

Cristian G. Bernal

Curriculum Vitae



*What we know is a drop, what we don't know is an ocean.
– Isaac Newton*

PERSONAL INFORMATION

Full Name Cristian Giovanni Bernal
Nationality Colombian
CellPhone +57 3161101752
Work E-mail cribernal@unal.edu.co
Work Address Universidad Nacional de Colombia, Bogotá, D.C., Colombia.
Website <http://www.astrofluidos-unal.edu.co/>

FORMAL EDUCATION

2009 **Ph.D. in Science (Astrophysics)**, *Instituto de Astronomía*, UNAM, México DF, México.
Home: <http://www.astroscu.unam.mx/>.

PH.D. THESIS

Title *Where is the NS1987A in the SN1987A?*
Advisors Dr. Dany Page Rollinet & Dr. William Lee Alardín
Description MHD simulations of the hypercritical accretion onto neutron star surfaces. The SN1987A scenario was revisited.

2005 **M.S. in Science (Astronomy)**, *Instituto de Astronomía*, UNAM, México DF, México.
Home: <http://www.astroscu.unam.mx/>.

MASTER THESIS

Title *No Master Thesis. Instead a general test about Astronomy and Astrophysics, including a presentation about a novel subject in astrophysics.*
Advisor Dr. William Lee Alardín
Description Presentation about the Exoplanets, in particular, the Hot Jupiters and the planetary migration models.

2002 **B.S. in Physics**, *Facultad de Ciencias, Departamento de Física*, Universidad del Valle, Cali, Colombia.
Home: <http://www.univalle.edu.co>.

UNDERGRADUATE THESIS

Title *Direct Transport in Harmonically Forced 1D Dispersion.*
Advisors Dr. Thomas Dittrich & Dr. Pedro Prieto
Description An application of the *Mesoscopic Chaos Theory* for the energy transport in quantum potential well chains.

COMPLEMENTARY EDUCATION

- 2024 *Diploma in university teaching – UNAL* (3 months.) Online, Bogotá, Colombia.
- 2024 *Full courses on Artificial Intelligence for Research and Education – OpenAI, Anthropic, GoogleLab* (100 h.) Online, Rio Grande, RS, Brazil.
- 2020 *Virtual Learning Environment using the Modular Object Oriented Dynamic Learning Environment – VLE MOODLE.* (80 h.) Universidade Federal de Rio Grande, Rio Grande, RS, Brazil.
- 2015 *First Astrobiology School at the Observatório Nacional and 19th Advanced School of Astrophysics.* (100 h.) Observatório Nacional-MCTI, Rio de Janeiro, Brazil.
- 2014 *Mexican Astrophysics School Look & Listen.* (80 h.) UNAM, Playa del Carmen, México.
- 2013 *First Winter School of Valongo Observatory.* (50 h.) Observatorio do Valongo, Rio de Janeiro, Brazil.
- 2011 *School and Conference on Analytical and Computational Astrophysics.* (200 h.), International Center For Theoretical Physics, ICTP, Trieste, Italy.
- 2008 *Workshop For Parallel Computing in Astrophysics.* (80 h.) University of Toronto, Toronto, Canada.
- 2006 *Fourth Advanced Chilean School of Astrophysics.* (50 h.) European Southern Observatory, ESO, Santiago de Chile, Chile.
- 2003 *Summer School in Cosmology and Astroparticles Physics.* (200 h.) International Center for Theoretical Physics, ICTP, Trieste, Italy.

SCHOLARSHIPS

- Postdoctoral **Project - Plasma-dynamics around compact stars**
Science without Borders Program, IF-UFF, Niterói, Brazil, 2014–2016.
- Postdoctoral **Project - Physics and astrophysics of neutron stars**
Consejo Nacional de Ciencia y Tecnología (CONACyT), IA-UNAM, México, 2011–2013.
- Postdoctoral **Project - The missing pulsar in SN1987A**
Instituto de Ciencia y Tecnología del Distrito Federal & Centro Latinoamericano de Física (ICyTDF/CLAF), ESFM-IPN, México, 2010–2011.
- Doctorate **PhD in Science (Astrophysics)**
Dirección General de Estudios de Posgrado (DGEP), IA-UNAM - México, 2005–2009.
- Master **M.S. in Science (Astronomy)**
Consejo Nacional de Ciencia y Tecnología (CONACyT), IA-UNAM, México, 2003–2005.

