

# YUZI LIU

Scientist

Electron & X-Ray Microscopy

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## Education

Ph.D. Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, China

B. S. Physics, Shandong Normal University, China

## Research interests

- In-situ experiments in TEM: to study the materials evolution under special circumstances (as electrical biased, liquid/gas, heating) by combining with analytical TEM.
- Analytical TEM/STEM: to understand the relationship between growth mechanism, properties and microstructure.
- Electron tomography: to characterize the morphology and chemical distribution of nanomaterials in three dimensions to reveal the hidden info.

## Professional Experience

Argonne National Laboratory - Center for Nanoscale Materials (CNM)  
Scientist

*2016-present*

Argonne National Laboratory - Center for Nanoscale Materials (CNM)  
Assistant Scientist

*2011-2016*

- Materials transformation under special circumstances (electrically biased, liquid, gas, and heating) by in situ transmission electron microscopy.
- The structure of nanomaterials in 3D.

Argonne National Laboratory - Materials Science Division  
Postdoctoral Appointee

*2008-2011*

- Application of site-specific nano-biasing in situ TEM to study the relationship between the transport properties and microstructure of magnetic tunnel junctions (MTJs) by combining this technique with analytical TEM.
- Study of the relationship between properties and microstructure of functional materials by analytical TEM.

Georgia Institute of Technology and University of Texas at Arlington  
Postdoc

*2007-2008*

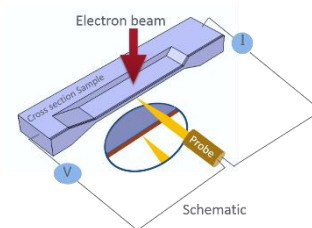
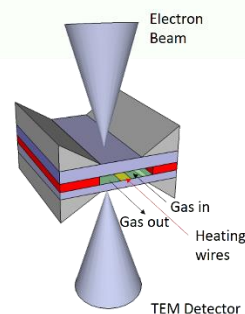
- Investigation of the composited (hard and soft magnets) magnetic materials microstructure including the nanoparticles and magnetron sputtered multilayer exchange spring magnet using the advanced analytical TEM to better understand the relationship between its chemistry and structure to enhance the energy product.

## Selected Publications

Selected from 80+ publications:

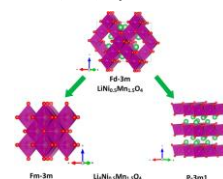
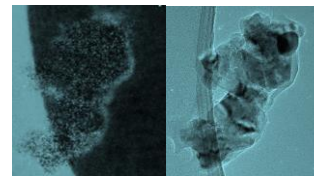
### Materials transformation by in situ transmission electron microscopy.

1. Y. A. Wu, L. Li, Z. Li, A. Kinaci, M. K. Y. Chan, Y. Sun, J. R. Guest, I. McNulty, T. Rajh, Y. Liu, "Visualizing Redox Dynamics of a Single Ag/AgCl Heterogeneous Nanocatalyst at Atomic Resolution", *Acs Nano* **2016**. 10(3): p. 3738.
2. Y. Liu and Y. Sun, "Electron beam induced evolution in Au, Ag, and interfaced heterogeneous Au/Ag nanoparticles", *Nanoscale*, **2015**. 7(32): p. 13687.
3. K. D'Aquila, Y. Liu, H. Iddir, and A. K. Petford-Long, "In situ TEM study of reversible and irreversible electroforming in Pt/Ti:NiO/Pt heterostructures", *Physica Status Solidi-Rapid Research Letters*, **2015**. 9(5): p. 301.
4. Y. Liu, X.-M. Lin, Y. Sun, and T. Rajh, "In Situ Visualization of Self-Assembly of Charged Gold Nanoparticles", *Journal of the American Chemical Society*, **2013**. 135(10): p. 3764.
5. Y. Liu, A. N. Chiamonti, D. K. Schreiber, H. Yang, S. S. P. Parkin, O. G. Heinonen, and A. K. Petford-Long, "Effect of annealing and applied bias on barrier shape in CoFe/MgO/CoFe tunnel junctions", *Physical Review B*, **2011**. 83(16) 165413.



