(Updated to July 2022)

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Education

Institution and Location	Degree	Year	Field of Study
Iowa State University/Ames Lab, Ames, IA	Ph. D	1991	Physics
University of Science & Technology of China (USTC), Hefei, China	BSc	1986	Physics (CUSPEA Program -T. D. Lee)

Employment History

2020 – SUNY Empire Innovation Professor, Department of Physics and Astronomy, Stony Brook University

2009 – Group leader, Advanced Energy Materials Group, Condensed Matter Physics and Materials Sciences Division (CMPMSD), Brookhaven National Laboratory (BNL)

1998 – Physicist (with tenure), CMPMSD, BNL

1995 – 98 Associate Scientist, Materials Sciences Division, BNL

1993 – 95 Assistant Scientist, Materials Sciences Division, BNL

1991 – 93 Postdoc Research Associate: Materials Sciences Division, BNL

Professional Experience (Last ten years, 2012 - Date)

1. **Principle Investigator (2018 – present, $1.3M/year):** Managing "Chiral Materials and Unconventional Superconductivity" program, funded by US DOE Office of Basic Energy Science. This is the core basic science program in the Advanced Energy Materials Group. The scope of this program is to study the charge transport in topological chiral materials and superconductors.

2. **Co-Principle Investigator (2020 – present, $20M/year):** Sub-thrust leader (2020-2021) on correlating materials and device applications for C2QA (Co-design Center for Quantum Advantage - one of the five National Quantum Information Science (QIS) Research Centers at BNL). C2QA is working toward quantum advantage in computations for high-energy and nuclear physics, chemistry, materials science, condensed matter physics, and other fields.

3. **Co-Principle Investigator and BNL Task Leader (2017 – present, $165K/year):** Working with AMSC and managing BNL's tasks in a DOE project, titled "Enhanced

2G HTS wires for electric machine applications" funded by US DOE EERE. This project aims at the development of an innovative Second Generation (2G) high temperature superconducting (HTS) wire combining an extremely uniform point-defect flux pinning microstructure produced by a reel-to-reel (R2R) irradiation process along with a novel wire architecture, resulting in minimal additional manufacturing cost, but leading to a substantial reduction in the wire cost in terms of $/kAm. The total project is funded at level of $4.0M for three years.

4. **Principle Investigator (2005 – 2018, $714K - 790K/year):** Managing "Superconducting Materials" program, funded by US DOE Office of Basic Energy Science. This was the core basic science program in the Advanced Energy Materials Group. The scope of this program is to study the basic relationships between nanostructures and the macroscopic properties of superconductors.

5. **Principle Investigator (2015 – 2018, $200K/year):** Managing "Chiral magnetic effect: from quark gluon plasma in RHIC to NSLS II" a BNL internal program. This Laboratory Directed Research and Development (LDRD) program explores the chiral magnetic effect in the heavy ion collision at RHIC (Relativistic Heavy Ion Collider) and to shape future directions of photon sciences through the design of challenging experiments for National Synchrotron Light Sources II (NSLS II) on the response of the chiral anomaly to optical stimulations by synchrotron X-rays.

6. **Principle Investigator (2010 – 2018, $50K/year):** Managing CRADA (Corporative Research and Development Agreement) program between BNL and NYSERDA (New York State Energy Research and Development Authority) for DOE's Energy Frontier Research Center (EFRC) at BNL, "Center for Emergent Superconductivity (CES)". The scope of work is to facilitate the transition of science discovery in superconductors at CES to energy application.

7. **Associated Principle Investigator (2010 – 2017, $147K/year):** Responsible for research at BNL on critical current in superconducting materials, a research area of DOE's Energy Frontier Research Center (EFRC) at BNL, "Center for Emergent Superconductivity (CES)", funded by US DOE Office of Basic Energy Science at ($4.0 - 5.0M/year). The managed effort is funded at $147K/year.

8. **Principle Investigator and Overall Project Manager (FY2011 – 2016, $3.06M)** Managing a DOE project "Superconducting wires for direct- drive wind power generators" funded by the US DOE ARPA-E (total funding $3.06M, in which $1.15M for BNL).

