Curriculum Vitae

Personal Details

Name: Oscar Jasel Berra Montiel.
Place of birth: Puebla, Puebla. México.
Nationality: Mexican.
CURP: BEMO31113HPLRNS03.
Address: Cerrada del Toro 133, Lomas 3a.
Telephone: 4442885326.
Civil status: Single.
Email: jasel.berra@.uaslp.mx

Education

PhD. Mathematics (2012) (Cum Laude)
Departamento de Matemáticas, Facultad de
Ciencias Físico Matemáticas, Benemérita
Universidad Autónoma de Puebla.

Disertation: “Applications of the pure Dirac-Bergmann algorithm to gauge theories”
Supervisor: Roberto Cartas, Alberto Escalante.

Master in Mathematics (2009) (Magna Cum Laude)
Departamento de Matemáticas, Facultad de
Ciencias Físico Matemáticas, Benemérita
Universidad Autónoma de Puebla.

Disertation: “ The Atiyah-Singer theorem and the moduli space of BF theories”
Supervisor: Roberto Cartas.

Bachelor in Physics (2006)
Facultad de Ciencias Físico Matemáticas, Benemérita
Universidad Autónoma de Puebla.

Disertation: “Aspects of Doubly Special Relativity”
Supervisor: Lorenzo Diaz Cruz.

List of Publications

J. Berra-Montiel, A. Molgado, "*Calculating star exponentials by using propagators from path integrals "*, sent to publication (2023).

A. Reyes-Velázquez, J. Berra-Montiel, A. Molgado and J.A. Martinez-Gonzalez, "A *General Path-Integral Monte Carlo Method for Exact Simulations of Chemical Reaction Networks*", J. Phys. Chem. A 19 127 (2023).

J. Berra-Montiel, A. Molgado and E. Torres-Cordero, "*Star product approach for loop quantum cosmolgy"*, Eur. Phys. J. Plus 137 1141 (2022).

J. Berra-Montiel and A. Molgado, *"Tomography in loop quantum cosmology*", Eur. Phys. J. Plus 137 283 (2022).

R. Cartas-Fuentevilla, A. Herrera-Aguilar and J. Berra-Montiel, *"The Higgs mechanism and geometrical flows for two maifolds",* Int. J. Geom. Meth. Mod. Phys. **19** 2250039 (2022).

J. Berra-Montiel, A. Molgado, A. Rodriguez-Lopez, "*A review of geometric formulations for classical field theory: the Bonzom-Livine model for gravity*", Class. Quantum Grav. 38 135012 (2021).

J. Berra-Montiel, E. Castellanos, A. Molgado, J. Trinidad-García, "*Superfluids in Polymer Quantum Mechanics*", Mod. Phys. Lett. A 36 (7), 2150045 (2021), arXiv:2006.14747.

J. Berra-Montiel, R. Cartas, "*Deformation quantization and the tomographic representation of quantum fields*", (2020), Int. J. Geom. Meth. Mod. Phys 17 (14), (2020), arXiv:2006.07688.

J. Berra-Montiel, A. Molgado, "*Quasi-probability distributions in Loop Quantum Cosmology"*, Class. Quantum Grav. 37, 215003 (2020), arXiv:2007.01324.

J. Berra-Montiel, "*Star product representation of coherent state path integrals*", Eur. Phys. J. Plus 136, 906 (2020) arXiv:2007.02483.

J. Berra-Montiel, A. Molgado, "*Coherent representation of fields and deformation quantization*", Int. J. Geom. Methods Mod. Phys. 17 (11) 2050166 (2020) arXiv:2005.14333.

J. Berra-Montiel, R. Cartas-Fuentevilla, O. Meza-Aldama, "*Hyperbolic ring based formulation for thermo field dynamics, quantum dissipation, entanglement, and holography*", Eur. Phys. J. C 80, 603 (2020).

J. Berra-Montiel, "*Deformation quantization of constrained systems: a group averaging approach*", Class. Quantum Grav. 37, 055009 (2020).

J. Berra-Montiel, "*The polymer representation for the scalar field: A Wigner functional approach*", Class. Quantum Grav. 37, 025006 (2019).

J. Berra-Montiel, A. Molgado, A. Rogriguez-López, "*Polysymplectic formulation for BF gravity with Immirzi parameter"*, Class. Quantum Gravity 36 (2), 025001 (2019).

