

Dr. Tim Hallatt

THEORETICAL ASTROPHYSICIST

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Academic Positions

Massachusetts Institute of Technology (MIT); MIT Kavli Institute for Astrophysics and Space Research

Cambridge, Massachusetts

POSTDOCTORAL ASSOCIATE

Sept. 2024 - present

- advisor: Dr. Sarah Millholland

Education

McGill University

Montréal, Quebec

PHD, PHYSICS

Sept. 2021 - July, 2024

- advisor: Dr. Eve J. Lee
- thesis title: “On the Formation of Planets in the Milky Way’s Thick Disk”
- topic: theoretical planet formation
- tools: **MESA** hydrodynamics/interior structure code, **REBOUND** dynamics code, **Python**, **Fortran**
- additional skills: machine learning with **scikit-learn**

McGill University

Montréal, Quebec

MSc, PHYSICS

Sept. 2019 - Sept. 2021

- advisor: Dr. Eve J. Lee
- thesis title: “Leveraging Exoplanet Occurrence Rates to Test Planet Formation Theory”
- topic: theoretical planet formation

University of Western Ontario

London, Ontario

HON. BSc, PHYSICS

Sept. 2015 - April, 2019

- honours thesis advisor: Dr. Paul Wiegert
- thesis title: “The Dynamics of Interstellar Asteroids and Comets Within the Galaxy”
- topic: dynamics

Publications

PUBLISHED

Hallatt, T., Lee, E. J., 2025. On the Formation of Planets in the Milky Way’s Thick Disk. *Astrophysical Journal*, vol. 979, no. 120. ([link to paper](#))

Hallatt, T., Lee, E. J., 2022. Sculpting the sub-Saturn Occurrence Rate via Atmospheric Mass Loss. *Astrophysical Journal*, vol. 924, no. 9. ([link to paper](#))

Hallatt, T., Lee, E. J., 2020. Can Large-Scale Migration Explain the Giant Planet Occurrence Rate? *Astrophysical Journal*, vol. 904, no. 2. ([link to paper](#))

Hallatt, T., Wiegert, P., 2020. The Dynamics of Interstellar Asteroids and Comets within the Galaxy: an Assessment of Local Candidate Source Regions for 1I/’Oumuamua and 2I/Borisov. *Astronomical Journal*, vol. 159, no. 4. ([link to paper](#))

Cadieux, C., Plotnykov, M., Doyon, R., et al. (incl. **Hallatt, T.**), 2023. New Mass and Radius Constraints on the LHS 1140 Planets – LHS 1140 b is Either a Temperate Mini-Neptune or a Water World (accepted by *Astrophysical Journal Letters*; [link to paper](#)).

SUBMITTED

Hallatt, T., Millholland, S., 2025. Shedding Light on Desert Dwellers (submitted to AAS Journals).

Hallatt, T., Millholland, S., 2025. Coupled Planetary Interior and Tidal Evolution (submitted to AAS Journals).

WHITE PAPERS

Benneke, B., Cowan, N., Rowe, J. et al. (incl. **Hallatt, T.**), 2019. Exoplanet instrumentation in the 2020s: Canada's pathway towards searching for life on potentially Earth-like exoplanets. Canadian Long Range Plan for Astronomy and Astrophysics White Papers, LRP2020. Online at <https://www.zenodo.org/communities/lrp2020>, id.65. ([link to paper](#))

Seminars & Presentations

June 2025. *Exoplanet Demographics: A Journey Through Space and Time*. Astrophysics Seminar, University of Bern, Bern, Switzerland.

June 2025. *Exoplanet Demographics: A Journey Through Space and Time*. Astrophysics Seminar, Max Planck Institute for Astronomy, Heidelberg, Germany.

June 2025. *Exoplanet Demographics: A Journey Through Space and Time*. Astrophysics Seminar, Institute of Astronomy, University of Cambridge, Cambridge, UK.

May 2025. *Shedding Light on Desert Dwellers*. Oral presentation. AAS Division of Dynamical Astronomy meeting (DDA), Atlanta, Georgia.

April 2025. *Shedding Light on Desert Dwellers*. Exoplanet Lunch, Harvard & Smithsonian Center for Astrophysics, Cambridge, USA.

October 2024. *On the Formation of Planets in the Milky Way's Thick Disk*. Planet & Star Formation Coffee, Max Planck Institute for Astronomy, Heidelberg, Germany. (online)

September 2024. *On the Formation of Planets in the Milky Way's Thick Disk*. Oral presentation. MIT & Harvard Planetary Meeting, Cambridge, USA.

June 2024. *On the Formation of Planets in the Milky Way's Thick Disk*. Poster presentation at Exoplanets 5 conference, Leiden, Netherlands.

