

Niayesh Afshordi

Astrophysics, cosmology, and gravity

Professor, University of Waterloo; Research Associate
Faculty, Perimeter Institute

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Comprehensive public academic CV — updated 12 July 2026

Profile

Niayesh Afshordi is an astrophysicist working at the interface of cosmology, gravitation, quantum theory, and observation. His research connects fundamental questions to gravitational-wave data, black holes, the cosmic microwave background, large-scale structure, compact objects, and other astrophysical probes. Current themes include quantum black holes and quadratic gravity, strong-gravity tests, early-universe cosmology, dark matter and dark energy, missing baryons, and modified gravity. His interdisciplinary work also includes medical-physics applications, radiotherapy, and epidemiological and public-health modelling.

Research profiles

- [arXiv author record](#)
- [INSPIRE author record](#)
- [ORCID 0000-0002-9940-7040](#)
- [Google Scholar profile](#)

Scope

This long public CV retains the complete professional record, including appointments, funding, teaching, supervision, service, presentations, and interviews, while excluding protected personal information. The publication list is refreshed independently from arXiv, INSPIRE, and ORCID. The separate website talks collection holds source decks and slide exports; raw filenames, duplicate export formats, and other speakers' files are not CV entries.

Professional record

Generated from the Canadian Common CV submitted on 15 August 2025. The protected cover page and personal contact, demographic, citizenship, and identifier fields are excluded. Administrative form metadata is suppressed for readability; the substantive academic record is retained.

Privacy screen: 3 protected source line(s) removed in addition to the protected cover page.

Language Skills

English and Persian: read, write, speak, understand, and peer review.

Degrees

2000/9 - 2004/11	Doctorate, PhD, Astrophysics, Princeton University Thesis Title: The Other 99 Percent Supervisors: Spergel, David, 2000/9 - 2004/11 Research Disciplines: Astronomy and Astrophysics
1996/9 - 1999/5	Bachelor's Honours, BSc, Physics, Sharif University of Technology

Recognitions

2020/1	The Buchalter Cosmology Prize 2019 Dr. Ari Buchalter Prize / Award The \$10,000 First Prize was awarded to Dr. Jahed Abedi of the Max-Planck-Institut für Gravitationsphysik (Albert-Einstein-Institut) and Leibniz Universität Hannover and Dr. Niayesh Afshordi of the University of Waterloo and the Perimeter Institute for Theoretical Physics, for their work entitled "Echoes from the Abyss: A highly spinning black hole remnant for the binary neutron star merger GW170817", published in the Journal of Cosmology and Astroparticle Physics and recognized by the judging panel as "a bold and innovative step towards understanding quantum gravitational phenomena, using observational data to demonstrate gravitational wave echoes from a binary neutron star merger, which could indicate that black hole interiors may be more complex than the simple regions predicted by General Relativity."
2016/1	The Buchalter Cosmology Prize 2015 Dr. Ari Buchalter Prize / Award The \$2,500 Third Prize was awarded to Dr. Niayesh Afshordi of the University of Waterloo and the Perimeter Institute for Theoretical Physics and Dr. Elliot Nelson of Perimeter Institute, for their work entitled "Cosmological Non-Constant Problem: Cosmological bounds on TeV-scale physics and beyond", published in the Journal of Physical Review D and recognized by the judging panel as "an intriguing proposition that the Planck scale of quantum gravity may soon be accessible by particle accelerators, based on the expected white noise fluctuations in the cosmological constant, which might not be constant at all but vary widely in space."
2011/10	Professor M.K.Vainu Bappu Gold Medal Astronomical Society of India Prize / Award The Vainu Bappu Memorial Gold Medal honours outstanding astronomers worldwide under the age of 35. I was one of the two recipients of this honour in 2011.
2011/9	Early Researcher Award - 150,000 (Canadian dollar) Government of Ontario Prize / Award The ERA program helps promising, recently-appointed Ontario researchers build their research teams of undergraduates, graduate students, post-doctoral fellows, research assistants, associates and technicians. The goal of the program is to improve Ontario's ability to attract and retain the best and brightest research talent.
2010/9 - 2013/9	Discovery Accelerator Supplement - 120,000 Natural Sciences and Engineering Research Council of Canada (NSERC) Prize / Award The Discovery Accelerator Supplement award provides substantial and timely resources to a small group of researchers whose research proposals suggest and explore highrisk, novel or potentially transformative concepts and lines of inquiry, and are likely to have impact by contributing to groundbreaking advances in the area. I was one of the 8 researchers in Physics who received this award in 2010.

User Profile

Researcher Status: Researcher Research Career Start Date: 1998/01/01 Engaged in Clinical Research?: No

Key Theory / Methodology General Relativity, Quantum Mechanics, Astrophysical and Cosmological Observations, Numerical Simulations, Large Data, Statistical Methods, Theoretical Modeling

Research Interests I lead a comprehensive and ambitious research program, which spans a wide area, from Astrophysics/Cosmology to Fundamental Physics, and includes a diverse spectrum of observational, numerical, and analytic elements. The program aims at linking deep mysteries in fundamental physics to novel observational results and techniques, which can be used to shed light on the structure and laws of our Universe. The areas that my group and I currently focus on are: 1. Phenomenology of Dark Energy and cosmological modifications of General Relativity 2. Distribution of Dark Matter on small scales and novel windows for Dark Matter detection 3. Observational consequences of Aether theories of gravity, and their connection to Quantum Gravity and Cosmological Constant Problem 4. Early Universe, and its links to foundations of Gravity and Quantum Mechanics 5. Missing baryons, and observational probes of intergalactic plasma 6. Physics of Neutron Stars, Black Holes and Accretion Disks.

Research Experience Summary I am an Astronomer, and a Physicist; in short I am an Astrophysicist. Currently, I am a Professor in the Astrophysics and Gravitation group at the Department of Physics and Astronomy, University of Waterloo. I am also Research Associate Faculty in the Cosmology and Gravitation group at the Perimeter Institute for Theoretical Physics (PI), the premier Canadian institute for research in theoretical Physics. I finished my PhD at

Princeton University Observatory in August 2004. I was then a fellow at the Institute for Theory and Computation (ITC) at the Harvard-Smithsonian Center for Astrophysics (2004-2007), and a Distinguished Research Fellow at PI (2008-2009). To date, I have published more than 120 peer-reviewed articles, which have been cited more than 7600 times. I have also (co-)supervised 86 students, and 28 postdoctoral fellows. Moreover, I have co-organized 31 international scientific meetings/seminar series, and raised over 1.5 million dollars in external funding.

Research Specialization Keywords Astrophysics, Cosmology, Gravitational Waves, Physics of Gravity, Cosmic Microwave Background, Dark Matter, Dark Energy, Black Hole Physics and Astrophysics, Missing Baryons, Lorentz Violation, Quantum Gravity, COVID-19 epidemiology, Flash Radiotherapy

Disciplines Trained In Astronomy and Astrophysics, Physics

Research Disciplines Astronomy and Astrophysics, Physics, Epidemiology and Biostatistics, Radiology

Areas of Research Galactic and Cosmic, Universe Structure, Gravitation, Quantum Phenomena, Elementary Particles

Fields of Application Foundations and Knowledge Acquisition, Biomedical Aspects of Human Health, Public Health

Employment

2022/9	Full Professor of Physics and Astronomy Physics and Astronomy, University of Waterloo Full-time, Professor Professor in the Astrophysics and Gravitation group. Founding Member of the Waterloo Centre for Astrophysics (2018)
2009/9	Research Associate Faculty Cosmology and Gravitation, Waterloo, Perimeter Institute for Theoretical Physics A Renewable appointment as a Perimeter Institute for Theoretical Physics Faculty Member.
2015/9 - 2022/7	Associate Professor Physics and Astronomy, Waterloo Centre for Astrophysics, University of Waterloo Full-time, Associate Professor Associate Professor in the Astrophysics and Gravitation group. Founding Member of the Waterloo Centre for Astrophysics (2018)
2009/9 - 2015/9	Assistant Professor Physics and Astronomy, Science, University of Waterloo Full-time, Assistant Professor Assistant Professor in the Astrophysics and Gravitation group
2012/9 - 2013/8	Visiting Professor Physics, North, SUNY at Buffalo Part-time, Visiting Professorship I visited this department on a regular basis and engaged and collaborated with the faculty in Cosmology.
2007/9 - 2009/8	Distinguished Research Fellow Cosmology and Gravitation, Waterloo, Perimeter Institute for Theoretical Physics
2004/9 - 2007/8	Postdoctoral Fellow Astrophysics, Institute for Theory and Computation, Harvard-Smithsonian Center for Astrophysics
2000/9 - 2004/8	Graduate Student Instructor and Researcher Astrophysical Sciences, Arts and Sciences, Princeton University
1999/9 - 2000/8	Graduate Student Teaching Assistant Physics, Arts and Sciences, Brown University
1998/9 - 1999/8	Research Associate Physics, Tehran, Institute for Theoretical Studies in Physics and Mathematics (IPM)
1996/1 - 1998/8	Instructor Iranian National Physics Olympiad Camp, International Physics Olympiad

Affiliations

The primary affiliation is denoted by (*)

(*) 2015/9 Associate Professor, University of Waterloo

2009/9

Leaves of Absence and Impact on Research

2019/9 - 2020/8 Sabbatical, University of Waterloo I was on sabbatical at Perimeter Institute, and did not have any research/teaching duties at U-Waterloo.

Research Funding History

Awarded

2009/9 - 2030/7 Perimeter Travel and Technology Fund (ongoing), Grant Principal Investigator Funding Sources: Perimeter Institute Travel and Technology Fund

2025/4 - 2030/3 Quantum Black Holes, Vacuum, and the Big Bang: Unraveling cosmic mysteries with Principal Investigator Multi-Messenger Astronomy, Grant

2025/4 - 2030/3 Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant

2022/9 - 2025/8 Quantum Spacetime in the Cosmos: From Conception to Reality, Grant Principal Investigator Funding Sources: University of Waterloo Interdisciplinary Trailblazer grant Co-investigator : Fraser, Doreen; Collaborator : Weinstein, Steven

2020/4 - 2025/3 Novel Astrophysical Probes of Fundamental Physics, Grant Principal Applicant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery

Completed

2021/9 - 2023/8 HQP Pooled Resources Competition, Grant Principal Investigator Funding Sources: Arthur B. McDonald Canadian Astroparticle Physics Research Institute HQP Pooled Resources Competition

2015/4 - 2020/3 Novel Astrophysical Probes of Fundamental Physics, Grant Principal Investigator Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery

2011/4 - 2016/3 Early Researcher Award, Grant Principal Applicant

2011/9 - 2016/9 Ontario Ministry of Research and Innovation (ON) Early Researcher Award

2010/4 - 2015/3 Discovery Grant, Grant Principal Applicant Funding Sources:

2010/4 - 2015/3 Natural Sciences and Engineering Research Council of Canada (NSERC)

2010/4 - 2013/3 Discovery Accelerator Supplement, Grant Principal Applicant Funding Sources:

2010/4 - 2013/3 Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Accelerator Supplement

Courses Taught

2025/9 - 2026/4 SCI 238: Introductory Astronomy, University of Waterloo (Fall 2025, Spring 2026, Winter 2026; Winter 2026 co-taught with Mike Hudson)

2013/1 - 2025/4 SCI 238: Introductory Astronomy, University of Waterloo (Winter/Spring 2013, Winter 2015, Winter 2019, Winter/Spring 2021, Spring 2022, Spring 2023, Spring 2025)

2021/9	PHYS 781: Fundamentals of Astrophysics, University of Waterloo (Fall 2021)
2013/9 - 2017/8	PHYS 781: Fundamentals of Astrophysics, University of Waterloo (Fall 2013–Fall 2017)
2018/9	PHYS 475: Astrophysics and Cosmic Structure, University of Waterloo (Fall 2018)
2011/9	PHYS 703: Introduction to Quantum Field Theory, University of Waterloo and Perimeter Institute (Fall 2011)
2010/1 - 2011/4	PHYS 275: Introduction to Astronomy, University of Waterloo (Spring 2010, Spring 2011)
2009/9	Cosmology: Expanding Universe, Perimeter Scholars International (2009)
2008/9	Astrophysics and Cosmology through Problems, University of Waterloo (Fall 2008)

