

# Curriculum Vitae

## SAEED RASTGOO

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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 Held

**Assistant Professor,** University of Alberta, Canada, July, 2022-Present

**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

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## 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: DGEGR-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

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## 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 most of the items below is in alphabetical order.

### Research papers

1. 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”, to appear in *Class. Quantum Grav.*, [arXiv:2305.18192 \[gr-qc\]](#).
2. 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 \[gr-qc\]](#).
3. 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 \[gr-qc\]](#).
4. 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 \[gr-qc\]](#).
5. K. G. Arun, . . . , S. Rastgoo, et. al., *New Horizons for Fundamental Physics with LISA*, *Living Rev. Rel.* **25** (2022) 1, 4, [arXiv:2205.01597 \[gr-qc\]](#).
6. P. Auclair, . . . , S. Rastgoo, et. al., *Cosmology with the Laser Interferometer Space Antenna*, *Living Rev. Rel.* **26** (2023) 1, 5, [arXiv:2204.05434 \[astro-ph.CO\]](#).
7. 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 \[gr-qc\]](#).
8. A. Addazi, . . . , S. Rastgoo, et. al., *Quantum gravity phenomenology at the dawn of the multi-messenger era – A review*, *Prog. Part. Nucl. Phys.* 103948 2022, [arXiv:2111.05659 \[hep-ph\]](#).
9. K. Blanchette, S. Das, S. Rastgoo, *Effective GUP-modified Raychaudhuri equation and black hole singularity: four models*, *JHEP* **09** (2021) 62, [arXiv:2105.11511 \[gr-qc\]](#).
10. 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 \[gr-qc\]](#).
11. 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 \[gr-qc\]](#).

12. 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 \[gr-qc\]](#).
13. 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 \[gr-qc\]](#).
14. H. A. Morales-Técolt, 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 \[gr-qc\]](#).
15. 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 \[gr-qc\]](#).
16. H. A. Morales-Técolt, S. Rastgoo, J. C. Ruelas, *Path integral polymer propagator of relativistic and non-relativistic particles*, Phys. Rev. D **95**, 065026 (2017), [arXiv:1608.04498 \[gr-qc\]](#).
17. 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 \[gr-qc\]](#).
18. S. Rastgoo, M. Requardt, *Emergent Space-Time via a Geometric Renormalization Method*, Phys. Rev. D **94**, 124019 (2016), [arXiv:1606.08073 \[gr-qc\]](#).
19. 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 \[gr-qc\]](#).
20. 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 \[gr-qc\]](#).
21. H. A. Morales-Técolt, 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 \[gr-qc\]](#).
22. 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 \[gr-qc\]](#).
23. S. Rastgoo, *A local true Hamiltonian for the CGHS model in new variables*, [arXiv:1304.7836 \[gr-qc\]](#), 2013.
24. 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).
25. 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 \[gr-qc\]](#).

26. 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 \[gr-qc\]](#).
27. R. Gambini, J. Pullin, S. Rastgoo, *New variables for 1+1 dimensional gravity*, Class. Quantum Grav. **27** 025002 (2010), [arXiv:0909.0459 \[gr-qc\]](#).
28. 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

- Member of the [LISA Consortium](#), 2021-Present
  - LISA Fundamental Physics Working Group (FPWG)
  - LISA Cosmology Working Group (CosWG)
  - LISA Astrophysics Working Group (AstroWG)
  - LISA group leader at the University of Alberta
- Member of [LISA-Canada](#), 2021-Present
- Member of, and University of Alberta’s representative in “[European COoperation in Science and Technology \(COST\)](#)”, project “[Quantum gravity phenomenology in the multi-messenger approach](#)”, Mar., 2020-Present
- Member of [Cosmic Explorer](#)
- [EXPLORE](#) International Programme

## Teaching

### Undergraduate courses:

#### 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
- *Electricity and Magnetism (PHYS 230)*, 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

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

#### 2021

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

#### 2020

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

#### 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:

### 2021

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

### 2018

- *Gravitation II*, Universidad Autonoma Metropolitana, Mexico

### 2016

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

### 2015

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

## ———— Supervision

### PhD students:

- Jorden Roberts, May 2023-Present
- Evan Vienneau, Jan., 2023-Present
- Federica Fragomeno, Jan., 2022-Present
- Keagan Blanchette, Sep., 2020-2022 (left academia for a position in data science in industry)
- Samantha Hergott, Sep., 2020-Present

