

# Benedetta Mestichelli

## PHD STUDENT

I currently am a second year PhD student of Astroparticle Physics at the Gran Sasso Science Institute. My main research field is related to the study of formation channels of intermediate-mass black holes in dynamical environments at various redshifts.

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### HOW TO REACH ME:

Via Francesco Crispi, 7 - L'Aquila (AQ) - Italy  
email: [benedetta.mestichelli@gssi.it](mailto:benedetta.mestichelli@gssi.it)  
LinkedIn: [@benedettamestichelli](#)  
Skype: [benedettamestichelli.7](#)

### CURRENT OCCUPATION

#### **Gran Sasso Science Institute**

PhD in Astroparticle Physics

- Attended Nov. 2022 - Nov. 2026

### EDUCATIONAL TRAINING

#### **University of Padova**

Master's degree in Astrophysics and Cosmology

- Attended Sept. 2020 - Sept. 2022

- Final grade: 110/110 cum laude

#### **University of Camerino**

Bachelor in Physics

- Attended Sept. 2016 - Feb. 2020

- Final grade: 109/110

### OTHER FUNDED RESEARCH POSITIONS

#### **Institut für Theoretische Physik - Universität Heidelberg**

Visiting PhD student

-Period: Nov. 2023 - July 2024

### PUBLICATIONS

#### **Co-author**

-Jiang et al. "Fading of the broad H-beta emission in OQ 208 from Copernico spectroscopic observations", *The Astronomer's Telegram* (n. 15354)

-Cozzumbo et al. "Opportunities and limits of lunar gravitational-wave detection"  
[10.48550/arXiv.2309.15160](https://arxiv.org/abs/10.48550/arXiv.2309.15160) (Sept. 2023)

## RESEARCH EXPERIENCE

### PhD Thesis

Gran Sasso Science Institute

Period: Nov. 2023 - Nov. 2026

Title: *Intermediate-mass black holes across cosmic time*

Supervisor: Prof. Marica Branchesi, Co-supervisor: Prof. Michela Mapelli

Abstract: We will focus on the formation scenarios of intermediate-mass black holes in massive clusters starting from the Milky Way and moving outwards to the remote universe.

### Master Thesis

University of Padova

Period: March 2022 - Sept. 2022

Title: *Intermediate-mass black hole formation in dense massive clusters*

Supervisor: Prof. Michela Mapelli, Co-supervisor: Dr. Sara Rastello

Abstract: In this work, we discussed the formation channels of intermediate-mass black holes in young globular clusters by generating simulations with the direct N-body code PeTar-MOBSE.

### Reverberation mapping campaign of quasars

University of Padova - Copernico Telescope (Asiago)

Period: March 2022 - April 2023

Supervisors: Prof. Mauro D'Onofrio, Prof. Paola Marziani

Training in the usage of the AFOSC instrument at the Copernico Telescope (Asiago) for the spectroscopic observation of quasars.

### Post-graduation scholarship

University of Camerino

Period: June 2020 - Sept. 2020

Supervisor: Prof. Sebastiano Pilati

Application of machine learning techniques to pharmacological issues. The aim of the developed algorithm was to predict the binding affinity of compounds for which such datum was missing. The goodness of such algorithm was tested using a smaller number of features, to which a lower performance corresponded.

### Bachelor Thesis

University of Camerino

Period: Sept. 2019 - Feb. 2020

Title: "Comparison among detection algorithms of continuous gravitational signals"

Supervisor: Dr. Flavio Travasso, Advisor: Prof. Paola Leaci

Abstract: In this study, we focused our attention on continuous gravitational signals generated by both isolated and binary neutron stars and on the current algorithms implemented for their detection.

## WORK EXPERIENCE

### Post-graduation scholarship

University of Camerino - 6 Tour s.r.l.

Period: March 2020 - June 2020

Handling of tasks involving data analysis with Python and training in the usage of JavaScript

## LANGUAGES

<b>Italian</b>	Mother tongue
<b>English</b>	Certificate in Advanced English (Cambridge Assessment English)

## COMPUTING SKILLS

**Python:** used throughout the master degree and the PhD for data analysis and computational astrophysics

**Bash:** used daily to manage simulations/data on computer clusters

**C:** used in the context of a bachelor degree course

**JavaScript:** learned during the work experience at 6Tour s.r.l. to create/manage websites

## CONFERENCES

Poster presentation: Two in a Million - ESO Garching (11-15 Sept. 2023)

## PHD SCHOOLS

-Scientific Communication in Astronomy - Bertinoro (2-6 Oct. 2023)

## OUTREACH

-Sharper Night - L'Aquila (29 Sept. 2023)