

ASAPH S. LEE

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EDUCATION

September 2022 – Present: Drexel University, Philadelphia, PA

- **College of Engineering: Candidate for Doctor of Philosophy**
Department: Materials Science and Engineering

August 2018 – May 2022: University of Pennsylvania, Philadelphia, PA

- **Vagelos Integrated Program in Energy Research** Coordinated dual degree undergraduate program
- **School of Arts and Sciences: Bachelor of Arts**
Major/Concentration: Physics/Chemical Principles
- **School of Engineering and Applied Sciences: Bachelor of Science in Engineering**
Major: Materials Science and Engineering

RESEARCH EXPERIENCE

Graduate Researcher, Drexel University, Philadelphia (July 2022 - Present)

Principal Investigator – Dr. Yury Gogotsi (Department of Materials Science and Engineering)

Undergraduate Researcher, University of Pennsylvania, Philadelphia (March 2019 – May 2022)

Principal Investigator – Dr. Eric Detsi (Department of Materials Science and Engineering)

- Worked on building a golf cart that runs on hydrogen gas to demonstrate viability of nanoporous aluminum for safe, effective hydrogen storage. Specifically, designed the converter system, soldered, and did electrical work
- Analyzed the formation of nanoporous silicon via wide-angle, small-angle X-ray scattering. Magnesium silicide was dealloyed in a bismuth melt; pore density, curvature, and size were optimized for potential applications
- Used COMSOL Multiphysics to model the piezoelectric effect in nanoporous gold. NP Au, as a conductor, cannot undergo bulk polarization from mechanical stress, but the magnitude of surface polarization experienced from nanoporosity allows for piezoelectric conductors
- Attended group meetings, delivered oral presentations, presented in poster sessions, and published
- Experimented with ways to improve nanoporous aluminum production via overnight electrolytic dealloying in electrolytes inside a glove box, using a potentiostat

Engineering Intern, Hydropore, Philadelphia, PA (June 2020 – May 2021)

- Investigated the use of nanoporous aluminum for hydrogen storage to improve drone range
- Ran heat simulations on COMSOL to design a nanoporous aluminum reaction chamber
- Used Arduino to set up a testing mechanism for prototype test runs
- Ordered parts, equipment for the Engineering team and Hydropore laboratory

Research Intern, California State University, Long Beach, CA (September 2017 – August 2018)

Supervisor – Dr. Shahab Derakhshan (Department of Chemistry and Biochemistry)

- Synthesized novel transition metal compounds & studied connections between their crystal structure, electronic structure & physical properties using techniques such as X-ray crystallography, with the goal of rationally designing compounds that can be used as more efficient renewable energy sources.

SKILLS

Laboratory Work: Glove Box; Furnace; Hydraulic Press; X-ray Diffraction; Hot Plate; Experiments
Engineering and Design: MATLAB; Arduino; COMSOL; Soldering; Electrical Wiring; Experiments