Lu Li

Department of Physics, University of Michigan
257 West Hall, 450 Church Street, Ann Arbor, MI 48109 USA
Office: (734)-647-9434 *E-mail:* luli@umich.edu
Webpage: http://research.physics.lsa.umich.edu/Li-Lab/
Google Scholar Page: https://scholar.google.com/citations?user=NtjEJmIAAAAJ&hl=en
Updated in March, 2020

Research Vision

To study novel electronic and magnetic phases in strongly correlated materials, such as high temperature superconductors, quantum magnets, complex oxide interfaces, and topological Kondo insulators. The primary objective is to develop novel experimental methods to probe these materials in extreme conditions. The new tools include high resolution magnetometry, sensitive transport property such as the Nernst effect and the thermal Hall effect, and capacitance spectroscopy.

Education

Princeton University, Princeton, NJ *2008*
Ph.D. in Physics Advisor: Prof. Nai Phuan Ong

University of Science and Technology of China (USTC), Hefei, China *2002*
B.S. in Physics Advisor: Prof. Xianhui Chen

Appointment

University of Michigan, Ann Arbor, MI *2019 - current*
Professor in Department of Physics

University of Michigan, Ann Arbor, MI *2016 - 2019*
Associate Professor in Department of Physics

University of Michigan, Ann Arbor, MI *2011 - 2016*
Assistant Professor in Department of Physics

Massachusetts Institute of Technology, Cambridge, MA *2008 - 2011*
Pappalardo Fellow in Physics *Supervisor: Prof. Raymond Ashoori*

Research Experience

University of Michigan, Ann Arbor, MI *2011 - current*

Massachusetts Institute of Technology, Cambridge, MA *2008 - 2011*
Pappalardo Fellow in Physics *Supervisor: Prof. Raymond Ashoori*

Princeton University, Princeton, NJ *2002 - 2008*
Research Assistant in Prof. Nai Phuan Ong's group

National High Magnetic Field Laboratory , Tallahassee, FL *2004 - present*
User in DC field and pulsed field facilities

University of Science and Technology of China *1999 - 2002*
Undergraduate research in Prof. Xianhui Chen's group

Honors and Awards

- **Winner of the Defense University Research Instrumentation Program**, *2017*

- **OCPA Outstanding Young Researcher Award**, *2015*
- **Office of Naval Research Young Investigator Award**, *2015*
- **Lee Osheroff Richardson North American Science Prize**, Oxford Instruments, *2013*
- **Department of Energy Early Career Award**, *2012 - present*
- **Pappalardo Fellowship**, MIT, *2008 - 2011*
- **First Year Fellowship in Science and Engineering**, Princeton University, *2002 - 2003*
- **First Year Joseph Taylor Merit Prize**, Princeton University, *2002 - 2003*
- **Outstanding Undergraduate Thesis Award**, USTC, *2002*

Teaching Experience

- Physics 420 *Physics for Educators* *Winter 2020*
- Physics 390 *Modern Physics* *Fall 2019*
- Physics 420 *Physics for Educators* *Winter 2019*
- Physics 390 *Modern Physics* *Fall 2018*
- Physics 420 *Physics for Educators* *Winter 2018*
- Physics 390 *Modern Physics* *Fall 2017*
- Physics 391 *Modern Physics Laboratory* *Winter 2017*
- Physics 391 *Modern Physics Laboratory* *Full 2016*
- Physics 520 *Condensed Matter Physics* *Winter 2016*
- Physics 106 *Everyday Physics* *Fall 2015*
- Physics 340 *Waves, Light and Heat* *Winter 2015*
- Physics 341 *Waves, Light and Heat Lab* *Winter 2014*
- Physics 340 *Waves, Light and Heat* *Fall 2013*
- Physics 341 *Waves, Light and Heat Lab* *Winter 2013*
- Physics 106 *Everyday Physics* *Winter 2012*
- Physics 341 *Waves, Light and Heat Lab* *Fall 2011*

Synergistic Activity

- Member of American Physical Society 2002 - present
- Mentor of $>$ 25 undergraduate students in past 5 years
- Mentor of 7 graduate students, 2 visiting graduate students and 3 postdoctoral fellows
- Referees for *Science, Nature Physics, Nature Communications, Science Advances, Scientific Reports, Physical Review Letters, Physical Review B, Physics Review X, Physical Review Applied, Journal of Physics:Condensed Matter*

- Proposal reviewer for Department of Energy
- Reviewer and Panelist for National Science Foundation
- Proposal reviewer for AFOSR
- User Committee of the National High Magnetic Field Laboratory 2016 - 2018
- User representative in the NSF review of the National High Magnetic Field Laboratory 2011
- co-organizer of Conference "Correlated Topological Insulators: SmB_6 and Beyond" 2015
- co-organizer of NSF workshop "Exploring quantum phenomena and quantum matter in ultrahigh magnetic fields " 2017
- Founding member of the department "Condensed Matter Theory" Seminar Series
- Member of Editorial Board of *Science Bulletin* 2017 - current

