

# NIKA JURLIN, PHD

Researcher | Educator

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## SUMMARY

- **Interdisciplinary researcher** with a PhD in Astrophysics, an MSc in Physics Education, and 10+ years of teaching experience. I combine a strong technical background with formal and practical educational training. Published 19 peer-reviewed papers in 7 years (4 first author papers).
- **Educational specialist** with 15 years of STEM experience. I mentored 4 researchers, designed 4 workshops, delivered 40+ international presentations, and founded Astronomy on Tap Groningen. I am formally trained in didactics, educational psychology, and constructive alignment.
- **Technical & AI expertise:** Proficient in Python (statistical modeling, Bayesian inference) and data visualisation. Currently exploring the integration of LLMs in STEM curriculum design and student-AI interaction patterns.
- **Collaborative leader:** Managed €680K+ in research funding and coordinated teams from Europe, US, and Asia.

## PROFESSIONAL EXPERIENCE

### International Physics & Math Educator, Founder

Sep 2024 – Present

📍 Asteria

- Mentoring 38 students in advanced STEM; applying **educational psychology** and **differentiated instruction** (5/5 rating on tutoring platform Preply).
- Designing and developing “Engineering in Astronomy” workshops to introduce the hardware logic and physical assembly of telescopes.
- Guest Lecturer at the University of Groningen on galactic habitability.

### Postdoctoral Research Fellow | Astronomy & Education

Sep 2022 – Sep 2024

📍 University of Texas at Austin – US

- Supervised 3 researchers, utilising a student-centered approach to transition them into independent investigators; guest lecturer for one University course; two-time invited outreach speaker.
- Developed Python-based pipelines to process 376 GB of data to understand the relationship between physical properties and observational parameters of galaxies.
- Secured and managed €180K in funding through scientific proposals (from the idea to execution).

### PhD researcher | Astronomy and Astrophysics

Jul 2017 – Sep 2022

📍 University of Groningen and ASTRON – Netherlands

- Founded “Astronomy on Tap Groningen”; led a team of 12 to organise 25+ events; mentored one student.
- Built data-driven statistical models on **radio observations** to quantify empirical trends and interpret high-energy astrophysics.
- Secured **420+ hours of observing time** (~€500K equivalent) via competitive proposals.
- Managed multi-year international projects, published results, presented at international conferences.

### Data and Process Analyst Intern

Jan 2016 – Jan 2017

📍 Miltonia d.o.o. – Croatia

- Analyzed production efficiency using **SQL**, identifying bottlenecks and recommending data-driven improvements.
- Developed roadmap for two new assembly machines, increasing operational efficiency by 15%.

## SELECTED ACHIEVEMENTS

- **Founded Astronomy on Tap Groningen**, leading a group of 12, organising and hosting 25+ monthly outreach events bridging science and society with international speakers.
- Secured **€180K** in competitive grants and 420+ hours of observing time (€500K equivalent).

- Published **19 peer-reviewed publications (4 as a first author and 3 as a co-lead)** and delivered **26 scientific presentations at international conferences**.
- Delivered 20+ popular science talks and workshops; Invited to speak at the Long Center in Austin, US, preceding a keynote by Neil deGrasse Tyson.

## EDUCATION

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- PhD** Astrophysics      *University of Groningen — Netherlands*      2017 – 2022
- MSc** Physics Education    *University of Zagreb — Croatia*      2015 – 2017
- *Specialized Coursework:* General Didactics, Teaching Methodology, Educational Psychology, Sociology, and Pedagogy.

## RELEVANT SKILLS

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**Research:** Quantitative & Qualitative methods, Python (pandas, scikit-learn), SQL, Statistical modeling (Bayesian inference), trend analysis, high-dimensional data analysis, Machine Learning (Self-Organising Maps), Literature reviews.

**Generative AI:** Prompt Engineering, LLM-assisted curriculum development, Knowledge of advantages and disadvantages of using different LLMs, using AI to create scientifically accurate pedagogical material (visualisations, simulations).

