harbin, China, June 17, 2013

References

- Prof. Riichiro Saito
  Department of Physics, Tohoku University
  Aramaki, Aoba, Sendai, 980-8754, Japan.
  847 Physics Building (next to Museum of National History)

+81-22-795-7754 (or 6445)
+81-22-795-6447 (Fax)
rsaito@phys.tohoku.ac.jp

- Prof. Zhi-dong Zhang
  Institute of Metal Research Chinese Academy of Sciences
  72 Wenhua Road, Shenyang, 110016 China
  zdzhang@imr.ac.cn

- Prof. Davd Tomanek
  Department of astronomy and physics, Michigan State University
  Lansing, Michigan, 48824 U.S.A.
  tomanek@pa.msu.edu

- Prof. Xing-Qiu Cheng
  Institute of Metal Research Chinese Academy of Sciences
  72 Wenhua Road, Shenyang, 110016 China
  xq.cheng@imr.ac.cn

- Prof. Zhanjie Wang
  Institute of Metal Research Chinese Academy of Sciences
  72 Wenhua Road, Shenyang, 110016 China
  wangzj@imr.ac.cn

Awards/Honors

- 2000-2004 Student Scholarship Award in Bohai University, China
- 2007 Excellent graduate student Award in Liaoning University, China
- 2007 Excellent Leader of student union Award in Liaoning University, China
- 2007 Dissertation Award for master graduated student, Liaoning, China
- 2009 Young Teacher’s Award in Jurong high school, Jiangsu, China