

NICOLAS WAEHNER

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EXPERIENCE

PhD Researcher – University of Buenos Aires

Studying what brain foundation models learn about the brain, using representational analysis and interpretability.

2026 – Present

Advisor: Enzo Tagliazucchi

Research Intern – Center for Astrophysics, Harvard & Smithsonian

Developing simulation-based inference methods to assess the significance of molecular detections in exoplanet atmospheres.

2026

Advisor: Cecilia Garraffo

Research Assistant – UNSAM

Built a CNN with an attention layer to detect planetary signals in radial-velocity periodograms of Sun-like stars, achieving 54% fewer false positives than the standard false-alarm-probability approach and no increase in false negatives. Thesis project. [\[GitHub\]](#) [\[Thesis\]](#)

2024 – 2025

Advisor: Rodrigo F. Díaz

Research Intern – FIUBA

Designed and built a low-cost miniature fluorescence microscope from smartphone camera lenses and an ESP32-CAM sensor, with 3D-printed lens mounts, and characterized its point spread function for super-resolution.

2023 – 2024

Advisor: Micaela Toscani

EDUCATION

University of Buenos Aires

PhD in AI applied to Neuroscience.

2026 – Present

Advisor: Enzo Tagliazucchi

University of Buenos Aires

Licentiate in Physics (BS + MS equivalent).

2019 – 2025

GPA (scale 0–10): 9.43

ACHIEVEMENTS

Hackathon Winner – Interpretable memory retrieval with sparse autoencoders, Y-Hat Hackathon, 2025. [\[Poster\]](#)

Best Poster Award – Scientific Symposium on AI and Applications (SCIAA), UdeSA, 2025.

Honorable Mention Poster Award – First Spring School on Deep Learning, 2025.

Honorable Mention Project Award – Simulation-based Inference for Parameter Estimation in Neural Spiking Models, LASCON X, 2026.

Students' Achievements – Trainer of the Argentine delegation to the Latin American Olympiad of Astronomy and Astronautics (OLAA) 2025: 1 gold medal, 2 silver, and 1 bronze.

Professor Academic Distinction – Awarded by the Rector of the University of Buenos Aires (UBA), 2025.

Gold Medal – National Astronomy Olympiad, 2019.

PUBLICATIONS

Nicolas Waehner, Enzo Tagliazucchi, Jacobo Sitt, Demian Wassermann, Giovanni Marraffini, Trinidad Borrell. *The Platonic Brain: Representational Convergence in EEG Foundation Models*. NeurIPS 2026 Workshop on Foundation Models for the Brain and Body.

Nicolas Waehner, Carolina Cuesta-Lazaro, Daniel Muthukrishna, Ana Glidden, Cecilia Garraffo. *Towards Robust Biosignature Gas Detection in Exoplanet Atmospheres*. NeurIPS 2026 Workshop on Machine Learning and the Physical Sciences (ML4PS).

TEACHING EXPERIENCE

Teaching Assistant, Universidad Torcuato Di Tella & Universidad Nacional de La Plata Diffusion models and Flow Matching for a course on AI applications to astrophysics.	2026
Teaching Assistant, Universidad de Buenos Aires Physics I (Mechanics), Physics III (Electromagnetism), and Advanced Laboratory V. Teaching practical classes, Q&A sessions, grading assignments and exams.	2024 – 2026
Astronomy Teacher, Colegio Nacional de Buenos Aires Instructor of a yearly elective astronomy course. Trainer of the Argentine delegation to the Latin American Olympiad of Astronomy and Astronautics 2025.	2023 – 2026

SCHOOLS AND CONFERENCES

AstroAI Workshop — Center for Astrophysics Harvard & Smithsonian	2026
LASCON X — Latin American School on Computational Neuroscience, São Paulo	2026
4th School on Data Science and Machine Learning — ICTP-SAIFR, São Paulo	2025
Spring School on Deep Learning — UBA	2025
SCIAA — Scientific Symposium on AI and Applications — UdeSA	2024 & 2025

CONFERENCE PRESENTATIONS

Nicolas Waehner , Luis Agustín Nieto, Rodrigo F. Díaz. <i>Machine learning for exoplanet detection through the radial velocity method</i> . Poster presented at SCIAA 2025, EPDL 2025, ICTP-SAIFR DSML 2025 and the CfA AstroAI Workshop 2026. [Poster]
Nicolas Waehner , J. Szereszewski, M. Smith. <i>Sparse Autoencoders for Interpretable Memory Retrieval in LLMs</i> . Poster presented at the Y-Hat Hackathon, FCEyN-UBA 2025. [Poster]
Nicolas Waehner , Lautaro Cabral, Oscar E. Martinez, Micaela Toscani. <i>Improvement of a miniature fluorescence microscope for applications in neuroscience</i> . Poster presented at RAFA 2024.

SCIENCE OUTREACH

Teaching Assistant at: Python Workshop (FIFA 2022).
Presenter at: “La Noche de los Museos” organized by the University of Buenos Aires (2019, 2023, 2024); Presenter at the “Physics Week” organized by the University of Buenos Aires (2024).
Organization and coordination: Co-organizer and grader at the Astronomical Challenges Conference (2025); Writer and grader at the Metropolitan Physics Olympiad (2025).

LANGUAGES

- **Spanish:** Native.
- **English:** Proficient (C1).