   Press Release: "Next generation superconducting wires for 10MW+ direct drive wind power generator" https://www.bnl.gov/newsroom/news.php?a=24697

9. **Co-Principle Investigator and BNL Task Leader (2010 – 2015, $2.85M)** Develop the concept and managing the project, with lead institute ABB, titled "Superconducting Magnet Energy Storage (SMES) System with Direct Power Electronics Interface" funded by the US DOE ARPA-E (total funding $6.35M, in which $2.85M for BNL)

   Press Release: "Grant Funds Superconducting Magnet Energy Storage Research at Brookhaven Lab" https://www.bnl.gov/newsroom/news.php?a=111174

10. **Co-Principle Investigator and BNL Task Leader (2013-2015, $560K):** Working with General Motors, LLC Warren, and managing BNL's task in a DOE project "Development of a thermoelectric generator (TEG) system to convert waste heat to electric power, with the control systems necessary to utilize that power in a vehicle." (total funding $8.2M, in which $560K for BNL)
11. **Principle Investigator (2011 – 2014, $60K):** "Numerical Model of A Small Scale Superconducting Energy Storage System for Air and Space Applications" Memorandum of Agreement between The Air Force Research Laboratory Propulsion Directorate and Brookhaven National Laboratory
12. **Co-Principle Investigator (2011-2013, $100K/year)** Responsible for a part of NSF/DOE program as an adjunct professor in the Materials Science and Engineering Department of Stony Brook University. This grant was an NSF/DOE Thermoelectrics Partnership award for "Thermoelectric Generators for Vehicular Applications"

Research Experience and Significant Expertise

Basic Science Research – Quantum information science, structure and property relationship in quantum topological materials, correlated electronic materials, superconductors, and thermoelectric materials

- Topological states and quantum phase transition
- Conventional and unconventional superconductivity
- Josephson junctions and superconducting qubits
- Topology enabled quantum information and chiral qubits
- Single crystal growth, and thin film growth by laser MBE, PLD, and CVD
- Synchrotron based crystalline structure, electronic property, and defect characterization
- High field transport property, thermodynamic property and magnetic property characterizations
- Nano-structure fabrications
- Radiation effect

Applied Research – mainly in superconductors and thermoelectrics

- Roll-to-roll process of superconducting tapes
- Roll-to-roll irradiation of superconducting wires/tapes.
- Fabrication of superconducting wires by metallurgical process
- Superconducting devices, including magnets and superconducting switches.
- Thermoelectric devices for cooling and heating

Honors/Award of Excellence

1) 2019 Brookhaven Science and Technology Award
2) R&D 100 Award for aFCL (active Superconducting Fault Current Limiter) (2015)

3) Fellow of American Physical Society (2013)

4) "New York State Leader in Superconductivity" for making important contributions to the research, development and commercialization of superconductivity in New York State, the New York State Superconductor Technology Summit (2011 Schnectady, NY)

5) Award for *Significant implication for DOE Energy-Related Technologies* (Nov.1991) The first place in Solid State Physics Category in the Department of Energy's 1991 Materials Sciences Research Competition for the research entitled "Superconducting Vortex Microscopy". This award was given to Douglas Finnemore based on the Ph.D thesis works of Q, Li and others

6) G. W. Fox Memorial Award (May 1991)

   Department of Physics and Astronomy, Iowa State University, Basis of this award is excellence in graduate research. (one acceptance per year, Iowa State Univ.)

Professional Services (Last 8 years)

Member/Reviewer of proposals, program reviewer panel, or advisor board

- DOE Office of Science - Basic Energy Science (BES) core programs, EFRC, and Earlier Career, EPSCoR
- DOE EERE – Advanced Manufacturing Office, Vehicle Technology Office
- DOE ARPA-E – more than 8 programs
- NSF – Materials Engineering and Processing Div., Materials Physics Div.
- DoD DARPA – Thermoelectrics program, High temperature superconductivity, Matrix program
- DoD AFRL – Energy/Power/Thermal division, including the development of Superconducting Energy Storage System for Air and Space Applications
- DoD ARL – Sensors and Electron Devices Directorate and Electrical Equipment, Appliance, and Component Manufacturing division (including the development of concept of Superconducting magnetic energy system for Army's tactical micro-grid)
- DoD NRL – DTEC Program (Direct energy conversion)
- Canada Foundation for Innovation
- Foundation for Scientific Research Belgium
- *New York State Superconductor Technology Summit*, Westchester Community College in Valhalla, NY, Nov. 12 2010

  Press Release: "Brookhaven Lab Materials Scientist Participates in Statewide Superconductivity Summit

  https://www.bnl.gov/newsroom/news.php?a=22143
- The third *New York State Superconductor Technology Summit*, Albany, NY, Nov. 12 2013
- Others

Reviewer for Science, Nature journals, Phys. Rev. journals, etc

Lead organizer for MRS and E-MRS (last ten years)

- Co-organizer of 2022 Spring Materials Research Society (MRS) symposium "Superconducting Materials and Applications" Honolulu, May 2022
- Lead organizer of 2021 Spring Materials Research Society (MRS) symposium "Superconducting Materials and Applications" Seattle, April 2021
- Principle organizer "Symposium - Recent Developments in Thermoelectric Materials and Applications" 2019 E-MRS Spring Meeting, Nice, France
- Lead organizer "Symposium AAA Superconducting Materials – From Basic Science to Deployment" 2013 MRS Spring Meeting, San Francisco
- Lead organizer "Symposium BB thermoelectric Materials – From Basic Science to Applications" 2013 MRS Fall Meeting, Boston

