College of Science
Department of Physics & Astronomy

Curriculum Vitae

Ivan Agullo

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PERSONAL INFORMATION

Ivan Agullo

Work address:
Department of Physics and Astronomy
Louisiana University
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Baton Rouge, LA, 70803, USA

Personal website
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EDUCATION

- **PhD in Physics**, University of Valencia, Spain, July 2009.
  PhD advisor: Prof. Jose Navarro-Salas.
  PhD thesis title: Quantum black holes, inflationary cosmology, and the Planck scale.
  With Honors *Cum Laude.*
- **Advanced Studies Diploma in Theoretical Physics**, University of Valencia, Spain, July 2006.
  Master thesis title: Black holes, short distances and TeV gravity.
- **Degree in Physics**, University of Valencia, Spain, July 2004.

PROFESSIONAL AND RESEARCH EXPERIENCE

Fields of research activity

Broadly speaking, my research interests lie in the areas of gravitational physics, quantum information and quantum technologies. At present, my activity includes a broad range of topics, including cosmology, black hole physics, the theory of gravitational waves, analog gravity in condensed matter systems, quantum optics, quantum gravity, quantum field theory in curved spacetimes and quantum science and technology. I am a member of the Theoretical and Experimental General Relativity group , and the Quantum Science and Technology group of Louisiana State University

Citations 2608, h-index 29, i-10 index 49, according to Google Scholar.

Professional Positions

- **Associate Professor of Physics with Tenure**

  Department of Physics and Astronomy, Louisiana State University

  City: Baton Rouge, US. Dates: since August 2019.

- **Assistant Professor of Physics**

  Department of Physics and Astronomy, Louisiana State University

  City: Baton Rouge, US. Dates: August 2013-August 2019.

Postdoctoral Positions

- **Marie Curie fellow at the Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge**

  City: Cambridge, UK. Dates: August 2012 to August 2013.

  Supervisor: Prof. Paul Shellard.

- **Institute for Gravitation and the Cosmos, The Pennsylvania State University**

  City: State College, U.S.A. Dates: October 2010 to August 2012.

  Supervisor: Prof. Abhay Ashtekar.

- **Center for Gravitation and Cosmology, University of Wisconsin-Milwaukee**

  City: Milwaukee, U.S.A. Dates: April 2009 to October 2010.

  Supervisor: Prof. Leonard Parker.

HONORS AND AWARDS

- **Visiting Fellow, Perimeter Institute for Theoretical Physics**

  Jan 2023 to Dec 2025

- **Recipient of the "Dàtil d'Or 2023", by the "Asociación de Informadores de la ciudad de Elche" (Association of Informants of the city of Elche).**

- **Recipient of the medal of the "Bi-milenario de la ciudad de Elche" (Bi-millelnial of the city of Elche) 2022**

- **Outstanding Graduate Teaching Award 2021, College of Science, Louisiana State University**

- **Outstanding Graduate Teaching Award 2021, Department of Physics and Astronomy, Louisiana State University**

- **Frontiers of Science Lecture Series**, Invited speaker, Florida Atlantic University, January 2021.
- **Invited speaker, American Physical Society April Meeting 2020, 2017, and 2012**
- **Raising Faculty Research Award 2018, Louisiana State University Alumni Association**
- **Frontiers of Science invited speaker, The Pennsylvania State University**. Invited to deliver one of the six 2019 Frontiers of Science talks, addressed for the general public. The list of speakers included the Nobel Laureate Barry Barish, and the winner of the Breakthrough Prize Jocelyn Bell.
- **Forty under 40 awardee 2018** Selected by the magazine Business Reports as one of the "brightest young leaders" under 40 years of age of the capital region of Louisiana.
- **First award in the Gravity Research Foundation international essay competition 2017**

  For an essay entitled "Gravity and Handedness of Photons", written in collaboration with J. Navarro-Salas and A. del Rio.
- **Outstanding Undergraduate Teaching Award 2017**

