

## Biographic Sketche

### Yimei Zhu

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### Education/Training:

Institution and Location	Degree	Year	Field of Study
Nagoya University	PhD	1987	Materials Sci./Appl. Phys.
Nagoya University	MS	1984	Electron Microscopy
Shanghai Jiaotong University	BS	1982	Materials Physics

### Research and Professional Experience:

Senior Physicist and Group Leader, CMPMS, BNL	2002 – present time
Special Advisor for the Director of CFN, BNL	2019 – present time
Facility Leader, Center for Functional Nanomaterials (CFN), BNL	2002 – 2010
Physicist with tenure and Group Leader, CMPMS, BNL	1997 – 2002
Scientist, Dept. Appl. Sci., BNL	1993 – 1997
Associate Scientist, Dept. Appl. Sci., BNL	1990 – 1993
Assistant Scientist, Dept. Appl. Sci., BNL	1988 – 1990
Research Associate, Department of Physics, Univ. of Virginia	1986 – 1987
Adjunct Professor, Dept. Phys. & Astron., Stony Brook Univ.	2004 – present time
Adjunct Professor, Dept. Appl. Phys. & Math., Columbia Univ.	2002 – present time
Adjunct Professor, Dept. Mater. Sci. & Eng., Stony Brook Univ.	1997 – present time

### Selected Peer Review Publications:

1. **Zhu, Y.**, "Cryogenic Electron Microscopy on Strongly Correlated Quantum Materials", Invited article, special issue on Cryogenic Electron Microscopy. Guest editors: Y. Cui and L. Kourkoutis, *Accounts of Chemical Research*, 54, 3518-3528 (2021).
2. Li, J.; Wu, L.; Yang, S.; Jin, X.; Wang, W.; Tao, J.; Boatner, L.; Babzien, M.; Fedurin, M.; Palmer, M.; Yin, W.; Delaire, O.; and **Zhu, Y.**, "Direct detection of V-V atom dimerization and rotation dynamic pathways upon ultrafast photoexcitation in VO<sub>2</sub>", *Phys. Rev. X* 12, 021032 (2022).
3. Fu, X.; Barantani, F.; Gargiulo, S.; Madan, I.; Berruto, G.; Lagrange, T.; Jin, L.; Wu, J.; Vanacore, G.M.; Carbone, F.; and **Zhu, Y.**; "Nanoscale-femtosecond dielectric response of Mott insulators captured by two-color near-field ultrafast electron microscopy", *Nat. Comm.*, 11:5770 (2020).
4. Fu, X.; Wang, E.; Zhao, Y.; Liu, A.; Montgomery, E.; Gokhale, V. J.; Gorman, J. J.; Jing, C.; Lau, J. W.; and **Zhu, Y.**, "Laser-free ultrafast electron microscopy of electromagnetic wave dynamics", *Science Advances*, 6 eabc3456 (2020).
5. Zhang, W.; Seo, D.-H.; Chen, T.; Wu, L.; Topsakal, M.; **Zhu, Y.**; Lu, D.; Ceder, G. and Wang, F. "Kinetic pathways of ionic transport in fast charging lithium titanate", *Science*, aax3520 (2020).
6. Han, M.-G.; Garlow, J. A.; Liu, Y.; Zhang, H.; Li, J.; DiMarzio, D.; Knight, M. W.; Petrovic, C.; Jariwala, D. and Zhu, Y., "Topological magnetic-spin textures in two-dimensional van der Waals Cr<sub>2</sub>Ge<sub>2</sub>Te<sub>6</sub>", *Nano Lett.* 19, 11, 7859-7865 (2019).
7. Cheng, S., Li, J., Han, M.G., Deng, S., Tan, G., Zhang, X., Zhu, J., and **Zhu, Y.**, "Topologically Allowed Non-Six-Fold Vortices in a Six-Fold Multiferroic Material: Observation and Classification", cover article, *Phys. Rev. Lett.*, 118, 145501 (2017).

8. Ma, C., Wu, L., Yin, W.-G., Yang, H., Shi, H., Wang, Z., Li, J., Homes, C.C., and **Zhu, Y.**, “Strong coupling of the iron-quadrupole and anion-dipole polarizations in  $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ ”, *Phys. Rev. Lett.* 112, 077001 (2014).
9. Pollard, S. D., Huang, L., Buchanan, K.S., Arena, D.A., **Zhu, Y.**, "Direct dynamic imaging of Non-Adiabatic Spin Torque effects", *Nature Communications*, 3 1028 (2012).
10. **Zhu, Y.**, Inada, H., Nakamura, K., and Wall, J., “Imaging single atoms using secondary electrons with an aberration-corrected electron microscope”, *Nature Materials*, 8 808-812 (2009).

