Curriculum Vitae

Saeed Rastgoo

Version: 25/July/2025

Assistant Lecturer
Department of Physics, and
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Theoretical Physics Institute
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Education

Ph.D., Physics (with distinction): Universidad de la Republica, Uruguay, Aug. 2012

- Advisor: Prof. Rodolfo Gambini
- Dissertation: *Two dimensional models in loop quantum gravity*

M.Sc., Physics: Shiraz University, Shiraz, Iran, July 2006

- Advisor: Prof. Azizollah Azizi
- Dissertation: *Dynamical cellular networks: A new approach to quantum gravity*

B.Sc., Physics: Kharazmi University, Tehran, Iran, Dec 2002

Positions

Assistant Lecturer, University of Alberta, Canada, July 2025-Present

Max Wyman Assistant Professor, University of Alberta, Canada, July 2022-June 2025

Assistant Professor, York University, Canada, Jan. 2020-June 2022

Assistant Professor, Monterrey Institute of Technology (ITESM), Mexico, Oct. 2018-Dec. 2019

Postdoctoral Fellow, Universidad Autonoma Metropolitana, Mexico, Sep. 2014-Aug. 2018

Postdoctoral Fellow, UNAM (Centro de Ciencias Matematicas), Mexico, Sep. 2012-Aug. 2014

Grants

- Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant, "*Probing the quantum gravitational structure of spacetime via black holes and gravitational waves*", Reference Number: RGPIN-2021-03644, 120K CAD, Apr. 2021 – Mar. 2026
- NSERC Discovery Launch Supplement, "*Probing the quantum gravitational structure of spacetime via black holes and gravitational waves*", Reference Number: DGECR-2021-00302, 12.5K CAD, Apr. 2021 – Mar. 2026
- Academic Innovation Fund (AIF) for "EXPLORE: Experiential Learning Opportunity through Research and Exchange", York University, 45840 CAD, 2021-2026
  Other project members: Nassim Bozorgnia, Jürgen Schaffner-Bielich, Laura Sagunski, Sean Tulin
- Junior Faculty Fund, York University, Canada, 2K CAD, Winter 2021
- YUFA Minor Research Grant, York University, Canada, 3K CAD, Winter 2021
- Junior Faculty Fund, York University, Canada, 1.1K, Winter 2020
- YUFA Minor Research Grant, York University, Canada, 2K, Winter 2020
- Project grant, CONACyT (National Council of Science and Technology), Mexico, 100K MXN, 2015-2017
  PI: Hugo Morales-Técotl

Fellowships and Awards

- "National Researcher Member" medal and recognition, Monterrey Institute of Technology, 2019
- CONACyT postdoctoral fellowship, Mexico, 2016-2018
- PRODEP postdoctoral fellowship, Universidad Autónoma Metropolitana (UAM-I), Mexico, 2014-2016
- Research grant, SNI (National System of Researchers), Mexico, 2014-2020
- DGAPA postdoctoral fellowship, Universidad Nacional Autónoma de México (UNAM), Mexico, 2012-2014
- Research grant, ANII (National Agency of Research and Innovations), Uruguay, Jun. 2011-May 2013
- "Honorable Mention", *Gravity Research Foundation*, 2011
- ANII Ph.D. fellowship, Universidad de la República, Uruguay, 2008-2010
- PEDECIBA Ph.D. fellowship, Universidad de la República, Uruguay, 2007-2008

Publications

The list of authors in the following is in alphabetical order as is common in gr-qc, except items 6 and 15 in which the students and their main supervisors come first, and item 12 which is in order of contribution.

Research papers

1. F. Fragomeno, S. Rastgoo, *Canonical Electrodynamics in Ashtekar-Barbero variables*, Submitted to JHEP, arXiv:2507.06276 [gr-qc].

2. S. Hergott, V. Husain, S. Rastgoo, *Dynamical model for black hole to white hole transitions*, Submitted to PRD, arXiv:2505.15096 [gr-qc].

3. E. Di Valentino, ..., S. Rastgoo, et. al., *The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics*, Submitted to Physics of the Dark Universe, arXiv:2504.01669 [astro-ph.CO].

4. D. M. Gingrich, S. Rastgoo, *Geometry of a generalized uncertainty-inspired spacetime*, Phys. Rev. D **111**, 104017 (2025), arXiv:2412.08004 [gr-qc].

5. F. Fragomeno, D. M. Gingrich, S. Hergott, S. Rastgoo, E. Vienneau, *A generalized uncertainty-inspired quantum black hole*, Phys. Rev. D **111**, 024048 (2025), arXiv:2406.03909 [gr-qc].

6. D. Montalvo , A. Smith-Orlik , S. , L. Sagunski , N. Becker, *Post-Newtonian effects in compact binaries with a dark matter spike: A Lagrangian approach*, Universe 2024, 10 (11), 427, arXiv:2401.06084 [gr-qc].

7. R. Alves Batista, ..., S. Rastgoo, et. al., *White Paper and Roadmap for Quantum Gravity Phenomenology in the Multi-Messenger Era*, Class. Quantum Grav. 42 (2025) 3, 032001, arXiv:2312.00409 [gr-qc].