  Department of Physics and Astronomy, Louisiana State University.
- **Young Scientist Award 2016, International Union of Pure and Applied Physics (IUPAP)-International Society of General Relativity and Gravitation**
  "For his outstanding contributions to the physics of the early universe and possible observational consequences of quantum gravity."
- **CAREER Award, National Science Foundation, 2016**
- **Marie Curie European Postdoctoral Fellowship 2012**
  Name of the project: Non-Gaussianity in the observable universe and the origin of cosmic inhomogeneities.
- **Einstein-Galilei Award 2012**
  Award offered by the Institute for Theoretical and Advance Mathematics Einstein-Galilei, Italy, for "outstanding contribution in science".
- **First Award in the Gravity Research Foundation essay competition 2011**
  For an essay entitled "Stimulated creation of quanta during inflation and the observable universe ", written in collaboration with L. Parker. It was the first time, in more than 60 years of history of this international contest, that a researcher from Spain was awarded this prize.
- **Young Researcher in Theoretical Physics Award 2011, Royal Spanish Physics Society**
  Award offered annually by the Royal Spanish Physics Society for researchers under 35 years old. Awarded for "the innovative and cutting-edge character of his research in the field of gravitation and cosmology."

- **Extraordinary Ph.D Prize 2010**
  University of Valencia.

- **Fourth Award in the Gravity Research Foundation essay competition 2009**
  For an essay entitled "Inflation, quantum fields, and CMB anisotropies", written in collaboration with J. Navarro-Salas, G. Olmo, and L. Parker.

- **FPU Fellowship 2005**
  Offered by the Spanish Ministry of Science to fund a 4-years PhD in theoretical physics.

- **Summer Student Fellowship at CERN 2004**
  Fellowship funded by CERN aimed at introducing to scientific research outstanding students. Duration: 3 months.

- **Introduction to Research Fellowship, CSIC 2003**
  Offered by CSIC (Spanish national research council) to provide a funded introduction to research for undergraduate students. Subject: CP violation in B mesons systems. Duration: 3 months.

- **Undergraduate research fellowship, Department of Theoretical Physics, University of Valencia 2003**
  Fellowship offered by the University of Valencia funding research in theoretical physics. Subject: Quantum radiance by black holes. Duration: 7 months.

GRANTS

• Principal investigator of the Supplemental Diversity Award NSF 2023, $60,000 to support one grad student.

• Principal (and only) investigator of a grant from Louisiana Board of Regents for a project entitled *Global Clock distribution via satellite constellations using entangled photons*, for the period June. 2023-June. 2025.
Amount $106000.

• Principal investigator of a grant-contract from Xairos Systems Inc. for a project entitled *Global Clock Synchronization using quantum resources*, for the period April. 2023-April. 2024.
Amount $25200.

• Principal investigator of the Supplemental Diversity Award NSF 2022, $60,000 to support one grad student.

• Principal investigator of a grant-contract from Xairos Systems Inc. for a project entitled *Global Clock Synchronization using quantum resources*, for the period Oct. 2021-Oct. 2022.
Amount $22509.

• Principal (and only) investigator of the NSF grant PHY-2110273 with title *Quantum aspects of matter fields and gravity*, for the period Sept. 2021-Sept. 2024.
Amount $300000.

• Principal Investigator in LSU of the collaborative grant *Satellite Constellations for Entanglement-Based Time Distribution* FA9453-20-P-0100, from the United States Air Force Research Laborator, in collaboration with SpectralQT Inc., for the period June 16 2020-November 16 2020.
Amount $150000 ($62000 for LSU).

• Principal (and only) investigator of the National Science Foundation (NSF) grant with title *CAREER: The early universe as a window to quantum gravity*, for the period Sept 2016-Sept 2021.
Amount $400000.

• Council of Research Summer Stipend Award, Louisiana State University, 2016.
Provided $5000 to support summer research.

• Principal (and only) investigator of the NSF grant PHY-1403943 with title *The early universe as a window to quantum gravity*, for the period June 2014-Jun 2017.
Amount $150000.

• Principal investigator of the NSF grant PHY-1503417 with title *Travel support for US researchers attending the 14th Marcel Grossmann Meeting.*
Amount $10000.

