

Curriculum vitae

Néstor Enrique Ortiz Madrigal

I. Academic career

(A) Education

1. **PhD in Physics**, Instituto de Física y Matemáticas (IFM), Universidad Michoacana de San Nicolás de Hidalgo (UMSNH) (2010 - 2014)
2. **Master's degree in Physics**, IFM, UMSNH (2008 - 2010)
3. **Bachelor's degree in Physics and Mathematics**, Facultad de Ciencias Físico-Matemáticas (FCFM), UMSNH (2003 - 2008)
4. **Languages** Spanish [native], English [advanced], Italian [basic], French [basic].

(B) Work experience

1. **Professor A, full time** (2019 -)
Institute for Nuclear Science (ICN), UNAM.
2. **Postdoctoral researcher** (2018 - 2019)
Theoretisch-Physikalisches Institut, Friedrich-Schiller-Universität Jena, Germany.
3. **Postdoctoral researcher** (2014 - 2018)
Perimeter Institute for Theoretical Physics. Waterloo, ON, Canada.
4. **Academic Technical Assistant A, half time** (2006)
Thin Film Laboratory, FCFM, UMSNH.

(C) Distinctions

1. **Member** of *Programa de Estímulos al Desempeño del Personal Académico de Tiempo Completo de la UNAM*, PRIDE, level C. (2024)
2. **Paper** *Effective-action model for dynamical scalarization beyond the adiabatic approximation* appeared in Physical Review D's special collection *Editor's Suggestions*. (2022)
3. **Paper** *Fixing extensions to General Relativity in the non-linear regime* appeared in Physical Review D's special collection *Editor's Suggestions*. (2017)
4. **Member** of *Sistema Nacional de Investigadoras e Investigadores* (SNII), level I. (2015 -)
5. **Graduated with honors from PhD**. (2014)
6. **Paper** *Conformal diagrams for the gravitational collapse of a spherical dust cloud* appeared in Classical and Quantum Gravity's special collection *IOP Select*. (2011)
7. **Recognition** awarded by the Presidency of Mexico as a winner of *Olimpiada del Conocimiento Infantil 1996-1997*. (1997)

(D) Collegiate bodies

1. **University Counselor**, UMSNH. (2010 - 2012)
2. **Local Counselor**, IFM, UMSNH. (2011 - 2013)

(E) Research projects

1. **PAPIIT-UNAM IA101123**. Project manager.
Neutron stars in General Relativity and beyond. (Jan. 2023 - Dec. 2024)
2. **PAPIIT-UNAM IN105223**. Project collaborator.
Compact objects in relativistic theories of gravity. (Jan. 2023 -)
3. **PECDA-Michoacán SC/SDCFL/C/271523/SACPC/PECDA/MICH/023/23**.
Category *Research and outreach of cultural heritage*. Project manager.
Instrumental endowment of 19th-century p'urhepecha music. (Dec. 2023 - May 2024)
4. **PAPIIT-UNAM IA100721**. Project manager.
Neutron star phenomenology in gravitational wave astronomy.
(Jan. 2021 - Dec. 2022)
5. **Ciencia de Frontera CONAHCyT 376127**. Project collaborator.
Shadows, lenses and gravitational waves from compact objects.
(Jan. 2021 - Feb. 2025)
6. **Ciencia de Frontera CONAHCyT 140630**. Project collaborator.
Exploring the confines of relativistic theories of gravitation and their observational consequences. (Jan. 2021 - Dec. 2024)

(F) Memberships

1. **Consejo de la crónica del Municipio de Paracho, Michoacán**. (2020 -)