**Pedagogy:** Constructive Alignment, Project-Based Learning, STEM Outreach, Engineering Education (Hardware & Radio systems).

## LEADERSHIP & PROFESSIONAL SERVICE

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### Conference Organising Committees:

- AGNL Meeting (Active Galactic Nuclei), Dwingeloo, NL      2019
- International Conference of Physics Students (ICPS), Zagreb, HR      2014
- Multiwavelength Surveys: Galaxy Formation and Evolution, Dubrovnik, HR      2014

### Tech Industry & Academic Volunteering:

- **MXT Conference** (Move Forward with Tech), Groningen, NL      Jan 2026
  - Facilitating networking and innovation sessions at the annual cross-tech conference exploring the convergence of AI, entrepreneurship, and digital technology.
- **Science Communicator & Public Speaker**, International (Europe & US)      2015 – Present
  - Delivered 20+ popular science talks; Invited to speak at the Long Center in Austin, US, preceding a keynote by Neil deGrasse Tyson.
- **STEM Mentor**, UT Austin, US and Groningen, NL      2021 – 2024

## INTERESTS

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- AI, education; Building telescopes and radio systems; Reading; Squash and hiking; Woodworking and art.

## REFERENCES

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### Prof. Dr. Raffaella Morganti

Professor and Senior Astronomer  
University of Groningen and ASTRON  
*Email:* [morganti@astron.nl](mailto:morganti@astron.nl)  
*Relationship:* PhD Supervisor

### Dr. Danielle A. Berg

Assistant Professor  
University of Texas at Austin  
*Email:* [daberg@austin.utexas.edu](mailto:daberg@austin.utexas.edu)  
*Relationship:* Postdoc Supervisor

## RESEARCH OUTPUT PORTFOLIO

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**Summary:** 19 peer-reviewed publications (7 as first or co-lead author) in A&A, MNRAS, ApJ, and Galaxies. 596 citations.

### Selected Peer-Reviewed Publications (Lead/Key Author):

1. **Jurlin, N.**, et al. (2023). “Nuclear regions as seen with LOFAR international baselines: A high-resolution study of the recurrent activity.” *A&A*, 682, A118.
2. **Jurlin, N.**, et al. (2021). “Multi-frequency characterisation of remnant radio galaxies in the Lockman Hole field.” *A&A*, 653, A110.
3. **Jurlin, N.**, et al. (2021). “The Photometric and Spectroscopic Properties of Remnant and Restarted Radio Galaxies in the Lockman Hole Field.” *Galaxies*, 9, 122.
4. **Morganti, R., Jurlin, N. (Co-lead)**, et al. (2021). “Combining LOFAR and Apertif Data for Understanding the Life Cycle of Radio Galaxies.” *Galaxies*, 9, 88.
5. **Jurlin, N.**, et al. (2020). “The life cycle of radio galaxies in the LOFAR Lockman Hole field.” *A&A*, 638, A34.
6. **Shabala, S. & Jurlin, N. (Co-lead)**, et al. (2020). “The duty cycle of radio galaxies revealed by LOFAR: remnant and restarted radio source populations.” *MNRAS*, 496, 1706.
7. **Ciliegi, P. & Jurlin, N. (Co-lead)**, et al. (2018). “The XXL Survey : XXVI. Optical and near-infrared identifications of the ATCA 2.1 GHz radio sources in the XXL-S Field.” *A&A*, 620, A11.