EMPLOYMENT HISTORY

- 2024–Today **Universidad Nacional de Colombia - UNAL:** I have restarted my academic career at the best university in Colombia. I was hired as Researcher/Teacher in the big field of astrophysical fluids. During the next few months I will be teaching Physics and Astrophysics in both graduate and postgraduate levels, carrying out advanced research and university outreach activities.
- 2016–2024 **Universidade Federal de Rio Grande - FURG:** I was working as Researcher/Teacher at the Institute of Mathematics, Statistics and Physics, IMEF-FURG (Brazil). The courses I taught were related to Physics and Astrophysics. During this period I collaborated on various international research projects. As member of the postgraduate programs, I advised five Master's students and five bachelor students.
- 2010–2016 **Postdoctoral Contracts:** During my postdoctoral contracts (IA-UNAM, ESFM-IPN México & IF-UFF Brazil), I was focused mainly on scientific research. However, I had the opportunity to teach some short courses on Astrophysics and Classical Mechanics. Also, I teach a postgraduate course on Astrophysical Hydrodynamics at ESFM-IPN México.

SCIENTIFIC INTERESTS

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|----------------------------|---|
| Theoretical Astrophysics | Compact Objects in Astrophysics (White Dwarfs, Neutron Stars and Black Holes); Accretion Processes at all Scales; Astrophysical Jets; Supernovae; Astrophysical Plasmas; Pulsar Magnetospheres; Gravitation; Astroparticles. |
| Computational Astrophysics | Numerical Simulations of Astrophysical Accretion Flows using a multi-physics parallel code that include gravitational and magnetic fields, complex equations of state and mixing of several elements. Also, Stellar Evolution and its compact remnants are studied using various numerical tools. |
| General Astronomy | Solar System; ExtraSolar Planets; Evaporation of Exoplanetary Atmospheres; Interstellar Medium; Astronautic and Space Sciences. |
| Cosmology | Theoretical Models and Computational Cosmological Simulations; The Early Universe; The Fate of our Universe. |