II. Publications

(A) Research papers

1. *Dynamical transition to spontaneous scalarization in neutron stars: the massive scalar field scenario*
Juan Carlos Degollado, Néstor Ortiz, and Marcelo Salgado.
Physical Review D **110** 084011 (2024).
2. *Analytically improved and numerical-relativity informed effective-one-body model for coalescing binary neutron stars*
Rossella Gamba, Matteo Breschi, Sebastiano Bernuzzi, Alessandro Nagar, William Cook, Georgios Doulis, Francesco Fabbri, Néstor Ortiz, Amit Poudel, Alireza Rashti, Wolfgang Tichy, and Maximiliano Ujevic.
Enviado a *Physical Review D*. Preprint arXiv:2307.15125 (2023).
3. *Effective-action model for dynamical scalarization beyond the adiabatic approximation*
Mohammed Khalil, Raissa F. P. Mendes, Néstor Ortiz, and Jan Steinhoff.
Physical Review D **106** 104016 (2022).
4. *Post-Newtonian Gravitational and Scalar Waves in Scalar-Gauss-Bonnet Gravity*
Banafsheh Shiralilou, Tanja Hinderer, Samaya M. Nissanke, Néstor Ortiz, and Helvi Witek.
Classical and Quantum Gravity **39** 035002 (2022).
5. *Gamma-radiation sky maps from compact binaries*
Néstor Ortiz, Federico Carrasco, Stephen R. Green, Luis Lehner, Steven L. Liebling, and John Ryan Westernacher-Schneider.
Journal of Cosmology and Astroparticle Physics **02** 027 (2022).

6. *Nonlinear dynamics of oscillating neutron stars in scalar-tensor gravity*
Raissa Mendes, Néstor Ortiz, and Nikolaos Stergioulas.
Physical Review D **104** 104036 (2021).
7. *Nonlinear curvature effects in gravitational waves from inspiralling black hole binaries*
Banafsheh Shiralilou, Tanja Hinderer, Samaya M. Nissanke,
Néstor Ortiz, and Helvi Witek.
Physical Review D **103**, L121503 (2021).
8. *Probing crust meltdown in inspiraling binary neutron stars*
Zhen Pan, Zhenwei Lyu, Béatrice Bonga, Néstor Ortiz, and Huan Yang.
Physical Review Letters **125** 201102 (2020).
9. *Accretion-induced prompt black hole formation in asymmetric neutron star mergers, dynamical ejecta and kilonova signals*
Sebastiano Bernuzzi, Matteo Breschi, Boris Daszuta, Andrea Endrizzi, Domenico Logoteta, Vsevolod Nedora, Albino Perego, Federico Schianchi, David Radice, Francesco Zappa, Ignazio Bombaci, and Néstor Ortiz.
Monthly Notices of the Royal Astronomical Society, 497, 2, 1488-1507 (2020).
10. *Spiral-wave wind for the blue kilonova*
Vsevolod Nedora, Sebastiano Bernuzzi, David Radice,
Albino Perego, Andrea Endrizzi, and Néstor Ortiz.
The Astrophysical Journal Letters 886:L30 (2019).
11. *Effective-one-body multipolar waveform for tidally interacting binary neutron stars up to merger*
Sarp Akcay, Sebastiano Bernuzzi, Francesco Messina, Alessandro Nagar,
Néstor Ortiz, and Piero Rettegno.
Physical Review D **99** 044051 (2019).
12. *New class of quasinormal modes of neutron stars in scalar-tensor gravity*
Raissa Mendes, and Néstor Ortiz.
Physical Review Letters **120** 201104 (2018).
13. *Extended I-Love relations for slowly rotating neutron stars*
Jérémie Gagnon-Bischoff, Stephen R. Green, Philippe Landry, and Néstor Ortiz.
Physical Review D **97** 064042 (2018).
14. *Cauchy horizon stability in a collapsing spherical dust cloud. II: Energy bounds for test fields and odd-parity gravitational perturbations*
Néstor Ortiz, and Olivier Sarbach.
Classical and Quantum Gravity **35** 025010 (2018).
15. *Fixing extensions to general relativity in the nonlinear regime*
Juan Cayuso, Néstor Ortiz, and Luis Lehner.
Physical Review D **96** 084043 (2017).
16. *Global Crustal Dynamics of Magnetars in Relation to their Bright X-ray Outbursts*
Christopher Thompson, Huan Yang, and Néstor Ortiz.
The Astrophysical Journal **841** 1 (2017).
17. *Highly compact neutron stars in scalar-tensor theories of gravity: spontaneous scalarization vs. gravitational collapse*
Raissa Mendes, and Néstor Ortiz.
Physical Review D **93** 124035 (2016).

