Lorena S. Grundy

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EDUCATION

University of California, Berkeley 2017–2022
- Ph.D. in Chemical and Biomolecular Engineering
- Dissertation title: "Polymer Electrolytes and the Limiting Current"

Princeton University 2013–2017
- B.S.E. *cum laude* in Chemical and Biological Engineering
- Certificates in Sustainable Energy and Applications of Computing

PROFESSIONAL APPOINTMENTS

University of Pennsylvania 2024–present
- Practice Assistant Professor, Chemical and Biomolecular Engineering
- Director, Energy and Sustainability (ENSU) Minor Program

RESEARCH EXPERIENCE

Koretsky Group, Tufts University: post-doctoral fellow 2022–2024
- Dept. of Chemical and Biological Engineering, Dept. of Education, and Institute for Research on Learning and Instruction (IRLI)
- Supported by **ASEE Postdoctoral Fellowship**

Balsara Lab, UC Berkeley: graduate student researcher 2017–2022
- Characterization of ion transport through polymer electrolytes using NMR
- Analysis of morphology using NMR and small angle X-ray scattering (SAXS)
- Block copolymer synthesis using anionic polymerization under high vacuum
- Electrochemical characterization and concentrated solution theory

Balsara Lab, UC Berkeley: lab safety coordinator 2018–2021
- COVID-19 response
- Lab chemical and equipment inventory and maintenance

Berkeley Nuclear Magnetic Resonance (NMR) Facility: assistant manager 2019
- Responsible for training all new users on NMR equipment
- Maintenance and repair of NMR instruments

Priestley Lab, Princeton University: undergraduate researcher 2016–2017
- Summer research: mechanism of Janus nanoparticle formation
- Senior thesis: morphology of nanoparticles made from block copolymer blends
- Experience with polymers, electron microscopy (TEM and SEM), nanoparticle fabrication techniques

Avalos Lab, Princeton University: undergraduate research 2015
- Research on yeast metabolic engineering for biofuel applications
- Experience with *E. coli* and *S. cerevisiae*, molecular biology, HPLC

AWARDS AND HONORS

Penn Sustainability Green Fund Award ($10,000) for Campus as Lab development 2025
American Society for Engineering Education (ASEE) Postdoctoral Fellowship 2022–2024
Berkeley Energy & Resources Collaborative (BERC) 1st Place Poster Prize Winner 2022
Selected for ACS POLY Excellence in Graduate Research Symposium 2022
Joe Wong Poster Award: Stanford Synchrotron Light Source User Meeting 2021
U.C. Berkeley Outstanding Graduate Student Instructor (GSI) Award 2021
U.C. Berkeley CBE GSI Excellence Award 2020
U.C. Berkeley Outstanding GSI Award 2019
Elected to the Society of Sigma Xi 2017

JOURNAL PUBLICATIONS

Grundy, L. S.; Koretsky, M. D. "More Conceptual Than Actual": Epistemic Metacognition in response to a Non-Numerical Statics Question. Under review.

Auby, H. A.; **Grundy, L. S.**; Huffman, S.; Cantilina, K.; Gavitte, S. B.; Kaczynski, S. E.; Penyai, M.; Koretsky, M. D. Reflections on a mentored group peer review process. *Journal of Engineering Education* **2024**, *113*, 1110-1114.

Koretsky, M. D.; Nolen, S. B.; Galisky, J.; Auby, H.; **Grundy, L. S.** Progression from the Mean: Cultivating Instructors' Unique Trajectories of Practice Using Educational Technology. *Journal of Engineering Education* **2024**, *113* (2), 330-359.

Galluzzo, M. D.; Steinrück, H.-G., Takacs, C. J.; Mistry, A.; **Grundy, L. S.**; Cao, C.; Narayanan, S.; Dufresne, E. M.; Zhang, Q.; Srinivasan, V.; Toney, M. F.; Balsara, N. P. Probing transference and field-induced polymer velocity in block copolymer electrolytes. *Cell Reports Physical Science* **2024**, *5*, 101766.