8. P. Bosso, O. Obregón, S. Rastgoo, W. Yupanqui, *Black hole interior quantization: a minimal uncertainty approach*, Class. Quantum Grav. 41 (2024) 135011, arXiv:2310.04600 [gr-qc].

9. A. Garcia-Chung, M. F. Carney, J. B. Mertens, A. Parvizi, S. Rastgoo, Y. Tavakoli, *Constraining the quantum gravity polymer scale using LIGO data*, Invited contribution to "Focus issue on Quantum Gravity Phenomenology in the Multi-Messenger Era: Challenges and Perspectives", Class. Quantum Grav. 41 (2023) 1, 015011, arXiv:2305.18192 [gr-qc].

10. A. Garcia-Chung, M. F. Carney, J. B. Mertens, A. Parvizi, S. Rastgoo, Y. Tavakoli, *What do gravitational wave detectors say about polymer quantum effects?*, JCAP **11** (2022) 054, arXiv:2208.09739 [gr-qc].

11. S. Hergott, V. Husain, S. Rastgoo, *Model metrics for quantum black hole evolution: Gravitational collapse, singularity resolution, and transient horizons*, Phys. Rev. D **106**, 046012 (2022), arXiv:2206.06425 [gr-qc].

12. S. Rastgoo, S. Das, *Probing the interior of the Schwarzschild black hole using congruences: LQG vs. GUP*, Invited contribution, Universe 2022, 8(7), 349, arXiv:2205.03799 [gr-qc].

13. K. G. Arun, ..., S. Rastgoo, et. al., *New Horizons for Fundamental Physics with LISA*, Living Rev. Rel. **25** (2022) 1, 4, arXiv:2205.01597 [gr-qc].

14. P. Auclair, ..., S. Rastgoo, et. al., *Cosmology with the Laser Interferometer Space Antenna*, Living Rev. Rel. **26** (2023) 1, 5, arXiv:2204.05434 [astro-ph.CO].

15. N. Becker, L. Sagunski , L. Prinz , S. Rastgoo, *Circularization vs. Eccentrification in Intermediate Mass Ratio Inspirals inside Dark Matter Spikes*, Phys. Rev. D **105**, 063029 (2022), arXiv:2112.09586 [gr-qc].

16. A. Addazi, ..., S. Rastgoo, et. al., *Quantum gravity phenomenology at the dawn of the multi-messenger era – A review*, Prog. Part. Nucl. Phys. 125 (2022) 103948, arXiv:2111.05659 [hep-ph].

17. K. Blanchette, S. Das, S. Rastgoo, *Effective GUP-modified Raychaudhuri equation and black hole singularity: four models*, JHEP **09** (2021) 62, arXiv:2105.11511 [gr-qc].

18. A. Garcia-Chung, J. B. Mertens, S. Rastgoo, Y. Tavakoli, P. Vargas Moniz, *Propagation of quantum gravity-modified gravitational waves on a classical FLRW spacetime*, Phys. Rev. D **103**, 084053 (2021), arXiv:2012.09366 [gr-qc].

19. P. Bosso, O. Obregón, S. Rastgoo, W. Yupanqui, *Deformed algebra and the effective dynamics of the interior of black holes*, Class. Quantum Grav. **38** 145006 (2021), arXiv:2012.04795 [gr-qc].

20. K. Blanchette, S. Das, S. Hergott, S. Rastgoo, *Black hole singularity resolution via the modified Raychaudhuri equation in loop quantum gravity*, Phys. Rev. D **103**, 084038 (2021), arXiv:2011.11815 [gr-qc].

21. R. Gambini, S. Rastgoo, J. Pullin, *Gravitation in terms of observables 2: the algebra of fundamental observables*, Class. Quantum Grav. **37** 145013 (2020), arXiv:2003.01589 [gr-qc].

22. H. A. Morales-Técotl, S. Rastgoo, J. C. Ruelas, *Effective dynamics of the Schwarzschild black hole interior with inverse triad corrections*, Ann. Phys. **426C** (2021) 168401, arXiv:1806.05795 [gr-qc].

23. Y. Bonder, A. Garcia-Chung, S. Rastgoo, *Bounds on the Polymer Scale from Gamma Ray Bursts*, Phys. Rev. D **96**, 106021 (2017), arXiv:1704.08750 [gr-qc].

24. H. A. Morales-Técotl, S. Rastgoo, J. C. Ruelas, *Path integral polymer propagator of relativistic and non-relativistic particles*, Phys. Rev. D **95**, 065026 (2017), arXiv:1608.04498 [gr-qc].

25. A. Corichi, J. Olmedo, S. Rastgoo, *Callan-Giddings-Harvey-Strominger vacuum in loop quantum gravity and singularity resolution*, Phys. Rev. D **94**, 084050 (2016), arXiv:1608.06246 [gr-qc].

26. S. Rastgoo, M. Requardt, *Emergent Space-Time via a Geometric Renormalization Method*, Phys. Rev. D **94**, 124019 (2016), arXiv:1606.08073 [gr-qc].

27. S. Rastgoo, Y. Tavakoli, J. C. Fabris, *Phenomenology of a massive quantum field in a cosmological quantum spacetime*, Ann. Phys. **415C** (2020) 168110, arXiv:1511.08823 [gr-qc].