18. *Shadow of a naked singularity*
Néstor Ortiz, Olivier Sarbach, and Thomas Zannias.
Physical Review D **92** 044035 (2015).
19. *Observational distinction between black holes and naked singularities: the role of the redshift function*
Néstor Ortiz, Olivier Sarbach, and Thomas Zannias.
Classical and Quantum Gravity **32** 247001 (2015).
20. *Gravitational redshift of photons traversing a collapsing dust cloud and observable consequences*
Néstor Ortiz and Olivier Sarbach.
Physical Review D **90** 124058 (2014).
21. *Cauchy horizon stability in a collapsing spherical dust cloud. I: Geometric optic approximation and spherically symmetric test fields*
Néstor Ortiz and Olivier Sarbach.
Classical and Quantum Gravity **31** 075003 (2014).
22. *Linear perturbations of self-gravitating spherically symmetric configurations.*
Eliana Chaverra, Néstor Ortiz, and Olivier Sarbach.
Physical Review D **87** 044015 (2013).
23. *Conformal diagrams for the gravitational collapse of a spherical dust cloud*
Néstor Ortiz and Olivier Sarbach.
Classical and Quantum Gravity **28** 235001 (2011).

(B) Conference proceedings

1. *On the behaviour of non-radial null geodesics in self-similar Tolman-Bondi collapse*
Néstor Ortiz, Olivier Sarbach, and Thomas Zannias.
J.Phys.Conf.Ser. 1208 no.1, 012010 (2019).
2. *Initial data giving rise to naked singularities in spherically symmetric dust collapse*
Néstor Ortiz.
AIP Conf. Proc. **1473**, pp. 49-53; (2012).
3. *Conformal diagrams for the gravitational collapse of a spherically symmetric dust cloud*
Néstor Ortiz and Olivier Sarbach.
AIP Conf. Proc. **1256**, pp. 349-356; (2010).

III. Supervisor and examiner

(A) Thesis supervisor

(a) Completed

1. **Daniela González Ruiz.** Bachelor's degree, Faculty of Science (FC), UNAM.
Neutron star perturbations in scalar-tensor theories of gravity.
Graduated on Sept. 20th, 2024.
2. **Enrique Galicia Pineda.** Bachelor's degree, FC, UNAM.
Compact star modelling with the Aztekas software.
Graduated with honors on April 15th, 2024.

3. **Fernando Vázquez Chávez.** Bachelor's degree, FC, UNAM.
Exploring spacetime nature through stellar orbits.
Graduated with honors on March 4th, 2024.
4. **Axel Morales Buendía.** Bachelor's degree, FC, UNAM.
On the emission zone of gamma rays from dipolar pulsar magnetospheres.
Graduated on Aug. 16th, 2023.

(b) **In progress**

1. **César Navarrete Zavala.** MSc. Graduate Program in Astrophysics (PA), UNAM.
Stellar orbits around supermassive black holes. 80% Progress.
2. **Edgar Pastrana Calderón.** Bachelor's degree. FC, UNAM.
Fixed Mesh Refinement in numerical hydrodynamics. 60% Progress.
3. **Axel Morales Buendía.** MSc. Graduate Program in Physics (PCF), UNAM.
Gravitational collapse in massive scalar-tensor gravity. 40% Progress.

(B) **Examiner**

(a) **Bachelor's degree**

1. **Alejandro Farid Cantun Estrella.** FC, UNAM.
Inflationary perturbations.
Graduated on Oct. 18th, 2024.
2. **José Carlos Joaquín Altamirano.** FC, UNAM.
Proca stars in General Relativity.
Graduated on July 30th, 2024.

