Olivier Lamarre

Planetary Roboticist and Aerospace Engineer

olamarre.com | olivier.lamarre@robotics.utias.utoronto.ca | Canada, Earth

Experience

Long-Distance Navigation Autonomy Intern

NASA Jet Propulsion Laboratory, California Inst. of Technology

Sep 2019 – Nov 2020 | Pasadena (CA), USA

- Lead field tests for the MAARS research group, mentored by Dr. Masahiro Ono
- Create a compression framework for long-term planetary navigation autonomy

Resource-Aware Navigation Intern

NASA Jet Propulsion Laboratory, California Inst. of Technology

Sep 2018 – May 2019 | Pasadena (CA), USA

- Develop approximation methods to provide kilometer-scale resource-aware strategic planning capabilities to future solar-powered Mars rovers
- Support navigation autonomy development for the PUFFER micro-rover project

ExoMars Rover Locomotion System Intern

MDA Space

May – Aug 2016 | Brampton, Canada

- Design fixtures and create test procedures to validate drive actuators dust seals efficacy while in partial immersion in Martian regolith simulant

Mars Rover Project Founder and Leader

McGill Robotics Engineering Design Team

Jul 2014 – Jul 2017 | Montreal, Canada

- Manage a team of 60 members designing tele-operated multipurpose rovers
- Lead field tests at the Canadian Space Agency & Mars Desert Research Station
- Ranked third internationally at the European Rover Challenges 2015 and 2016

Education

Ph.D. Aerospace Science, Engineering and Robotics

University of Toronto Institute for Aerospace Studies

Sep 2017 – 2025 (expected) | Toronto, Canada

- Thesis: Adaptive Long-range Planetary Navigation Autonomy
- STARS Laboratory, supervised by Prof. Jonathan Kelly

B. Eng. Mechanical Engineering (Major) & Geology (Minor)

McGill University

Jan 2013 – May 2017 | Montreal, Canada

Extracurricular: McGill Robotics Mars Rover Team (Founder & Project Lead)

Honors & Awards

Alexander Graham Bell Canada Graduate Scholarship
Natural Sciences and Engineering Research Council of Canada

Graduate Fellowship
NASA Jet Propulsion Laboratory

Ontario Graduate Scholarship (x3)

Robotics Leadership in Service
U. of Toronto Robotics Institute

Third Place Internationally (x2)
European Rover Challenges 2015-16

Dean's Honour List
McGill University, Faculty of Eng.

Skills & Strengths

Field Robotics | Leadership | Community Outreach | Public Speaking | Teamwork | Project Management

ROS 1/2 | QGIS | Python | C++ | Mission Systems

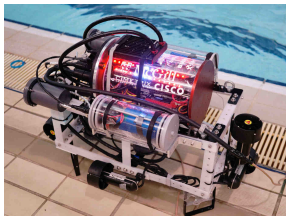
Certifications

PADI Rescue Scuba Diver
PADI Peak Performance Buoyancy
First Aid (Heart & Stroke Foundation)

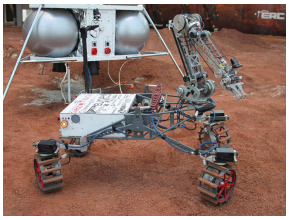
Languages

English & French (fluent), Spanish (begin.)

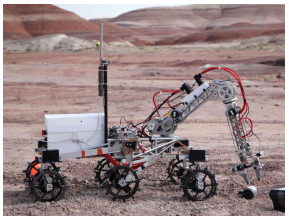
Below are some of the robots I helped design and/or extensively field-tested.



Asimov AUV
Robosub Competition

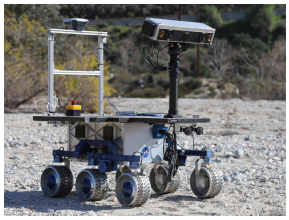


Bhūmi Rover
European Rover Challenge



Calliope Rover
University Rover Challenge

Customized Husky
Canadian Space Agency



Athena Rover
NASA JPL

Publications

Journal Articles

- **Lamarre**, **Olivier**, Shantanu Malhotra, and Jonathan Kelly (Dec. 2023). “Recovery Policies for Safe Exploration of Lunar Permanently Shadowed Regions by a Solar-Powered Rover”. In: *Acta Astronautica* 213, pp. 706–724.
- **Lamarre**, **Olivier**, Oliver Limoyo, Filip Maric, and Jonathan Kelly (May 2020). “The Canadian Planetary Emulation Terrain Energy-Aware Rover Navigation Dataset”. In: *The International Journal of Robotics Research* 39.6, pp. 641–650.

Conference Proceedings

- **Lamarre**, **Olivier** and Jonathan Kelly (Nov. 19–21, 2024). “The Importance of Adaptive Decision-Making for Autonomous Long-Range Planetary Surface Mobility”. In: *Proceedings of the International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*. To Appear. Brisbane, Queensland, Australia.
- **Lamarre**, **Olivier**, Shantanu Malhotra, and Jonathan Kelly (Mar. 2–9, 2024). “Safe Mission-Level Path Planning for Exploration of Lunar Shadowed Regions by a Solar-Powered Rover”. In: *Proceedings of the IEEE Aerospace Conference*. Big Sky, Montana, USA, pp. 1–14.
- **Lamarre**, **Olivier**, Ahmad Bilal Asghar, and Jonathan Kelly (Oct. 29, 2020). “Impact of Traversability Uncertainty on Global Navigation Planning in Planetary Environments”. In: *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop on Planetary Exploration Robots*. Moog Workshop Poster Competition First Prize. Las Vegas, Nevada, USA.
- **Lamarre**, **Olivier** and Jonathan Kelly (June 4–6, 2018). “Overcoming the Challenges of Solar Rover Autonomy: Enabling Long-Duration Planetary Navigation”. In: *Proceedings of the International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*. Madrid, Spain.

Other Co-Authored Work

- Ono, Masahiro, Brandon Rothrock, Kyohei Otsu, Shoya Higa, Yumi Iwashita, Annie Didier, Tanvir Islam, Christopher Laporte, Vivian Sun, Kathryn Stack, Jacek Sawoniewicz, Shreyansh Daftry, Virisha Timmaraju, Sami Sahnoune, Chris A. Mattmann, **Olivier Lamarre**, Sourish Ghosh, Dicong Qiu, Shunichiro Nomura, Hiya Roy, Hemanth Sarabu, Gabrielle Hedrick, Larkin Folsom, Sean Suehr, and Hyoshin Park (2020). “MAARS: Machine learning-based Analytics for Automated Rover Systems”. In: *2020 IEEE Aerospace Conference*, pp. 1–17.
- Higa, Shoya, Yumi Iwashita, Kyohei Otsu, Masahiro Ono, **Olivier Lamarre**, Annie Didier, and Mark Hoffmann (2019). “Vision-Based Estimation of Driving Energy for Planetary Rovers Using Deep Learning and Terramechanics”. In: *IEEE Robotics and Automation Letters* 4.4, pp. 3876–3883.