28. A. Corichi, A. Karami, S. Rastgoo, T. Vukašinac, *Constraint Lie algebra and local physical Hamiltonian for a generic 2D dilatonic model*, Class. Quantum Grav. **33** 035011 (2016), arXiv:1508.03036 [gr-qc].

29. H. A. Morales-Técotl, D. H. Orozco-Borunda, S. Rastgoo, *Polymer quantization and the saddle point approximation of partition functions*, Phys. Rev. D **92**, 104029 (2015), arXiv:1507.08651 [gr-qc].

30. S. Rastgoo, M. Requardt, *The Structurally Dynamic Cellular Network and Quantum Graphity Approaches to Quantum Gravity and Quantum Geometry - A Review and Comparison*, Journal of Cellular Automata 10/2015; **10**(5-6):341-392, arXiv:1501.00391 [gr-qc].

31. S. Rastgoo, *A local true Hamiltonian for the CGHS model in new variables*, arXiv:1304.7836 [gr-qc], 2013.

32. R. Gambini, J. Pullin, S. Rastgoo, *Reply to comment on "Small Lorentz violations in quantum gravity: do they lead to unacceptably large effects?"*, Class. Quantum Grav. **29** 088002 (2012).

33. R. Gambini, J. Pullin, S. Rastgoo, *Quantum scalar field in quantum gravity: the propagator and Lorentz invariance in the spherically symmetric case*, Gen. Relat. Gravit. **43** 3569 (2011), arXiv:1105.0667 [gr-qc].

34. R. Gambini, J. Pullin, S. Rastgoo, *Small Lorentz violations in quantum gravity: do they lead to unacceptably large effects?*, Class. Quantum Grav. **28** 155005 (2011), arXiv:1106.1417 [gr-qc].

35. R. Gambini, J. Pullin, S. Rastgoo, *New variables for 1+1 dimensional gravity*, Class. Quantum Grav. **27** 025002 (2010), arXiv:0909.0459 [gr-qc].

36. R. Gambini, J. Pullin, S. Rastgoo, *Quantum scalar field in quantum gravity: the vacuum in the spherically symmetric case*, Class. Quantum Grav. **26** 215011 (2009), arXiv:0906.1774 [gr-qc].

Conference papers and proceedings

1. A. Garcia-Chung, J. B. Mertens, S. Rastgoo, Y. Tavakoli, P. Vargas Moniz, *A model of polymer gravitational waves: theory and some possible observational consequences*, Proceedings of

the Sixteen Marcel Grossmann Meeting on General Relativity, arXiv:2111.00292 [gr-qc], 2021.

2. K. Blanchette, S. Das, S. Hergott, S. Rastgoo, *Effective black hole interior and the Raychadhuri equation*, Proceedings of the Sixteen Marcel Grossmann Meeting on General Relativity, arXiv:2110.05397 [gr-qc], 2021.

3. H. A. Morales-Técotl, D. H. Orozco-Borunda, S. Rastgoo, *Polymerization, the Problem of Access to the Saddle Point Approximation, and Thermodynamics*, in Proceedings of the Fourteenth Marcel Grossmann Meeting on General Relativity, World Scientific, 2017, ISBN: 978-9813226593, arXiv:1603.08076 [gr-qc].

4. R. Gambini, J. Pullin, S. Rastgoo, *Quantum scalar field in quantum gravity with spherical symmetry*, J. Phys.: Conf. Ser. **360** 012005 (2012).

Large Collaborations

- LISA Consortium, 2021-Present
  - LISA Fundamental Physics Working Group (FPWG)
  - LISA Cosmology Working Group (CosWG)
- LISA-Canada, 2021-Present
- European COoperation in Science and Technology (COST)
  - Action CA23130 "Bridging high and low energies in search of quantum gravity (BridgeQG)", 2024-Present
  - Action CA23115 "Relativistic Quantum Information (RQI)", 2024-Present
  - Action CA21136 "Addressing observational tensions in cosmology with systematics and fundamental physics (CosmoVerse)", 2023-Present
  - Action CA22113 "Fundamental challenges in theoretical physics (THEORY-CHALLENGES)", 2023-Present
  - Action CA18108 "Quantum gravity phenomenology in the multi-messenger approach (QGMM)", 2020-2023 (end of Action)
- NANOGrav, 2024-Present
- Cosmic Explorer, 2023-Present
- Einstein Telescope, 2025-Present
- EXPLORE International Programme, 2021-Present

Teaching

Undergraduate courses:

2025-2026

- *Electricity and Magnetism (PHYS 230)*, University of Alberta, Canada
- *Calculus for the Physical Sciences II (MATH 146)*, University of Alberta, Canada
- *Linear Algebra I (MATH 125)*, University of Alberta, Canada
- *Applied Linear Algebra (MATH 102)*, University of Alberta, Canada
- *Undergraduate Research Project (PHYS 499/MA PH 499)*, University of Alberta, Canada

2024-2025

- *Electricity and Magnetism (PHYS 230)*, University of Alberta, Canada
- *Calculus for the Physical Sciences II (MATH 146)*, University of Alberta, Canada
- *Topics in Interdisciplinary Studies (INT D 200)*, University of Alberta, Canada

