

Mingda Li

77 Massachusetts Ave,
Building 24-209
Cambridge, MA 02139, US

Phone: +1(617) 452-2505
Email: mingda@mit.edu
Web: <http://qm.mit.edu/>

RESEARCH

Thermal Transport / Neutron & X-ray scattering / Topological Materials / Machine Learning

APPOINTMENT

2022 – Present **Class of 1947 Career Development Professor**, MIT
2023 – Present **Associate Professor** of Nuclear Science and Engineering, MIT
2020 – 2022 **Norman C. Rasmussen Career Development Professor**, Department of
Nuclear Science and Engineering, MIT
2018 – 2023 **Assistant Professor** of Nuclear Science and Engineering, MIT
2015 – 2017 **Postdoctoral Associate**, Mechanical Engineering, MIT
Advisors: Prof. Gang Chen and Prof. Mildred S Dresselhaus
2015 Jun – 2015 **Summer Researcher**, MIT Energy Initiative
Aug Advisors: Dr. Frank O'Sullivan and Dr. Sergey Paltsev

EDUCATION

2009 – 2015 **PhD**, Nuclear Science and Engineering, MIT
Thesis: "Investigation of magnetic interactions in topological insulators"
Advisors: Prof. Ju Li, Dr. Jagadeesh Moodera, Dr. Yimei Zhu (BNL)
2008 Feb – 2008 **Exchange Student Diploma**, Department of Engineering and System
Jun Science (ESS), National Tsinghua University (NTHU)
Advisor: Prof. Chih-Hao Lee (NTHU)
2005 – 2009 **BS**, Engineering Physics, Tsinghua University, China
Advisor: Prof. Ling-An Wu (Institute of Physics, CAS)

PUBLICATIONS

Preprints

094. C Fu, P Siriviboon, A Boonkird, R Dally, JW Lynn, C Li, W Xie and M Li, "Anomalous Neutron Nuclear-Magnetic Interference Spectroscopy."
093. B Han, A Savici, M Li and Y Cheng*, "INSPIRED: Inelastic Neutron Scattering Prediction for Instantaneous Results and Experimental Design."
092. NT Hung*, T Nguyen, VVThanh, S Wang, R Saito*, and M Li*, "Symmetry breaking in 2D materials for optimizing second-harmonic generation", submitted. (Invited Review Article)
091. NC Drucker*, T Nguyen, M Mandal, P Siriviboon, Y Quan, A Boonkird, R Okabe, F Li, K Burrage, F Funuma, M Matsuda, D Abernathy, T Williams, S Chi, F Ye, C Nelson, B Liao, P Volkov*, and M Li* "Incipient nematicity from electron flat bands in a kagome metal", [arXiv:2401.17141](https://arxiv.org/abs/2401.17141), submitted.
090. Y Zhou, R Ciarla, A Boonkird, T Nguyen, Z Jiang, X Zuo, J Ranasinghe, W Hu, B Scott, S Huang,

M Li and Y Xu*, "Defects Vibrations Engineering for Enhancing Interfacial Thermal Transport", [arXiv:2310.10945](https://arxiv.org/abs/2310.10945), submitted.

089. M Cheng*, R Okabe, A Chotrattanapituk and M Li*, "Machine Learning Detection of Majorana Zero Modes from Zero Bias Peak Measurements," [arXiv:2310.18439 \(2023\)](https://arxiv.org/abs/2310.18439).

088. M Mandal*, A Chotrattanapituk, K Woller, H Xu, N Mao, R Okabe, A Boonkird, T Nguyen, NC Drucker, T Momiki, J Li, J Kong, and M Li*, "Precise Fermi-level engineering in a topological Weyl semimetal via fast ion implantation," [arXiv:2130.07828](https://arxiv.org/abs/2130.07828), submitted.

087. A Boonkird*, NC Drucker, M Mandal, T Nguyen, J Yeo, V Belosevich, E Spero, C Ortiz, Q Ma, L Fu, T Palacios, M Li*, "Sustainability-Driven Exploration of Topological Materials", [arXiv:2308.09526](https://arxiv.org/abs/2308.09526).

086. CT Chou, BC McGoldrick, T Nguyen, S Gohsh, KA Mkhoyan, M Li and L Liu*, "Ultra-High Magnetic Field Resilience of Tunneling Magnetoresistance in an Antiferromagnetic Tunnel Junction," submitted.

085. R Okabe†, A Chotrattanapituk†, A Boonkird, N Andrejevic, X Fu, TS Jaakkola, Q Song, T Nguyen, NC Drucker, S Mu, B Liao, Y Cheng, and M Li*, "Virtual Node Graph Neural Network for Full Phonon Prediction", [arXiv:2301.02197](https://arxiv.org/abs/2301.02197).

084. N. Andrejevic†, F. Han†, T. Nguyen, A. Puzosky, Q. Meng, Y-F Zhao, W. Zhao, L. Wu, D. Geohegan, C-Z Chang, Y. Zhu*, S. Huang*, M. Li*, "Spectroscopic Signatures of Nonlocal Interfacial Coupling in Superconducting FeSe/SrTiO₃ Heterostructures", [arXiv:1908.05648](https://arxiv.org/abs/1908.05648). (†Equal contribution)

083. R. Pablo-Pedro*†, N. Andrejevic†, Y. Tsurimaki, Z. Ding, T-H Liu, G.D. Mahan, S. Huang, and M. Li*, "Phonon quantum phase transition", [arXiv:1809.06495](https://arxiv.org/abs/1809.06495). (†Equal contribution)

2024

082. R Okabe*†, S Xue†, J Vavrek†, J Yu, R Pavlovsky, V Negut, B Quiter, J Cates, T Liu, B Forget, S Jegelka, G Kohse, L-W Hu* and M Li*, "Tetris-inspired detector with neural network for radiation mapping," [arXiv:2302.07099](https://arxiv.org/abs/2302.07099). (In Production, Nature Communications 2024)

081. SN Kajale, T Nguyen, M Li and D Sarkar*, "Deterministic and non-volatile switching of all-van der Waals spin-orbit torque system above room temperature without external magnetic fields", [arXiv:2309.04930](https://arxiv.org/abs/2309.04930), Accepted by *Science Advances* 2024.

