

# Steven Fahlman

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## Education

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### PhD (Expected)

University of Alberta

Sept 2019 - Sept 2023

Computational Astrophysics

### MSc

University of Alberta

Sept 2017 - Sept 2019

Computational Astrophysics

### BSc

University of Calgary

Sept 2013 - April 2017

Astrophysics Honours

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## Academics

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### PhD and MSc Thesis Project

(Sept 2017 - Sept 2023)

- Research the state-of-the-art in the field and identify interesting unexplored avenues
- Develop and validate a new branch of the open source FLASH magnetohydrodynamic fluid code
- Model black holes and neutron stars in complex large scale fluid simulations on compute clusters
- Analyze terabytes of simulation data efficiently in Fortran, Python, and visualization software
- Collaborate with co-authors to write technical reports on competitive deadlines
- Peer review papers submitted to journals for scientific rigor and significance
- Present work at international conferences and local seminars for experts and nonprofessionals
- Assist in managing the day-to-day of newer students in the research group

### BSc Honours Thesis Projects

(Jan 2017 - April 2017)

- Analyze photometry data from untested cameras in Python to get insights into the optimal settings
- Design and implement a project to get orbital properties of the four biggest moons of Jupiter
- Communicate the methodology and results to peers

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## Publications

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- You Must Construct Additional Hypermassive Neutron Stars (2023)
- Secular Outflows from 3D-MHD Hypermassive Neutron Star Accretion Disk Systems (2023)
- The Fast Flavor Instability in Hypermassive Neutron Star Disk Outflows (2022)
- Long-term 3D-MHD Simulations of Black Hole Accretion Disks in Neutron Star Mergers (2022)
- Outflows, Mergers, and Tori, Oh My! (2019)
- Hypermassive Neutron Star Disk Outflows and Blue Kilonovae (2018)

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## Conferences

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- High School - University Physics Collaboration Day (2023)
- EMMI + IReNA Workshop: Remnants of Neutron Star Mergers: Connecting Hydrodynamic models to nuclear, neutrino, and kilonova physics (2022)
- INT 20R-1b: The r-process and the nuclear EOS after LIGO-Virgo's third observing run (2022)
- Canadian Astronomical Society Annual General Meeting (2021)
- Quarks to Cosmos APS April Meeting (2019,2021)
- Fifty-One Ergs: An International Conference on the Physics and Observations of Supernovae and Supernova Remnants (2019)

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## Work Experience

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### Lead Teaching Assistant

#### **University of Alberta Undergraduate Physics Labs (PT, 12 hours a week, Sept 2022 - April 2023)**

- Facilitate discussion in weekly meetings to train and prepare teaching assistants for the labs
- Provide actionable feedback on issues in the labs, ongoing during the semester and at end-of-term
- Co-facilitate annual Teaching Assistant Bootcamp, educating peers on effective teaching methods
- Create engaging teaching materials and templates for other teaching assistants to use
- Demonstrate university level physics experiments to high school students in outreach program

### Teaching Assistant

#### **University of Alberta Undergraduate Physics Labs (PT, 12 hours a week, Sept 2017 - Sept 2022)**

- Teach new concepts to undergraduate students and give individualized assistance
- Train first year students in the safe operation of equipment during experiments and supervise
- Design new experiments which students can conduct at home during Covid-19 lockdowns
- Cooperatively redesign and improve the physics major stream first year labs

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## Awards

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- Mary Margaret Sturrock Teaching Assistant Award (2022)
- Graduate Student Teaching Award (2020, 2021)
- Doctoral Recruitment Scholarship (2019)
- Dean's List, Faculty of Science (2017)

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## Relevant Skills and Interests

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- Expertise in LaTeX, Python, Fortran, Bash and Microsoft Office suite
- Introductory knowledge in Java, C++, SQL and visualization softwares
- First aid certified
- Talk to me about baking, computer hardware, Star Trek, or in German (but slowly, I'm rusty)