



Maria Paola Vaccaro

Born on July 11th, 1997
in Larino (CB), Italy

✉ mariapaola.vaccaro
@studenti.unipd.it

✉ mariapaolavaccaro@gmail.com
☎ +39 320 031 2701

Scientific interests

- Compact objects
- Gravitational waves sources
- Black holes dynamics
- Stellar clusters
- Computational astrophysics

Numerical tools

Python ●●●●

C ●●●○

Matlab ●●●○

Operating systems

Linux/Unix ●●●○

Windows ●●●○

Languages

Italian (mother tongue)

English (fluent, level C1)

Spanish (basic, level A2)

Education

Oct. 2020 – Sep. 2022 Master degree in Astrophysics

At Università degli Studi di Padova, Padua (PD), Italy

Final grade: 110/110 *cum laude*, GPA: 29.4/30

Supervisor: Prof. Michela Mapelli - Thesis title: "Hierarchical Black Holes Mergers in Active Galactic Nuclei"

Sep. 2019 – Jul. 2020 Master course in Matter Physics

At Università di Pisa, Pisa (PI), Italy - GPA: 28.8/30

Course not completed.

Sep. 2016 – Sep. 2019 Bachelor degree in Physics

At Università di Pisa, Pisa (PI), Italy

Final grade: 110/110 *cum laude*, GPA: 28.6/30

Supervisor: Prof. Pier Giorgio Prada Moroni - Thesis title:

"Evoluzione di raffreddamento delle nane bianche e cosmocronologia" (i.e. "Cooling evolution of white dwarfs and cosmochronology")

Sep. 2011 – Jul. 2016 High school diploma

At Liceo Scientifico Alfano da Termoli, Termoli (CB), Italy

Final grade: 100/100 *cum laude*

Aug. 2014 – Jul. 2015 High school exchange year

At Mead High School in Mead, Colorado, USA

GPA: 4.0/4 - ACT score: 33/36

Current activity

I am a computational astrophysicist, working in the field of gravitational-wave astronomy and black hole dynamics.

In particular, I am currently developing a semi-analytical model of the active galactic nucleus (AGN) disk scenario for hierarchical black hole (BH) mergers. The AGN environment enhances interactions among BHs, with consequent efficient binary formation and rapid merger. The merger remnants are usually retained in the system and they can often go through multiple episodes of pair-up and merger. Hence, AGNs are promising environments for the formation of BHs in the upper mass gap with masses $M_{\text{BH}} \in [50, 130] M_{\odot}$ and intermediate-mass black holes (IMBHs) with masses $M_{\text{BH}} \in [10^2, 10^5] M_{\odot}$.

Funding

Since February 1st, 2023: **Type A Research Grant**

For the research project entitled "Hierarchical evolution of stellar-sized binary black holes in active galactic nuclei" under the supervision of Prof. Michela Mapelli in Università degli Studi di Padova, Padua (PD).

Recent courses and conference attendance

- 4th G2Net Training School "A network for Gravitational Waves, Geophysics and Machine Learning" hosted by Aristotle University of Thessaloniki (remote attendance) - March 28th-30th, 2023
- Python Course (level advanced) hosted by ICFO in Barcelona, Spain - November 24-30 2022
- Einstein Telescope Annual Meeting hosted by EGO, Pisa, Italy - November 15-17 2022 (attended remotely)
- GW Open Data Workshop hosted by GWOSC - May 23-25 2022 (online event)
- "Update on the LIGO, Virgo, and KAGRA detector upgrades for O4" - April 28 2022
- IFPU colloquium "Massive black hole pairs and binaries in the cosmos", Marta Volonteri - March 25 2022
- IPAM Workshop III: Source inference and parameter estimation in Gravitational Wave Astronomy (remote attendance) - November 15-19 2021

Outreach

I've been a member of the cultural association Scholé based in Roccella Ionica (RC), Italy since 2020. I'm currently part of the organizing committee for the "School of physics" 2023: a series of lectures held by university professors in the high school Liceo Volta in Reggio Calabria.

Awards and other activities

- Don Peppe Presutto award from Circolo CFR Serracapriola for academic achievements - 2016, 2020
- Aupair program in Cork, Ireland for language enhancement - Summer 2018
- Lions Club Tifernus award and scholarship for educational achievements - 2016
- Internship in the local newspaper Termolionline in Termoli (CB), Italy - June 2014