Abdo, E. A.; **Grundy, L. S.**; Galluzzo, M. D.; Loo, W. S.; Fong, A. Y.; Takacs, C. J.; Balsara, N. P. Cylinder-Gyroid Phase Transition in a Block Copolymer Electrolyte Induced by Ionic Current. *Macromolecules* **2024**, *57* (2), 503-513.

Quill, T. J.; LeCroy, G.; Halat, D. M.; Sheelamanthula, R.; Marks, A.; **Grundy, L. S.**; McCulloch, I.; Reimer, J. A.; Balsara, N. P.; Giovannitti, A.; Salleo, A.; Takacs, C. J. An Ordered, Self-Assembled Nanocomposite with Efficient Electronic and Ionic Transport. *Nature Materials* **2023**, *22*, 362–368.

Grundy, L. S.; Fu, S.; Galluzzo, M. D.; Balsara, N.P. The Effect of Annealing on Ionic Conductivity of Block Copolymer Electrolytes. *Macromolecules* **2022**, *55* (23), 10294-10301.

Grundy, L. S.; Fu, S.; Hoffman, Z. J. Electrochemical Characterization of PEO/LiTFSI Electrolytes at the Solubility Limits. *Macromolecules* **2022**, *55* (20), 9030-9038.

Grundy, L. S.; Galluzzo, M. D.; Loo, W. S.; Fong, A.; Balsara, N. P.; Takacs, C. P. Inaccessible Polarization-Induced Phase Transitions in a Block Copolymer Electrolyte: An Unconventional Mechanism for the Limiting Current. *Macromolecules* **2022**, *55* (17), 7637-7649.

Mistry, A.; **Grundy, L. S.**; Halat, D. M.; Newman, J.; Balsara, N. P.; Srinivasan, V. Effect of Solvent Motion on Ion Transport in Electrolytes. *J. Electrochem. Soc.* **2022**, *169* (4), 040524.

Galluzzo, M. D.; **Grundy, L. S.**; Takacs, C. J.; Cao, C.; Steinrück, H.-G.; Fu, S.; Rivas Valdez, M. A.; Toney, M. F.; Balsara, N. P. Orientation-Dependent Distortion of Lamellae in a Block Copolymer Electrolyte under DC Polarization. *Macromolecules* **2021**, *54* (17), 7808-7821.

Halat, D. M.; Snyder, R. L.; Sundararaman, S.; Choo, Y.; Gao, K. W.; Hoffman, Z. J.; Abel, B. A.; **Grundy, L. S.**; Galluzzo, M. D.; Gordon, M. P.; Celik, H.; Urban, J. J.; Prendergast, D.; Coates, G. W.; Balsara, N. P.; Reimer, J. A. Modifying Li+ and Anion Diffusivities in Polyacetal Electrolytes: A Pulsed-Field-Gradient NMR Study of Ion Self-Diffusion. *Chemistry of Materials* **2021**, *33* (13), 4915–4926.

Grundy, L. S.; Shah, D. B.; Nguyen, H. Q.; Diederichsen, K. M.; Celik, H.; DeSimone, J. M.; McCloskey, B. D.; Balsara, N. P. Impact of Frictional Interactions on Conductivity, Diffusion, and Transference Number in Ether and Perfluoroether-Based Electrolytes. *J. Electrochem. Soc.* **2020**, *167* (12), 120540.

Loo, W. S.; Faraone, A.; **Grundy, L. S.**; Gao, K. W.; Balsara, N. P. Polymer Dynamics in Block Copolymer Electrolytes Detected by Neutron Spin Echo. *ACS Macro. Lett.* **2020**, *9* (5), 639-645.

Shah, D. B.; Nguyen, H. Q.; **Grundy, L. S.**; Olson, K. R.; Mecham, S. J.; DeSimone, J. M.; Balsara, N. P. Difference Between Approximate and Rigorously Measured Transference Numbers in Fluorinated Electrolytes. *Physical Chemistry Chemical Physics* **2019**, *21* (15), 7857-7866.