### Co-authored Peer-Reviewed Publications:

- Gazagnes, S., ..., **Jurlin, N.**, et al. (2025). “A negligible contribution of two luminous  $z \sim 7.5$  galaxies to the ionizing photon budget of reionization.” *MNRAS*, 540, 2331.
- Sweijen, F., ..., **Jurlin, N.**, et al. (2025). “The low-frequency size distribution of radio sources in the Lockman Hole.” *MNRAS*, 540, 416
- Debski, M. H., ..., **Jurlin, N.**, et al. (2025). “HETDEX-LOFAR Spectroscopic Redshift Catalog.” *ApJ*, 978, 101.
- Nair, D. G., ..., **Jurlin, N.**, et al. (2024). “Core prominence as a signature of restarted jet activity in the LOFAR radio-galaxy population.” *A&A*, 691, A287.
- Gazagnes, S., ..., **Jurlin, N.**, et al. (2023). “Interpreting the Si II and C II line spectra from the COS Legacy Spectroscopic SurveyY.” *ApJ*, 952, 164.
- Mostert, R. I. J., ..., **Jurlin, N.**, et al. (2023). “Finding AGN remnant candidates based on radio morphology with machine learning.” *A&A*, 674, A208.
- Morganti, R., ..., **Jurlin, N.**, et al. (2021). “The best of both worlds: Combining LOFAR and Apertif to derive resolved radio spectral index images.” *A&A*, 648, A9.
- Mostert, R. I. J., ..., **Jurlin, N.**, et al. (2021). “Unveiling the rarest morphologies of the LoTSS population with self-organised maps.” *A&A*, 645, A89.
- Slaus, B., ..., **Jurlin, N.**, et al. (2020). “The XXL Survey. XLI. Radio AGN luminosity functions based on GMRT 610 MHz observations.” *A&A*, 638, A46.
- Mahatma, V. H., ..., **Jurlin, N.**, et al. (2019). “LoTSS DR1: Double-double radio galaxies in the HETDEX field.” *A&A*, 622, A13.
- Butler, A., ..., **Jurlin, N.**, et al. (2018). “The XXL Survey: XXXI. Classification and host galaxy properties of 2.1 GHz ATCA XXL-S radio sources.” *A&A*, 620, A16.
- Smolcic, V., ..., **Jurlin, N.**, et al. (2017). “(Sub)millimetre interferometric imaging of a sample of COSMOS/AzTEC submillimetre galaxies III. Environments.” *A&A*, 597, A4.

### Selected Research Proposals:

- **Principal Investigator:** 9 successful proposals for VLA, WHT, and McDonald telescopes.
- **Co-Investigator:** 8 successful proposals for JWST, HST, VLA, GBT, and VLBI telescopes.

### Selected Talks and Conference Presentations:

- *Invited Talk:* “Galactic Habitability”, University of Groningen, NL

2025

- *Invited Talk*: “Galaxy Lensing”, Long Center in Austin, US (Preceding Neil deGrasse Tyson) 2023
- *Invited Talk*: “The Life Cycle of Radio AGN”, EAS Meeting, Krakow, PL 2023
- *Invited Talk*: “Radio Source Evolution”, University of Zagreb, HR 2022
- *Invited Talk*: “AGN Life Cycles”, Bologna Institute of Radio Astronomy, IT 2019
- *Invited Talk*: “LOFAR Deep Fields”, Leiden University, NL 2018
- *Selected Talk*: AGN on the Beach, Tropea, IT 2023
- *Selected Talk*: UV Galaxies, Reykjavik, ISL 2023
- *Selected Talk*: Thesis Colloquium, University of Groningen, NL 2022
- *Selected Talk*: EAS Conference (Online) 2021
- *Selected Talk*: Dutch Astronomers Conference (Online) 2020
- *Selected Talk*: Low-redshift AGN Physics WG meeting, Dublin, IE 2019
- *Selected Talk*: MWSKY-II conference at NCRA, Pune, IND 2019
- *Selected Talk*: LOFAR SKSP science meeting, Leiden, NL 2017
- Delivered over 40 presentations including conference presentations, departmental seminars, and high-profile outreach talks for the general public.

#### **Other relevant output:**

- **Jurlin, N.** (2017). “Optical identification of radio sources in the XXL-South field using likelihood technique.” *Master’s Thesis, University of Zagreb*.
- **Jurlin, N.** (2017). “Misconceptions in astronomy education in high schools all over the world.” *Master’s Thesis, University of Zagreb*.