

Noah Sadaka

Ph.D. Candidate in Astronautics at Purdue University
Canadian Citizenship

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RESEARCH INTERESTS

Cislunar astrodynamics, space situational awareness, multi-body dynamics, operational constraints applied to mission design, dynamical systems theory, resonant interactions

EDUCATION

Aug. 2023 – present	Ph.D. Aeronautics and Astronautics Expected Graduation: May 2027 Advisor: Dr. Kathleen Howell	PURDUE UNIVERSITY. WEST LAFAYETTE, IN, USA
Aug. 2020 – May 2023	M.Sc. Aeronautics and Astronautics Advisor: Dr. Kathleen Howell Thesis title: “There and Back Again: Generating Repeating Transfers Using Resonant Structures”.	PURDUE UNIVERSITY. WEST LAFAYETTE, IN, USA
Sep. 2015 – Dec. 2019	B.Eng. Aerospace Engineering Graduated <i>With Great Distinction</i>	CONCORDIA UNIVERSITY. MONTREAL, QC, CANADA

RESEARCH EXPERIENCE

May 2023 – Present	Cislunar Surveillance Constellation Design Advised by Dr. Kathleen Howell Developed a comprehensive astrodynamics toolset for cislunar constellation design and analysis, including orbit generation and analysis in the circular restricted three-body problem, an object-oriented differential corrections module, continuation techniques, and optical apparent magnitude modeling. Additionally, a C++ N -body ephemeris propagation tool wrapped for Python was created for trajectory validation, as well as extensive frame transformation tools. Kalman filtering and optimization extensions were also incorporated.	PURDUE UNIVERSITY
May 2023 – Aug. 2023	Cislunar Spacecraft Servicing Advised by Dr. Kathleen Howell Leveraging invariant manifolds of Lagrange point orbits in the circular restricted three-body problem to produce transfers for spacecraft servicing scenarios.	PURDUE UNIVERSITY
Sep. 2023	Concurrent Design Engineering Workshop Orbital Mechanics Team Worked with a team of 30 students to design a cislunar surveillance mission. Contributed to orbit selection and design using STK/Astrogator.	EUROPEAN SPACE AGENCY
Sep. 2019 – Dec. 2019	Heated Tube in Flow Advised by Dr. Brian Vermeire Created 2D meshes, ran simulations with custom bash scripts, post-processed in Python and Paraview.	CONCORDIA UNIVERSITY
May 2018 – June 2019	Solar Powered Aircraft Ventilation Advised by Dr. Susan Liscouët-Hanke Developed a parametric transient thermal model for aircraft cabins with solar-powered ventilation	CONCORDIA UNIVERSITY

PUBLICATIONS

CONFERENCE PUBLICATIONS

1. **Sadaka, N. I.**, Howell, K. C. “Tracking Cislunar Targets from Visibility- and Information-Informed Optical Observer Constellations”. *77th International Astronautical Congress*. Antalya, Türkiye, October 5-9, 2026. (*Accepted, published after Congress*)
2. **Sadaka, N. I.**, Howell, K. C. “A Geometrically-Informed Design Approach for Synodic-Resonant Cislunar SSA Constellations”. *2026 AAS/AIAA Astrodynamics Specialist Conference*. Whistler, Canada, July 26-30, 2026.

3. **Sadaka, N. I.**, Fahey, L., Howell, K. C. "Surveilling Cislunar Space by Leveraging Non-Ballistic Periodic Solutions". *2025 AAS/AIAA Astrodynamics Specialist Conference*. Boston, MA, USA, August 10-15, 2025.
4. **Sadaka, N. I.**, Howell, K. C. "Designing Multi-Orbit Constellations for Potential Surveillance in the Cislunar Regime". *35th AAS/AIAA Spaceflight Mechanics Meeting*. Kaua'i, HI, USA, January 19-23, 2025.
5. Janisch K. et al., (incl. **Sadaka, N. I.**) "Detection and Tracking of Space Debris in Cislunar Environment-A Phase o Mission Design". *75th International Astronautical Congress*. Milan, Italy, October 14-18, 2024.
6. **Sadaka, N. I.**, Gupta, M., Howell, K. C., Fruch, C. "Observing the Cislunar Surveillance Cone from Synodic Resonant Orbit Constellations". *2024 AAS/AIAA Astrodynamics Specialist Conference*. Broomfield, CO, USA, August 11-15, 2024.
7. **Sadaka, N. I.**, Howell, K. C. "Periodic Transfers that Depart and Return to an Operating Orbit Using Resonant Structures in the Planar Three-Body Problem". *33rd AAS/AIAA Space Flight Mechanics Meeting*. Austin, TX, USA, January 15-19, 2023.
8. **Sadaka, N. I.**, Sanchez, F, and Liscouët-Hanke, S., "Model Development for the Conceptual Design of a Solar-Powered Aircraft Air-Conditioning System". *Canadian Aeronautics and Space Institute AERO*. Laval, QC, 2019.