EXTENDED PERIODS IN OTHER INSTITUTIONS

- Center: **Perimeter Institute for Theoretical Physics,** Waterloo, Canada.
  Year: 2023. Duration: 1 months (June-July).
- Center: **University of Chicago,** Chicago, IL, U.S.A.
  Year: 2008. Duration: 2 months (July-September).
  Supervisor: Prof. Robert M. Wald.
- Center: **University of Maryland**, College Park, MD, U.S.A.
  Year: 2007. Duration: 3 months (September-November).
  Supervisor: Prof. Ted Jacobson.
- Center: **University of Chicago**, Chicago, IL, U.S.A.
  Year: 2006. Duration: 3 months (July-September).
  Supervisor: Prof. Robert M. Wald.

- Center: **CERN**, Geneve, Switzerland.

  Year: 2004. Duration: 3 months.

TEACHING EXPERIENCE

- Undergraduate level:

  1. Spring 2019: "Introduction to Cosmology", PHYS-4750 (3 credits), Louisiana State University. Evaluations: 4.00 (3.48 Department average).
  2. Spring 2018: Gravity, electricity and magnetism, PHYS-2113 (3 credits), Louisiana State University. Evaluations: 3.85 (3.34 Department average).
  3. Fall 2017: Gravity, electricity and magnetism, PHYS-2113 (3 credits), Louisiana State University. Evaluations: 3.63 (3.20 Department average).
  4. Spring 2017: Electrodynamics and electromagnetic waves, PHYS-4132 (3 credits) Louisiana State University. Evaluations: 3.64 (3.57 Department average).
  5. Fall 2016: Electricity and Magnetism, PHYS-2231 (3 credits) Louisiana State University. Evaluations: 3.93 (3.44 Department average).
  6. Spring 2016: Electrodynamics and electromagnetic waves, PHYS-4132 (3 credits) Louisiana State University. Evaluations: 3.60 (3.40 Department average)
  7. Fall 2015: Electricity and Magnetism, PHYS-2231 (3 credits) Louisiana State University. Evaluations: 3.69 (3.49 Department average).
  8. Year 2008-2009: Linear Algebra (35 hours) University of Valencia.
  9. Year 2007-2008: Linear Algebra (45 hours) University of Valencia.
  10. Year 2006-2007: Linear Algebra (45 hours) University of Valencia.

- Graduate level:

  1. Fall 2022: "Quantum Field Theory", PHYS-7745 (3 credits), Louisiana State University. Evaluations: 3.80 (3.42 Department average).
  2. Spring 2022: "Differential Geometry and Physics", PHYS-7212 (3 credits), Louisiana State University. Evaluations: 3.93 (3.26 Department average).
  3. Spring 2021: "Graduate Quantum Mechanics II", PHYS-7242 (3 credits), Louisiana State University. Evaluations: 3.93 (3.33 Department average).
  4. Fall 2020: "Graduate Quantum Mechanics I", PHYS-7241 (3 credits), Louisiana State University. Evaluations: 3.95 (3.41 Department average).
  5. Spring 2020: "Quantum Field Theory", PHYS-7745 (3 credits), Louisiana State University. Evaluations: 3.90 (3.52 Department average).

6. Fall 2019: "Classical Mechanics for graduates", PHYS-7221 (3 credits), Louisiana State University. Evaluations: 3.91 (3.50 Department average).
7. Fall 2018: "Classical Mechanics for graduates", PHYS-7221 (3 credits), Louisiana State University. Evaluations: 3.96 (3.51 Department average).
8. Spring 2016: "Quantum Field Theory in Curved Spacetimes", PHYS-7895 (3 credits), Louisiana State University. Evaluations: 4.00 (3.52 Department average).
9. Spring 2015: "Introduction to Cosmology", PHYS-7895 (3 credits), Louisiana State University. Evaluations: 3.88 (3.63 Department average).
10. Fall 2014: "Classical Mechanics for graduates", PHYS-7221 (3 credits), Louisiana State University. Evaluations: 3.83 (3.56 Department average).
11. Fall 2013: "Classical Mechanics for graduates", PHYS-7221 (3 credits), Louisiana State University. Evaluations: 3.83 (3.66 Department average).