Grundy, L. S.; Sethi, G. K.; Galluzzo, M. D.; Loo, W. S.; Maslyn, J. A.; Teran, A. A.; Thelen, J. L.; Timachova, K.; Reimer, J. A.; Madsen, L. A.; Balsara, N. P. Detection of the Order-to-Disorder Transition in Block Copolymer Electrolytes Using Quadrupolar ^{7}Li NMR Splitting. *ACS Macro Letters* **2019**, *8* (2), 107-112.

Grundy, L. S.; Lee, V. E.; Li, N.; Sosa, C.; Mulhearn, W. D.; Liu, R.; Register, R. A.; Nikoubashman, A.; Prud'homme, R. K.; Panagiotopoulos, A. Z.; Priestley, R. D. Rapid Production of Internally Structured Colloids by Flash Nanoprecipitation of Block Copolymer Blends. *ACS Nano* **2018**, *12* (5), 4660-4668.

- Highlighted in *Science* **2018**, *360* (6392), 977.

Sosa, C.; Lee, V. E.; **Grundy, L. S.**; Burroughs, M.; Lui, R.; Prud'homme, R. K.; Priestley, R. D. Combining Precipitation and Vitrification to Control the Number of Surface Patches on Polymer Nanocolloids. *Langmuir* **2017,** *33* (23), 5835-5842.

CONFERENCE PAPERS

Grundy, L. S.; Koretsky, M. D. Contradicting Objects: An Activity Systems Perspective Towards Transformative Learning. *Proceedings of the American Society for Engineering Education Annual Conference* **2024.**

Grundy, L. S. Reflections on a "Math Disaster": the Role of Instructor Confusion in the Classroom. *Proceedings of the American Society for Engineering Education Annual Conference* **2024.**

Welsh, K. E.; **Grundy, L. S.**; Self, B. P. Thinking Outside the Box: Understanding Student Thinking on Statics in Mechanics. *Proceedings of the American Society for Engineering Education Annual Conference* **2024.**

Grundy, L. S.; Koretsky, M. D. Student Metacognitive Reflection on a Conceptual Statics Question. *Proceedings of the American Society for Engineering Education Annual Conference* **2023.**

PRESENTATIONS

Grundy, L. S. Contradicting Objects: An Activity Systems Perspective Towards Transformative Learning (talk), ASEE Annual Conference, June 2024.

Grundy, L. S. Reflections on a "Math Disaster": the Role of Instructor Confusion in the Classroom (talk). ASEE Annual Conference, June 2024.

Grundy, L. S. Framework and Initial Steps Towards Industry-Relevant Undergraduate Electrochemical Engineering Education (**invited talk**). Electrochemical Society Spring Meeting, May 2024.

Grundy, L. S. Student Metacognitive Reflection on a Conceptual Statics Question. ASEE Annual Conference (talk), June 2023.

Grundy, L. S. Limitations to our Understanding of the Limiting Current (**invited talk**). Battery Modeling Webinar Series, 2023.

Grundy, L. S. Limitations on Charging Rates in Lithium Metal Batteries with Block Copolymer Electrolytes (**invited talk**). Tufts University Chemical Engineering Department Colloquium, 2022.

Grundy, L. S. Inaccessible Current-Induced Phase Transitions in Block Copolymer Electrolytes (talk). ACS Spring Meeting, 2022.
- Selected for ACS POLY **Excellence in Graduate Research** Symposium

Grundy, L. S. Inaccessible Phase Transitions in Block Copolymer Electrolytes (talk). APS March Meeting, 2022
- Presented in the APS DPOLY Dillon Medal Symposium

Grundy, L. S. Distortion of Lamellae in a Block Copolymer Electrolyte Under Polarization (**invited focus session talk**). APS March Meeting, 2022.

Grundy, L. S. Distortion of Lamellae in a Block Copolymer Electrolyte Under Polarization (poster). Stanford National Accelerator Laboratory User Meeting, 2021.
- Received Joe Wong **Outstanding Poster Award**

Grundy, L. S. Distortion of Lamellae in a Block Copolymer Electrolyte Under Polarization (**invited talk**). ALS User Meeting, 2021.