080. SN Kajale†, T Nguyen†, CA Chao, DC Bono, A Boonkird, M Li and D Sarkar*, "Current-induced deterministic switching of vdW magnet at room temperature", [Nature Communications 15, 1485 \(2024\)](https://doi.org/10.1038/s41467-024-01485-1).

- Press Release at [MIT News](https://news.mit.edu/2024/01-15-quantum-switching).

2023

079. R Okabe, M Li, Y Iwasaki, N Regnault, C Felser, M Shirai, A Kovacs, T Schrefl and A Hirohata*, "Materials Informatics for the Development and Discovery of Future Magnetic Materials", [IEEE Magnetic Letters 14, 2500305 \(2023\)](https://doi.org/10.1109/MAG.2023.2500305).

078. JP Wakefield, M Kang, PM Neves, D Oh, S Fang, R McTigue, SYF Zhao, TN Lamichhane, A Chen, S Lee, S Park, JH Park, C Jozwiak, A Bostwick, E Rotenberg, A Rajapitamahuni, E Vescovo, JL McChesney, D Graf, JC Palmstrom, T Suzuki, M Li, R Comin*, and JG Checkelsky*, "Three Dimensional Flat Bands in Pyrochlore Metal CaNi₂", [Nature 623, 301 \(2023\)](https://doi.org/10.1038/s41586-023-0301-1).

077. NC Drucker*†, T Nguyen†, F Han†, P Siriviboon†, X Luo†, N Andrejevic, Z Zhu, G Bednik, QT Nguyen, Z Chen, LK Nguyen, TJ Williams, MB Stone, AI Kolesnikov, S Chi, J Fernandez-Baca, C nelson, A Alatas, T Hogan, AA Puzosky, S Huang, Y Yue* and M Li*, "Topology stabilized fluctuations in a magnetic nodal semimetal", [Nature Communications 14, 5182 \(2023\)](https://doi.org/10.1038/s41467-023-03182-1).

- Press Release at [MIT News](https://news.mit.edu/2023/11-15-topology-stabilized-fluctuations), Science Highlight at NSLS-II, BNL, Headline at DOE Office of Science homepage, [DOE Office of Science Research News Update](https://www.doe.gov/science-research-news-update).

076. M Mandal†, NC Drucker†, P Siriviboon†, T Nguyen, A Boonkird, TN Lamichhane, R Okabe, A Chotrattanapituk and M Li*, “Topological superconductors from a materials perspective”, [Chem. Mater. 35, 6184 \(2023\)](#).

- Invited Perspective article.

075. A Chotrattanapituk, M Mandal and M Li*, “Bridging the gap to THz optoelectronics with nonlinear Hall Devices”. [Matter 6, 2514 \(2023\)](#).

- Invited Preview article.

074. J Hales, U Bajpai, T Liu, DR Baykusheva, M Li, M Mitrano, Y Wang*, “Witnessing Light-Driven Entanglement using Time-Resolved Resonant Inelastic X-Ray Scattering”, [Nature Communications 14 3512 \(2023\)](#).

073. Y Yang*, W Zhou, S Yin, SY Wang, Q Yu, MJ Olszta, YQ Zhang, SE Zeltmann, M Li, M Jin, DK Schreiber, J Ciston, MC Scott, JR Scully, RO Ritchie, M Asta, J Li, MP Short* and AM Minor*, “One Dimensional Wormhole Corrosion in Metals”, [Nature Communications 14, 988 \(2023\)](#).

072. A Francesco*, L Scaccia, F Formisano, E Guarini, U Bafille, D Nykypanchuk, A Alatas, M Li, ST Lynch, and A Cunsolo, “The Effect of Embedded Nanoparticles on the Phonon Spectrum of Ice: An Inelastic X-ray Scattering Study”, [Nanomaterials, 13, 918 \(2023\)](#).

071. YQ Cheng, G Wu, MB Stone, A Savici, M. Li and A Ramirez-Cuesta, “Direct prediction of inelastic neutron scattering spectra from crystal structure”, [Mach. Learn.: Sci. & Technol. 4, 015010 \(2023\)](#).

070. Z Chen*, X Shen*, N Andrejevic, T Liu, D Luo, T Nguyen, NC Drucker, M Kozina, Q Song, C Hua, G Chen, X Wang, J Kong, and M Li*, “Panoramic mapping of phonon transport from ultrafast electron diffraction and machine learning”, [Advanced Materials, 35, 2206997 \(2023\)](#).

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069. H Chen, SR Chitturi, R Plumley, L Shen, NC Drucker, N Burdet, C Peng, S Mardanya, D Ratner, A Mishra, CH Yoon, S Song, M Chollet, G Fabbris, M Dunne, S Nelson, M Li, A Lindenberg, C Jia, Y Nashed, A Bansil, S Chowdhury, AE Feiguin, JJ Turner, Jana B. Thayer, “Testing the data framework for an AI algorithm in preparation for high data rate X-ray facilities”, 2022 4th Annual Workshop on Extreme-scale Experiment-in-the-Loop Computing (XLOOP), [DOI: 10.1109/XLOOP56614.2022.00006 \(2022\)](#).

068. MS Akhanda, S Krylyuk, DA Dickie, AV Davydov, F Han, M Li and M Zebarjadi*, “Phase-transition-induced Thermal Hysteresis in Type-II Weyl Semimetals MoTe_2 and $\text{Mo}_{1-x}\text{W}_x\text{Te}_2$ ”, [Materials Today Physics 29, 110918 \(2022\)](#).

067. N. Andjejevic†, J. Andrejevic†, BA Bernevig, N Regnault, F Han, G Fabbris, T Nguyen, NC Drucker, CH Rycroft* and M Li*, “Machine learning spectral indicators of topology”, [Advanced Materials 34, 202204113 \(2022\)](#). (†Equal contribution)

- Press Release at [MIT News](#). Selected as Department of Energy (DOE) Basic Energy Sciences (BES) Highlight and National Science Foundation (NSF) Highlight for Designing Materials to Revolutionize and Engineer our Future (DMREF) Program.

