Department of Physics
Florida State University

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RESEARCH POSITION

Department of Physics, Florida State University — Tallahassee, FL, America
Assistant Professor — August **2024** - Present

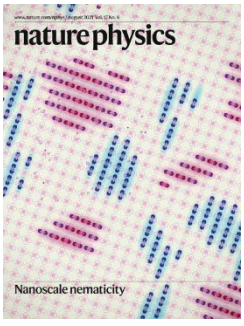
EDUCATION

Department of Physics, Shandong University — Ji Nan, Shandong, China
B.S. of Physics — September **2010** - May **2014**
Department of Physics, Boston College — Chestnut Hill, MA, America
Ph.D. of Physics — June **2014** - September **2020**
Advisor **Ilija Zeljkovic**
Department of Physics, Boston College — Chestnut Hill, MA, America
Postdoc — October **2020 -** March **2021**
Advisor **Ilija Zeljkovic**
Condensed Matter Physics and Materials Science Department, — Upton, NY, America
Brookhaven National Laboratory — April **2021 –** July **2024**
Postdoc Research Associate — Advisor **Abhay Pasupathy**

PUBLICATIONS

Google Scholar [Link] (Lead authorship in: 2 ***Nature***, 3 ***Nature physics***, 1 ***Nature Materials***, 1 ***Science Advances***, 1 ***Physics Review B***, 1 **under review**)

1. **He Zhao**†, et al., "Visualizing the finite-momentum pairing state in $EuRbFe_4As_4$ by quasiparticle interference" *under review* (2025)
2. **He Zhao**, et al., "Smectic pair density wave order in $EuRbFe_4As_4$" ***Nature*** 618, 940–945 (2023) Link
3. **He Zhao**, et al., "Cascade of correlated electron states in the kagome superconductor CsV_3Sb_5" ***Nature*** 599, 216–221 (2021) Link
4. Hong Li*, **He Zhao***, et al., "Rotation symmetry breaking in the normal state of a kagome superconductor KV_3Sb_5" ***Nature Physics*** 18, 265 (2022) Link



5. **He Zhao**, et al., "Nematic transition and nanoscale suppression of superconductivity in Fe(Te, Se)" ***Nature Physics*** 17, 903–908 (2021), *Cover work* Link
6. **He Zhao**, et al., "Imaging antiferromagnetic domain fluctuations and the effect of atomic scale disorder in a doped spin-orbit Mott insulator" ***Science Advances*** 7, eabi6468 (2021) Link
7. **He Zhao**, et al., "Atomic-scale fragmentation and collapse of antiferromagnetic order in a doped Mott insulator" ***Nature Physics*** 15, 1267–1272 (2019), *Cover work* Link
8. **He Zhao**, et al., "Charge-Stripe Crystal Phase in an Insulating Cuprate" ***Nature Materials*** 18, 103-107 (2019) Link
9. **He Zhao**, et al, "Superconducting Proximity Effect in a Topological Insulator using Fe(Te, Se)" ***Physical Review B*** 97, 224504 (2018) Link
10. Bryan Rachmilowitz*, **He Zhao***, et al., "Proximity-Induced Superconductivity in a Topological Crystalline Insulator" ***Physical Review B*** 100, 241402(R) (2019) Link

11. Hong Li, **He Zhao**, et al., "Unidirectional coherent quasiparticles from high-temperature rotational symmetry broken phase of AV_3Sb_5 kagome superconductors" ***Nature Physics*** 19, 637–643 (2023) Link
12. Hong Li, **He Zhao**, et al., "Manipulation of Dirac band curvature and momentum-dependent g factor in a Kagome magnet" ***Nature Physics*** 18, 644–649 (2022) Link
13. Zheng Ren, Hong Li, **He Zhao**, Shrinkhala Sharma, Ziqiang Wang, and Ilija Zeljkovic, "Nanoscale decoupling of structural anisotropy and electronic nematicity in FeSe thin films" ***Nature Communications*** 12, 10 (2021) Link
14. Bryan Rachmilowitz, **He Zhao**, et al., "Coulomb Blockade Effects in a Topological Insulator Grown on a High-T_c Cuprate Superconductor" ***npj Quantum Materials*** 5, 72 (2020) Link
15. Lianyang Dong, **He Zhao**, Ilija Zeljkovic, Stephen D Wilson, John W Harter. "Bulk superconductivity in via physicochemical pumping of excess iron" ***Physical Review Materials*** 3, 114801 (2019) Link
16. Shang Gao, Felix Flicker, Raman Sankar, **He Zhao**, et al., "Atomic-Scale Strain Manipulation of a Charge Density Wave" ***PNAS*** 115, 6986 (2018) Link

Notes: † *Corresponding author*; * *Equally contributed*

Talks

1. "A tale of two Pair Density Wave (PDW) states in an Iron-based superconductor", Invited talk, Florida State University Dirac Quantum Discussions, **Feb 2025**
2. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, National University of Singapore, **May 2024**
3. "Smectic pair density wave order in a magnetic superconductor", Invited talk, Session "Recent Developments in Experiment and Theory of Pair Density Waves in Unconventional Superconductors", American Physical Society, Minneapolis, MN, **March 2024**
4. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, Rutgers University, New Brunswick, **Feb 2024**
5. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, University of Houston, Houston, **Feb 2024**
6. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, University of Texas, Austin, **Feb 2024**
7. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, University of Minnesota, Twin city, **Feb 2024**
8. "A tale of two Pair Density Wave (PDW) states in a magnetic superconductor", Invited talk, University of Illinois, Chicago, **Feb 2024**
9. "Superconductors coupled to magnets", Invited talk, Flatiron Institute, Manhattan, NY, **October 2023** (Symposium: Superconductivity)
10. "Visualizing pair density wave order in a magnetic superconductor", Invited talk, Columbia University, Manhattan, NY, **May 2023** (*Pro-QM Zeminar*)

11. "Smectic pair density wave order in $EuRbFe_4As_4$", Invited talk, Pennsylvania State University, State College, PA, **Jan 2023** (*CAMP Seminar*)

12. "Smectic pair density wave order in $EuRbFe_4As_4$", APS march meeting, Las Vegas, NV, **March 2023** (Session chair)

13. "Atomic-scale fragmentation and collapse of antiferromagnetic order in a doped Mott insulator", American Physical Society, Denver, CO, **March 2020**

14. "Observation of the Charge-Stripe Crystal Phase in an Insulating Cuprate", American Physical Society, Boston, MA, **March 2019**

15. "Proximity-Induced Superconductivity in a Topological Insulator using an Fe-based Superconductor", American Physical Society, Los Angeles, CA, **March 2018**

Posters

1. He Zhao, Raymond Blackwell, Morgan Thinel, Taketo Handa, Shigeyuki Ishida, Xiaoyang zhu, Akira Iyo, Hiroshi Eisaki, Abhay N. Pasupathy, Kazuhiro Fujita (Gordon Research conference/Seminar, Ventura, CA, May 2023) "Smectic pair density wave in magnetic iron-based superconductor $EuRbFe_4As_4$"
2. He Zhao, Zheng Ren, Bryan Rachmilowitz, John Schneeloch, Ruidan Zhong, Genda Gu, Ziqiang Wang, Ilija Zeljkovic (Gordon Research Conference, Mt. Holyoke College, June 2018) "Observation of the Charge-Stripe Crystal Phase in an Insulating Cuprate"

PROFESSIONAL SERVICE

- **Reviewer** for: Science, Physical Review Letters, Physical Review B