Group members

Postdoctoral Fellows
Ziji Xiang, Kuan-Wen Chen

Graduate Students
Lu Chen, Guoxin Zheng, Dechen Zhang
Dmitri Mihaliov (co-advising with Prof. Cagliyan Kurdak)

Current and Former Undergraduate Students
Adam Berkley, Tong Gao, Wudi Wang, Sheng Wang, Dou Liu, Timothy Barasa, Alexa Rakoski, Jia Li, Ilya Beskin, Erik Loyd, Eric Larson, Paul Corbae, Ahmed Zaid, Caroline Su, Zhen Su, Hongjie Ning Shangnan Zhou, Dmitri Mihaliov, Donley Cormode, Shibing Zhou, Zijie Yan, Lu He, Dechen Zhang Maxim Sharipov, Marius Kongsoere, Jack Barlow, Bingzheng Han, Carola Jansohn, Andrew Keisling Aric Moilanen, Yusui Li, Cameron Zinn, Kaila Daley, Navpreet Singh, Haozhi Xu, Shriya Sinha

Former Postdoctoral Fellows
Gang Li

Former Graduate Students
Ben Lawson, Fan Yu, Tomoya Asaba, Colin Tinsman

Former Visiting Graduate Students
Ziji Xiang, Peng Cai

Departmental Services

- LSA instrument shop oversight committee *2019 - 2020*
- Faculty Search Committee *2019 - 2020*
- Graduate student admission committee *2019 - 2020*
- Graduate student admission committee *2018 - 2019*
- Organizing department CMT seminar series *2018 - 2020*
- Physics department executive committee *2018 - 2020*
- Graduate student admission committee *2017 - 2018*
- LSA instrument shop oversight committee *2017 - 2018*

- Graduate student admission committee *2016 - 2017*
- LSA instrument shop oversight committee *2016 - 2017*
- Faculty Search Committee *2015 - 2016*
- Organizing department CM/AMO seminar series *2015 - 2016*
- LSA instrument shop oversight committee *2015 - 2016*
- Faculty Search Committee *2014 - 2015*
- Graduate student admission committee *2013 - 2014*
- Organizing department CM/AMO seminar series *2013 - 2014*
- Graduate student admission committee *2012 - 2013*
- LSA instrument shop oversight committee *2012 - 2013*
- Department IT oversight committee *2011 - 2012*

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Invited Talks, Seminars, Colloquia and Public Talks

- *"Quantum Oscillations of Electrical Resistivity in an Insulator"*, FCMP lecture, Columbia 2019
- *"Quantum Oscillations in Resistivity and Magnetization of Kondo Insulators"*, KITP Program: Topological Quantum Matter: Concepts and Realizations, University of California, Santa Barbara , 2019
- *"Quantum Oscillations in Resistivity of Kondo Insulators"*, Quantum matter working group, Los Alamos National Laboratory, 2019
- *"Quantum Oscillations in Resistivity of Kondo Insulators"*, PhuanFest70, Princeton University, 2019
- *"Quantum Oscillations in Resistivity of Kondo Insulators"*, Michigan State University 2019
- *"Quantum Oscillations in Resistivity of Kondo Insulators"*, APS March Meeting, Boston 2019
- *"Quantum Oscillations and New Progress in Kondo Insulators'*, 3rd FQM Workshop on Samarium Hexaboride, University of Maryland, 2019
- *"Colloquium: Quantum Oscillations in Kondo Insulators"*, University of Michigan, 2018
- *"Colloquium: Quantum Oscillations in resistivity of Kondo Insulators"*, Wayne State University, 2018
- *"Quantum Oscillations in Resistivity of Kondo Insulators"*, Workshop on Advances in Non-Fermi Liquids, Lawrence Berkeley National Laboratory 2018
- *"Quantum Oscillation in Kondo insulators SmB6 and YbB12"*, Workshop "New Frontiers of Strongly Correlated Electron Materials",Kavli Institute for Theoretical Sciences, Chinese Academy of Sciences, Beijing, China 2018
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, 12th International Conference on Materials and Mechanism of Superconductivity and High Temperature Superconductors, Beijing, China 2018
- *"Colloquium: Quantum Oscillations in Kondo Insulators"*, University of Tennessee, 2018
- *"Quantum Oscillations in resistivity of Kondo Insulators"*, 2018 International Conference on Magnetism, San Francisco, CA 2018
- *"Quantum Oscillations in resistivity of Kondo Insulators"*, 12th International Conference on Research in High Magnetic Fields , Santa Fe, NM 2018

