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Wang, Zhipan (王之盼) Ph.D.

Background

Department of Physics, Harvard University MA, USA
Postdoctoral Fellow 2022 - Now
- Advisor: Prof. Norman Yao and Christopher Laumann
- Research area: Quantum sensing under extreme condition

Department of Physics, University of California, Davis CA, USA
Ph.D. in Condensed Matter Physics 2017 - 2022
- Advisor: Prof. Nicholas Curro
- Research area: Nuclear magnetic resonance and NV quantum sensing

Department of Physics, University of Science and Technology of China China
B.S. in Applied Physics 2013 - 2017
- Honor Program: Yan, Jici Talent Student Program
- Advisor: Prof. Zhenhua Qiao

Publications

Manuscripts under review

1. SV Mandyam*, E Wang*, **Z Wang***, B Chen*, et al. Uncovering origins of heterogeneous superconductivity in $La_3Ni_2O_7$ using quantum sensors. *Under review in* ***Nature***
2. G He*, R Gong*, **Z Wang***, et al. Probing stress and magnetism at high pressures with two-dimensional quantum sensors. *Under review in* ***Nature Commuication***

Publications

1. **Z Wang**, C McPherson, R Kadado, N Brandt, S Edwards, WH Casey, and NJ Curro. ac sensing using nitrogen-vacancy centers in a diamond anvil cell up to 6 gpa. ***Physical Review Applied***, 16(5):054014, 2021
2. **Z Wang**, I Vinograd, Z Mei, P Menegasso, D Garcia, P Massat, IR Fisher, and NJ Curro. Anisotropic nematic fluctuations above the ferroquadrupolar transition in $TmVO_4$. ***Physical Review B***, 104(20):205137, 2021
3. **Z Wang**, C McPherson, R Kadado, WH Casey, and NJ Curro. Optically detected nmr in a diamond-anvil cell for geochemistry. In ***Advances in Inorganic Chemistry***, volume 78, pages 269–287. Elsevier, 2021
4. P Bhattacharyya, W Chen, X Huang, S Chatterjee, B Huang, B Kobrin, Y Lyu, TJ Smart, M Block, E Wang, **Z Wang**, et al. Imaging the meissner effect in hydride superconductors using quantum sensors. ***Nature***, 627(8002):73–79, 2024
5. I. Vinograd, SP Edwards, **Z Wang**, T Kissikov, JK Byland, JR Badger, V Taufour, and NJ Curro. Inhomogeneous knight shift in vortex cores of superconducting FeSe. ***Phys. Rev. B***, 104:014502, Jul 2021
6. P Menegasso, JC Souza, I Vinograd, **Z Wang**, SP Edwards, PG Pagliuso, NJ Curro, and RR Urbano. Hyperfine couplings as a probe of orbital anisotropy in heavy-fermion materials. ***Physical Review B***, 104(3):035154, 2021
7. I Vinograd, KR Shirer, P Massat, **Z Wang**, T Kissikov, D Garcia, MD Bachmann, M Horvatic, IR Fisher, and NJ Curro. Second order zeeman interaction and ferroquadrupolar order in $TmVO_4$. ***npj Quantum Materials***, 7(1):1–8, 2022
8. VA Norman, S Majety, **Z Wang**, WH Casey, NJ Curro, and M Radulaski. Novel color center platforms enabling fundamental scientific discovery. ***Infomat***, 3(8):869–890, 2021
9. WH Casey, **Z Wang**, N Brandt, and NJ Curro. The promise of optical nmr spectroscopy for experimental aqueous geochemistry. ***American Journal of Science***, 320(6):533–545, 2020

Research Highlights

X-Ray Structural Characterization of Nickelate Superconductivity at High Pressure
Advanced Light Source HPCAT 2025.04

Investigating Superconductivity under Pressure using NV Sensors
Harvard Yao Lab 2022.09 - Now

Development of an Optically Detected Magnetic Resonance Spectrometer under Pressure
UC Davis Curro Lab (PhD thesis) 2017.09 - 2022.09

Investigating Critical Nematic Fluctuations in the Ferroquadrupolar Insulator $TmVO_4$
UC Davis Curro Lab 2017.09 - 2022.09

Fellowship Awards

- UC Davis Graduate Program Fellowship 2020
- UC Davis Graduate Studies Travel Award 2019
- UC Davis Graduate Program Fellowship 2018
- USTC National Scholarship for Outstanding Students 2014-2017
- USTC Freshman Scholarship 2013

Conference Presentations

- American Physical Society March meeting, CA 2025.03
- Gordon research conference Research in High Pressure, NH 2024.08
- APS March meeting, MN 2024.03
- APS March meeting, IL 2022.03
- APS March meeting, remote 2021.03
- APS March meeting, MA 2019.03
- APS FWS Annual Meeting, CA 2018.10

Experimental Skills

Cryogenics (cryostat build & cryogenic liquid use)

High pressure (diamond anvil cell and gas membrane, piston cell & Razorbill strain cell build)

Nuclear magnetic resonance (NMR spectrometer and probe build & spectra post-processing)

Laser optics (high-speed confocal, wide-field & Raman microscope build)

Fabrication and imaging (e-beam diamond fabrication, color center fabrication & SEM FIB use)

Teaching Experiences

Mentor to multiple undergraduate research interns and graduate students at Harvard University 2022-Now

Teaching assistant in upper-division Quantum Mechanics (PHY115A&B) at UC Davis 2019-2020

UC Davis Physics Research Experiences for Undergraduates program (REU) graduate student mentor 2018-2020