

## Xing WU, Ph.D.

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### RESEARCH INTERESTS

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Broadly trained experimental physicist with expertise in precision measurement, and in atomic, molecular & optical physics. With extensive experience in cooling & decelerating molecules and using them to test fundamental laws of physics, I have both invented a unique device to decelerate intense molecular beams to a standstill, and measured the most stringent bound on the value of electron Electric Dipole Moment (EDM) to date, searching for new physics beyond Standard Model.

### EDUCATION

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<b>Ph.D. in Physics</b>	2011 – 17
Technical University of Munich, & Max-Planck-Institute of Quantum Optics, Germany	
<u>Thesis</u> : A centrifuge decelerator and a thermometer for cold polar molecules	
<u>Faculty Advisor</u> : Gerhard Rempe	
<b>M.Sc. in Engineering Physics</b>	2010 – 11
Technical University of Munich, Germany	
<b>B.S. (1<sup>st</sup> Honors) in Physics</b>	2005 – 09
Nanyang Technological University, Singapore.	

### POSITIONS

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<b>Assistant Professor of Physics</b>	2023.08 –
Facility for Rare Isotope Beams, Michigan State University	
<b>Postdoctoral Associate in precision measurement &amp; atomic physics</b>	2021 – 23
Department of Physics, Harvard University & University of Chicago	
Department of Physics, Harvard University & Yale University	
2017 – 20	
<u>Faculty Advisor</u> : John Doyle and David DeMille	
<u>Project</u> : ACME Collaboration. Electron EDM search with cold Thorium Monoxide molecules.	

### FUNDINGS & GRANTS

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<b>NSF</b>	2136573	(significant contributor)	2019 – 24
ACME III: Advanced Cold Molecule Electron EDM Search			\$ 3.7 Million
<b>Moore Foundation</b>	GBMF8024.01	(significant contributor)	2019 – 24
The ACME Electric Dipole Moment Experiment			\$ 1.2 Million

### PUBLICATIONS

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#### Manuscript in preparation:

1. **X Wu**, et. al. *in situ* magnetometry and active field cancellation using molecular quantum state during the ACME electron EDM search. *in prep.* (2023)

### Selected Publications:

2. **X Wu**, P Hu, Z Han, D G Ang, C Meisenhelder, G Gabrielse, J M Doyle, D DeMille. Electrostatic focusing of cold and heavy molecules for the ACME electron EDM search. *New Journal of Physics* 24, 073043 (2022)
3. **X Wu**, Z Han, J Chow, D G Ang, C Meisenhelder, C D Panda, E P West, G Gabrielse, J M Doyle and D DeMille. The metastable  $Q^3\Delta_2$  state of ThO: A new resource for the ACME electron EDM search. *New Journal of Physics* 22, 023013 (2020)
4. **ACME Collaboration**. Improved limit on the electric dipole moment of the electron. *Nature* 562, 355 (2018)
5. **X Wu**, T Gantner, M Koller, M Zeppenfeld, S Chervenkov, and G Rempe. A cryofuge for cold-collision experiments with slow polar molecules. *Science* 358, 645 (2017)
6. S Chervenkov, **X Wu**, J Bayerl, A Rohlfes, T Gantner, M Zeppenfeld, and G Rempe. Continuous centrifuge decelerator for polar molecule. *Phys. Rev. Lett.* 112, 013001 (2014)