SCIENTIFIC PROJECTS

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| Education | Astro-Physics Online: <i>Project Leader.</i> Teaching project that proposes a computational approach in the classroom. Física-UNAL-Bogotá, Colombia. 2024-Today. |
| Outreach | Sharing the Universe: <i>Project Leader.</i> Project that proposes to disseminate astronomical and physical knowledge through several channels: lectures, astronomical observations, websites, blogs and scientific news. Física-UNAL-Bogotá, Colombia. 2024-Today. |
| Research | High Energy Computational Astrophysics: <i>Project Leader.</i> Associate Students: Henrique Hirsch, Ana Beatriz Minari and Joelson Sartori. IMEF-FURG, Brazil & Física-UNAL-Bogotá, Colombia. 2020-Today. Astrophysics of Compact Stars: <i>Project Leader.</i> Associate Students: Henrique Hirsch, Ana Beatriz Minari, Lucas Selbach. IMEF-FURG, Brazil & Física-UNAL-Bogotá, Colombia. 2020-Today. Astrophysical Plasma-Dynamics in the Gamma-Ray Bursts Scenario: <i>Project Leader.</i> Associate Researcher: Dr. Nissim Illich Fraija. Associate Students: Augusto Calígula, Henrique Hirsch, Ana Beatriz Minari. FURG-UNAM, Brazil & Física-UNAL-Bogotá, Colombia. 2017-Today. |
| Finished | Astro&physics in the classroom: <i>Project Leader.</i> Teaching project that proposes a computational approach in the classroom. IMEF-FURG, Brazil. 2020-2024. The universe in the evenings: <i>Project Leader.</i> Project that proposes to disseminate astronomical and physical knowledge through several channels: lectures, astronomical observations, websites, blogs and scientific news. IMEF-FURG, Brazil. 2017-2024. Astronomic Observatory at FURG: <i>Associate Researcher.</i> Project responsible for coordinating the proposal, construction, coordination and administration of an Astronomical Observatory at FURG. IMEF-FURG, Brazil. 2017-2024. The Dynamics of Supernova Remnants: <i>Associate Researcher.</i> Project Leader: Dr. Fabio de Colle. Associate Student: M.S. Felipe Vargas. FURG-UNAM, Brazil, 2019-2020. Interaction Between Solar Wind and the Martian Atmosphere: <i>Project Leader.</i> Associate Researcher: Dr. Primoz Kajdic. Associate Student: Laura Neves do Amaral. FURG-UNAM, Brazil, 2017-2019. Central Compact Objects in Supernova Remnants: <i>Project Leader.</i> Associate Researcher: Dr. Nissim Illich Fraija. FURG-UNAM, Brazil, 2016-2018. Numerical Studies of Astrophysical Emission Processes from Neutron Stars: <i>Associate Researcher.</i> Project Leader: Dr. Rodrigo Picanço Negreiros. IF-UFF, CAPES. Brazil 2014-2016. Drag Force of a Type-Plumer Perturber Immersed in a Gaseous Medium: <i>Associate Researcher.</i> Project Leader: Dr. Javier Sánchez Salcedo. IA-UNAM, CONACyT, México, 2013-2014. |

Physics and Astrophysics of Neutron Stars: *Associate Researcher.* Project Leader: Dr. Dany Page Rollinet. IA-UNAM, CONACyT, México, 2011-2013.

The Missing Pulsar in SN1987A: *Associate Researcher.* Project Leader: Dr. Ana Hidalgo Gamez. ESFM-IPN, ICYTDF/CLAF, México, 2010-2011.

Quark Stars Search: *Associate Student.* Project Leader: Dr. Dany Page Rollinet. IA-UNAM, PAPIIT, México, 2008-2009.

Supernova Remnants and the Magnetic Field Importance: *Associate Student.* Project Leader: Dr. Manuel Peimbert Sierra. IA-UNAM, CONACyT, México, 2007-2008.

Dynamic of Galaxies with Interaction: *Associate Student.* Project Leader: Dr. Margarita Rosado. IA-UNAM, PAPIIT IN120802, 2005-2006.

Accretion Hydrodynamics onto Compact Objects: *Associate Student.* Project Leader: Dr. William Lee. IA-UNAM, CONACyT, México, 2004-2005.

The Chemical Evolution in High-Redshift Systems: *Associate Student.* Project Leader: Dr. Leticia Carigi. IA-UNAM, CONACyT, México, 2003-2004.

TEACHING EXPERIENCE

POSTGRADUATE COURSES

- Physics Advanced Topics in Physics (IMEF-FURG Brazil, 2016-2018); Teaching Stage (IMEF-FURG Brazil, 2017-2019, 2023); Master's Dissertation 1&2 (IMEF-FURG Brazil, 2018-2019.)
- Astrophysics Theory of Stellar Evolution (IMEF-FURG Brazil, 2019, 2023); Computational Hydrodynamics in Astrophysics (ESFM-IPN México, 2010; IMEF-FURG Brazil, 2023)

