

Yu Wen, Ph.D.

Postdoctoral Researcher

Northwestern University

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Research/Work Experience

Northwestern University, USA

11/2024 – Present

Postdoctoral Researcher

- Low dose (cryo-)EM characterization for beam sensitive materials.
- Training and operations of FIB and TEM in the EPIC facility.

Ames Laboratory, U.S. Department of Energy

01/2024 – 11/2024

Postdoctoral Researcher

- Low-dose HR(S)TEM imaging of clay minerals, which are beam-sensitive materials.
- Studied the transport of rare earth elements in layered natural and synthetic minerals by (S)TEM, EFTEM, and EELS.

TDK Corporation, Japan

04/2022 – 12/2023

Materials Evaluation Engineer

- Provided TEM analysis of electronic devices for the Group's R&D centers at home and abroad.
- Collaborated with product researchers to develop new products and apply for patents.
- Managed evaluation equipment including FIB (JIB-4700F) and TEM (FEI Titan and Arm-200F).

Foxconn Technology Group, China

07/2017 – 03/2019

Materials Engineer

- Developed high-performed TiC-based coating materials for cutting tools by physical vapor deposition.
- Provided failure analysis of cutting tools during service by SEM and XRD.

Education

University of Tsukuba & National Institute for Materials Science, Japan

04/2019 – 03/2022

PhD, Materials Science and Engineering

Thesis: Application of topological analysis to TEM images of metal-oxide nanocomposites for quantitative structural description

Central South University, China

09/2014 – 06/2017

MSc, Materials Science and Engineering

Central South University, China

09/2010 – 06/2014

BSc, Materials Chemistry

Skills

- **Electron microscopy:**
 - Transmission electron microscopy (TEM) including STEM, EDS, EFTEM, EELS and 3D tomography. Experienced in operating Thermo Fisher Scientific Themis, Titan and Tecnai, and JEOL ARM-200F, JEOL-2100F.
 - Scanning electron microscopy (SEM), electron backscattered diffraction (EBSD), and X-ray diffraction (XRD).
 - Focused ion beam (FIB) for making lamellas. Experienced in operating JEOL JIB-4700F and FEI Helios, versa.
- **Image/video processing:** Python, Digital Micrograph, ImageJ, Velox, Avizo.
- **Structure modelling:** Materials studio, Vesta.
- **Languages:** Mandarin, English, Japanese.
- **Certification:** "Nano Advanced Interdisciplinary Education and Research Training Program" Education Program for Working People by Osaka University.

Publications

- **Y. Wen**, T. Prozorov. Adsorption of Nd Element in Natural Muscovite Mica. In progress.
- R. Eguchi, **Y. Wen**, H. Abe, A. Hashimoto. Interpretable Structural Evaluation of Metal-Oxide Nanostructures in Scanning Transmission Electron Microscopy (STEM) Images via Persistent Homology. *Nanomaterials*. 2024, 14(17), 1413.
- F. Uesugi, **Y. Wen**, A. Hashimoto, M. Ishii. Prediction of Nanocomposite Properties and Process Optimization Using Persistent Homology and Machine Learning. *Micron*. 2024, 103664.
- **Y. Wen**, H. Abe, A. Hirata, A. Hashimoto, Correlation between the Charge-Transport Properties and the 3D-Phase Connectivities in Patterned Pt/CeO₂ Nanostructured Composites: Implications for Solid-Oxide Fuel Cells. *ACS Appl. Nano Mater.* 2021, 4(12), 13602-13611.
- **Y. Wen**, H. Abe, K. Mitsuishi, A. Hashimoto, Tracking the Emergence of Epitaxial Metal–Oxide Interfaces from Precursor Alloys. *Nanoscale*. 2021, 13, 18987-18995. (Cover)
- **Y. Wen**, A. Hashimoto, A. S. B. M. Najib, A. Hirata, H. Abe, Topological Trends in Ionic Transport through Metal-Oxide Composites. *Appl. Phys. Lett.* 2021, 118, 054102. (Featured article)
- H. Ham, W. F. Simanullang, Y. Kanda, **Y. Wen**, A. Hashimoto, H. Abe, K. Shimizu, S. Furukawa, Silica-Decoration Boosts Ni Catalysis for (De)Hydrogenation: Step-Abundant Nanostructures Stabilized by Silica. *ChemCatChem*. 2021, 13 (5), 1306–1310.
- A. Strijevskaya, A. Yamaguchi, S. Shoji, S. Ueda, A. Hashimoto, **Y. Wen**, A. Wardhana, J. Lee, M. Liu, H. Abe, M. Miyauchi, Nanophase-Separated Copper–Zirconia Composites for Bifunctional Electrochemical CO₂ Conversion to Formic Acid. *ACS Applied Materials & Interfaces*. 2023, 15(19): 23299-23305.
- A. Strijevskaya, Z. Kadirova, S. Daminova, M. Miyauchi, A. Hashimoto, **Y. Wen**, H. Abe, Study of Nano Phase-separation in Cu₅₃Zr₁₄ Alloy. *Chemistry and Chemical Engineering*, 2023: No.2, Article 5.
- H. Xiong, **Y. Wen**, Z. Li, K. Zhou, Dual-grained (Ti, W) C–Ni Cermets by Two-step Carbonization: Hot Isotropic Press Sintering of NiTiW Alloys and Colloidal Graphite. *Journal of the American Ceramic Society*. 2019, 102(7):4296-305.
- H. Xiong, **Y. Wen**, X. Gan, Z. Li, L. Chai. Influence of coarse TiCN Content on the Morphology and Mechanical Properties of Ultrafine TiCN-based Cermets. *Materials Science and Engineering: A*. 2017, 13;682:648-55.
- H. Xiong, Y. Guo, **Y. Wen**, Y. Lv, Z. Li, K. Zhou. Large-scale Synthesis of TiC Whiskers by Carbothermal Reduction with Microcrystalline Cellulose as the Carbon Source. *Journal of Crystal Growth*. 2015, 1;431:64-71.

Conferences

- **Y. Wen**, A. Hashimoto, A. Hirata, H. Abe. Quantitative analysis of 3D structures in metal-oxide composites. **Microscopy and Microanalysis**. 2021, 27(S1):2974-5.
- **Y. Wen**, H. Abe, A. Hashimoto. Growth mechanism of periodic nanopattern in metal-oxide composites. **Microscopy and Microanalysis**. 2021, 27(S1):2324-5.
- **Y. Wen**, A. Hashimoto, A.S. Najib, A. Hirata, H. Abe. Topological Analysis of Metal and Metal Oxide Hybrid Nanostructures. **Microscopy and Microanalysis**. 2020, 26(S2):2096-8.
- **Y. Wen**, A. Hashimoto, A. Hirata, H. Abe. Topological analysis of metal/oxide composites in three dimensions. **The 77th annual meeting of the Japanese Society of Microscopy**. 2021.

Awards

- Excellent graduate student of the University of Tsukuba. 2022
- The Best Poster Presentation of the 63rd symposium of the Japanese Society of Microscopy. 2020