

Jonah Wang

PhD Candidate, The City College of New York

Expected Graduation: Summer 2025

CONTACT

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LANGUAGES

English: Native

Chinese: Conversational Proficiency

Electrochemistry Skills

- Galvanostatic Cycling
- Cell Construction and Troubleshooting
- Cyclic Voltammetry
- Dunn Analysis (Capacitive vs. Faradaic charge analysis)
- Electrochemical Impedance Spectroscopy

Characterization Skills

- Nuclear Magnetic Resonance (NMR)
- Differential Scanning Calorimetry (DSC)
- X-ray Photon Spectroscopy (XPS)
- Scanning Electron Microscopy (SEM)
- Energy Dispersive X-ray Spectroscopy (EDS)
- X-Ray Diffraction (XRD)
- Raman Spectroscopy

Education

PhD Chemical Engineering

The City College of New York, GPA: 3.8. Expected graduation: 2025

MS Chemical Engineering

The City College of New York, 2022

BS Chemical Engineering

University of Utah, 2020

Project Experience

-Li-ion electrolyte development: Developed novel high temperature Li-ion electrolytes for NASA's Venus Aerobot project. Collaborated with NASA's principal electrolyte engineer to improved on cell cycle life of original electrolyte he developed by greater than 50+ cycles at 100 °C. Conducted X-ray Photon Spectroscopy on discharged electrodes to interpret surface compositions.

Wang, J., Keating, M.J., Asare, H., Biddinger, E. J., Messinger, R. J., West, W.C., & Jones, J-P. (2024) A Fluorinated Ether Co-solvent to Enable High Operating Temperature Li-ion batteries. *JECS*. Accepted Dec 2024.

- Al electrolyte development: Leveraged electrolyte composition to widen the liquid temperature window for space application of Al-battery electrolytes. Decreased the observable freezing point of functioning electrolyte by more than ~50 °C and demonstrated for the first time functional Al electrodeposition down to -70 °C.

Wang, J., Schoetz, T., Gordon, L. W., Biddinger, E. J., & Messinger, R. J. (2024). Ternary Ionic Liquid Analogues as Electrolytes for Ambient and Low Temperature Rechargeable Aluminum Batteries. *ACS Applied Energy Materials* 7 (13), 5438-5446

- Electrode Fabrication/Characterization: Fabricated electrode sheets for primary cells by casting. Galvanostatically cycled primary cells, and conducted XRD, SEM and EDS on discharged harvested electrodes to determine compositions to confirm defluorination of the CF_x electrode.

Robinson, L. E., **Wang, J.,** Asare, H., Andrews, J.L., Tripathi, B., Ram Katiyar, R., Melot, B.C. Messinger, R.J. Jones, S.C., and West, W.C (2024). *The Journal of Physical Chemistry C* 128, no. 34: 14195-14205.

Software Experience

- Python; Libraries: numpy, Pandas, Pytorch, plotly, matplotlib
- EC Lab (Echem): Nyquist plot fitting, CV integrations,
- Topspin (NMR): phasing, integrating spectra, T1/T2 analysis
- Multipak (XPS): Deconvolution, composition analysis
- TA Instruments (DSC): Tangent line/half-height analysis.
- LAMMPS (MD Simulation): Radial Distribution Function calculations, Coordination Number calculations
- DMFit (NMR): Deconvolution, T2 filtering
- Excel: Data Processing

Personal Skills

- Project Management
- Market/Product Knowledge
- Commercial Acumen
- Conflict Resolution
- Resource Management

-Electrolyte Characterization via NMR-Conducted liquid-state ^1H and ^{27}Al NMR for ionic liquid electrolyte samples. Processed and interpreted spectra to understand how speciation affected charge storage in aluminum-quinone systems.

Gordon, L. W., **Wang, J.**, & Messinger, R. J. (2023). *Journal of Magnetic Resonance*, 348, 107374.

-Melting point characterization via DSC-Tested ionic liquid samples and analyzed/interpreted thermal transitions (melting points, glass transitions) using TA instruments software to determine how different ionic ratios of constituents affected freezing temperatures of electrolytes.

Hawkins, B. E., Schoetz, T., Gordon, L. W., Kt, S., **Wang, J.**, & Messinger, R. J. (2023). *The Journal of Physical Chemistry Letters*, 14(9), 2378-2386.

Professional Experience and Activities

- **Internship - NASA-Jet Propulsion Lab** Feb-July 2023
 - Co-authored 3 provisional patents with NASA-JPL during 5-month internship, two of which directly led to publications.
 - NTR 52816 “Fluorinated Ether Co-solvents Enable Wide-Operating Temperature Lithium-ion cells”
 - NTR 52808 “Improvements in the Fluoride-ion Primary Battery Cell”
 - NTR 52802 “Development of a Novel Fluoride Ion Cathode: Molybdenum Sulfide”
 - Pioneered use of fluorinated ether for high temperature lithium-ion cells at JPL, where its use is still being investigated as part of DOE grant.
- **Teaching Assistant, Thermodynamics I & II** Jan 2022- Dec 2022
 - Organized bi-weekly office hours around curriculum regarding equations of state, applications in python, and density of states.
 - Graded weekly homework, aided in proctoring exams.
- **CCNY ChE Graduate Department Social Chair** Feb 2022- Feb 2023
 - Organized social events, weekly coffee hours and department surveys to establish sense of community within department and foster connection between people to allow for more positive workplace environment.
- **Flow.Crew NYC** Feb 2021- Present
 - Teach/learn tricks at weekly/monthly longboarding events held in different locations throughout NYC.