Caleb Farrelly

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EDUCATION

Cornell University, College of Engineering, Ithaca, NY **Expected May 2025**
Bachelor of Science, Mechanical Engineering **GPA:** 3.71
Achievements: Dean's List, Engineering Leadership Certificate

RELEVANT EXPERIENCE

SpaceX, Brownsville, TX, *Starship Propulsion Engineering Intern* **May 2024-Aug. 2024**

- Responsible Engineer for propulsion flight hardware across Starship V1, V2, and Super Heavy Booster V3
- Designed propulsion component tray using NX for sheet metal design and ANSYS for structural and vibration analysis, coordinated with integration and manufacturing technicians, achieving successful integration into Starship in 8 weeks
- Designed a critical path valve retrofit kit for Starship flight 5, directly overseeing and assisting installation, which resulted in hardware delivery ahead of schedule by several days
- Re-engineered and manufactured a prototype of a pressurized conduit for Booster V3 within 3 weeks, significantly improving the initial design by reducing part count, simplifying manufacturing, and eliminating dynamic seals

Cornell Rocketry Team, Ithaca, NY

Team-Lead **Jun. 2023-Present**

- Responsible for leading a team of 50 students across 6 subteams in the development of a high-powered hybrid rocket to compete in the Spaceport America Cup

Hybrid Propulsion Lead / Propulsion Subteam Co-Lead **Dec. 2022-Jun. 2023**

- Successfully defined, developed, and managed the first ever hybrid rocket program at Cornell, leading an interdisciplinary team of 13 mechanical, electrical, and software engineers
- Lead the design and development of a hybrid propulsion test stand, subscale and full-scale hybrid engine from concept through to successful hot fire, generating 260 lbf of thrust and 400 lbf thrust respectively
- Wrote MATLAB hybrid rocket design tool to calculate fuel grain dimensions, oxidizer load, throat diameter, and thrust
- CNC machined over 40 unique components on 3- and 4-axis HAAS mills, accumulating over 175 hours of experience
- Secured over $66,500 in corporate sponsorships of cash and propulsion hardware

Propulsion Subteam member **Oct. 2021-Dec. 2022**

- Designed fluid system and created piping and instrumentation diagram (P&ID) for hybrid propulsion test stand
- Verified N_2O flow rates and purge/pressurization performance using thermodynamics and fluid dynamics calculations
- Guided members in designing modular N_2O oxidizer injector, mechanically actuated valve, and oxidizer vent system

Astranis Space Technologies, San Francisco, CA, *Propulsion Engineering Intern* **May 2023-Aug. 2023**

- Created system P&ID, manufactured GSE cart and wrote procedure, enabling first ion thruster hot-fire test at Astranis
- Developed and executed leak and vibration testing procedures to validate flexible PEEK tubing termination hardware
- Designed and machined aluminum fixtures for simulated launch vibration testing of flexible tubing hardware
- Created pressure drop calculation tool in MATLAB to evaluate Xenon propulsion filter, tubing, and valve selection

Helios, Lunar oxygen production startup, Kochav Yair, Israel, *Engineering Intern* **May 2022-Aug. 2022**

- Designed vacuum furnace lift in Solidworks, outsourced machining of components and successfully installed device
- Conducted research and successfully developed a procedure to 3D print components in-house with novel ceramics
- Created vacuum assemblies to withstand temperatures up to 1900°C to enable material science experiments

Pika, Early-stage household appliance startup, Tel Aviv, Israel, *Consultant* **Feb 2021-Jul. 2021**

- Corresponded with investors and applied for accelerator competitions, winning the team a trip to a German accelerator

BloomX, Artificial pollination startup, Kfar Monash, Israel, *Engineering Intern* **Sep. 2020-Jan. 2021**

- Designed pollination device components in SolidWorks and built electrical control boxes, modified circuit diagrams

Duke University Photonics Laboratory, Durham, NC, *Engineering Intern* **Jul. 2019-Aug. 2020**

- Successfully designed, built, and tested a specialized optical microscope to align and test nanoscale photonic devices

Science National Honor Society, Durham, NC, *Founding member/President* **Sep. 2019- Jul. 2020**

- Established rocketry outreach program engaging 70+ disadvantaged middle & elementary students with hands-on science & engineering – making rocket fuel, building and launching Estes rockets

SPECIALIZED SKILLS

Programs: NX, ANSYS Mechanical, SolidWorks, Fusion 360 (CAD +CAM), MATLAB, LaTeX

Skills: CNC mill + lathe programming and operation, welding, additive manufacturing, soldering, automotive repair, Spanish