Student/Postdoctoral Supervision

Bachelor's

2023/9 - 2025/8	Rasheed, Nabeel, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA project: "Analytic models for gravitational wave form templates" Present Position: PhD Student, Massachusetts Institute of Technology
2026/9	Sahoo, Aliv, University of Waterloo, Undergraduate research intern. Present Position: Undergraduate Student, Indian Institute of Science (IISc)
2023/9 - 2024/7	Yin, Xitai (John), University of Waterloo Principal Supervisor Thesis/Project Title: Black Holes in Quantum Gravity Present Position: MSc Physics – Quantum Technology, University of Waterloo (2025)
2023/9 - 2025/8	Tang, Ruijing, University of Waterloo Principal Supervisor Thesis/Project Title: BSc thesis project: "Exploring Gravitational Effects on accretion disk dynamics in the Teleparallel Born-Infeld gravity" Present Position: Graduate Student, Paris Observatory
2021/9 - 2023/8	Liu, Ruolin, University of Waterloo Principal Supervisor Thesis/Project Title: BSc Thesis Project: "Detecting cosmological scalar fields using orbital networks of quantum sensors" Present Position: PhD Student, University of Waterloo and Perimeter Institute
2022/1 - 2025/4	Subhi, Hassan, University of Waterloo Principal Supervisor Student Degree Expected Date: 2025/4 Thesis/Project Title: Research Project: "Gravitational Wave Echoes in Pulsar Timing Arrays" Present Position: MMath Student, University of Waterloo and Perimeter Institute
2021/2 - 2021/9	Zheng, Jolene, University of Waterloo Principal Supervisor Thesis/Project Title: Covid forecast modeling and online dashboard Present Position: Software Engineer, Bloomberg
2021/2 - 2021/9	Olalekan Koiki, Shafika, University of Waterloo Principal Supervisor Thesis/Project Title: Co-op project: "Covid forecast modeling and online dashboard"
2021/1 - 2021/8	Wisniewski, Kasia, University of Waterloo Principal Supervisor Thesis/Project Title: BSc thesis project: "Searching for Black Hole Echoes from the Failed Supernova AT2017be" Present Position: Satellite Operations Technician, GHGSat

Bachelor's Honours

2024/9 - 2025/5	Shah, Saral, University of Waterloo Principal Supervisor Student Degree Expected Date: 2025/5 Thesis/Project Title: Bachelor's thesis: "Dynamical Friction in a neutrinos sea" Present Position: Undergraduate Student, University of Waterloo
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2024/9 - 2025/5	Yanover, Lyvia, University of Waterloo Principal Supervisor Student Degree Expected Date: 2025/5 Thesis/Project Title: Bachelor's thesis: "Bi-Thermal Big Bang" Present Position: MSc Student, University of Waterloo
2024/9 - 2025/5	Murali, Nikhil, University of Waterloo Principal Supervisor Student Degree Expected Date: 2025/5 Thesis/Project Title: Bachelor's Thesis: "Quantum Black Holes: quantum corrections at the tip of a cigar" Present Position: Undergraduate Student, University of Waterloo
2024/9 - 2025/5	Brisebois, Alex Dominic Raul, University of Waterloo Principal Supervisor Student Degree Expected Date: 2025/5 Thesis/Project Title: Bachelor's thesis: "Clustering in the Action-Angle Space" Present Position: PhD Student, University of Toronto
2023/9 - 2024/1	Zhao, Guandi, Fudan University, China Principal Supervisor Thesis/Project Title: BSc visiting student at Perimeter Institute for Theoretical Physics: "Thermal SZ contribution from Low mass galaxies in the unWISE survey" Present Position: MSc student, ETH Zurich, Switzerland
2023/9 - 2024/8	Goel, Lakshay, University of Waterloo Co-Supervisor Thesis/Project Title: Accelerated detector in a superposed spacetime Present Position: Co-founder and Team Lead, MedullaAI
2023/9 - 2024/7	Gifford, Hazel, University of Waterloo Principal Supervisor Thesis/Project Title: Bohmian Rhapsody: Cuscuton and Cosmology Present Position: MSc Student, Brock University
2022/9 - 2023/6	Schiebelbein-Zwack, Aryanna, University of Waterloo Principal Supervisor Thesis/Project Title: BSc Thesis Projects: "Mystery noise in LIGO" Present Position: PhD Student, University of Toronto and CITA
2022/1 - 2024/7	Li, Yu, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA project: "Detecting cosmological scalar fields using orbital networks of quantum sensors" Present Position: PhD Student, California Institute of Technology
2021/5 - 2023/8	Lawrence, Jensen Pierce Thomas, University of Waterloo Principal Supervisor Thesis/Project Title: Research Project: "Universal horizon formation in the incompressible limit of Einstein-Aether theory" Present Position: PhD Student, Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology
2020/9 - 2023/8	Wen, Robin, Department of Applied Math, University of Waterloo Principal Supervisor Thesis/Project Title: BSc Thesis project: "A Cosmic Glitch in gravity" Present Position: PhD Student, California Institute of Technology
2020/9 - 2021/8	Stewart, Meagan, University of Waterloo Principal Supervisor Thesis/Project Title: BSc thesis project: "Inferring Transient Weak Lensing from Quasar Light Curves" Present Position: MSc Student, Simon Fraser University, British Columbia
2020/5 - 2022/5	Shawqi, Shafayat, University of Waterloo Principal Supervisor Thesis/Project Title: BSc Thesis Project: "Sorkin-Johnston Effective Field Theory" Present Position: Graduate Research Assistant in Physics, University of Alberta
2020/1 - 2020/5	Duff, Petra Mary, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA project: "Echoes from the Abyss" Present Position: PhD Student, University of Toronto
2019/9 - 2022/8	Minhas, Palka, University of Waterloo Principal Supervisor Thesis/Project Title: Fast Radio Bursts Present Position: MSc Student, McGill University
2017/1 - 2017/4	Adair, Connor, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA recipient working on Gravitational Wave Echoes Present Position: MSc Student, University of British Columbia
2016/1 - 2016/4	Dykaar, Hannah, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA research project: "Echoes from the Abyss" Present Position: PhD Student, University of Toronto
2016/1 - 2016/4	Elgood, Zachary, University of Waterloo Principal Supervisor Thesis/Project Title: NSERC USRA recipient working on Einstein-Aether Black Holes Present Position: La Caixa Doctoral Scholar, Institute of Theoretical Physics (IFT), Madrid, Spain

2010/9 - 2011/6	Bovard, Luke, University of Waterloo Co-Supervisor Thesis/Project Title: Undergraduate B.Sc. Honours Research Project Present Position: Senior Data Scientist, Plato
2008/9 - 2009/8	Mueller, Matthias, Ulm University Co-Supervisor Thesis/Project Title: Undergraduate Research Project Present Position: Scientist, Forschungszentrum Juelich

Master's non-Thesis

2026/9 - 2028/8	Li, Harrison (Haoye), University of Waterloo, Principal Supervisor, MSc student
2023/9 - 2025/8	Liu, Ruolin, University of Waterloo Principal Supervisor Thesis/Project Title: Quadratic Gravity in Big Bang and Black Holes Present Position: PhD Student, University of Waterloo and Perimeter Institute
2023/3 - present	Friedman-Shaw, Batia, Perimeter Institute for Theoretical Physics/ University of Waterloo Co-supervisor Thesis/Project Title: MSc Project: "Doppler Bias: Impact of Peculiar Velocities on Color Selection and the Large Scale Structure of Galaxy Surveys" Present Position: PhD Student
2022/9 - 2023/6	Hrytseniak, Oleksandra, Perimeter Institute for Theoretical Physics/ Co-Supervisor University of Waterloo Thesis/Project Title: Project supervision: "Search for flattened non-gaussianity" Present Position: Resident PhD Student, Perimeter Institute and University of Waterloo
2019/9 - 2020/8	Chua, Wan Zen, University of Waterloo Principal Supervisor Thesis/Project Title: PSI Research Project: "Electromagnetic Albedo of Fuzzballs" Present Position: PhD student, Cornell University
2015/9 - 2016/6	Wang, Qingwen, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Fuzzball approach to black holes Present Position: XVA Quant, Scotiabank
2013/8 - 2014/6	Roberts, Brodyn, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: PSI Research Project Present Position: Software Engineer, Index Exchange, Toronto, Canada
2010/9 - 2012/6	Agarwal, Abhineet, University of Waterloo Principal Supervisor Thesis/Project Title: Thermal Tachyacoustic Cosmology Present Position: PhD, Jamia Millia Islamia (2020)

Master's Thesis

2022/9 - 2024/8	Yang, Jiayue, University of Waterloo Co-Supervisor Thesis/Project Title: Entropy of Analogue Black Holes in Tilted Dirac Cone Materials Present Position: PhD Student, University of Waterloo
2021/1 - 2021/12	Golafshani, Hamid (Withdrawn), University of Waterloo Principal Supervisor Thesis/Project Title: Topics in Astrophysics and Cosmology Present Position: Professor of Mechanical Engineering, Conestoga College, Waterloo, ON
2018/9 - 2020/8	Hergott, Samantha, University of Waterloo Principal Supervisor Thesis/Project Title: Unifying Big Bang and Black Holes Present Position: PhD, York University and Perimeter Institute (2025)
2018/9 - 2019/8	Yang, Tianyi, University of Waterloo Principal Supervisor Thesis/Project Title: Cosmic Filaments, Galactic Kinematics in Gaia Present Position: PhD Student, University of Edinburgh
2018/9 - 2020/8	Chen, Alice, University of Waterloo Principal Supervisor Thesis/Project Title: Cosmological Structure Formation Present Position: PhD Student, University of Waterloo
2017/9 - 2018/7	Boruah, Supranta, University of Waterloo Co-Supervisor Thesis/Project Title: Constraining the mass of Milky Way based on clustering in the action space of Gaia DR2 stars Present Position: Center for Particle Cosmology Fellow, University of Pennsylvania
2016/9 - 2017/8	Kim, Hyungjin (Tony), University of Waterloo Principal Supervisor Thesis/Project Title: The Early Universe: New aspects of Cuscuton Theory, Modified Dispersion Relations and Pulsar Constraints on Vacuum Noise Present Position: Software Engineer, Validus Risk Management

2014/9 - 2016/8	Meiers, Michael, University of Waterloo Co-Supervisor Thesis/Project Title: Universal Horizons in Black Holes Present Position: PhD Student, University of California-Davis
2012/8 - 2013/6	Okoli, Chiamaka, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Concentration of cosmological haloes Present Position: Deceased
2011/9 - 2013/5	Yazdi, Yasaman, University of Waterloo Principal Supervisor Thesis/Project Title: A Spacetime Approach to Defining Vacuum States and Entropy Present Position: Avadh Bhatia Postdoctoral Fellow, University of Alberta
2011/8 - 2012/6	Schuhmann, Robert, University of Waterloo/Perimeter Institute for Principal Supervisor Theoretical Physics Thesis/Project Title: PSI Research Project Present Position: Postdoctoral Research Associate, University of Manchester
2009/8 - 2010/6	Ponce, Yosdanis, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Cosmology of a Black Hole Lattice Present Position: Adjunct Faculty in Physics, Miami Dade College, Wolfson Campus