UNDERGRADUATE COURSES

- Physics Fundamental Electromagnetism, Elasticity & Fluids (Física-UNAL-Bogotá, 2024); Fundamental Physics 1&2 (IMEF-FURG Brazil, 2016-2024); Classical Mechanics (IMEF-FURG Brazil, 2016, 2018, 2020-2021, 2023); Physics for Oceanography (IMEF-FURG Brazil, 2017, 2018); Undergraduate Dissertation 1&2 (IMEF-FURG Brazil, 2016-2017, 2020-2022); Physics and Society (IMEF-FURG Brazil, 2017); Topics of Physics 1&2 (IMEF-FURG Brazil, 2019, 2021); Classical Physics (Facultad de Ciencias-UNAM México, 2008.)
- Astrophysics Introduction to Astrophysics (IMEF-FURG Brazil, 2017, 2018, 2019, 2021.); Fundamental Cosmology (IMEF-FURG Brazil, 2020)

OTHER COURSES

- Short Courses Pulsars: The overall properties (IMEF-FURG Brazil, 2022-2023); High Energy Astrophysics: From Supernovae to Active Galaxies (IMEF-FURG Brazil, 2016); The Universe: From its Violent Birth to its Catastrophic Death (IMEF-FURG Brazil, 2017); High Energy Astrophysics: GRBs (IMEF-FURG Brazil, 2016); Astrophysics, Neutron Stars and Pulsars (IF-UFU Brazil, 2017); Numerical Simulations of Astrophysical Fluids (IMEF-FURG Brazil, 2017); Astrophysical Plasmas and Simulations (IF-UIS Colombia, 2013.)
- High-School Teacher of Physics and Mathematics (Nuestra Señora de la Gracia, Colombia, 2001-2002.)

ACADEMIC ADVISORY & GRADUATION BOARD

Master **M.S. Laura Neves do Amaral:** *Comparative Analysis of the Interaction of Mars with Solar Events Transient During a Minimum and a Maximum Solar.* Co-Advisor: Dr. Primoz Kajdic. CAPES, IMEF-FURG, Brazil, 2019.

M.S. Augusto César Calígula: *Analysis of the Spectral Energy Distribution of the GRB170817A/GW170817 Multi-messenger Object.* Co-Advisor: Dr. Nissim Illich Fraija. CAPES, IMEF-FURG, Brazil, 2019.

M.S. Felipe Ventura Vargas: *Supernova & a Nutshell: A Study on the Transition of SN2014c from Type I to Type II.* Co-Advisor: Dr. Fabio de Colle. CAPES, IMEF-FURG, Brazil, 2019.

M.S. Ana Beatriz Minari: *On the late reactivation of millisecond magnetars in the GRB scenario.* Co-Advisor: Dr. Nissim Fraija. CAPES, IMEF-FURG, Brazil, 2024.

M.S. Henrique Hirsch: *Protomagnetars as possible central engines in long GRBs with extended emission.* Co-Advisor: Dr. Nissim Fraija. CAPES, IMEF-FURG, Brazil, 2024.

Undergraduate **Laura Neves do Amaral:** *Solar Winds on Mars.* TCC, IMEF-FURG, Brazil, 2016.

Joelson S. & Davi Kray: *Machine Learning & Pulsars.* TCC, IMEF-FURG, 2020-2021.

Henrique H. & Beatriz Minari: *Accretion Flows.* TCC, IMEF-FURG, 2019-2022.

Boards **Augusto César Calígula:** *PhD Astrophysics Exame.* PhD Advisor: Dr. Nissim Illich Fraija. IA-UNAM, México, 2023.

Felipe Ventura Vargas: *PhD Astrophysics Qualification Exame.* PhD Advisor: Dr. Fabio de Colle. IA-UNAM, México, 2021.

Gibrán Morales Rivera: *PhD Astrophysics Exame.* PhD Advisor: Dr. Nissim Illich Fraija. IA-UNAM, México, 2020.

Lucas Mucaroppi: *The CELESTIA Program as a Tool for Teaching Astronomy.* Undergraduate Advisor: Dr. Luiz Fernando Mackedanz. IMEF-FURG, Brazil, 2018.

Lara Gato: *The Optical Wavelength Classification of OH Mega-Maser Galaxies.* Undergraduate Advisor: Dr. Dinalva Aires de Sales. IMEF-FURG, Brazil, 2017.