*Plenary, Keynote, and Invited Presentations at International/National Conference/Workshops (*canceled due to COVID-19)*

1) **Invited Speaker**: "Topological states in iron-chalcogenide superconductors for Quantum Computing" *MRS Spring Conference*, Honolulu, May 11, 2022
2) **Invited Plenary Speaker:** "Dynamics of chiral fermions in condensed matter systems" at *Nobel Symposium on "Chiral Matters"* Stockholm, Sweden, June 28 – July 2, 2021
3) **Invited Plenary Speaker:** "Quantum computing with chiral fermions" at International Quantum Summer Summit, Stony Brook, August 13, 2021
4) ***Invited Speaker**: "Topological phases in thermoelectric materials" *International Conference on Thermoelectrics*, Seattle, June 28 – July 2, 2021
5) **Invited Speaker**: "Effect of ion irradiation on cuprate and iron-based superconductors" *Joint 23rd Cryogenic Engineering Conference and International Cryogenic Materials Conference*, June 17, 2021
6) **Invited Speaker**: "Topological states and transport properties in iron chalcogenide superconductors" virtual *MRS Spring Conference*, April 18, 2021
7) **Invited Speaker**: "The chiral qubit: quantum computing with chiral anomaly" virtual *MRS Spring Conference*, Phoenix, AZ April. 13-17, 2020
8) ***Invited Speaker**: "Iron-chalcogenide superconductors: from power applications to quantum computing" 7th "International Conference on Superconductivity and Magnetism"- ICSM2020, Bodrum- Turkey, April 19 - 25, 2020.
9) ***Invited Speaker**: "The chiral qubit: quantum computing with chiral anomaly" *American Physical Society March Meeting* Denver, CO, March 2-6, 2020
10) **Invited Speaker**: "Chiral Matters: from Quark-Gluon Plasma to Quantum Computing" *The 3rd Workshop on Functional Materials Science*, Sapporo, Japan, Dec. 18-20, 2019

11) **Invited Speaker**: "Effect of ion irradiation on cuprate and iron-based superconductors" *Materials Research Meeting 2019, Yokohama, Dec. 10-14, 2019*

12) **Invited Speaker**: "Chiral materials and their thermoelectric properties" *PACRIM13 the 13th Pacific Rim Conference of Ceramic Society*, Okinawa, Japan, Oct. 27 - Nov. 1, 2019

13) **Invited Speaker**: "Electronic materials and states for the next generation quantum information technology" *Quantum Workshop: Distributed Quantum Systems Enhanced by Materials Design*, Buffalo, NY, Oct. 21-23, 2019

14) **Invited Speaker**: "Chiral fermion transport and their thermoelectric properties" *MRS Spring Conference*, Phoenix, AZ April. 22-26, 2019

15) **Invited Speaker**: "Chiral Fermion Transport and Terahertz Spectroscopy" *Weyl Metals and Transport Workshop,* the Instituto de Física Teórica, IFT-UAM/CSIC, Madrid, Spain, Feb. 11 – Feb. 15, 2019

16) **Invited Speaker**: "Chiral Fermion Transport and Coherent Terahertz Emission" *Plasma 2019 Workshop,* Orlando, FL, USA. January 18-21, 2019

17) **Invited Speaker**: "An Experimental Overview on Chiral Fermion Transport in Condensed Matters" *Workshop on Open Problems and Opportunities in Chiral Fluids,* Santa Fe NM, July. 7-9, 2018

18) **Invited Speaker**: "Thermoelectric Properties in Dirac/Weyl Semimetals" *8th Forum on New Materials and 14th International Conference on Modern Materials and Technologies (CIMTEC 2018),* Perugia, Italy, June 10 to 14, 2018.