2023-2024

- *Electricity and Magnetism (PHYS 230)*, University of Alberta, Canada
- *Calculus for the Physical Sciences I (MATH 144)*, University of Alberta, Canada
- *Calculus for the Physical Sciences II (MATH 146)*, University of Alberta, Canada
- *Undergraduate Research Project (PHYS 499/MA PH 499)*, University of Alberta, Canada
- *Topics in Interdisciplinary Studies (INT D 200)*, University of Alberta, Canada

2022-2023

- *Calculus for the Physical Sciences I (MATH 144)*, University of Alberta, Canada
- *Calculus for the Physical Sciences II (MATH 146)*, University of Alberta, Canada
- *Undergraduate Research Project (PHYS 499/MA PH 499)*, University of Alberta, Canada
- *Topics in Interdisciplinary Studies (INT D 200)*, University of Alberta, Canada

2021-2022

- *Physics: The big picture (PHYS 114)*, University of Alberta, Canada
- *Calculus for the Physical Sciences I (MATH 144)*, University of Alberta, Canada
- *Undergraduate Research (PHYS4310)*, York University, Canada

2020-2021

- *Classical Mechanics: Lagrangian and Hamiltonian formulations (PHYS 3010)*, York University, Canada
- *Engineering Mechanics (PHYS 1800)*, York University, Canada
- *Undergraduate Research (PHYS4310)*, York University, Canada

2019-2020

- *Classical Mechanics: Lagrangian and Hamiltonian formulations (PHYS 3010)*, York University, Canada
- *Engineering Mechanics (PHYS 1800)*, York University, Canada
- *Undergraduate Research (PHYS4310)*, York University, Canada

2018-2019

- *Physics I (Mechanics)*, Monterrey Institute of Technology, Mexico
- *Physics II (Fluids, Oscillations, Waves, Thermodynamics)*, Monterrey Institute of Technology, Mexico
- *Mathematics and Physics for Architecture and Industrial Design*, Monterrey Institute of Technology, Mexico

Graduate courses:

2025-2026

- *Advanced Quantum Mechanics II (PHYS 512)*, University of Alberta, Canada

2024-2025

- *Special Topics in Physics: Quantum Field Theory (PHYS 495/595)*, University of Alberta, Canada

2020-2021

- *General Relativity & Cosmology (PHYS 5230)*, York University, Canada

2017-2018

- *Gravitation II*, Universidad Autonoma Metropolitana, Mexico

2015-2016

- *Quantum Field Theory I*, Universidad Autonoma Metropolitana, Mexico
- *Gravitation I*, Universidad Autonoma Metropolitana, Mexico

2014-2015

- *Classical and Quantum Black Holes*, Universidad Autonoma Metropolitana, Mexico

Supervision

PhD students:

1. Paolo Fragolino (joint supervision with Don Page), Sep. 2024-Present
2. Jorden Roberts, May 2023-Present
3. Evan Vienneau, Jan. 2023-Present
4. Federica Fragomeno, Jan. 2022-Present
5. Samantha Hergott, Sep. 2020-2025 (Graduated in Summer 2025)
6. Keagan Blanchette, Sep. 2020-2022 (left academia for a position in data science in industry)

Master's students:

- Jorden Roberts, Sep. 2021-2023 (transferred to the PhD program)

Undergraduate students:

1. Suzanne Parr (York University, Canada), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Oct. 2024-May 2025
2. Darius Piercey Andrews (York University, Canada), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Oct. 2024-May 2025
3. Lukas Lehmann (Goethe University, Germany), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Oct. 2024-May 2025

4. Fahim Shahriar Khan (University of Alberta, Canada), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Oct. 2024-May 2025

5. Tanner Nelson, MA PH 499 (Undergraduate Research Project), Topic: Magnetogravity in quantum black hoels, University of Alberta, Canada, Jan.-May 2024

6. Tanner Nelson, MA PH 499 (Undergraduate Research Project), Topic: The problem of time, University of Alberta, Canada, Sep.-Dec. 2023

7. Hemish Ahuja (York University, Canada), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Sep. 2023-May 2024

8. Tanzim Parvej (University of Alberta, Canada), EXPLORE International Programme, Topic: Quantum black holes, University of Alberta, Canada, Sep. 2023-May 2024

9. Nathaniel Bartolome, Summer student, Topic: Gravitational lensing and dark matter, University of Alberta, Canada, May-Sep. 2023

10. Rene Payne, MA PH 499 (Undergraduate Research Project), Topic: Fermions in Loop Quantum Gravity, University of Alberta, Canada, Jan.-May 2023

11. Amol Sandhu, MA PH 499 (Undergraduate Research Project), Topic: Gravitational waves and dark matter, University of Alberta, Canada, Jan.-May 2023

12. Zena Khadour (University of Alberta, Canada), EXPLORE International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct. 2022-May 2023

13. Akash Kav (University of Alberta, Canada), EXPLORE International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct. 2022-May 2023

14. Tanner Nelson (University of Alberta, Canada), EXPLORE International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct. 2022-May 2023

15. Alexander Dreichner (Goethe University, Germany), EXPLORE International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct. 2022-May 2023