- Short advanced courses:

1. 2010: "Inflationary Cosmology and the generation of cosmic inhomogeneities". Penn State University, USA.
2. 2012: "Compact Course on Quantum Cosmology." University of Erlangen-Nuremberg, Germany.
3. 2016, Loop Quantum Cosmology and the early universe, School on Quantum Gravity: schemes, models and phenomenology, Mexico.
4. 2019, Quantum field theory in curved spacetimes, Loop's 19 summer school, Bard College, New York.
5. 2021, Quantum field theory in curved spacetimes, Loop's 21 summer school, online.
6. 2022, Loop Quantum Cosmology, Loop's 22 summer school, Marseille, France
7. 2023, Quantum field theory in curved spacetimes, Analogue Gravity in 2023 summer school, Centro de Ciencias Pedro Pascual, Benasque, Spain.

STUDENTS AND POSTDOCS

Current

1. Beatriz Elizaga-Navascues, current postdoc, Louisiana State University.
2. Adria Delhom, current postdoc, Louisiana State University.
3. Paula Cabrera, current PhD student, Louisiana State University.
4. Rachel. McDonald, current PhD student, Louisiana State University.
5. Patricia Ribes-Metidieri, current PhD student (co-advisor), Radboud University.
6. Riley Dawkins, current PhD student, Louisiana State University.

7. Sage Ducoing, current PhD student, Louisiana State University.
8. Stav Haldar, current PhD student (co-advisor), Louisiana State University.
9. Dimitrios Kranas, current PhD student, Louisiana State University.

Past

1. Sergi Nadal, Visiting student 2021, University of Valencia.
2. Rachel McDonald, REU student 2021, Louisiana State University.
3. Anthony Brady, PhD student, Louisiana State University. Graduated in May 2021.
4. Javier Olmedo, postdoc from October 2018 until March 2020, Louisiana State University.
5. Adrian del Rio, PhD student (co-advised). Graduation July 2018, University of Valencia. Adrian's PhD Thesis has been awarded the Bergmann-Wheeler Thesis Prize from the International Society of General Relativity and Gravitation (offered only once every three years), and the Thesis Prize of the Theoretical Physics Division of the Royal Spanish Physics Society.
6. Boris Bolliet, visiting PhD. student, 2016, University of Grenoble Alpes.
7. Esteban Mato, visiting PhD. student, 2016, University of the Republic of Uruguay.
8. Aitor Landete, visiting PhD. student, 2015, University of Valencia.
9. Noah Morris, Master student. Graduation 2015, Louisiana State University.
10. Sreenath Vijayakumar, postdoc (2015-2017), Louisiana State University.
11. Kadi Runnels, undergraduate student (2015-2016), Louisiana State University.
12. Lia Klein, REU student 2014, Louisiana State University.
13. James Tarka, REU student 2014, Louisiana State University.

SELECTED RECENT INVITED TALKS

- Invited contribution, Beyond Center for Fundamental Concepts in Science Workshop, The Arizona State University, February 2022.

  Title: *Event Horizons are tunable factories of quantum entanglement.*

- Colloquium, The Pennsylvania State University, November 2022.

  Title: *Analog Gravity, Hawking Radiation and Quantum Information.*

- Invited seminar, The Pennsylvania State University, November 2022.

  Title: *On entanglement in Quantum Field Theory*

- Invited online talk, Quantum Information and Structure of Spacetime (QISS) seminar series, October 2022.

  Title: *Entanglement in Field Theory and the early universe.*

- Invited online talk, Copernicus Webminar Series, September 2022.

  Title: *How much entanglement is carried out by Hawking's radiation?.*

- Plenary talk, 31st Texas Symposium on Relativistic Astrophysics, Prague, September 2022.

