
Bogar Díaz Jiménez

Personal data

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Publons (P): [G-7210-2019](https://publons.com/author/publons/G-7210-2019)

Google citations (G): [Bogar Díaz](https://scholar.google.com/citations?user=BogarDiaz)

Citations: G 72, P 52

h-index: G 5, P 4

Birthdate: January 13, 1987

Citizenship: Mexican

Address: Madrid, Spain

Research interest

I am currently working at the Department of Mathematics, UC3M. My research lies within the field of mathematical and theoretical physics. I am interested in the study of classical and quantum aspects of general relativity, and field theory. But, I also make research in atmosphere thermodynamics, percolation theory, and quantum information theory.

Current position

Mathematics department, Universidad Carlos III de Madrid, Spain - UC3M
Conex-Plus Marie Curie postdoctoral fellow

With *Eduardo J. S. Villaseñor*

March 2021 - PRESENT

Professional Experience

Mathematics department, Universidad Carlos III de Madrid, Spain - UC3M
Conex-Plus Marie Curie postdoctoral fellow

With *Eduardo J. S. Villaseñor*

March 2021 - PRESENT

Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México, Mexico - DGAPA postdoctoral fellow

With *J. David Vergara*

October 2018 - March 2021

Instituto de Estructura de la Materia, Consejo Superior de Investigaciones Científicas, Spain - CONACyT postdoctoral fellow

With *J. Fernando Barbero G.*

October 2018 - September 2020

Facultad de Ciencias Físico Matemáticas, Benemérita Universidad Autónoma de Puebla, Mexico - *Postdoctoral researcher*

With *Gerardo F. Torres del Castillo*

March 2017 - September 2018

Education

Facultad de Ciencias Físico Matemáticas, Benemérita Universidad Autónoma de Puebla, México - *PhD (Applied Physics)*

August 2012 - January 2017

- Thesis: Geometric approach to Lagrangian systems

Facultad de Ciencias Físico Matemáticas, Benemérita Universidad Autónoma de Puebla, México - *MsC (Applied Physics)*

August 2010 - July 2012

- Thesis: Symplectic structures for continuous systems and fields (in Spanish).
- Distinction: Cum Laude

Facultad de Ciencias Físico Matemáticas, Benemérita Universidad Autónoma de Puebla, México - *B.S (Physics)*

August 2005 - May 2010

- Thesis: Multipole expansion of the electromagnetic fields (in Spanish).
- Distinction: Cum Laude

Research funding:

Total amount €27,000.00

2021-2024: Project title: “Geometric Approach to Physical Field Theories in the Presence of Boundaries”, €27,000.00. (Euros)

Total amount \$145,000.00

2020: Project title: “Analysis of the spatio-temporal propagation process of COVID-19 in Puebla state”, \$145,000.00. (Mexican pesos)

Publications in JCR journals

For an up to date list of my publications, please visit my academic profiles at ORCID, Google Scholar or ResearchGate

14 articles (13 published, 1 accepted)

Citations: Google 72, Publons 52

h-index: Google 5, Publons 4

- 1) Diana Rosales Herrera, J. E. Ramírez, Jorge Velázquez-Castro, **Bogar Díaz**, M. I. Martínez, P. Vázquez Juárez, and A. Fernández Téllez
Mobility strategies based on percolation theory to avoid the spread of diseases: COVID-19
Accepted for publication in Revista Mexicana de Física
ArXiv: [2105.10934](https://arxiv.org/abs/2105.10934)
- 2) J. E. Ramírez, **Bogar Díaz** and C. Pajares
Interacting color strings as the origin of the liquid behavior of the quark-gluon plasma.
Physical Review D 103 (2021) 094029
DOI: [10.1103/PhysRevD.103.094029](https://doi.org/10.1103/PhysRevD.103.094029)
- 3) J. Fernando Barbero G., **Bogar Díaz**, Juan Margalef-Bentabol, and Eduardo J.S. Villaseñor
Hamiltonian Gotay-Nester-Hinds analysis of the parametrized unimodular extension of the Holst action.
Physical Review D 103 (2021) 064062
DOI: [10.1103/PhysRevD.103.064062](https://doi.org/10.1103/PhysRevD.103.064062)
- 4) J. Fernando Barbero G., **Bogar Díaz**, Juan Margalef-Bentabol, and Eduardo J.S. Villaseñor
Concise symplectic formulation for tetrad gravity.
Physical Review D 103 (2021) 024051
DOI: [10.1103/PhysRevD.103.024051](https://doi.org/10.1103/PhysRevD.103.024051)
- 5) **Bogar Díaz** and J. E. Ramírez
Adiabatic lapse rate of nonideal gases: The role of molecular interactions and vibrations.
Physical Review E 102 (2020) 042197
DOI: [10.1103/PhysRevE.102.042107](https://doi.org/10.1103/PhysRevE.102.042107)
- 6) J. Fernando Barbero G., **Bogar Díaz**, Juan Margalef-Bentabol, and Eduardo J.S. Villaseñor
Generalizations of the Pontryagin and Husain-Kuchař actions to manifolds with boundary
Journal of High Energy Physics 2019 (2019) 121
DOI: [10.1007/JHEP10\(2019\)121](https://doi.org/10.1007/JHEP10(2019)121)
- 7) J. Fernando Barbero G., **Bogar Díaz**, Juan Margalef-Bentabol, and Eduardo J.S. Villaseñor
Dirac's algorithm in the presence of boundaries: a practical guide to a geometric approach
Classical and Quantum Gravity 36 (2019) 205014
DOI: [10.1088/1361-6382/ab436b](https://doi.org/10.1088/1361-6382/ab436b)