### **Other information of Interest:**

Delivered over 370 invited talks at international conferences and workshops, 50 at academic institutions; authored and co-authored more than 680 peer reviewed journal articles, 250 conference proceedings, 1 book, 14 chapters in books and encyclopedias and edited and co-edited 7 books.

### **Synergistic Activities**

1. Director for Physical Sciences, Microscopy Society of America (2018-2020);
2. Regional Executive Editor (North America), *J. of Electron Microscopy*, Oxford Univ. Press, (2006 - 2013); Editorial Board of *MICRON*, the *International Res. & Rev. J. for Microscopy* (1995 - present);
3. Co-organizer and report writer of DOE/BES basic research needs workshops on “Cryo-EM Roundtable” (2021), “Basic Research Needs for Innovation and Discovery of Transformative Experimental Tools” (2016); “Future of Electron Scattering” (2014); PIs Meeting on Electron and Scanning Probe Microscopy (2014);
4. DOE/BES Review Panels: Germantown 2015; triennial review panels: ORNL 2015, 2018, 2021, LBNL 2016, 2019; ANL 2016; NSF Review Panels: S&T Center - U. Colorado-Boulder (Chair 2015, 2020); Superconductivity - Washington DC (2014); MRI Infrastructures (2021)
5. Organizer and Co-organizer of DOE/BES-CAS (Chinese Academy of Sciences) Collaboration Workshop on Superconductors and Related Quantum Materials, Berkeley (2014), Stony Brook (2015), Shanghai (2016), Half-Moon Bay (2017).

### **Honors and Awards**

- Elected fellow of APS, AAAS, MRS, MSA (inaugural class) and MAS;
- Peter Duncumb Award, highest honor of the Microanalysis Society (2021);
- Distinguished Scientist Award, highest honor of the Microscopy Society of America (2018);
- Member of the National Academy of Inventors (2019);
- R&D100 Award, *R&D World Magazine*, for the development of Laser-free Retrofittable Stroboscopic Solution for Ultrafast Electron Microscopy (2019); for development of Multimodal Optical Nanoprobe (2011);
- Microscopy Innovation Award, *Microscopy<sup>Today</sup>*, for the Development of laser-free electron pulser for ultrafast electron microscopy (2020); for the Development of Compact Quadrupole-based MeV Ultrafast Electron Microscope (2019); for the Development of an innovative method on in-situ optoelectronic microscopy (2011); for the Development of an innovative method of ultra-high-resolution atomic imaging of surfaces and bulk materials (2010);
- Distinguished Asian American Awards, from New York State Governor A. Cuomo (2015);
- World Premier Institute Visiting Professor, Japanese Ministry of Education and Culture (2013);
- Brookhaven National Laboratory’s Distinguished Science and Technology Award (2003).

### **Advisory Committees:**

- Advisory Board, NSF Science and Technology Center for Bright Beams, Cornell Univ., (2018-)
- Chair of the Advisory Board, NSF Center for Translational Applications of Nanoscale Multiferroic Systems, UCLA, CA (2013-);

- Science Advisory Committee, Center for Nanoscale Materials, ANL (2020-);
- External Advisory Board, DOE-EFRC “Manipulation of Atomic Ordering for Manufacturing Semiconductors” (2022-);
- International Scientific Advisory Board, Relativistic Ultrafast Electron Diffraction & Imaging Facility (RUEDI), UK (2021-).

**Graduate and Postdoctoral Advisors:**

Doris Kuhlmann-Wilsdorf, University of Virginia, deceased; Toru Imura, Nagoya University, deceased.

**Graduate Students/Postdoctoral Researchers Supervised (last 5 years):**

Postdoctoral Researchers: Zhen Wang, Shaobo Cheng, Shize Yang, Sung Joo Kim; Wei Wang, Alex Pofelski, Spencer Reisbick, Zach Mansley, and Junsik Mun. Graduate Students: Joseph Garlow, Tatiana Konstantinova, Shiqing Deng and Chuhang Liu.

**Recent Patents:**

- United States Patent, Patent No.: US 11,410,829 B1, “TEM sample holder with cryogenic cooling and broadband RF irradiation”, inventors: C. Jing, S. Ross, R. Kostin, and Y. Zhu, Date of patent issued: Aug. 9, 2022.
- US patent on “Ultra broad band continuously tunable electron beam pulser”, patent No. US 10,319,556 B2, C. Jing, J. Qiu, S.V. Baryshev, J. Lau, and Y. Zhu (2019).
- US patent on “A stroboscopic transmission electron microscope for imaging at MHz and GHz rates”, patent No. 62/236,567, S. Baryshev, J. Qiu, J. Lau, and Y. Zhu (2018).
- US patent on “Apparatus for GHz rate high duty cycle pulsing and manipulation of low and medium energy DC electron beams”, patent No. US 9697982, S. Baryshev, J. Qiu, C. Jing, S. Antipov, J. Lau, and Y. Zhu (2016).