### Additional Research Publications:

7. T Masuda, A Hiramoto, DG Ang, C Meisenhelder, C Panda, N Sasao, S Uetake, **X Wu**, D Demille, JM Doyle, G Gabrielse, K Yoshimura. High-sensitivity low-noise photodetector using large-area silicon photomultiplier. *Optics Express* 31, 2, 1943-1957 (2023)
8. A Hiramoto, T Masuda, DG Ang, C Meisenhelder, C Panda, N Sasao, S Uetake, **X Wu**, D Demille, JM Doyle, G Gabrielse, K Yoshimura. SiPM module for the ACME III electron EDM search. *Nucl. Instrum. Methods Phys. Res. A.*, 1045, 167513 (2023)
9. D G Ang, C Meisenhelder, C D Panda, **X Wu**, D DeMille, J M Doyle, G Gabrielse. Measurement of the  $H^3\Delta_1$  Radiative lifetime in ThO. *Phys. Rev. A.* 106 (2), 022808 (2022)
10. T Masuda, D G Ang, N R Hutzler, C Meisenhelder, N Sasao, S Uetake, **X Wu**, D DeMille, G Gabrielse, J M Doyle, and K Yoshimura. Suppression of the optical crosstalk in a multi-channel silicon photomultiplier array. *Optics Express* 29, 11, 16914 (2021)
11. T Gantner, M Koller, **X Wu**, G Rempe, and M Zeppenfeld. Buffer-gas cooling of molecules in the low-density regime: comparison between simulation and experiment. *J. Phys. B.* 53, 145302 (2020)
12. C D Panda, C Meisenhelder, M Verma, D G Ang, J Chow, Z Lasner, **X Wu**, D DeMille, J M Doyle and G Gabrielse. Attaining the shot-noise-limit in the ACME measurement of the electron electric dipole moment. *J. Phys. B* 52, 235003 (2019)
13. M Zeppenfeld, T Gantner, R Glöckner, M Ibrügger, M Koller, A Prehn, **X Wu**, S Chervenkov, and G Rempe. An experimental toolbox for the generation of cold and ultracold polar molecules. *Journal of Physics: Conference Series* 793 012035 (2017)
14. **X Wu**, T Gantner, M Zeppenfeld, S Chervenkov, and G Rempe. Thermometry of guided molecular beams from a cryogenic buffer-gas cell. *ChemPhysChem* 17 (22), 3631-3640 (2016)
15. T Müller, **X Wu**, A Mohan, A Eyvazov, Y Wu, and R Dumke. Towards a guided atom interferometer based on a superconducting atom chip. *New Journal of Physics* 10, 073006 (2008)

### Invited Conference & Seminar Talks

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| 1. Midwest Cold Atom Workshop, University of Wisconsin, Madison, WI                   | 2022 |
| 2. Quantum Metrology & Laser Applications, Vrije University of Amsterdam, Netherlands | 2022 |
| 3. 9th International Symposium on Cold Atom Physics, Quanzhou, China.                 | 2022 |
| 4. International Symposium on Precision Measurement Physics, Wuhan, China.            | 2022 |

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| 5. Van Swinderen Institute Colloquia, University of Groningen, Netherlands          | 2022 |
| 6. Institute of Science and Technology Austria Colloquia, Vienna, Austria           | 2022 |
| 7. Colorado State University Colloquia, Fort Collins, CO                            | 2022 |
| 8. Harvard Quantum Initiative Seminar, Harvard University, Cambridge, MA            | 2022 |
| 9. Center for Ultracold Atoms Seminar, MIT & Harvard University, Cambridge, MA      | 2020 |
| 10. Center for Fundamental Physics Colloquia, Northwestern University, Evanston, IL | 2020 |
| 11. Center of Gravitational Experiments Colloquia, HUST, Wuhan, China,              | 2018 |
| 12. Physics Department Seminar, NTU, Singapore                                      | 2018 |
| 13. Cold and Controlled Molecules & Ions Conference, Athens, GA                     | 2018 |

### **Contributed Talks**

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| 1. 53 <sup>rd</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2022 |
| 2. 85 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section.  | 2022 |
| 3. 52 <sup>nd</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2021 |
| 4. 51 <sup>st</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2020 |
| 5. 50 <sup>th</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2019 |
| 6. 49 <sup>th</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2018 |
| 7. 47 <sup>th</sup> annual meeting of the APS Division of Atomic, Molecular & Optical Physics.                       | 2016 |
| 8. 80 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section.  | 2016 |
| 9. 79 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section.  | 2015 |
| 10. 78 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section. | 2014 |
| 11. 77 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section. | 2013 |
| 12. 76 <sup>th</sup> German Physics Society spring meeting of Atomic, Molecular, Quantum Optics & Photonics Section. | 2012 |

### **Leadership & Contribution to the Academic Community**

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After being nominated as conference chair, I am currently organizing the Gordon Research Seminar (GRS) in Atomic Physics, at Newport RI, in 2023. GRS is the associated seminar for the prestigious Gordon Research Conference (GRC) in Atomic Physics, specifically for graduate students and postdoctoral researchers. I am also assisting the GRC chairs, Dr. Derek Kimball and Dr. Heather Lewandowski, to organize the upcoming 25<sup>th</sup> GRC in Atomic Physics in 2023.

### **Public Outreach**

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Work as lab instructor for advanced physics lab course in high schools in Singapore.	2006-07
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