Doctorate

2026/9 - 2030/8	Alharbi, Ohoud K., University of Waterloo, Principal Supervisor, PhD student
2026/1	Oberfrank, Robin, Perimeter Institute/University of Waterloo, Co-supervised PhD student
2023/9 - present	Kolonia, Eleanna (Former Research Assistant), PhD student, Swansea University
2023/10 - 2025/8	Nasiri, Arad, Imperial College London Co-Supervisor Student Degree Expected Date: 2025/8 Thesis/Project Title: Project Supervision: "Stochastic Dark Matter: Covariant Brownian Motion from Planckian Discreteness (arXiv:2409.02188)" Present Position: Postdoctoral Fellow, University of New Brunswick
2023/9 - 2024/12	Patterson, Everett Avison, University of Waterloo Co-Supervisor Student Degree Expected Date: 2025/12 Thesis/Project Title: Project Supervision: "Accelerated detector in a superposed spacetime (arXiv:2409.12441)" Present Position: PhD Student, University of Waterloo
2023/1 - 2026/12	Chen, Alice, University of Waterloo and Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Machine Learning and Cosmic Structure Formation Present Position: PhD Student
2022/9 - 2025/8	Borissova, Johanna, Perimeter Institute for Theoretical Physics/ University Co-Supervisor of Waterloo Thesis/Project Title: Scale-invariance at the core of quantum black holes Present Position: Research Assistant, Imperial College London
2022/7 - 2024/12	Kim, Jungjoon Leo, Queen's University Co-Supervisor Thesis/Project Title: Project Supervision: "A Poisson Log-Normal Framework for Dark Sirens" Present Position: Postdoctoral Fellow, York University
2022/7 - 2022/9	Boyanov Savov, Valentin, Universidad Complutense de Madrid Principal Supervisor Thesis/Project Title: Visiting PhD student: "Aspects of Quantum Black Holes in semiclassical gravity" Present Position: Postdoctoral Researcher, CENTRA and Instituto Superior Tecnico, Lisbon (through April 2026)
2020/9 - 2024/12	Dailey, Conner, University of Waterloo and Perimeter Institute Principal Supervisor Student Degree Expected Date: 2024/12 Thesis/Project Title: On the Initial Boundary Value Problem in Numerical Relativity Present Position: Postdoctoral Researcher, Friedrich Schiller University Jena
2019/8 - 2020/4	Longo, Luis Felipe, University of Sao Paulo, Brazil and Perimeter Institute for Principal Supervisor Theoretical Physics Thesis/Project Title: visiting PhD student: "Echo-Diversity in Binary Black Hole Mergers" Present Position: European Research Council (ERC) Postdoctoral Fellow, Friedrich- Schiller Universitaet, Jena, Germany

2019/2 - 2020/7	Tsuna, Daichi, University of Tokyo Co-Supervisor Thesis/Project Title: visiting PhD student: "Quantum Black Hole Seismology" Present Position: ITC Fellow, Center for Astrophysics, Harvard & Smithsonian
2018/9 - 2019/8	Held, Aaron, University of Heidelberg Principal Supervisor Thesis/Project Title: Visiting PhD student: "Quantum Black Holes in Asymptotic Safety" Present Position: Philippe Meyer Junior Research Chair, Ecole Normale Supérieure, Paris
2018/9 - 2019/8	Giri, Utkarsh, University of Waterloo/Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Pressure of haloes in cosmological simulations Present Position: Postdoctoral Scholar Research Associate, California Institute of Technology
2018/9 - 2023/8	Saraswat, Krishan, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Quantum Aspects of Black Holes: From Microstates to Echoes and Somewhere In-Between Present Position: Postdoctoral Fellow, University of Southern California
2018/1 - 2018/9	Oshita, Naritaka, University of Tokyo Principal Supervisor Thesis/Project Title: visiting PhD student: "Probing microstructure of black hole spacetimes with gravitational wave echoes" Present Position: Assistant Professor, Kyoto University, Yukawa Institute, Kyoto, Japan
2017/9 - 2018/4	Dhumuntarao, Aditya, University of Minnesota Principal Supervisor Thesis/Project Title: visiting NSF PhD student: "Temperature for local observers in Quantum Field Theory in curved spacetime" Present Position: Postdoctoral Researcher, Sandia National Laboratories
2017/9 - 2021/6	Robbins, Matthew, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Gravitational Waves, Bose-Einstein Condensates, and Modified Gravity Present Position: Teaching Faculty (tenure-track), University of Toronto
2017/9 - 2018/4	Gherzi, Jose Tomas Galvez, Simon Fraser University Principal Supervisor Thesis/Project Title: visiting PhD student: "Temperature for local observers in Quantum Field Theory in curved spacetime" Present Position: Assistant Professor, Universidad de Ingenieria y Tecnologia, Peru
2016/9 - 2020/6	Wang, Qingwen, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Black Hole Echology Present Position: XVA Quant, Scotiabank
2016/9 - 2018/8	Abedi, Jahed, Sharif University of Technology Co-Supervisor Thesis/Project Title: Black Hole Echoes Present Position: Postdoctoral Fellow, University of Stavanger, Norway
2016/9 - 2017/8	Haghighi, Mohammad Zhooldideh, Sharif University Principal Supervisor Thesis/Project Title: visiting PhD student: "X-ray Cooling Flows and Modified Gravity" Present Position: Assistant Professor, K. N. Toosi University of Technology
2015/9 - 2016/8	Lynch, Morgan, University of Wisconsin-Milwaukee Principal Supervisor Thesis/Project Title: visiting PhD student: "Temperatures of renormalizable quantum field theories in curved spacetime" Present Position: Postdoctoral Researcher, Max Planck Institute for Nuclear Physics
2014/9 - 2018/6	Karami, Mansour, University of Waterloo/Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Dark Matter on Small Scales Present Position: Principal AI Engineer and Quantitative Developer, HOOPP
2014/9 - 2018/6	Altamirano, Natacha, University of Waterloo/Perimeter Institute for Co-Supervisor Theoretical Physics Thesis/Project Title: The quantum and the Gravity: Newtonian and Cosmological Applications Present Position: Director, Data Science, Birch Hill Equity Partners, Toronto, Canada
2014/9 - 2018/6	Okoli, Chiamaka, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Dark Matter and Neutrinos in the Foggy Universe Present Position: Deceased
2014/4 - 2014/11	Nelson, Elliot, Penn State University Principal Supervisor Thesis/Project Title: Cosmological Non-Constant Problem Present Position: Future Impact Group
2013/9 - 2017/6	Yazdi, Yasaman, University of Waterloo Co-Supervisor Thesis/Project Title: Physics and Astrophysics of Black Holes Present Position: Avadh Bhatia Postdoctoral Fellow, University of Alberta

2013/9 - 2014/8	Narimani, Ali, University of British Columbia Principal Supervisor Thesis/Project Title: visiting PhD student: "How does pressure gravitate?" Present Position: Google
2013/9 - 2014/6	Karami, Mansour, Sharif University of Technology Co-Supervisor Thesis/Project Title: Cosmic Structure Formation, Modified Gravity and Dark Energy, Gravitational Lensing Present Position: Principal AI Engineer and Quantitative Developer, HOOPP
2013/9 - 2017/6	Zwane, Nosiphiwo, University of Waterloo/Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Cosmological Tests of Causal Set Phenomenology Present Position: Lecturer, University of Eswatini
2013/9 - 2014/8	Jeremy Sakstein, University of Cambridge Co-Supervisor Student Degree Start Date: 2010/9 Student Degree Received Date: 2014/7 Thesis/Project Title: visiting PhD student: "Novel Approaches to Modified Gravity" Present Position: Assistant Professor, University of Hawaii
2011/9 - 2017/6	Gould, Elizabeth, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: A Non-Local Reality: Is there a Phase Uncertainty in Quantum Mechanics? Present Position: Postdoctoral Fellow, Arthur B. McDonald Canadian Astroparticle Physics Research Institute
2011/9 - 2016/6	Saravani, Mehdi, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Aspects of Non-locality Present Position: Executive Director, Goldman Sachs, United Kingdom
2011/9 - 2014/7	Pourhasan, Razieh, University of Waterloo/Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Adventures in Holography Present Position: Research Assistant, University of Ottawa, Canada
2011/9 - 2015/5	Kamiab, Farbod, University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Thesis/Project Title: Neutron Stars, the Exotica - From Modifying General Relativity to Strong Magnetic Fields Present Position: Analytics, Facebook, Dublin, Ireland
2011/1 - 2012/8	Ponce, Yosdanis (Withdrawn), University of Waterloo/Perimeter Institute for Theoretical Principal Supervisor Physics Student Degree Start Date: 2011/1 Thesis/Project Title: Black Hole Halo Model/ Holographic Cosmology Present Position: Adjunct Faculty in Physics, Miami Dade College, Wolfson Campus
2010/9 - 2011/9	Baghran, Shant, Sharif University of Technology Co-Supervisor Thesis/Project Title: The Observational Tests of Dark Energy and Modified Gravity Theories Present Position: Assistant Professor, Sharif University, Tehran, Iran
2010/9 - 2011/6	Gryb, Sean, University of Waterloo/Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Shape Dynamics and Mach's Principles: Gravity from Conformal Geometrodynamics Present Position: Research Associate, Philosophy Department, University of Bristol, England
2010/9 - 2014/6	Aslanbeigi, Siavash, University of Waterloo/Perimeter Institute for Principal Supervisor Theoretical Physics Thesis/Project Title: Cosmic Atoms: from Causal Sets to Clusters Present Position: Vice President, Trading Products, BMO Capital Markets, Canada
2008/9 - 2010/6	Prescod-Weinstein, Chanda, University of Waterloo Co-Supervisor Thesis/Project Title: Cosmic Acceleration As Quantum Gravity Phenomenology Present Position: Assistant Professor, University of New Hampshire
2007/9 - 2008/8	Loverde, Marilena, Columbia University Co-Supervisor Thesis/Project Title: Extended Limber Approximation Present Position: Professor and Dr. Ann Nelson Endowed Professor, University of Washington

Post-doctorate

2024/9 - 2026/8	Manita, Yusuke, Perimeter Institute, Postdoctoral researcher
2024/3 - 2024/12	Dunsky, David, New York Univesrity Co-Supervisor Thesis/Project Title: Project Supervision: "Dark Matter Disk Accretion into Black Holes" Present Position: Postdoctoral Fellow, New York Univesrity

