

SOPHYA MIRZA

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PORTFOLIO: sophyamirza.github.io

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

Propulsion RE Intern

San Francisco, CA
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°C to +71°C** and **14.1 g_{rms} 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°C to +80°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 (±10 V / ±20 mA, 16-bit)** PT/load cell, and **EL2634 4 channel relay solenoid actuation**, achieving **1 kHz telemetry**

SpaceX

Starship Primary Structures RE - Intern

Brownsville, TX
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

Propulsion RE, Prop. Deputy, Lead Prop. Deputy

Richmond, CA
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

Mechanical Intern

Oakland, CA
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

Thermals Battery R&D, Co-op

Burlingame, CA
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)

AM, SAF and Aerospace Standards & Regulations

Warrendale, PA
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

Lawrence Berkeley National Lab

Alameda County, CA
JAN 22 – AUG 23

Cryogenic Mechanical Engineer

- 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** (Tc) 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

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