(b) **MSc**

1. **Iván Hernández Garibay.** PCF, UNAM.
Direct Urca process in neutron stars with relativistic mean field theory models.
Graduated on June. 28th, 2024.
2. **Omar Elías Velasco Castillo.** PCF, UNAM.
Light deflection nearby ultracompact stars.
Graduated on April 26th, 2024.
3. **Aldo Javier Gamboa Castillo.** PCF, UNAM.
Accretion of a relativistic collisionless kinetic gas onto a black hole from finite radius.
Graduated on Aug. 1st, 2022.
4. **Víctor Dennis Muñoz Vitelly.** PCF, UNAM.
The structure of cosmic strings for a $U(1)$ gauge field related to the conservation of the baryon-number minus lepton-number.
Graduated on June 2nd, 2022.
5. **Santiago Ontañón Sánchez.** PCF, UNAM.
Modelling rotating boson stars using finite differences and global Newton methods.
Graduated on Feb. 15th, 2022.

(c) **PhD**

(c-1) **Predoctoral**

1. **Nadir Ijaz.** PCF, UNAM.
On the role of self-interactions in gravitational dark matter production.
May 21st, 2024.

2. **Brandon Mariano Martínez Olivas.** PCF, UNAM.
Study of quantum geometry of cosmological models and black holes through Loop Quantum Gravity.
Nov. 17th, 2023.
3. **José Damián López Díaz.** PCF, UNAM.
Non linear evolution of Proca stars.
May 8th, 2023.
4. **Karen Susana Villa Aguirre.** PCF, UNAM.
Semiclassical gravity and collapse theories.
Nov. 11th, 2021.

(c-2) **Candidate**

1. **Erik Rodrigo Jiménez Vázquez.** PCF, UNAM.
Critical gravitational collapse in Numerical Relativity with spherical and axial symmetries.
Feb. 17th, 2021.
2. **Emmanuel Herrera Flores.** PCF, UNAM.
Rigorous treatment of Unimodular Gravity.
April, 2020.

(c-3) **Degree**

1. **Emmanuel Herrera Flores.** PCF, UNAM.
Rigorous treatment of Unimodular Gravity.
Feb. 6th, 2024.
2. **Alejandro Aguayo Ortiz.** PA, UNAM.
Numerical studies of accretion and ejection in Astrophysics.
Aug. 4th, 2022.

(C) **Academic Advisory Committees**

(a) **MSc**

1. **Ramón Tamayo Andrade.** PCF, UNAM.
Jan. 2025 -
2. **José Carlos Joaquín Altamirano.** PA, UNAM.
Aug. 2024 -
3. **Donaldo Emilio Mora Chávez.** PA, UNAM.
Numerical modelling of black hole jets.
Jan. 2024 -
4. **Jorge Yahir Mio Pacherre.** PCF, UNAM.
Structure of charged Proca stars in spherical symmetry.
Aug. 2023 -
5. **Claudio César Lazarte Melgar.** PCF, UNAM.
Structure of rotating Proca stars.
Sept. 2022 - Aug. 2023.
6. **Daniel Núñez Trigueros.** PFC, UNAM.
Gravitational collapse and singularity formation.
Oct. 2021 - Oct. 2023.

(D) **CONAHCyT Referee**

1. *Postdoctoral fellowships* (2024).
2. *Postdoctoral fellowships* (2022).
3. *Postdoctoral fellowships* (2021).

(E) **Journal Referee**

1. *Physical Review Letters*
2. *Monthly Notices of the Royal Astronomical Society*
3. *The Astrophysical Journal, American Astronomical Society*
4. *Physical Review D*
5. *Classical and Quantum Gravity*
6. *Revista Mexicana de Física*
7. *Astrophysics and Space Science*
8. *Physica scripta*

IV. Teaching

(A) **UNAM**

1. **Numerical Relativity.** MSc Program, PCF. (Jan. 2025 -)
2. **Quantum Mechanics.** Bachelor's Program, FC. (Aug. - Dec., 2024)
3. **Research Seminar I.** MSc Program, PA. (Aug. - Dec., 2024)
4. **Selected Topics on Relativity, Cosmology, and Gravitation I: Stellar orbits around black holes.** Bachelor's Program, FC. (Jan. - May, 2024)
5. **Electromagnetism I.** Bachelor's Program, FC. (Jan. - May, 2023)
6. **Classical Mechanics.** Bachelor's Program, FC. (Aug. - Dec., 2022)
7. **Preparatory course on Classical Mechanics.** PCF. (Jan. - May, 2022)
8. **Numerical Relativity.** MSc Program, PCF. (Aug. - Dec., 2021)
9. **General Relativity.** MSc Program, PCF. (Feb. - June, 2021)
10. **Relativistic Astrophysics.** Bachelor's Program, FC. (Jan. - June, 2020)
11. **Preparatory course on Classical Mechanics..** PCF. (March - May, 2020)

