Alex Laguë

David Rittenhouse Laboratory
209 S 33rd St
Philadelphia, PA 19104
alague@sas.upenn.edu
https://www.cita.utoronto.ca/∼lague

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Employment

University of Pennsylvania — Philadelphia, USA
Postdoctoral Researcher — *2022 to Present*

Education

University of Toronto & CITA — Toronto, Canada
PhD in Astronomy & Astrophysics — *2017 to 2022*
Thesis: Ultralight Axions and the Cosmic Web
Supervisors: J. Richard Bond, Renée Hložek

McGill University — Montréal, Canada
BSc in Honours Mathematics and Physics — *2014-2017*
First Class Honours
Thesis: Cross-Correlations to Probe the Existence of Cosmic Strings
Supervisor: Robert Brandenberger

Awards and Fellowships

Ontario Graduate Scholarship. 2021-2022
($15 000)
Frank S. Hogg Memorial Fellowship. 2020
($5 700)
Mary and Ron Martin Graduate Fellowship in Astrophysics. 2018
($4 700)
Natural Sciences and Engineering Research Council of Canada Undergraduate Research Award. 2016
($5 000)
Fonds de recherche Québec, Nature et Technologie Undergraduate Research Award. 2016
($1 000)

Selected Publications

8. 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.

7. 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.

6. 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.

5. **Laguë, A.**, Bond, J. R., Hložek, R., Rogers, K. K., Marsh, D. J. E., Grin, D. (2022) Constraining Ultralight Axions with Galaxy Surveys. Accepted for publication by the Journal of Cosmology and Astroparticle Physics.

4. **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.

3. 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.

2. **Laguë, A.**, Meyers, J. (2019). Prospects and Limitations for Constraining Light Relics with Primordial Abundance Measurements. Physical Review D, 2020(02), 101, 9 pages.

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

- 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).