PETER PARKER

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Education

Doctor of Philosophy in Engineering (PhD) | *Mechanical Engineering* Sept 2021 – Apr 2025

McMaster University, Hamilton ON

- Thesis: Multiphysics Modeling of Heat Transfer in Deployable Radiators for Deep Space Missions

Bachelor of Engineering (BEng) | *Engineering Physics* Sept 2017 – April 2021

McMaster University, Hamilton ON

- Specialization: Space Systems Engineering
- Awarded Provost Honour Medal for achieving 12/12 GPA in final year of study
- Granted $3k CAD Engineering Award of Excellence for high admission average

Professional Experience

Satellite Research Assistant | *Department of Mechanical Engineering* May - Dec 2024

McMaster University, Hamilton ON

- Researched passive and active thermal management for small satellites in microgravity
- Designed and tested miniaturized heat pipes and phase change materials for CubeSats, reducing thermal load on overall system
- Conducted thermal simulations in COMSOL and validated results via vacuum chamber tests
- Collaborated with McMaster Interdisciplinary Satellite Team on subsystem integration, highlighting ability teamwork ability and professional partnership skills

Thermal Systems Research Assistant | *Space Systems Engineering Laboratory* May - Aug 2023

University of Toronto, Toronto ON

- Researched passive thermal control using composite materials for small satellites, identifying optimal materials to reduce heat loss
- Simulated thermal behavior in ANSYS and validated with lab experiments and sensor data
- Contributed to CubeSat subsystem design for a proposed LEO mission with a multidisciplinary team, highlighting teamwork and communication skills

Simulation Research Assistant | *Space Plasma Physics Laboratory* May - Aug 2022

University of Toronto

- Investigated ionospheric plasma dynamics using satellite data from the Swarm mission, focusing on field-aligned currents and auroral zone interactions
- Processed and visualized large datasets using Python and MATLAB, applying signal filtering and statistical analysis techniques
- Supported the development of a numerical model simulating magnetosphere-ionosphere coupling under varying solar wind conditions

Teaching Experience

Design Studio Teaching Assistant | *Engineering Design Course* Sept 2020 – Apr 2021

McMaster University

- Facilitated "design studio" tutorials of around 40 students dedicated for project work by assisting in parts fabrication and design guidance, demonstrating critical-thinking and communication skills
- Operated specialized equipment (3D printers, Laser cutters) to fabricate student-designed parts
- Provided individualized feedback to all assignment and projects so that students were able to improve their future work to meet all course expectations

Projects

Autonomous Navigation Software for Planetary Rover | *Capstone Project* Sept 2020 – Mar 2021

McMaster University, Hamilton ON

- Designed and implemented a physics-informed autonomous navigation system for a planetary rover, applying principles of kinematics, dynamics, and control theory to enable real-time obstacle avoidance in complex terrains
- Developed SLAM algorithms integrating LIDAR and stereo vision data, enhancing spatial mapping accuracy and deepening understanding of sensor fusion and probabilistic modeling
- Applied numerical methods and differential equations to simulate rover motion and optimize path planning under variable terrain conditions, highlighting computational physics and algorithm skills
- Conducted experimental validation in simulated extraterrestrial environments, refining data analysis and troubleshooting abilities through iterative testing and performance evaluation
- Collaborated with a multidisciplinary team using agile workflows, strengthening technical communication and systems-level thinking while managing integration of hardware and software subsystem

Publications

- Parker, P. (2025). *Multiphysics Modeling of Heat Transfer in Deployable Radiators for Deep Space Missions*. Doctoral dissertation, McMaster University (Under review)
- Thompson, R., Parker, P., & Li, J. (2029). *Design and Experimental Validation of a Passive Thermal Control System for CubeSat-Class Spacecraft Using Miniaturized Heat Pipes*. *Acta Astronautica* (Under review)
- Thompson, L. J., Rahman, A., Chen, M., Parker, P. (2027). Modeling Field-Aligned Currents in the Auroral Zone Using Swarm Satellite Data and Magnetosphere-Ionosphere Coupling Simulations. Journal of Geophysical Research: Space Physics.

Skills

Programming Languages: Python (Pandas, Numpy, Matplotlib, Seaborn), C/C++, Java, R, MATLAB

Software: SolidWorks, AutoCAD, ANSYS, Abaqus, Multisim, Simulink, Maple, COMSOL Multiphysics, Excel