

# SOPHYA MIRZA

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PORTFOLIO: sophyamirza.github.io

Willing to relocate

## EDUCATION

University of California, Berkeley, B.S. **Mechanical Engineering**

**M.Eng Grad. Coursework:** Failure of Structural Material, Fracture Mechanics, Robotics Locomotion, Composite Materials

## EXPERIENCE

### Astranis

San Francisco, CA

**Propulsion RE Intern**

JAN 25 - MAY 25

- Designed (**Solidworks**) K-seals and manifold to qualify sealing interfaces to **1.5×MEOP**, achieving  $< 10^{-6}$  **SCCS** leak rate at  $< 1$  **torr vacuum** over  $-54^{\circ}\text{C}$  to  $+71^{\circ}\text{C}$  and **14.1 g<sub>rms</sub> vibe (3 min/axis)** to **delete all on bus propulsion welds**
- Designed (**SW**) **cold gas thruster** test stand for diagnostics of **steady state fire** of thruster quad (**4N – 30N** in **TVAC (1e-7 torr)**), thermals of  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  (**MEOP 300 BarA**) measured with **load cells**, **TCs**, and **PTs**
- Developed a **Beckhoff DAQ** with **TwinCAT PLC++** automated controls using **ELM3348 (24-bit, 1 kS/s)** TC modules, **EL3174 ( $\pm 10$  V /  $\pm 20$  mA, 16-bit)** PT/load cell, and **EL2634 4 channel relay solenoid actuation**, achieving **1 kHz telemetry**

### SpaceX

Brownsville, TX

**Starship Primary Structures RE - Intern**

APR 24 - AUG 24

- Deleted distortion** on **OML** and **IML** of **ogive primary structure** of Starship (S29-S35) **nosecone by 90%** through designing (**NX**) vents and propulsion hardware and reducing high heat input welds by standardizing **weld processes**
- Designed (**NX**) platform lug assembly and **biaxial superstron load test** via coupons at cryo (**76K**), ambient(**298K**) and high temp (**390K**) for header **tank parent material** and **vent passthrough punchloads** qualifications pushing to flight/stack
- Dev tested **Heatshield Thermal Protection System (TPS) permeability rationale** across fixturing to primary structure
- Cut build time by **>60%** by leading **critical path build** and integration for **headertank TPS** and designed operational (**18' x 20'**) **production** line for future builds

### Space Technologies and Rocketry

Richmond, CA

**Propulsion RE, Prop. Deputy, Lead Prop. Deputy**

NOV 21 - JAN 25

- Led prop team in building the sick-est rocket ever!
- Designed, built and tested components Ethly/LoX feed, not limited to main valves, RQD, injector and engine chamber, UHAUL driving critical flight hardware to Mojave to test

### NASA, SSL TRACERS Mission

Oakland, CA

**Mechanical Intern**

MAY 23 - AUG 23

- Designed (**SW**) **GSE**, built a computational model (**Python**) and (**ANSYS**) analysis, conducted moment of inertia, static and dynamic **testing** (ea. acceptance vibe, etc.)
- Designed (**SW**) airbearing, and **Assembled, load, stress, deployment** and integration tested the **MAG up to 5 Hz**, MSC from **2 Hz – 1 kHz** booms on **satellite** and **mounts in ISO 8**

### Proterra

Burlingame, CA

**Thermals Battery R&D, Co-op**

MAY 22 - DEC 22

- Designed (**CATIA**), built and tested **cell charger** to qualify **x200 4680 cells (4.2V/2400mA charge, 10-20A discharge)** and validate **lifecycle analysis at >4000 cycles at 90% DoD**
- Resolved **cell failures in 123kWh (6 MWh, 1200 VDC)** packs for **Class 8 EVs** by performing **root cause analysis** and deploying corrective action to **reduce welding defects** in production by **40%**
- Designed (**CATIA**) fixturing inside a **thermal runaway test bunker** for destructive qualification and performed **microscopic bond gap analysis (KEYENCE)** on battery spines to assess degradation and **passive propagation resistance** across all assembly levels.

### SAE International (Remote)

Warrendale, PA

**AM, SAF and Aerospace Standards & Regulations**

AUG 23 - AUG 24

- Streamlined (**Python**) **regulatory certification** process by **23% for >200** standards cited by **EASA** to approve guidance and **compliance** through a **UI (JavaScript)**
- Documented **government aviation initiatives** focusing additive manufacturing and **Sustainable Aviation Fuels**, managing **OKRs**

- Supported Makerspace equipment/machines and student teams teaching students to rapidly ideate, design, and prototype innovative projects
- Mentored 4 underclassmen ME students providing tailored academic support and guidance

## PROJECTS & RESEARCH

- Designed (**SW**), built, and tested custom **cryogenic instrumentation** for a **Bluefors closed-cycle cryostat** to characterize **temperature stability** and support **cosmic microwave background** experiments, mapping **thermal fluctuations** to system performance
- Developed and tested a **superconducting transition temperature** ( $T_c$ ) measurement box (**EAGLE, SW, ANSYS**) with **single pixel chip** integration, and designed a **Dunk Probe** single pixel chip to monitor cryogenic **dewar LOX levels**.

**Other personal projects can be found here:** [sophyamirza.github.io](https://sophyamirza.github.io)

## SKILLS

- **CAD:** NX, CATIA, SW, Onshape, Fusion, GD&T (ASME Y14.5), DFM, PDM, PLM
- **Analysis:** Ansys, Thermal desktop, Abaqus, Nastran, Matlab, Simulink, Refprop, EES, Excel, FMEA, FEA, CFD
- **Build/Test:** CNC & manual machining, amateur welding (MIG, HHLBW, Stud, TIG), waterjet/laser, Cryo experience, fluid valves & regulators, instrumentation, seals, manifolds, tubes, DAQ, ATP authoring, cleanroom (ISO 8)
- **Additional:** P&IDs, CMM, Python, C, ROS, Jira/Confluence, S-016, 91-710 & addit. standards, ESD Rev L(24) by NASA JPL