

## Prof. Dr. JI, Wei (季伟)

PKU-Ji-lab  
School of Physics N223  
Peking University, Beijing, China  
wei.ji@pku.edu.cn

### Research Interest Keywords

- New Physics beyond the Standard Model  
Exotic Spin-Dependent Force (5th Force)  
Ultralight Bosonic Dark Matter
- Precision Magnetometry  
LeMaMa (Levitated Magnet Magnetometer)  
Atomic Magnetometers

### Employment

|                                                                              |                       |
|------------------------------------------------------------------------------|-----------------------|
| Assistant Professor, Peking University                                       | Mar. 2025 -           |
| Research Associate, Helmholtz Institute Mainz, Johannes Gutenberg University | Apr. 2021 - 12. 2024  |
| Section Leader: Prof. Dr. Dmitry Budker                                      |                       |
| Research Associate, Tsinghua University                                      | Aug. 2020 - Mar. 2021 |
| Visiting Instructor for Physics, Duke Kunshan University                     | Aug. 2019 - Jul.2020  |

### Education

#### **Ph.D. in Physics, Sep. 2014 - Jul. 2019**

Department of Physics, Tsinghua University

- Doctoral Advisor: Haiyan Gao  
Henry Newson Professor, Department of Physics, Duke University, U.S.A  
Visiting Professor, Tsinghua University, China (2009 - 2019)
- Ph.D Dissertation:  
*Searching for Spin and Velocity Dependent forces with Spin-Exchange-Relaxation-Free magnetometer and SmCo5.*

- Joint Training of Doctoral Students (non-degree),  
Department of Physics, Duke University Aug. 2017 - Aug. 2018  
Advisor: Haiyan Gao & Calvin R. Howell

### Bachelor of Science, Sep. 2010 - Jul. 2014

Department of Mathematics , Jilin University

- Major: Physics- Aoqing Tang Elite Class  
(National Training Plan of Basic Science of Top-notch Students).

- Academic Dissertation:

*Optimization of the magnetic field uniformity in the searching for Spin-Dependent Short Range Force experiment.*

- Exchange Students (non-degree) Aug. 2013 - Dec. 2013  
Georgia Institute of Technology

## Honors and Awards

- 2019 Doctoral Thesis With the Highest Distinction, Tsinghua University
- 2019 Chih-Kung Jen Prize, Tsinghua University
- 2019 Yu-Hsun Woo Nominee Prize, Tsinghua University
- 2018 First Prize (for oral presentation),  
PFUNT (Physics Five Universities, the National Top) Forum

## Publications

\* represent the corresponding author(s), <sup>†</sup> represent the co-first author(s).

Invited or peer-reviewed publication:

- [1] Heng Xing, Zitong Xu, Xiaofei Huang, Dinghui Gong, Guoqing Tian, **Wei Ji**<sup>\*</sup>, Jiancheng Fang, Dmitry Budker, and Kai Wei<sup>\*</sup>. *Search for a parity-violating long-range spin-dependent interaction.* **Proceedings of the National Academy of Sciences** 122(41), e2512538122 (2025).
- [2] Zitong Xu, Heng Xing, Guoqing Tian, Di Gong, Lei Cong, **Wei Ji**<sup>\*</sup>, Dmitry Budker, and Kai Wei<sup>\*</sup>. *Constraints on Axion Mediated Dipole-Dipole Interactions.* **Physical Review Letters** 134, 181801 (2025).
- [3] Lei Cong<sup>\*†</sup>, **Wei Ji**<sup>\*†</sup>, Pavel Fadeev, Filip Ficek, Min Jiang, Victor V. Flambaum, Haosen Guan, Derek F. Jackson Kimbal, Mikhail G. Kozlov, Yevgeny V. Stadnik and Dmitry Budker. *Spin-dependent exotic interactions.* **Reviews of Modern Physics** 97,025005(2025)
- [4] Kai Wei <sup>†</sup>, Zitong Xu <sup>†</sup>, Yuxuan He, Xiaolin Ma, Xing Heng, Xiaofei Huang, Wei Quan, **Wei Ji**<sup>\*</sup>, Jia Liu<sup>\*</sup>, Xiaoping Wang, Dmitry Budker and Jiancheng Fang<sup>\*</sup> *Dark*