  Title: *Loop Quantum Cosmology and the Cosmic Microwave Background.*

- Plenary talk, Loops 22 conference, Lyon, July 2022.

  Title: *Event horizons are tunable factories of quantum entanglement.*

- Invited Lecturer, Loops 22 summer school, Marseille, July 2022.

  Title: *The phenomenology of Loop Quantum Cosmology.*

- Contributing talk, Conference on analog gravity, Higgs Center for Theoretical Physics, June 2022.

  Title: *Squeezing and Entanglement in the early universe.*

- Contributed talk, Conference When $\hbar$ meets G, Astrophysics Institute of Paris, Paris , June 2022.

  Title: *Quantum aspects of stimulated Hawking radiation and optical analogs.*

- Colloquium, Universidad de la Republica, Montevideo, Uruguay, May 2022.

  Title: *Event horizons are tunable factories of quantum entanglement.*

- Plenary invited talk, Online Conference on Quantum Field Theory on curved spacetimes, May 2022.

  Title: *Quantifying the entanglement generated in the Hawking process.*

- Invited Panelist, International Loop Quantum Gravity Seminar, April 2022.

  Title: *Loop Quantum Cosmology: Connection with Observations.*

- Invited talk, 5th Valencia Winter Workshop (online), December 2021.

  Title: *Squeezing and Entanglement in the Early Universe?*

- Invited talk, QuILT day, Louisiana State University, December 2021.

  Title: *Squeezing and Entanglement in the Early Universe.*

- Invited talk, IACS, India, Oct. 2021 (online talk).

  Title: *Hawking radiation on an analog white-black hole pair and its stimulated counterpart.*

- Invited panelist, Quantum Gravity and fundamental cosmology panel, International Society of Quantum Gravity online meeting, Oct. 2021.

  Title: *Quantum Gravity and fundamental cosmology panel: my views.*

- Contributing talk to the Spanish-Portuguese Relativity Meeting (EREP), Spain, Sept. 2021 (online talk).

  Title: *Quantum aspects of stimulated Hawking radiation in an analog optical white-black hole pair.*

- Contributing talk, 17 Journees of Matiere Condensee, France, August. 2021 (online talk).

  Title: *Quantum aspects of stimulated Hawking radiation in an analog optical white-black hole pair.*

- Invited lecturer at the summer school *Loops'21*, (online) June. 2021.

  Course title: *Quantum field theory in curved spacetimes*

- Invited Colloquium at the IAFE, University of Buenos Aires, Argentina, Sept. 2020 (online talk).

  Title: *The early universe from the perspective of loop quantum cosmology.*

- Invited talk at the April meeting of the American Physical Society, April 2020, online.

  Title: *Cosmic bounce as the origin of the anomalies in the CMB.*

- Invited plenary talk at the conference Foundations of Cosmology and Quantum Gravity, January 2020, Abu Dhabi, UAE.

  Title: *The pre-inflationary universe, quantum cosmology, and the CMB.*

- Invited plenary talk at the conference Quantum Gravity in the Southern Cone, December 2019, Valdivia, Chile.

  Title: *The Chiral anomaly of photons and gravitational radiation.*

- Invited plenary talk at the conference Quantum Gravity and Matter, September 2019, Heidelberg, Germany.

  Title: *Cosmological perturbations in quantum spacetimes.*

- Invited plenary talk at Loops19 conference, June 2019, Penn State University, USA.

  Title: *The phenomenology of loop quantum cosmology: an overview.*

- Invited lecturer at the Bard College School on quantum gravity, June 2019, Bard College, USA.

  Title: *Quantum field theory in curved spacetimes.*

- Invited plenary talk at GRAV19 conference, April 2019, Cordoba, Argentina.

  Title: *Electromagnetic duality anomaly in curved spacetimes.*

- Invited plenary talk at the Marcel Grossmann international conference, July 2018, Rome, Italy.

  Title: *Loop Quantum Cosmology and the Cosmic Microwave Background.*

- Invited plenary talk to the Spanish-Portuguese relativity meeting EREP, September 2017, Malaga, Spain.

