

Honglie Ning

Department of Physics, Massachusetts Institute of Technology

Email: hning@mit.edu

Website: www.hongliening.com

Phone: 626-253-0782

PROFESSIONAL EXPERIENCE AND EDUCATION

Massachusetts Institute of Technology

Postdoctoral researcher
Advisor: Nuh Gedik

Cambridge, MA
US

Sep. 2022 -
Now

California Institute of Technology

Ph.D. in Physics
Advisor: David Hsieh

Pasadena, CA
US

Sep. 2016 -
Aug. 2022

Peking University

B.S. in Physics (with Honors)

Beijing, BJ
China

Sep. 2012 -
Aug. 2016

PUBLICATIONS

Articles (* denotes equal contribution, † denotes corresponding author):

H. Ning*, K. H. Oh*, Y. Su*, A. von Hoegen, Z. Porter, A. Capa Salinas, Q. L. Nguyen, M. Chollet, T. Sato, V. Esposito, M. C. Hoffmann, A. White, C. Melendrez, D. Zhu, S. D. Wilson, and N. Gedik†, Dynamical decoding of the competition between charge density waves in a kagome superconductor, *Nat. Commun.*, **15**, 7286 (2024).

H. Ning† and N. Gedik†, Visualizing the moiré of moiré, *Nat. Mater.*, accepted (2024).

X. Li, I. Esin, Y. Han, Y. Liu, H. Zhao, **H. Ning**, C. Barrett, J. Shan, K. Seyler, G. Cao, G. Refael, D. Hsieh†, Time-hidden magnetic order in a multi-orbital Mott insulator, *Nat. Phys.*, accepted (2024).

H. Ning*, O. Mehio*, X. Li*, M. Buchhold, M. Driesse, H. Zhao, G. Cao, D. Hsieh†, A coherent phonon induced hidden quadrupolar ordered state in Ca_2RuO_4 , *Nat. Commun.* **14**, 8258 (2023).

O. Mehio*, X. Li*, **H. Ning***, Z. Lenarčič, Y. Han, M. Buchhold, Z. Porter, N. J. Laurita, S. D. Wilson, D. Hsieh†, A Hubbard exciton fluid in a photo-doped antiferromagnetic Mott insulator, *Nat. Phys.* **19**, 1876 (2023).

H. Ning*, O. Mehio*, C. Lian*, X. Li, E. Zoghlin, P. Zhou, B. Cheng, S. D. Wilson, B. M. Wong, D. Hsieh†, Light-induced Weyl semiconductor-to-metal transition mediated by Peierls instability, *Phys. Rev. B.* **106**, 205118 (2022).

X. Li*, **H. Ning***, O. Mehio*, B. Hu, M. C. Lee, K. W. Kim, T. W. Noh, G. Cao, D. Hsieh†, Keldysh space control of charge dynamics in a strongly driven Mott insulator, *Phys. Rev. Lett.* **128**, 187402 (2022).

H. Ning, O. Mehio, M. Buchhold, T. Kurumaji, G. Refael, J. G. Checkelsky, D. Hsieh†, Signatures of ultrafast reversal of excitonic order in Ta_2NiSe_5 , *Phys. Rev. Lett.* **125**, 267602 (2020).

A. Ron, S. Chaudhary, G. Zhang, **H. Ning**, E. Zoghlin, S. D. Wilson, R. D. Averitt, G. Refael, D. Hsieh†, Ultrafast enhancement of ferromagnetic spin exchange induced by ligand-to-metal charge transfer, *Phys. Rev. Lett.* **125**, 197203 (2020).

Y. Zhang*, **H. Ning***, Y. Li, Y. Liu, and J. Wang†, Negative to positive crossover of the magnetoresistance in layered WS_2 , *Appl. Phys. Lett.* **125**, 153114 (2016).

Manuscripts under review and in preparation (* denotes equal contribution, † denotes corresponding author):

T. Luo*, **H. Ning***, B. Ilyas*, A. von Hoegen*, E. Viñas Boström, J. Park, J. Kim, J.-G. Park, D. Juraschek, A. Rubio, N. Gedik†, Terahertz control of linear and nonlinear magnon-phononics, under review (2024).

Z. Zhang*, **H. Ning***, Z.-J. Liu*, J. Hou, A. D. Mohite, E. Baldini, N. Gedik, K. A. Nelson†, Keldysh tuning of photoluminescence in a lead halide perovskite crystal, under review (2024).

O. Mehio*, Y. Han*, X. Li, **H. Ning**, Z. Porter, S. D. Wilson, D. Hsieh†, Observation of excitons bound by antiferromagnetic correlations, under review (2024).