066. HA Merker†, H Heiberger†, LK Nguyen†, T Liu†, Z Chen, N. Andrejevic, NC Drucker, R. Okabe, Y. Wang, T. Smidt* and M. Li*, “Machine Learning Magnetism Classifiers from Atomic Coordinates”. [iScience: Cell Press 25, 105192 \(2022\)](#). (†Equal contribution)

065. V Lauter, KL Wang, T Mewes, A Glavic, B Toperverg, M Ahmadi, B Assaf, B Hu, M Li, X Liu, Y Liu, JS Moodera, L Rokhinson, D Singh and N Sun, “M-STAR: Magnetism Second Target Advanced Reflectometer at the Spallation Neutron Source”, [Rev. Sci. Instrum. 93, 103903 \(2022\)](#).

064. NC Drucker, T Liu, Z Chen, R Okabe, A Chotrattanapituk, T Nguyen, Y Wang and M Li,

“Challenges and Opportunities of Machine Learning on Neutron and X-ray Scattering”, [Synchrotron Radiation News 35, 16 \(2022\)](#).

- Invited perspective article; Journal Feature Article.

063. J-W Shin, G.A. Gamage, Z. Ding, K. Chen, F. Tian, X. Qian, J. Zhou, H. Lee, J. Zhou, L. Shi, T. Nguyen, F. Han., M. Li, D. Broido, A. Schmidt, Z. Ren*, G. Chen*, “High ambipolar mobility in cubic boron arsenide”, [Science 377, 437 \(2022\)](#).

062. S Wang, H Jiang, Y Dong, D Clarkson, H Zhu, CM Settens, Y Ren, T Nguyen, . Han, W Fan, SY Kim, J Zhang, We Xue, SK Sandstrom, G Xu, E Tekoglu, M Li, S Deng, Q Liu, SG Greenbaum, X Ji*, T Gao*, and J Li*, "Acid-in-Clay Electrolyte for Wide-Temperature-Range and Long-Cycle Proton Batteries", [Adv. Mater. 34, 2202063 \(2022\)](#).

061. N. Andrejevic*†, Z. Chen†, T. Nguyen, L. Fan, H. Heiberger, L-J Zhou, Y-F Zhao, C-Z Chang, A. Grutter, and M Li*, "Elucidating proximity magnetism through polarized neutron reflectometry and machine learning", [Appl. Phys. Rev. 9, 011421 \(2022\)](#). (†Equal contribution)

- Journal featured article; [AIP Scilight](#). Press Release on [MIT News](#). Highlighted on DOE Office of Science Homepage.

060. T. Nguyen and M. Li*, “Electronic properties of correlated kagomé metals AV₃Sb₅ (A = K, Rb, Cs): A perspective”, [J. Appl. Phys. 131, 060901 \(2022\)](#).

- Invited perspective article & Editors’ Pick.

059. K-P So, M Stapelberg, Y. R. Zhou, M. Li, MP Short* and S. Yip*, “Observation of dynamical transformation plasticity in metallic nanocomposites through a precompiled machine-learning algorithm”, [Mater. Res. Lett. 10, 14 \(2022\)](#).

058. T. Nguyen†, Y. Tsurimaki†, R. Pablo-Pedro†, G. Bednik†, A. Apte, N. Andrejevic and M. Li* (†Equal contribution), "Topological Signatures in Nodal Semimetals through Neutron Scattering", [New J. Phys. 24, 013016 \(2022\)](#). (†Equal contribution)

057. J.M. Fang, S. Basu, M. Li, K-C Shih, J. Wang, M. Cotlet, X. Wang, J. Zhao, TJ Mountziaris, JJ LoTurco, and M-P Nieh*, “Restriction-in-Motion of Surface Ligands Enhances Photoluminescence of Quantum Dots – Experiment and Theory”, [Adv. Mater. Interfaces, 2102079 \(2022\)](#).

056. M. Li* and Y. Wang*, “One-way express ticket to quantum criticality”, [Nature Materials 21, 3 \(2022\)](#).

- Invited News and Views article.

2021

055. J. Xu, F. Han, T-T Wang, LR Thoutam, SE Pate, M. Li*, X. Zhang, Y-L Wang*, R. Fovotat, U. Welp, X. Zhou, W-K Kwok, DY Chung, MG Kanatzidis, and Z-L Xiao*, “Extended Kohler’s Rule of Magnetoresistance”, [Phys. Rev. X. 11, 041029 \(2021\)](#).

054. T. Nguyen, N. Andrejevic, H. C. Po, Y. Tsurimaki, N. Drucker, A. Alatas, E. E. Alp, B. M. Leu, A. Cunsolo, Y. Cai, L. Wu, J. A. Garlow, Y. Zhu, A. C. Gossard, S. Huang* and M. Li*, “Signature of Many-Body Localization of Phonons in Strongly Disordered Superlattices”, [Nano Lett. 21, 7419 \(2021\)](#).

- Press Release on [MIT News](#). Highlighted on DOE Office of Science Homepage. [APS Science Highlight](#) at Argonne National Laboratory.

053. Z. Chen†, N. Andrejevic†, N. C. Drucker, T. Nguyen, R.P. Xian, T. Smidt, Y. Wang, R. Ernstorfer, A. Tennant, M. Chan, and M. Li*, "Machine Learning on Neutron and X-Ray Scattering", [Chem. Phys. Rev 2, 031301 \(2021\)](#) (†Equal contribution)

- Invited Review Article; Journal Featured Article; [AIP Scilight](#).

052. Z. Chen[†], N. Andrejevic[†], T. Smidt[†], Z. Ding, Y-T Chi, Q. Nguyen, A. Alatas, J. Kong and M. Li*, "Direct prediction of phonon density of states with Euclidean neural networks", [DOI:10.1002/adv.202004214](#), *Advanced Science* (2021). (†Equal contribution)

- Press Release on [MIT News](#) and MIT Daily, selected as journal Front Cover.

051. P. Cao*, K-P So, Y. Yang, JG Park, M. Li, L. Yan, J. Hu, M. Kirk, M. Li, YH Lee, MP Short* and J. Li*, "Carbon nanotube (CNT) metal composites exhibit greatly reduced radiation damage", [Acta. Mater. 203, 116483 \(2021\)](#).

50. L. Zhao, S. Wang, Y. Dong, W. Quan, F. Han, Y. Huang, Y. Li, X. Liu, M. Li, Z. Zhang*, J. Zhang*, Z. Tang, J. Li*, "Coarse-grained reduced $\text{Mo}_x\text{Ti}_{1-x}\text{Nb}_2\text{O}_{7+x}$ anodes for high-rate lithium-ion batteries", [Energy Storage Materials, 34, 574 \(2021\)](#).

