

Patricia Iglesias Navarro

Contact

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Languages

Spanish (Native Proficiency)

English (Advanced C1)

Italian (Basic B1)

French (Basic A2)

Research interest

Galaxy evolution

Machine Learning

Stellar population properties

Star formation histories

High-redshift galaxies

SUMMARY

Predoctoral researcher in galaxy formation and evolution.

RESEARCH EXPERIENCE

Nov.2021-Jul.2022 **Universidad de La Laguna & Instituto Astrofísico de Canarias**

Early-career research fellowship

- Intended for university students to carry out research tasks in university departments.
- I worked in the Astrophysics department, exploring Deep Learning techniques for the study of barred galaxies, as well as for the reconstruction of SFH of galaxies from their spectra, using IllustrisTNG simulations.
- 300 hours in 9 months.

Nov.2023-Today **Instituto Astrofísico de Canarias**

Predoctoral Researcher

- FPI fellowship.
- Galaxy formation and evolution.
- Unveiling the structural transformations of galaxies in the era of JWST and Euclid with Artificial Intelligence.

EDUCATION

Sep.2017-Jul.2021 **University of La Laguna (ULL)**

Bachelor's Degree in Physics

- Average mark: 8.8/10.
- Internship of 420 hours in the Instituto Astrofísico de Canarias (IAC). It consisted of applying Supervised, Unsupervised and Self-Supervised Machine Learning to classify galaxy images from the project EuclidZoo according to their morphology.
- Final Degree Project developed at the Instituto Astrofísico de Canarias (IAC) under the title **Searching for Compaction in TNG50 Cosmological Simulation Using Deep Learning**. It consisted of using Supervised Machine Learning (a CNN) to identify an evolutionary phase called 'Blue Nuggets' in galaxies from TNG50 cosmological simulation. Final mark: 10/10.

Sep.2021-Jul.2023 **University of La Laguna (ULL)**

Master's Degree in Astrophysics and Cosmology.

- Theoretical and computational specialization.
- Average mark: 8.8/10.
- Master's thesis: **Deriving Star Formation Histories of Galaxies with Bayesian Deep Learning**. We explored a novel approach based on probabilistic machine learning and likelihood-free inference to estimate the star formation histories of galaxies from their optical absorption spectra. Final mark: 10/10.

Nov.2023-Today **University of La Laguna (ULL)**

PhD in Astrophysics

COMPUTING SKILLS

- **Programming Languages:** Python (advanced), Latex (advanced), Fortran (intermediate), R (basic), IDL (basic).
- **Astronomical tools:** Astropy, Topcat, DS9.

- **Deep Learning Frameworks:** TensorFlow, Keras, Pytorch.
- **Operating Systems:** Windows, Linux, macOS.
- **Other Tools:** Slack, GitHub, Jupiter Notebook, Google Suite (including Google Colab and Google Console), and Microsoft Office Suite (Word, Excel, PowerPoint).

PUBLICATIONS

First author

- **Simulation-based inference of galaxy properties from JWST pixels** (June 2025). arXiv e-prints. **Iglesias-Navarro, Patricia**, Huertas-Company, Marc, Pérez-González, Pablo, et al.
- **Deriving the star formation histories of galaxies from spectra with simulation-based inference** (September 2024). A&A, 689, A58. **Iglesias-Navarro, Patricia**, Huertas-Company, Marc, Martín-Navarro, Ignacio, Knapen, Johan H., Pernet, Emilie

Collaborations

- **Euclid Quick Data Release (Q1) Exploring galaxy properties with a multi-modal foundation model** (March 2025). arXiv e-prints. Euclid Collaboration, Siudek, M., Huertas-Company, M., et al., **(including P. Iglesias-Navarro)**
- **Euclid Quick Data Release (Q1), A first look at the fraction of bars in massive galaxies at $z < 1$** (March 2025). arXiv e-prints. Euclid Collaboration, Huertas-Company, M., Walmsley, M., et al., **(including P. Iglesias-Navarro)**
- **Euclid preparation: LXVIII. Extracting physical parameters from galaxies with machine learning** (March 2025). A&A, 695, A284. Euclid Collaboration, Kovačić, I., Baes, M., et al., **(including P. Iglesias-Navarro)**
- **ZF-UDS-7329: A relic galaxy in the early Universe** (February 2025). A&A, 694, L7. Hartmann, Eduardo A., Martín-Navarro, Ignacio, Huertas-Company, Marc, et al., **(including P. Iglesias-Navarro)**
- **The building up of observed stellar scaling relations of massive galaxies and the connection to black hole growth in the TNG50 simulation** (January 2022). MNRAS, 509, 2654-2673. Varma, S., Huertas-Company, M., Pillepich, A., et al., **(including P. Iglesias-Navarro)**

Click [here](#) for the full list on ADS.