J. Berra-Montiel, A. Molgado, "Polymer *Quantum Mechanics as a Deformation Quantization"*, Class. Quantum Grav. 36035001 (2018).

J. Berra-Montiel, A. Molgado, "*Polymer quantum mechanics and the zeros of the Riemann zeta function*", Int. J. Geom. Methods Mod. Phys. Vol. 15, No. 6, 1850095 (2018).

J. Berra-Montiel, A. Molgado and D. Serrano-Blanco, "*Moyal product for (n − 1)-forms within the covariant Hamiltonian formalism for fields"*, Proc. XI Esc. DGFM-SMF (2018).

J. Berra-Montiel, "*Que es esa cosa llamada tiempo"*, Universitarios Potosinos 224, (2018).

J. Berra-Montiel, A. Molgado and D. Serrano-Blanco, "*Covariant Hamiltonian formulation for MacDowell-Mansouri gravity"*, Class. Quantum Grav. 34 235002 (2017), arXiv:1703.09755 [gr-qc].

J. Berra-Montiel, E. del Río and A. Molgado, "*Polysymplectic formulation for topologically massive Yang-Mills field theory"*, Int. J. Mod. Phys. A32 1750101 (2017), arXiv:1702.03076v2 [hep-th].

J. Berra-Montiel, J. Martıínez-Montoya and A. Molgado, *The Unruh effect for higher derivative field theory*, Class. Quantum Grav. 34 075007 (2017), arXiv:1612.07344 [gr-qc].

J. Berra-Montiel, A. Molgado, C. D. Palacios-Garcia, "Causal Poisson bracket via deformation quantization", *Int. J. Geom. Methods Mod. Phys.* **13**, 1650104 (2016).

J. Berra-Montiel, A. Molgado, E. Rojas, "Deformation quantization of the Pais-Uhlenbeck fourth order oscillator", Ann. Phys. **362** 298-310 (2015).

J. Berra-Montiel, E. Rosales Quintero, "Discrete canonical analysis of three dimensional gravity with cosmological constant", *Int. J. Mod. Phys. A* **30**, 1550080 (2015).

A. Escalante, J. Berra Montiel "A pure Dirac's analysis of the Husain-Kuchar theory", en Int. J. of Geom. Meth. in Modern Physics, v10, N7, (2013).

A. Escalante, J. Berra Montiel, "A pure Dirac's method for the Maxwell and Yang-Mills theories expressed as constrained BF-like theory", Int. J. of Pure and App. Mathematics, Vol. 79 No. 3 (2012), 405-423.

R. Cartas-Fuentevilla, A. Escalante, J. Berra Montiel, “Dimension of the moduli space and Hamiltonian analysis of BF field theories”, Int.J.Mod.Phys. A26 (2011) 3013-3034.

R. Cartas Fuentevilla, A. Escalante, J. Solano-Altamirano, J. Tlapanco Limon, J. Berra Montiel, “Reconsiderations on the formulation of general relativity based on Riemannian structures”, Gen.Rel.Grav. 43 (2011) 1365-1390.

Academic Memberships

Affiliate member of the American Mathematical Society since August 2017.

Affiliate member of the Dual CP Institute of High Energy Physics since November 2017.

Affiliate member of the Internatonal Society for Relativistic Quantum Information, since 2022.

Affiliate member to the Mexican Mathematical Society.

Meetings and Conferences (recently)

“Quantum computing in phase space”, talk presented at VII Encuentro de Modelado Matemático en Física y Geometría, UAM México, december 1-2, 2022.

Workshop on Mathematical and Conceptual Aspects of Quantum Theory, Casa Matemática Oaxaca, June 12-17, 2022.

“Quantum Information Tools for Loop Quantum Gravity.” Course presented at Mexilazos 2021, Chihuahua, Mex. November 11-12, 2021.

“Quantum computing at planck scale”, talk presented at 2da Conferencia Mexican Hat 2021, IIMAS UNAM, December 2021.

“Quantum information of continuous variables and Loop Quantum Cosmology”, talk presented at Seminario del Cuerpo Academico de Física de Partículas Elementales, BUAP, Puebla, May 27, 2021.

“Quantum information of continuous variables and Loop Quantum Gravity”, talk presented at Seminario Jesús Reyes Corona, BUAP, Puebla, June 11, 2021.

