

Joaquín Pelle

POSTDOCTORAL RESEARCHER · THEORETICAL ASTROPHYSICS

Max Planck Institute for Gravitational Physics (Albert Einstein Institute) · Potsdam, Germany

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Employment

Max Planck Institute for Gravitational Physics (Albert Einstein Institute)

Golm, Potsdam, Germany

POSTDOCTORAL RESEARCHER

2024–Present

- Division: Computational Relativistic Astrophysics
- Mentor: Prof. Masaru Shibata

Education

Universidad Nacional de Córdoba

Córdoba, Argentina

PH.D. IN ASTRONOMY

2019–2024

- Topic: Applications of relativistic radiative transfer to the astrophysics of neutron stars and exotic compact objects
- Advisor: Prof. Oscar Reula

Universidad Nacional de La Plata

La Plata, Argentina

LICENCIATURA IN ASTRONOMY

2014–2019

- Thesis: Injection of leptonic matter above accreting black holes
- Advisor: Prof. Gustavo E. Romero
- Co-advisor: Dr. Leonardo Pellizza
- Average mark: 9.38/10

GRADUATE COURSES

2020	PDEs: analytical and numerical methods, Universidad Nacional de Córdoba, Argentina	Mark: 10
2020	Symmetries in general relativity and field theories, Universidad Nacional de Córdoba	Mark: 10
2019	Introduction to magnetohydrodynamics, Universidad Nacional de Córdoba, Argentina	Mark: 10
2019	Introduction to university teaching, Universidad Nacional de Córdoba, Argentina	Mark: 10

Funding

FELLOWSHIPS

2019–2024 **Doctoral Fellowship**, Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina

GRANTS

DYNAMICS OF MATTER IN EXTREME CURVATURE SPACETIMES

2022–2024

- PI: Prof. Oscar Reula
- Awarding organization: Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina
- ID: PIP 112202101 00914CO

Publications

SUBMITTED MANUSCRIPTS

- 2026 **First fast radio burst search campaign at the Argentine Institute of Radio Astronomy**, C.O. Lousto, H. Prajapati, E. Zubieta, S.B. Araujo Furlan, G. Gancio, J. Pelle, G.E. Romero, F. García, S. del Palacio, N. Cahill. Submitted to *A&A*; arXiv:2608.03914 [astro-ph.HE].
- 2026 **Accretion-powered flares from black hole-disk collisions in galactic nuclei**, J. Pelle, K. Kawaguchi, M. Shibata, A.T.-L. Lam. Submitted to *MNRAS*; arXiv:2604.07443 [astro-ph.HE].

REFEREED JOURNAL ARTICLES

- 2026 **Dark matter in galactic structure: From the Milky Way to the high redshift universe**, C.R. Argüelles, E.A. Becerra-Vergara, S. Collazo, V. Crespi, A. Deluca, A. Krut, M.F. Mestre, J. Pelle, J.A. Rueda, R. Ruffini, F.L. Vieyro. *International Journal of Modern Physics D*, 35(06), 2540018.
- 2025 **Black hole-accretion disk collision in general relativity: Axisymmetric simulations**, A.T.-L. Lam, M. Shibata, K. Kawaguchi, J. Pelle. *Physical Review D*, 112, 083006.
- 2025 **A parameter study of the electromagnetic signatures of an analytical mini-disk model for supermassive binary black hole systems**, K. Porter, S.C. Noble, E.M. Gutiérrez, J. Pelle, M. Campanelli, J. Schnittman, B.J. Kelly. *The Astrophysical Journal*, 979, 155.
- 2024 **Imaging fermionic dark matter cores at the centre of galaxies**, J. Pelle, C.R. Argüelles, F.L. Vieyro, V. Crespi, C. Millauro, M.F. Mestre, O.A. Reula, F.L. Carrasco. *Monthly Notices of the Royal Astronomical Society*, 534(2), 1217–1226.
- 2024 **Accretion disks and relativistic line broadening in boson star spacetimes**, J.L. Rosa, J. Pelle, D. Pérez. *Physical Review D*, 110(8), 084068.
- 2023 **Relativistic force-free models of the thermal X-ray emission in millisecond pulsars observed by NICER**, F.L. Carrasco, J. Pelle, O.A. Reula, D. Viganò, C. Palenzuela. *Monthly Notices of the Royal Astronomical Society*, 520(2), 3151–3163.
- 2023 **The shadow of charged traversable wormholes**, M.R. Neto, D. Pérez, J. Pelle. *International Journal of Modern Physics D*, 32(02), 2250137.
- 2022 **Skylight: a new code for general-relativistic ray tracing and radiative transfer in arbitrary spacetimes**, J. Pelle, O.A. Reula, F.L. Carrasco, C. Bederian. *Monthly Notices of the Royal Astronomical Society*, 515(1), 1316–1327.
- 2020 **Injection of leptonic matter above accreting black holes**, J. Pelle, G.E. Romero, L.J. Pellizza. *Boletín de la Asociación Argentina de Astronomía*, 61(B).

