

# Ana María Conrado

PhD Candidate in Astrophysics



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## Education

- 2021 – present ★ **Ph.D. Astrophysics, University of Granada** (Granada, Spain)  
Thesis title: *The role of low density environment in the SFH of galaxies*. Supervised by Rosa González Delgado (IAA) and Rubén García-Benito (IAA)
- 2020 – 2021 ★ **M.Sc. Physics and Mathematics, University of Granada** (Granada, Spain). Specialisation in astrophysics  
Thesis title: *Dark matter in void galaxies*. Supervised by Isabel Pérez (UGR) and Anne-Marie Weijmans (University of St. Andrews)
- 2015 – 2020 ★ **B.Sc. Physics, University of Granada** (Granada, Spain)  
Thesis title: *Velocity maps and dark matter content of galaxies in voids*. Supervised by Isabel Pérez (UGR) and Rubén García-Benito (IAA)
- 2017 – 2018 ★ **B.Sc. Physics, Ludwig-Maximilians University** (Munich, Germany)  
ERASMUS exchange

## Positions

- Sep 2021 – present ★ **PhD in Astrophysics**, Instituto de Astrofísica de Andalucía (Granada, Spain). Supervised by Rosa González Delgado and Rubén García-Benito
- Feb – Jun 2024 ★ **Research stay**, ICRAR, International Centre of Radio Astronomy Research (Perth, Australia). Supervised by Aaron Robotham and Luke Davies

## Skills

- Languages ★ Spanish (mother tongue), English (C1), German (B1), French (A2), Russian (A1)
- Coding ★ Python, R, C++, Matlab, HTML and Css, Fortran
- Operating Systems ★ Linux, MacOS, Windows
- Astrophysical data ★ Data: Optical spectroscopy, IFS data, astronomical catalogues, SDSS images.  
Visualisation: ds9, python (matplotlib, bokeh, seaborn), R (ggplot2), Matlab  
Data analysis: stellar population synthesis (STARLIGHT, ProSpect), emission line fitting (SHIFU), velocity maps and rotation curve fitting (<sup>3D</sup>BAROLO, JAM), machine learning and artificial neural networks
- HPC ★ GRID, use of the IAA cluster (Spain) and the Setonix supercomputer (Australia)
- Others ★ L<sup>A</sup>T<sub>E</sub>X, GIMP, Krita, GitHub, Arduino, OpenOffice, Microsoft Office, Ableton Live 12 Suite, FL Studio, GarageBand, Sibelius

## Awards and Certifications

### Awards and Achievements

- 2020 – 2025 ★ **FPI predoctoral fellowship**, associated with the project PID2019-109067GB-I00 funded by Spanish Ministry of Science, Education and Universities (MCIN)

## Awards and Certifications (continued)

- 2017 – 2018 ★ **ERASMUS+ grant**, for studying two semesters at Ludwig-Maximilians University (Munich, Germany), cofunded by University of Granada, European Commission, Spanish Ministry of Science, Education and Universities and Junta de Andalucía

### Certification

- 2023 ★ **Taekwondo Black Belt**. Awarded by Real Federación Española de Taekwondo
- 2020 ★ **Goethe-Zertifikat B1**. Awarded by Goethe-Institut e.V.
- 2014 ★ **ISE II. Level 1 Certificate in ESOL International. B2 of the CERF**. Awarded by Trinity College London

## International Research Consortia

- 2021 – present ★ **WEAVE (WHT Enhanced Area Velocity Explorer)**. Member of the WEAVE-Apertif survey and the WEAVE-Apertif Quality Assurance team (WAQA)
- 2020 – present ★ **CAVITY (Calar Alto Void Integral-field Treasury survey)**. Member of the Quality Control group

## Scientific Production Summary

- ★ 7 refereed publications   ★ h-index 3   ★ 100+ citations   ★ Check my articles in [ADS](#)

## International Conferences

- ★ **1st CAVITY Annual Meeting 2021**. Contributed talk: *Dark Matter in CAVITY galaxies*
- ★ **2nd CAVITY annual meeting 2022**. Contributed talk: *Star formation histories of void galaxies*
- ★ **EAS 2022**. Poster presentation: *The role of environment in SF of galaxies*
- ★ **3rd CAVITY annual meeting 2023**. Contributed talk: *Spatially-resolved stellar populations in CAVITY galaxies*
- ★ **EAS 2023**. Poster presentations: *Spatially-resolved stellar population properties in the WEAVE early results* and *Local main sequence in low density environments*
- ★ **4th CAVITY annual meeting 2024**. Contributed talk: *Ionized gas and stellar populations in the CAVITY IFUs*
- ★ **SEA 2024**. Contributed talk: *Spatially-resolved stellar population properties of galaxies in voids with the CAVITY project*

## Observational Experience

- ★ **Nordic Optical Telescope** (La Palma, Spain). ALFOSC, long-slit spectroscopy. 3 nights, Dec 2023.

## Service Activities

- Apr 2024 – present ★ **Equity, diversity and inclusion committee** (IAA-CSIC). Organisation of seminars, round tables, videos, talks and outreach activities for dates as the 11F, 8M, 25N, LGBTQ+ pride day, day of LGBTQ+ people in STEM, day of women engineers. Redaction of the II IAA Equality Plan and assistance to the CSIC research institutes DEI committee meetings.

## Service Activities (continued)

- Jul 2024 ★ **Volunteer XVI SEA Meeting** (Granada, Spain).
- Oct 2022 ★ **Volunteer IAA Severo Ochoa Meeting** (Granada, Spain).
- Jun 2022 ★ **Volunteer EAS 2022** (Valencia, Spain).