MANUSCRIPTS UNDER REVIEW

9. **Sadaka, N. I.**, Gupta, M., Howell, K. C., Fruch, C. "Repeating and Persistent Viewing of Cislunar Regions from Synodic-Resonant Constellations". *Journal of the Astronautical Sciences (Under Review)*.

BOOK CHAPTERS

10. Liscouët-Hanke, S., **Sadaka, N.**, and El Chaar, R., "A Supplemental Solar Power System for Future Aircraft: Challenges and Opportunities". Chapter in *The Future of Solar Power*, Hauppauge, NY: Nova Science Publishers, Inc. 2023.

INDUSTRY EXPERIENCE

May 2023 – Aug. 2023	Canadian Space Agency Systems Engineering & Orbital Mechanics Systems Engineering: Requirements mapping for WildFireSat Mission. <i>Advisor: Dr. Isabelle Jean</i> Teaching: Prepared and presented a series of orbital mechanics webinars. <i>Advisor: Dr. Alfred Ng</i> Mission Design: Parametric constellation maintenance tool with Python and STK/Astrogator	LONGUEUIL, QC, CANADA
Sep. 2019 – Dec.2019	Pratt & Whitney Canada Data Scientist – Oil Analysis Technologies Dash and Plotly Express data visualization dashboards Data exploration in Python of metal particle composition in engine oil	LONGUEUIL, QC, CANADA
May 2019 – Aug. 2019	Pratt & Whitney Canada Mechanical Transmission – Engine Seals Conducted gas turbine engine seal tests Designed test rig components in CATIA V5 Analyzed test results in Python and presented findings to team leads	LONGUEUIL, QC, CANADA
Jan. 2018 – May 2018	Bombardier Aerospace Core Engineering – Loads Created GUI MATLAB tools for visualization and validation of aerodynamic loads simulations	MONTREAL, QC, CANADA
Sep. 2016 – Dec. 2016	Bombardier Aerospace Service Engineering Wrote maintenance procedures for aircraft modifications Used CATIA V5 to produce part and assembly drawings	MONTREAL, QC, CANADA

HONORS AND AWARDS

2023 – 2026	NSERC Doctoral Scholarship	101,000\$ CAD OVER 36 MONTHS
2023 – 2027	FRQNT Doctoral Scholarship (Awarded, held for four months).	106,000\$ CAD OVER 48 MONTHS
2021 – 2022	FRQNT Master's Scholarship.	25,334\$ CAD OVER 16 MONTHS
2020	Trottier Space Institute Graduate Fellowship (declined).	3,000\$ CAD
2020	Concordia University Aerospace Engineering Medal (<i>graduating cohort's leading student</i>)	
2018	Concordia Undergraduate Student Research Award.	5,625\$ CAD
2015 – 2019	Dean's List (four years), Concordia University.	
2018	Concordia University John N. and Sophia Economides Scholarship.	1,545\$ CAD
2017	Concordia University Used Book Fair Scholarship.	1,000\$ CAD
2016	Concordia University Golf Classic Entrance Scholarship.	2,000\$ CAD

TEACHING

Aug. 2021 – May 2023	Teaching Assistant in the First Year Engineering Dept. Developed course materials and assignments for an introductory MATLAB and Python course (ENGR 133). Managed a team of 10 undergraduate teaching assistants and graders. Ran office hours for Excel, Python, and MATLAB project-based courses (ENGR 131, 132, and 133).	PURDUE UNIVERSITY
Dec. 2020 – July 2021	Private tutor One-on-one tutoring in high school mathematics, differential and integral calculus, and linear algebra.	MONARQUE TUTORING
Fall 2018 and 2019	Engineering Design Project (AERO 390) Teaching Assistant. Presented weekly on aerospace design topics during tutorials Helped student teams during tutorial sessions on their design project Graded exams	CONCORDIA UNIVERSITY

SKILLS

Languages: Fluent in both English and French
Programming: Python, MATLAB, Bash scripting, C++ (intermediate)
Communication: L^AT_EX, public speaking and presenting, technical writing
Development: Linux environments (remote servers and personal computer), Git

ACADEMIC SERVICE

2026	Reviewer, <i>Chaos: An Interdisciplinary Journal of Nonlinear Science</i> .
2025	Session Chair, 35th AAS/AIAA Space Flight Mechanics Meeting.

TALKS AND MEDIA

Summer 2023	Presentations at the Canadian Space Agency's "Astroclub" (in french) Presentation titled "De la Terre à la Lune (and Back!)". Presentation titled "La Résonance dans le Système Solaire"
Sept. 2025	Invited talk to Prof. Carolin Frueh's research group at Purdue University Presentation titled "Research Summary".
2022	Guest on the <i>Abstract: The Future of Science</i> Podcast Episode 74 "Astrodynamics & The 3-Body Problem ft. Noah Sadaka".