  Title: *Quantum Cosmology and the Cosmic Microwave Background.*

- Invited talk to the conference "Bouncing scenarios in cosmology", Perimeter Institute, June 2017, Waterloo, Canada.

  Title: *Loop Quantum Cosmology, non-Gaussianity, and the CMB anomalies.*

- Invited talk at the conference Quantum Vacuum and Gravitation, March 2017, Mainz Institute for Theoretical Physics, Mainz, Germany,

  Title: *Loop quantum cosmology.*

- Invited plenary talk at the conference "IberiCos", April 2017, University of Valencia, Spain.

  Title: *Loop quantum cosmology and the CMB.*

- Invited contribution to the American Physical Society Meeting, April 2017, Washington, USA.

  Title: *Loop Quantum Cosmology and the Cosmic Microwave Background.*

- Invited mini-course at the school "Quantum Gravity, schemes, models and phenomenology", December 2016, Mexico.

  Title: *An introduction to Loop Quantum Cosmology and the Cosmic Microwave Background.*

- Invited plenary talk to the conference "70&70 Gravitational Fest", September 2016, Colombia.

  Title: *Loop Quantum Cosmology and the Cosmic Microwave Background.*

- Colloquium at Wake Forest University, September 2015, Wiston-Salem, US,

  Title: *The observable universe, gravity and the quantum.*

- Invited talk at Quantum Vacuum and Gravitation, July 2015, Mainz Institute for Theoretical Physics, Mainz, Germany,

  Title: *Loop quantum cosmology and the CMB.*

- Invited plenary talk at General Relativity & Gravitation: a Centennial Perspective, June 2015, Penn State, Pennsylvania, US,

  Title: *Phenomenological consequences of loop quantum cosmology.*

- Invited talk at Erlangen Workshop on Cosmology and Quantum Gravity, January 2015, Erlangen, Germany,

  Title: *Phenomenological consequences of loop quantum cosmology.*

- Invited seminar Simon Fraser University, January 2014, Vancouver, Canada,

  Title: *Primordial magnetic fields and the conformal anomaly.*

- Colloquium University of Wisconsin-Milwaukee, January 2014, Milwaukee, USA.

  Title: *Quantum Gravity and the observable universe.*

- Colloquium Florida Atlantic University, February 2014, Boca Raton, USA.

  Title: *Quantum Gravity and the observable universe.*

- Invited plenary talk, Loops'13 conference, Perimeter Institute, July 2013, Canada.

  Title: *A quantum gravity extension of the inflationary scenario.*

- Invited talk, Quantum Gravity and Fundamental Cosmology Workshop, March 2013, Postdam, Germany.

  Title: *Observational effects from pre-inflationary physics and loop quantum cosmology.*

- Invited seminar, Imperial College of London, January 2013, London, UK.

  Title: *A quantum gravity extension of the inflationary scenario.*

- Invited contribution to the 13th Marcel Grossmann meeting, July 2012, Stockholm, Sweeden.

  Title: *A quantum gravity extension of the inflationary scenario.*

- Invited contribution to the American Physical Society Meeting, April 2012, Atlanta, USA.

  Title: *Beyond the standard inflationary paradigm.*

- Colloquium University of Wisconsin-Milwaukee, March 2011, Milwaukee, USA.

