

PETER KHORANI

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SUMMARY

Physics graduate with hands-on experience in astrodynamics, orbit propagation, and uncertainty-analysis simulation, plus space mission-concept development as a competition finalist. Seeking entry-level roles in mission analysis, orbital/space domain awareness, and systems engineering.

EDUCATION

University of Texas at Austin

B.S. in Physics, Space Sciences Concentration; Certificate in Quantum Information Science

Austin, TX

May 2026

EXPERIENCE

NASA RASC-AL Finalist – DUSTEE Lunar Surface Preparation Concept

Austin, TX

Systems Team Member & Sintering Subsystem Lead

Aug. 2025 – Jun. 2026

- Helped develop DUSTEE, a national finalist in NASA's 2025-2026 RASC-AL competition that autonomously sinters lunar regolith into roads and landing pads, and led the project's technical documentation.
- Led the sintering analysis with a 50,000-case Monte Carlo thermal model across six regolith and optical uncertainties, deriving the required surface concentration ratio (95% Confidence interval 273-596) that sized the concentrator against lunar south-pole irradiance.
- Designed the laser sintering subsystem: a continuous-wave 976 nm diode-laser architecture delivering 70 W to a 2 mm spot, with raster-based energy-deposition control for uniform sintered tracks.

Quantum Information Center, University of Texas at Austin

Austin, TX

Teaching Assistant & Student Project Lead – Quantum Computing

Jan. 2023 – Jan. 2025

- Led course and project support for 26 undergraduate students, translating quantum-computing concepts and algorithms into structured technical guidance.
- Implemented a Grover-based maze-search routine in Qiskit, demonstrating the algorithm's theoretical quadratic query advantage over classical unstructured search.

Aramco Auto Glass

Houston, TX

Software Engineering Intern

Jun. 2024 – Aug. 2024

- Normalized and indexed inventory tables in Azure to accelerate per-vehicle part lookup across a NAGS-based auto-glass catalog spanning makes and models from the late 1950s to current model years.
- Structured aftermarket and OEM part data including sensors, brackets, clips, and gaskets to improve lookup consistency and support quote and invoice generation for staff and customers unfamiliar with part identifiers.

TECHNICAL PROJECTS

Earth-Moon CR3BP & Lagrange-Point Stability | Python, SciPy, NumPy, Matplotlib

Spring 2026

- Modeled Earth-Moon Lagrange-point locations under the planar circular restricted three-body problem and propagated Monte Carlo particle clouds near L1 and L4.
- Characterized finite-time trajectory dispersion over approximately 61 days, monitored Jacobi-constant drift, and documented assumptions including planar motion, circular primaries, and no station-keeping.

Orbital Intelligence Dashboard | Python, FastAPI, React, Three.js, SGP4

Summer 2026

- Built a full-stack space-domain awareness dashboard that propagates satellite trajectories from TLE data using SGP4 and visualizes 3D orbit geometry, 24-hour ground tracks, and Earth-relative motion.
- Developed modular analysis tools for access-window estimation, orbital-trend monitoring, and rule-based assessment, with a FastAPI backend, React frontend, and offline TLE caching for reproducible use.

Longhorn Rocketry Association | Aerodynamics Team Member

Mar. 2023 – May 2026

- Designed clipped-delta fins for the Triton rocket in SolidWorks and evaluated aerodynamic behavior using ANSYS Fluent CFD simulations, documenting trades in design-review reports.
- Documented geometry, simulation results, and design trades in technical reports and drawings supporting manufacturing and design reviews.

TECHNICAL SKILLS

Programming & Analysis: Python (NumPy, SciPy, Matplotlib), MATLAB, SQL, Java, LaTeX

Engineering Tools: SolidWorks, ANSYS Fluent, Qiskit, Jupyter, Azure, Git/GitHub, VS Code

Methods: Astrodynamics, optical/directed-energy systems, Monte Carlo simulation, numerical integration, requirements definition, mass/power budgeting, technical risk analysis, data visualization

Work Eligibility: U.S. Citizen

Interests: Astrophotography, Mathematical Visualization, Piano, Chess, Reading, Volunteering