Peter J. Smith

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Education

PhD Astronomy
2024-2028 (expected)

Max Planck Institute for Astronomy/Heidelberg University — *Heidelberg, Germany*

- Thesis Title: Dynamical Models of Omega Centauri
- Thesis Supervisor: Dr. Nadine Neumayer

MSc Astronomy
2022-2024

Saint Mary's University — *Halifax, Canada*

- Thesis Title: Dynamical Inference of Black Hole Populations in Globular Clusters
- Thesis Supervisor: Dr. Vincent Hénault-Brunet

BSc Honours in Astrophysics
2018 - 2022

Saint Mary's University — *Halifax, Canada*

- Thesis Title: The Effects of Binary Stars on Recovered Remnant Populations in Globular Clusters
- Thesis Supervisor: Dr. Vincent Hénault-Brunet
- Faculty of Science Dean's List: 2019, 2020, 2021, 2022
- Summa Cum Laude

Research

PhD Thesis
Sep. 2024 - Present

Max Planck Institute for Astronomy — *Heidelberg, Germany*

- Supervisor: Dr. Nadine Neumayer
- Using state-of-the-art datasets to constrain the present-day dynamics and formation of Omega Centauri, the most massive globular cluster in the Milky Way, and likely our nearest galactic nucleus.

Masters Thesis
Sep. 2022 - Aug. 2024

Saint Mary's University — *Halifax, Canada*

- Supervisor: Dr. Vincent Hénault-Brunet
- Began the computation of a grid of dynamical models of globular clusters with a bottom-light IMF.
- Extracted mock data from a large grid of pre-computed dynamical models.
- Developed a method to test dynamically-inferred remnant populations on mock data.
- Developed and applied a method to used pulsar timing data to constrain dynamical models of globular clusters.

Honours Thesis
Sept. 2021 - Apr. 2022

Saint Mary's University — *Halifax, Canada*

- Supervisor: Dr. Vincent Hénault-Brunet
- Developed a method to include the dynamical effects of binary stars in equilibrium models of globular clusters.
- Tested the effects of binary stars on recovered remnant populations in globular clusters.

Undergraduate Research Assistant
Jan. 2020 - Sep. 2021

Saint Mary's University — *Halifax, Canada*

- Supervisor: Dr. Vincent Hénault-Brunet
- Developed a method to include pulsar timing data in the fitting of multimass equilibrium models to globular clusters.
- Updated our existing stellar population synthesis code to use the latest prescriptions for black hole natal-kicks and ejections.
- Obtained strong constraints on the dark remnant population in 47 Tuc which represent a significant improvement over previous works.

Publications

oMEGACat. VI. Analysis of the overall kinematics of Omega Centauri in 3D: velocity dispersion, kinematic distance, anisotropy, and energy equipartition
ApJ

M. Häberle, N. Neumayer, C. Clontz, A. Seth, **P. Smith**, S. Kamann, R. Pechetti, M. S. Nitschai, M. Alfaro-Cuello, H. Baumgardt, A. Bellini, A. Feldmeier-Krause, N. Kacharov, M. Libralato, A. P. Milone, S. Souza, G. van de Ven, Z. Wang
Apr. 2025

Probing Populations of Dark Stellar Remnants in the Globular Clusters 47 Tuc and Terzan 5 Using Pulsar Timing
ApJ

P. J. Smith, V. Hénault-Brunet, N. Dickson, M. Gieles, H. Baumgardt
Nov. 2024

Multimass modelling of Milky Way globular clusters - II. present-day black hole populations
MNRAS

N. Dickson, **P.J. Smith**, V. Hénault-Brunet, M. Gieles, H. Baumgardt
Mar. 2024

Multimass modelling of Milky Way globular clusters - I. Implications on their stellar initial mass function above $1\ M_{\odot}$ *MNRAS*

N. Dickson, V. Hénault-Brunet, H. Baumgardt, M. Gieles, **P.J. Smith** *Jul. 2023*

Teaching

Tutor *Heidelberg, Germany*

Heidelberg University *Apr. 2025 - Present*

- Courses: Einführung in die Astronomie und Astrophysik II (Intro Astronomy II)
- Duties include running weekly tutorial sessions and marking and managing exercise sheets and exams.

Teaching Assistant *Halifax, Canada*

Saint Mary's University *Sep. 2022 - Aug. 2024*

- Courses: Math Methods I, Quantum Mechanics I, University Physics II, Introduction to Astronomy, Life in the Universe
- Duties include marking and managing tests and assignments, assisting with in-class demonstrations and assisting individual students during lectures.

Outreach and Volunteer Activities

Observatory Tour Volunteer *Saint Mary's University*

Burke-Gaffney Observatory *2022 - 2024*

- Assist with public tours and open houses at the Burke-Gaffney Observatory.
- Answer questions from the tour participants and operate small telescopes on the observing deck.

Volunteer Judge *Saint Mary's University*

SMU Department of Astronomy and Physics Annual Mini-Symposium on Undergraduate Summer Research *Sep. 2023*

- Evaluate student presentations and select a winner and runner-up.

Talks and Presentations

MODEST-25 *June 2025*

Poster Presentation *Seoul National University*

Globular Clusters and Their Tidal Tails: From the Milky Way to the Local Group *May 2024*

Oral Presentation *University of Toronto*

Institute for Computational Astrophysics Symposium *Feb. 2024*

Oral Presentation *Saint Mary's University*

MODEST-23 *Aug. 2023*

Poster Presentation *Northwestern University*

Eastern Association for Stellar Astrophysics *Oct. 2022*

Oral Presentation *Virtual*

Atlantic Undergraduate Physics and Astronomy Conference *Feb. 2022*

Oral Presentation *Université de Moncton (Virtual)*

Canadian Undergraduate Physics Conference *Nov. 2021*

Oral Presentation *Ryerson University (Virtual)*

SMU Department of Astronomy and Physics Annual Mini-Symposium on Undergraduate Summer Research *Sep. 2021*

Oral Presentation *Saint Mary's University (Virtual)*

Canadian Astronomical Society AGM 2021 *May 2021*

Poster Presentation *Dominion Radio Observatory (Virtual)*

Atlantic Undergraduate Physics and Astronomy Conference *Feb. 2021*

Oral Presentation *Dalhousie University (Virtual)*

SMU Department of Astronomy and Physics Annual Mini-Symposium on Undergraduate Summer Research *Sep. 2020*

Oral Presentation *Saint Mary's University (Virtual)*

Honours & Awards

2022	**Tindall/Steinitz Award in Research**, Atlantic Universities Physics and Astronomy Conference	*Université de Moncton*
2021	**Science Atlantic Communication Award**, Atlantic Universities Physics and Astronomy Conference	*Dalhousie University*
2020	**1st Place Award**, Saint Mary's University Department of Astronomy and Physics Annual Mini-Symposium on Undergraduate Summer Research	*Saint Mary's University*