- *"Quantum Oscillations in resistivity of Kondo Insulators"*, Workshop "Next-Generation Quantum Systems based on Topological Phases and Integrated Quantum Photonics", 2018 APS/CNM User Meeting, Argonne National Lab, 2018
- *"Quantum Oscillations in resistivity of Kondo Insulators"*, 2nd Fudan Workshop on Complex Quantum Material, Fudan University, Shanghai, China 2018
- *"Quantum Oscillations in Kondo Insulators"*, NSF workshop "Exploring quantum phenomena and quantum matter in ultrahigh magnetic fields", 2017
- *"Transport and topology - techniques and a case study on SmB6"*, NSF PARADIM Summer School, Johns Hopkins University, 2017
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, Topological States and Phase Transitions in Strongly Correlated Systems, Kavli Institute for Theoretical Sciences, Chinese Academy of Sciences, Beijing, China 2017
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, International Conference on Strongly Correlated Electronic System, Prague, Czech 2017
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, 3rd Conference on Condensed Matter Physics (CCMP-2017), Shanghai, China 2017
- *"Correlated Topological Materials'*, ONR review workshop, 2017
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Florida State University, 2017
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, APS March Meeting, New Orleans 2017
- *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, Energy Materials Nanotechnology (EMN) West Workshop, Orlando 2017
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Johns Hopkins University, 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, International Conference on Strongly Correlated Electronic System, Hangzhou, China 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Sichuan University, Chengdu, China 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Zhejiang University, Hangzhou, China 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Rutgers University 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, University of California, Berkeley, CA, 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, University of Texas, Austin, TX, 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, 8th International conference on Physical Phenomena at High Magnetic Fields, Tallahassee, FL 2016
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, IAS Program and Croucher Conference on Topological Phases in Condensed Matter and Cold Atomic Systems, Hong Kong University of Science and Technology, 2015
- *"Colloquium: Quantum Oscillations in Kondo Insulator SmB_6"*, Boston College 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Ohio State University 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Washington University, St. Louis 2015
- *"Probing Strongly Correlated Materials with Magnetometry in Ultrahigh Magnetic Field "*, 2015 Experimental Condensed Matter Physics Principal Investigators' Meeting, Department of Energy, Gaithersburg, MD 2015

- *"Two Dimensional Fermi Surfaces in Kondo Insulator SmB_6"*, KITP Program: New Phases and Emergent Phenomena in Correlated Materials with Strong Spin-Orbit Coupling, University of California, Santa Barbara 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, 1st Conference on Condensed Matter Physics (1st-CCMP), Beijing, China 2015
- *"Tutorial on Quantum Oscillations in Strongly Correlated Materials"*, Tsinghua University, 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, 52nd Design Automation Conference, San Francisco CA 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, ICAM-I2CAM: Strongly Correlated Topological Insulators: SmB6 and Beyond, Ann Arbor MI 2015
- *"Electrons and Topology in Solids"*, Saturday Morning Physics, University of Michigan 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, APS March Meeting, San Antonio TX 2015
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Los Alamos National Laboratory 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Massachusetts Institute of Technology 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Texas A & M University 2014
- *"Colloquium: Quantum Oscillations in Kondo Insulator SmB_6"*, Oakland University 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Georgia Institute of Technology 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, University of Wisconsin 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Asia-Pacific Workshop on Strongly Correlated System, Beijing, China 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, European Materials Research Society (E-MRS) meeting, Warsaw, Poland 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, The 21st International Conference on High Magnetic Fields in Semiconductor Physics,Panama City Beach, Florida 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, University of British Columbia, Canada 2014
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, University of Minnesota 2014
- *"Colloquium: Quantum Oscillations in Kondo Insulator SmB_6"*, University of Chicago 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Aspen Center of Physics 2014
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Topological Materials Workshop, Mathematical Sciences Center,Tsinghua University 2013
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, University of Maryland 2013
- *"Quantum Oscillations in Kondo Insulator SmB_6"*, Aspen Center of Physics 2013
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*,Peking University, China 2013
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*,University of Science and Technology of China, China 2013
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Lee Osheroff Richardson Prize Reception Talk, APS March Meeting, Baltimore, MA 2013
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*,University of Notre Dame, 2013

- *"Diamagnetism and pairing in hole-doped high T_c superconductor"*, Energy Materials Nanotechnology (EMN) West Workshop, Houston 2013
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Tsinghua University 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Institute of Advanced Studies (IAS) Asia Pacific Workshop, University of Science and Technology, Hong Kong 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Michigan State University 2012
- *"Colloquium: Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Georgetown University 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, University of Pennsylvania 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Ohio State University 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Aspen Center of Physics 2012
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Princeton University 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, National High Magnetic Field Lab 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, Argonne National Lab 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Indiana University 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, University of Illinois 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, The 19th International Conference on Electronic Properties of Two-Dimensional Systems (EP2DS 19), Tallahassee, FL 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, University of Colorado 2011
- *"Magnetism of $LaAlO_3/SrTiO_3$ heterostructure interfaces"*, Penn State University 2011
- *"Oxide interface: a chance for new electronics"*, Pappalardo Symposium, MIT, Cambridge MA 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, Tulane University, New Orleans, LA 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, University of California, Irvine CA 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, University of Arkansas, Fayetteville AR 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, Stanford University, Stanford CA 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, University of Connecticut, Storrs, CT 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, McGill University, Montreal, Canada 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, Columbia University, New York, NY 2011
- *"Magnetism and electronic compressibility at $LaAlO_3/SrTiO_3$ interfaces"*, University of Michigan, Ann Arbor, MI 2011
- *"Phase transitions of Dirac electrons in Bismuth"*, Physical Phenomena at High Magnetic Fields (PPHMF-VII), Tallahassee, FL 2010

