

Morgan E. Seidler

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Education

PhD	University of California, Berkeley	Chemical Engineering	August 2024
		Dissertation: <i>Atomic-scale TEM imaging of polymers</i>	
		Advisor: Professor Nitash Balsara	
	National Science Foundation Graduate Research Fellowship Program		2020 – 2024
BS	University of Notre Dame	Chemical Engineering	2019
	<i>Cum Laude</i>	Senior Thesis: <i>Single-ion Conducting Polymer Electrolytes for High Performance Lithium Battery Applications</i>	
		Advisor: Professor Jennifer Schaefer	

Research Skills

TRANSMISSION ELECTRON MICROSCOPY	Specialize in cryo-TEM of beam-sensitive materials Atomic-scale imaging of neutral, charged, and ion-containing polymers Electron diffraction Scanning nanodiffraction (4D-STEM) Elemental analysis (EDS)
PROGRAMMING AND DATA ANALYSIS	Familiar with Python and MATLAB Electron crystallography (2dx) Single particle analysis (Relion, Cryosparc, and Eman)
CRYO-EM VITRIFICATION	Freeze beam-sensitive polymer crystals in a thin layer of amorphous water for TEM imaging
TEM SAMPLE PREPARATION	Cryo-microtome, polymer crystallization, custom TEM grids
AC IMPEDANCE SPECTROSCOPY	Measure conductivity of polymer films
DIFFERENTIAL SCANNING CALORIMETRY	Glass transition temperature of polymers

Publications

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- Jiang, X., **Seidler, M.**, Butterfoss, G.L., Luo, X., Yu, T., Xuan, S., Prendergast, D., Zuckermann, R.N., and Balsara, N.P. (2023) Atomic-Scale Corrugations in Crystalline Polypeptoid Nanosheets Revealed by Three-Dimensional Cryogenic Electron Microscopy. *ACS Macro Letters*. 12(5), p. 632-638. <https://doi.org/10.1021/acsmacrolett.3c00101>
 - Seidler, M.**, Li, N.K., Luo, X., Xuan, S., Zuckermann, R.N., Balsara, N.P., Prendergast, D. and Jiang, X. (2022) Importance of the Positively Charged σ -Hole in Crystal Engineering of Halogenated Polypeptoid. *J. Phys. Chem. B*, 126(22), p. 4152–4159. <https://doi.org/10.1021/acs.jpccb.2c01843>
 - Yu, X., Jiang, X., **Seidler, M.**, Shah, N.J., Gao, K., Chakraborty, S., Villaluenga, I., and Balsara, N.P. (2022). Nanostructured Ionic Separator Formed by Block Copolymer Self-Assembly: A Gateway for Alleviating Concentration Polarization in Batteries. *Macromolecules*. 55(7), p.2787–2796. <https://doi.org/10.1021/acs.macromol.2c00193>
 - Ford, H.O., Park, B., Jiang, J., **Seidler, M.**, and Schaefer, J.L. (2020). Enhanced Li^+ Conduction within Single-Ion Conducting Polymer Gel Electrolytes via Reduced Cation–Polymer Interaction. *ACS Materials Lett.* 2(3), p. 272-279. <https://doi.org/10.1021/acsmaterialslett.9b00510>

1. Elmore, C.*, **Seidler, M.***, Ford, H., Merrill, L., Upadhyay, S., Schneider, W. and Schaefer, J. (2018). Ion Transport in Solvent-Free, Crosslinked, Single-Ion Conducting Polymer Electrolytes for Post-Lithium Ion Batteries. *Batteries*. 4(2), 28. <https://doi.org/10.3390/batteries4020028> (* indicates equal contributions)

Presentations

6. Microscopy & Microanalysis 2023 (July 2023), *Atomic-scale imaging polypeptoid crystals with varying molecular side chains*, **Seidler, M.**, Yu, T., Luo, X., Prendergast, D., Zuckermann, R.N., Balsara, N.P., and Jiang, X. (Poster presentation)
5. American Physical Society March Meeting (March 2023), *Atomic-scale imaging of self-assembled polypeptoid crystals with varying molecular side chains*, **Seidler, M.**, Yu, T., Luo, X., Prendergast, D., Zuckermann, R.N., Balsara, N.P., and Jiang, X. (Oral presentation)
4. Microscopy & Microanalysis 2022 (July 2022), *The Importance of the σ -hole in the Self-Assembly of Halogenated Polypeptoids*, **Seidler, M.**, Li, N.K., Luo, X., Xuan, S., Prendergast, D., Zuckermann, R.N., Balsara, N.P., and Jiang, X. (Oral presentation)
3. American Physical Society March Meeting (March 2022), *The importance of the σ -hole in the self-assembly of halogenated peptoid nanosheets*, **Seidler, M.**, Li, N.K., Luo, X., Xuan, S., Zuckermann, R.N., Prendergast, D., Balsara, N.P., and Jiang, X. (Oral presentation)
2. Microscopy & Microanalysis 2021 (July 2021), *Using cryo-TEM to study the effect of side-chain chemistry on the crystal motifs in polypeptoid nanosheets*, **Seidler, M.**, Li, N.K., Xuan, S., Prendergast, D., Zuckermann, R.N., Balsara, N.P., and Jiang, X. (Oral presentation)
1. American Physical Society March Meeting (March 2021), *Atomic-scale imaging of the effect of side-chain chemistry on the crystal motifs in polypeptoid nanosheets*, **Seidler, M.**, Li, N.K., Xuan, S., Prendergast, D., Zuckermann, R.N., Balsara, N.P., and Jiang, X. (Oral presentation)

Experience

TEACHING	Transport and Separations Processes	Spring 2022
	Chemical Process Design	Fall 2020
	Introduction to Chemical Engineering Design	Fall 2019
	Mentored undergraduate student	2022-Present
LEADERSHIP	Vice President of Chemical and Biomolecular Engineering	
	Graduate Student Advisory Committee	2021-2023
	Chemical Engineering Recruitment Chair	2020-2021
SERVICE	Kitchen Preparation Volunteer at Dorothy Day House	2023

Awards and Achievements

National Science Foundation Graduate Research Fellowship Program	2020-2024
Microscopy & Microanalysis Student Travel Award	2021
- 30 awarded annually	
Invited Speaker at Microscopy & Microanalysis Pre-Meeting Student Congress	2021
Outstanding GSI Award	2020
- 10 awarded annually	

Hobbies and Interests

Volleyball, biking, downhill skiing