Loop Quantum Gravity Summer School, Paris, June 7-25, 2021.

“Estados Coherentes y Productos Estrella”, talk presented at V Encuentro de Modelado Matemático en Física y Geometría, BUAP, October (2020).

Vienna Summer School 2020 on Gravitational Quantum Physics, University of Vienna, September 3-6, 2020.

“Curiosidades Matemáticas: De agujeros negros al entrelazamiento cuántico”, talk presented at Celebración del Día Internacional de las Matemáticas, UASLP, March 2020.

“Star product representation of path integrals in quantum mechanics and loop quantum cosmology”, talk presented at Primera Conferencia MEXICAN HAT 2020, IMAS UNAM, December (2020).

“Deformation quantizaton and quantum geometry” plenary talk presented at Mexilazos 2019, Centro de Ciencias Matematicas, UNAM campus Morelia (2019).

“Phase space formulation of Loop Quantum Cosmology”, talk presented at XIII Taller de la División de Gravitación y Física Matemática de la Sociedad Mexicana de Física, (2019).

“Polymer quantum mechanics as a deformation quantization” talk presented at the XXVI th International Colloquium on Integrable Systems (ISQS-26), Mathematics Czech Technical University in Prague (2019).

“Towards a representation of Loop Quantum Gravity in the deformation quantization approach”, talk presented at the International Conference on Mathematical Methods in Physics in memory of Ahmed Intissar, Marrakech, Morocco, (2019).

“Aspects in loop quantum gravity within the formalism of deformation quantization”, talk presented at reunión de trabajo sobre el tema de “Cuantización por deformación y sus aplicaciones” Centro de Colaboración Samuel Gitler, Cinvestav, México (2019).

“Phase space representation of polymer quantum mechanics”, talk presented at Mathematical and Conceptual Aspects of Quantum Theory, Centro de Ciencias Matematicas UNAM, Morelia, Mexico (2018).

“Phase space representation of polymer quantum mechanics”, talk presented at Theoretical Particle Physics and Cosmology seminar series at King’s College London, London , England (2018).

“Singular representations of quantum mechanics in deformation quantization”, talk presented at Colima Workshop in Geometry 2018, UCOL, Colima, México (2018).

“The polymer representation of the scalar field in deformation quantization”, talk presented at III Encuentro de Modelado Matemático en Física y Geometría, UNACH, MCTP, Chiapas, México (2018).

“New representations in quantum gravity”, talk presented at Seminario del Cuerpo Académico de Partículas, Campos y Relatividad General, BUAP, Puebla, México (2018).

“The loop representation of Quantum Gravity as a deformation quantization”, talk presented at The 27th Workshop on General Relativity and Gravitation in Japan, JRGR27, Hiroshima, Japan (2017).

“Polymer Quantum Mechanics as a Deformations Quantization”, talk presented at Mexilazos 2017, Instituto de Ciencias Nucleares, UNAM (2017).

“Quantum gravity meets the Riemann hypothesis”, talk presented at Seminar of Physics Department of King’s College London (2017).

“The loop representation in phase space quantum mechanics”, talk presented at 4th International Conference on Mathematics and its Applications, BUAP (2017).

“New applications of distribiutions in geometry”, talk presented at 4th International Conference on Mathematics and its Applications, BUAP (2017).

“Quantum gravity and the Riemann conjecture”, talk presented at X Taller de Algebra y Topología, UAM-UASLP, (2016).

Third Mexican Worksop in Fractional Calculus, Zacatecas, México (2016).

“Cuantización por lazos y la conjetura de Riemann”, talk presented at Seminario del Instituto de Física BUAP, Puebla (2016).

“Multisymplectic geometry and its applications ”, talk presented at Third International Conference on Mathematics and its Applications, Puebla, Mex. (2016).

“Gravedad Cuántica y la Hipótesis de Riemann”, talk presented at Third International Conference on Mathematics and its Applications, Puebla, Mex. (2016).

“Deformation quantization of higher derivative theories”, talk presented at I Escola Patricio Letelier de Física-Matemática, Ubu, Espiritu Santo, Brasil (2016) .

“The Unruh and Hawing effects in higher derivative theories”, talk presented at I Workshop on Geometry and Physics, San Luis Potosí, SLP. (2015).

