

# Andreas Betz

andreasbetz@berkeley.edu – 310.251.6561

Berkeley, CA / Los Angeles, CA

Fueled by a passion for national security, I seek to channel my physics intuition, problem-solving skills, and relentless work ethic into a dynamic, fast-paced environment dedicated to innovation and agility.

## EDUCATION

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### University of California, Berkeley

September 2023 – May 2027

B.A. in Physics, Minor in Aerospace Engineering

GPA: 3.80 — Relevant Coursework: Honors Quantum Mechanics, Honors Electricity and Magnetism, Honors Classical Mechanics, Honors Laboratory, Foundations of Data Science, Linear Algebra

## EXPERIENCE

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### Mu2e Engineering Intern

August 2025 – Present

*Lawrence Berkeley National Laboratory*

*Berkeley, CA*

- Designed and machined precision fittings for next-generation mylar straw tracker technology, ensuring tight tolerances for particle detection accuracy in the Mu2e experiment.
- Developed CAD models and manufacturing protocols for straw assembly components, optimizing designs for machinability while meeting structural and alignment requirements.

### STAR (Space Technology and Rocketry at Berkeley)

August 2025 – Present

*Guidance, Navigation & Control Team*

*Berkeley, CA*

- Used first-principles fluid/thermodynamics to program pressure-regulated feed system, thrust chamber, and regenerative cooling plant functions to generate look-up tables enabling the vehicle controller to execute closed-loop thrust throttling.
- Modeled the thermodynamic, fluid dynamic, and structural properties of a combustion chamber to determine the vehicle's optimal thrust chamber geometry.

### Engineering Intern

May 2025 – July 2025

*STAX Engineering*

*Long Beach, CA*

- Designed and prototyped fail-safe locking mechanism for SPUDS, extending SPUD wire operational lifespan by approximately 2 years while boosting safety. Scaled fleet-wide for risk mitigation.
- Upgraded FTIR sensors for precise pre/post-emission analysis, achieving 100% CARB compliance since launch.

### Filippenko Supernovae Research Group

January 2024 – Present

*UC Berkeley Physics Department*

*Berkeley, CA*

- Led recruitment, training, and management of 16 undergraduate researchers to collect all photometry data (approx 32,000 exposures) for the UC Berkeley Astrophysics department.
- Analyzed Nickel telescope data on SN 2023ixf to refine the Hubble constant in a peer-reviewed publication.

### Engineering Intern - LTREX Group

April 2023 – September 2023

*LIGO Laboratory, Caltech*

*Pasadena, CA*

- Validated a proprietary beam tube baking technique for LIGO beam tubes.
- Engineered power delivery system with integrated sensors for uniform beam tube heating, incorporating Python-based real-time thermal hotspot detection.

## PROJECTS

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### Regenerative Cooling Liquid Rocket Engine

Fall 2025

Programmed a simulation from first principles to derive optimal liquid engine chamber geometry. Then, designed the feed system and thrust chamber to be manufactured soon.

### Kalman Filter for Rocket Guidance Systems

Winter 2025

Developed 34-state Kalman filter for real-time Bayesian rocket trajectory estimation (position, velocity, acceleration, heading, attitude); integrated into STAR's autonomous flight control system.

### Supersonic Tennis Ball Cannon

Ten Year Passion Project

Designed and manufactured an automated 15-foot-long propane-propelled supersonic tennis ball cannon.

**Portfolio:** [andreasbetz05.github.io/andreas\\_betz\\_portfolio](https://andreasbetz05.github.io/andreas_betz_portfolio)

## SKILLS

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**Software:** Solidworks/Onshape, Python (SciPy, PyTorch, Matplotlib), Mathematica, LaTeX, KiCad, Git

**Hardware/Fabrication:** Vacuum systems, machining (lathes, mills, grinders), 3D printing, sensor integration (FTIR, thermal)

**Professional:** Teaching/mentoring, team leadership (16+ members), collaboration