16. Rosalyn Chan Yoke Ling, PHYS 4310 (undergraduate research course), Topic: Modified gravitational collapse, York University, Canada, Jan.-May 2022

17. Diego Montalvo, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Jan.-May 2022

18. Anvir Basra, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Jan.-May 2022

19. Hazkeel Khan (York University, Canada), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May 2022
20. Nifia Garg (York University, Canada), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May 2022
21. Duc Khoa (York University, Canada), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May 2022
22. Diego Montalvo, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Oct.-Dec. 2021
23. Andrew Tamplin, PHYS 4310 (undergraduate research course), Topic: Effective dynamics of the interior of black holes in quantum gravity, York University, Canada, May-Sep. 2021
24. Rayhan Walia, PHYS 4310 (undergraduate research course), Topic: Quantum gravity modified dynamics of the interior of the Schwarzschild black hole, York University and University of Toronto, Canada, May-Sep. 2021
25. Diego Montalvo (York University, Canada), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep. 2021
26. Nour Khalil (York University, Canada), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep. 2021
27. Ida Schmidt (Goethe University, Germany), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep. 2021
28. Lukas Hölker (Goethe University, Germany), EXPLORE International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep. 2021
29. Tony Chu, PHYS 4310 (undergraduate research course), Topic: Hamiltonian gauge systems, York University, Canada, Jan.-Jun. 2020

Visitors:

- Wolfgang Wieland, Postdoctoral researcher, University of Erlangen-Nuremberg, Aug., 2024
- Sami Viollet, PhD student, Marseille University, Apr.-May, 2024

Professional Memberships

- International Society for Quantum Gravity (ISQG), 2021-Present
- International Loop Quantum Gravity Society (ILQGS), 2021-Present
- International Astronomical Union (IAU), 2025-Present
- Canadian Association of Physicists (CAP), 2020-Present

- Canadian Institute of Particle Physics (IPP), 2020-Present
- Quantum Alberta, 2022-Present
- SNI (National System of Researchers), Mexico, 2014-2020
- SNI, Uruguay, 2011-2013

Editorial and Refereeing

- Community Reviewer on the Editorial Board of *Cosmology* (specialty section of *Frontiers in Astronomy and Space Sciences* and *Frontiers in Physics*), 2023-present
- Invited Guest Editor, *Frontiers in Astronomy and Space Sciences*, Dec. 2021
- Invited Guest Editor, *Symmetry*, Dec. 2021
- Topic Editor, *Symmetry*, 2021-present
- Referee of:
  - *Classical and Quantum Gravity*
  - *Physical Review D*
  - *International Journal of Modern Physics A (IJMPA)*
  - *Nuclear Physics B*
  - *Gravitation and Cosmology*
  - *Annals of Physics*
  - *AMS Mathematical Reviews*
  - *Foundations of Physics*
  - *Europhysics Letters (EPL)*
  - *The European Physical Journal Plus (EPJP)*
  - *European Physical Journal C*
  - *Universe*
  - *Symmetry*
  - *Entropy*
- Member of the Mexican CONACyT referee committee, for
  - Fellowships awarded for studying abroad, 2015
  - Projects to receive grant for "Investigación Científica Básica 2015", Oct. 2015

Talks and Presentations

Invited/Plenary Talks:

1. **Black Holes: Inside and Out**, *Prairie Universities Physics Seminar Series (PUPSS)*, Feb. 7, 2025, University of Winnipeg, Canada

2. **Quantum black holes, quantum spacetime, and their signatures**, *University of Manitoba Physics and Astronomy Colloquium*, Feb. 6, 2025, University of Manitoba, Canada

3. **Quantization of Black Holes: LQG, GUP, and Beyond**, *Theory Canada 16*, May 24, 2024, University of Waterloo, Canada

4. **Quantum Black Holes: Fundamentals and Phenomenological Aspects**, *CAP Congress 2023*, Jun. 19, 2023, University of New Brunswick, Canada

5. **The problem of time, relational observables, and quantum clocks**, *BIRS workshop 23w5092 - Quantum Information Theory in Quantum Field Theory and Cosmology*, Jun. 5, 2023, Banff, Canada

6. **Fundamental physics with LISA**, *LISA-Canada 2022*, Aug. 25, 2022, (remote talk)

7. **A review of loop quantum gravity and some of its results**, *National Conference on Gravity and Cosmology*, Jan. 27-28, 2021, The Physics Society of Iran and Beheshti University, Iran (remote talk)

8. **Effective evolution of the interior of the Schwarzschild black hole in non-perturbative quantum gravity**, *The Winter Meeting on Geometry and Physics*, Jan. 23-25, 2019, University of San Luis Potosi (UASLP), Mexico

9. **Dealing with further corrections to the effective dynamics of the Schwarzschild's interior**, *MexiLazos 2018*, Nov. 26-27, 2018, Universidad Autonoma Metropolitana - Iztapalapa, Mexico City, Mexico

10. **Black hole interior in non-perturbative canonical quantum gravity: the singularity resolution**, *The Fifth International Conference on Mathematics and its Applications (5CIMA)*, Sep. 3-7, 2018, University of Puebla (BUAP), Mexico

