

# Alexander Laroche

University of Toronto, 50 St. George Street, Toronto, ON, M5S 3H4  
✉ alex.laroche@mail.utoronto.ca • 🌐 astro.utoronto.ca/ alexander.laroche

## Education

<b>University of Toronto</b> <i>PhD in Astronomy &amp; Astrophysics</i>	<b>Toronto, ON, Canada</b> 2022 –
<b>McGill University</b> <i>BSc in Honours Physics (First Class Honours)</i> Supervisors: Jo Bovy, Daniel Gilman, Adrian Liu, Jonathan Sievers	<b>Montreal, QC, Canada</b> 2018 – 2022

## Awards & Fellowships

at University of Toronto.....	
<b>Graduate Entrance Scholarship</b> <i>5,000 CAD, David A. Dunlap Department of Astronomy &amp; Astrophysics</i>	<b>Sep 2022 – Aug 2023</b>
<b>NSERC USRA Fellowship</b> <i>9,600 CAD, Natural Sciences &amp; Engineering Research Council</i>	<b>May 2021 – Aug 2021</b>
at McGill University.....	
<b>Canada 150 Research Chair Undergraduate Research Grant</b> <i>6,000 CAD, Canada 150 Research Chairs Program</i>	<b>May 2020 – Aug 2020</b>
<b>Charles River Laboratories Scholarship</b> <i>2,000 CAD, Academic merit</i>	<b>Sep 2020 – Aug 2021</b>
<b>Wing Hing Chan Scholarship in Science</b> <i>500 CAD, Academic merit</i>	<b>Sep 2020 – Aug 2021</b>
<b>Dean's Honours List</b> <i>Top 10% of Faculty of Science</i>	<b>Sep 2020 – Aug 2021</b>

## Publications

- Peer-Reviewed Journal Articles.....
1. **Alexander Laroche**, Daniel Gilman, Xinyu Li, Jo Bovy, Xiaolong Du. Quantum fluctuations masquerade as halos: Bounds on ultra-light dark matter from quadruply-imaged quasars, *Mon. Not. Roy. Astron. Soc.* **517**, 1867 (2022) arXiv:2206.11269 [astro-ph.CO].
- Theses.....
1. **A. Laroche**, J. Banghal (2021). "Quantifying Density-Ionization Correlations with the 21cm Power Spectrum While Including X-ray Heating Effects". McGill University. BSc Honours Research Thesis.

## Research Experience

<b>Undergraduate Research Assistant - UofT Galactic Astrophysics Group</b> <i>Department of Astronomy &amp; Astrophysics</i> Supervisors: Jo Bovy, Daniel Gilman	<b>2021-2022</b> <i>University of Toronto</i>
○ Constraining ultra-light dark matter with strong gravitational lensing	
<b>Undergraduate Research Assistant - McGill Cosmic Dawn Group</b> <i>Department of Physics</i> Supervisor: Adrian Liu	<b>2020-2021</b> <i>McGill University</i>

- Investigating the effect of x-ray heating on density-ionization correlations during the Epoch of Reionization with the 21cm power spectrum
- Undergraduate Research Assistant - McGill Radio Lab** **2020-2021**  
*Department of Physics* *McGill University*  
 Supervisor: Jonathan Sievers
- Data selection and analysis for the Probing Radio Intensity at high-Z from Mario (PRIZM) experiment

## Teaching Experience

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- AST101: The Sun and Its Neighbours** **Fall 2022**  
*Graduate teaching assistant, University of Toronto*
- PAPER Tutor** **2019-2020**  
*Undergraduate math and physics tutor, Montreal, QC*

## Presentations

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- Conferences.....
- Canadian Astro-Particle Physics Summer Student Talk Competition** **Aug 2022**  
*Quantum fluctuations masquerade as halos* *Subdury, ON*
- University of Toronto 2022 Stellar Stats Workshop** **May 2022**  
*Constraining ultra-light dark matter by forward modeling flux ratios* *Toronto, ON*
- Other Talks.....
- McGill University Undergraduate Research Project Presentation** **Dec 2021**  
*Probing the quantum mechanics of ultra-light dark matter with strong lensing* *Montreal, QC*
- University of Toronto NSERC USRA Poster Seminar** **Aug 2021**  
*Probing the quantum mechanics of ultra-light dark matter with strong lensing* *Toronto, ON*
- McGill University Undergraduate Research Thesis Presentation** **Apr 2021**  
*Density-ionization correlations with the 21cm power spectrum including X-ray heating* *Montreal, QC*