  Title: *Gravity, the quantum, and the observable universe.*

OUTREACH

• Books

I. Agullo, *Más allá del Big Bang: Un breve recorrido por la historia del universo*, Debate (Random Penguin), 2020.

• Recent outreach talks

1. *Qué es Big Bang? El universo más allá de Einstein*
   Universidad de la Republica, Uruguay, May 2022.
2. *Gravedad Cuántica de Lazos y el Universo Temprano*
   Outreach series, Conversations with J. Edelstein, online, Oct. 2021.
3. *En busca del Big Bang*
   Online talk, Universidad de la Republica, Uruguay, Sept. 2021.
4. *Understanding the Big Bang: The Universe Beyond Einstein*
   Frontiers of Science, Public Lecture Series, Florida Atlantic University, January 2021.
5. *Qué es Big Bang? El universo más allá de Einstein*
   Online talk, CAIFA, Buenos Aires, Argentina, Sep. 2020.
6. *Qué es Big Bang? El universo más allá de Einstein*
   CosmoCaxa, Barcelona, Spain, March 2020.
7. *Where do Galaxies come from?*
   Saturday Science, Public Library Baton Rouge, USA, 2019.
8. *The Universe Beyond Einstein: Lessons from Primordial Messengers*
   Lectures on the Frontiers of Science, Penn State University, February 2019.
9. *Más allá del Big Bang*
   La Torreta High School, Spain, May 2018.
10. *Beyond the Big Bang*
    Astronomy on Tap, Baton Rouge, May 2018.

• Media: After the publication of my popular-science book, I became active in contributing to interviews in radio and news papers in several Spanish-speaker countries. They included media such as El Pais, El Mundo, Punt Avui, La Tribuna, Cadena Ser, etc.

• Contribution to the documentary "Before the Big Bang", created by Phil and Monica Harper, which has accumulated over 411000 views in YouTube.

• Contribution to the documentary "The Big Bounce, Signs in the CMB? A Loop Quantum Gravity update", created by Phil and Monica Harper, which has accumulated over 16000

views in YouTube since 2019.

• I have contributed to the documentary "Gravity Land", made of 13 episodes of about 25 minutes each. I was the invited scientist in Episode 11, with title "Where gravity finds quantum mechanics".

• I have contributed to the documentary "G-Ambassadors", created by the COST project of the European Union to promote science on gravitational physics.

DEIA

Diversity, Equity, Inclusion and Accessibility are core values for me, and I am committed to defending and promoting them within my capabilities. Being of Hispanic origin, I am conscious of the importance of these values. I have learned that my viewpoint is more limited than I initially thought, and that I need to keep broadening my horizons. At present, my research group is as diverse as the topics we investigate, something that helps all of us to educate ourselves and grow on aspects of DEIA.

OTHER RELEVANT INFORMATION

Member of the Editorial Board of General Relativity and Gravitation, Springer, 2016-2021.

Organizer of the summer school and workshop "Analogue gravity in 2023", Centro de Ciencias Pedro Pascual, Benasque, Spain.

Member of the scientific organizing committee for the international conference GR24.

Referee of: Phys. Rev. X, Phys. Rev. Lett., PNAS, Phys. Rev. D, Class. Quant. Grav., Gen. Rel. Grav., JCAP, JHEP, Int. Jour. Mod. Phys., Eur. Phys. Journal, Frontiers in Astronomy and Space science, NSF (American National Science Foundation), Chilean Conicyt (Chilean national Commission of research and technology), Canadian Journal of Physics, MINECO.

Languages
Spanish, Catalan, English.

PUBLICATIONS IN PEER REVIWED JOURNALS

1. S. Haldar, I. Agullo, and J. E. Troupe, *Synchronizing clocks via satellites using entangled photons: Effect of relative velocity on precision*, arXiv: 2306.08146, Under review in Phys. Rev. A.

2. I. Agullo, B. Bonga, P. Ribes-Metidieri, D. Kranas and Sergi Nadal-Gisbert, *How ubiqutous is entanglement in quantum field theory?*, arXiv:2302.13742. Under review in Phys. Rev. D.

3. I.Agullo, A. Wang, and E. Wilson-Ewing, *Loop quantum cosmology: relation between theory and observations*, arXiv: 2301.10215. To be published in **Handbook of Quantum Gravity** (Eds. C. Bambi, L. Modesto and I.L. Shapiro, Springer, expected 2023).

4. I. Agullo, B. Brady, D. Kranas, *Robustness of entanglement in Hawking radiation for optical systems immersed in thermal baths*, **Phys. Rev. D.** 107 085009 (2023).

5. S. Haldar, I. Agullo, A. J. Brady, A. Lamas-Linares, W. C. Proctor, J. E. Troupe, *Towards global Time Distribution via Satellite-Based Sources of Entangled Photons*, **Phys. Rev. A.** 107, 022615 (2023).