- *"Electronic compressibility and magnetism at $LaAlO_3/SrTiO_3$ interfaces"*, Brookhaven National Laboratory, Upton, NY 2010
- *"Electronic compressibility and magnetism at $LaAlO_3/SrTiO_3$ interfaces"*, Harvard University, Cambridge MA 2010
- *"Phase transitions of Dirac electrons in Bismuth"*, 19th International Conference on the Application of High Magnetic Fields in Semiconductor Physics and Nanotechnology (HMF-19), Fukuoka, Japan 2010
- *"Electronic compressibility and magnetism at $LaAlO_3/SrTiO_3$ interfaces"*, Univ. Tokyo, Japan 2010
- *'Negative electronic compressibility at the $LaAlO_3/SrTiO_3$ interface'"*, 2010 Villa Conference on Complex Oxide Heterostructures, Santorini, Greece 2010
- *"Diamagnetism and pairing in hole-doped high T_c superconductors"*, Boston college, Boston, MA 2010
- *"Electronic compressibility and magnetism at $LaAlO_3/SrTiO_3$ interfaces"*, MIT, Cambridge MA 2010
- *"Torque Magnetometry in high T_c superconductors and Oxide Interfaces"*, Caltech, Pasadena, CA 2010
- *"Nernst effect and diamagnetism in pseudogap state"*, Quantum Vortices and Fluctuations in Superconductors and Superfluids, Aspen Center for Physics, Aspen CO 2009
- *"Diamagnetism and pairing above T_c in hole-doped high T_c superconductors"*, Seminar, National High Magnetic Field Lab, Florida State University, Tallahassee FL 2009
- *"Mystery of high T_c superconductors"*, Pappalardo Symposium, MIT, Cambridge MA 2009
- *"Torque Magnetometry in hole-doped high T_c superconductors"*, Faculty Lunch Meeting, MIT, Cambridge MA 2009
- *"Phase transitions of Dirac electrons in Bismuth"*, APS March Meeting, Pittsburgh PA 2009
- *"Phase transitions of Dirac electrons in Bismuth"*, Staff Meeting, MIT, Cambridge MA 2008

Conference Presentation

- *"Search for evidence of quantum anomalous vortices in Iron-based Topological Superconductor $Fe_{1+y}Te_{1-x}Se_x$ "*, APS March Meeting, Denver 2020
- *"Coexistence of Superconductivity and magnetism at the $LaAlO_3/SrTiO_3$ interface"*, APS March Meeting, Boston MA 2012
- *"Magnetism at the $LaAlO_3/SrTiO_3$ interface"*, APS March Meeting, Dallas TX 2011
- *"'Unusual Nernst effect suggestive of time-reversal violation in the striped cuprate $La_{2-x}Ba_xCuO_4$ "*, APS March Meeting, Dallas TX 2011
- *"Negative electronic compressibility at the $LaAlO_3/SrTiO_3$ interface"*, APS March Meeting, Portland OR 2010
- *"Negative electronic compressibility at the $LaAlO_3/SrTiO_3$ interface"*, Exotic Insulating States of Matter, Johns Hopkins University, Baltimore MD 2010
- *"Phase transitions of Dirac electrons in Bismuth"*, Gordon Conference, Biddeford ME 2008
- *"Unusual diamagnetic response in p-wave superconductors* Sr_2RuO_4 *"*, APS March Meeting, New Orleans LA 2008
- *"The low-temperature vortex liquid in $La_{2-x}Sr_xCuO_4$ and $Bi_2Sr_{2-y}La_yCuO_6$ "*, APS March Meeting, Denver CO 2007

- *"Magnetization curves in underdoped cuprates measured at low T in fields up to 45 Tesla"* , APS March Meeting, Baltimore MD 2006
- *"Fractional-exponent behavior of magnetization near T_c in $Bi_2Sr_2CaCu_2O_8$"*, APS March Meeting, Los Angeles CA 2005