2024/3 - 2024/12	Ghalsasi, Akshay, Harvard University Co-Supervisor Thesis/Project Title: Project Supervision: "Dark Matter Disk Accretion onto Black Holes" Present Position: Postdoctoral Fellow, Department of Physics, Harvard University
2024/3 - 2027/3	Faraji, Shokoufe, University of Waterloo Principal Supervisor Thesis/Project Title: Quantum Gravity and Accretion Physics around Black Holes Present Position: Postdoctoral Fellow, Department of Physics and Astronomy, University of Waterloo
2023/3 - 2024/12	Krolewski, Alex, University of Waterloo/ Perimeter Institute for Theoretical Co-Supervisor Physics Thesis/Project Title: Impact of Peculiar Velocities on Color Selection and the Large Scale Structure of Galaxy Surveys Present Position: Research Scientist, California Institute of Technology
2023/1 - 2025/9	Quintin, Jerome, University of Waterloo Co-Supervisor Thesis/Project Title: Quadratic Gravity in Cosmology and Black Holes Present Position: Assistant Professor, ETS, and Visiting Fellow, McGill University
2022/8 - 2024/12	Hassani, Farbod, University of Oslo Principal Supervisor Thesis/Project Title: Project Supervision: "Simulating dynamical friction with cosmic neutrinos" Present Position: Researcher, Institute of Theoretical Astrophysics, University of Oslo
2022/1 - 2024/12	Longo, Luis Felipe, Friedrich-Schiller Universitaet, Jena, Germany Principal Supervisor Thesis/Project Title: Spectrogram Correlated Stacking Present Position: European Research Council (ERC) Postdoctoral Fellow, Friedrich- Schiller Universitaet, Jena, Germany
2021/9 - 2022/8	Muir, Jessica, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Project supervision: "Search for flattened non-gaussianity" Present Position: Postdoctoral Fellow, Perimeter Institute for Theoretical Physics
2021/3 - 2025/4	Mylova, Maria, Perimeter Institute for Theoretical Physics and IPMU, Japan Principal Supervisor Thesis/Project Title: 1- Non-Gaussian Signatures of a Thermal Big Bang 2- Effective Cuscuton Theory Present Position: Project Researcher, Kavli IPMU
2020/10 - 2024/12	Nikakhtar, Farnik, Yale University Co-Supervisor Thesis/Project Title: Project Supervision: "Action-Angle Space Clustering" Present Position: YCAA Postdoctoral Fellow, Yale University
2020/3 - 2024/3	Dey, Ramit, Western University, Ontario, Canada Co-Supervisor Thesis/Project Title: 1- Spectrogram correlated stacking: A novel time-frequency domain analysis of the Stochastic Gravitational Wave Background 2- Black Hole Echoes Present Position: Postdoctoral Fellow, Western University, and Associate Postdoctoral Researcher, Perimeter Institute
2020/2 - 2020/6	Shoshany, Barak, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Bayesian Search for Black Hole Echoes Present Position: Associate Professor, Brock University
2019/4 - 2021/3	Oshita, Naritaka, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Echoes from Quantum Black Holes Present Position: Assistant Professor, Kyoto University, Yukawa Institute, Kyoto
2019/1 - 2023/12	Abedi, Jahed, University of Stavanger, Norway Principal Supervisor Thesis/Project Title: Search for Black Hole Echoes in Gravitational Wave Observations Present Position: Assistant Professor, Beijing Institute for Mathematical Sciences and Applications (BIMSA)
2015/9 - 2018/6	Nelson, Elliot, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Quantum Decoherence during Inflation from Gravitational Nonlinearities Present Position: Future Impact Group
2013/9 - 2017/8	Guariento, Daniel, Universidade de Sao Paulo/Perimeter Institute for Principal Supervisor Theoretical Physics Thesis/Project Title: Cosmological Black Holes from Self-Gravitating Fields Present Position: Professor, Conestoga College, Canada
2013/9 - 2014/8	Scrimgeour, Morag, University of Waterloo Principal Supervisor Thesis/Project Title: Mass of Neutrinos from Neutrino Wakes Present Position: Data Scientist, Square, San Francisco CA
2012/9 - 2015/8	Marsh, David, Perimeter Institute for Theoretical Physics Thesis/Project Title: Structure of Dark Matter Haloes Present Position: Sofja Kovaleskaja Fellow, University of Goettingen

2012/9 - 2016/8	Kubiznak, David, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Black Hole Chemistry Present Position: Senior Fellow, Perimeter Scholar International program
2012/9 - 2016/8	Hinterbichler, Kurt, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Consistent modifications of Einstein gravity Present Position: Assistant Professor, Case-Western Reserve University
2012/9 - 2015/8	Kobayashi, Takeshi, Perimeter Institute for Theoretical Physics/Canadian Principal Supervisor Institute for Theoretical Astrophysics Thesis/Project Title: Primordial Magnetic Fields from the Post-Inflationary Universe Present Position: Associate Professor, SISSA (Scuola Internazionale Superiore di Studi Avanzati)
2011/9 - 2013/8	Lavaux, Guilhem, University of Waterloo/Perimeter Institute-CITA National Co-Supervisor Fellow Thesis/Project Title: A New Light on Missing Baryons Present Position: CNRS Permanent Position, L'Institut d'Astrophysique de Paris, France
2011/9 - 2012/8	Baghran, Shant, University of Waterloo/Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Prospects for Detecting Dark Matter Halo Substructure with Pulsar Timing Present Position: Professor at Sharif University, Sharif University, Tehran, Iran
2010/9 - 2013/8	Zavala, Jesus, University of Waterloo - CITA National Fellow Principal Supervisor Thesis/Project Title: Clustering in the Phase Space of Dark Matter Haloes Present Position: Professor at U-Iceland, University of Iceland
2010/9 - 2012/8	Johnson, Matthew, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Determining the Outcome of Cosmic Bubble Collisions in Full General Relativity Present Position: Associate Professor at York University, Associate Faculty at Perimeter Institute
2009/9 - 2011/8	Shandera, Sarah, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Breakdown of Semiclassical Methods in de Sitter Space Present Position: Associate Professor, Penn-State University
2009/9 - 2013/8	Erickcek, Adrienne, Perimeter Institute for Theoretical Physics/Canadian Principal Supervisor Institute for Theoretical Astrophysics Thesis/Project Title: Catastrophic Consequences of Kicking the Chameleon Present Position: Assistant Professor, University of North Carolina-Chapel Hill

Research Associate

2021/9 - 2022/5	Mukherjee, Suvodip, Perimeter Institute for Theoretical Physics Principal Supervisor Thesis/Project Title: Spectrogram correlated stacking: A novel time-frequency domain analysis of the Stochastic Gravitational Wave Background Present Position: Reader, Tata Institute of Fundamental Research, India
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Staff Supervision

Number of Visiting Researchers: 1

Event Administration

2020/7 - 2024/12	Member of the Organizing Committee, "Copernicus Weekly Webinar Series" focusing on cosmology and high energy physics https://indico.cern.ch/event/936284/overview , Seminar, 2020/7 - 2024/12
2023/3 - 2024/7	Local Organizing Committee (Chair), "50 Years of Horndeski Gravity: Exploring Modified Gravity" University of Waterloo and Perimeter Institute for Theoretical Physics, Conference, 2024/7 - 2024/7
2019/10 - 2024/6	Scientific Advisory Committee member, "[RN50] The Event Horizon and Beyond - Celebrating 50 Years of Narayan" Boston Museum of Science, Boston, MA https://www.cfa.harvard.edu/events/rn50-celebrating-50-years-narayan , Conference, 2024/6 - 2024/6

2023/11 - 2024/5	Local Organizing Committee (chair), "McNamara@65: Understanding Feedback in Galaxies and Clusters" University of Waterloo, Conference, 2024/5 - 2024/5
2023/11 - 2024/4	Scientific Organizing Committee Member, "Cosmological Frontiers in Fundamental Physics" (University of Edinburgh), Conference, 2024/4 - 2024/4
2022/10 - 2023/5	Organizing Committee (Chair), "Quantum Spacetime in the Cosmos: From Conception to Reality" Perimeter Institute, Conference, 2023/5 - 2023/5
2020/8 - 2021/5	Scientific Organizing Committee Member, "Cosmological Frontiers in Fundamental Physics" (Virtual at APC, Paris), Conference, 2021/5 - 2021/5
2020/2 - 2020/2	Organizer, "Echoes in Southern Ontario" Perimeter Institute, Workshop, 2020/2 - 2020/2
2019/5 - 2019/11	Co-organizer, Everpresent Lambda: Theory meets Observations, Conference, 2019/11 - 2019/11
2019/3 - 2019/9	Lead Organizer, "Cosmological Frontiers in Fundamental Physics 2019" Perimeter Institute, Conference, 2019/9 - 2019/9
2019/2 - 2019/7	Chairperson of Parallel Session, 22nd International Conference on General Relativity and Gravitation, Conference, 2019/7 - 2019/7
2017/9 - 2019/4	Chair, Astrophysics Seminar Chair, University of Waterloo, Seminar, 2017/9 - 2019/4
2019/1 - 2019/2	Scientific Organizing Committee, Tehran Meeting on Cosmology at the Crossroads (Virtual), Conference, 2019/2 - 2019/2
2017/9 - 2018/12	Chair, Physics 10 Undergraduate Lectures, University of Waterloo, Course, 2017/9 - 2018/12
2018/1 - 2018/6	Co-organizer, Asymptotic Safety in a Dark Universe, Conference, 2018/6 - 2018/6
2017/5 - 2017/11	Co-organizer, Quantum Black Holes in the Sky?, Conference, 2017/11 - 2017/11
2016/1 - 2016/7	Co-organizer, Philosophy of Cosmology, Conference, 2016/7 - 2016/7
2015/6 - 2015/12	Co-organizer, Mann Fest, Conference, 2015/12 - 2015/12
2015/2 - 2015/8	Co-organizer, Cosmic Flows (and Other Novelties on Large Scales), Conference, 2015/8 - 2015/8
2014/3 - 2014/4	Co-organizer, Implications of BICEP2, Workshop, 2014/4 - 2014/4
2011/5 - 2012/5	Co-organizer, Conformal Nature of the Universe, Conference, 2012/5 - 2012/5
2011/10 - 2012/4	Co-organizer, Theoretical Physics Workshop, Workshop, 2012/4 - 2012/4
2010/9 - 2011/9	Co-organizer, Unravelling Dark Matter 2011, Conference, 2011/9 - 2011/9
2009/12 - 2010/6	Co-organizer, Cosmological Frontiers of Fundamental Physics, Workshop, 2010/6 - 2010/6
2008/9 - 2009/8	Chair, Cosmology Seminar Series, Seminar, 2008/9 - 2009/8
2008/11 - 2009/5	Co-organizer, New Prospects for Solving the Cosmological Constant Problem, Workshop,
2009/5	- 2009/5
2008/5 - 2009/5	Co-organizer, Sunyaev-Zel'dovich Universe and the Future of Cluster Cosmology, Conference, 2009/4 - 2009/5

2008/10 - 2008/12	Co-organizer, Young Researchers Conference, Conference, 2008/12 - 2008/12
2008/4 - 2008/10	Co-organizer, PI/CITA Cosmology Mini-Workshop, Workshop, 2008/10 - 2008/10
2007/12 - 2008/6	Co-organizer, Small Scale Structure of Dark Matter, Workshop, 2008/6 - 2008/6
2008/1 - 2008/3	Co-organizer, Origins and Observations of Primordial Non-Gaussianity, Workshop, 2008/3 - 2008/3

Editorial Activities

2014/1 - 2020/8	Scientific Editor, Research in Astronomy and Astrophysics, Journal
2012/9 - 2013/8	Editorial Board Member, Phys13 News, Newsletter
2010/9 - 2011/8	Editorial Board Member, Phys13 News, Newsletter

Graduate Examination Activities

2024/9 - 2024/9	PhD External Examiner, Danieli, Valentina, Astroparticle Physics, Scuola Inter. Superiore di Studi Avanzati
2024/9 - 2024/9	PhD External Examiner, Velluci, Vania, Astroparticle Physics, Scuola Inter. Superiore di Studi Avanzati

Community and Volunteer Activities

2009/9	Speaker/Educator, Perimeter Institute for Theoretical Physics I am a regular contributor to outreach events at Perimeter Institute. My responsibilities include giving lectures, participating in Q&A's, and discussions with primary and high school students, as well as high school teachers.
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Knowledge and Technology Translation

2026/3 - present	Consultant, Aligned. Activity Description: Testing frontier AI models in scientific research.
2020/2 - 2023/5	Creator, Research Uptake Strategies Target Stakeholder: General Public Outcome / Deliverable: Based on our study of North American demographic, mobility, climate, and COVID-19 data, we provided a predictive model for growth and mitigation strategies for each US and Canadian city and county. The models were publicly available in the form of an online portal, during April 2021- May 2023. References / Citations / Web Sites: Canada: http://mylocalcovid.uwaterloo.ca [decommissioned in May 2023] US: https://wolfr.am/COVID19Dash
2020/4 - 2021/10	Scientific Advisor, Consultation Service Group/Organization/Business Serviced: Public Broadcasting Company (PBS) Target Stakeholder: General Public Outcome / Deliverable: NOVA Universe Revealed: Big Bang, Venture back to the birth of space and time as NOVA probes the mystery of the Big Bang. Premiered: 11/24/21 at 9pm EST Runtime: 53:16, PBS documentary Evidence of Uptake/Impact: While the specific viewership for this program is not publicly released, PBS is the premier public national broadcaster in the US. Each month, approximately 100 million people watch their local PBS stations. References / Citations / Web Sites: https://www.pbs.org/wgbh/nova/video/nova-universerevealed-big-bang/ Activity Description: I acted as the scientific advisor for the PBS NOVA documentary: "NOVA Universe Revealed: Big Bang", and helped with creating a scientifically accurate portrait of the Big Bang