2020

049. K. Zhang, T. Wang, X. Pang, F. Han, S-L Shang, N.T. Hung, A.R.T. Nugraha, Z-K Liu, M Li*, R. Saito* and Shengxi Huang*, "Anisotropic Fano resonance in a Weyl semimetal candidate LaAlSi", [Phys. Rev. B 102, 235162 \(2020\)](#).

048. F. Han[†], N. Andrejevic[†], T. Nguyen[†], V. Kozii[†], Q. Nguyen, T. Hogan, Z. Ding, R. Pablo-Pedro, S. Parjan, B. Skinner, A. Alatas, E. Alp, S. Chi, J. Fernandez-Baca, S. Huang, L. Fu* and M. Li*, "Quantized Thermoelectric Hall Effect Induces Giant Power Factor in a Topological Semimetal", [Nature Communications, 11, 6167 \(2020\)](#). (†Equal contribution)

- Press Release on [MIT News](#), Highlighted on [MIT The Infinite](#). Highlighted on DOE Office of Science Homepage.

047. T. Nguyen[†], F. Han[†], N. Andrejevic[†], R. Pablo-Pedro[†], A. Apte, Y. Tsurimaki, Z. Ding, K. Zhang, A. Alatas, E. E. Alp, S. Chi, J. Fernandez-Baca, M. Matsuda, D.A. Tennant, Y. Zhao, Z. Xu, J.W. Lynn, S. Huang and M. Li*, "Topological Singularity Induced Chiral Kohn Anomaly in a Weyl Semimetal", [Phys. Rev. Lett. 124, 236401 \(2020\)](#). (†Equal contribution)

- PRL Editors' Suggestion. Press Release on [MIT News](#), Highlighted on DOE Office of Science Homepage, DOE Basic Energy Sciences (BES) [Science Highlights](#).

046. M. Li and G. Chen, "Thermal transport for probing quantum materials", [MRS Bulletin 45, 348 \(2020\)](#).

- Invited Review Article.

045. R. Pablo-Pedro, MA Magana-Fuentes, M. Videa, J. Kong, M. Li, J. Mendoza-Cortes* and T. van Voorhis*, "Understanding disorder in 2D materials: the case of carbon doping of Silicene", [Nano Lett 20, 6336 \(2020\)](#).

044. R. Gao, M. Jin*, F. Han, B. Wang, X. Wang*, Q. Fang, Y. Dong, C. Sun, L. Shao, M. Li, and Ju Li*, "Superconducting Cu/Nb nanolaminate by coded accumulative roll bonding and its helium damage characteristics", [Acta Mater. 197, 212 \(2020\)](#).

043. Y. Tsurimaki, X. Qian, S. Pajovic, F. Han, M. Li and G. Chen*, "Large non-reciprocal absorption and emission of radiation in time-reversal-symmetry-breaking type-I Weyl semimetals", [Phys. Rev. B 101, 165426 \(2020\)](#).

042. K. Zhang, X. Pang, T. Wang, F. Han, S-L Shang, N.T. Hung, A.R.T. Nugraha, Z-K Liu, M. Li*, R. Saito* and S. Huang*, "Phonon-mode dependent Raman spectroscopy of topological nodal semimetal

TaP", [Phys. Rev. B 101, 014308 \(2020\)](#).

2019

041. Y-Y Lyu, F. Han, Z-L Xiao*, J. Xu, Y-L Wang*, H-B Wang, J-K Bao, DY Chung, M. Li*, I. Martin, U. Welp, MG Katsidis, and W-K Kwok, "Magnetization Governed Magnetoresistance Anisotropy in Topological Semimetal CeBi", [Phys. Rev. B 100, 180407\(R\) \(2019\)](#).

040. W. Gong*, B. Fugetsu*, Z-P Wang, T. Ueki, I. Sakata, H. Ogata, F. Han, M. Li, L. Su, X. Zhang, M. Terrones, and M. Endo, "Thicker carbon-nanotube / manganese-oxide hybridized nanostructures as electrodes for creation of fiber-shaped high-energy-density supercapacitors", [Carbon 154, 169 \(2019\)](#).

039. J. Xu, F. Wu, J. Bao, F. Han, Z-L Xiao*, I. Martin*, Y-Y Lyu, Y-L Wang, DY Chung, M. Li, W Zhang*, J. Pearson, J. Jiang, MG Kanatzidis, and W-K Kwok, "Orbital flop in rare Earth monopnictide CeSb", [Nature Communications 10, 2875 \(2019\)](#).

038. Y. Xu, D. Kraemer, B. Song, Z. Jiang, J. Zhou, J. Loomis, J. Wang, M. Li, H. Ghasemi, X. Huang, X. Li and G. Chen*, "Nanostructured polymer films with metal-like thermal conductivity", [Nature Communications, 10, 1771 \(2019\)](#).

037. M. Li*, "Quantized dislocations", [J. Phys.: Condens. Matter 31, 083001 \(2019\)](#).

- Invited Topical Review.

2018

036. Z. Ding, J. Zhou, B. Song, M. Li, T-H Liu and G. Chen*, "Umklapp scatterings are not necessarily resistive", [Phys. Rev. B: Rapid Communications 98, 180302 \(2018\)](#).

035. M. N. Luckyanova, J. Mendoza, H. Lu, B. Song*, S. Huang, J. Zhou, M. Li, Y. Dong, H. Zhou, J. Garlow, L. Wu, B. J. Kirby, A. J. Grutter, A. A. Puretzky, Y. Zhu, M. S. Dresselhaus, A. Gossard, and G. Chen*, "Phonon localization in heat conduction", [Science Advances 4, eaat9460 \(2018\)](#).

034. T-H Liu, B. Song, L. Meroueh, Z. Ding, Q. Song, J. Zhou, M. Li and G. Chen*, "Simultaneously high electron and hole mobilities in cubic boron-V compounds: BP, BAs and BSb", [Phys. Rev. B: Rapid Commun, 98, 081203 \(2018\)](#).