Student Conference Presentations from my group

- Lu Chen, Ziji Xiang, Colin Tinsman, Genda Gu, Lu Li. *"Spontaneous Nernst Effect in an Iron-based Topological Superconductor $Fe_{1+y}Te_{1-x}Se_x$"*, 2020 APS March Meeting, Denver 2020
- Kuan-Wen Chen, Tomoya Asaba, Ziji Xiang, Colin Tinsman, Lu Chen, Jiaqiang Yan, Lu Li. *"Study of the spin orbit coupling metal $Cd_2Re_2O_7$ by torque magnetometry"*, 2020 APS March Meeting, Denver 2020
- Ziji Xiang, Yuichi Kasahara, Lu Chen, Tomoya Asaba, Yuki Sato, Colin Tinsman, Fumitoshi Iga, John Singleton, Yuji Matsuda, Lu Li. *"Field-induced Exotic Metal Phase in Kondo insulator YbB_{12}"*, 2020 APS March Meeting, Denver 2020
- Colin Tinsman, Ziji Xiang, Lu Chen, Dmitri Mihaliov, Sara Haravifard, Lu Li. *"Thermal Transport Study of the Dimerized Quantum Magnet Strontium Copper Borate"*, 2019 APS March Meeting, Boston 2019
- Ziji Xiang, Yuichi Kasahara, Tomoya Asaba, Benjamin Lawson, Colin Tinsman, Lu Chen, Yuki Sato, Fumitoshi Iga, John Singleton, Yuji Matsuda, Lu Li. *"Pulsed field studies of Kondo insulator YbB_{12}"*, 2019 APS March Meeting, Boston 2019
- Lu Chen, Ziji Xiang, Colin Tinsman, Tomoya Asaba, Qing Huang, Haidong Zhou, Lu Li. *"Enhancement of Thermal Conductivity Across the Metal-Insulator Transition in Vanadium Dioxide"*, 2019 APS March Meeting, Boston 2019
- Ziji Xiang, Ben Lawson, Tomoya Asaba, Colin Tinsman, Lu Chen, C Shang, XH Chen, Lu Li. *"Bulk Rotational Symmetry Breaking in Kondo Insulator SmB_6"*, 2018 APS March Meeting, Los Angeles 2018
- Lu Chen, Fan Yu, Ziji Xiang, Colin Tinsman, Tomo Asaba, Benjamin Lawson, Weida Wu, B. L. Kang, Xianhui Chen, and Lu Li. *"Magnetometry with Quartz Tuning Fork"*, 2018 APS March Meeting, Los Angeles 2018
- Colin Tinsman, Ziji Xiang, Dmitri Mihaliov, Tomoya Asaba, Lu Chen, Sara Haravifard, Lu Li. *"Thermal Transport Measurements of a Shastry-Sutherland Magnet with Capacitive Thermometry"*, 2018 APS March Meeting, Los Angeles 2018
- Ziji Xiang, Lu Chen, Tomoya Asaba, Colin Tinsman, Yasuyuki Nakajima, Dariusz Kaczorowski, Madhab Neupane, Lu Li *"Unusual high-frequency quantum oscillations in topological nodal semimetal ZrSiS"*, 2018 APS March Meeting, Los Angeles 2018
- Tomoya Asaba, Ziji Xiang, Colin Tinsman, Jiaqiang Yan, Lu Li *"Quantum Oscillations in a Pyrochlore Superconductor $Cd_2Re_2O_7$"*, 2018 APS March Meeting, Los Angeles 2018
- Tomoya Asaba. *"Rotational Symmetry Breaking in a Trigonal Superconductor Nb-doped Bi_2Se_3"*, (Invited talk) 2018 APS March Meeting, Los Angeles 2018
- Ziji Xiang. *"Bulk Electrical Quantum Oscillation in Kondo Insulator"*, (Invited talk) EMN West Meeting, Las Vegas 2018
- Fan Yu, T Li, R Liu, G Li, Z Xiang, C Tinsman, R Du, and Lu Li. *"Thermoelectric Measurements on InAs/GaSb double Quantum Well"*, 2017 APS March Meeting, New Orleans LA 2017
- Ziji Xiang, Colin Tinsman, Tomoya Asaba, Benjamin Lawson, Gang Li, Fan Yu, Lu Chen, Hongwoo Baek, Chao Shang, Xianhui Chen, and Lu Li. *"Thermoelectric Measurements and Angle-Resolved Magnetic Torque in Kondo Insulator SmB_6"*, 2017 APS March Meeting, New Orleans LA 2017