Grundy, L. S. Impact of Frictional Interactions on Conductivity and Transference Number in Ether-Based Electrolytes (talk). APS March Meeting, 2021.

Grundy, L. S. Using ^{7}Li NMR to Detect Order-to-Disorder Transitions in Block Copolymer Electrolytes (**invited talk**). ACS Fall Meeting, 2020.

Grundy, L. S. Locating Phase Transitions in Block Copolymer Electrolytes (talk). APS March Meeting, 2019.

Grundy, L. S.; Mongcopa, K. I. Correlation Between Monomeric Friction Coefficient and Ionic Diffusivity in Polymer Electrolytes (poster). Polymer Physics Gordon Research Conference, 2018.

Grundy, L. S.; Mason, L. et al. Flash Nano-Precipitation of Polymer Blends: A Role for Fluid Flow? (talk) Annual Meeting of the APS Division of Fluid Dynamics, 2017.

TEACHING

Lead Instructor

University of Pennsylvania

- Engineering Sustainability at Penn (ENGR 5020) — spring 2025
  - New project-based course in collaboration with the Penn Sustainability Office, using Campus as Lab principles to engage students in authentic campus sustainability projects
- Energy and Sustainability: Science, Engineering and Technology (CBE/ENGR 4215/5215) — spring 2025
- Energy and Sustainability: Science, Engineering and Technology (CBE/ENGR 4215/5215) — fall 2024
  - New semester-long technical elective developed as part of the core of a planned Energy and Sustainability MS program
  - On student evaluations, received overall instructor rating of 3.50 (0 – 4 scale)
- Material and Energy Balances of Chemical Processes (CBE 2300) — fall 2024
  - Core undergraduate course, 33 students
  - On student evaluations, received overall instructor rating of 3.57 (0 – 4 scale)

Tufts University

- Electrochemical Engineering (ChBE 193) — fall 2023
  - Developed semester-long elective course for solo lead delivery fall 2023
  - On student evaluations, received overall instructor rating of 4.83 (1 – 5 scale) compared with department average of 3.90
- Learning and Teaching in STEM: A Seminar for Learning Assistants (ED 20) — spring 2023
  - Co-instructed pedagogy course for undergraduate learning assistants

Tufts Academic Support System for Engr. Learning (TASSEL) Instructor — fall 2022

- Developed materials for and led twice weekly workshops to support first-year engineering students in calculus and introductory physics

Graduate Student Instructor (GSI)*, University of California, Berkeley*

- Graduate Thermodynamics and Statistical Mechanics (CBE 240; remote) — fall 2020
  - Received Outstanding GSI Award (4-5 recipients/semester)
- Introduction to Chemical Engineering Design (CBE 40) — spring 2020
  - Received Departmental GSI Excellence Award (2-3 recipients/year)
  - Transitioned course to remote instruction at the onset of COVID-19
- Introduction to Chemical Process Analysis (CBE 140) — fall 2018
  - Received Outstanding GSI Award (4-5 recipients/semester)
- Introduction to Chemical Engineering Design (CBE 40) — fall 2017

Berkeley Pre-Engineering Program (PREP) Instructor — 2020–2021

- Designed and taught a fully-remote, three-week chemistry course to incoming Berkeley undergraduate engineering students who are first-generation college students, Pell eligible, or from non-traditional engineering backgrounds
- Student confidence increased 49% in chemistry overall
- Led workshops on student success strategies

MENTEES

Deja Preusser – Oregon State University CBEE undergraduate student ’23 — 2022–2023

- Supervised senior honors thesis research on the impacts of COVID on undergraduate instruction

Emily Abdo – UC Berkeley CBE Ph.D. candidate — 2021–2022

- Designed Ph.D. research project on *in situ* SAXS characterization of polymer electrolytes and supervised training and research development