033. L. Ding, M. Ukhtary, M. Chubarov, T. Choudhury, F. Zhang, R. Yang, A. Zhang, J. Fan, M. Terrones, J. Redwing, T. Yang, M. Li, R. Satio and S. Huang*, "Understanding interlayer coupling in tmd-hBN heterostructure by Raman spectroscopy", [DOI: 10.1109/ TED.2018.2847230](#), *IEEE Trans. Electron Devices*, 2018.

032. G. Wei, B. Fugetsu*, Z. Wang, I. Sakata, L. Su, X. Zhang, H. Ogata, M. Li., C. Wang, J. Li, J. Ortiz-Medina, M. Terrones and M. Endo, "Carbon nanotubes and manganese oxide hybrid nanostructures as high performance fiber supercapacitors", [Commun. Chem. 1, 16 \(2018\)](#).

031. W. Zhao[†], M. Li[†], C-Z Chang^{†*}, J. Jiang, L. Wu, C. Liu, Y. Zhu*, J. S. Moodera and M. H. W. Chan*, "Direct observation of transfer and superconducting pairing of electrons at the FeSe/SrTiO₃ interface", [Science Advances 4, eaao2682 \(2018\)](#). ([†]Equal contribution)

030. M. Li^{††}, Y. Tsurimaki[†], Q. Meng, N. Andrejevic, Y. Zhu, G. D. Mahan and G. Chen*, "Theory of electron-phonon-dislon interacting system – toward a quantized theory of dislocations", [New J. Phys. 20, 023010 \(2018\)](#). ([†]Equal contribution)

029. T-H Liu, J. Zhou, M. Li, Z. Ding, Q. Song, B. Liao, L. Fu and G. Chen*, "Electron mean-free-path filtering in Dirac material SnTe for improved thermoelectric performance", *Proc. Natl. Acad. Sci.*, [DOI: 10.1073/pnas.1715477115 \(2018\)](#).

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028. F. Han, N. Andrejevic and M. Li*, "A hidden dimension to explore new thermoelectrics", [Joule 2, 16 \(2018\)](#). (Invited Preview Article).

027. Z. Ding, J. Zhou, B. Song, V. Chiloian, M. Li, T-H Liu and G. Chen*, "Phonon hydrodynamic heat conduction and Knudsen minimum in graphite", [Nano Lett. 18, 638 \(2018\)](#).

2017

026. M. Li*†, Q. Song†, W. Zhao, J. A. Garlow, T-H Liu, L. Wu, Y. Zhu, J. S. Moodera, M. H. W. Chan, G.. Chen* and C-Z Chang*, "Dirac-electrons-mediated magnetic proximity effect in topological insulator / magnetic insulator heterostructures", [Phys. Rev. B: Rapid Commun. 96, 201301 \(2017\)](#). (†Equal contribution)

025. M. Li*, Q. Song, T-H Liu, L. Meroueh, G. D. Mahan, M. S. Dresselhaus and G. Chen*, "Tailoring superconductivity with quantum dislocations", [Nano Lett. 17, 4604 \(2017\)](#).

024. C. Fu, M. Li*, "Oscillative deviation from Matthiessen's rule due to interacting dislocations", [J. Phys. Condens. Matter 29, 325702 \(2017\)](#).

023. M. Li*, Z. Ding, Q. Meng, J. Zhou, Y. Zhu, H. Liu, M. S. Dresselhaus and G. Chen*, "Nonperturbative quantum nature of the dislocation-phonon interaction", [Nano Lett. 17, 1587 \(2017\)](#).

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022. M. Li*, W. Cui, M. S. Dresselhaus and G. Chen*, "Electron energy can oscillate near a crystal dislocation", [New J. Phys. 19, 013033 \(2017\)](#).

- Selected as [New Journal of Physics Highlights of 2017](#).

2016

021. A. Vipin*, B. Fugetsu, I. Sakata, A. Isogai, M. Endo, M. Li, M. S. Dresselhaus, "Cellulose nanofiber backboneed Prussian blue nanoparticles as powerful adsorbents for the selective elimination of radioactive cesium", [Sci. Rep. 6, 37009 \(2016\)](#).

020. Z. Zhu, M. Li and J. Li*, "Topological semimetal- topological insulator quantum phase transition in zintl compounds Ba₂X (X=Si, Ge)", [Phys. Rev. B 94, 155121 \(2016\)](#).

019. K-P So, D. Chen, A. Kushima, M. Li, S. Kim, Y. Yang, Z. Wang, J-G Park, Y-H Lee, R. I. Gonzalez, M. Kiwi, E. M. Bringa, S. Lin* and J. Li*, "Dispersion of carbon nanotubes in aluminum improves radiation resistance", [Nano Energy 22, 319 \(2016\)](#).

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018. C-Z Chang* and M. Li, "Quantum anomalous hall effect in time-reversal-symmetry breaking topological insulators", [J. Phys. Condens. Matter 28, 123002 \(2016\)](#).

- Invited Topical Review.

2015

017. M. Li*, C. Chang*, B. J. Kirby, M. Jamer, W. Cui, L. Wu, P. Wei, Y. Zhu, D. Heiman, J. Li and J. S. Moodera*, "Proximity driven enhanced magnetic order at ferromagnetic insulator / magnetic topological insulator interface", [Phys. Rev. Lett. 115, 087201 \(2015\)](#).

- Press Release on [MIT News](#), [Phys.org](#), etc.

016. M. Li*, C. Chang*, L. Wu, J. Tao, W. Zhao, M. Chan, J. S. Moodera, J. Li and Y. Zhu*, "Experimental verification of the van Vleck nature of long-range ferromagnetic order in vanadium-doped three-dimensional topological insulator Sb₂Te₃". [Phys. Rev. Lett. 114, 146802 \(2015\)](#).

- Press Release on [BNL News](#), [BNL homepage](#), [ScienceDaily](#), [Phys.org](#), etc.

015. M. Li*, W. Cui, J. Yu, Z. Dai, Z. Wang, F. Katmis, W. Guo and J. Moodera, "Magnetic proximity effect and interlayer exchange coupling of ferromagnetic / topological insulator / ferromagnetic trilayer", [*Phys. Rev. B* **91**, 014427 \(2015\)](#).

014. A. Ugur, F. Katmis, M. Li, L. Wu, Y. Zhu, K. Varanasi and K. Gleason*, "Low-dimensional conduction mechanisms in highly-conductive and transparent conjugated polymers", [*Advanced Materials* **31**, 4604 \(2015\)](#).