International Collaboration Activities

2019/8 - 2029/8	Member of Laser Interferometer Space Antenna (LISA) consortium, Canada The Laser Interferometer Space Antenna (LISA) is a planned space-based observatory designed to detect and study gravitational waves. As a member of the LISA consortium, I am contributing to the agenda and ideas for the "Fundamental Physics" and "Waveform Modelling" working groups.
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Committee Memberships

2024/7 - 2025/7	Committee Member, Seminars and Colloquia Committee, Perimeter Institute for Theoretical Physics
2020/9 - 2024/8	Committee Member, Undergraduate Experience Committee, University of Waterloo Organize and coordinate events to improve student experience
2023/9 - 2024/7	Committee Member, Postdoctoral Search Committee, Perimeter Institute for Theoretical Physics
2021/9 - 2023/8	Chair, PhD Student Student Affairs, Perimeter Institute for Theoretical Physics
2013/1 - 2022/7	Committee Member, Early Researcher Award Grant Review Panel, Ministry of Research and Innovation, Government of Ontario I served on the review panel for most years, during this period.
2019/9 - 2020/8	Committee Member, Emmy Noether Fellowship Search Committee, Perimeter Institute for Theoretical Physics
2019/7 - 2019/10	Chair, "Astrophysics Theory Panel" grant review committee, National Aeronautics and Space Administration (NASA) Chair of a review panel for Theoretical Astrophysics grants
2014/8 - 2017/8	Chair, Colloquium Committee, Department of Physics and Astronomy, University of Waterloo
2013/9 - 2014/8	Committee Member, Co-op Report Marking Committee, University of Waterloo Ongoing Membership
2010/9 - 2012/8	Committee Member, Seminar/Colloquium Committee, University of Waterloo
2010/9 - 2011/8	Committee Member, SIN Exam Committee, University of Waterloo
2010/9 - 2011/8	Committee Member, PI/UW Astronomy Faculty Search Committee, University of Waterloo
2008/9 - 2010/8	Committee Member, Postdoctoral Recruitment Committee, Perimeter Institute for Theoretical Physics

Other Memberships

2021/1	Member, Canadian Institute for Theoretical Astrophysics, Incorporated (CITA, Inc) The Canadian Institute for Theoretical Astrophysics (CITA), located at the University of Toronto, is a leading research centre dedicated to exploring fundamental questions in theoretical astrophysics. CITA's research spans areas such as cosmology, galaxy formation, black holes, high-energy astrophysics, and planetary science. As a member of CITA Inc., I collaborate with other members across the country to advance theoretical astrophysics. As part of this organization, I contribute to recruiting top talent to Canada and mentoring highly qualified personnel, fostering the next generation of astrophysicists in this dynamic field.
2015/1	Ordinary Member, Canadian Astronomical Society (CASCA) CASCA is a professional society for Canadian astronomers and researchers involved in the fields of astronomy, astrophysics, and related disciplines. The primary goals of CASCA are to promote the advancement of astronomical research, education, and outreach in Canada.

Presentations

- 1 (2026). Quantum Gravity in the Wild: Testing Horizon-Scale Physics with Gravitational Waves and Cosmology. Recent Development of Quantum Gravity and Applications to Cosmology and Black Hole Physics, Hangzhou, China
- 2 (2026). Quadratic Gravity panel contribution. Recent Development of Quantum Gravity and Applications to Cosmology and Black Hole Physics, Hangzhou, China
- 3 (2026). Massive Neutrinos. Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada
- 4 (2026). *Battle of the Big Bang*. Howard University, Washington, DC, United States of America
- 5 (2026). *Battle of the Big Bang*. Kitchener Public Library, Kitchener, ON, Canada
- 6 (2025). Quantum Black Holes & the Conundrum of Cosmic Causality. Physics Colloquium, Arizona State University, Phoenix, AZ, United States of America
- 7 (2025). Battle of the Big Bang: How the Universe Began (and Why It's a Big Mystery!). Physics Literacy for Kids (Zoom talk),
- 8 (2025). Copenhagen Survey on Black Holes and Fundamental Physics. Physics Colloquium (virtual), Tehran, Iran
- 9 (2025). Quantum Black Holes & the Conundrum of Cosmic Causality. Physics & Astronomy Colloquium, McMaster University, Hamilton, ON, Canada
- 10 (2025). Quantum Causality & the Crisis in Physics: Black Holes, the Big Bang, and Beyond. Sydney CPPC virtual seminar, Sydney, Australia
- 11 w/ Stefano Liberati (SISSA). (2024). Quantum Black Holes (concluding panel discussion, and wrap-up). Black Holes inside and out, Niels Bohr Institute, Copenhagen, Denmark
- 12 (2024). Precision Quantum Cosmology: Past, Present, and Future. Gravity and Cosmology 2024, Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan
- 13 (2024). Quantum Spacetime in the Sky: from the horizon to horizon. Heising-Simons Foundation (HSF) Collaboration on Quantum Gravity and Its Observational Signatures (QuRIOS) Journal Club (virtual), Waterloo, ON, Canada
- 14 (2024). Quantum Black Holes in the Sky. The Event Horizon and Beyond, Celebrating 50 years of Narayan, Boston, MA, United States of America
- 15 (2024). Quantum Black Holes & the Conundrum of Cosmic Causality. Physics Colloquium, International Center for Theoretical Physics Asia-Pacific (ICTP-AP), Beijing, China
- 16 (2024). Quantum Spacetime in the Sky: from the horizon to the vacuum. Bottom-Up Cross-Cutting Workshop "JENAS Initiative: Gravitational Wave Probes of Fundamental Physics" 12–16 Feb 2024 Sapienza University of Rome, Rome, Italy
- 17 (2024). Quantum Black Holes & the Conundrum of Cosmic Causality. Physics Colloquium, Institute of High Energy Physics, Beijing, China
- 18 (2024). Quantum Spacetime in the Sky: from the horizon to horizon. International Congress of Basic Science 2, Beijing Institute for Mathematical Science and Applications (BIMSA), Beijing, China
- 19 (2024). Imaging Quantum Black Holes & (Towards) Optimal Estimators of Stochastic Gravitational Wave Background. The 1st Tsinghua Relativity Workshop, Beijing, China
- 20 (2023). The Big Picture: New Vistas in Gravitational Wave Astronomy. Canadian Astronomical Society (CASCAS) Annual General Meeting, Penticton, BC, Canada

- 21 (2023). Quantum Spacetime and the Cosmic Endgame. Physics Colloquium, Simon Fraser University, Burnaby, Canada
- 22 (2023). A Tale of Stars and Sirens. The Past, Present and Future of Astronomical Surveys - A Celebration of the Scientific Careers of Michael Strauss and Robert Lupton, Princeton University, Princeton, NJ, United States of America
- 23 (2023). Quantum Gravity and the Cosmos. Testing Aspects of General Relativity-II (virtual), Waterloo, ON, Canada
- 24 (2023). The paradox of human and the cosmos. Ottawa Intellectual Discussions (Virtual), Waterloo, ON, Canada
- 25 (2023). The Endgame: Quantum Spacetime and the Cosmos. Physics Colloquium, University of British Columbia, Vancouver, BC, Canada
- 26 (2023). The Big Picture. DE Shaw Company (virtual seminar), Waterloo, ON, Canada
- 27 (2023). Quantum Spacetime in the Sky: from Conception to Reality. ISRA 2023: The International Symposium on Recent Developments in Relativistic Astrophysics, Gangtok, India
- 28 (2023). Into the Unknown: A Journey on the Dark Side. Virtual Public Lecture for Lord Byng high school Astronomy Club (Vancouver, BC), Waterloo, ON, Canada
- 29 (2023). From Black Holes to the Big Bang: Humanity's Cosmic Paradox. Public Lecture at Kitchener Public Library, Kitchener, ON, Canada
- 30 (2023). Spectrogram correlated stacking: A novel time-frequency domain analysis of the Stochastic Gravitational Wave Background. Cosmology and Gravitation Seminar, Perimeter Institute, Waterloo, ON, Canada
- 31 (2023). Quantum Precision Cosmology. Testing Gravity 2023, Vancouver, BC, Canada
- 32 (2023). The War Within: Humanity's Cosmic Paradox. Physics 10 seminar series, University of Waterloo, Waterloo, ON, Canada
- 33 (2022). Einstein vs Einstein. Testing Aspects of General Relativity (Joint Canadian/Indian virtual conference), Waterloo, Canada
- 34 (2022). Einstein vs Einstein: The Great War. Physics Colloquium Institute for Research in Fundamental Sciences (IPM), (remote presentation), Tehran, Iran
- 35 (2022). Mapping the Big Bang. Remote Public Talk at Farzanegan High School, Tehran (virtual talk in Persian), Tehran, Iran
- 36 (2022). Stimulating Hawking Radiation of Gravitational waves: from theory to observation. New horizons for (no-)horizon physics: from gauge to gravity and back, Galileo Galilei Institute, Florence, Italy
- 37 (2022). Einstein vs Einstein: The Great War. Cosmo Coffee Seminar Series, Theory Group, the European Organization for Nuclear Research (CERN) (remote presentation), Geneva, Switzerland
- 38 (2022). Stimulating Hawking Radiation of Gravitational Waves. Quantum Simulators of Fundamental Physics (virtual seminar series), Waterloo, Canada
- 39 (2022). Quantum Black Holes: from holography to scrambling and gravitational wave astronomy. The 1st International Conference of Holography and its Applications, Damghan University (remote presentation), Damghan, Iran
- 40 (2022). Fundamental Physics vs. Fundamentalism. History, Philosophy, and Sociology of Cosmology and Astroparticle Physics Conference, Bonn, Germany
- 41 (2021). Cosmology of the Pandemic. Journal-club Galaxies, Institut d'Astrophysique de Paris (remote talk), Paris, France
- 42 (2021). Einstein vs Einstein: The Great War. Gravity Seminar Series, University of Southampton (remote presentation), Southampton, United Kingdom

- 43 (2021). Black Holes, Unscripted. Copernicus Webinar Series (virtual presentation), Waterloo, Canada
- 44 (2021). On the origin of the LIGO "mystery" noise and the high energy particle physics desert. Sixteenth Marcel Grossmann Meeting (virtual), Waterloo, ON, Canada
- 45 (2021). Physics and Astrophysics with Gravitational Waves. 14th Iranian national conference on Astronomy and Astrophysics, Semnan University (Virtual public talk in Persian), Semnan, Iran
- 46 (2021). Big Bang: Fact vs Fiction. The 28th IPM Physics Spring Conference, Tehran, Iran (remote presentation), Tehran, Iran
- 47 (2021). Cosmology and the Pandemic. Virtual conference on Gravity and Cosmology, Shahid Beheshti University (Remote keynote presentation in Persian), Tehran, Iran
- 48 (2021). A New Way to Measure Mass. Streams 21 (virtual conference), Waterloo, Canada
- 49 (2021). Cosmology: Triumphs, Trials, and Tribulations. Physics Colloquium, Tarbiat Modares University (remote presentation), Tehran, Iran
- 50 (2021). From Cosmos to the Pandemic. 37th Science and Technology Conference, Allameh Helli High School (virtual talk in Persian), Tehran, Iran
- 51 (2021). Into the Unknown. Physics Colloquium, University of Northern Iowa (remote), Cedar Falls, IA, United States of America
- 52 (2021). Black Holes, Unscripted. Black-Hole Microstructure, virtual conference organized by U-Saclay, France (remote presentation), Saclay, France
- 53 (2021). From Cosmology to the Pandemic. Sharif University of Technology Alumni Associate Webinar Series (virtual talk in Persian), Waterloo, ON, Canada
- 54 (2021). On Nothing!. Alternative Gravities and Fundamental Cosmology 2021 (virtual conference, organized by University of Szczecin, Poland), Szczecin, Poland
- 55 (2021). On the origin of the LIGO "mystery" noise and the high energy particle physics desert. The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2021, virtual), Waterloo, ON, Canada
- 56 (2021). From the Cosmos to the Pandemic: A Dive into the Unknown. 26th Special Physics School, Institute for Advanced Studies in Basic Sciences (remote talk in Persian), Zanjan, Iran
- 57 (2020). Probing Physics Beyond the Standard Model with the Gravitational Wave "Mystery" Noise. Quantum Spacetime and the Renormalization Group (organized by CP3 Origins, Denmark, virtual conference), Waterloo, ON, Canada
- 58 (2020). Local drivers of growth and containment for COVID-19 pandemic. Seminar Series on the Mathematical Modelling of COVID-19, Fields Institute for Research in Mathematical Sciences, Toronto, Canada
- 59 (2020). A New Way to Measure Mass. CANadian Virtual Astronomy Seminar (CANVAS) (virtual presentation), Waterloo, Canada
- 60 (2020). On the Edge of the Abyss. Virtual Seminar, McGill Space Institute, Montreal, QC, Canada
- 61 (2020). A New Way to Measure Mass. Galactic Dynamics Journal Club, University of Pennsylvania (remote presentation), Philadelphia, PA, United States of America
- 62 (2020). Quantum Black Hole Seismology. The 13th International LISA Symposium (virtual conference, prerecorded talk), Waterloo, Canada
- 63 (2020). Quantum Black Hole Seismology. 23rd meeting in Astronomical Research, Zanjan, Iran (remote presentation), Zanjan, Iran
- 64 (2020). A novel predictive framework for the novel coronavirus. Centre for Disease Modelling, Canada- China Distinguished Lecture, Canada