Gabriel Lauffer Ramos: *Stellar Pulsation Periods using Conditional Shannon Entropy.* Undergraduate Advisor: Dr. Fabricio Ferrari. IMEF-FURG, Brazil, 2016.

Geferson Lucatelli: *Morphology of Galaxies using MORFOMETRIKA.* Undergraduate Advisor: Dr. Fabricio Ferrari. IMEF-FURG, Brazil, 2016.

OUTREACH & AWARDS

Outreach *Various Talks on Astrophysics for Students and Colleagues in the IMEF-FURG Colloquium.* Rio Grande, Brazil. 2016-2024.

Various Talks on Astronomy for Pedestrian in the Project "Na Praia da Ciência". Rio Grande, Brazil. 2016-2017.

Various Talks on Astrophysics for Students and Colleagues in the IF-UFF Colloquium. Niteroi, Brazil. 2014-2016.

Various Talks on Astrophysics for Students and Colleagues in the IA-UNAM Colloquium. México DF, México. 2010-2013.

Various Talks on Astrophysics for Students and Colleagues in the ESFM IPN Colloquium. México DF, México 2010-2011.

Invited Astronomer for outreach of Astronomy at UNAM (La noche de las estrellas.) México DF, México, 2010, 2012, 2013.

H.E. Astrophysics – Interview for Radio-UNAM, México 2013.

Invited Astronomer for outreach of Astronomy at SAM (Astronomía para todos.) México DF, México, 2012.

Invited Astronomer for outreach of Science in the Seminar "Al Encuentro del Mañana" México DF, México, 2012.

Invited Astronomer for outreach of Astronomy in the event "Eclipse en el Zócalo" México DF, México, 2012.

Terraforming Mars – Interview for "La Jornada", a national newspaper, México 2008.

Awards PhD Thesis with Honorary Mention (Cum Laude)

Honorable Mention Poster Award, ICTP-Trieste, 2011.

Cover Illustration for RCF, Vol 45, No.1, No.2 (2013.)

LANGUAGES

Spanish Fluent (my mother tongue).

English Reading, writing and listening (advanced), speaking (acceptable).

Portuguese Reading, writing, listening and speaking (advanced).

WORKING EXPERIENCE

Operating Systems

All Microsoft Operating Systems™, MacOS™, Linux.

Programming Languages

Procedural Fortran 90, Python, GNUPlot, Google Colaboratory, ChatGPT, Gemini, Claude.
Scientific AMR Flash Code v4.X, VisIt 3.X-Parallel version, MESA code.
Mathematical Mathematica™, Maple™, MatLab™.
Web HTML, Perplexity.