- Press Release on [MIT news](#), [MIT homepage](#), etc.

013. Z. Tian*, M. Li*, Z. Ren, H. Ma, A. Alatas, S. Wilson and J. Li, "Investigation of phonon transport in PbTe-PbSe alloys using inelastic x-ray scattering", [*J. Phys. Condens. Matter* **27**, 375403 \(2015\)](#).

012. M. Li*, W. Cui, L. Wu, Q. Meng, Y. Zhu, Y. Zhang, W. Liu and Z. Ren, "Topological effect to surface plasmon excitation in topological insulator nanowires". [*Can. J. Phys.* **93**, 591-598 \(2015\)](#).

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011. M. Li*, Z. Dai, W. Cui, Z. Wang, F. Katmis, P. Le, J. Wang, L. Wu and Y. Zhu, "Tunable THz surface plasmonics based on topological insulator-layered superconductor hybrid structure", [*Phys. Rev. B* **89**, 235432 \(2014\)](#).

010. Z. Wang, E. Fratini, M. Li, P. Le, E. Manontov, P. Baglioni, S-H Chen, "Hydration-dependent dynamic crossover phenomenon in protein hydration water", [*Phys. Rev. E* **90**, 042705 \(2014\)](#).

009. J. Niu, A. Kushima, M. Li, W. Li, Z. Wang, and J. Li*, "Scalable synthesis of sulfur nanosponge cathode for lithium-sulfur battery with greatly improved cyclability", [*J. Mater. Chem. A* **2**, 19788-19796 \(2014\)](#).

008. W. Cui, M. Li*, Z. Dai, Q. Meng and Y. Zhu, "Near-field optical effect of a core-shell nanostructure in proximity to a flat surface", [*J. Chem. Phys.* **140**, 044109 \(2014\)](#).

007. Z. Wang, W-S Chiang, P. Le, E. Fratini, M. Li, A. Alatas, P. Baglioni and S-H Chen*, "One role of hydration water in proteins: key to the 'softening' of short time intraprotein collective vibrations of a specific length scale", [*Soft Matter* **10**, 4298 \(2014\)](#).

006. Z. Wang, K-H Liu, P. Le, M. Li, W-S Chiang, J. Leao, M. Tyagi, J. Copley, A. Podlesnyak, A. I. Kolesnikov, C-Y Mou, and S-H Chen*, "Boson peak in deeply-cooled confined water: a possible way to explore the existence of the liquid-to-liquid transition in water", [*Phys. Rev. Lett.* **112**, 237802 \(2014\)](#).

005. A.D. Liao, M. Yao, F. Katmis, M. Li, S. Tang, J. Moodera, C. Opeil, and M. S.Dresselhaus, "Inducing anisotropic electronic transport in bismuth thin films", [*Appl. Phys. Lett.* **105**, 063114 \(2014\)](#).

Before 2014

004. S. Paltsev, F. O'Sullivan, N. Lee, A. Agarwal, M. Li, X. Li, N. Fylaktos (2013), "[Natural Gas Monetization Pathways for Cyprus: Interim Report - Economics of Project Development Options](#)", MIT Energy Initiative, Massachusetts Institute of Technology, Cambridge, MA. ISBN 978-0-9828008-8-1.

003. M. Li, XQ Chu, E. Fratini, P. Baglioni, A. Alatas, E.E. Alp, S-H Chen*, "Phonon-like excitation in secondary and tertiary structure of hydrated protein powders", [*Soft Matter* **7**, 9848-9853 \(2011\)](#).

002. C-S Tsao, M. Li, Y. Zhang, J. B. Leao, W-S Chiang, T-Y Chung, Y-R Tzeng, M-S Yu, and S-H Chen*, "Probing the room temperature spatial distribution of hydrogen in nanoporous carbon by use of small-angle neutron scattering", [*J. Phys. Chem. C* **114**, 19895 \(2010\)](#).

001. C-S Tsao, Y. Liu, M. Li, Y. Zhang, J. B. Leao, H-W Chang, M-S Yu and S-H Chen*, "Neutron scattering methodology for absolute measurement of room-temperature hydrogen storage capacity and evidence for spillover effect in a pt-doped activated carbon", [*J. Phys. Chem. Lett.* **1**, 1569-1573 \(2010\)](#).

Book Chapters

B01. M. Li* and R. Pablo-Pedro, "Quantized Dislocations for Functional and Quantum Materials",

INVITED TALKS

- T073. M Li, Dec 2024, Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA.
- T072. M Li, Sept 2024, Keynote Speaker, Materials Science and Engineering Conference (MSE 2024) by German Association of Materials Research (DGM).
- T071. M Li, Jun 2024, Tutorial Lecturer, American Conference of Neutron Scattering (ACNS) 2024.
- T070. M Li, Jun 2024, Telluride Science Research Center (TSRC) workshop on “Quantum Materials for Emergent Applications in Quantum Science.”
- T069. M Li, Jun 2024, Integrated Photonic Systems Roadmap (IPSR) 2024 Spring Meeting.
- T068. M Li, May 2024, MRSEC Seminar, University of Tennessee-Knoxville.
- T067. M Li, Apr 2024, Keynote Speaker, Machine Learning Conference for X-Ray and Neutron-Based Experiments, Heinz Maier-Leibnitz Zentrum (MLZ), Germany.
- T066. M Li, Mar 2024, Minerals, Metals, and Materials Society (TMS) 153th Annual Meeting & Exhibition, Orlando, FL.
- T065. M Li, Dec 2023, 2023 Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, MA.
- T064. M Li, Nov 2023, Physics Colloquium in Physics Department, U Mass Boston.
- T063. M Li, Oct 2023, Chemistry Colloquium, Michigan State University (MSU).
- T062. M Li, Sept 2023, Speaker at Monie A Ferst Award Symposium in honor of Sidney Yip.
- T061. M Li, Sept 2023, International Conference and Expo on Condensed Matter Physics, Rome, Italy.
- T060. M Li, Sept 2023, ALS Visioning Workshop, Lawrence Berkeley National Lab.
- T059. M Li, Aug 2023, Seminar, Quantum Foundry, UC Santa Barbara.
- T058. M Li, Jun 2023, AI in the Scattering Workshop, U Maryland College Park and NIST.
- T057. M Li, June 2023, Symposium on Quantum Materials, Congress of the Canadian Association of Physicists (CAP), Canada.
- T056. M Li, May 2023, Special Seminar, The University of Tokyo, Japan.
- T055. M Li, May 2023, IEEE International Magnetic Conference (INTERMAG) 2023, Sendai, Japan.
- T054. M Li, May 2023, Materials Science and Engineering Seminar, UC Riverside.
- T053. M Li, May 2023, APS / CNM 2023 Users Meeting Workshop 11 “Time-resolved X-ray Opportunities toward APS-U”, Argonne National Lab.
- T052. M Li, Apr 2023, APS / CNM 2023 Users Meeting Workshop 2 “Bright Perspectives of Inelastic X-ray Scattering Post-APS-U”.
- T051. M Li, Mar 2023, Minerals, Metals, and Materials Society (TMS) 152th Annual Meeting & Exhibition, San Diego, CA.
- T050. M Li, Mar 2023, Condensed Matter Physics and Materials Science Seminar, Brookhaven National Lab (BNL).
- T049. M Li, Feb 2023, Seminar for the Nuclear Engineering (NE) Program, Virginia Tech (VT).
- T048. M Li, Jan 2023, Frontier Research Institute for Interdisciplinary Sciences (FRIS) Seminar, Tohoku University, Japan.
- T047. M Li, Jan 2023, International Conference on Plasticity, Damage & Fracture (ICPDF), Dominican Republic.
- T046. M Li, Dec 2022, “Interfacial and bulk defect resolution using machine-learning augmented ultrafast diffraction,” 2022 Materials Research Society (MRS) Fall Meeting & Exhibit.
- T045. M Li, Dec 2022, Physics Colloquium, Wesleyan University.