September 2023. *Constraining Planet Formation Theory via Exoplanet Occurrence Rates*. Stars & Planets Seminar, Yale University, New Haven, USA.

July 2023. *On the Formation of Planets in the Milky Way's Thick Disk*. Oral presentation. Towards Other Earths III: the Planet-Star Connection, Instituto de Astrofísica e Ciências do Espaço, Porto, Portugal

June 2023. *On the Formation of Planets in the Milky Way's Thick Disk*. Oral presentation. Emerging Researchers in Exoplanet Science, Yale University, New Haven, USA.

May 2021. *Sculpting the sub-Saturn Occurrence Rate via Atmospheric Mass Loss*. Oral presentation. High Energy Exoplanets, European Space Agency XMM-Newton Workshop, Online.

November 2020. *Can Large-Scale Migration Explain the Giant Planet Occurrence Rate?*. Oral presentation. ExoDem Conference, Caltech, Online.

October 2020. *Can Large-Scale Migration Explain the Giant Planet Occurrence Rate?*. Oral presentation. Exocoffee, Max Planck Institute for Astronomy, Online.

August 2020. *The Dynamics of Interstellar Asteroids and Comets Within the Galaxy*. Oral presentation. Division of Dynamical Astronomers Meeting, Online. [Link to presentation](#)

June 2020. *The Dynamics of Interstellar Asteroids and Comets Within the Galaxy*. Poster presentation. American Astronomical Society meeting, Online.

Select Awards & Fellowships

2021	Alexander Graham Bell Canada Graduate Scholarship-Doctoral , NSERC	\$ 105,000
2021	Perseverance Scholarship , McGill University	\$ 1200
2021	L. Trottier Science Accelerator fellowship , McGill University	\$ 5000
2020	Alexander Graham Bell Canada Graduate Scholarship-Master's , NSERC	\$ 17,500
2020	Technologies for Exoplanetary Science Fellowship , NSERC	\$ 6500
2019	Donald R. Hay Prize (for best thesis) , Physics & Astronomy Dept., University of Western Ontario	\$ 300
2019	Dr. Gérard Hébert Scholarship in Physics (for community service, academic excellence, research potential) , Physics & Astronomy Dept., University of Western Ontario	\$ 1700

Media Citations & Interviews

Universe Magazine (2025): Galactic imbalance: Ancient radiation “killed” planets in embryo

Science News (2025): Galactic chaos at cosmic noon may have stunted Milky Way planet formation

Astronomy Magazine (2021): Our Galaxy's Marvelous Rogues and Misfits

Scientific American (2020): Mystery of Interstellar Visitor 'Oumuamua Gets Trickier

Nature (2019): How Two Intruders From Interstellar Space are Upending Astronomy

Populär Astronomi (2019): Interstellar comet Borisov is a well-known stranger

Service & Outreach

2020-present	Peer Reviewer , AAS Journals, Monthly Notices of the Royal Astronomical Society	
August, 2023	McGill STEM summer camp , Science Discussion/Q+A Group Leader	McGill University
2023	Trottier Space Institute , arXiv discussion organizer/leader	McGill University
2020-2022	Trottier Space Institute , Meeting With Speaker organizer/leader	McGill University
2021-2022	McGill Graduate Association of Physics Students , VP Academic	McGill University
2021-2022	McGill Graduate Association of Physics Students mentorship program , lead organizer	McGill University
2019-2022	McGill Graduate Association of Physics Students mentorship program , mentor	McGill University
2021-2022	McGill Graduate Association of Physics Students , Meeting with Speaker organizer/leader	McGill University
2019-2022	McGill Hackathon , mentor	McGill University
2022	Vanderbilt Astronomy Club , public lecture., Online	Vanderbilt University
2021	AstroMcGill public lecture. Our Galactic Neighbourhood: Insights From Exoplanets and Interstellar Objects , Online	McGill University
2018-2019	Physics and Astronomy Students' Association , President	University of Western Ontario
2016-2019	Physics and Astronomy Students' Association Help Center , lead organizer/tutor	University of Western Ontario

Mentorship

2025	DJ Liveoak , Undergraduate; research mentorship on dynamical evolution of hot Jupiters with companion planets	<i>MIT</i>
summer, 2023	Vincent Savignac , Undergraduate; research mentorship on sub-Neptune core-envelope interaction	<i>McGill University</i>
2020-2021	Didar Seghi , Undergraduate; academic mentorship	<i>McGill University</i>
2019-2020	Griffin Schwartz , Undergraduate; academic mentorship	<i>McGill University</i>
2019-2020	Harper Sewalls , Undergraduate; academic mentorship	<i>McGill University</i>