11. **The continuum limit of metric spaces: a renormalization framework for the emergence of space(time)**, *MexiLazos 2017*, Nov. 16-17, 2017, ICN, UNAM, Mexico City, Mexico

12. **Geometry From Renormalized Pre-geometry**, *MexiLazos 2016*, Nov. 10-11, 2016, Universidad Autonoma San Luis Potosi, Mexico

13. **Black hole singularity resolution in loop quantum gravity**, *Field Theory, Gravitation and Cosmology Workshop (Taller de Teoría de Campo, Gravitación y Cosmología)*, Oct. 17-18, 2016, Universidad de Puebla, Mexico

14. **Polymer Quantization, Saddle Point Issue, and Black Hole Thermodynamics**, *MexiLazos 2015*, Nov. 12, 2015, IIMAS, Mexico City, Mexico

15. **Towards the resolution of the singularity of the CGHS black hole in loop quantum gravity**, *MexiLazos 2014*, Nov. 14, 2014, Universidad de Puebla, Puebla, Mexico

16. **Constraint Lie algebra and true local Hamiltonian for all the 2D dilatonic models**, *MexiLazos 2013*, Nov. 7-8, 2013, Universidad Autónoma Metropolitana (UAM), Mexico City, Mexico

17. **Vacuum state and propagator of the scalar field in spherically symmetric loop quantum gravity**, *MexiLazos 2012*, Nov. 9-10, 2012, UNAM, Morelia, Mexico

Seminars:

1. **Modified gravitational waves from post-Newtonian effects in binaries with dark matter spike**, GRAPPA, University of Amsterdam, Jul. 21, 2023, The Netherlands

2. **Gravitational waves: Messengers of the mysteries of the Universe**, Colloquium of the Physics Department, Mar. 10, 2023, University of Alberta, Canada

3. **Down The Rabbit Hole: Quantum Mechanics, Entanglement, and EPR**, Panel on Physics Nobel Prize 2022– Colloquium of the Physics Department, Feb. 3, 2023, University of Alberta, Canada

4. **Nonperturbative quantum gravity, black holes and gravitational waves**, Biruni Observatory and the Physics Department of Shiraz University, Jan. 24, 2022, Shiraz, Iran (remote talk)

5. **Effective Schwarzschild interior, Raychaudhuri equation, and singularity resolution**, Gravitation and Field Theory Department, ICN, UNAM, Oct. 29, 2020, Mexico City, Mexico (remote talk)

6. **Loop quantum gravity and black hole interior**, Cosmology Group, Physics Department, Sharif University of Technology, Aug. 9, 2020, Iran (remote talk)

7. **A glimpse of quantum gravity and quantum black holes**, Colloquiums of Department of Physics & Astronomy, York University, May 3, 2020, Canada

8. **How is spacetime quantized in Loop Quantum Gravity?**, Universidad de Guanajuato Campus León, División de Ciencias e Ingenierías, Sep. 12, 2019, Mexico

9. **Effective polymer dynamics of Schwarzschild interior via path integral: challenges and new results**, Theoretical Gravity Group, Department of Physics & Astronomy, Louisiana State University, May 9, 2019, USA

10. **Nonperturbative canonical quantum gravity: basics and some applications**, Universidad de Guanajuato Campus León, División de Ciencias e Ingenierías, Feb. 19, 2019, Mexico

11. **Treatment of black holes in nonperturbative canonical quantum gravity**, Instituto de Física, Universidad de la República, Apr. 16, 2018, Uruguay

12. **Loop Quantum Gravity, Polymer Quantization, and The Relation Between Them**, Escuela Superior de Física y Matemáticas, IPN, Feb. 23, 2018, Mexico City, Mexico

13. **Confronting Polymer Quantization of Photons with GRB Experiments**, *AmsterDark* meeting, University of Amsterdam, Jun. 28, 2017, The Netherlands

14. **Loop Quantum Gravity: An Introduction**, Physics Department, UAM-I , Mar. 7, 2017, Mexico City, Mexico

15. **Emergent Space(time) as Renormalized Pre-geometry**, The Quantum Gravity Group, Radboud University, Feb. 22, 2017, Nijmegen, The Netherlands

16. **Quantum black holes, information paradox and some of the proposed solutions**, Gravitation and Field Theory Department, ICN, UNAM, Nov. 26, 2015, Mexico City, Mexico

17. **The black hole information paradox and some of its proposed solutions**, Physics Department, UAM-I , Feb. 10, 2015, Mexico City, Mexico

18. **Resolving the singularity of the CGHS black hole in loop quantum gravity**, The Gravitation and Field Theory Department, ICN, UNAM, Apr. 24, 2014, Mexico City, Mexico

19. **A beginner introduction to loop quantum gravity**, Physics Department, University of Michoacan (UMSNH), May 31, 2013, Morelia, Mexico

20. **Ashtekar's Variables in 1+1 Dimensional Gravity**, Centro de Estudios Científicos (CECs), Sep. 30, 2009, Valdivia, Chile

Contributed Talks:

1. **The problem of time and evolving constants of motion: the cosmological case**, *Lee's Fest: Quantum Gravity and the Nature of Time*, Jun. 6, 2025, Perimeter Institute, Canada

2. **Gravitational waves and the Structure of Quantum Spacetime**, *NANOGrav Spring 2025 Collaboration Meeting*, Apr. 15-16, 2025, Online.

