

Jungjoon Leo Kim

Postdoctoral Fellow at York University

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Employment

2025–Present **Postdoctoral Fellow**, Department of Physics and Astronomy, York University, Toronto, ON, Canada.

Education

2021–2025 **PhD, Physics**, Queen's University, Kingston, ON, Canada.

Thesis: On the Formation, Evolution, and Observation of Dark Compact Objects [\[link\]](#)

Advisor: Joseph Bramante [\[link\]](#)

2019–2021 **MMath, Applied Mathematics**, University of Waterloo, Waterloo, ON, Canada.

Thesis: Spectrum of Cuscuton Bounce and Cosmological Parameter Inference Using Dark Sirens [\[link\]](#)

Advisor: Ghazal Geshnizjani [\[link\]](#)

2014–2019 **BMath, Mathematical Physics**, University of Waterloo, Waterloo, ON, Canada.

Select Honours & Awards

2022–2025	NSERC Canada Graduate Scholarship – Doctoral (CGS D)	\$110,000
2024	Harold M. Cave Graduate Travel Scholarship	\$800
2024	McDonald Institute Student Achievement Award for Equity Leadership	\$250
2023	Harold M. Cave Graduate Travel Scholarship	\$1,000
2021	University of Waterloo Applied Math Outstanding Teaching Assistant Award	\$500
2018	NSERC Undergraduate Student Research Award	\$4,500
2016	NSERC Undergraduate Student Research Award [Declined]	\$4,500

Publications and Preprints

†alphabetical ordering of authors following HEP convention

8. J. Berger, A. Bhoonah, J. Bramante, **J. L. Kim**[†], N. Song and L. M. Widrow, *Seed galactic magnetic fields from ultralight dark photons*, In prep.
7. **J. L. Kim**, G. Geshnizjani, N. Afshordi, S. S. Boruah and W. G. Dallaway, *A Poisson Log-Normal Framework for Dark Sirens*, In prep.
6. D. S. Hosseini, A. Dehghani, **J. L. Kim**, A. Krolewski, S. Mukherjee and G. Geshnizjani, *Modeling Gravitational Wave Bias from 3D Power Spectra of Spectroscopic Surveys*, [\[2506.11201\]](#).
5. A. Dehghani, **J. L. Kim**, D. S. Hosseini, A. Krolewski, S. Mukherjee and G. Geshnizjani, *The gravitational wave bias parameter from angular power spectra: bridging between galaxies and binary black holes*, *JCAP* **04** (2025) 056 [\[2411.11965\]](#).
4. J. Bramante, M. D. Diamond and **J. L. Kim**[†], *Dimming Starlight with Dark Compact Objects*, *Phys. Rev. Lett.* **134** (2025) 141001 [\[2409.08322\]](#).
3. J. Bramante, C. V. Cappiello, M. D. Diamond, **J. L. Kim**[†], Q. Liu and A. C. Vincent, *Dissipative dark cosmology: From early matter dominance to delayed compact objects*, *Phys. Rev. D* **110** (2024) 043041 [\[2405.04575\]](#).

2. J. Bramante, M. Diamond and **J. L. Kim**[†], *The effect of multiple cooling channels on the formation of dark compact objects*, *JCAP* **02** (2024) 002 [[2309.13148](#)].
1. **J. L. Kim** and G. Geshnizjani, *Spectrum of Cuscuton Bounce*, *JCAP* **03** (2021) 104 [[2010.06645](#)].

Presentations

Colloquium and Invited Talks

- Apr 2025 **Invited Seminar**, *C.N. Yang Institute for Theoretical Physics – Stony Brook University*, Stony Brook, NY, USA.
“Forming and Finding Dark Compact Objects”
- Nov 2024 **Colloquium**, *Physics Colloquium (PhD slot) – Queen’s University*, Kingston, ON, Canada.
“The secret life of dark compact objects”
- Sep 2024 **Invited Seminar**, *Particle Theory Group – UC Irvine*, Irvine, CA, USA.
“Forming and Finding Dark Compact Objects”
- Sep 2024 **Invited Seminar**, *TEPAPP – UCLA*, Los Angeles, CA, USA.
“Dissipative Dark Matter in a Slow Cooker: Delayed Dark Clumps and Primordial Black Holes”

Conference/Workshop Talks

- Jul 2025 **Contributed Parallel Talk**, *Dark Side of the Universe 2025 – McGill University/Université de Montréal*, Montréal, QC, Canada.
“Dimming Starlight with Dark Compact Objects”
- Oct 2024 **Contributed Plenary Talk**, *Dark Interactions 2024 – Simon Fraser University*, Vancouver, BC, Canada.
“Cloudy with a Chance of Dark Matter”
- Aug 2024 **Contributed Parallel Talk**, *TeVPA 2024 – University of Chicago*, Chicago, IL, USA.
“Cloudy with a Chance of Dark Matter”
- May 2024 **Contributed Parallel Talk**, *DPF-PHENO 2024 – University of Pittsburgh/Carnegie Mellon University*, Pittsburgh, PA, USA.
“Dissipative Dark Matter in a Slow Cooker: Delayed Dark Clumps and Primordial Black Holes”
- Feb 2024 **Contributed Plenary Talk**, *Dark Matter, First Light – Perimeter Institute for Theoretical Physics*, Waterloo, ON, Canada.
“The effect of multiple cooling channels on the formation of dark compact objects”
- May 2023 **Contributed Parallel Talk**, *PHENO 2023 – University of Pittsburgh*, Pittsburgh, PA, USA.
“More Ways to (Be) Cool: Compact Objects from Inelastic Dark Matter”
- Aug 2022 **Contributed Parallel Talk**, *TeVPA 2022 – Queen’s University*, Kingston, ON, Canada.
“A Poisson Log-Normal Framework for Cosmological Parameter Inference Using Dark Sirens”
- Nov 2020 **Contributed Poster and Lightning Talk**, *The 9th KIAS Workshop on Cosmology and Structure Formation – Korea Institute for Advanced Study*, Seoul, South Korea.
“Power spectrum for scalar and tensor perturbations in Cuscuton bounce”

