

ALEX LAGUË

David Rittenhouse Laboratory
209 S 33rd St
Philadelphia, PA 19104
alague@sas.upenn.edu
alexlague@github.io

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Research Experience

University of Pennsylvania Postdoctoral Researcher	Philadelphia, USA <i>2022 to Present</i>
University of Toronto & CITA Graduate Research Assistant	Toronto, Canada <i>2017-2022</i>
McGill University Undergraduate Researcher (Mathematics) Undergraduate Researcher (Physics)	Montréal, Canada <i>2016</i> <i>2015 & 2017</i>

Education

University of Toronto & CITA PhD in Astronomy & Astrophysics Thesis: Ultralight Axions and the Cosmic Web Supervisors: J. Richard Bond, Renée Hložek	Toronto, Canada <i>2017 to 2022</i>
McGill University BSc in Honours Mathematics and Physics First Class Honours Thesis: Cross-Correlations to Probe the Existence of Cosmic Strings Supervisor: Robert Brandenberger	Montréal, Canada <i>2014-2017</i>

Awards and Fellowships

Ontario Graduate Scholarship.	2021-2022
Frank S. Hogg Memorial Fellowship.	2020
Mary and Ron Martin Graduate Fellowship in Astrophysics.	2018
Natural Sciences and Engineering Research Council of Canada Undergraduate Research Award.	2016
Fonds de recherche Québec, Nature et Technologie Undergraduate Research Award.	2016

Publications

First Author

5. **Laguë, A.**, McCarthy, F., Madhavacheril, M., Hill J. C., Qu, F. J. (2024). Constraints on Dark Matter-Dark Energy Scattering from ACT DR6 CMB Lensing. arXiv Preprint.
4. **Laguë, A.**, Schwabe, B., Hložek, R., Marsh, D. J. E., Rogers, K. K. (2023) Cosmological simulations of mixed ultralight dark matter. Physical Review D.
3. **Laguë, A.**, Bond, J. R., Hložek, R., Rogers, K. K., Marsh, D. J. E., Grin, D. (2022) Constraining Ultralight Axions with Galaxy Surveys. Journal of Cosmology and Astroparticle Physics.
2. **Laguë, A.**, Bond, J. R., Hložek, R., Marsh, D. J. E., Söding, L. (2021). Evolving Ultralight Scalars into Non-Linearity with Lagrangian Perturbation Theory. Monthly Notices of the Royal Astronomical Society, Volume 504, Issue 2, June 2021, Pages 2391–2404.
1. **Laguë, A.**, Meyers, J. (2019). Prospects and Limitations for Constraining Light Relics with Primordial Abundance Measurements. Physical Review D, 2020(02), 101, 9 pages.

Contributing Author

7. ACT Collaboration (2023). The Atacama Cosmology Telescope: DR6 Gravitational Lensing Map and Cosmological Parameters. arXiv Preprint.
6. ACT Collaboration (2023). The Atacama Cosmology Telescope: A Measurement of the DR6 CMB Lensing Power Spectrum and its Implications for Structure Growth. arXiv Preprint.
5. Rogers K. K., Hložek, R., **Laguë, A.**, Ivanov, M. M., Philcox, O. H. E., Cabass, G., Akitsu, K., Marsh, D. J. E. (2023). Ultra-light axions and the S_8 tension: joint constraints from the cosmic microwave background and galaxy clustering. Accepted for publication in the Journal of Cosmology and Astroparticle Physics.
4. Vogt, S. M. L., Marsh, D. J. E., and **Laguë, A.** (2023), Improved mixed dark matter halo model for ultralight axions. Phys. Rev. D 107, 063526.
3. Dentler, M., Marsh, D. J. E., Hložek, R., **Laguë, A.**, Rogers, K. K., Grin, D. (2022). Fuzzy Dark Matter and the Dark Energy Survey Year 1 Data. Monthly Notices of the Royal Astronomical Society, Volume 515, Issue 4, October 2022, Pages 5646–5664.
2. Bauer, J. B., Marsh, D. J. E., Hložek, R., Padmanabhan, H., **Laguë, A.** (2020). Intensity Mapping as a Probe of Axion Dark Matter. Monthly Notices of the Royal Astronomical Society, Volume 500, Issue 3, January 2021, Pages 3162–3177.
1. Anthonisen, M., Brandenberger, R., **Laguë, A.**, Morrison, I. A., and Xia, D. (2016). Cosmic Microwave Background spectral distortions from cosmic string loops. Journal of Cosmology and Astroparticle Physics, 2016(02), 047, 7 pages.

Invited Presentations (*presenting authors)

- Hložek, R*, **Laguë, A.***, Rogers, K. K.* The Nature of DM on Small Scales, Yale University (2021).
- **Laguë, A.*** New Horizons in Astro and Particle Theory, Queens University (2021).
- **Laguë, A.*** Efficient Modelling of Ultralight Axions. LEPP Seminar, Cornell (2021).

- **Laguë, A.*** Fuzzy Dark Matter. From Inflation to the Hot Big Bang, Kavli Institute for Theoretical Physics , Santa-Barbara, USA (2020).
- **Laguë, A.***, Hložek R., Stein, G., Bond, J. R. Non-Linear Fuzzy Dark Matter Modelling with Extended LPT. The CMB in HD: The Low-noise High-resolution Frontier, New York, USA (2019).

Teaching Experience

Teaching assistant (TA) for the following classes: AST 101: The Sun and Its Neighbors[†], AST 201: Stars and Galaxies[†], AST 210: Great Moments in Astronomy[†], AST 222: Galaxies and Cosmology*, AST 325: Introduction to Practical Astronomy*, AST 326: Practical Astronomy*.

* Special appointment as computing teaching assistant involving the creation of a Python guide and tutorials for astronomy students, taking them from their first line of code to data analysis for research purposes.

[†] Included preparing and leading tutorials and exam review sessions as well as hosting office hours (both in-person and virtual).

Outreach, Mentoring and Scientific Communication

- Astro on Tap Philadelphia
- Panel moderator for the general public symposium *Mysteries of the Universe: Black Holes, Dark Matter, and Dark Energy* organized by the Astronomy and Space Exploration Society.
- Planetarium operator which involved creating and presenting planetarium shows to the general public about recent events in astronomy.
- Animator for the public outreach event *AstroTours* which involved presenting detailed 3D-printed models of existing and upcoming telescopes to the general public.
- Undergraduate Mentorship: Zara Zaman (undergraduate research thesis), Alexander Spencer London (undergraduate summer research project) and Ishika Bangari (mentorship program).

Languages

English and French (native speaker).