

Logan S. Pachulski

STUDENT RESEARCHER

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Education

Commonwealth Connections Academy

Harrisburg, PA (remotely)

HIGH SCHOOL DIPLOMA (EXPECTED JUNE 2020)

July 2018 - present

- Proposed and completed an independent study curriculum of online courses from MIT OCW and edX.
- Sample coursework: Multivariable Calculus (MIT's 18.02), Linear Algebra (18.06), Principles of Chemical Science (5.111), Introduction to Computer Science and Programming in Python (6.0001, 6.0002), Introduction to Solid-State Chemistry (3.091).
- Completed an olympiad preparation course and participated in the US National Chemistry Olympiad.

Research Experience

Xiaoji Xu Research Group

Lehigh University

RESEARCH ASSISTANT

February 2019 - present

- Designed and 3D printed a motor mount and free axle to study triboluminescence in tape peeling.
- Collected data using atomic force microscopy and Fourier transform IR spectroscopy, to appear in a forthcoming publication.

Kai Landskron Research Group

Lehigh University

RESEARCH ASSISTANT

March 2019 - present

- Synthesized electrodes which use supercapacitive swing adsorption to improve existing techniques for CO₂ scrubbing (paper in preparation).
- Optimized electrode resistivity and capacitance using potentiostat measurements, improving energy recapture during cell discharge.

ARC-Oak Ridge Middle School Science Academy

Oak Ridge, Tennessee

PARTICIPANT

July 2016

- Attended a competitive residential summer science program funded by the Department of Energy.
- Synthesized biodiesel via transesterification of common food-stock oils, and presented results to local researchers.

Extracurricular Activities

Math Enrichment

The University of Chicago

March 2017 - present

- Attended weekly online meetings on advanced mathematics organized by a physics PhD student at the University of Chicago.
- Wrote an expository paper on infinite products and the Dedekind eta function.
- Solved all integrals on MIT's 2015 Integration Bee and presented solutions in an online lecture.

Personal Projects

Jim Thorpe, PA

2016 - present

- Planned and built a home chemistry lab (including chemicals, glassware, and other apparatus) for amateur experiments.
- Solved mathematical programming challenges on Project Euler.
- Wrote Python code to investigate random matrix theory, the Fourier transform, the diffusion equation, and other topics.
- Trained machine learning models to predict the boiling points of molecules using chemical graph theory.

Invited Talks

MIT Splash

Cambridge, MA

TEACHER

Nov. 2018

- Designed and taught an enrichment class for high school students on applications of symmetry and group theory in chemistry.

jtTalks

Jim Thorpe, PA

SPEAKER

Dec. 2018

- Presented a talk titled "Harmony, Photons, and the Shape of Molecules" at an annual STEM-focused outreach event for high school students.

Skills

Programming

Python, LaTeX, Github, Wolfram Mathematica.

Hobbies

3D modeling and printing, electronics, chess, meditation, cross country running.