“Cuantización por deformación de teorías con derivadas de alto orden”, talk presented at 48 Congreso Nacional de Matemáticas, Hermosillo, Sonora (2015).

“Estructuras de Poisson covariantes y su cuantización”, talk presented at Segundo Congreso Internacional de Matemáticas y sus Aplicaciones, Puebla, Mex. (2015).

“Deformation quantization o higher derivative theories”, talk presented at Mexi-Lazos 2015, UNAM México (2015).

“Covariant Poisson structures in Hamiltonian field theories”, talk presented at V Taller de Geometría y Sistemas Dinámicos, San Carlos Sonora, México (2015).

“Estructuras de Poisson covariantes y su cuantización”, tal presented at IX Taller en Algebra y Topología, Universidad Autónoma de Morelos (2015).

“Cuantización por deformación de estructuras covariantes”, talk presented at Encuentro de Geometría, Campos y Cuantización , San Luis Potosí, SLP. (2015).

“Some aspects of multisymplectic field theories”, talk presented at Mexilazos 2014, Puebla, México (2014).

“Refinde Algebraic Quantization”, seminar presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2013).

“Black Holes and AdS/CFT”, seminar presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2013).

“Quantum Landscape”, Perimeter Institute, Waterloo Canada, 2013.

“Canonical formulation of diffeomorphisms invariant systems” IX Taller de Geometría y Sistemas Dinámicos, Departamento de Matemáticas, Universidad de Sonora (2013).

School on Ricci Flows, CIMAT, Guanajuato Mex. (2012).

Quantum Fest, Mathematical Physics and Quantum Theory, Departamento de Física del CINVESTAV. (2012).

XX Anual meeting DGFM–SFM, Mexico DF, Marzo (2012).

Mextrings '12, Taller de Mexicuerdas/ Mexstrings, Universidad Autónoma de México, (2012).

Dual CP Institute of High Energy Physics, “News from LHC”, University of Puebla, Mex. (2012).

“Hamiltonian analysis of three dimensional gravity revisited: From a a pure Dirac's analysis to the consistent discretization approach”, talk presented in the IX Workshop on Gravitation, Mathematics and Physics, Colima Universtity, Mexico (2011).

Solomon Lefschetz Memorial Lecture Series, Mathermatics Department, CINVESTAV, Mexico (2011).

Workshop on 3-manifolds, at the Center of Mathematics Research (CIMAT), Mex. (2011).

Workshop on Symplectic and Poisson Geometry, (2011), Colima University. Mex.

Workshop on Differental Geometry, Center of Mathematics Research (CIMAT), Mex. (2011).

“Quantum Geometry and atoms of spacetime”, talk presented in The Conference of Gravitation and Particle Physics, Puebla University (2011), Mex.

Organizing events

56th National Congress on Mathematics (56 Congreso Nacional de la Sociedad Mexicana de Matemáticas), Universidad Autónoma de San Luis Potosí, October 22-27, 2023.

Seminario de Matemáticas Aplicadas, Facultad de Ciencias, Universidad Autonoma de San Luis Potosí, January-June, 2023.

XIV Taller de la División de Gravitación y Fisica Matemática de la Sociedad Mexicana de Física, Facultad de Ciencias, UASLP, November 14-18, 2022.

Mexican Hat 2022, IIMAS UNAM, december 8-9, 2022.

Winter Meeting on Geometry and Physics, UASLP, San Luis Potosí, Mexico, March 2022.

54 Congreso Nacional de la Sociedad Mexicana de Matemáticas, BUAP, October 18-22, 2022.

Winter Meeting on Geometry and Physics, UASLP, San Luis Potosí, Mexico, March 2021.

Winter Meeting on Geometry and Physics, UASLP, San Luis Potosí, Mexico, February 2020.

Winter Meeting on Geometry and Physics, UASLP, San Luis Potosí, Mexico, January 2019.

Autumn School on Mathematics and Applications (Escuela de Otoño de Matematicas y sus Aplicaciones), Facultad de Ciencias, UASLP, San Luis Potosí, Mexico, October 2018.

Mexilazos 2016, Facultad de Ciencias, UASLP, San Luis Potosí, Mex. (November 2016).

Centenary of Einstein's General Relativity (Centenario de la Relatividad General de Einstein), en conjunto con el Museo Laberinto de las Ciencias y Artes, San Luis Potosí, de Novimbre 2015-Julio 2016.