- Benjamin Lawson, Paul Corbae, Gang Li, Fan Yu, Tomoya Asaba, Colin Tinsman, Y Qiu, JE Medvedeva, YS Hor, and Lu Li. *"Comparison of the Fermi Surfaces of Bi_2Se_3, $Cu_xBi_2Se_3$, and $Nb_xBi_2Se_3$"*, 2017 APS March Meeting, New Orleans LA 2017
- Lu Chen, Fan Yu, Ziji Xiang, Colin Tinsman, Tomo Asaba, Benjamin Lawson, Weida Wu, and Lu Li. *"Magnetometry with Quartz Tuning Fork"*, 2017 APS March Meeting, New Orleans LA 2017
- Colin Tinsman, Ziji Xiang, Gang Li, Fan Yu, Tomoya Asaba, Benjamin Lawson, Lu Chen, and Lu Li. *"Measuring the Thermal Hall Effect with Oxygen-18 Annealed Strontium Titanate Capacitive Thermometry"*, 2017 APS March Meeting, New Orleans LA 2017
- Tomoya Asaba, B.?J. Lawson, Colin Tinsman, Lu Chen, Paul Corbae, Gang Li, Y. Qiu, Y.?S. Hor, L. Fu,, and Lu Li. *"Rotational symmetry breaking in a trigonal superconductor Nb-doped Bi_2Se_3"*, 2017 APS March Meeting, New Orleans LA 2017
- Tomoya Asaba, Saturday Morning Physics, University of Michigan, 2017
- T. Asaba, G. Li, P. Wittlich, J. Mannhart, and Lu Li *"Electric field effect on magneto-thermopower in oxide interface $LaAlO_3/SrTiO_3$"*, APS March Meeting, Baltimore MD 2016
- G. Li, T. Asaba, C. Tinsman, F. Yu, B. Lawson, Y. Chen, and Lu Li *"Magnetic torque study of Weyl semimetal compounds TaP and NbP up to 45 Tesla"*, APS March Meeting, Baltimore MD 2016
- P. Corbae, B. Lawson, G. Li, F. Yu, T. Asaba, C. Tinsman, Y Qui, YS Hor, and Lu Li *"Magnetic Ordering In Superconducting Nb-doped Bi_2Se_3"*, APS March Meeting, Baltimore MD 2016
- C. Tinsman, G. Li, F. Yu, T. Asaba, B. Lawson, C. Su, and Lu Li *"Observation of the Thermal Hall Effect Using Capacitive Thermometers in Bismuth"*, APS March Meeting, Baltimore MD 2016
- B. Lawson, P. Corbae, G. Li, F. Yu, T. Asaba, C. Tinsman, Y. Qiu, YS Hor, and Lu Li, *"Multi-orbits observed in superconducting Nb-doped Bi_2Se_3"*, APS March Meeting, Baltimore MD 2016
- Gang Li, Colin Tinsman, Benjamin Lawson, Fan Yu, Tomoya Asaba, Xiangfeng Wang, Johnpierre Paglione and Lu Li, *"Quantum oscillations in magnetically doped SmB_6"*, APS March Meeting, San Antonio TX 2015
- Colin Tinsman, Gang Li, Benjamin Lawson, Fan Yu, Tomoya Asaba, Xiangfeng Wang, Johnpierre Paglione and Lu Li, *"Torque magnetometry study of Fe and Ni doped SmB_6"*, APS March Meeting, San Antonio TX 2015
- Benjamin Lawson, Gang Li, Colin Tinsman, Fan Yu, Tomoya Asaba, Xiangfeng Wang, Johnpierre Paglione and Lu Li, *"High field magnetization of Half-Heusler compound LuPdBi'*, APS March Meeting, San Antonio TX 2015
- Tomoya Asaba, Fan Yu, Gang Li, Benjamin Lawson, Colin Tinsman, Jochen Mannhart and Lu Li, *"Electric field control of thermoelectric effect in oxide interface $LaAlO_3/SrTiO_3$"*, APS March Meeting, San Antonio TX 2015
- F. Yu, G. Li, T. Asaba, B. Lawson, P. Kai, C. Tinsman, M. Hirschberger, J. Singleton, T. Lowe, B. Keimer, N. P. Ong and Lu Li, *"Measurement of diamagnetic signal on UD YBCO"*, APS March Meeting, Denver CO 2014
- G. Li, Z. Xiang, F. Yu, T. Asaba, B. Lawson, P. Kai, C. Tinsman, A. Berkeley, S. Wolgast, Y. S. Eo, D. J. Kim, C. Kurdak, K. Sun, J. W. Allen, X. H. Chen, Y. Y. Wang, Z. Fisk, and Lu Li, *"Two dimensional Fermi surfaces in Kondo insulator SmB_6"*, APS March Meeting, Denver CO 2014
- C. Tinsman, G. Li, Z. Xiang, F. Yu, T. Asaba, B. Lawson, P. Kai, A. Berkeley, S. Wolgast, Y. S. Eo, D. J. Kim, C. Kurdak, K. Sun, J. W. Allen, X. H. Chen, Y. Y. Wang, Z. Fisk, and Lu Li, *"High Field Torque Magnetometry of SmB_6"*, APS March Meeting, Denver CO 2014
- B. J. Lawson, G. Li, T. Asaba, F. Yu, Z. Xiang, C. Tinsman, Y. S. Hor, and Lu Li *"Quantum oscillations in $Cu_xBi_2Se_3$" intense magnetic field"*, APS March Meeting, Denver CO 2014

- Lu Li, T. Asaba, T. Han, B. J. Lawson, F. Yu, C. Tinsman, G. Li, and Y. S. Lee *"Magnetic Field Driven Phase Transitions in S = Kagome Lattice Antiferromagnet $ZnCu_3(OH)_6Cl_2$"*, APS March Meeting, Denver CO 2014