### Energy storage materials study by analytical transmission electron microscopy

6. L. Chen, Y. Liu, N. Detz-Rago, and L. L. Shaw, "Bottom-up, hard template and scalable approaches toward designing nanostructured Li<sub>2</sub>S for high performance lithium sulfur batteries", *Nanoscale*, **2015**. 7(43): p. 18071.
7. S. Tepavcevic, Y. Liu, D. Zhou, B. Lai, J. Maser, X. Zuo, H. Chan, P. Kral, C. S. Johnson, V. Stamenkovic, N. M. Markovic, and T. Rajh, "Nanostructured Layered Cathode for Rechargeable Mg-Ion Batteries", *ACS nano*, **2015**. 9(8): p. 8194
8. H. He, B. Liu, A. Abouimrane, Y. Ren, Y. Liu, Q. Liu, and Z.-S. Chao, "Dynamic Lithium Intercalation/Deintercalation in 18650 Lithium Ion Battery by Time-Resolved High Energy Synchrotron X-Ray Diffraction", *Journal of the Electrochemical Society*, **2015**. 162(10): p. A2195.
9. Q. Wu, Y. Liu, C. S. Johnson, Y. Li, D. W. Dees, and W. Lu, "Insight into the Structural Evolution of a High-Voltage Spinel for Lithium-Ion Batteries", *Chemistry of Materials*, **2014**. 26(16): p. 4750.
10. L. Chen, Y. Liu, M. Ashuri, C. Liu, and L. L. Shaw, "Li<sub>2</sub>S encapsulated by nitrogen-doped carbon for lithium sulfur batteries", *Journal of Materials Chemistry A*, **2014**. 2(42): p. 18026.



### Nanomaterials study by transmission electron microscopy

11. Y. Hu, Y. Liu, and Y. Sun, "Mesoporous Colloidal Superparticles of Platinum-Group Nanocrystals with Surfactant-Free Surfaces and Enhanced Heterogeneous Catalysis", *Advanced Functional Materials*, **2015**. 25(11): p. 1638.
12. S. G. Kwon, G. Krylova, P. J. Phillips, R. F. Klie, S. Chattopadhyay, T. Shibata, E. E. Bunel, Y. Liu, V. B. Prakapenka, B. Lee, and E. V. Shevchenko, "Heterogeneous nucleation and shape transformation of multicomponent metallic nanostructures", *Nature Materials*, **2015**. 14(2): p. 215.

13. J. Zhang, C. Rowland, Y. Liu, H. Xiong, S. Kwon, E. Sheychenko, R. D. Schaller, V. B. Prakapenka, S. Tkachev, and T. Rajh, "Evolution of Self-Assembled ZnTe Magic-Sized Nanoclusters", *Journal of the American Chemical Society*, **2015**. 137(2): p. 742.

14. H. C. Fry, Y. Liu, N. M. Dimitrijevic, and T. Rajh, "Photoinitiated charge separation in a hybrid titanium dioxide metalloporphyrin peptide material", *Nature Communications*, **2014**. 5 4606.
15. Y. Liu, D. K. Schreiber, A. K. Petford-Long, and K.-Z. Gao, "Three-dimensional characterization of near-field transducers by electron tomography", *Materials Characterization*, **2012**. 72: p. 104.
16. Y. Sun, Y. Ren, Y. Liu, J. Wen, J. S. Okasinski, and D. J. Miller, "Ambient-stable tetragonal phase in silver nanostructures", *Nature Communications*, **2012**. 3 971.
17. Y. Liu, A. N. Chiamonti, D. K. Schreiber, H. Yang, S. S. P. Parkin, O. G. Heinonen, and A. K. Petford-Long, "Effect of annealing and applied bias on barrier shape in CoFe/MgO/CoFe tunnel junctions", *Physical Review B*, **2011**. 83(16) 165413.
18. Y. Liu, Y. Q. Wu, M. J. Kramer, Y. Choi, J. S. Jiang, Z. L. Wang, and J. P. Liu, "Microstructure analysis of a SmCo/Fe exchange spring bilayer", *Applied Physics Letters*, **2008**. 93(19) 192502.
19. Y. Liu, W. G. Wang, T. Moriyama, J. Q. Xiao, and Z. Zhang, "Direct measurement of barrier asymmetry in AlOx/ZrOy magnetic tunnel junctions using off-axis electron holography", *Physical Review B*, **2007**. 75(13) 134420.
20. Y. Liu, M. J. Ying, X. L. Du, J. F. Jia, Q. K. Xue, X. D. Han, and Z. Zhang, "The 30 degrees rotation domains in wurtzite ZnO films", *Journal of Crystal Growth*, **2006**. 290(2): p. 631.