- (2020). Quantum Black Holes in the Sky. Quantum Gravity and the Renormalization Group, Odense, Denmark
65
- (2020). Managing the COVID-19 Pandemic across Geography and Demography. seminar for the Google
66 COVID-19 data working group (virtual), Waterloo, ON, Canada
- (2020). On the secrets of black holes, worm holes, white holes, and the firewalls. Remote public talk in Persian
67 for Astronomy (Nojoom) Magazine, Tehran, Iran
- (2020). Quantum Black Hole Seismology. Astrophysics Seminar Series, Bar-Ilan University, Israel (remote
68 presentation), Israel
- (2020). Quantum Black Hole Seismology. High Energy Physics (HEP) seminar series, school of physics,
69 Institute for Research in Fundamental Sciences (IPM), Tehran (remote presentation), Tehran, Iran
- (2020). Managing the COVID-19 Pandemic across Geography and Demography. Seminar Series, Astronomy
70 School, Institute for Research in Fundamental Sciences (IPM), Tehran (remote, tehran, Iran
- (2020). A New Way to Measure Mass. Astrophysics Seminar, Sharif University (remote presentation), Tehran,
71 Iran
- (2020). The invisible 99 percent. Physics Club (remote public talk in Persian), Tehran, Iran
72
- (2020). Managing the COVID-19 Pandemic across Geography and Demography. Colloquium, Perimeter
73 Institute, Waterloo, ON, Canada
- (2020). Hubble Tension and an Everpresent Lambda. 3rd Online Workshop on Quantum Gravity, “Quantum
74 Gravity meets dark energy” (virtual conference), waterloo, Canada
- *Aslanbeigi, S; *Saravani, M. (2019). Dark Matter from Quantum Gravity. Everpresent Lambda: Theory
75 Meets Observations, Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada
- (2019). Dark Energy [On Nothing]. CosmoCruise 2019, Venice, Italy
76
- (2019). A Tale of Big Bang. Milky Way Persian Science Channel, Iran (virtual), Waterloo, ON, Canada
77
- (2019). Quantum Black Holes in the Sky. Testing Gravity 2019, Vancouver, BC, Canada
78
- (2019). Cosmological non-Constant (CnC) Problem. 5th Bahamas Advanced Study Institute and Conferences
79 2019 (BASIC 2019) (remote presentation), Bahamas
- (2019). Quantum Black Holes in the Sky. Testing Gravity 2019, Vancouver, Canada
80
- (2019). On Nothing!. Physics Colloquium at Grand Valley State University, Grand Rapids, MI, United States
81 of America
- (2018). Quantum Black Holes in the Sky: From Quantum Gravity to Astrophysics and Cosmology. Solvay-
82 Perimeter-APC Workshop on "Cosmological Frontiers in Fundamental Physics" - Solvay Institute, Brussels, Belgium
- (2018). Quantum Black Holes in the Sky: from Quantum Gravity to Astrophysics and Cosmology. Cosmology
83 and Gravitation Seminar Series, Perimeter Institute, Waterloo, ON, Canada
- (2018). Seeing through Simulation Blindspots. Rotman Summer Institute on Philosophy of Cosmology,
84 Goderich, Canada
- (2018). Reviving Aether in Einstein’s Universe: Trials, Tribulations, and Triumphs. Lecture for undergraduate
85 Cosmology and Gravitation class at Western University, London, ON, Canada
- (2018). Seeing Cosmic Nanostructure: From Plasma to Dark Matter. Seminar - Canadian Institute for
86 Theoretical Astrophysics, University of Toronto, Toronto, Canada
- (2018). Quantum Black Holes in the Sky: from Quantum Gravity to Astrophysics and Cosmology. Physics and
87 Astronomy Colloquium, Western University, London, ON, Canada

- 88 (2018). Quantum Black Holes in the Sky: from Quantum Gravity to Astrophysics and Cosmology. Theoretical High Energy Physics Seminar Series, McGill University, Montreal, QC, Canada
- 89 (2018). Adios, Lorentz! Hola, Kuhn!. Rotman Summer Institute on Philosophy of Cosmology, Goderich, Canada
- 90 (2018). Cosmological non-Constant Problem. Asymptotic Safety in a Dark Universe, Perimeter Institute, Waterloo, ON, Canada
- 91 (2018). Quantum Black Holes in the Sky: From Quantum Gravity to Astrophysics and Cosmology. HEP Seminar - McGill University, Montreal, Canada
- 92 (2018). The Other 99 Percent: A Dark Cosmos. Keynote lecture for high school teachers, Perimeter Institute, Waterloo, ON, Canada
- 93 (2018). Quantum Black Holes in the Sky: from Quantum Gravity to Astrophysics and Cosmology. Cosmology and Gravitation Seminar, Perimeter Institute, Waterloo, ON, Canada
- 94 (2017). Echoes from the Abyss. Testing Gravity 2017, Vancouver, Canada
- 95 (2017). Reflections on Spacetime. Cosmology and the Future of Spacetime - Western University, London, Canada
- 96 (2017). Echoes from the Abyss. Seminar - Department of Applied Mathematics, University of Waterloo, Waterloo, Canada
- 97 (2017). Quantum Black Holes in the Sky. Colloquium - University of Kansas, Lawrence, Kansas, United States of America
- 98 (2017). Quantum Black Holes in the Sky. Colloquium - Department of Physics, Ohio State University, Columbus, United States of America
- 99 (2017). Quantum Black Holes in the Sky - Plenary Lecture. CosPA 2017, Kyoto, Japan
- 100 (2017). How to turn Quantum Gravity into Science?. Probing the Spacetime Fabric: From Concepts to Phenomenology - SISSA, Trieste, Italy
- 101 (2017). Echoes from the Abyss. Physics and Astrophysics at the eXtreme (PAX), Amsterdam, Netherlands
- 102 (2017). Seeing Dark in the Extremes: From Nanostructure, to Infinity and Beyond. CPARC Colloquium - Queen's University, Kingston, Canada
- 103 (2016). The Many Faces of the Cosmological Constant Problem. Experimental Search for Quantum Gravity - Frankfurt Institute for Advanced Studies, Frankfurt, Germany
- 104 (2016). Cosmological Non-Constant Problem: Astrophysical Limits of Particle Physics. HET-Discovery Seminar - Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark
- 105 (2016). E.F.T. is Evil!. Unifying Tests of General Relativity - Walter Burke Institute for Theoretical Physics, Caltech, Pasadena, United States of America
- 106 (2016). Accretion in Radiative Equipartition. Seminar - Dark Cosmology Centre, University of Copenhagen, Copenhagen, Denmark
- 107 (2015). (Real) Cosmology with Quark-Gluon Plasmas. Cosmology/HEP Seminar - Brookhaven National Laboratory, Upton, New York, United States of America
- 108 (2015). Pulsar Timing Constraints on Physics Beyond Standard Model. Mann Fest - University of Waterloo, Waterloo, Canada
- 109 (2015). Cosmological (Non-)Constant Problem. Testing Gravity 2015, Vancouver, Canada
- 110 (2015). First Erlangen Workshop on Quantum Gravity and Cosmology. High Energy Physics Seminar - University of Toronto, Toronto, Canada

- (2015). Cosmological Non-Constant Problem: The Case for TeV Scale Quantum Gravity. First Erlangen
111 Workshop on Quantum Gravity and Cosmology, Erlangen, Germany
- (2015). Alice in the (Relativistic) Wonderland. Colloquium - Department of Mathematics, Western University,
112 London, Canada
- (2014). Probing Dark Matter Nanostructure. Mitchell Workshop on Collider and Dark Matter Physics, College
113 Station, United States of America
- (2014). From Black Holes to Big Bang, and Back!. Cosmology Seminar - Perimeter Institute for Theoretical
114 Physics, Waterloo, Canada
- (2014). Cosmological (Non)-Constant Problem. Large Angle Anomalies: from a posteriori to a priori - Case-
115 Western Reserve University, Cleveland, United States of America
- (2014). An Introduction to the Universe - Plenary Talk. Sharif University Alumni Conference, Tehran, Iran
116
- (2014). From Black Holes to Big Bang, and Back!. Colloquium - Department of Physics, Isfahan University of
117 Technology, Isfahan, Iran
- (2014). Probing Dark Matter Nanostructure. Cosmology Seminar - Department of Physics, Sharif University of
118 Technology, Tehran, Iran
- (2014). Dark Matter Nanostructure. Astrophysics Seminar - Department of Physics and Astronomy, University
119 of Waterloo, Waterloo, Canada
- (2014). From Black Holes to Big Bang, and Back!. Invited Colloquium - School of Astronomy, Institute for
120 Research in Fundamental Sciences (IPM), Tehran, Iran
- (2014). An Introduction to the Universe, Q&A. Zaferanieh Amateur Observatory, Tehran, Iran
121
- (2014). Life after Lorentz: Quantum Mechanics, Gravity, and the Crisis of Falsifiability. Physics Colloquium -
122 University of Tehran, Tehran, Iran
- (2013). Missing Baryons: How Much? How Hot? How Fast?. Cross-Correlating Cosmic Fields Conference,
123 Shanghai, China
- Gould E. (2013). A Non-Local Reality: Is there a Phase Uncertainty in Quantum Mechanics?. Quantum
124 Foundations Seminar - Perimeter Institute for Theoretical Physics, Waterloo, Canada
- (2013). Tales of Dark Matter on Small Scales. Colloquium - Kavli Institute for Astronomy and Astrophysics,
125 Beijing, China
- (2013). Dynamical Emergence of Universal Horizons During the Formation of Black Holes. LOOPS 13,
126 Waterloo, Canada
- (2013). Out of the White Hole: A Holographic Origin for the Big Bang. Cosmology After Planck 2013, Ann
127 Arbor, United States of America
- (2013). Where Will Einstein Fail?. CASCA 2013, Vancouver, Canada
128
- (2013). Why is Particle Physics Lorentz-Invariant?. Kavli Workshop - IPMU Focus Week on Gravity and
129 Lorentz Violation, Kashiwa, Japan
- (2013). Life after Lorentz: Quantum Mechanics, Gravity, and the Crisis of Falsifiability. Colloquium -
130 University of Wisconsin-Madison, Madison, United States of America
- (2013). Tales of Dark Matter on Small Scales. TAMU Workshop on Dark Matter, College Station, United
131 States of America
- (2012). Horava-Lifshitz Cosmology and Dark Matter Holes - 2-Lecture Series. Cape Town International
132 Cosmology School 2012, Stellenbosch, South Africa, Republic of
- (2012). Hot Big Bang at a Lifshitz Point. CAP Congress 2012, Calgary, Canada
133