3. **A minimal-uncertaininty quantum black hole**, *CAP Congress 2024*, May 30, 2024, Western University, Canada

4. **The problem of time in quantum cosmology with a quantum clock**, *Quantum Gravity 2023*, Jul. 10-14, 2023, Radboud University Nijmegen, The Netherlands

5. **Polymer gravitational waves and its consequences: a model**, *9th Tux Workshop on Quantum Gravity*, Feb. 14-18, 2022, Tux, Austria

6. **Nonperturbative quantization of gravitational waves, and their signatures: a model**, *9th LISA Cosmology Working Group Workshop*, Dec. 8-9, 2021, Online

7. **Non-perturbative quantization of gravitational waves, a model**, *COST CA18108 Second Annual Conference*, Oct. 6-8, 2021, Corfu, Greece

8. **Effective black hole interior and the Raychadhuri equation**, *MG16*, Jul. 5-10, 2021, Rome, Italy

9. **A model of polymer gravitational waves: theory and some possible observational consequences**, *MG16*, Jul. 5-10, 2021, Rome, Italy

10. **Interior of Schwarzschild: further quantum corrections, issues and remedies**, *Seventh Tux Workshop on Quantum Gravity*, Feb. 11-15, 2019, Tux, Austria

11. **Emergent Space(time) from Renormalizing Discrete Metric Spaces**, *Loops 17*, Jul. 3-7, 2017, University of Warsaw, Poland

12. **Emergent continuous spacetime via a geometric renormalization method**, *Fifth Tux Workshop on Quantum Gravity*, Feb. 13-17, 2017, Tux, Austria

13. **Spacetime emergence through a geometric renormalization method**, *GR21*, Jul. 10-15, 2016, Columbia University, New York, USA

14. **From discrete to continuum: Lessons from the Gromov-Hausdorff space**, *Fourth Tux Workshop on Quantum Gravity*, Feb. 18, 2016, Tux, Austria

15. **Polymerization, the Problem of Access to the Saddle Point Approximation, and Thermodynamics**, *Fourteenth Marcel Grossmann Meeting - MG14*, Jul. 12-18, 2015, University of Rome La Sapienza, Rome, Italy

16. **Dilatonic black holes in LQG: two recent results**, *Loops 15*, Jul. 6-10, 2015, Erlangen, Germany

17. **Polymerization and saddle point approximation issues in dilatonic black holes: a toy model**, *Third EFI winter conference on Quantum Gravity*, Feb. 16-20, 2015, Tux, Austria

18. **On the singularity resolution of the CGHS black hole**, *Second EFI winter conference on quantum gravity, black holes and dynamics*, Feb. 10-14, 2014, Tux, Austria

19. **Towards resolution of the singularity of the CGHS black hole**, *International Loop Quantum Gravity Seminars*, Dec. 10, 2013, Online talk

20. **Constraint Lie algebra and true local Hamiltonian for the CGHS model**, *Loops 13*, Jul. 22-26, 2013, Perimeter Institute for Theoretical Physics, Waterloo, Canada

21. **An analysis of the CGHS model in new variables**, *GR20*, Jul. 7-13, 2013, University of Warsaw, Warsaw, Poland

22. **Ashtekar's Variables for 1+1 Gravity,** *Loops 11*, May 23-28, 2011, Madrid, Spain

23. **Dynamical Cellular Networks,** Institute of theoretical Physics and Mathematics (IPM), 2006, Tehran, Iran

Scientific Visits and Conference Participation

Visits:

- GRAPPA and Institute for Theoretical Physics, University of Amsterdam (UvA), The Netherlands, Jul. 2023
- Instituto de Física, Universidad de la República, Uruguay, Apr. 9 - 20, 2018
- Institute for Theoretical Physics, University of Amsterdam (UvA), The Netherlands, Jun. 2017
- The Quantum Gravity Group, Radboud University, Nijmegen, The Netherlands, Feb. 2017
- Centro de Estudios Científicos (CECs), Valdivia, Chile, Sep. 20 - Oct. 5, 2009

Conference Participation:

- **Fundamental Physics with LISA**, Aug. 9-11, 2023, Niels Bohr Institute, Copenhagen, Denmark
- **Werner Israel Memorial Symposium**, May 18-19, 2023, University of Victoria, Canada
- **CarloFest**, Conference for the celebration of the 60th birthday of Carlo Rovelli, May 23-27, 2016, Marseilles, France
- **Summer School on Cosmology**, Aug. 4-15, 2014, ICTP, Trieste, Italy
- **SIGRAV graduate school in contemporary relativity and gravitational physics, XI Edition: Gravity and the Quantum**, Jun. 1-6, 2014, Centro di Cultura Scientifica Alessandro Volta, Como, Italy
- **Second Erlangen Fall School on Quantum Geometry**, Oct. 7-11, 2013, Friedrich-Alexander-Universitat Erlangen-Nurnberg (FAU), Erlangen, Germany
- **Workshop on scalar fields and dark matter**, Oct. 2-4, 2013, University of Michoacan, Morelia, Mexico
- **Quantum Gravity in the Southern Cone V**, Jul. 28-31, 2010, Buenos Aires, Argentina
- **International School in Quantum Gravity**, Jul. 19-27, 2010, La Plata, Argentina
- **GR19**, Jul. 5-9, 2010, Mexico City, Mexico
- **PASI Quantum Gravity Summer School**, Jun. 23 - Jul. 3, 2010, Morelia, Mexico
- **School on Gauge/Gravity Correspondence**, May 19-30, 2008, ICTP, Trieste, Italy
- **Quantum Gravity in the Southern Cone IV**, Oct. 22-25, 2007, Punta del Este, Uruguay
- **Second School Of Cosmology**, Aug. 28 - Sep. 2, 2004, Institute of theoretical Physics and Mathematics (IPM), Tehran, Iran

