

Taylor Peterson

Physics and Mathematics

Email: tpeterson5@carthage.edu

Phone: (262) 994-4862

LinkedIn: <https://www.linkedin.com/in/tpeterson5/>

Website: <https://taylorpeterson5.github.io>

EDUCATION

09-2017 - 05-2021 **Carthage College, Bachelor of Arts**
Physics, Minor in Mathematics

EXPERIENCE

- 06-2020-08 - 2020 **NASA Kennedy Space Center Intern - Advanced Engineering Development Branch**
Modal Propellant Gauging - International Space Station (MPG-ISS)
Worked with Engineers at NASA to design a payload that implements Modal Propellant Gauging (MPG), a fuel gauging method for spacecraft. Used Autodesk Inventor to design various aspects of the payload for testing such as a front panel layout for communication between two payload lockers and the payload racks onboard the International Space Station (ISS). This payload will launch on a SpaceX Dragon Capsule in 2021 and be onboard the ISS for 30-60 days for continuous autonomous testing.
- 09-2019 - Present **Data Acquisition and Analyst Lead**
Modal Propellant Gauging - Propellant Refueling and on-Orbit Transfer Operations (MPG-PROTO)
Designed, built and tested a research payload that implements Modal Propellant Gauging (MPG) and a Propellant Management Device to study fluid behavior at low fill fractions inside modeled propellant tanks in low-gravity. Used 3D modeling software (Autodesk Inventor) to help design the payload. Currently working with other team members to prepare the payload for flight on Blue Origin's New Shepard Vehicle in the coming year. This payload was tested on Zero G's 727 in November 2020.
- 09-2019 - Present **Lead Mechanical Engineer**
Capillary Flow in Microgravity Environments, RockSat-C Program
Designed a research payload that will predict equilibrium surface liquid configuration for six different capillary flow vessel geometries in a microgravity environment. Used Autodesk Inventor to design the payload and performed Computational Fluid Dynamics (CFD) simulations in SimFlow of our flow vessels. Performed stress testing on support structures in preparation for design reviews. Developed and presented various conceptual, preliminary, and critical design reviews. The data from this experiment will be used to validate the CFD results of the software OpenCV.
- 09-2018 - Present **Mission Team Lead, Lead Mechanical Engineer**
Magneto-active Slosh Control (MaSC) in Microgravity Environments
Designed, integrated, and tested a set of Helmholtz Coils to generate a varying magnetic field to control a diaphragm made of a metallic alloy material inside of a modeled propellant tank. Helped design support structures for the coils producing the magnetic field in SolidWorks.
- 02-2018 - Present **Mission Team Lead, Lead Data Acquisition and Analyst, Lead Mechanical Engineer**
Modal Propellant Gauging in Microgravity Environments - Future implementation on SLS/Orion
Built a research payload that implements Modal Propellant Gauging for testing in low-gravity environments. Created CFD simulations of propellant tanks in microgravity. Used Finite Element Analysis to predict resonant frequencies of the modeled propellant tanks. Utilized MATLAB to generate Frequency Response Functions from the Data Acquisition System. This payload has seen successful flights on Blue Origin's New Shepard Vehicle in January and December 2019.

PUBLICATIONS & AWARDS

- 10 - 2020 **Wisconsin Space Grant Consortium Student Ambassador**
I was selected to represent the Wisconsin Space Grant at Carthage College for the 2020-2021 academic year.
- 04 - 2020 **2020 "Move it!" Lemelson-M.I.T. Student Prize Awardee**
Competed in the Lemelson-MIT Student Prize Competition with Modal Propellant Gauging (MPG) against top schools and surpassed around 200 applicants.
- 02 - 2020 **Wisconsin Space Grant Representative, Space Grant 30th Anniversary**
Represented the Wisconsin Space Grant at the Space Grant 30th Anniversary in Washington D.C. Presented research on Capitol Hill to Congress and other Space Grants.
- 09 - 2019 **Peterson, Taylor *et. al*, "Modal Propellant Gauging in Microgravity"**
Proceedings of the 29th Wisconsin Space Conference, 2020, doi: 10.17307/wsc.v1i1.300
- 09 - 2018 **Peterson, Taylor *et. al*, "Modal Propellant Gauging - Blue Origin Payload"**
Proceedings of the 28th Wisconsin Space Conference, 2019, doi: 10.17307/wsc.v1i1.243