Office Automation

LaTeX, LyX, OverLeaf, Microsoft Office™, MacOS X Iwork™, LibreOffice

SCIENTIFIC CONFERENCES

- Invited Speaker
- *High Energy Astrophysics*. UdeA, Medellín, Colombia, 2022.
 - *A Neutron Star with a Pearl Necklace*. UFT, Palmas, Brazil, 2021.
 - *The Strange Case of SN1987A*. Universidad de Cartagena, Cartagena, Colombia, 2020.
 - *The Chameleon Supernova 2014C*. UFMT, Cuiabá, Brazil, 2019.
 - *Numerical Simulations of Astrophysical Fluids*. 2da Escola de Física do Extremo Sul - EFESUL, Rio Grande, Brazil, 2017.
 - *High Energy Astrophysics - Neutron Stars and Pulsars*. X Semana da Física UFU, Uberlândia, Brazil, 2017.
 - *Revisiting the Spin Evolution of Young Neutron Stars*. The Second ICRANet Cesar Lattes Meeting, Niteroi, Brazil, 2015.
 - *Simulations of Astrophysical Fluids*. Compact Objects Summer Fest, Bucaramanga, Colombia, 2013.
- Local Committee
- *2da Escola de Física do Extremo Sul - EFESUL*. Rio Grande, Brazil, 2017.
 - *XV Latin American Regional IAU Meeting (LARIM)*. Cartagena, Colombia, 2016.
 - *Mexican Astrophysics School Look & Listen - Electromagnetic and Gravitational Waves Signals from Compact Objects*. Playa del Carmen, México, 2014.
- Attended
- *Enredando 2024 - Escuela Iberoamericana de Redes y Sistemas Complejos*. UNAL - Bogotá, Colombia. 2024.
 - *On the Reemergence of a Buried Magnetic Field in NS*. The 7th International Workshop on Astronomy and Relativistic Astrophysics IWARA, Gramado, Brazil. 2016.
 - *The Hidden Magnetic Field Scenario: A Link Between CCOs and XDINs*. 1st Brazilian CTA Collaboration Meeting, Universidade de São Paulo, Brazil, 2015.
 - *The Role of the Magnetic Fields in NS*. 19th Advanced School of Astrophysics, Rio de Janeiro, Brazil, 2014.
 - *First Astrobiology School*. Observatório Nacional, Rio de Janeiro, Brazil, 2014.
 - *The Inner Boundary Layer in Accretion Disks*. First Winter School of Valongo Observatory, Rio de Janeiro, Brazil, 2013.
 - *The Gravitational Drag Force Felt by a Plummer-Type Perturber Immersed in a Gas*. XIV Latin American Regional IAU Meeting (LARIM), Florianópolis, Brazil, 2013.
 - *Hyperaccretion and Magnetic Reconnection Inside a Supernova*. Magnetic Fields in the Universe IV: From Laboratory and Star to Primordial Structures, Playa del Carmen, México, 2013.
 - *Dynamics and Structure of Neutron Stars*. XXV National Astronomy Congress, México D.F., México, 2013.
 - *Thin Accretion Disks around Neutron Stars*. 3rd Congreso Colombiano de Astronomía - COCOA, Bucaramanga, Colombia, 2012.

- *The Inner Boundary Layer in Accretion Disks*. School & Conference on Analytical and Computational Astrophysics, Trieste, Italy, 2011.
- *Growing Magnetic Fields in CCOs*. Symposium of Astrophysics, ESFM IPN, México D.F., México, 2011.
- *The Centrifugal Barrier in Accretion Disks*. XXIV National Astronomy Congress, Guadalajara México, 2011.
- *Hyperaccretion onto the SN1987A Core*. Symposium of Astrophysics, ESFM IPN, México D.F., México, 2010.
- *Growing Magnetic Fields in Pulsars*. XIII Latin American Regional IAU Meeting LARIM, Morelia, México, 2010.
- *Accretion and Magnetic Field Submergence in Neutron Star Surfaces*. Cosmic Magnetic Fields: From Planets, to Stars and Galaxies, Puerto Santiago Tenerife, Spain, 2008.
- *Interferometry in the epoch of ALMA and VLTI*. Fourth Advanced Chilean School of Astrophysics, Santiago de Chile, Chile, 2006.
- *Production and Collimation of Astrophysical Jets or Accretion? M87 and SN1987A Scenarios*. XI Latin American Regional IAU Meeting (LARIM), Pucón, Chile, 2005.
- *Collimation of Astrophysical Outflows*. Magnetic Field in the Universe: From Laboratory and Star to Primordial Structures, Angra dos Reis, Brazil, 2004.
- *Astrophysical Jets and Outflows*. Physics of Active Galactic Nuclei at All Scales, Santiago de Chile, Chile, 2003.