Service

Organizations:

- Representative for Theoretical and Mathematical Physics at the Canadian National Liaison for IUPAP (International Union of Pure and Applied Physics) committee, Jul. 2023- Jun. 2026

Committees:

- Invited external evaluator of grants, Seneca Foundation of Spain, Dec. 2023
- Faculty of Science Committee on Teaching and Learning (CoTL), York University, Sep. 2021-Jan. 2022
- Faculty of Science Committee on Examinations and Academic Standards, York University, Mar.-May 2021
- Department of Physics and Astronomy Careers Committee, York University, 2020-2022
- Faculty of Science Appeals Committee, York University, Jul. 2020 - Apr. 2021
- Faculty of Science Petitions Committee, York University, Jan.-Jul. 2020
- Accredited Evaluator of CONACyT (RCEA member), 2015-2109

Graduate Defense Committees:

- Member, Max Stratmann Meouchi (MSc student), University Of Alberta, Sep. 2024
- Member, Shankar Ganesh (PhD student), University Of Alberta, Aug. 2024
- Member, Nima Ronaghikhameneh (MSc student), University Of Alberta, Jan. 2024
- Member, Ho Chun Lau (MSc student), University Of Alberta, Dec. 2023
- Chair, Syed Navid Reza (MSc student), University of Alberta, Apr. 2023
- Member, Mason Protter (PhD student), University Of Alberta, Nov. 2022
- Chair, Nelson Nunes (MSc student), York University, 2021

Research Evaluation/Supervisory Committees:

- Shafakat Arifeen, (MSc student), University of Alberta, 2024-2025
- Akanksha Katil, (MSc student), University of Alberta, 2024-2025
- Zachary Cox (MSc student), University of Alberta, 2023
- Fabian Yilber Bautista Chivata (PhD student), York University, 2021
- Nima Ronaghikhameneh (MSc student), York University, 2021-2023

Event Organization

- Organizer and Chair, Gravity Seminars (weekly), University of Alberta, Sep. 2022-Present
- Co-organizer, EXPLORE 2023 summer school, Aug. 28 - Sep. 1, 2023
- Co-organizer, LISA Canada Workshop, Apr. 27-29, 2021
- Organizer, Joint Journal Clubs (York University, University of New Brunswick, University of Lethbridge, University of Washington at St. Louis, University of Colima), Sep. 2020-Jul. 2022

Outreach

- **Outreach and multimedia appearances**:

  1. Mysterious and secretive: What happens in and around black holes?, Archbishop MacDonald high school, Edmonton, Alberta, Canada, Nov. 19, 2024
  2. *A journey into the black holes: How we imagine their interior spacetimes*, Royal Astronomical Society of Canada, Edmonton Centre, Canada, Nov. 4, 2024
  3. *The strange spacetime near a black hole*, Talk presented to high school students at Collège de Bois-de-Boulogne, Montreal, Quebec, Canada, Feb. 15, 2022
  4. *Black holes: what we see on the outside, what happens inside*, Royal Astronomical Society of Canada, Toronto Centre and David Dunlap Observatory, Canada, Feb. 11, 2022
  5. *Black holes: where gravity meets the quantum*, York University Allan I. Carswell Observatory TeleTube talk, Mar. 31, 2021
  6. *Math and Physics Podcast*, Mar. 6, 2021
  7. *Reason and Science Podcast*, Aug. 1, 2020
  8. *Seeing the unseeable: the first photo of a black hole (Viendo lo invisible y misterioso: primera foto de un agujero negro)*, in Spanish, for bachelor students and public, Monterrey Institute of Technology, Campus Leon, Mexico, Apr. 30, 2019
  9. *Black holes: wonders of the universe (Agujeros negros: maravillas del universo)*, in Spanish, for bachelor students and public, Monterrey Institute of Technology, Campus Leon, Mexico, Nov. 21, 2018

- **Workshops and classes**:

  – *Leader*, workshops on construction of four Newtonian telescopes including the main mirror, Kharazmi Universiy, 1999-2003

  – *Instructor*, theoretical course on amateur astronomy, observation, and telescope making, Kharazmi Universiy, 1999-2003

- **Astronomical observation nights**:

- *Leader and organizer*, event for students and public, Monterrey Institute of Technology, Campus Leon, Mexico, Nov. 21, 2018
- *Leader and organizer*, numerous events for students and public, Tehran, Iran, 1998-2005

References

- **Professor Rodolfo Gambini** (Ph.D. advisor)
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