Software

SKYLIGHT.JL

- Open-source Julia package for general-relativistic ray tracing and radiative transfer in arbitrary spacetimes
- Creator, lead developer, and maintainer
- github.com/joaquinpelle/Skylight.jl

Research Stays

Max Planck Institute for Gravitational Physics (Albert Einstein Institute)

Golm, Potsdam, Germany
Sep 2023–Nov 2023

- Host: Prof. Masaru Shibata

Rochester Institute of Technology

*Rochester, NY, USA
Aug 2022–Feb 2023*

- Host: Prof. Manuela Campanelli
- Topic: Dynamics of gas around supermassive black hole binaries

Honors

DISTINGUISHED GRADUATE

2019

- Highest average mark in Astronomy
- Awarding organization: Universidad Nacional de La Plata

JOAQUÍN V. GONZÁLEZ AWARD

2019

- Awarded to the ten highest average marks in the Department of Astronomy, Geophysics and Meteorology
- Awarding organization: Municipality of La Plata

Presentations

CONTRIBUTED TALKS

Jul 2026	Accretion-powered flares from black hole-disk collisions in galactic nuclei, UK & Ireland Discs Meeting 2026, Department of Applied Mathematics and Theoretical Physics, University of Cambridge	Cambridge, UK
Feb 2026	Electromagnetic signals from black hole-disk collisions, Multi-Messenger Astrophysics in the Dynamic Universe, Yukawa Institute for Theoretical Physics, Kyoto University	Kyoto, Japan
2024	Workshop Juliero, Córdoba, Argentina	
2024	Grav24, Córdoba, Argentina	
2022	CosmoSur, Córdoba, Argentina	
2022	Friends of Friends Meeting, Córdoba, Argentina	
2019	61st Annual Meeting of the Argentine Astronomical Association, Viedma, Argentina	

CONTRIBUTED POSTERS

2023	65th Annual Meeting of the Argentine Astronomical Association, San Juan, Argentina
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SEMINARS

2023	Universidad Nacional de La Plata, La Plata, Argentina
2023	Universidad Nacional de Córdoba, Córdoba, Argentina
2022	Institute of Space Sciences, Barcelona, Spain
2022	Rochester Institute of Technology, Rochester, NY, USA

Conference Organization

2024	Grav24, Córdoba, Argentina
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Refereeing

Journals *The Astrophysical Journal, Universe, Boletín de la Asociación Argentina de Astronomía*

Teaching Experience

- May–Jun 2025 **Minicourse on partial differential equations: Analytical and numerical tools**, Teaching Assistant, ICTP-SAIFR/IFT-UNESP, São Paulo, Brazil.
- 2021 **PDEs: analytical and numerical methods**, Collaborator, Facultad de Matemática, Astronomía, Física y Computación, Universidad Nacional de Córdoba.
- 2019 **Summer leveling course**, Teaching Assistant, Facultad de Astronomía, Geofísica y Meteorología, Universidad Nacional de La Plata.
- 2018–2019 **Complex variable calculus**, Teaching Assistant, Facultad de Astronomía, Geofísica y Meteorología, Universidad Nacional de La Plata.
- 2017–2019 **Algebra, numerical calculus and analytical geometry**, Teaching Assistant, Facultad de Ciencias Exactas, Universidad Nacional de La Plata.

Supervision and Examination

- Mar–Jun 2026 **Lois Coquart**, Research-project tutor; home institution: Freie Universität Berlin.
- 2026 **Ariel De Luca**, Member, undergraduate thesis examination committee (Licenciatura in Astronomy), Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata.

Outreach

- 2023 **Black holes and gravitational waves: a cosmic symphony**, Public talk at Facultad de Astronomía, Geofísica y Meteorología, Universidad Nacional de La Plata.
- 2023 **¿Por qué es importante que por primera vez se haya registrado el “ruido” cósmico?**, Interview for the Argentine newspaper *Clarín*.

Academic Service

SEMINAR ORGANIZATION

- 2026–Present **Seminar Organizer**, Max Planck Institute for Gravitational Physics (Albert Einstein Institute).

OPEN SCIENCE

- 2026–Present **Open Science Ambassador**, Max Planck Society.

GOVERNING BOARDS

- 2021–2024 **Instituto de Física “Enrique Gaviola”**, Board member; Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina.

FACULTY SELECTION COMMITTEES

- 2021 **Non-linear dynamics**, Selection committee for Head Teaching Assistant, Facultad de Astronomía, Geofísica y Meteorología, Universidad Nacional de La Plata.
- 2021 **Summer leveling course**, Selection committee for Instructor, Facultad de Astronomía, Geofísica y Meteorología, Universidad Nacional de La Plata.