T044. M Li, Nov 2022, Materials with Long Range Order (MLRO) Workshop, National Science Foundation (NSF).

T043. M Li, Nov 2022, Materials Spectrum 2022.

T042. M Li, Oct 2022, Materials Science & Technology (MS&T) 2022 Technical Meeting & Exhibition, Pittsburg, PA.

T041. M Li, Oct 2022, Applied Physics and Applied Math Seminar, Columbia University.

T040. M Li, Sept 2022, Seminar Department of Physics, Clemson University.

T039. M Li, Aug 2022, 300th Colloquium at SPring-8, Japan.

T038. M Li, Aug 2022, Seminar, Department of Chemistry, Emory University.

T037. M Li, Aug 2022, ORNL Quantum Materials Young Investigator Workshop.

T036. M Li, Jun 2022, American Conference on Neutron Scattering (ACNS) 2022.

T035. M Li, Feb 2022, Physics Colloquium, University of Maryland.

T034. M Li, Feb 2022, Quantum Information and Quantum Materials Seminar, Oak Ridge National Lab (ORNL).

T033. M Li, Nov 2021, U Alabama at Birmingham Physics Colloquium.

T032. M Li, Oct 2021, Physics Colloquium, Physics Division, Argonne National Lab.

T031. M Li, Sept 2021, U Mass Amherst Mechanical Engineering Seminar.

T030. M Li, Sept 2021, Workshop on meV IXS, Spring-8, APS, NSLS-II and ESRF.

T029. M Li, Aug 2021, Joint Nanoscience and Neutron Scattering User Meeting, ORNL.

T028. M Li, Jun 2021, Quantum Materials: New Insights from Neutron Scattering Workshop, U Minnesota Center for Quantum Materials.

T027. M Li, Jun 2021, Quantum Complex Matter 2021 Symposium, Rome - RICMASS and Frascati National Laboratory.

T026. M Li, Apr 2021, Brookhaven National Laboratory (BNL) Condensed Matter Physics and Materials Science Seminar.

T025. M Li, Apr 2021, Lecture for Society of Physics Students, University of Puerto Rico, Mayagüez.

T024. M Li, Apr 2021, Idaho National Laboratory Frontiers of Energy Science Seminar.

T023. M Li, Mar 2021, WUSTL Physics Seminar.

T022. M Li, Mar 2021, American Physical Society (APS) March Meeting 2021.

T021. M Li, Mar 2021, Minerals, Metals, and Materials Society (TMS) 2021 150th Annual Meeting.

T020. M Li, Oct 2020, MIT Alumni Faculty Forum.

T019. M Li, Aug 2020, Argonne National Lab (ANL) APS/CNM Workshop.

T018. M Li, Aug 2020, ORNL Neutron Scattering Division, Neutrons and Complementary Techniques for Quantum Materials Workshop.

T017. M Li, Jul 2020, MIT MechE Alliance Seminar Series.

T016. M Li, Dec 2019, ORNL Second Target Station Workshop.

T015. M Li, Oct 2019, U Minnesota Condensed Matter Seminar.

T014. M Li, Sept 2019, 2019 SSRL/LCLS Users' Meeting, SLAC National Accelerator Laboratory.

T013. M Li, Apr 2019, 2019 Nano Conference Boston.

T012. M Li, Mar 2019, University of Virginia Department of Materials Science and Engineering Seminar.

T011. M Li, Jan 2019, MIT IAP Physics Lecture Series.

T010. M Li, Oct 2018, Department of Physics Seminar Series, Boston College.

T009. M Li, Oct 2018, Materials Science and Engineering Seminar, Rensselaer Polytechnic Institute.

T008. M Li, Sept 2018, Institut Quantique Seminar, University of Sherbrooke, Canada.

T007. M Li, Feb 2018, MIT CEE Henry L. Pierce Laboratory Seminar Series.
 T006. M Li, Nov 2017, 2017 Materials Research Society (MRS) Fall Meeting.
 T005. M Li, Apr 2017, seminar at Mechanical Engineering Department, University of South Carolina.
 T004. M Li, Apr 2016, National Synchrotron Light Source- II Friday Lunchtime Seminar Series, Brookhaven National Lab.
 T003. M Li, Feb 2016, Del Favero Doctoral Thesis Prize Lecture.
 T002. M Li, Jun 2015, DOE Energy Frontier Research Center (EFRC), Solid-State Solar Thermal Energy Conversion (S³TEC) Seminar.
 T001. M Li, Feb 2015, Condensed-Matter Physics & Materials Science Seminar, Brookhaven National Lab.