Z. Ye*, C. Zhang*, **H. Ning**, W. Li, L. Chen, T. Jia, M. Hashimoto, D. Lu, Z.-X. Shen, Y. Zhang†, Simultaneous emergence of superconductivity, inter-pocket scattering and nematic fluctuation in potassium-coated FeSe superconductor, arXiv: 1512.02526 (2015).

H. Ning*, T. Luo*, B. Ilyas*, E. Viñas Boström, J. Park, J. Kim, J.-G. Park, D. Juraschek, A. Rubio, N. Gedik†, Spontaneous emergence of phonon chirality through hybridization with magnons, in prep (2024).

H. Ning*, O. Mehio*, Y. Han, X. Li, K. L. Seyler, Z. Porter, S. D. Wilson, D. Hsieh†, Differential impact of photo-excited free and bound carriers on ultrafast demagnetization, in prep (2024).

H. Ning*, K. H. Oh*, Y. Su*, A. Zong, D. Wu, B. Q. Lv., D. Z. Shi, Z. Shen, G. Kang, H. Choi, H.-W. Kim, S. Ha, J. Kim, S. Sarker, J. P. C. Ruff, B. J. Kim, N.-L. Wang, H. Jang, N. Gedik†, Optically controllable enhancement and reduction of charge density waves mediated by phase competition, in prep (2024).

K. H. Oh*, Y. Su*, **H. Ning***, A. Zong, D. Wu, B. Q. Lv., D. Z. Shi, Z. Shen, G. Kang, H. Choi, H.-W. Kim, S. Ha, J. Kim, X. Shen, D. Luo, S. Weathersby, P. Kramer, X.Cheng, S. Sarker, J. P. C. Ruff, B. J. Kim, N.-L. Wang, H. Jang, N. Gedik†, Shear-type topological defects in jointly commensurate charge density wave, in prep (2024).

PRESENTATIONS AND POSTERS

Invited:

Terahertz control of magno-phononics in 2D antiferromagnets, XII Ultrafast Dynamics and Ultrafast Bandgap Photonics, 2024

Ultrafast optical control of order parameters in quantum materials, Institute of Physics, Chinese Academy of Science, 2023

Evidence for light-induced order decoupling and phase competition in a kagome metal, Moore Postdoctoral Symposium, 2023

Ultrafast manipulation of order parameters in strongly correlated materials, Massachusetts Institute of Technology, 2021

Ultrafast manipulation of order parameters in condensed matter, Stanford University, 2021

Ultrafast manipulation of order parameters in condensed matter, University of California, Berkeley, 2021

Probing the ultrafast switch of electronic orders via coherent phonons, California Institute of Technology, 2021

Contributed:

Crossover between linear and nonlinear magno-phononics, Gordon Research Conference, 2024

Dynamical decoding of competing charge density waves in a kagome superconductor, APS March Meeting, 2024

Dynamics of antiferromagnetic order in a Mott insulator upon photodoping, APS March Meeting, 2023

Signatures of light-induced switch of spin-orbit-coupled quadrupolar order in Ca_2RuO_4 , Gordon Research Conference, 2023

Wavelength-dependent coherent phonon spectroscopy of Ca_2RuO_4 , APS March Meeting, 2022

Signatures of ultrafast reversal of excitonic order in Ta_2NiSe_5 , APS March Meeting, 2021

Dynamics of an order parameter coupled phonon in an excitonic insulator, APS March Meeting, 2020

Time-resolved second harmonic generation polarimetry study of elemental tellurium, APS March Meeting, 2019

ACADEMIC SERVICE

Review editor for *Frontiers in Electronic Materials*.

Reviewed for journals: *Nat. Rev. Mater.*, *Nat. Mater.*, *Phys. Rev. Lett.*, *Phys. Rev. Mater.*, *npj Quantum Mater.*, *Nano Lett.*

HONORS AND AWARDS

DMP Postdoctoral travel award	APS	2024
Miller Postdoctoral Fellowship (declined)	Johns Hopkins University	2022
Tombrello Scholar, France A Cordova Graduate Student Fund	California Institute of Technology	2021
National Scholarship, WeiMingXueZi Fellowship, Samsung Scholarship, Tung OOCL Scholarship	Peking University	2013-2015

TEACHING ASSISTENTSHIP, MENTORSHIP, AND SCIENTIFIC OUTREACH

Judge at the Annual Science and Engineering Fair	Pioneer Charter School of Science	2023, 2024
DEI journal club committee member	Massachusetts Institute of Technology	2022-Now
Teaching assistant for Physics of Measurement (Graduate)	California Institute of Technology	2021
Thesis mentor for 2 graduate students	Massachusetts Institute of Technology	2022-Now
Mentor for 5 undergraduates and 4 high school students	California Institute of Technology	2017-2021