

RESEARCH APPOINTMENTS

- 2024–present **University of Manchester**
Postdoctoral Researcher, Condensed Matter Physics (Lozada-Hidalgo group),
National Graphene Institute
- 2018–2023 **University of Chicago**
Graduate Student, Pritzker School of Molecular Engineering (Liu group)
- 2017–2018 **National Institute of Standards and Technology (Boulder)**
Research Associate, Fiber Sources and Applications (Newbury group)
- 2016–2017 **Williams College**
Honors Undergraduate Researcher, Department of Physics (Majumdar group)

EDUCATION

- 2018–2023 **University of Chicago**
PhD in Molecular Engineering
Committee: Chong Liu (advisor), Giulia Galli and Paul Nealey
- 2013–2017 **Williams College**
BA in Physics with Honors

AWARDS AND FELLOWSHIPS

- 2023 & 2020 First Place, AMEWS-EFRC PhD Presentation Award, Argonne National Laboratory
- 2021 Materials Research Center Fellowship, University of Chicago
- 2020 NSF GRFP Honorable Mention
- 2017 Nomination to Sigma Xi Research Honor Society, Williams College
- 2017 Purple Key Award, Williams College
- 2016 Summer Science Research Fellowship, Williams College
- 2016 NCAA D-1 All-American in Nordic Skiing
- 2015 Alumni Sponsored Internship Program Grant, Williams College
- 2013–2017 Dean's List, Williams College

TEACHING AND LEADERSHIP

- 2024–present PhD student mentor, Condensed Matter Physics, University of Manchester
- 2021 Co-organizer, Early Career Journal Club, AMEWS-EFRC, Argonne National Laboratory
- 2020 Teaching assistant, "The Science, History, Policy and Future of Water", Pritzker School of Molecular Engineering, University of Chicago
- 2018–2019 Teaching assistant, "Honors Mechanics" and "Electricity and Magnetism", Department of Physics, University of Chicago
- 2017 Captain, Williams College Nordic Ski Team
- 2015–2016 Tutor, "Electricity and Magnetism", "Newtonian Mechanics", "Principles of Modern Physics", Math and Science Resource Center, Williams College

CONFERENCE TALKS

- 2023 Ion Transport in MoS₂ Nanochannels (invited), EFRC-Hub PI meeting (virtual)
- 2022 Mechanisms of Selective Ion Transport in Layered MoS₂ and Graphene Oxide, MRS Fall Meeting, Boston

2022	Controlling the Structure of Restacked Two-Dimensional Materials for Ion-Selective Separations, MRS Spring Meeting, Honolulu
2020	Desalination with Laminar MoS ₂ Membranes, EFRC annual review, Argonne National Laboratory
2017	A Precise Measurement of the Electric Quadrupole Amplitude in the 6s ² 6p ² 3P ⁰ → 3P ² Transition in Pb — Poster, DAMOP Spring Meeting, Sacramento
2017	Precise Measurements of Atomic Structure in Heavy Atoms Using Vapor Cell Spectroscopy — Poster, New England Section APS Meeting, MCLAs

SKILLS

- *Nanofabrication* – dry and wet etching, photolithography, e-beam lithography, 2D transfer of vdW heterostructures, PVD/PECVD/CVD
- *Characterization* – AFM (peak-force, tapping, liquid), Raman/PL, FIB/SEM/TEM, XRD
- *Electronic and electrochemical measurement* – Keithley 2600-series SMUs, Zurich Instruments lock-in amplifiers, Bio-Logic potentiostats
- *Data and control* – Python (QCodes, NumPy, SciPy, pandas, Matplotlib), LabVIEW, MATLAB; automated instrument control, fitting, and modeling

PUBLICATIONS

Z. Liu, Y. Tan, J. Qian, M. Cao, **E. Hoenig**, *et al.* "Robust and tuneable ion selectivity in vermiculite membranes intercalated with unexchangeable ions," *Nature Communications* (accepted)

Y.-C. Soong, H. Li, Y. Fu, J. Tong, S. Huang, X. Zhang, E. Griffin, **E. Hoenig**, *et al.* "Mechanism of the electrochemical hydrogenation of graphene," *Nature Communications* (accepted)

M. Wang, Q. Xiong, X. Yue, G. Yan, Y. Han, Z. Lyu, Z. Li, L. Sun, **E. Hoenig**, *et al.* "Cooperative and inhibitory transport in functionalized angstrom-scale two-dimensional channels," *Nature Communications*, 2025

E. Hoenig, *et al.* "In situ generation of (sub) nanometer pores in MoS₂ membranes for ion selective transport," *Nature Communications*, 2024

M. Wang, Q. Xiong, M. Wang, N. Lewis, D. Ying, G. Yan, **E. Hoenig**, *et al.* "Lanthanide transport in angstrom-scale MoS₂-based two-dimensional channels," *Science Advances*, 2024.

M. Wang, T. Sadhukhan, N. Lewis, M. Wang, X. He, G. Yan, D. Yin, **E. Hoenig**, *et al.* "Anomalously enhanced ion transport and uptake in functionalized angstrom-scale two-dimensional channels," *Proceedings of the National Academy of Sciences*, 2024.

J. Ip, Q. Gao, K. Nguyen, C. Yan, G. Yan, **E. Hoenig**, *et al.* "Preservation of Topological Surface States in Millimeter-Scale Transferred Membranes," *Nano Letters*, 2024.

G. Yan, G. Kim, R. Yuan, **E. Hoenig**, *et al.* "The role of solid solutions in iron phosphate-based electrodes for selective electrochemical lithium extraction," *Nature communications*, 2022.

M. Wang, X. He, **E. Hoenig**, G. Yan, G. Peng, *et al.* "Tuning transport in graphene oxide membrane with single-site copper (II) cations," *iScience*, 2022.

J. Wang, Z. Jiang, G. Peng, **E. Hoenig**, et al. "Surface valence state effect of MoO_{2+x} on electrochemical nitrogen reduction," *Advanced Science*, 2022.

E. Barry, ... **E. Hoenig**, et al. "Advanced materials for energy-water systems: the central role of water/solid interfaces in adsorption, reactivity, and transport," *Chemical Reviews*, 2021.

A. Suresh, G. Hill*, **E Hoenig***, and C. Liu. "Electrochemically mediated deionization: a review," *Molecular Systems Design & Engineering*, 2021.

E. Hoenig, et al. "Controlling the structure of MoS₂ membranes via covalent functionalization with molecular spacers," *Nano Letters*, 2020

J. Friedlein, E. Baumann, K. Briggman, G. Colacion, F. Giorgetta, A. Goldfain, D. Herman, **E. Hoenig**, et al. "Dual-comb photoacoustic spectroscopy," *Nature Communications*, 2020.

E. Baumann, **E. Hoenig**, et al. "Dual-comb spectroscopy with tailored spectral Broadening in Si₃N₄ nanophotonics," *Optics Express*, 2019.

C. Alden, S. Coburn, R. Wright, E. Baumann, K. Cossel, E. Perez, **E. Hoenig**, et al. "Single blind quantification of natural gas leaks from 1 km distance using frequency combs," *Environmental Science & Technology*, 2019.

D. Maser, **E. Hoenig**, et al. "High-precision measurement and *ab initio* calculation of the (6s2 6p2) 3P0 → 3P2 electric-quadrupole-transition amplitude in Pb²⁰⁸," *Physical Review A*, 2019.