## Membership

- ★ **Sociedad Española de Astronomía (SEA)**
- ★ **European Astronomical Society (EAS)**

## Software Development

- ★ **PyCASSO**: Adaptation to fit both arms of WEAVE LIFU data cubes with STARLIGHT
- ★ **ProSpect**: Help to adapt ProSpect to fit optical spectra. Inclusion of new stellar libraries (XSL). Development of a pipeline to fit IFU data cubes

## Seminars

- May 2024 ★ **ICRAR, International Centre of Radio Astronomy Research (ICRAR)** (Perth, Australia)  
*Spatially-resolved stellar population properties in void galaxies with CAVITY*

## Courses

- Nov 2022 ★ **Multivariate Exploratory Data Analysis (MEDA): Understanding by looking at data.** UGR (Granada, Spain)
- Oct 2022 ★ **Course on Scientific Writing.** IAC (La Laguna, Spain)
- May 2022 ★ **IAA-CSIC Severo Ochoa Advanced School on Galaxy Evolution.** IAA (Granada, Spain)
- Mar 2022 ★ **Taekwondo timekeeper course.** Andalusian taekwondo federation (Sevilla, Spain)
- ★ **Basic Course on Gender Equality.** Spanish ministry of science and innovation (MCIN)
- Nov 2021 ★ **IAA Severo Ochoa Advanced School on Star Formation.** IAA (Granada, Spain)
- ★ **2nd IAA-CSIC Severo Ochoa School on Statistics, Data Mining, and Machine Learning.** IAA (Granada, Spain)
- Sep 2021 ★ **IV edition of the course in communication and scientific outreach.** Desgranando ciencia (Granada, Spain)
- Sep 2020 ★ **Using Python for Research.** EdX, Harvard University
- Apr 2020 ★ **Machine Learning.** Coursera, Stanford University

## Outreach








- Sep 2024 ★ **European Researchers Night.** *Cosmic workshop: What is the shape of the Universe?*
- Jul 2024 ★ **Espacio3.** *Ordering the Universe: From Chaos to Structure*
- Sep 2023 ★ **European Researchers Night.** *Cosmic webs and hermit galaxies*
- Jun 2023 ★ **ATPATC vol.4.** *What do an Italian and a black hole have in common?*
- May 2023 ★ **Pint of Science.** *Space deserts: cosmic voids*
- Mar 2023, Feb 2022 ★ **Chat with an astronomer.**

## Outreach (continued)

- Feb 2023    ★ **Ask an astronomer.**
- Sep 2015 – Jun 2017    ★ **JEDA (Junior Empresa de Divulgación).** I have taken part in the following events:
- Science Week in the faculty of sciences
  - Desgranando Ciencia
  - Open day in Parque de las Ciencias

## List of Publications

### Journal Articles

- 1 A. M. Conrado, R. M. González Delgado, R. García-Benito, *et al.*, “The CAVITY project: The spatially resolved stellar population properties of galaxies in voids,” *A&A*, vol. 687, A98, Jul. 2024.  DOI: [10.1051/0004-6361/202449414](https://doi.org/10.1051/0004-6361/202449414). arXiv: 2404.10823 [astro-ph.GA].
- 2 R. García-Benito, A. Jiménez, L. Sánchez-Menguiano, *et al.*, “CAVITY: Calar Alto Void Integral-field Treasury survey: I. First public data release,” *A&A*, vol. 691, A161, Nov. 2024.  DOI: [10.1051/0004-6361/202451400](https://doi.org/10.1051/0004-6361/202451400). arXiv: 2410.08265 [astro-ph.GA].
- 3 S. Jin, S. C. Trager, G. B. Dalton, *et al.*, “The wide-field, multiplexed, spectroscopic facility WEAVE: Survey design, overview, and simulated implementation,” *MNRAS*, vol. 530, no. 3, pp. 2688–2730, May 2024.  DOI: [10.1093/mnras/stad557](https://doi.org/10.1093/mnras/stad557). arXiv: 2212.03981 [astro-ph.IM].
- 4 G. Martínez-Solaache, R. García-Benito, R. M. González Delgado, *et al.*, “Exploring galaxy properties of eCALIFA with contrastive learning,” *A&A*, vol. 688, A160, Aug. 2024.  DOI: [10.1051/0004-6361/202450074](https://doi.org/10.1051/0004-6361/202450074). arXiv: 2405.13471 [astro-ph.GA].
- 5 I. Pérez, S. Verley, L. Sánchez-Menguiano, *et al.*, “CAVITY, Calar Alto Void Integral-field Treasury survey and project extension,” *A&A*, vol. 689, A213, Sep. 2024.  DOI: [10.1051/0004-6361/202449749](https://doi.org/10.1051/0004-6361/202449749). arXiv: 2405.04217 [astro-ph.GA].
- 6 S. F. Sánchez, R. García-Benito, R. González Delgado, *et al.*, “The CAVITY Project: Spatially-Resolved and Characteristic Properties of Galaxies Derived Using pyPipe3D,” *RMxAA*, vol. 60, pp. 323–341, Oct. 2024.  DOI: [10.22201/ia.01851101p.2024.60.02.10](https://doi.org/10.22201/ia.01851101p.2024.60.02.10).
- 7 G. Torres-Ríos, I. Pérez, S. Verley, *et al.*, “Effect of the local and large-scale environment on the star formation histories of galaxies,” *A&A*, vol. 691, A341, Nov. 2024.  DOI: [10.1051/0004-6361/202450675](https://doi.org/10.1051/0004-6361/202450675).

### Conference Proceedings

- 1 G. Torres-Ríos, I. Pérez, S. Verley, *et al.*, “The effect of local and large scale environment on star formation histories in galaxies,” in *EAS2024*, Jul. 2024, p. 1965.