- T. Asaba, G. Li, B. J. Lawson, F. Yu, Z. Xiang, C. Tinsman, H. Hwang, J. Mannhart, and Lu Li *"Magnetic ordering temperatures at oxide interface $LaAlO_3/SrTiO_3$"*, APS March Meeting, Denver CO 2014

- B. J. Lawson, Y. S. Hor, and Lu Li *"Quantum oscillations in topological superconductor candidate $Cu_xBi_2Se_3$"*, Autumn School on Correlated Electrons: Emergent Phenomena in Correlated Matter, Germany

- T. Asaba, G. Li, B. J. Lawson, F. Yu, Z. Xiang, P. Cai, C. Tinsman, T. Han, Y. S. Lee, and Lu Li *"High field magnetic studies of Herbertsmithite $ZnCu_3(OH)_6Cl_2$"*, Autumn School on Correlated Electrons: Emergent Phenomena in Correlated Matter, Germany

- B. J. Lawson, G. Li, Y. S. Hor, and Lu Li *"Quantum oscillations in topological superconductor candidate $Cu_xBi_2Se_3$"*, APS March Meeting, Baltimore MD 2013

- T. Asaba, G. Li, B. J. Lawson, F. Yu, Z. Xiang, P. Cai, C. Tinsman, T. Han, Y. S. Lee, and Lu Li *"High field magnetic studies of S=1/2 Kagome lattice single crystalline Herbertsmithite"*, APS March Meeting, Baltimore MD 2013

Publications

4700+ citation, H-index = 25
δ marks the postdoctoral fellow and visiting students I advised.
$*$ marks the graduate students I advised.
$**$ marks the undergraduate students I advised.

Papers in preprint

- Jie Ma, Jianshu Li, Yong Hao Gao, Changle Liu, y Qingyong Ren, Zheng Zhang, Zhe Wang, Rui Chen, Jan Embs, Erxi Feng, Fengfeng Zhu, Qing Huang, Ziji Xiang, Lu Chen, E. S. Choi, Zhe Qu, Lu Li, Junfeng Wang, Haidong Zhou, Yixi Su, Xiaoqun Wang, Qingming Zhang, Gang Chen. *Spin-orbit-coupled triangular-lattice spin liquid in rare-earth chalcogenides*, arXiv preprint arXiv:2002.09224 (2020).

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- X. Rao, G. Hussain, Q. Huang, N. Li, W. J. Chu, X. Zhao, Z. Dun, E. S. Choi, T. Asaba*, L. Chen*, **Lu Li**, Y. H. Gao, J. Zhao, G. Chen, H. D. Zhou, and X. F. Sun. "*Quantum spin liquid with weak spin freezing in $YbMgGaO_4$*", Physical Review Letters, *under review*

- **Lu Li**, Kai Sun, Cagliyan Kurdak, and J. W. Allen. "*Emergent Mystery in Kondo Insulator Samarium Hexaboride*", Nature Reviews Physics, *under review*

- Lu Chen*, Ziji Xiang$^\delta$, Colin Tinsman*, G. D. Gu, and **Lu Li**. "*Spontaneous Nernst Effect in an Iron-based Superconductor $Fe_{1+y}Te_{1-x}Se_x$*", Physical Review X, *under review*

Journal Publication

1. P. Wittlich, H. Boschker, T. Asaba*, **Lu L**i, H. M. L. Noad, C. A. Watson, K. A. Moler, D. Daraselia, D. Japaridze, A. Shengelaya, J. Wang, J. Xia, and J. Mannhart. "*Exploring possible ferromagnetism of the $LaAlO_3/SrTiO_3$ interface*", Physical Review Materials, **3**, 104418 (2019)

2. Y. Sato, Z. Xiang$^{\delta}$, Y. Kasahara, T. Tanigguchi, S. Kasahara, Lu Chen*, Tomoya Asaba*, Colin Tinsman*, O. Tanaka, Y. Mizukami, T. Shibauchi, F. Iga, J. Singleton, **Lu Li**, Y. Matsuda. "*Unconventional thermal metallic state of charge-neutral fermions in an insulator*", Nature Physics, **15**, 954 (2019)

3. Lu Chen*, Z. Xiang$^{\delta}$, Colin Tinsman*, Q. Huang, K. Reynolds, Haidong Zhou, **Lu Li**. "*Anomalous Thermal Conductivity at the Structural Transition in a Spin-Phonon Coupled System*", Applied Physics Letters, **114**, 251904 (2019)

4. H. Boschker, T Harada, T Asaba*, R Ashoori, AV Boris, H Hilgenkamp, ME Holtz, CR Hughes, **Lu Li**, DA Muller, H. Nair, P. Peith, X Renshaw Wang, DG Schlom, A Soukiassian, J Mannhart, *Ferromagnetism and conductivity in atomically thin $SrRuO_3$*, Physical Review X, **9**, 011027 (2019)