(B) **Other institutions**

1. **General Relativity.** MSc Program. Teacher Assistant. Friedrich-Schiller Universität Jena, Germany. (Oct. 2018 - March 2019)
2. **Physics III (Modern Physics).** Bachelor's Program, Faculty of Electrical Engineering (FIE), UMSNH. (Aug. 2012 - Feb. 2013)
3. **Electromagnetic Theory.** Bachelor's Program, FIE, UMSNH. (Aug. 2012 - Feb. 2013)
4. **Thermodynamics.** Bachelor's Program, FCFM, UMSNH. (Feb. - Aug., 2012)

5. **Physics II.** Bachelor's Program, FCFM, UMSNH. (Aug. 2011 - Feb. 2012)
6. **General Relativity.** MSc Program. Teacher Assistant. IFM, UMSNH. (Aug. 2010 - Feb. 2011)
7. **Chemistry.** Bachelor's Program, FIE, UMSNH. (Aug. 2010 - Feb. 2011)
8. **Physics.** Bachelor's Program, Faculty of Biology, UMSNH. (Aug. 2010 - Feb. 2011)
9. **Physics II.** Bachelor's Program, FIE, UMSNH. (Aug. 2009 - Feb. 2010)
10. **Laboratory of Physics III.** Bachelor's Program, FIE, UMSNH. (Aug. 2009 - Feb. 2010)
11. **Chemistry.** Bachelor's Program, FIE, UMSNH. (Aug. 2009 - Feb. 2010)
12. **Selected Topics on Physics.** High-school Program, *Preparatoria Isaac Arriaga*, UMSNH. (Feb. - Aug., 2007)
13. **Advanced Mathematics .** Workshop for teachers, *Instituto Nacional de Educación para Adultos.* (Jan. - Feb., 2006)

(C) **Social Service Supervisor**

Program *Physics of neutron stars and black holes.* ICN, UNAM (Jan. 2020 -)

1. **Pedro Estrada Gallegos.** FC, UNAM.
Numerical simulations in Unimodular Gravity with the software Einstein Toolkit.
(Dec. 2024 -)
2. **Edgar Pastrana Calderón.** FC, UNAM.
Fixed Mesh Refinement in Numerical Relativity.
(Apr. 2024 - Dec. 2024)
3. **José Alejandro Santiago Bañuelos.** FC, UNAM.
Neutron star modelling with the Enthalpy Method.
(March 2023 - Sept. 2023)
4. **Fernando Vázquez Chávez.** FC, UNAM.
Stellar orbits around supermassive black holes.
(Nov. 2022 - June 2023)
5. **Tomás Hernández Martínez.** FC, UNAM.
Black hole simulations with the software Einstein Toolkit.
(Nov. 2022 - May 2023)
6. **Axel Morales Buendía.** FC, UNAM.
Gamma ray emission from pulsar magnetospheres.
(March 2021 - Oct. 2021)
7. **José Eduardo Ibáñez Martínez.** FC, UNAM.
Black hole images in augmented reality. (March 2021 - Oct. 2021)
8. **Enrique Galicia Pineda.** FC, UNAM.
Compact star modelling with the software Aztekas.
(Feb. 2021 - Oct. 2021)
9. **Daniela González Ruiz.** FC, UNAM.
Non linear perturbation of scalarized neutron stars. (Aug. 2020 - April 2021)
10. **Jérémie Gagnon-Bischoff.** University of Ottawa.
Nonlinear tides of neutron stars.
Summer Program, PI, Canada. (May 2017 - Aug. 2017)

11. **Francesco Alessio**. University of Naples.
Strong lensing effects due to collapsing objects.
Summer Program, PI, Canada. (May 2016 - June 2016)

(D) **Production of educational material** (in Spanish)

