

Taylor Peterson, MS

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Aerospace Engineering Profile

- Successfully led complex engineering projects through all phases including conceptual design, part sourcing, prototype development, iterative refinement, ground testing, and final in-flight microgravity validation for 4 suborbital flights and many parabolic flight campaigns.
- Versatile and driven aerospace engineer with a strong research foundation and specialized expertise in fluid system design and computational fluid dynamics (CFD) simulations.
- Proven ability to collaborate effectively, communicate clearly, and excel in design, troubleshooting, and utilizing advanced engineering software.
- Objective: Obtain a position in fluids, systems, or payload integration engineering that leverages experience in thermal/fluid analysis, hardware integration, and multidisciplinary testing to enable safe and reliable spaceflight operations.

PROFESSIONAL EXPERIENCE

NASA Glenn Research Center

Aug 2024 – Present

OSTEM Aerospace Engineer Research Intern

- Setting up, running, and post-processing complex 1D and CFD simulations of propellant transfer line flow.
- Using ANSYS DesignModeler, FLUENT, CFD-Post, and MATLAB to analyze thermal behavior and phase transitions in liquid hydrogen, for thermal management for in-space cryogenic propellant transfer.
- Utilizing MATLAB to recreate boiling curves from literature, determining the best correlations for microgravity predictions.
- Investigated the performance and limitations of commercial CFD software for cryogenic chilldown processes and assisted in determining the necessity of the development of advanced boiling models for accurate predictions.

Embry-Riddle Aeronautical University

Aug 2024 – Present

Ph.D. Student, Aerospace Engineer

- Conducting a literature review of CFD simulations of cryogenic line chilldown in 1g and microgravity.
- Using Star-CCM+ to recreate CFD models in 1g and extending to microgravity for space applications.
- Integrating CFD results into FEA software to perform modal analysis, track boiling locations, and determine pipe fill levels for improved system design.

Zero-Gravity (Zero-G) Corporation

Jul 2021 – Present

Parabolic Flight Coach

- Ensuring a safe and engaging experience by guiding passengers on parabolic research and consumer flights, both in flight and on the ground.
- Assisting researchers in achieving experimental objectives in microgravity, prioritizing successful research execution.
- Assisting in pre-flight payload readiness reviews followed by installing/un-installing payloads on the aircraft.

University of Central Florida

Aug 2021 – Aug 2024

Graduate Research Assistant, Aerospace Engineer

- Led the design, development, and flight readiness of a microfluidic experiment studying osteoporosis in astronauts, which launched on Blue Origin's New Shepard (NS-23 and NS-24) in collaboration with imec.
- Conducted CFD simulations in Star-CCM+ to model the microfluidic geometries representing bone structures in normal and microgravity.
- Fabricated and tested polydimethylsiloxane devices, validating CFD to ensure experimental accuracy.
- Led and mentored undergraduate students, by teaching CFD, device fabrication, and experimental procedures.

OSTEM Aerospace Engineer Research Intern

- Designed, built and tested a payload for the ISS implementing a fuel gauging technology, Modal Propellant Gauging (MPG), launching on a SpaceX Dragon Capsule for continuous autonomous testing.
- Designed the payload in Autodesk Inventor, including astronaut interfaces and custom parts fabricated at KSC.
- Performed modal analysis in Inventor Nastran to determine frequency responses of tanks at varying fill levels.
- Assembled an engineering prototype and conducted an integrated subsystem test to ensure functionality.
- Presented progress and engineering analyses to NASA branch engineers, receiving feedback and refining payload design.

Wisconsin Space Grant Consortium/Carthage College

Feb 2018 – May 2021

Student Project Lead and Student Mechanical Lead

- Designed, tested, and flew multiple MPG payloads on parabolic flights and Blue Origin New Shepard launches (NS-10, NS-12, and NS-17), supporting ISS and Artemis technology development.
- Designed and optimized payloads in SolidWorks and Inventor.
- Used FEA analysis to process modal data in MATLAB, improving accuracy of fuel gauging predictions.
- Led a new MPG initiative from concept to flight testing, overseeing design part sourcing, fabrication, iterative testing, and integration of a liquid transfer system for on-orbit refueling demonstrations.
- Participated in various tests and payload readiness reviews for suborbital and parabolic flights.
- Developed CFD simulations in SimFlow/Paraview, analyzing liquid equilibrium states with varying fill levels.

EDUCATION**Ph.D. Aerospace Engineering** | Embry-Riddle Aeronautical University

Est. Aug 2027

M.S. Aerospace Engineering | University of Central Florida

Aug 2024

B.A. Physics and Minor in Mathematics | Carthage College

May 2021

SKILLS & EXPERTISE

Computational Fluid Dynamics | Troubleshooting | Test Procedures | 3D Printing (Filament & Resin) | C++ | Python | MATLAB
 R | HTML | LaTeX | Post Processing | 3D Modeling | Data Analysis
 Relationship Building | Communication | Problem Solving | Leadership | Project Management | Time Management
 ANSYS | Star-CCM+ | SolidWorks | Autodesk Inventor | Inventor Nastran | Fusion 360 | REFPROP | Microsoft Office 365

AWARDS

National Science Foundation Graduate Research Fellowship

Mar 2023

ISS National Lab Space Leader Fellowship

Jul 2022

Sigma Pi Sigma Inductee – Physics Honor Society

Feb 2021

2020 Lemelson-MIT “Move it!” Student Prize Competition

Feb 2020

PAPERS

- Peterson, Taylor et al. “A Study of the Effects of Osteoporosis in Microgravity.” (in press). *AIP Physics of Fluids*. **In press**
- Peterson, Taylor, “A Study of the Effects of Microgravity Through Porous Media in Microfluidic Devices.” (2024). *Graduate Thesis and Dissertation 2023-2024*. 290. <https://stars.library.ucf.edu/etd2023/290> **Aug 2024**
- Le Henaff, Sylvian, Peterson, Taylor et al., “A Study of Microfluidic Device Geometries on Fluid Instabilities.” *Proceedings of the ASME Fluids Engineering Division Summer Meeting, 2022*, <https://doi.org/10.1115/FEDSM2022-87470>. **Feb 2022**
- Peterson, Taylor, “Propellant Mass Gauging via Modal Analysis on the International Space Station.” *Proceedings of the 31st Wisconsin Space Conference, 2021*, <https://doi.org/10.17307/wsc.v1i1.336> **Feb 2022**
- Peterson, Taylor et al., “Modal Propellant Gauging in Microgravity.” *Proceedings of the 29th Wisconsin Space Conference, 2019*, <https://doi.org/10.17307/wsc.v1i1.300>. **Mar 2020**