### Master's students:

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

## Undergraduate students:

- Romina Ghasemizadeh, MITACS international student from Goethe University, Topic: Gravitational waves and dark matter, University of Alberta, Canada, Jul.-Sep., 2023
- Nathaniel Bartolome, Summer student, Topic: Gravitational lensing and dark matter, University of Alberta, Canada, May-Sep., 2023
- Rene Payne, MA PH 499 (Undergraduate Research Project), Topic: Fermions in Loop Quantum Gravity, University of Alberta, Canada, Jan.-May, 2023
- Amol Sandhu, MA PH 499 (Undergraduate Research Project), Topic: Gravitational waves and dark matter, University of Alberta, Canada, Jan.-May, 2023
- Zena Khadour, [EXPLORE](#) International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct., 2022-May, 2023
- Akash Kay, [EXPLORE](#) International Programme, Topic: Gravitational waves with machine learning, University of Alberta and Goethe University, Canada, Oct., 2022-May, 2023
- Tanner Nelson, [EXPLORE](#) International Programme, Topic: Gravitational waves with machine learning, University of Alberta and Goethe University, Canada, Oct., 2022-May, 2023
- Alexander Dreichner, international student from Goethe University within [EXPLORE](#) International Programme, Topic: Gravitational waves with machine learning, University of Alberta, Canada, Oct. 2022-May, 2023
- Rosalyn Chan Yoke Ling, PHYS 4310 (undergraduate research course), Topic: Modified gravitational collapse, York University, Canada, Jan.-May, 2022
- Diego Montalvo, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Jan.-May, 2022
- Anvir Basra, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Jan.-May, 2022
- Hazkeel Khan, [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May, 2022
- Nifia Garg, [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May, 2022
- Duc Khoa, [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, Jan.-May, 2022
- Diego Montalvo, PHYS 4310 (undergraduate research course), Topic: Gravitational waves, black holes and quantum gravity, York University, Canada, Oct.-Dec., 2021
- 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



- 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
- Diego Montalvo, [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep., 2021
- Nour Khalil, [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep., 2021
- Ida Schmidt, international student from Goethe University within [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep., 2021
- Lukas Hölker, international student from Goethe University within [EXPLORE](#) International Programme, Topic: Probing dark matter with gravitational waves, York University, Canada, May-Sep., 2021
- Tony Chu, PHYS 4310 (undergraduate research course), Topic: Hamiltonian gauge systems, York University, Canada, Jan.-Jun., 2020

## Professional Memberships

- International Society for Quantum Gravity ([ISQG](#)), 2021-Present
- [LISA Consortium](#), 2021-Present
- [LISA-Canada](#), 2021-Present
- Canadian Association of Physicists (CAP), 2020-Present
- Canadian Institute of Particle Physics (IPP), 2020-Present
- Quantum Alberta, 2022-Present
- [European COoperation in Science and Technology \(COST\)](#), 2020-Present
- SNI (National System of Researchers), Mexico, 2014-2020
- Accredited Evaluator of CONACyT (RCEA member), 2015-2109
- SNI, Uruguay, 2011-2013

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## Editorial and Refereeing

- Review Editor 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)*
  - *AMS Mathematical Reviews*
  - *Annals of Physics*
  - *Gravitation and Cosmology*
  - *Foundations of Physics*
  - *Europhysics Letters (EPL)*
  - *The European Physical Journal Plus (EPJP)*
  - *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

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## Talks and Presentations

### Invited/Plenary Talks:

1. **Quantum Black Holes: Fundamentals and Phenomenological Aspects**, *CAP Congress 2023*, Jun. 19, 2023, University of New Brunswick, Canada
2. **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
3. **Fundamental physics with LISA**, *LISA-Canada 2022*, Aug. 25, 2022, (remote talk)

