Department of Applied Mathematics
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Jungjoon Leo Kim

MMath Graduate Student in Applied Mathematics

Research Interests

Early universe cosmology, inflation and alternatives to inflation, general relativity, modified gravity, gravitational wave cosmology

Education

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

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

Research Experience

2019–Present **Graduate Research Assistant**, *University of Waterloo*, Waterloo, ON, Canada.
Supervisor: Dr. Ghazal Geshnizjani
Thesis: TBD

2019 **Undergraduate Research Assistant**, *McGill University*, Montréal, QC, Canada.
Supervisor: Dr. Gantumur Tsogtgerel
Project: Quadrilateral Regge Elements

2018 **Undergraduate Research Assistant**, *University of Waterloo*, Waterloo, ON, Canada.
Supervisor: Dr. Ghazal Geshnizjani
Project: Power Spectrum for Cuscuton Bounce

2016 **Undergraduate Researcher**, *Institute for Quantum Computing*, Waterloo, ON, Canada.
Supervisor: Dr. Kyung Soo Choi
Project: PID Controllers for ECDL Frequency Stabilization

Publications and Preprints

Submitted

1. **J. L. Kim** and G. Geshnizjani, *Spectrum of Cuscuton Bounce*, 2010.06645.

Talks & Presentations

2020 'Power spectrum for scalar and tensor perturbations in Cuscuton bounce" (poster and talk)
The 9th KIAS Workshop on Cosmology and Structure Formation (virtual) – *Korea Institute for Advanced Study*

2020 "Towards scale invariance in Cuscuton bounce"
Applied Mathematics Graduate Seminar (virtual) – *University of Waterloo*

2020 "Towards scale invariance in Cuscuton bounce"
Cosmology group meeting (virtual) – *Perimeter Institute for Theoretical Physics*

2019 "Quadrilateral Regge elements"
Mathematics and Statistics Undergraduate Research Conference – *McGill University*

2018 "Power spectrum for Cuscuton bounce" (Awarded best presentation)
Applied Mathematics Undergraduate Research Mini-Conference – *University of Waterloo*

Honours & Awards

University of Waterloo

2020	Math Domestic Graduate Student Award	*$3000*
2019	Mathematics Domestic Masters Scholarship	*$5000*
2019	Math Domestic Graduate Student Award	*$3000*
2018	NSERC Undergraduate Student Research Award	*$4500*
2016	NSERC Undergraduate Student Research Award (Declined)	*$4500*
2014	Adel S. Sedra Entrance Scholarship	*$3000*
2014	University of Waterloo President's Scholarship	*$1500*

Conference & Workshop Participation

2020	The 9th KIAS Workshop on Cosmology and Structure Formation (virtual) – Korea Institute for Advanced Study
2020	Cosmology from Home (virtual) – *Cosmology from Home*
2020	48th SLAC Summer Institute (virtual) – *SLAC National Accelerator Laboratory*
2020	Michigan Cosmology Summer School (virtual) – *University of Michigan*
2019	Mathematics and Statistics Undergraduate Research Conference – *McGill University*
2018	Applied Mathematics Undergraduate Research Mini-Conference – *University of Waterloo*

Teaching Experience

2019–Present **Graduate Teaching Assistant**, *University of Waterloo*, Waterloo, ON, Canada.
- 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–Present **Private Tutor**, *Self-employed*, Waterloo, ON, Canada.
- MTE 203: Advanced Calculus (Mechatronics)
- MATH 124: Calculus for Kinesiology
- MATH 127: Calculus for Honours Science
- PHYS 112: Physics 2
- PHYS 115: Mechanics for Engineering
- PHYS 121: Mechanics for Honours Physics
- MCAT Physics

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)

Graduate Coursework

University of Waterloo, Waterloo, ON, Canada

2020	PHYS 782: Fundamentals of Astrophysics II (Ongoing)
2020	AMATH 731: Applied Functional Analysis (Ongoing)
2020	AMATH 872: Quantum Field Theory for Cosmology
2019	AMATH 875: General Relativity for Cosmology
2019	PHYS 787: Cosmology

Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada

2019   PHYS 601: Perimeter Scholars International Quantum Field Theory 1
2019   PHYS 603: Perimeter Scholars International Quantum Field Theory 2

Volunteer Activities

2019–Present   Instructor and General Executive Member – University of Waterloo Kendo Club
2018–2019   VP of Communications – University of Waterloo Kendo Club
2018   Mathematics Ambassador – Faculty of Mathematics, University of Waterloo
2017–2018   Volunteer Notetaker – AccessAbility Services, University of Waterloo