

# Taylor Peterson

*Physics and Mathematics*

Email: [tpeterson5@carthage.edu](mailto:tpeterson5@carthage.edu)

Phone: (262) 994-4862

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

## EDUCATION

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

## EXPERIENCE

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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 Propellant Management Device to study fluid dynamics in extended periods of low-gravity. This payload will launch on a SpaceX Dragon Capsule in late 2021 and be onboard the International Space Station for 30-60 days for continuous autonomous testing.

09-2019 - Present      **Mission Team Lead, 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 design the payload and performed Finite Element Analysis on the modeled propellant tank. Wrote XML code for the payload to communicate with Blue Origin's New Shepard Vehicle. This payload will take flight in the coming year.

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 perform stress analysis as well as Computational Fluid Dynamics (CFD) simulations. 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. Designed support structures for the coils producing the magnetic field in SolidWorks (AutoCAD). Manipulated LabVIEW code to vary the generated magnetic field.

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 Computational Fluid Dynamics (CFD) simulations of propellant tanks in microgravity environments. Used Finite Element Analysis to predict resonant frequencies of modeled propellant tanks. Utilized MATLAB to generate accurate 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

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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, such as Johns Hopkins and MIT, and surpassed over 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*