8^{th} Summer School together with University of Valencia (8va Escuela de Verano Conjunta), Universidad de Valencia-UASLP, San Luis Potosí, (2016).

I Workshop on Geometry and Pyhsics, UNAM-Morelia, UASLP, San Luis Potosí (2015).

Scientific divulgation

“Beyond quantum computing: exploring new frontiers of the cosmos”, (“Más allá de la computación cuántica: explorando nuevas fronteras del cosmos”), Jornadas de Divulgación Científica, Tecnológico Nacional de México, San Luis Potosí, March 23, 2023.

Noche de las Estrellas San Luis Potosí, Museo Laberinto de las Ciencias y las Artes, San Luis Potosí, December 3, 2022. Workshop presented: The Quantum Universe.

Jornada de Divulgación de Ciencia y Tecnología Primavera 2022, BUAP, Puebla, February 2022. Talk presented: Amor cuántico; una historia de fantasmas y universos paralelos.

“Información Cuántica, Geometría Y Gravedad”, Semana de la Licenciatura en Física, UASLP, San Luis Potosí, October 29, 2021.

“Mathematical Curiosities: From Black holes to quantum entanglement” (“Curiosidades Matemáticas: de agujeros negros al entrelazamiento cuántico”), Pi-day UASLP (2020).

Puertas Abiertas, Facultad de Ciencias, UASLP, September 20, 2019.

Science Pub Quizz, in collaboration with Prismatic, Callejón 7B, San Luis Potosí, December 12, 2019.

“Quantum love: a story of ghosts and parallels universes” (“Amor cuántico: una historia de fantasmas y universos paralelos”), Noche de Libres Pensadores, San Luis Potosí, December 2018.

“ The art of mastering intuition: Black holes and the problem of time” (“El arte de dominar la intuición: Agujeros Negros y el Problema del Tiempo”,) Tuna Tech 2017, Centro de las Artes, San Luis Potosí, 19 and 20 August 2017.

“A tale called time” (“Un cuento llamado tiempo”), Jornada Académica Ciencias en mi Escuela, San Luis Potosí, February 2017.

“A tale called time” (“Un cuento llamado tiempo”), Prismatic IPICYT, San Luis Potosí, December (2016).

“Centenary of Einstein’s General Relativity” (“Centenario de la Relatividad General de Einstein”), en conjunto con el Museo Laberinto de las Ciencias y Artes, San Luis Potosí, de Novimbre 2015-July 2016.

“Black holes and other monsters in the universe” (“Agujeros Negros y otros Monstruos en el Universo”), talks presented at Instituto Cultural Manuel José Othon, San Luis Potosí, Mex. (2016).

Teaching experience and seminars

Graduate level

Quantum Information", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2023).

"Quantum Field Theory", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2022).

"Quantum Information", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2022).

"Algebraic methods in geometry and phsycis", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2021).

"Functional Analysis", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2019).

"Harmonic Analysis", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2019).

"Discrete Dynamical Systems", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2018).

"Functional Analysis applied to Quantum Mechanics" course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autonoma de San Luis Potosí (2018).

"Differential Geometry", course presented in Master program on Mathematics and Mathematical-Physics, Universidad Autónoma de San Luis Potosí (2017).

"Topics in General Relativity", course presented inMaster program on Mathematics and Mathematical-Physics, Universidad Autónoma de San Luis Potosí (2016).

"Quantization of Gauge Theories", course presented iMaster program on Mathematics and Mathematical-Physics, Universidad Autónoma de San Luis Potosí (2015).

Undergraduate level

"Theoretical Physics II (Introduction to Quantum Information)", course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2023).

"Ordinary Differential Equations", course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2022).

"Introduction to Quantum Field Theory", ourse presented in Departamento de Física, Universidad Autonoma de San Luis Potosí (2022).

“Theoretical Physics I”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2022).

“Ordinary Differential Equations”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2022).

“Theoretical Physics II (Introduction to Quantum Information)”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2022).

“Functional Analysis”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2021).

“Variational calculus and optimization”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2021).

“Ordinary Differential Equations”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2021).

“Theoretical Physics II (Introduction to Quantum Information)”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2021).

“Variational calculus and optimization”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2020).

“Theoretical Physics I”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2020).