TEACHING

2023 Fall	22.52 "Quantum Theory of Materials Characterization" (Rating 7.0/7.0)
2023 Fall	22.12 "Radiation Matter Interaction" (Rating 5.9/7.0)
2023	MIT Alan J. Lazarus (1953) Excellence in Advising Award
2023	MIT School of Engineering Junior Bose Award
2022 Spring	22.C51 "Machine learning in nuclear science and engineering" (Rating 6.8/7.0)
2022 Spring	22.02 "Applied nuclear physics" (Rating 6.0/7.0)
2022	Outstanding Teacher Award by American Nuclear Society (ANS) at MIT
2021 Fall	22.S902 "Quantum theory of materials characterizations" (Rating 7.0/7.0)
2021 Fall	22.12 "Radiation-matter interaction" (Rating 5.7/7.0)
2021	MIT Ruth and Joel Spira Award for Excellence in Teaching
2021	Panelist, MIT Teaching + Learning Lab English-as-a-Second-Language Faculty Panel
2021 Spring	22.042 "Machine learning in nuclear science and engineering" (Rating 6.6/7.0)
2021 Spring	22.02 "Applied nuclear physics" (Rating 6.3/7.0)
2020 Fall	22.12 "Radiation-matter interaction" (Rating 6.8/7.0)
2020 Spring	22.02 "Applied nuclear physics" (Rating N/A)
2020	MIT Alumni Class Funds Education Initiatives Funding
2019 Fall	22.12 "Radiation-matter interaction" (Rating 6.3/7.0)
2019 Spring	22.02 "Applied nuclear physics" (Rating 6.4/7.0)
2018 Fall	22.12 "Radiation-matter interaction" (Rating 6.4/7.0)
2018 Spring	22.02 "Applied nuclear physics" (Rating 6.6/7.0)
2017	MIT Educational Technology Teaching Certificate
2016	MIT Kaufman Teaching Certificate
2015	MIT NSE Outstanding Teaching Assistant (TA) Award
2015	MIT NSE Outstanding Grader of the Year

SERVICE

2024	Chair, SNS/HFIR User Group (SHUG) Executive Committee (EC), Oak Ridge
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	National Lab (ORNL)
2024	Tutorial Lecturer for American Conference of Neutron Scattering (ACNS)
2024	Co-Chair, American Conference of Neutron Scattering (ACNS) 2024 Symposium on Emerging applications in Neutron Scattering
2024	Organizing Committee, NT24 (24 th International Conference on the Science and Applications of Nanotubes and Low-Dimensional Materials)
2024	Co-organizer, NT24 (24 th International Conference on the Science and Applications of Nanotubes and Low-Dimensional Materials), 16th Symposium on Computational Challenges in Nanotubes, 2D Materials, and Their Macroscopic Assemblies
2023	Organizing Committee member, 2023 Advanced Light Source (ALS) Visioning Workshop, Lawrence Berkeley National Laboratory (LBL)
2023	Organizing Committee for the 2023 Neutron Scattering Users Meeting, Oak Ridge National Lab (ORNL)
2023 – 2024	Vice Chair of the Executive Committee (EC), SNS/HFIR User Group (SHUG) at Oak Ridge National Lab (ORNL)
2023	Organizer for MRS 2023 Fall Meeting Symposium QT02 “ <i>Space, Energy and Time-Resolved Spectroscopies for Emergent Quantum Materials</i> ”
2023	Organizing Committee for the APS/CNM 2023 Users Meeting, Argonne National Lab (ANL)
2023	Organizer, “Topological Quantum Materials toward an Energy Efficient World”, an NSE and NSF Workshop
2023	Co-organizer for American Chemical Society (ACS) Fall Meeting 2023 Symposium
2023	NSF Reviewer, Center for High Resolution Neutron Scattering (CHRNS) at NIST NCNR.
2022 – Present	Executive Committee (EC) member, SNS/HFIR User Group (SHUG) at Oak Ridge National Lab (ORNL)
2022 – Present	Ambassador, MIT Recreation
2022 – Present	Editorial Advisory Board, APL Machine Learning, AIP Publishing
2021 – Present	Advisory Board, Artificial Intelligence for MultiModal Analysis (AIMM), Department of Energy (DOE) Scientific User Facilities
2021 – Present	Member, MIT Center of Quantum Engineering (CQE)
2021 – Present	Advisory Board, Center for Quantum Actinide Science and Technology (C-QAST), Idaho National Lab (INL), funded by National Science Foundation (NSF)
2021 – Present	Member, MIT-IBM Watson AI Lab
2021 – Present	Member, APS User Organization Steering Committee, Argonne National Lab
2022 – Present	Vice Chair, APS User Organization Steering Committee, Argonne National Lab
2021	Organizer for MRS 2021 Fall Meeting Symposium EQ04 “ <i>Machine Learning on Experimental Data for Emergent Quantum Materials</i> ”
2021	Organizer for Brookhaven National Laboratory NSLS-II & CFN Annual Users’ Meeting Workshop “ <i>Machine Learning Augmented X-Ray Scattering and</i>

Spectroscopies

2021 Co-Organizer for MRS 2021 Spring Meeting Symposium CT04 “*Predictive Modeling Augmented Multimodal Characterization of Emergent Quantum Materials*”

2020 Co-organizer for AMSE 2020 Symposium 27 “*Quantum Materials*”

2020 – Present Science Reviewer, Neutron Sciences General User Program at Oak Ridge National Lab

2020 Co-organizer for Argonne National Laboratory APS/CNM Users Meeting Workshop “*Multi-Modal X-ray Techniques for Emergent Quantum Materials*”

2019 – Present Voting Member, MIT Radiation Protection Committee (RPC)

2019 Organizer for MRS 2019 Fall Meeting Symposium MQ03 “*Predictive Synthesis and Advanced Characterization of Emerging Quantum Materials*”

2019 Organizer for Brookhaven National Laboratory NSLS-II & CFN Users’ Meeting Workshop “*Collective Phenomena in Quantum Materials*”

2018 – 2021 Member of Editorial Board, *iScience* (Cell Press)

2018 – Present Member of Editorial Board, *PeerJ Materials Science*

2018 – Present Proposal Review Panel, Advanced Photon Source, Argonne National Lab

2018 – Present Reviewer, National Science Foundation (NSF)