1. Solving the wave equation using the Method of Lines
Red Universitaria de Aprendizaje (RUA), UNAM (2024)

(E) **Academic Advisory Registers**

1. Graduate Program in Physics, UNAM.
2. Graduate Program in Astrophysics, UNAM.

(F) **Other committees**

1. **Library Committee**, ICN, UNAM (2021 -)
2. **Academic Committee of the Bachelor's Program in Physics**, FC, UNAM (2024 -)

(G) **Training**

1. **Guidelines for communicating science**, Workshop, ICN, UNAM. (2022)

V. Science communication

(A) **Specialized talks**

1. **Spontaneous scalarization of neutron stars in massive scalar-tensor gravity.**
XV Workshop of the Mexican Physical Society, University of Guanajuato. Mexico. (2024)
2. **Numerical simulations of compact objects beyond General Relativity.**
Gravity Seminar, ICN, UNAM. Mexico. (2024)
3. **Numerical simulations beyond GR.**
Arcadio Poveda Colloquium. Institute for Astronomy, UNAM. Mexico. (2024)
4. **Neutron star oscillations in scalar-tensor gravity.**
Manuel Sandoval Vallarta Seminar. Institute for Physics, UNAM. Mexico. (2023)
5. **Nonlinear oscillations of neutron stars in scalar-tensor gravity.** Workshop on Fundamental Fields and Compact Objects: New Opportunities. Mexico. (2023)
6. **Progress on nonlinear simulations beyond General Relativity.**
Gravitation, Spacetime and the Quantum Workshop. Mexico. (2023)
7. **Nonlinear oscillations of neutron stars in scalar-tensor gravity.**
Seminar at Max Planck Institut für Gravitationsphysik. Germany. (2023)
8. **Panelist** in debate *The late-inspiral and merger: challenges beyond General Relativity.* Max Planck Institut für Gravitationsphysik. Germany. (2023)

9. **Neutron stars beyond Einstein's Gravity.** DivulGAE Seminar, FC, UNAM. Mexico. (2023)
10. **Neutron stars in alternative theories of gravity.** XII Solaris Conference on Physics and Mathematics, Universidad de las Américas Puebla. Mexico. (2022)
11. **Neutron stars in alternative theories of gravity.** InvestiGAE Seminar, Institute for Physics, UNAM. Mexico. (2022)
12. **Excitation of scalar oscillation modes in neutron stars.** Applied and Computational Mathematics Seminar, University College Dublin. Ireland. (2020)
13. **Constraining alternative theories of gravity using neutron stars.** Seminar at Universidad Autónoma del Estado de México. Mexico. (2020)
14. **Excitation of scalar oscillation modes in binary neutron stars.** Gravity Seminar, UMSNH. Mexico. (2020)
15. **Constraining alternative theories of gravity using neutron stars.** Seminar at the Faculty of Science, National University of Engineering. Peru. (2020)
16. **New class of quasinormal modes of neutron stars in scalar-tensor gravity.** XIII Mesoamerican Workshop on Cosmology and Gravity. Mexico. (2019)
17. **On the possibility to fix ill posed Cauchy problems for alternative theories of gravity.** Gravity Seminar, ICN, UNAM. Mexico. (2019)
18. **Possibility to fix ill posed Cauchy problems for alternative theories of gravity.** XIII Workshop of the Mexican Physical Society, University of Guanajuato. Mexico. (2019)
19. **New class of quasinormal modes of neutron stars in scalar-tensor gravity.** Gravity Seminar at Max Planck Institut für Gravitationsphysik. Germany. (2019)
20. **New class of quasinormal modes of neutron stars in scalar-tensor gravity.** Seminar at Theoretisch-Physikalisches Institut, Friedrich-Schiller Universität Jena. Germany. (2018)
21. **The role of neutron stars in the era of gravitational wave astronomy.** Gravity Seminar, ICN, UNAM. Mexico. (2018)
22. **Spontaneous scalarization of neutron stars in the unconstrained parameter regime of scalar-tensor theories.** Annual NewCompStar Conference. Polish Academy of Science. Poland. (2017)
23. **On the stability of naked singularities arising from collapsing spherical dust stars.** Seminar at Fluminense Federal University. Brazil. (2017)
24. **Tidal forces in neutron stars.** Gravity Seminar, IFM, UMSNH. Mexico. (2017)
25. **Spontaneous scalarization of neutron stars in the unconstrained parameter regime of scalar-tensor theories.** 21st International Conference on General Relativity and Gravitation. USA. (2016)
26. **Spontaneous scalarization in an unexplored parameter regime of scalar-tensor gravity.** Gravity Seminar. IFM, UMSNH. Mexico. (2016)
27. **Spontaneous scalarization in an unexplored parameter regime of scalar-tensor gravity.** Colloquium. Division of Science and Engineering, University of Guanajuato. Mexico. (2016)