“Fourier Analysis”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2020).

“Theoretical Physics II (Differential geometry and fiber bunles)”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2020).

“Theoretical Physics I”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2019).

“Ordinary Differential Equations”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2019).

“Dynamical Systems”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2018).

“Theoretical Physics I”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2018).

“Fourier Analysis”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2018).

“Theoretical Physics II”, course presented in Departamento de Matemáticas, Universidad Autonoma de San Luis Potosí (2018).

“Algebra I”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2017).

“Acustics I”, course presented in Departamento de Física, Universidad Autónoma de San Luis Potosí (2017).

“Variational Calculus and Optimization”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2017).

“Quantum Field Theory” course presented in Departamento de Física, Universidad Autónoma de San Luis Potosí (2016).

“Topics in functional analysis”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2016).

“Variational Calculus and Optimization”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2016).

“Ordinary Differential Equations”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2016).

“Introduction to Informatics”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2016).

“Topics in Differential Geometry”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2015).

“Variational Calculus and Optimization”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2015).

“Theoretical Physics II”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2015).

“Integral Calculus in several variables”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2015).

“Topics in Algebra and Geometry”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2014).

“Partial Differential Equations”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2014).

“General Relativity”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2014).

“Probability Theory”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2014).

“Introduction to Informatics”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2014).

“Fundamentals of Mathematics”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2013).

“Advanced Algebra”, course presented in Departamento de Matemáticas, Universidad Autónoma de San Luis Potosí (2013).

“Hopf algebras and quantum groups”, seminar presented in Facultad de Ciencias, Universidad Autonoma de San Luis Potosí, (2012).

“Non Hermitian Quantum Mechanics and Dynamically generated Hilbert spaces”, seminar presented in Facultad de Ciencias, Universidad Autónoma de San Luis Potosí.

“Introducción al análisis armónico y teorías de campo no perturbativas.”, seminar presented in Departamento de Matemáticas, Universidad Autónoma de Puebla (2012).

“Seminar in Loop quantum gravity”, seminar presented in Departamento de Matemáticas, Universidad Autónoma de Puebla, (2011).

“Introduction to C* algebras and quantum mechanics for mathematicians”, seminar presented in Departamento de Matemáticas, Universidad Autónoma de Puebla.(2010).

“Introduction to string theory”, seminar presented in Instituto de Física, Luis Rivera Terrazas, Universidad Autónoma de Puebla, (2009).

“ Fiber Bundles and application to physics”, seminar presented in Instituto de Física, Luis Rivera Terrazas, Universidad Autónoma de Puebla, (2009).

“Differential Geometry, Topology and Physics “, seminar presented in Instituto de Física, Luis Rivera Terrazas, Universidad Autónoma de Puebla, (2009).

Distinctions

National Research Grant for Basic Science CB-283838 SEP-Conacyt, “Loop Quantum Gravity in the Deformation Quantization formalism” (2018-2022).

Sistema Nacional de Investigadores, SNI, CONACyT, Nivel: I, January 2017-December 2024.

Perfil PROMEP UASLP, July 2016–present day

Sistema Nacional de Investigadores, SNI, CONACyT, Nivel: Candidato , January 2014-December 2016.

Cum Luade , PhD in Mathematics, Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Puebla ,2012.

Magna Cum Luade, MsC in Mathematics, Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Puebla , 2009.

Research Students

Graduate Level

Daniel Arturo Morales Tovar, Phase Space Quantization methods in Relativistic Quantum Information, Instituto de Física, BUAP, (work in progress).

Victor A. Amador Ortega, Harvesting correlations of the polymer scalar field in Loop Quantum Gravity, Facultad de Ciencias, Master program in Mathematics and Mathematical Physics, UASLP (2023).

Eduardo Torres Cordero, The Star Product in Loop Quantum Cosmology, Facultad de Ciencias, Master program in Mathematics and Mathematical Physics, UASLP (2023).

Jonathan Trinidad, Superfluids in polymer quantum mechanics, Facultad de Ciencias, Master program in Mathematics and Mathematical Physics, UASLP (in collaboration with E. Castellanos), (2020).

Eslava del Rıo Argüelles, Multisymplectic formulation for topologically massive Yang-Mills field theory, Facultad de Ciencias, Maestría en Matemáticas y Física Matemática, UASLP (in collaboration with Alberto Molgado, 2017).