19) **Invited Speaker**: "A route for simultaneous increase of T_c and J_c in iron-based superconductors by low-energy proton irradiation" *6th International Conference on Superconductivity and Magnetism (ICSM2018)*, Antalya, Turkey, April 29 – May 4, 2018

20) **Invited Speaker**: "Thermoelectric Properties in Dirac/Weyl Semimetals" *MRS Spring Conference*, Phoenix, AZ April. 2-6, 2018

21) **Invited Speaker**: "Enhanced critical current and critical temperature in cuprate and iron based superconductors by practical ion irradiation process" *MRS Spring Conference*, Phoenix, AZ April. 2-6, 2018

22) **<u>Invited Keynote Speaker</u>**: "Thermoelectric Properties in Dirac Semimetals" *International Union of Materials Research Societies Conference, IUMRS-ICAM*, Kyoto Aug. 27 – Sept. 1 2017

23) **Invited Speaker:** "Chiral Materials and Thermoelectrics" *12th Pacific Rim Conference on Ceramic and Glass Technology including Glass & Optical Materials Division Meeting*, Waikoloa, Hawaii, May 21 - 27, 2017

24) **Invited Speaker:** "Chiral Magnetic Effect in Condensed Matter – A New Route for Non-Dissipative Charge Transport at Room Temperature" *2nd International Workshop SUPERHYDRIDES, Towards Room Temperature Superconductivity: Hydrides and More,* Orange, California, May 8-9 2017

25) **Invited Speaker:** "Chiral Magnetic Effect in Condensed Matters" *American Physical Society March Meeting* New Orleans, LA, March 13-17, 2017

26) **Invited Speaker:** "Discovery of Chiral Magnetic Effect in Condensed Matter" *International workshop on Chiral Matter -from quarks to Dirac semimetals*, Wako, Saitama, Japan December 5-8, 2016.

27) **Invited Plenary Speaker** "Application Driven Superconducting Wires Development and Future Prospects in US" *1st Asian ICMC-CSSJ 50th Anniversary Conference: The First International Cryogenic Materials Conference (ICMC) in Asia, and joint conference on 50-years celebration of the Cryogenics and Superconductivity Society of Japan (CSSJ).* Kanazawa, Japan, Nov. 7-10, 2016.

28) **Invited Speaker** "Chiral Magnetic Effect in Condensed Matters" *The Division of Nuclear Physics (DNP) Fall meeting in the American Physical Society* Vancouver, BC Oct. 12-15 2016.

29) **Invited Speaker**: "Chiral Magnetic Effect in Condensed Matters" *XII Quark Confinement and the Hadron Spectrum*, Thessaloniki, Greece Aug. 29 – Sept. 3 2016.

30) **Invited Speaker**: "Transport Properties of Thermoelectric Materials near Quantum Critical Point (Dirac Semimetals)" *35th International Conference on Thermoelectrics (ICT/ACT 2016)* Wuhan, China May 29 - June 2, 2016.

31) **Invited Speaker**: "Dirac semimetals and thermoelectric materials" *International Workshop on Thermoelectric Materials* Shanghai, China, May 27-28, 2016

32) **Invited Speaker**: "Ion irradiation effect on iron chalcogenide superconductors" *5th International Conference on Superconductivity and Magnetism (ICSM2016)*, Fethiye, Turkey, April 24 - 30, 2016

33) **Invited Speaker**: "Doubling in-field critical current in HTS coated conductors by a roll-to-roll ion irradiation process" *2016 MRS Spring Meeting & Exhibit*, Phoenix, Arizona, March 28 - April 1, 2016

34) **Invited Speaker**: "Doubling in-field J_c in HTS coated conductors by a roll-to-roll ion irradiation process" *ACS Electronic Materials and Applications* 2016, Orlando, FL, Jan. 20-22 2016

35) **Invited Speaker**: "A Journey from Thermoelectrics to Dirac Semimetals" *International Conference on Thermoelectric Materials Science* (TMS2015), Nagoya University, Japan, November 9-11 2015

36) **Invited Speaker**: "Thermoelectrics, Superconductors, and Dirac Semimetals in Chalcogenides and Pnictides" *14th International Union of Materials Research Societies-International Conference on Advanced Materials (IUMRS-ICAM 2015)*, Jeju, Korea, October 25 -29, 2015

37) **Invited Keynote Speaker:** "Chiral Magnetic Effect in Condensed Matter Systems" *Quark Matter 2015, XXV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions*, Kobe, Japan, September 27 - October 3, 2015

38) **Invited Speaker:** "Atomic Displacement and Electronic Structure in the Charge-Compensated Filled Skutterudites" *International Conference on Thermoelectrics*, Dresden, Germany, June 28 – July 2, 2015

39) **Invited Speaker:** "Direct Measurements of Atomic Displacement in Thermoelectric Materials" - *11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications*, Vancouver, Canada, June 14 – 19, 2015

40) **Invited Speaker:** "Jc enhancement in 2G coated conductors by ion irradiation" *International Workshop on Coated Conductors for Applications (CCA)* 2014 Jeju, South Korea, Nov. 30 - Dec. 3 2014

41) **Invited Keynote Speaker:** "Understanding the Fundamental Science of Thermoelectric Materials – A Physicist's Perspective" *6th Chinese Thermoelectric Conference*, Nanchang, China, Oct. 12-14 2104

42) **Invited Keynote Speaker:** "Recent progress on the RE-123 based SMES and Wind Turbine Projects in the United States" *The 15th IUMRS-International Conference in Asia (IUMRS-ICA 2014)* Fukuoka, Japan Aug. 24 – 30 2014.

