

Lavinia Paiella

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Research interests

I am strongly interested in **compact objects** and their **multi-messenger** emissions. I am currently investigating the role of **star clusters** in producing **heavy intermediate-mass black holes** using semi-analytic **population synthesis codes** and their potential detection with current and future **gravitational-wave** interferometers.

Education

Ph.D. program

Astroparticle Physics

Supervisors: Prof. Manuel Arca Sedda, Prof. Gor Oganesyan

keywords: intermediate mass black holes, star clusters, population codes, gravitational waves

Gran Sasso Science Institute

Nov 2022 - Present

Master Degree

Astrophysics, 110/110 w.h.

keywords: neutron star binaries, gravitational waves, kilonovae

La Sapienza University

Sep 2020 - Sep 2022

Bachelor Degree

Physics, 110/110 w.h.

keywords: machine learning, galaxy surveys

La Sapienza University

Sep 2017 - Sep 2020

Awards and Honours

Transnational Visitor Programme Grant

Awarded by AHEAD2020, ~ 2.5k euros

April 2024

Grant for short-term visitor programmes aimed at the realization of projects in high energy astrophysics.

Milla Baldo Ceolin National Prize

Awarded by INFN, ~ 1k euros

July 2023

National award for the 10 best master theses in Theoretical Physics written by women.

Scientific visits

Short term stay (AHEAD2020)

Barcelona , Spain

ICCUB

22 Sept - 13 Oct 2024

Project on the formation of black hole - neutron star binaries and their potential as gamma-ray bursts progenitors. Supervision of Dr. Sara Rastello and Prof. Mark Gieles.

Short term stay

Baltimore , USA

Johns Hopkins University

25 Oct - 23 Nov 2023

Hosted by Prof. Emanuele Berti's research group in the context of ITA-USA Bilateral Agreement between GSSI and Johns Hopkins University.

Publications (short-author)

- [1]: **Paiella L.**, Arca Sedda M., Mestichelli B., Ugolini C., *Seeds to success: growing heavy black holes in dense star clusters*, arXiv preprint, arXiv:2511.00200
- [2]: **Paiella, L.**, Ugolini, C., Spera, M., Branchesi, M., and Arca Sedda, M., *Assembling GW231123 in star clusters through the combination of stellar binary evolution and hierarchical mergers*, ApJL, 2025, 10.3847/2041-8213/ae1447
- [3]: Mestichelli B., Mapelli M., Santoliquido F., Arca Sedda M., Branchesi M., **Paiella L.**, Costa G., Iorio G., Mould M. and Lipatova V., *et al.*, *Black Hole - Neutron Star and Binary Neutron Star Mergers from Population III and II stars*, A&A, 10.1051/0004-6361/202555951
- [4]: Toubiana, A., Gerosa, D., Mould, M., Rinaldi, S., Arca Sedda, M., Bruel, T., Buscicchio, R., Gair, J., **Paiella, L.**, Santoliquido, F., Tenorio, R., Ugolini, C., *Comparing astrophysical models to gravitational-wave data in the observable space*, arXiv preprint, arXiv:2507.13249
- [5]: Cozzumbo, A., Mestichelli, B., Mirabile, M., **Paiella, L.**, Tissino, J., and Harms, J., *Opportunities and limits of lunar gravitational-wave detection*, Phil. Trans. R. Soc. A, 2023, rsta.2023.0066

Seminars & Talks

Seminars

Teeminars 2026 <i>Online</i>	Heidelberg University 27 Jan 2026
Galaxy Evolution Coffee <i>Garching, Germany</i>	ESO 13 Nov 2025
APC Seminars <i>Trieste, Italy</i>	SISSA 19 March 2025
Pizza Seminars <i>Barcelona, Spain</i>	ICE - CSIC 11 Oct 2024

Invited talks

GRaviCon2026 <i>Pisa, Italy</i>	Scuola Normale Superiore 22-24 April 2026
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Contributed talks

LISA Astro-WG Meeting <i>Geneva, Switzerland</i>	Campus Biotech 15-17 Dec 2025
EAS 2025 <i>Cork, Ireland</i>	University College Cork 23-27 June 2025
MODEST 2025 <i>Seoul, South Korea</i>	Seoul National University 16-20 June 2025
ET Symposium 2025 <i>Bologna, Italy</i>	CNR center 26-30 May 2025
Unveiling massive black hole evolution with gravitational waves and light <i>Paris, France</i>	APC Paris 19-23 May 2025

MODEST 2024*Warsaw, Poland***Nicolaus Copernicus Astronomical Center***19 -23 Aug 2024***Short talks.....****Challenges and future perspectives in GW astronomy***Leiden, Netherlands***Lorentz center***14 -18 Oct 2024*

Outreach

Ricerca Fuori Campo*L'Aquila, Italy*

Event moderator of public discussion on the representation and role of researchers in society.

Gran Sasso Science Institute*24 Nov 2025***European Researchers' Night***L'Aquila, Italy*

Volunteered at the activities organized by Gran Sasso Science Institute.

Gran Sasso Science Institute*26 Sep 2025***Space Explorers***L'Aquila, Italy*

Outreach event organized by the Astrophysics and Cosmology Group of Gran Sasso Science Institute for elementary schools in L'Aquila.

Gran Sasso Science Institute*2023 - Present***European Researchers' Night***L'Aquila, Italy*

Volunteered at the activities organized by Gran Sasso Science Institute.

Gran Sasso Science Institute*29-30 Sep 2023*

Technical skills

Programming: Python (advanced),
C/C++ (intermediate),
Mathematica, Fortran (beginner)**O.S.:** Linux, Windows (advanced)**Other:** \LaTeX , Office (advanced),
Matlab (beginner)

Languages

Italian: Native**English:** Proficient*IELTS Certificate, average score: 8 (January 2022)*