David Serrano Blanco, Moyal product in polymomentum phase-space, Facultad de Ciencias, Maestría en Matemáticas y Física Matemática , UASLP (in collaboration with Alberto Molgado, 2017).

Undergraduate Level

Daniel Bear, Phase space representation of Quantum Algorithms, acultad de Ciencias, UASLP, (work in progress).

Gustavo Mora, The tomographic representation of higher derivative theories, Facultad de Ciencias, UASLP, (work in progress).

Daniel Arturo Morales Tovar, Analysis of the Unruh effect for a scalar field , Facultad de Ciencias, UASLP, (2022).

Eduardo Torres, Representations of quantum mechanics on the Snyder space, Licenciatura en Física, UASLP, (in collaboration with J.A. Vallejo), (2019).

Otoniel Enoc Hernandez Agundis, Non-commutative quantization of the Pais-Uhlenbeck oscillator, Licenciatura en Física, UASLP, (in collaboration with Alberto Molgado) (2018).

Abiel Ortiz, Variational formulation of the covariant Schrödinger equation, Licenciatura en Matemáticas, UASLP, (in collaboration with Alberto Molgado) (2018).

Angel Manuel Rodríguez López, The Wigner function of SU(1,1) invariant models, UASLP, (in collaboration with Alberto Molgado) (2017).

Alma Edith López Rentería, Mathematical study of the Hyperbolic Heat Equation, Facultad de Ciencias, UASLP (in collaboration with J. A. Vallejo, 2018).

Johann Edir Hernández, Polymer quantization of the Liouville model, Licenciatura en Física, UASLP (in collaboration with Alberto Molgado) (2017).

Eslava del Río Argüelles, Poisson structures associated to Bianchi cosmological models, Facultad de Ciencias, UASLP (in collaboration with Alberto Molgado, 2015).

David Serrano Blanco, The Wigner function of SL(2, R) symmetric models, Facultad de Ciencias, UASLP (in collaboration with Alberto Molgado, 2015).

Jairo Javier Martínez Montoya, Poisson structures and non-autonomous systems, Facultad de Ciencias, UASLP (in collaboration with Alberto Molgado, 2014)

David Hernández Granados, Uso del software libre R para la enseñanza de la Estadística a nivel medio superior, Licenciatura en Matemáticas, UASLP (in collaboration with Antonio Morante Lezama) (2015)

Outreach

Evaluating commission Postdoctoral Fellowships 2018, CONACyT, Mexico 2023.

Evaluating commision at National Frontier Science projects, CONACyT, 2023.

Jury at ExpoCiencias Nacional 2022, Decembre 6-9, 2022.

Participant in 2022 Science Summer programme as host researcher (National mode), 6 June to 15 July, 2022.

Participant in 2021 Science Summer programme as host researcher (National mode), 21 June to 16 July, 2021.

Participant in 2019 Science Summer programme as host researcher (National mode), 3 June to 12 July, 2019.

Jury at the XXI Concurso Nacional de Prototipos y II Encuentro Nacional de Emprendedores 2019, San Luis Potosi, Mexico, 26 February 2019.

Participant in UASLP 2018 Science Summer programme as host researcher (National mode), 08 June to 17 July, 2018.

Evaluating commission Convocatoria de Investigación Científica Básica 2017-2018 CONACyT, Mexico 2018.

Evaluating commission Postdoctoral Fellowships 2018, CONACyT, Mexico 2018.

Jury at the XIX Concurso Nacional de Prototipos 2017, San Luis Potosi, Mexico, 24-25 May, 2017.

Participant in UASLP 2015 Science Summer programme as host researcher (National mode), 08 June to 17 July, 2017.

Participant in UASLP 2015 Science Summer programme as host researcher (National mode), 06 June to 20 July, 2016.

Jury at the XVI Concurso Nacional de Prototipos 2014 (Etapa estatal), DGETI-SLP, San Luis Potosi, Mexico, 26 February, 2014.

Lines of Research

Deformation quantization and phase pace quantum mechanics.
Quantum gravity and quantum cosmology
Relativistic Quantum Information and Quantum Computing
Differential and Symplectic Geometry.

Languages

Spanish (Native)
English-very good knowledge of written and spoken.
Italian-very good knowledge of written and spoken.

Personal References

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