*matter search with a resonantly-coupled hybrid spin system.* **Reports on Progress in Physics** 88, 057801 (2025). **Research Highlight of the Year! & Editor's Pick!**

- [5] Felix Ahrens, **Wei Ji**, Dmitry Budker, Chris Timberlake, Hendrik Ulbricht, and Andrea Vinante *Levitated ferromagnetic magnetometer with energy resolution well below  $\hbar$ .* **Physical Review Letters** 134, 18, 110801 (2025).
- [6] Haowen Su, Min Jiang, Yuanhong Wang, Ying Huang, Xiang Kang, **Wei Ji**, Xinhua Peng, and Dmitry Budker. *New constraints on axion-mediated spin interactions using magnetic amplification.* **Physical Review Letters** 133, no. 19 : 191801 (2024).
- [7] Zitong Xu, Xiaolin Ma, Kai Wei, Yuxuan He, Xing Heng, Xiaofei Huang, Tengyu Ai et al. Constraining ultralight dark matter through an accelerated resonant search. **Communications Physics** 7, no. 1: 226 (2024).
- [8] Saarik Kalia, Dmitry Budker, Derek F. Jackson Kimball, **Wei Ji**, Zhen Liu, Alexander O. Sushkov, Chris Timberlake, Hendrik Ulbricht, Andrea Vinante, and Tao Wang. *Ultralight dark matter detection with levitated ferromagnets.***Physical Review D** 110, 115029 (2024).
- [9] **Wei Ji**, Weipeng Li, Pavel Fadeev, Jianan Qin, Kai Wei\*, Yong-Chun Liu\*, and Dmitry Budker. *New Constraints on Spin-Spin-Velocity-Dependent Interaction.* **Physical Review Letters** 130, 133202(2023).
- [10] Kai Wei, Tian Zhao, Xiujie Fang, Zitong Xu, Chang Liu, Qian Cao, Arne Wickenbrock, Yanhui Hu\*,**Wei Ji**\*, Jiancheng Fang and Dmitry Budker. *Ultrasensitive Atomic Comagnetometer with Enhanced Nuclear Spin Coherence.* **Physical Review Letters** 130, 063201 (2023).
- [11] Wang, Yuanhong, Ying Huang, Chang Guo, Min Jiang\*, Xiang Kang, Haowen Su, Yushu Qin, **Wei Ji**, Dongdong Hu, Xinhua Peng\*, Dmitry Budker, *Search for Exotic Parity-Violation Interactions with Quantum Spin Amplifiers.* **Science Advances**, 9, eade0353 (2023)
- [12] Kai Wei, **Wei Ji**\*, Changbo Fu\*, Arne Wickenbrock, Victor V. Flambaum, Jiancheng Fang, and Dmitry Budker. *Constraints on Exotic Spin-Velocity-Dependent Interactions.* **Nature Communications** 13.1 (2022): 7387.
- [13] Yuanhong Wang, Haowen Su, Min Jiang\*, Ying Huang, Yushu Qin, Chang Guo, Zehao Wang, Dongdong Hu, **Wei Ji**, Pavel Fadeev, Xinhua Peng\*, and Dmitry Budker. *Limits on Axions and Axionlike Particles within the Axion Window Using a Spin-Based Amplifier.* **Physical Review Letters** 129, no. 5 (25 July 2022): 051801.
- [14] Haowen Su, Yuanhong Wang, Min Jiang\*, **Wei Ji**, Pavel Fadeev, Dongdong Hu, Xinhua Peng\*, and Dmitry Budker. *Search for Exotic Spin-Dependent Interactions with a Spin-Based Amplifier,* **Science advances** 7, no. 47 (2021): eabi9535.