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- 8) Emilio Alvarez Navarro, **Bogar Díaz**, Miguel Ángel García-Ariza, and J.E. Ramírez.
Effects of the second virial coefficient on the adiabatic lapse rate of dry atmospheres
The European Physical Journal Plus 134 (2019) 458
DOI: [10.1140/epjp/i2019-12826-4](https://doi.org/10.1140/epjp/i2019-12826-4)

 - 9) Merced Montesinos, Rodrigo Romero, and **Bogar Díaz**
Symmetries of first-order Lovelock gravity
Classical and Quantum Gravity 35 (2018) 235015
DOI: [10.1088/1361-6382/aaea21](https://doi.org/10.1088/1361-6382/aaea21)

 - 10) **Bogar Díaz** and Merced Montesinos
Geometric Lagrangian approach to the physical degree of freedom count in field theory
Journal of Mathematical Physics 59 (2018) 052901
DOI: [10.1063/1.5008740](https://doi.org/10.1063/1.5008740)

 - 11) Merced Montesinos, Diego González, Mariano Celada, and **Bogar Díaz**
Reformulation of the symmetries of first-order general relativity
Classical and Quantum Gravity 34 (2017) 205002
DOI: [10.1088/1361-6382/aa89f3](https://doi.org/10.1088/1361-6382/aa89f3)

 - 12) **Bogar Díaz**, Daniel Higueta, and Merced Montesinos
Lagrangian approach to the physical degree of freedom count
Journal of Mathematical Physics 55 (2014) 122901
DOI: [10.1063/1.4903183](https://doi.org/10.1063/1.4903183)

 - 13) **Bogar Díaz**, Elizabeth Galindo-Linares, Cupatitzio Ramírez-Romero, Gilberto Silva-Ortigoza, Román Suárez-Xique, Gerardo F. Torres del Castillo, and Mercedes Velázquez
Noether symmetries in the phase space
AIP Advances 4 (2014) 097135
DOI: [10.1063/1.4896601](https://doi.org/10.1063/1.4896601)

 - 14) **Bogar Díaz** and Gerardo F. Torres del Castillo
Maxwell Equations Solution Using Spin-weighted Spherical Harmonics
AIP Conference Proceedings 1361 (2011) 383
DOI: [10.1063/1.3622733](https://doi.org/10.1063/1.3622733)

Teaching activities

2017-present: 3 undergraduate courses (Physics and Mathematics programs).

2017-present: 3 graduate courses (master program in Physics).