5. $\star$ Z. Xiang$^{\delta}$, Y. Kasahara, Tomoya Asaba*, B. J. Lawson*, Colin Tinsman*, Lu Chen*, G. Li$^{\delta}$, S. Yao, Y. L. Chen, F. Iga, John Singleton, Y. Matsuda, **Lu Li**. "*Quantum Oscillations of Electrical Resistivity in an Insulator*", Science, **362**, 65 (2018)

6. Tomoya Asaba*, Z. Xiang$^{\delta}$, T. H. Kim, M. S. Rzchowski, C. B. Eom, **Lu Li**. "*Unconventional Ferromagnetism in epitaxial (111) $LaNiO_3$*", Physical Review B, **98**, 121105(R) (2018)

7. Lu Chen*, Z. Xiang$^{\delta}$, C. Tinsman*, T. Asaba*, Q. Huang, H. Zhou, **Lu Li**. "*Enhancement of thermal conductivity across the metal-insulator transition in vanadium dioxide*", Applied Physics Letters, **113**, 061902 (2018)

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19. **Lu Li**. Y. Wang, and N. P. Ong *"Reply to 'Comment on Diamagnetism and Cooper pairing above T_c in cuprates' "* Physical Review B, **87**, 056502 (2013)

20. B. J. Lawson*, Y. S. Hor, and **Lu Li** *"Quantum oscillations in topological superconductor candidate $Cu_{0.25}Bi_2Se_3$"* Physical Review Letters, **109**, 226406 (2012)

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1. **Lu Li**, Y. Wang, J.G. Checkelsky, M.J. Naughton, S. Komiya, S. Ono, Y. Ando, and N.P. Ong *"Depairing field, onset temperature and the nature of the transition in cuprates"*, Physica C, **460**, 48-51 (2007)

2. **Lu Li**, Y. Wang, M. J. Naughton, S. Koyima, S. Ono, Y. Ando and N. P. Ong *"Magnetization, Nernst effect and vorticity in the cuprates"*, Journal of Magnetism and Magnetic Materials, **310**, 460-466 (2007)

3. M. L. Foo, T. Klimczuk, **Lu Li**, N. P. Ong, R. J. Cava, Q. Huang, J. W. Lynn, and H. W. Zandbergen *"Synthesis of three layer Na_xCoO_2 (x=0.3, 0.5, 0.6, 0.75, 1.0) and superconductivity in three layer $Na_{0.3}CoO_2 \cdot 1.3H_2O$"*, Solid-State Chemistry of Inorganic Materials V, **848**, 275 (2005)

News and Views

1. **Lu Li** *"Superconductivity on a Charge Diet"*, Physics, **6**, 45 (2013)

2. **Lu Li** *"Probe for electronic dimensionality"*, Nature Physics, **6**, 7 (2010)

Research Support

Federal grants

- Department of Energy, Early Career Award Grant No. [DE-SC0008110] $750,000
  "Probing High Temperature Superconductors with Magnetometry in Ultrahigh Magnetic Fields"
  Principal Investigator 2012 - 2017

- National Science Foundation Grant No. [ECCS-1307744] $360,000
  "Nanofabrication, Characterization, and Analysis of Topological Insulator Nanostructures"
  Principal Investigator 2013 - 2016

- National Science Foundation Grant No. [DMR-1428226] $474,642
  "MRI: Acquisition of Cryogen-Free High Magnetic Field Physical Property Measurement System"
  Principal Investigator 2014 - 2017

- Office of Naval Research, Young Investigator Award Grant No. [N00014-15-1-2382] $510,000
  "Correlated Topological Materials"
  Principal Investigator 2015 - 2018

- National Science Foundation CEMRI for Photonics and Multiscale Nanomaterials $60,000
  "Seed: Quantum Transport in Epitaxially Grown Transition Metal Dichalcogenides"
  Principal Investigator 2016 - 2017

- Office of Naval Research Grant No. [N00014-17-1-2357] $298,941
  "DURIP: Development of Magnetometry Detecting Spin Textures in Topological Materials"
  Principal Investigator 2017 - 2019

- National Science Foundation Grant No. [DMR-1707620] $360,000
  "Search for Novel Electronic State in Strongly Correlated Kondo Insulators"
  Principal Investigator 2017 - 2020

- National Science Foundation Grant No. [DMR-1707620] $59,998
  "AGEP-GRS Supplement for Search for Novel Electronic State in Strongly Correlated Kondo Insulators"
  Principal Investigator 2019 - 2020

- Department of Energy Grant No. [DE-SC0020184] $510,000
  "Magnetometry Studies of Quantum Correlated Topological Materials in Intense Magnetic Fields"
  Principal Investigator 2019 - 2022

Internal grants

- University of Michigan Mcubed project
  "Topological insulator, nano transistors for post-CMOS era" $60,000
  Principal Investigator 2013 - 2015

- University of Michigan Mcubed project
  "Different geometry in complex systems" $60,000
  co-Principal Investigator 2016 - 2018

- University of Michigan Mcubed project
  "Charge and Spin Transport in Strongly Correlated Low Dimensional Quantum Heterostructures" $60,000
  co-Principal Investigator 2019- current