

# Joaquin Pelle

PHD STUDENT · ASTRONOMY

Universidad Nacional de Córdoba, Argentina

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## Education

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### Universidad Nacional de Córdoba

Córdoba, Argentina

#### PHD ASTRONOMY

2019 - present

- Topic: Astrophysical applications of general-relativistic radiative transfer
- Advisor: Dr. Oscar Reula

### Universidad Nacional de La Plata

La Plata, Argentina

#### LIC. ASTRONOMY

2014 - 2019

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

### GRADUATE COURSES

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

## Funding

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### FELLOWSHIPS

2019-2024 **Doctoral Fellowship**, Argentine National Research Council

### GRANTS

#### DYNAMICS OF MATTER IN EXTREME CURVATURE SPACETIMES

2022 - 2024

- PI: Dr. Oscar Reula
- Awarding organization: Argentine National Research Council
- ID: PIP 112202101 00914CO

## Publications

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### REFEREED: INTERNATIONAL

- 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.
- 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.

### REFEREED: NATIONAL

- 2020 **Injection of leptonic matter above accreting black holes**, **J. Pelle**, G.E. Romero, L.J. Pellizza (2020). *Boletín de la Asociación Argentina de Astronomía*, Vol. 61(B).

## Software

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### SKYLIGHT

- Description: General-relativistic ray tracing and radiative transfer in arbitrary spacetimes
- Role: Main developer
- URL: [github.com/joaquinpelle/Skylight.jl](https://github.com/joaquinpelle/Skylight.jl)

## Research stays

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### Rochester Institute of Technology

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

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

### Max Planck Insitute for Gravitational Physics (Albert Einstein Institute)

*Golm, Potsdam, Germany  
Sep 2023 - Nov 2023*

- Host: Dr. Masaru Shibata

## Honors

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### DISTINGUISHED GRADUATE

2019

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

### JOAQUIN V. GONZALEZ AWARD

2019

- Highest average mark in the Department of Astronomy, Geophysics and Meteorology
- Awarding organization: La Plata City Council

## Presentations

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### CONTRIBUTED TALKS

- 2019 **Injection of leptonic matter above accreting black holes**, 61 Annual Meeting of the Association of Argentine Astronomy. Viedma, Argentina.
- 2022 **Strong non-dipolar magnetic fields in millisecond pulsars?**, Friends of Friends Meeting. Córdoba, Argentina. Córdoba, Argentina.
- 2022 **Strong non-dipolar magnetic fields in millisecond pulsars?**, CosmoSur. Córdoba, Argentina. Córdoba, Argentina.

### CONTRIBUTED POSTERS

- 2023 **Gas dynamics and iron lines around supermassive black holes**, 65 Annual Meeting of the Association of Argentine Astronomy. San Juan, Argentina.

### SEMINARS

- 2022 **Skylight: a new code for general-relativistic ray tracing and radiative transfer in arbitrary spacetimes**, Rochester Institute of Technology, USA.
- 2022 **Relativistic force-free models of the thermal X-ray emission in millisecond pulsars observed by NICER**, Institute for Space Sciences, Barcelona, Spain.
- 2023 **Gas dynamics around supermassive black hole binaries**, Universidad Nacional de Córdoba, Argentina
- 2023 **Relativistic force-free models of the thermal X-ray emission in millisecond pulsars observed by NICER**, Universidad Nacional de La Plata, Argentina

## Outreach Talks

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2023 **Black holes and gravitational waves: a cosmic symphony**, Astronomy, Geophysics and Meteorology Department, Universidad Nacional de La Plata.

## Teaching Experience

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Sep 2017 - **Algebra, numerical calculus and analytical geometry**, Teaching Assistant, Exact Sciences Department, Universidad Nacional de La Plata.  
Mar 2019  
Mar 2018 - **Complex variable calculus**, Teaching Assistant, Astronomy, Geophysics and Meteorology Department, Universidad Nacional de La Plata.  
Mar 2019  
Feb 2019 - **Summer leveling course**, Teaching Assistant, Astronomy, Geophysics and Meteorology Department, Universidad Nacional de La Plata.  
Mar 2019  
Aug 2021 - **PDEs: analytical and numerical methods**, Collaborator, Mathematics, Astronomy and Physics Department, Universidad Nacional de Córdoba.  
Dec 2021

## Institutional management

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### MEMBER OF GOVERNING BOARDS

2021 -  
present **“Enrique Gaviola” Physics Institute**, Argentina National Research Council.

### MEMBER OF FACULTY SELECTION COMMITTEES

2021 **Non-linear dynamics**, Head teaching assistant. Astronomy, Geophysics and Meteorology Department, Universidad Nacional de La Plata.  
2021 **Summer Leveling Course**, Instructor. Astronomy, Geophysics and Meteorology Department, Universidad Nacional de La Plata.

## Skills

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**Computing** Julia, Python, C, Fortran 77/90, Bash, SLURM, Git, Vim,  $\text{\LaTeX}$ .  
**Languages** Spanish (native), English (proficient), Italian (basic), French (basic).