4. **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)
5. **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
6. **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
7. **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
8. **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
9. **Geometry From Renormalized Pre-geometry**, *MexiLazos 2016*, Nov. 10-11, 2016, Universidad Autonoma San Luis Potosi, Mexico
10. **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
11. **Polymer Quantization, Saddle Point Issue, and Black Hole Thermodynamics**, *MexiLazos 2015*, Nov. 12, 2015, IIMAS, Mexico City, Mexico
12. **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
13. **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
14. **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 in quantum cosmology with a quantum clock**, *Quantum Gravity 2023*, July. 10-14, 2023, Radboud University Nijmegen, The Netherlands
2. **Polymer gravitational waves and its consequences: a model**, *9th Tux Workshop on Quantum Gravity*, Feb. 14-18, 2022, Tux, Austria
3. **Nonperturbative quantization of gravitational waves, and their signatures: a model**, *9th LISA Cosmology Working Group Workshop*, Dec. 8-9, 2021, Online
4. **Non-perturbative quantization of gravitational waves, a model**, *COST CA18108 Second Annual Conference*, Oct. 6-8, 2021, Corfu, Greece
5. **Effective black hole interior and the Raychadhuri equation**, *MG16*, Jul. 5-10, 2021, Rome, Italy
6. **A model of polymer gravitational waves: theory and some possible observational consequences**, *MG16*, Jul. 5-10, 2021, Rome, Italy
7. **Interior of Schwarzschild: further quantum corrections, issues and remedies**, *Seventh Tux Workshop on Quantum Gravity*, Feb. 11-15, 2019, Tux, Austria
8. **Emergent Space(time) from Renormalizing Discrete Metric Spaces**, *Loops 17*, Jul. 3-7, 2017, University of Warsaw, Poland
9. **Emergent continuous spacetime via a geometric renormalization method**, *Fifth Tux Workshop on Quantum Gravity*, Feb. 13-17, 2017, Tux, Austria
10. **Spacetime emergence through a geometric renormalization method**, *GR21*, Jul. 10-15, 2016, Columbia University, New York, USA
11. **From discrete to continuum: Lessons from the Gromov-Hausdorff space**, *Fourth Tux Workshop on Quantum Gravity*, Feb. 18, 2016, Tux, Austria
12. **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
13. **Dilatonic black holes in LQG: two recent results**, *Loops 15*, Jul. 6-10, 2015, Erlangen, Germany

14. **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
15. **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
16. **Towards resolution of the singularity of the CGHS black hole**, *International Loop Quantum Gravity Seminars*, Dec. 10, 2013, Online talk
17. **Constraint Lie algebra and true local Hamiltonian for the CGHS model**, *Loops 13*, Jul. 22-26, 2013, Perimeter Institute for Theoretical Physics, Waterloo, Canada
18. **An analysis of the CGHS model in new variables**, *GR20*, Jul. 7-13, 2013, University of Warsaw, Warsaw, Poland
19. **Ashtekar's Variables for 1+1 Gravity**, *Loops 11*, May 23-28, 2011, Madrid, Spain
20. **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:

- 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

## Graduate Defense Committees:

- Chair of the Committee of Syed Navid Reza (MSc student), University of Alberta, Apr., 2023
- Examining Committee Member of Mason Protter (PhD student), University Of Alberta, Nov., 2022
- Chair of the Committee of Nelson Nunes (MSc student), York University, 2021

## Research Evaluation/Supervisory Committees:

- Zach Cox (MSc student), University of Alberta, 2023
- Fabian Yilber Bautista Chivata (PhD student), York University, 2021
- Nima Ronaghikhameneh (PhD student), York University, 2021

## ————— Event Organization

- [EXPLORE 2023 summer school](#), Aug. 28 - Sep. 1, 2023
- [LISA Canada Workshop](#), Apr. 27-29, 2021
- 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:**
  - *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
  - *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
  - *Black holes: where gravity meets the quantum*, York University Allan I. Carswell Observatory TeleTube talk, Mar. 31, 2021
  - *Math and Physics Podcast*, Mar. 6, 2021
  - *Reason and Science Podcast*, Aug. 1, 2020
  - *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
  - *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 University, 1999-2003
- *Instructor*, theoretical course on amateur astronomy, observation, and telescope making, Kharazmi University, 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

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## References

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