6. J. Troupe, S. Haldar, I. Agullo, P. Kwiat, *Quantum Clock Synchronization for Future NASA Deep Space Quantum Links and Fundamental Science*, Topical white paper submitted for the Decadal Survey on Biological and Physical Sciences Research in Space 2023-2032, arXiv:2209.15122 (2022).

7. I. Agullo, B. Brady, D. Kranas, *Symplectic circuits, entanglement, and stimulated Hawking radiation in analog gravity* , **Phys. Rev. D.** 106 105021 (2022).

8. I. Agullo, J. Olmedo and E. Wilson-Ewing, *Observational constraints on anisotropies for bouncing alternatives to inflation*, **JCAP** 10 045 (2022).

9. I. Agullo, B. Brady, D. Kranas, *Event horizons are tunable factories of quantum entanglement*, **Int. Jour. Mod. Phys** 2242008 (2022).

10. I. Agullo, B. Bonga, P. Ribes-Metidieri, *Does inflation squeezes cosmological perturbations?*, **JCAP** 09 032 (2022).

11. I. Agullo, B. Brady, D. Kranas, *Stimulating the Quantum Aspects of an Optical Analog White-Black Hole*, **Phys. Rev. Lett.** 128 9 091301 (2022) .

12. I. Agullo, D. Kranas, V. Sreenath, *Anomalies in the Cosmic Microwave Background and Their Non-Gaussian Origin in Loop Quantum Cosmology*, **Front. Astron. Space Sci.** 8 703845 (2021).

13. I. Agullo, V. Cardoso, A. del Rio, M. Maggiore, J. Pullin, *Absorption spectroscopy of quantum black holes with gravitational waves*, **Int. J. Mod. Phys. D** 30 (2021).

14. I. Agullo, V. Cardoso, A. del Rio, M. Maggiore, J. Pullin, *Potential gravitational-wave signatures of quantum gravity*, **Phys. Rev. Lett.** 126 4 041302 (2021) .

15. I. Agullo, D. Kranas, V. Sreenath, *Large scale anomalies in the CMB and non-Gaussianity in bouncing cosmologies*, **Class. Quantum. Grav.** 38 6 065010 (2021).

16. I. Agullo, D. Kranas, V. Sreenath, *Anomalies in the CMB from a cosmic bounce*, **Gen. Rel. Grav.** Gen.Rel.Grav. 53 2 17 (2021).

17. I. Agullo, J. Olmedo, and S. Vijayakumar, *Observational consequences of Bianchi I spacetimes in loop quantum cosmology*, **Phys. Rev. D** 102 4, 043523 (2020).

18. I. Agullo, J. Olmedo, and S. Vijayakumar, *Hamiltonian theory of classical and quantum gauge invariant perturbations in Bianchi I spacetimes*, spacetimes **Phys. Rev. D** 101 12, 123531 (2020).

19. I. Agullo, J. Olmedo, and S. Vijayakumar, *Predictions for the CMB from an anisotropic quantum bounce*, **Phys. Rev. Lett.** 124 25 251301 (2020).

20. A. del Rio, N. Sanchis, V. Mewes, I. Agullo, J. Font, J. Navarro-Salas, *Spontaneous creation of circularly polarized photons in chiral astrophysical systems* , **Phys. Rev. Lett.** 124 21 211301 (2020).

21. I. Agullo, J. Olmedo, and S. Vijayakumar, *xAct Implementation of the Theory of Cosmological Perturbation in Bianchi I Spacetimes*, **Mathematics** 8 2 290 (2020).

22. I. Agullo, A. del Rio, and J. Navarro-Salas *On the Electric-Magnetic Duality Symmetry: Quantum Anomaly, Optical Helicity, and Particle Creation*, **Symmetry** 10 12, 763, (2018).

23. I. Agullo, A. del Rio, and J. Navarro-Salas *Classical and quantum aspects of electric-magnetic duality rotations in curved spacetimes*, **Phys. Rev. D** 98 12 125001, (2018).

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