Erika **Korb**

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Education

now | **PhD in Astrophysics**, **University of Padua**
Oct 2022 | Thesis: *Binary compact object populations*
Supervisor: Prof. Michela Mapelli

› With the stellar evolution software MESA, I study the correlation between stellar structure and mass transfer efficiency. I aim to extract fitting-formulae and tables that can be implemented by population-synthesis codes, allowing for more realistic simulations.

Sep 2022 | **Master in Astrophysics and Cosmology**, **University of Padua**
Oct 2020 | Thesis: *Wolf-Rayet – black hole binaries as progenitors of binary black holes*
Supervisor: Prof. Michela Mapelli; Co-Supervisor: Dr. Giuliano Iorio
Grade: 110/110 cum laude

› I used the SEVN population-synhtesis code to study binaries hosting a Wolf-Rayet star and a black hole. I investigated their role as progenitors of merging binary black holes, comparing my results to the observed properties of Cyg X-3.

Sep 2020 | **Bachelor in Astronomy**, **University of Padua**
Oct 2017 | Thesis: *Impact of mass transfer efficiency on the formation of binary compact objects*
Supervisor: Prof. Michela Mapelli; Co-Supervisor: Dr. Giuliano Iorio
Grade: 110/110 cum laude

› By means of numerical simulations with the SEVN code, I studied the impact of mass transfer processes on the formation of binary compact objects, focusing on binaries merging via gravitational wave emission.

Jul 2017 | **Scientific High School "G.B. Benedetti"**, **Venice**
Sep 2012 | Final project: *The Pleiades*
Grade: 100/100 cum laude

› I calculated the distance of the Pleiades open cluster with the parallax method, reducing Hipparcos data with the TOPCAT software.

Achievements

2020 | **Mille e una lode** by **University of Padua**

› I was in the 3% of students with the highest average grade in my bachelor. For this, I received a 1 k€ scholarship for a 250 hours internship; I included it in my master thesis work.

2016 | **Il cielo come laboratorio** by **University of Padua**
2015

› I was selected (23% of candidates, regional selection) for a three-days stage at the Asiago observatory (Italy) to analyze photometric and spectroscopic data in teams of 2-3 people.

Schools

3-7 Oct 2022 | **3rd Astrostatistics School**, **INAF Brera, Milan**
Teacher: Prof. Stefano Andreon

› I used the JAGS software to apply Bayesian statistics in the astrophysical context.

Memberships & Collaborations

2022 - now **LISA** - Member of the Laser Interferometer Space Antenna consortium

2022 - now **ET** - Member of the Einstein Telescope collaboration

2022 - now **TEONGRAV** - Member of the Theory of Gravitational Wave Sources collaboration at INFN

2022 - now **INFN** - Affiliated to the Italian Institution for Nuclear Physics; Section of Padua

2020 - now **DEMOBLACK** - Member of the ERC-funded research group led by Michela Mapelli

€ Fundings

2021 | **PRIN** (**577.5 k€ for 3 years**)
By: MIUR (Italian Minister for Education, University and Research)
Title: *Multimessenger astronomy in the Einstein Telescope Era (METE)*
Co-I | PI: Marica Branchesi; co-PIs: Enrico Cappellaro, Michela Mapelli, Michele Punturo
› Success rate: 9.5%
› Covers most of my PhD expenses

Publications submitted

Co-author | **Compact object mergers: exploring uncertainties from stellar and binary evolution with SEVN**
Giuliano Iorio, Guglielmo Costa, Michela Mapelli, Mario Spera, Gastón J. Escobar, Cecilia Sgalletta, Alessandro A. Trani, **Erika Korb**, Filippo Santoliquido, Marco Dall'Amico, Nicola Gaspari, Alessandro Bressan
2022, MNRAS
arxiv.org/abs/2211.11774 gitlab.com/sevncodes/sevn

Conferences & Talks

4-5 Aug 2022 **Post-PAX meeting**, *Harvard–Smithsonian Center for Astrophysics* - Poster presentation

8 Apr 2022 **Spring Workshop on Physics of Data**, *Istituto Veneto di Scienze Lettere ed Arti* - Partecipant

Outreach

16 Jul 2019 | **Public observational evening**, **Padua**
› I collaborated with the amateur astronomers of Padua, using their telescopes to illustrate celestial objects to the public during the event organized for the partial lunar eclipse.

Software skills

Advanced: Python (e.g., *Numpy, Matplotlib, Pandas, Dask, Scipy, RegEx, Streamlit, Altair*; Jupyter, IDLE), LaTeX(TeXstudio, Overleaf), Slurm (Queue scheduler for HPC), Git, Linux, Windows, SEVN (Population-synthesis code), MESA (Stellar evolution software)

Intermediate: Markdown, Bash, Inkscape/GIMP (Graphics)

Basic: C++, JAGS (Gibbs sampler), SAOImage DS9, TOPCAT

Languages

	A1	A2	B1	B2	C1	C2	
Italian	●	●	●	●	●	●	(native)
English	●	●	●	●	●	○	
German	●	●	○	○	○	○	

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