- 134 (2012). Reviving Gravity's Aether in Einstein's Universe. Colloquium - York University, Toronto, Canada
- 135 (2012). Tales of Dark Matter on Small Scales. Theoretical Physics Workshop - UWO, London, Canada
- 136 (2012). Why is Particle Physics Lorentz Invariant?. Experimental Search for Quantum Gravity: The Hard Facts, Waterloo, Canada
- 137 (2012). Modern Cosmology. Cosmology & Gravitation Seminar - Perimeter Institute for Theoretical Physics, Waterloo, Canada
- 138 Bonanno A, Brandenberger R, Magueijo J, Nemiroff R, Amelino-Camelia G. (2012). Photons and Quantum Gravity in Astrophysics. Experimental Search for Quantum Gravity 2012, Waterloo, Canada
- 139 (2012). Trials and Tribulations of Aether. Conformal Nature of the Universe Conference, Waterloo, Canada
- 140 (2011). Where will Einstein Fail? Insights into Gravity and Dark Energy. CITA Invited Seminar - University of Toronto, Toronto, Canada
- 141 (2011). Largest and Smallest Dark Matter Clusters, and What We Can Learn from Them. High Energy Theory Seminar - University of Michigan, Ann Arbor, United States of America
- 142 (2011). Structure in the Phase Space and Dark Matter Astronomy. Unravelling Dark Matter Conference 2011, Waterloo, Canada
- 143 (2011). Where will Einstein Fail? Insights into Gravity and Dark Energy. KICP Colloquium - University of Chicago, Chicago, United States of America
- 144 (2011). Aether, Quantum Gravity and Cosmology. Philosophy of Cosmology Workshop - 11th Annual Conference in the Foundations of Physics, London, Canada
- 145 (2011). Where will Einstein Fail? Insights into Gravity and Dark Energy. Vainu Bappu Memorial Gold Medal Award Ceremony - Astronomical Society of India, Pune, India
- 146 (2011). Aether, Quantum Gravity and Cosmology. Cosmological Frontiers in Fundamental Physics 2011, Paris, France
- 147 (2011). How can Astrophysical Compact Objects Shed Light on Dark Cosmology?. High Energy Theory Seminar - University of Amsterdam, Amsterdam, Netherlands
- 148 (2011). Fine Structure of Dark Matter Phase Space. Dark Matter: Its Origin, Models, and Detection, Albuquerque, United States of America
- 149 (2010). Non-Linear Structure Formation in Cosmology - 2-Part Lecture Series. Invited Lectures on Structure Formation - Institute for Research in Fundamental Sciences, Tehran, Iran
- 150 (2010). First Precision Measurement in Quantum Gravity. Cosmology Seminar - Institute for Research in Fundamental Sciences, Tehran, Iran
- 151 (2010). Stellar Black Holes and the Thermodynamic Origin of Cosmic Acceleration. Colloquium - Institut d'Astrophysique de Paris, Paris, France
- 152 (2010). Cosmological Constant Problem: Rethinking Quantum and Gravity. Laws of Nature: Their Nature and Knowability 2010, Waterloo, Canada
- 153 (2010). Cosmology and the End of Physics!. Colloquium - University of Guelph, Guelph, Canada
- 154 (2010). Hierarchy in the Phase Space and Dark Matter Astronomy. Astrophysics Seminar - Queen's University, Kingston, Canada
- 155 (2009). The End of the Cosmological Constant Problem. Astrophysics Workshop - Interactions in the Dark Sector, Leiden, Netherlands
- 156 (2009). Black Hole Horizons and the Origin of Cosmic Acceleration. Holographic Cosmology Workshop 2009, Waterloo, Canada

- 157 (2009). Gravitational Aether as a Solution to the CC Problem and more!. New Prospects for Solving the
Cosmological Constant Problem 2009, Waterloo, Canada
- 158 (2009). Stellar Black Holes and the Origin of Cosmic Acceleration. Cosmology Seminar - KIPAC, Stanford,
United States of America
- 159 (2009). Hierarchy in the Phase Space and Dark Matter Astronomy. CYGNUS 2009, Cambridge, United States
of America
- 160 (2009). The End of the Cosmological Constant Problem. Cosmology Seminar - IPMU, Kashiwa, Japan
- 161 (2009). Stellar Black Holes and the Origin of Cosmic Acceleration. Theory Canada 5 Conference, Fredericton,
Canada
- 162 (2009). Cuscuton and Solving the Cosmological Constant Problem. High Energy Physics Seminar - Vanderbilt
University, Nashville, United States of America
- 163 (2009). Cuscuton and Horava-Lifshitz Gravity. Gravity at a Lifshitz Point 2009, Waterloo, Canada
- 164 (2009). (Towards) the End of the Cosmological Constant Problem!. Cosmology & Gravitation Seminar -
Perimeter Institute for Theoretical Physics, Waterloo, Canada
- 165 (2008). Gravitational Aether as a Solution to the Cosmological Constant Problem. 14th International
Symposium on Particles, Strings and Cosmology (PASCOS '08), Waterloo, Canada
- 166 (2008). Physics Beyond the Horizon. Cosmology and Gravitation Seminar - Perimeter Institute for Theoretical
Physics, Waterloo, Canada
- 167 (2008). Physics Beyond the Horizon. Physics Colloquium - University of Pennsylvania, Philadelphia, United
States of America
- 168 (2008). Physics Beyond the Horizon. Colloquium - Perimeter Institute for Theoretical Physics, Waterloo,
Canada
- 169 (2008). Observational Evidence for Massive Gravity. PI CITA Joint Cosmology Day 2008, Waterloo, Canada
- 170 (2008). Missing Thermal Energy of the Universe. Astroparticle Workshop - Open Questions from Clusters of
Galaxies, Toulouse, France
- 171 (2008). Primordial Non-Gaussianity, Statistics of Collapsed Objects, and the ISW Effect. Origins and
Observations of Primordial Non-Gaussianity 2008, Waterloo, Canada
- 172 (2008). Galaxy Clusters as Cosmic Canaries. High Energy Physics Seminar - Syracuse University, Syracuse,
United States of America

Broadcast Interviews

- 2026/05/31 - [What Came Before The Big Bang?](#), Apple Finch Pudding, YouTube.
- 2026/04/02 - [The Big Bang May Not Be the Beginning: Dr. Niayesh Afshordi on Time and Nothingness](#),
Philosophy Everyday, YouTube.
- 2025/10/09 - [Has Science Just Proved God?](#), Premier Unbelievable? debate with Michel-Yves Bollore, hosted
by John Nelson, YouTube.
- 2025/09/16 - [Are We Wrong About the Big Bang?](#), Dr Brian Keating, YouTube.
- 2025/06/12 - [Was There Anything Before Us?](#), Event Horizon, with Phil Halper, YouTube.
- 2025/05/26 - [Mindscape 316: Niayesh Afshordi and Phil Halper on the Big Bang and Before](#), Sean Carroll's
Mindscape, YouTube.
- 2025/01/19 - [An Astrophysicist Breaks Down Modern Cosmology](#), Miles K. Donahue, YouTube.

- 2024/09/27 - Physicists search for Black Hole Bombs, Phil Halper's YouTube Channel, YouTube.com,
<https://youtu.be/bJlqWGgt2hw?si=cn9waXQiKvUHIZw3>
- 2024/10/12 - What's inside a black hole? Fuzzballs, Echoes & The Big Bang, Phil Halper's YouTube
 Channel, YouTube.com, <https://youtu.be/JN9jlg9AdYM?si=c4158UQDt8pRFAfn>
- 2024/05/17 - Did the Universe Create itself ? The PTC model, Before the Big Bang 11, YouTube.com,
 2024/10/12 <https://youtu.be/cLSuM8rKMyk?si=x dh2appUW8wAEi-7>
- 2023/04/28 - The Fine Tuning Argument: the critics strike back, Phil Halper's YouTube channel,
 2024/10/12 YouTube.com, https://youtu.be/zNH-ZgSpBuQ?si=fahqxSe3_F4xgzDv
- 2022/10/09 - Echoes from the Abyss: The Mind-Bending Science Behind the Strange Sounds of
 2024/10/12 Black Holes, Time before Space, YouTube.com https://www.youtube.com/watch?v=d1mcfBip_sw&ab_channel=TimebeforeSpace
- 2022/05/27 - Ghazal Geshnizjani & Niayesh Afshordi: Cosmologically Coupled, Conversations at
 2024/10/12 Perimeter Institute, <https://conversationsattheperimeter.podbean.com/>
- 2020/10/28 - A New Model for the Covid Pandemic, Sabine Hossenfelder's channel, YouTube.com,
 2024/10/12 <https://youtu.be/H0oZUpMtJrs?si=TA5cEInNhZRnN5ug>
- 2024/05/03 - Astronomers claim universe has "cosmic glitch", Phil Halper's Youtube Channel [https://](https://youtu.be/GOctev5cUCI?si=LacFQqSuTPKsAUyO)
 2024/05/03 youtu.be/GOctev5cUCI?si=LacFQqSuTPKsAUyO, Youtube
- 2020/11/20 - Fighting COVID-19 with Physics, Interview with the local CTV station in Kitchener-
 2021/11/20 Waterloo, CTV News, Kitchener-Waterloo
- 2020/11/12 - Q&A with the Experts: The problem with Herd Immunity and COVID-19, Mike Farwell
 2021/11/12 Show, 570 News, Kitchener Radio
- 2019/10/04 - Black Hole Genesis, Before the Big Bang, Episode 10, YouTube.com 2019/10/04
- 2018/10/17 - Varying Speed of Light Cosmology, Before the Big Bang, Episode 8, YouTube.com 2019/07/31
- 2017/02/10 - Big Bang and Holography, Science Friday with Ira Flatow, National Public Radio, USA
 2017/02/06 2017/02/10
- 2017/02/06 - Big Bang, Big Think, Radio Canada International ([https://www.rcinet.ca/en/2017/02/06/the-](https://www.rcinet.ca/en/2017/02/06/the-universe-is-holographic/)
 2017/02/06 [universe-is-holographic/](https://www.rcinet.ca/en/2017/02/06/the-universe-is-holographic/))

- 2017/02/01 - Holographic Cosmology, Morning Edition, CBC Kitchener-Waterloo 2017/02/01
- 2017/01/01 - Enigmatic echo from Black Hole, Science@ORF.at, Austrian Broadcasting Corporation 2017/01/01
- 2013/10/13 - Bye Bye Big Bang?, FQXi Podcast, FQXi.org 2013/10/13
- 2013/03/16 - Working at PI, Fresh Air with Mary Ito, CBC Radio 2013/03/16
- 2012/07/04 - Discovery of Higgs Particle at CERN, 60 Minutes, BBC Persian TV 2012/07/04
- 2011/10/04 - Legacy of Stephen Hawking, 60 Minutes, BBC Persian TV 2011/10/04
- 2011/09/24 - (Claimed) Discovery of Superluminal Neutrinos, 60 Minutes, BBC Persian TV 2011/09/24