43) **Invited Speaker:** "Copper Selenides – Structures and Thermoelectric Properties" *The 15th IUMRS-International Conference in Asia (IUMRS-ICA 2014)* Fukuoka, Japan Aug. 24 – 30 2014.

44) **Invited Speaker:** "Superconductivity and Critical Current of Iron-Based Superconductors in High Field" *2014 APS March meeting*, Denver March 3-7 2014

45) **Invited Speaker:** "Iorn-based superconducting films" *MRS Spring Conference*, San Francisco, CA, April. 21-25, 2014

46) **Invited Speaker:** "Pushing the Tc-Jc-Hc2 Boundaries of Iron-Chalcogenide Superconductors" *EMA 2014 meeting (Electronic Materials and Applications, American Ceramic Society)*, Orlando Florida, Jan. 22-24, 2014

47) **Invited Speaker:** "Superconductivity, Critical Current, and Nano-scaled Structural Defects in Iron-Based Superconductors" *MRS Fall Conference*, Boston, MA, Dec. 1-6, 2013

48) **Invited Speaker:** "Scalable, Non-equilibrium Processing of Thermoelectric Materials and Their Properties" *11th European Thermoelectric Conference*, ESA/ESTEC Noordwijk, The Netherlands November 18-20 (2013)

49) **Invited Speaker:** "Copper selenides – structural phase transition and thermoelectric properties" *TEP-CH 2013International workshop: Synthesis and Function of Thermoelectric Materials*, Dübendorf, Switzerland, September 16-19, 2013

50) **Invited Speaker:** "Development of SMES for large-scale energy management" *16th US-Japan Workshop on Advanced Superconductors,* Dayton, Ohio, July 9-12, 2013

51) **Invited Speaker:** "Pushing the Tc-Jc-Hc2 Boundaries of Iron-Chalcogenide Superconductors" *14th International Workshop on Vortex Matter in Superconductors*, Nanjing, China, May 21 -28, 2013

52) **Invited Speaker:** "Superconductivity: Rising to The energy Challenges" *superconductivity symposium at the EMA 2013 meeting* (Electronic Materials and Applications, ACS) Orlando Florida, January 23-25, 2013

53) **Invited Speaker:** "Review of ARPA-E Superconductor Application Projects" *25th International Symposium on Superconductivity (ISS2012),* Tokyo, Japan, Dec. 3-5, 2012

54) **Invited Speaker:** "Breaking the Thermal Conductivity Glass Limit" *2012 Materials Science & Technology Conference & Exhibition* Pittsburgh, Pennsylvania, October 7-11, 2012.

55) **Invited Speaker:** "Long Term Superconducting Magnetic Energy Storage (SMES) for GRIDS, Air and Space Applications" *Applied Superconductivity Conference*, Portland, OR, Oct. 7-12 2012

56) **Invited Speaker:** "Superconductivity: Rising to the Energy Challenges" *2012 International Union of Materials Research Societies – International Conference on Electronic Materials* Yokohama, Japan, Sept. 23-28 2012

57) **Invited Speaker:** "Breaking the Thermal Conductivity Glass Limit" *2012 International Union of Materials Research societies – International Conference on Electronic Materials* Yokohama, Japan, Sept. 23-28 2012

58) **Invited Speaker:** "Status and Future Prospect of SMES for Grid Applications" *2012-Advanced Microgrid Concepts and Technologies Workshops*, Washington DC, June 7-8, 2012

59) **Invited Speaker:** "The Future Prospects for Large Scale Applications of Fe-based Superconductors" *International Conference on superconductivity and Magnetism*, Istanbul, Turkey April 29-May 4 2012

60) **Invited Speaker:** "Superconductors for electricity transmission, storage, and generation" *2012 Spring Meeting of the New York Section of the APS,* Binghamton, New York, April 20-21, 2012

61) **Invited Speaker:** "Films of Iron-Chalcogenide Superconductors" *2012 Villa Conference on Iron-based Superconductors*, Orlando, FL, April 16-20, 2012

62) **Invited Speaker:** "Films of Iron-Chalcogenide Superconductors and Prospects for Large Scale Applications" *MRS Spring Meeting, San Francisco*, April 9-13, 2012

63) **Invited Speaker:** "Superconductivity and Thermoelectricity: Rising to the Energy Challenges" *International Symposium on Sustainability Science*, Hiroshima, Japan, March 8, 2012

