# Erick Cignachi

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## RESEARCH INTERESTS

My research program is centered on observational studies of the high-redshift universe to build a comprehensive picture of galaxy and large-scale structure evolution. My primary area of investigation involves galaxy groups, which I study through a multi-pronged observational approach. I utilize strong gravitational lensing as a natural telescope to probe mass distributions and employ high-resolution interferometric imaging to resolve structural details. Furthermore, I investigate the internal kinematics of high-redshift galaxies using both long-slit spectroscopy and Stellar Population Synthesis (SSP) to understand their dynamical states. Complementing my observational work, I have a strong interest in the development of new research techniques, spanning both innovative methodologies and the creation of open-source software to improve astronomical data analysis.

## EDUCATION

**Federal University of Rio Grande do Sul (UFRGS)**    *Porto Alegre, Brazil*
MSc in Astrophysics    *Sep 2023 – Present*
*Master's Thesis: Probing a Possible Galaxy Group Merger: A Kinematically Constrained Gravitational Lens Model of the HELMS18 System*
Advisors: Cristina Furlanetto & Marina Trevisan

**Federal University of Rio Grande do Sul (UFRGS)**    *Porto Alegre, Brazil*
BSc in Physics with Emphasis in Astrophysics    *Mar 2019 – Sep 2023*
*Bachelor's Thesis: Investigating the Gravitational Lensing of the HELMS18 System: Two Interacting Galaxy Groups at z = 0.6?* (Portuguese only)
Advisors: Cristina Furlanetto & Marina Trevisan

**Federal Institute of Education, Science and Technology of Rio Grande do Sul (IFRS)**    *Farroupilha, Brazil*
    *Mar 2015 – Dec 2018*
Technical Degree in Information Technology
*Capstone Project: Development and Design Management of an Educational Game for Programming Learning* (Portuguese only)
Advisor: Rafael Vieira Coelho

## ACADEMIC HONOURS

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| 2024/05-2025/02 | Master research fellowship granted by PROEX |
| 2022-2023 | Undergraduate research fellowship granted by PIBIC CNPq-UFRGS |
| 2020-2022 | Undergraduate research fellowship granted by BIC UFRGS |
| 2018-2019 | Undergraduate research fellowship granted by PIBEN |

## PUBLICATIONS

[1] **E. Cignachi**, C. Furlanetto, and M. Trevisan, *Probing Group-Scale Halo Assembly with Strong Lensing and Kinematics* - In preparation.

## SCIENTIFIC TALKS AND POSTERS

2024     **III Workshop on Lensing by Galaxies and Clusters (III LeGaC) - Rio de Janeiro, Brazil**
Oral. Title: Investigating a pair of galaxy groups with strong lensing and dynamics.

2024     **XLVII Brazilian Astronomical Society meeting - Águas de Lindóia, Brazil**
Oral. Title: Modeling the mass distribution of a pair of galaxy groups.

2022     **II Workshop on Lensing by Galaxies and Clusters (II LeGaC) - Rio de Janeiro, Brazil**
Oral. Title: Investigating the Gravitational Lensing of the HELMS18 System: Two Interacting Galaxy Groups at z = 0.6?

2021     **XLIV Brazilian Astronomical Society virtual meeting - Virtual Meeting**
Poster. Title: Investigating the Gravitational Lens of the Helms18 System: a Merging Pair of Galaxy Groups at z=0.6?

## SCHOOLS AND WORKSHOPS

2025     **Supercomputer School Santos Dumont 2025**
School held by the National Laboratory of Cientific Computing (LNCC). Summer School on supercomputer architecture, paralel computing on CPU and GPU, machine and deep learning.

## TEACHING EXPERIENCE

2025     Teaching Internship at undergraduate Astrophysics course: Fundamentals of Astronomy and Astrophysics, UFRGS.

## SKILLS AND LANGUAGES

**Computer Skills**     Python, C/C++, Java, JavaScript, TypeScript, SQL, LaTeX, HTML, Open MPI, CUDA

**Astronomy tools**     IRAF & PyRAF, DS9, pPXF, PyAutoLens, Astropy, CASA, CARTA, TOPCAT

**Other Useful Tools**     ScyPy, Pandas, NumPy, Dynesty, Nautilus, Jupyter, VSCode, Netbeans, mySQL, Spyder, Pycharm.

**Languages**     Proficient in Portuguese and English