FELLOWSHIPS

- Grants for Predoctoral Contracts for Doctoral Training (2022). Spanish State Research Agency.
- LSST Discovery Alliance Data Science Fellowship Program (2025-2027).

PROFESSIONAL ACTIVITIES

- Co-organizer of weekly meetings Galaxy coffees at Instituto Astrofísico de Canarias
- Co-chair LOC meeting LSST@Europe6 (September 2024)
- SOC meeting Simulation-based inference for galaxy evolution (May 2025)
- Reviewer for Astronomy and Astrophysics (A&A)

TALKS AND POSTERS

- **A life devoted to stellar populations:** Poster contribution. 2-6 October, 2023. Puerto de La Cruz, Spain.
- **Galaxies & AGN with the first Euclid data and beyond:** Contributed talk. 14-16 February, 2024. Bologna, Italy.
- **Simulation-based Inference for Galaxy Evolution:** Contributed talk. 9-12 April, 2024. Bristol, UK.
- **Star formation across cosmic scales. Machine Learning insights and applications:** Online contributed talk. 13-17 May, 2024. Budapest, Hungary.

- **JWST/CEERS Team Meeting 2024**: Contributed talk. 12–16 May, 2024. Madrid, Spain.
- **EAS annual meeting 2024**: Contributed talk. 1-5 July 2024. Padova, Italy.
- **IAU General Assembly 2024**: Poster contribution. 6-15 August 2024. Cape Town, South Africa.
- **LSST@Europe6**: Contributed talk. 16-20 September 2024. La Palma, Spain.
- **Cosmology and galaxy astrophysics with simulations and machine learning 2024**: Contributed talk. 9-12 December 2024. New York, US.
- **EDUCADO annual meeting**: Contributed talk. 13-17 January 2025. La Palma, Canary Islands, Spain.
- **CRISOL25: galaxy origin in the JWST era**: Poster contribution. 12-16 May 2025. Toledo, Spain.
- **Simulation-based Inference for Galaxy Evolution**: Invited talk. 27-30 May, 2025. Bristol, UK.
- **Open SkAI**: Contributed talk. 2-5 September, 2025. Chicago, US.

OTHER TRAININGS AND CERTIFICATIONS

- **Skills to Speak in Public** (2016): course - workshop given by Miguel Ángel Guisado in which several techniques were taught to make effective and impactful presentations, lectures and conferences. 8 hours. Habor.
- **Information Sources for University Education** (2017): participation at the course focused on how to search, evaluate and communicate information from different sources. 1 ECTS. University of La Laguna.
- **Introductory Course to University Mathematics** (2017): participation at the course focused on establishing a solid basis in academic mathematics. 3 ECTS. University of La Laguna.
- **Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning** (2020): the Machine Learning course and Deep Learning Specialization from Andrew Ng introduced me to the most important and foundational principles of Machine Learning and Deep Learning. It also included a TensorFlow Specialization in order to start building and applying scalable models to real-world problems. 30 hours. Coursera.
- **5th Summer School at ICE** (2022): Modified gravities, Inflation and Primordial Perturbations Lectures - theory and computing. From July 4th until July 15th, 2022. The Institute of Space Sciences (ICE-CSIC).
- **XXXV Canary Islands Winter School of Astrophysics: Baryonic Cycle Across Space & Time** (2024): From October 8th until October 17th, 2024. Instituto Astrofísico de Canarias.
- **Second EDUCADO Training School: Foundations & Applications of Computer Science** (2025): From June 16th until June 20th, 2025. La Laguna, Tenerife, Canary Islands, Spain.

OUTREACH ACTIVITIES

- Organization of the open days of the Teide Observatory (June 2024).
- **Conference: Un paseo cosmológico: galaxias, materia oscura e inteligencia artificial** (October 2024). Museo de la ciencia y el cosmos de Tenerife.
- Organizer of monthly event **Astronomy on Tap - Canary Islands (AstroTragos)**.

MORE CONSIDERATIONS

- Driving license class B.
- Geographic mobility.