64) **Invited Speaker:** "Superconducting Magnetic Energy Storage (SMES) Systems for GRIDS" *Tenth EPRI Superconductivity Conference* Tallahassee, Florida. October 11-13, 2011

65) **Invited Speaker:** "Superconductivity – An Energy Carrier" *The International Conference on Novel Superconductivity,* Tainan, Taiwan Aug. 5- 10 2011

66) **Invited Speaker:** "Magnetic/Superconducting Multilayer Oxides" *The International Conference on Physics Education and Frontier Physics*, Kaohsiung, Taiwan, Aug. 1 – 5, 2011

67) **Invited Speaker:** "Correlation between structure and thermoelectric properties of bulk high performance materials for energy conversion" *EMRS meeting and -MRS / MRS Bilateral Conference on Energy*, Nice, France May 9-13, 2011

68) **Invited Speaker:** "Superconducting magnetic energy storage (SMES) system for GRIDS" *MRS Spring Conference*, San Francisco, April 25 - 29, 2011

69) **Invited Speaker:** "Superconducting Iron-Chalcogenide Thin Films and Coated Conductors" *The 2011 Villa Conference on Iron Pnictide Superconductors* (VCIPS 2011) Las Vegas, April 21-25, 2011

70) **Invited Speaker:** "Correlation Between Structure and Thermoelectric Properties of Bulk High Performance Materials for Energy Conversion" *2nd Thermoelectric Applications Workshop*, San Diego, January 3 - 6, 2011

71) **Invited Speaker:** "Properties of Robust Thermoelectric Materials Prepared by Non-Equilibrium Synthesis Method for Energy Conversion" *3rd International Congress of Ceramics* in Osaka, Japan (organized by International Ceramic federation, Ceramic Society of Japan, American Ceramic Society) Nov. 14-18, 2010

72) **Invited Speaker:** "Superconducting Iron-Chalcogenide Thin Films and Coated Conductors" *Materials Science & Technology 2010 Conference & Exhibition*, Houston, TX, Oct. 17-21, 2010

73) **Invited Speaker:** "Growth and Properties of Thermoelectric Oxide Single Crystals and Thin Films" *The 16th International Conference on Crystal Growth (ICCG-16)* Beijing, China August 8-13, 2010

74) **Invited Speaker:** "Superconducting iron-chalcogenide films" *Applied Superconductivity Conference*, Washington DC, Aug. 1-6, 2010

75) **Invited Speaker:** "Properties of bulk non-equilibrium synthesized thermoelectric materials" *NSF Workshop on complex materials for energy applications*, Kellogg Center, Michigan State University, June 13 - 16, 2010

76) **Invited Speaker:** "New Avenues towards High Efficiency Thermoelectric Materials" *ICAM International Workshop – Physics of Novel Energy Materials* –Beijing, China May 31 – June 3, 2010

77) **Invited Speaker:** "Thermoelectricity and Topological Insulators" *International Workshop on High Performance Ceramics*, Hangzhou, China (May 27-30, 2010)

78) **Invited Speaker**: "Non-Equilibrium Synthesis and Characterization of Bulk High Performance Thermoelectric Materials for Power Generational and Cooling" *2009 DOE Thermoelectric Application Workshop* San Diego, Sept. 29-Oct. 1 2009.

79) **Invited Speaker**: "Enhanced Power Factor and Reduced Lattice Thermal Conductivity in Bulk Thermoelectric Materials" *2nd International Symposium on*

Novel Thermoelectric Materials, Devices and Applications EMPA, Zurich, Switzerland, July 24, 2009.

80) **Invited Speaker**: "Metal-Insulator Transition and Thermoelectricity" *International Workshop of Relationships Between (Nano)structures and Thermoelectric properties*, CRISMAT Caen, France, July 22, 2009

81) **Invited Speaker**: "Novel Thermoelectric Materials" *8th Pacific rim conference on ceramic and glass technology*, Vancouver, Canada. (organized by American Ceramic Society, ant Pac-Rim Country Ceramic Society) May 31-June 5, 2009.

82) **Invited Speaker**: "Novel Thermoelectric Materials: Basic Understanding and New Directions" *IUMRS (international Union of MRS) International Conference in Asia* 2008 (IUMRS-ICA2008) in Nagoya, Japan, (organized by IUMRS with MRS Japan). Dec. 9-13 2008

83) **Invited Speaker**: "Superconductivity and Thermoelectricity at the Interface of Perovskite Oxides" *Materials Science & Technology 2008 Conference*, Pittsburgh, (organized by American Ceramic Society) Oct. 5-9 2008.