PUBLICATIONS RECORD

Published

20. *On the Overall Properties of Young Neutron Stars: An applications to the Crab Pulsar*. **Cristian G. Bernal**; Carlos Frajuca; Ana B. Minari, Henrique Hirsch; Lucas Selbach. *Frontiers in Astronomy and Space Sciences*. 2024.
19. *Survival of the Fittest: Numerical Modeling of the "Chameleon" Supernova 2014C*. Felipe Vargas; Fabio De Colle; Daniel Brethauer; Raffaella Margutti; **Cristian G. Bernal**. *The Astrophysical Journal*. 2022.
18. *Interaction of Space Weather Phenomena With Mars Plasma Environment During Solar Minimum 23/24*. P. Kajdic; B. Sanchez-Cano; L. Neves do Amaral; O. Witasse; **C. G. Bernal**; D. Rojas-Castillo; H. Nilsson. *JGR-Space Physics*. 2021.
17. *Could a Hypercritical Accretion be Associated with the Atypical Magnetic-Field Behavior in RX J0822- 4300?* Fraija N.; **C. G. Bernal**; Morales G.; R.Negreiros. *Publications of the Astronomical Society of the Pacific*. v.130, p.124201, 2018.
16. *Many Aspects of Magnetic Fields in Neutron Stars*. R. Negreiros; **C. G. Bernal**; Dexheimer V.; Troconis O. *Journal Universe*. v.4, p.43 - 65, 2018.
15. *Hypercritical Accretion Scenario in Central Compact Objects Accompanied with an Expected Neutrino Burst*. Fraija N.; **C. G. Bernal**; Morales G.; R.Negreiros. *Physical Review D*. v.98, p.083012, 2018.
14. *On the Submergence and Reemergence of Magnetic Fields in Young Supernovae*. **Bernal, Cristian G.** *International Journal of Modern Physics*. v.45, p.1760051, 2017.
13. *A Central Compact Object in Kes 79: The Hypercritical Regime and Neutrino Expectation*. **C. G. Bernal** & Fraija N. *MNRAS*. v.462, p.3646 - 3659, 2016.
12. *On the Spin-Down of Young Neutron Stars*. **Bernal, Cristian G.** & R. Negreiros. *American Institute of Physics*. v.1693. p.030006, 2015.
11. *Hypercritical Accretion Phase and Neutrino Expectation in the Evolution of Cassiopeia A*. Fraija N. & **C. G. Bernal**. *MNRAS*. v.451, p.455 - 466, 2015.
10. *The Gravitational Drag Force Felt by a Plummer-Type Perturber Immersed in a Gas*. **C. G. Bernal** & F. J. Sánchez-Salcedo. *RevMex A&A*. Vol. 44, pp. 108-108, 2014.
9. *Signatures of Neutrino Cooling in the SN1987A Scenario*. Fraija N.; **C. G. Bernal** & Hidalgo-Gómez A. M. *MNRAS*, v. 442, Issue 1, p.239-250. 2014.
8. *The Gravitational Drag Force on an Extended Object Moving in a Gas*. **Cristian G. Bernal** & F.J. Sánchez-Salcedo. *ApJ*, 775, 72. 2013.

7. *Hypercritical Accretion onto a Newborn Neutron Star and Magnetic Field Submergence*. **Cristian G. Bernal**; Dany Page & William H. Lee. *ApJ*, 770, 106. 2013.
6. *Submergence, Reemergence and Magnetic Reconnection Inside Supernovae*. **Cristian Bernal**. *RCF*, v45, No.2, 115-128. 2013.
5. *Analytical Propagation of Astrophysical Outflows*. **Cristian Bernal**. *RCF*, v45, No.1, 21-27. 2013.
4. *Growing Magnetic Fields in Pulsars*. **C.G. Bernal** & D. Page. *RevMex A&A*, Vol. 40, p. 149-150. 2011.
3. *Hypercritical Accretion onto a Magnetized Neutron Star Surface: A Numerical Approach*. **C. G. Bernal**; W. H. Lee, & Dany Page. *RevMex A&A*, Vol. 46, p. 309 – 322. 2010.
2. *Accretion and Magnetic Field Submergence onto Neutron Stars Surfaces*. **C. G. Bernal**; D. Page & W. Lee, Cambridge University Press, Volume 259, p. 135-136. 2008.
1. *Analytical Productions and Collimations of Astrophysical Jets*. **C. G. Bernal** & W. H. Lee, *American Institute of Physics*, V. 784, pp 676-684. 2005.