28. **Gamma-ray emission from the coalescence of binary neutron stars: an electromagnetic counterpart of gravitational radiation.** Plenary talk at School on General Relativity and Gravitational Waves. Autonomous University of Guadalajara. Mexico. (2016)
29. **On the observational distinction between black holes and naked singularities.** PI-CITA Day. Canadian Institute for Theoretical Astrophysics. Canada. (2015)
30. **The shadow of a naked singularity.** Midwest Relativity Meeting. Northwestern University. USA. (2015)
31. **On the stability of naked singularities arising from spherical dust collapse.** Cosmology meeting. PI. Canada. (2015)
32. **The shadow of a naked singularity.** Cosmology meeting. PI. Canada. (2015)
33. **Light curves from binary neutron star coalescence.** American Physical Society APR15 Meeting. USA. (2015)
34. **Stability of test fields propagating on a collapsing spherical dust cloud.** 20th International Conference on General Relativity and Gravitation. Poland. (2013)
35. **Redshift through a collapsing spherical dust cloud.** X Workshop of the Mexican Physical Society. Mexico. (2013)
36. **On the stability of the Cauchy horizon in spacetimes describing a spherically symmetric dust collapse.** Max Planck Institut für Gravitationsphysik. Germany. (2012)
37. **On the stability of the Cauchy horizon in spacetimes describing a spherically symmetric dust collapse.** Workshop on relativity. Germany. (2012)
38. **Conformal diagrams for the gravitational collapse of a spherically symmetric dust cloud.** Conference on Advances and Challenges in Computational General Relativity. Brown University. USA. (2011)
39. **Conditions on the formation of naked singularities from spherical dust collapse.** IX Workshop of the Mexican Physical Society. Mexico. (2011)
40. **Conformal diagrams for the gravitational collapse of a spherical dust cloud.** XIX Annual Meeting of the Mexican Physical Society. Instituto Politécnico Nacional. Mexico. (2011)
41. **Quasispherical collapse of dust in General Relativity.** VIII School of the Mexican Physical Society. Mexico. (2009)
42. **Numerical solution of non linear hyperbolic systems.** Gravity Seminar, IFM, UMSNH. Mexico. (2008)
43. **Hydrodynamics, Astrophysics, and other computer games.** FCFM, UMSNH. Mexico. (2008)
44. **First tests on Newtonian Hydrodynamics.** 4th International Conference on Numerical Methods in Engineering and Applied Sciences. Mexico. (2007)
45. **High-Resolution Methods for the numerical solution of non linear hyperbolic systems: Implementation and tests in hydrodynamics.** VII Workshop of the Mexican Physical Society. Mexico. (2007)
46. **On the mysteries of quantum physics and the Schrödinger's Cat.** FC, UMSNH. Mexico. (2006)

47. **Mathematics, Arts, and Nature: The Golden Ratio and the Fibonacci numbers.** FC, UMSNH. Mexico. (2005)
48. **Measuring Planck's Constant using LEDs.** FC, UMSNH. Mexico. (2004)