Delivered talks at conferences

1. *Diseño y construcción de un telescopio binocular* 2006
Sociedad Mexicana de Física. Congreso Nacional de Física
2. *Construcción y Caracterización de R* 2007
Benemérita Universidad Autónoma de Puebla. Tercera Gran Semana Nacional de la Matemática
3. *Digitalización de señales analógicas generadas por muones atmosféricos en contadores de centelleo* 2007
Sociedad Mexicana de Física. Congreso Nacional de Física
4. *Reproducción del experimento de Joule* 2007
Sociedad Mexicana de Física. Congreso Nacional de Física
5. *Operadores relacionados con separación de variables* 2008
Sociedad Mexicana de Física. Congreso Nacional de Física
6. *Maxwell Equations Solution Using Spin-weighted Spherical Harmonics* 2009
Sociedad Mexicana de Física. XII Mexican Workshop on particles and fields
7. *Desarrollo multipolar de los campos electromagnéticos* 2010
Sociedad Mexicana de Física. VIII Taller de la División de Gravitación y Física Matemática
8. *Un panorama de las teorías con dimensiones extra* 2011
Benemérita Universidad Autónoma de Puebla. Séptima Gran Semana Nacional de la Matemática
9. *Estructuras simplécticas para sistemas continuos y campos* 2012
Benemérita Universidad Autónoma de Puebla. Octava Gran Semana Nacional de la Matemática
10. *Symplectic structure for continuous systems and fields* 2012
Sociedad Mexicana de Física. IX escuela de la DGFM: Cosmología para el siglo XXI
11. *Gravedad linealizada como teoría tipo BF* 2013
Seminar, Grupo de Geometría y Gravitación del departamento de Física, CINVESTAV-IPN
12. *Gravedad Linealizada con teoría tipo BF* 2013
Benemérita Universidad Autónoma de Puebla. Novena Gran Semana Nacional de la Matemática
13. *Alternative Lagrangian formulations for linearized general relativity* 2013
Universidad Autónoma Metropolitana. Mexilazos 2013
14. *Alternative Lagrangian formulations for linearized general relativity* 2014
Centre de Physique Théorique. Frontiers of fundamental physics

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15. *Simetrías variacionales y no variacionales de $\dot{x}=0$* 2014
Benemérita Universidad Autónoma de Puebla. First International Conference on Mathematics and Its Applications
 16. *Lagrangian approach to the physical degree of freedom count* 2014
Benemérita Universidad Autónoma de Puebla. First International Conference on Mathematics and Its Applications
 17. *Lagrangian approach to the physical degree of freedom count* 2014
Benemérita Universidad Autónoma de Puebla. MexiLazos 2014
 18. *Lagrangian approach to the physical degree of freedom count in field theory* 2016
Partículas, Campos y Relatividad General seminar, FCFM-BUAP
 19. *Reformulation of the symmetries of first-order general relativity* 2017
Benemérita Universidad Autónoma de Puebla. Fourth International Conference on Mathematics and Its Applications
 20. *Transformaciones de norma y relatividad general* 2018
Student Seminar, Física-matemática y gravitación, FCFM-BUAP
 21. *Alternative Description of the Gauge Symmetries of General Relativity* 2018
Universidad de las Américas Puebla (UDLAP). VIII Congreso de Física y Matemáticas
 22. *Descripción alternativa de las simetrías de norma de relatividad general en el formalismo de primer orden* 2018
Seminar, Centro Universitario de los Valles, Universidad de Guadalajara

Conference organization

- A. Organizer of the *Novena Gran Semana Nacional de la Matemática (9GSNM)* 2013
Benemérita Universidad Autónoma de Puebla
- B. Organizer of the *First International Conference on Mathematics and Its Applications (1CIMA)* 2014
Benemérita Universidad Autónoma de Puebla
- C. Organizer of the *Second International Conference on Mathematics and Its Applications (2CIMA)* 2015
Benemérita Universidad Autónoma de Puebla
- D. Organizer of the *Third International Conference on Mathematics and Its Applications (3CIMA)* 2016
Benemérita Universidad Autónoma de Puebla
- E. Organizer of the *Fourth International Conference on Mathematics and Its Applications (4CIMA)* 2017
Benemérita Universidad Autónoma de Puebla

Conferences-Courses attended

- *XII Mexican Workshop on particles and fields 2009*
Sociedad Mexicana de Física
- *Loops 13 2013*
Perimeter Institute
- *Sigrav Graduate School- XI Editionn “Gravity and the Quantum” 2014*
Lake Como school of advanced studies
- *Loops15 2015*
Friedrich-Alexander Universität
- *Fourteenth Marcel Grossmann Meeting 2015*
ICRA

Committee for revision of theses

2017-present: 1 Bachelor theses

Referee

AIP Advances

Participation in activities to promote research

- ❑ *Efecto de traslaciones complejas en las funciones especiales 2012*
Programa Jóvenes Investigadores, VIEP-Benemérita Universidad Autónoma de Puebla
- ❑ Referee in *XXIV Concurso Estatal de Aparatos y Experimentos de Física 2014*
División regional de Puebla de la Sociedad Mexicana de Física.