Sean Fu – UC Berkeley CBE undergraduate student ’23 — 2021–2022

- Supervised undergraduate research on electrochemical characterization of polymer electrolytes, resulting in 3 peer-reviewed publications and admission to several top Ph.D. programs

Karim Aruta – UC Berkeley CBE Ph.D. candidate — 2020–2022

- Designed Ph.D. research project on NMR characterization of polymer electrolytes and supervised training and research development

Rohan Chakraborty – UC Berkeley CBE undergraduate student ’19 — 2018–2019

- Current Ph.D. student at University of Minnesota
- Supervised senior undergraduate research on PFG-NMR characterization of polymer electrolytes, including training, data analysis, presentation

SERVICE

Penn School of Engineering and CBE Department Service

- Director of school-wide Energy and Sustainability (ENSU) minor 2024–present
  - Implemented reforms to curriculum and advising process based on student and faculty feedback
- Member, departmental Energy and Sustainability committee 2024–present
- Designed and implemented standardized department-wide mid-semester course evaluation process

Panels and Events

- Advancing Women in Engineering Master's Student Panel (Jan. 2025)
- Society of Women Engineers Career Pathways Panel (Nov. 2024)
- Underrepresented Student Advisory Board in Engineering Fireside Chat (Oct. 2024)

ASEE Chemical Engineering Division (ChED): Communications Chair 2023–present

AIChE Education Division: Membership Committee 2024–present

Conference Session Chair / Moderator: Electrochemical Society Meeting, ASEE Annual Conference (ChED and ERM Divisions) 2023–present

Tufts University Postdoctoral Association: Executive Committee Member 2023–2024

Berkeley CBE Graduate Student Advisory Committee (GSAC) President 2019–2020

- Elected to lead and represent graduate students to the faculty; administered, analyzed, and reported on annual departmental climate surveys
- Achieved stipend increase, increased inclusivity in faculty hiring and graduate admissions, and implemented anti-racism seminars and training

Berkeley CBE GSAC Vice President, Treasurer, and Social Chair 2018–2019

- Managed organization budget and coordinated all departmental social events

Respect is a Part of Research (RPR): facilitator 2019–2021

- Facilitated peer-led sexual violence / sexual harassment (SVSH) training following Title IX requirements

Coordinated Community Review Team for Sexual Violence and Misconduct 2021–2022

- Part of the chancellor's committee, largely composed of administrators and staff, working to unify SVSH prevention and response campus-wide

Berkeley CBE Orientation Co-Chair 2021

- Rebuilt graduate student orientation program with a focus on inclusion

Affinity Groups Fellow 2021

- Coordinated a summer program to connect trainees with a shared identity

Berkeley CBE Remote Instruction Committee 2020–2022

- Coordinated department transition to online learning during COVID-19, including technology and workshops for faculty and students

Princeton Charter Club President 2015–2017

- Elected to lead an undergraduate eating club, managed a $60,000 budget
- Appointed and led a team of 13 undergraduate officers
- Led an effort to increase financial aid for dining options

Undergraduate Council, Princeton Chem & Bio Engineering department 2016–2017

Princeton Outdoor Action: pre-orientation backpacking trip leader 2014–2017

- Led groups of inexperienced freshmen on week-long backcountry trips

REVIEWING

Journal Reviewer: *Journal of Engineering Education, Chemical Engineering Education, ACS Macromolecules*, *Journal of the Electrochemical Society*, *Cell Biology Education – Life Sciences Education* 2019–present

Conference Paper Reviewer: American Society for Engineering Education 2023–present

Book Review: Koretsky, M. D.; Grundy, L. S. Having A Teaching Mentor on Your Bookshelf: A Review of *Teaching and Learning STEM: A Practical Guide. International Journal of Engineering Education* 2024, *40* (4), 993–995.

ADDITIONAL SKILLS	Proficient in Python, Java, C, HTML, and Microsoft Office CPR and First Aid certification, Leave No Trace Master Educator certification Leadership, Team-Building, and Conflict Resolution Training