Andreas Betz

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Berkeley, CA / Los Angeles, CA

Driven by a passion for autonomy and advanced technology, I seek to apply my physics intuition, problem-solving ability, and relentless work ethic to tackle complex engineering challenges and develop innovative systems that push the boundaries of what technology can achieve.

EDUCATION

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

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.

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.

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

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.

Mu2e Straw Tube Particle Detector Winter 2025

Designed and manufactured precise electron detector technology for the Mu2e experiment, building the system from first principles and tailoring it for high-accuracy measurements of 105 MeV electrons.

Supersonic Tennis Ball Cannon 2018-2025

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

Portfolio: andreasbetz05.github.io/andreas_betz_portfolio

SKILLS

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