Internal Talks

- Oct 2024 **Talk**, *Astroparticle Group Meeting – Queen’s University*, Kingston, ON, Canada.
“Cloudy with a Chance of Dark Matter”
- Feb 2024 **Talk**, *Astroparticle Group Meeting – Queen’s University*, Kingston, ON, Canada.
“The effect of multiple cooling channels on the formation of dark compact objects”
- Jun 2020 **Talk**, *Applied Mathematics Graduate Seminar – University of Waterloo*, Waterloo, ON, Canada.
“Towards scale invariance in Cuscuton bounce”

- Jun 2020 **Talk**, *Cosmology group meeting – Perimeter Institute for Theoretical Physics*, Waterloo, ON, Canada.
“Towards scale invariance in Cuscuton bounce”
- Aug 2019 **Contributed Talk**, *Mathematics and Statistics Undergraduate Research Conference – McGill University*, Montréal, QC, Canada.
“Quadrilateral Regge elements”
- Aug 2018 **Contributed Talk**, *Applied Mathematics Undergraduate Research Mini-Conference – University of Waterloo*, Waterloo, ON, Canada.
“Power spectrum for Cuscuton bounce” (Awarded best presentation)

Mentoring & Teaching

Mentoring

- 2023–2025 **Queen’s University Upper-year undergraduate Mentorship Program (Q-PUMP)**, *Queen’s University*, Kingston, ON, Canada.
Graduate School Application, Undergraduate Research Assistant Application Mentorship
Mentees: Alexander Katrusiak, Francesca Valentini (Queen’s)
- 2020 **Summer Undergraduate Research Project**, *University of Waterloo and Perimeter Institute for Theoretical Physics*, Waterloo, ON, Canada.
Project: Cross-correlation of the Astrophysical Gravitational Wave Background with Galaxy Surveys
Mentees: Kieana Fana (Waterloo), Jordan Krywonos (Perimeter), Madison Tindall (Perimeter)

Teaching

- 2021–2025 **Graduate Teaching Assistant**, *Queen’s University*, Kingston, ON, Canada.
- PHYS 345: Quantum Physics of Atoms, Nuclei and Particles (Winter 2022, 2023, 2024, 2025)
 - Physics Help Desk (Winter 2024)
 - APSC 112: Physics II (Winter 2023)
 - PHYS 316: Methods in Mathematical Physics I (Fall 2021, Fall 2022)
 - PHYS 344: Introduction to Quantum Mechanics (Fall 2021)
- 2019–2021 **Graduate Teaching Assistant**, *University of Waterloo*, Waterloo, ON, Canada.
- MATH 674: Special Relativity for Teachers (Spring 2021)
 - AMATH 373: Quantum Theory 1 (Winter 2021)
 - MATH 228: Differential Equations for Physics and Chemistry (Winter 2021)
 - AMATH 456: Calculus of Variations (Fall 2020)
 - MATH 636: Linear Algebra for Teachers (Spring 2020)
 - AMATH 353: Partial Differential Equations 1 (Winter 2020)
 - MATH 217: Calculus 3 for Chemical Engineering (Winter 2020)
 - MATH 115: Linear Algebra for Engineering (Fall 2019)
- 2016–2019 **Undergraduate Teaching Assistant**, *University of Waterloo*, Waterloo, ON, Canada.
- MATH 137: Calculus 1 for Honours Mathematics (Fall 2016, Fall 2018)
 - MATH 138: Calculus 2 for Honours Mathematics (Winter 2017, Winter 2019)
 - ECE 206: Advanced Calculus 2 for Electrical Engineers (Fall 2017)

Outreach

- 2022–2024 **Public Education Specialist**, *Arthur B. McDonald Canadian Astroparticle Physics Research Institute*, *Queen’s University*, Kingston, ON, Canada.
- 2023 **Summer Camp Counsellor**, *IDEAS Initiative*, *Queen’s University*, Kingston, ON, Canada.
- 2023 **Volunteer**, *Science Rendezvous Kingston*, Kingston, ON, Canada.

Community Service

- 2023-2025 **Founding Member, Graduate Mentor, Executive Member**, *Queen's Physics upper-year Undergraduate Mentorship Program (Q-PUMP)*, Queen's University, Kingston, ON, Canada.
- 2022-2024 **Colloquium Committee Graduate Representative**, *Graduate Physics Society*, Queen's University, Kingston, ON, Canada.
- 2022 **Volunteer**, *TeVPA 2022*, Queen's University, Kingston, ON, Canada.