- In preparation
1. *On the Magnetic Torque of Proto-Magnetars inside GRBs*. **Cristian G. Bernal**; Henrique Hirsch & Ana B. Minari. *BJP*. 2024.
 2. *Estimating Neutral Hydrogen Mass Fraction in Galaxies Using Bayesian Neural Networks*. Joelson Sartori, Jorge Barrera & **Cristian G. Bernal**. *MNRAS*. 2024.
 2. *A Long-lasting Brightening by Internal Dissipation in a Millisecond Magnetar*. Nissim Fraija, **Cristian G. Bernal** & Antonio M. *ApJ*. 2024.
 3. *On the Precursors of GRB Flux as Millisecond Magnetars Signatures*. Nissim Fraija, **Cristian G. Bernal**, Rosa Becerra & Antonio M. *ApJ*. 2024.

OTHER ACTIVITIES

SCIENCE NETWORK

- 2024–Today Founder of ASTROFLUIDOS-UNAL. Astrophysical research and science dissemination group for all audiences, whose purpose is to popularize physics and astronomy through various channels of information. Homepage: <http://astrofluidos-unal.edu.co>
- 2017–Today Collaborator of several research projects in Astrophysics, with colleagues from various countries including Colombia, México, Brazil, Italy and EE.UU.
- 2008–Today Member of ASTROCO. Community of Colombian Professional Astronomers who work and study in Colombia and other countries, interested in advancing astronomy in the country. Homepage: <https://accefyn.com/microsites/nodos/astroco/>
- 2016–2024 Founder of ASTROFURG. Astronomical research and science dissemination group for all audiences, whose purpose was to popularize physics and astronomy through various channels of information.
- 2018–2020 Postdoctoral Advisory: Dr. Kellen Pascoal. Posdoc in the Plasma-Neutrinos Project at IMEF-FURG.

ACADEMIC ISSUES

- Journal Referee Brazilian Journal of Physics (BJP), Monthly Notices of the Royal Astronomical Society (MNRAS), Universe. 2017-Today.
- Committee Board Judging commission board for a Tenure Track for a full time Physics Teacher at IMEF FURG. 2024.
- Judging commission board for a Tenure Track for Substitute Physics Teacher at IMEF FURG. 2017.
- Committee member to select scholarship projects for undergraduate students at IMEF FURG. 2018.
- IMEF Counselor Council Member in the IMEF-FURG, representing the Physics group. 2019-2022.
- Assistant Coordinator One period Assistant Physics Coordinator in the IMEF FURG, Including organization, administration and coordination activities. 2020-2022.

OTHER INTERESTS

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| Artificial Intelligence | I am very excited about the scientific possibilities of the new disruptive technologies of Generative Artificial Intelligence. I am cautiously and excitedly exploring this new world. |
| Social Science | I am interested in making science available to the public, especially to Colombian students. |
| Science Fiction | I like all related with this sort, in particular, Movies, TV Series, Books and Video-Games. |
| Relax | I like reading, writing, sports, good movies, as well as enjoying classical, rock & Latin music. |

REFERENCES

These persons are familiar with my professional qualifications and my character:

Dr. Dany Page Rollinet

Ph.D. Thesis Advisor
Dept. of Theoretical Astrophysics – UNAM
Universidad Nacional Autónoma de México

Phone: +5255-5622-4016
Email: page@astro.unam.mx
<https://www.astrosu.unam.mx/>

Dr. William Lee Alardín

Master and Ph.D. Thesis Advisor
Coordinator of Scientific Research at UNAM
Universidad Nacional Autónoma de México

Phone: +5255-5622-4020
Email: wlee@astro.unam.mx
<https://www.astrosu.unam.mx/>

Dr. Nissim Illich Fraija

Scientific Collaborator
Researcher at IA-UNAM
Universidad Nacional Autónoma de México

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<https://www.astrosu.unam.mx/>

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