84) **Invited Speaker**: "Thermoelectric Materials with Potential High Power Factors" *International Conference on Thermoelectrics*, Corvallis, OR, USA, (organized by International Thermoelectric Society) Aug. 3-7, 2008.

85) **Invited Speaker:** "Thermoelectricity and Topological Insulators" *International Workshop on High Performance Ceramics*, Hangzhou, China (May 27-30, 2010

86) **Invited Speaker:** "Fundamental Understanding of Novel Bulk Thermoelectric Materials" *EMRS Spring Conference* Strasbourg, France – (organized by European MRS Society) May 26-30 2008

87) **Invited Speaker:** "Oxides: A New Avenue for High Efficiency Thermoelectric Materials", *2nd International Symposium on Thermoelectric Materials for Power Conversion Applications (32nd International Conference on Advanced Ceramics and Composites)* Daytona Beach, Florida (organized by American Ceramic Society) Jan. 27-Feb. 1, 2008

88) **Invited Speaker:** "New Avenues towards High Efficiency Thermoelectric Materials: Increasing the Power Factor First" *Materials Research Society (MRS) Fall conference* Boston, Ma, USA November 26 - 30, 2007

89) **Invited Speaker:** "Bulk Thermoelectric Materials With Nanoscale Substructure". *7th Pacific Rim Conference on Ceramic and Glass Technology*, Shanghai, China. (organized by American, Australia, Japan, China, Korean Ceramic Society) Nov. 10-14, 2007.

90) **Invited Speaker:** "Path for improvements in superconducting materials by understanding the mechanism" *Materials Science & Technology 2007 Conference*, Detroit, by American Ceramic Society) Sept. 16-20 2007.

91) **Invited Speaker:** "New Directions for Bulk Thermoelectric Materials Research" *International Workshop on Electronic Structure and Functionality of Thermoelectric Materials* Reykjavik, Iceland July 30 July-August 1, 2007

92) **Invited Speaker:** "High-Efficiency Bulk Thermoelectric Materials With Nanoscale Substructure" *International Symposium on Nano-Thermoelectrics* Osaka, Japan, June 11-12 2007.

93) **Invited Speaker:** "Magnetic Coupling and Flux Pinning in Coated Conductors and Superconductor/Ferromagnetic Bilayers", *Materials Science and Technology 2006* Conference, Cincinnati, OH, Organized by ACerS, AIST, ASM, and TMS OCT 15-19, 2006.

94) **Invited Speaker:** "A new direction n thermoelectric research" *5th Joint Meeting of Chinese Physicists Worldwide and International Conference on Physics Education and Frontier Physics*, Taipei, Taiwan, June 27-30, 2006.

95) **Invited Speaker:** "Layered Cobaltates with High Thermoelectric Power" *Materials Research Society (MRS) Fall Meeting*, Boston MA, Nov. 28-Dec. 2, 2005

96) **Invited Speaker:** "Layered Cobaltates with High Thermolectric Power" *6th Pacific Rim Conference on Ceramic and Glass Technology*, organized by American Ceramic Society, Maui, Hawaii, USA September 11-16, 2005.

97) **Invited Speaker:** "Layered Cobaltates with High Thermoelectric Power" in The *Direct Energy Conversion Program Review and Workshop*, organized by DARPA and ONR, Coronado, CA. December 13-15, 2004.

98) **Invited Speaker:** "Testing Order Parameter Symmetry with c-Axis Twist Grain Boundary Junctions in $Bi_2Sr_2CaCu_2O_{8+\delta}$ Bicrystals" *First International Workshop on the Symmetry in Macroscopic Quantum States-Quantitative Experiments and Theory*, Augsburg, Germany. April 21-23, 2002.

99) **Invited Speaker:** "Bicrystal Grain Boundary Junctions and Order Parameter Symmetry" *International Conference on Superconductivity, CMR, and Related Materials, Novel Trends*. Giens, France, May 31- June 6, 2002.

100) **Invited Speaker:** "Superconducting and Microstructural Properties of MgB_2/Mg Nano-Composites" *Applied Superconductivity Conference*, Houston USA, Aug. 4-9 2002

101) **Invited Speaker:** "$Bi_2Sr_2CaCu_2O_{8+\delta}$ Bicrystal c-axis Twist Josephson Junctions-A New Phase-sensitive Probe to Superconducting Order Parameter Symmetry" *American Physical Society March Meeting*, Seattle, Washington, March 12-16, 2001.

102) **Invited Speaker:** "Electromagnetic and Microstructural Properties of Bulk Bicrystal Grain Boundaries in High Temperature Superconductors" *6th International Conference on Materials and Mechanisms of Superconductivity (**M^2S**), and High Temperature Superconductivity*, Houston, TX, USA Feb. 20 – Feb. 25, 2000.

