BRADEN K. OH

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EDUCATION & AWARDS

- **Olin College of Engineering — Engineering with Physics — May 2023 — GPA: 3.95/4.0**.
- **Massachusetts Space Grant Undergraduate Research Award** — 2021, 2022.
- **BOW Presidential Innovation Grant** — Full funding grant for 2021 Hall thruster research project.
- **US Provisional Patent No. 63/340566**, *Additively Manufactured, Azimuthal Gas Diffuser for Hall Thrusters*.

TECHNICAL EXPERIENCE

Busek Co. Inc., Electric Propulsion R&D Intern — Summer 2022

- Studied operating principles of hollow, inductively coupled plasma, and electron cyclotron resonance cathodes.
- Designed and conducted material science experiment to investigate root cause of thruster hardware failure.
- Performed mechanical design activities for, assembled, and conducted vacuum testing on lab model cathodes.

Olin Satellite + Spectrum Technology & Policy (OSSTP) Group, Research Team Lead — Aug 2020-present

- **Currently:** Lead a team developing methodology for estimating radiation-induced single event effects in avionics on board the multi-university SWARM-EX CubeSat mission.
- **Previously:** Developed a fastener-free electro-mechanical joint for affixing CubeSat dual-deployable solar panels.
- Designed spacecraft wire harnessing and secured in-kind donation of hardness components for SWARM-EX.
- Built radiation environment model, performed total ionizing dose (TID) analysis, and wrote mitigation plan that included avionics shielding requirements for SWARM-EX.
- Conducted interference-to-noise (I/N) compliance validation calculations for the OneWeb satellite constellation; co-authored a paper reporting the results of I/N compliance calculations for multiple satellite constellations.
- Delivered orbital debris assessment report (ODAR) and accompanying NASA DAS re-entry simulation for SWARM-EX.

Olin College, Undergraduate Hall Effect Thruster Team Lead — Fall 2018, Fall 2021-present

- Founded, led, and secured all funding and laboratory resources for an undergraduate space propulsion lab.
- Published papers at ASEE, IEPC, and JEP reporting development activities and outlining undergraduate curricula.
- **High Vacuum Chamber & Heaterless Cathodes (Fall 2022-present) -** Designed and manufactured a turbopump-based high vacuum chamber and led R&D activities for heaterless laboratory plasma sources for electric propulsion engines.
- **50mm Hall Thruster (2021-2022) -** Assembled an 8-student team across three colleges that designed, fabricated, and tested an electromagnet HET. Conducted live-fire testing (with Krypton) at MIT SPL. Lead-authored BOW grant proposal that won full funding and lead-authored a paper that was presented at IEPC in 2022.
- **19.5mm Hall Thruster (Fall 2018) -** Founded a 4-student team that developed a permanent-magnet HET. Created all CAD models and manufacturing diagrams; designed metallic components for external manufacturing and served as manufacturing coordinator; and self-fabricated all Boron Nitride components. Testing with Argon achieved pulse-fire.

NASA Jet Propulsion Laboratory — Summers 2017 & 2018

- **Mars 2020 Entry Descent & Landing Intern (2018) -** Designed and performed flight software system verification tests in a flight hardware testbed; developed automation capabilities for Entry, Descent, and Landing (EDL) simulation engines for the Mars 2020 (Perseverance) rover team. Delivered testing procedure and anomaly report, documented source code for automation capabilities, and delivered Python scripts to perform state configuration of a simulated spacecraft.
- **Europa Fault Protection Intern (2017) -**Wrote interactive data visualization software to aid in fault tree analysis (FTA), analyzed the use of SysML as a tool to model spacecraft fault protection systems, and developed high-level FTA templates for lab-wide use (has been used by Europa Clipper, Europa Lander, and Psyche mission teams). Delivered SysML training document and cost/benefit analysis, standalone visualizer application and source code, and Excel FTA templates for four mission phases.

PUBLICATIONS

1. **Design, Fabrication, and Testing of an Undergraduate Hall Effect Thruster** – JEP (peer reviewed) 2022.
2. **Interference-to-Noise (I/N) Compliance Validation of Telesat, OneWeb and SpaceX's 2020 Ka-Band NGSO FCC Processing Round Applications** – AIAA SciTech 2023.
3. **CubeSat Radiation Hardness Assurance Beyond Total Dose: Evaluating Single Event Effects** – SSC 2022.
4. **Design, Fabrication, and Testing of an Undergraduate Hall Effect Thruster** – IEPC 2022.
5. **Coordinating Development of the SWARM-EX CubeSat Swarm Across Multiple Institutions** – SSC 2021.
6. **Undergraduate Demonstration of a Hall Effect Thruster: Self-Directed Learning in an Advanced Project Context** – Earned the Aerospace Division Distinguished Student Paper Award – ASEE (peer reviewed) 2020.