Text Interviews

- 2024/05/15 Newfound 'glitch' in Einstein's relativity could rewrite the rules of the universe, study suggests, LiveScience.com <https://www.livescience.com/physics-mathematics/newfoundglitch-in-einsteins-relativity-could-rewrite-the-rules-of-the-universe-study-suggests>
- 2024/05/15 A Cosmic Glitch in Gravity, Nautilus Magazine https://nautil.us/a-cosmic-glitch-in-gravity-593171/?_sp=0f3668e3-5102-4de7-b03f-fc59eb4ec411.1715821798622
- 2024/05/01 A 'cosmic glitch' in gravity, Waterloo News <https://uwaterloo.ca/news/media/cosmic-glitch-gravity>
- 2024/01/29 Over Gravity's Rainbow: An alternative framework of physics, in which light's speed can vary By Zeeya Merali, John Templeton Foundation Newsletter <https://www.templeton.org/news/over-gravitys-rainbow>
- 2023/02/17 "Dark energy from supermassive black holes? Physicists spar over radical idea", Science News <https://www.science.org/content/article/dark-energy-supermassive-black-holesphysicists-spar-over-radical-idea>
- 2021/09/20 Chiamaka Okoli was a rarity in physics. She challenged norms until her untimely death A Black woman, mother, and a devout Catholic, Okoli was a trailblazer in her field before tragedy struck, Boradview.com <https://broadview.org/chiamaka-okoli/>
- 2021/06/04 Modelling the mysteries of the universe, closer to home Professor Niayesh Afshordi used his knowledge of modelling the mysteries of the Cosmos to start modelling the mysteries of COVID-19, Waterloo News <https://uwaterloo.ca/news/science/modeling-mysteriesuniverse-closer-home>
- 2021/02/08 Echoes from black hole could force us to rethink laws of physics Gravitational echoes may confirm the late Stephen Hawking's quantum black hole hypothesis, Waterloo News, <https://uwaterloo.ca/news/global-impact/echoes-black-hole-could-force-us-rethink-lawsphysics>
- 2020/02/10 Spacetime 'Echoes' From Quantum Black Holes Could Soon Change Physics Forever, VICE Motherboard
- 2020/02/01 Musta aukko sateilee, TAHDET JA AVARUUS Finland
- 2020/01/31 Black holes shouldn't echo, but this one might. Score 1 for Stephen Hawking?, Live Science
- 2019/10/30 Einstein killed the aether. Now the idea is back to save relativity, New Scientist
- 2019/06/18 Big Bang BOMBSHELL: Are we living inside a HUGE higher dimensional black hole?, Express.co.uk, <https://www.express.co.uk/news/science/1140059/black-hole-higherdimensional-big-bang-theory-universe-hologram-space-news>

2019/05/24	We've Found Gravitational Waves. What Will We Learn From Them?, Discover Magazine
2019/05/15	Ripple Effect, Discover Magazine
2019/01/16	Crisis at the Heart of Physics, New Scientist
2018/06/20	Total Wipeout, New Scientist
2018/05/14	Echoes of gravitational waves could point to quantum gravity, Physics World
2017/03/29	Echoes of a Black Hole, Aeon.COM
2017/02/04	Could the universe actually be a flat hologram?, Christian Science Monitor
2017/01/31	Lost in space? A brief guide to the 'holographic principle' of the universe, Guardian
2016/12/13	Was Einstein wrong? Controversial theory claims the speed of light is not a constant, Wired Magazine
2016/11/28	Theory Challenging Einstein's View On Speed of Light Could Soon Be Tested, The Guardian
2016/09/12	LIGO black hole echoes hint at general-relativity breakdown, Nature News
2016/02/05	Much Ado around Nothing: The Cosmological non-Constant Problem, Backreaction
2016/01/11	The Sky as a Limit, Perimeter Institute News
2015/02/11	Do Black Hole Firewalls Have Observable Consequences?, Backreaction
2013/09/26	Was Our Universe Born in an Extra-Dimensional Black Hole?, PBS NOVA
2013/09/13	Did a Hyper-Black Hole Spawn the Universe?, Nature News
2013/07/16	Cosmologist Claims Universe May Not Be Expanding, Nature News
2010/07/01	Cosmic Bubble Made Cold Spot in Big Bang Afterglow, New Scientist
2009/03/16	Gravity May Venture Where Matter Fears to Tread, New Scientist

Publications

Complete public scholarly record refreshed 2026-07-10 from arXiv, INSPIRE, and ORCID. DOI links point to the published version; arXiv links point to the open manuscript.

2026

- ¹ Shokoufe Faraji, Niayesh Afshordi. Self-regularized entropy: What does black hole entropy predict for tests of Kerr no-hair theorem? *Classical and Quantum Gravity (CQG)*, June 2026.
[doi:10.1088/1361-6382/ae7793](https://doi.org/10.1088/1361-6382/ae7793) [arXiv:2508.20421](https://arxiv.org/abs/2508.20421)
- ² Guandi Zhao, Alex Krolewski, Niayesh Afshordi. Thermal Sunyaev-Zel'dovich cross-correlations with unWISE galaxies: disentangling radio contamination, dust properties, and electron pressure. [arXiv:2606.28099](https://arxiv.org/abs/2606.28099)
- ³ Ruijing Tang, Shokoufe Faraji, Niayesh Afshordi. Exploring Born-Infeld $f(T)$ teleparallel gravity through accretion disk dynamics. *Phys. Rev. D* 113, 123021 (2026). [doi:10.1103/6q8h-k57n](https://doi.org/10.1103/6q8h-k57n) [arXiv:2502.03775](https://arxiv.org/abs/2502.03775)
- ⁴ Niayesh Afshordi, Phil Halper, Matteo Rini, Michael Schirber. Big Mysteries Survey: Physicists' Views on Cosmology, Black Holes, Quantum Mechanics, and Quantum Gravity. [arXiv:2605.11058](https://arxiv.org/abs/2605.11058)
- ⁵ Ruolin Liu, Jerome Quintin, Niayesh Afshordi. Ultraviolet Completion of the Big Bang in Quadratic Gravity. *Phys. Rev. Lett.* 136, 111501 (2026). [doi:10.1103/6gtx-j455](https://doi.org/10.1103/6gtx-j455) [arXiv:2510.18733](https://arxiv.org/abs/2510.18733)
- ⁶ Emanuele Berti, Vitor Cardoso, Gregorio Carullo, Jahed Abedi, Niayesh Afshordi, Simone Albanesi, Vishal Baibhav, Swetha Bhagwat, et al.. Black hole spectroscopy: from theory to experiment. *Class. Quant. Grav.* 43, 123001 (2026). [doi:10.1088/1361-6382/ae59e2](https://doi.org/10.1088/1361-6382/ae59e2) [arXiv:2505.23895](https://arxiv.org/abs/2505.23895)

2025

- ⁷ Jiayue Yang, Niayesh Afshordi, Mahdi Torabian, Seyed Akbar Jafari, G. Baskaran. Smart Holes: Analogue black holes with the right temperature and entropy. *JHEP* 07, 226 (2025).
[doi:10.1007/jhep07\(2025\)226](https://doi.org/10.1007/jhep07(2025)226) [arXiv:2412.08517](https://arxiv.org/abs/2412.08517)
- ⁸ Alice Chen, Niayesh Afshordi. Where are all the dark galaxies? Predicting galaxy/halo locations from their bright neighbors. [arXiv:2507.01814](https://arxiv.org/abs/2507.01814)
- ⁹ Martin Radler, Niayesh Afshordi, Reza Taleei, Katia Parodi, Ramin Abolfath, Julie Lascaud. A semiclassical model of the immediate temperature distribution surrounding the track of heavy ions with therapeutic energies. *Physics in Medicine & Biology*. [doi:10.1088/1361-6560/add83b](https://doi.org/10.1088/1361-6560/add83b)
- ¹⁰ Alice Y. Chen, Phil Halper, Niayesh Afshordi. Copenhagen Survey on Black Holes and Fundamental Physics. [arXiv:2503.15776](https://arxiv.org/abs/2503.15776)
- ¹¹ Batia Friedman-Shaw, Alex Krolewski, Matteo Foglieni, Niayesh Afshordi. Doppler bias: impact of peculiar velocities on color selection and the large scale structure of galaxy surveys. *JCAP* 03, 059 (2025).
[doi:10.1088/1475-7516/2025/03/059](https://doi.org/10.1088/1475-7516/2025/03/059) [arXiv:2410.04705](https://arxiv.org/abs/2410.04705)
- ¹² Ruolin Liu, Jerome Quintin, Niayesh Afshordi. Conformal Cores of Quantum Black Holes in Quadratic Gravity. *Phys. Rev. D* 111, 044031 (2025). [doi:10.1103/physrevd.111.044031](https://doi.org/10.1103/physrevd.111.044031) [arXiv:2411.19311](https://arxiv.org/abs/2411.19311)
- ¹³ Conner Dailey, Erik Schnetter, Niayesh Afshordi. Formulating the complete initial boundary value problem in numerical relativity to model black hole echoes. *Class. Quant. Grav.* 42, 025002 (2025).
[doi:10.1088/1361-6382/ad9701](https://doi.org/10.1088/1361-6382/ad9701) [arXiv:2409.17970](https://arxiv.org/abs/2409.17970)
- ¹⁴ Lakshay Goel, Everett A. Patterson, Maria Rosa Preciado-Rivas, Mahdi Torabian, Robert B. Mann, Niayesh Afshordi. Accelerated detector in a superposed spacetime. *Phys. Rev. D* 111, 025015 (2025).
[doi:10.1103/physrevd.111.025015](https://doi.org/10.1103/physrevd.111.025015) [arXiv:2409.06818](https://arxiv.org/abs/2409.06818)
- ¹⁵ Robin Y. Wen, Lukas T. Hergt, Niayesh Afshordi, Douglas Scott. A glitch in gravity: cosmic Lorentz-violation from fiery Big Bang to glacial heat death. *Astrophys. Space Sci. Proc.* 61, 435 (2025).
[doi:10.1007/978-3-031-90186-7_35](https://doi.org/10.1007/978-3-031-90186-7_35) [arXiv:2412.09568](https://arxiv.org/abs/2412.09568)
- ¹⁶ LISA Consortium Waveform Working Group, Niayesh Afshordi, Sarp Akcay, Pau Amaro Seoane, Andrea Antonelli, Josu C. Aurrekoetxea, Leor Barack, Enrico Barausse, et al.. Waveform Modelling for the Laser Interferometer Space Antenna. *Living Rev. Rel.* 28, 9 (2025).
[doi:10.1007/s41114-025-00056-1](https://doi.org/10.1007/s41114-025-00056-1) [arXiv:2311.01300](https://arxiv.org/abs/2311.01300)

- 17 Niayesh Afshordi, Stefano Liberati. Quantum black holes: from regularization to information paradoxes. *Gen. Rel. Grav.* 57, 25 (2025). doi:10.1007/s10714-025-03356-7

2024

- 18 Sedighe Sajadian, Niayesh Afshordi. Simulating Self-Lensing and Eclipsing Signals due to Detached Compact Objects in the TESS Light Curves. *The Astronomical Journal*. doi:10.3847/1538-3881/ad7fdd arXiv:2409.12441
- 19 Niayesh Afshordi, Abhay Ashtekar, Enrico Barausse, Emanuele Berti, Richard Brito, Luca Buoninfante, Raul Carballo-Rubio, Vitor Cardoso, et al.. Black Holes Inside and Out 2024: visions for the future of black hole physics. arXiv:2410.14414
- 20 Yu Li, Ruolin Liu, Conner Dailey, Niayesh Afshordi. Detecting cosmological scalar fields using orbital networks of quantum sensors. *Phys. Rev. D* 110, 043028 (2024). doi:10.1103/physrevd.110.043028 arXiv:2311.17873
- 21 Ramin Abolfath, Niayesh Afshordi, Sohrab Rahvar, Adri van Duin, Martin Radler, Reza Taleei, Katia Parodi, Julie Lascaud, Radhe Mohan. A molecular dynamics simulation of the abrupt changes in the thermodynamic properties of water after formation of nano-bubbles / nano-cavities induced by passage of charged particles. *Eur. Phys. J. D* (2024) 78: 141. doi:10.1140/epjd/s10053-024-00928-1 arXiv:2403.05880
- 22 M. Mylova, N. Afshordi. Effective Cuscuton Theory. *JHEP* 04, 144 (2024). doi:10.1007/jhep04(2024)144 arXiv:2312.06066
- 23 Robin Y. Wen, Lukas T. Hergt, Niayesh Afshordi, Douglas Scott. A cosmic glitch in gravity. *JCAP* 03, 045 (2024). doi:10.1088/1475-7516/2024/03/045 arXiv:2311.03028
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