103) **Invited Speaker:** "Electromagnetic and Microstructural Properties of Pure C-axis Twist Bi2212 Bicrystal Junctions" SPIE's International Conference Superconducting Superlattices II: Native and Artificial, San Diego, California, USA. July 19-24, 1998.

104) **Invited Speaker:** "Characteristics of grain boundaries in Bi(2212) bi-crystals" 1997 Gordon Research Conference on Superconductivity", Ventura, California, USA. Jan 12-17, 1997.

105) **Invited Speaker:** "Fluctuations in the Magnetization of Quasi Two-Dimensional High-T_c Superconductors" *American Physical Society March Meeting*, Pittsburgh, PA, March 21-25, 1994

106) **Invited Speaker:** "Fluctuations in the Magnetization of High-T_c Superconductors" Workshop on the Statics and Dynamics of Vortices in Superconductors, Eugene, OR. USA Aug. 1 - 3, 1993.

Patents:

1) D. Kharzeeev and Q. Li "Quantum computing using chiral qubits" US patent #10,657,456 B1 (May 19, 2020)
2) Martin W Rupich, Srivatsan Sathyamurthy, Qiang Li, Vyacheslav F Solovyov "Long length high temperature superconducting wires with uniform ion implanted pinning microstructures" European Patent 30020-345EP1 (April 2020).
3) Martin W Rupich, Srivatsan Sathyamurthy, Qiang Li, Vyacheslav F Solovyov "Long length high temperature superconducting wires with uniform ion implanted pinning microstructures" Patent # US10242770B2 (March 26, 2019)
4) Vyacheslav Solovyov, Qiang Li "Radio frequency-assisted fast superconducting switch" Patent #US9837814B2 (Dec. 5, 2017)

Recent Invited Seminars and Colloquiums:

1) Colloquium at Physics Department, University of Kansas " Chiral Fermions in Condensed Matters and Quantum Computing", Lawrence, Kansas, April 15, 2019
2) Colloquium at Physics Department, Iowa State University "Chiral Magnetic Effect in Condensed Matters", Ames, Iowa, Oct. 15, 2018
3) Condensed Matter Physics Seminar, Physics Department, University of Colorado "Chiral Fermion Transport in Condensed Matters", Boulder, CO, Sept. 13, 2018
4) Colloquium at Physics Department, Brown University "Chiral Magnetic Effect in Condensed Matters", Brown University, Providence, R.I. February 26, 2018

5) Condensed Matter Physics Seminar, Physics and Astronomy Department, Stony Brook University "Chiral Magnetic Effect in Condensed Matters", Stony Brook, NY, Sept. 27, 2017

6) Physics Department Colloquium, University at Buffalo "Chiral Magnetic Effect in Condensed Matters", Buffalo, NY, Sept. 21, 2017

7) Physics Department Colloquium, University of Central Florida "Chiral Magnetic Effect from Quark Gluon Plasma to Condensed Matters", Orlando, FL, Oct. 21, 2016

8) Ulher Symposium, Physics Department, University of Michigan, "A Journey from Superconductivity to Chiral Magnetic Effect" Ann Arbor, Michigan, Oct. 7, 2016

9) Los Alamos National Laboratory, Condensed Matter Science Colloquium, "Chiral Magnetic Effect from Quark Gluon Plasma to Condensed Matters" Los Alamos, June 15, 2016

10) Center for Quantum Matters Distinguished Lecture and Seminar of Physics Department, Stony Brook University "Discovery of the Chiral Magnetic Effect in Condensed Matters", SBU, Simons Center Lecture Hall 102, Stony Brook University. Feb. 12, 2016

11) Invited Lecture at Toronto Thermoelectric Summer School, University of Toronto, "Fundamental Understanding of Thermoelectric Materials" Toronto, Canada, July 11 2014.

Publications:

Books and book chapters

1) "Thermoelectric Energy Conversion Theories and Mechanisms, Materials, Devices, and Applications" edited by R. Funahashi, L. Chen, M. Gao, E. Guilmeau, Q. Li, and Y. Miyazaki, Elsevier (2020).

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3) "Effect of Vortex and Critical Fluctuations on the Magnetization of High T_c Superconductors" Q. Li**,** a chapter in the book "*Physical Properties of High Temperature Superconductivity V*", edited by D. M. Ginsberg, World Scientific, 1996).

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Corresponding author **Q. Li** underlined)

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3) C. Cho, P. Wang, F. Tang, S. Park, M. He, R. Lortz, G. Gu, Q. Li, and L. Zhang "Thermal transport properties and some hydrodynamic-like behavior in three-dimensional topological semimetal $ZrTe_5$", *Phys. Rev*. B **105**, 085132 (February, 2022)

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