(B) **Posters**

1. **Conformal diagrams for the gravitational collapse of a spherically symmetric dust cloud.** Néstor Ortiz and Olivier Sarbach. 19th International Conference on General Relativity and Gravitation. Mexico. (2010)
2. **Basic tests of general relativistic hydrodynamical codes.** Néstor Ortiz and Francisco S. Guzmán. VII School of the Mexican Physical Society. Mexico. (2006)
3. **What are Sun and Moon Coronae?** Néstor Ortiz and Luis Mariano Hernández. XLVIII National Physics Conference. Mexico. (2005)
4. **Measuring Planck's Constant using LEDs.** Néstor Ortiz and Luis Mariano Hernández. XLVII National Physics Conference. Mexico. (2004)

(C) **Outreach**

1. **Workshop collaborator** in *Día de puertas abiertas ICN*, UNAM. (2024)
2. **Neutron stars.** Public talk in *La noche de las estrellas*, UNAM. (2023)
3. **Interview** for Unidad de Comunicación de la Ciencia, ICN-UNAM, Gravity beyond Einstein (2023)
4. **Interview** for TV show CAPITAL21 The 'heartbeat' of our Universe. (2023)
5. **Video** NANOGRAV Collaboration (2023)
6. **The importance of learning science.** Public talk. Colegio de Bachilleres del Estado de Michoacán (COBAEM). Paracho, Mexico. (2023)
7. **Lightyear.** Cinema-Debate. *Sociedad Astronómica Nibiru A.C.* (2022)
8. **Nature of sound.** Public talk. Casa de la Cultura, Paracho. Mexico. (2022)
9. **On Physics graduate school.** Public talk. UMSNH. Mexico. (2022)
10. **Nature of sound.** Public talk. Universidad Intercultural Indígena de Michoacán. Mexico. (2021)
11. **How to hunt black holes.** Public talk. Universum. Mexico. (2020)
12. **How to hunt black holes.** Public talk. Paracho. Mexico. (2019)
13. **On the possibilities of science in Mexico.** Public talk. Teatro-Cine Rex. Paracho. Mexico. (2019)
14. **Interview** for radio show *Saber más*, Sistema Michoacano de Radio y Televisión. (2017)
15. **Our daily science.** Public talk. Colegio de Bachilleres del Estado de Michoacán. Cherán. Mexico. (2014)
16. **Interview** for radio show *Semblanzas de la Ciencia*, Sistema Michoacano de Radio y Televisión. (2013)
17. **Co-organizer and speaker** at *Museo Móvil de Acercamiento a la Ciencia*, through non-profit organization *Movimiento Michoacano, A.C.*. In Morelia, Mexico: *Ernesto Che Guevara High School; Escuela Normal Superior de Michoacán; Centro Integral de Innovación Educativa; Planetarium*. In Álvaro Obregón: *Escuela Integral de Educación Básica 'Josefa Ortiz de Domínguez'*, and City Hall. (2013)

18. **What is our Universe made of?** Public talk.
Ernesto Che Guevara High School. Morelia. Mexico. (2012)
19. **Poster** *Conformal diagrams for gravitational collapse of a spherical dust cloud*, in *11a. Feria de Posgrados*. CONACyT, Mexico City, Pachuca, and Campeche. Mexico. (2010)
20. **Science at school**. Public talk. Consejo Estatal de Ciencia y Tecnología (COECyT). Uruapan. Mexico. (2009)
21. **Science at school**. Public talk. COECyT. Uruapan. Mexico. (2009)
22. **Constructivism in Mathematics**. Public talk.
XXIV Anniversary of CBTis 198. Celaya. Mexico. (2008)
23. **Astrophysics**. Public talk. 15a Semana Nacional de Ciencia y Tecnología. Celaya. Mexico. (2008)
24. **Golden Ratio and the Fibonacci numbers**. Public talk. COECyT, Morelia. Mexico. (2007)
25. **Speaker** in the XIV, XV, and XVI editions of *Tianguis de la Ciencia*. UMSNH, Morelia. Mexico. (2004, 2005, and 2006, respectively)

(D) **Scientific organizing committees**

1. *Weekly Seminar* of the Gravity and Field Theory Department, ICN, UNAM. Mexico. (2021 -).
2. *2016 Midwest Relativity Meeting*, Conference at PI, Canada. (2016)
3. *4th International conference and 2nd National conference on numerical methods in engineering and applied science*. Morelia. Mexico. (2007)

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