# Erika **Korb**

**PhD student in Astrophysics | University of Padua**

Venice, Italy
erika.korb.astro@gmail.com erikakorb erikakorb
https://erikakorb-website-welcome-9etk7i.streamlit.app/


## Education

**now – Oct 2022** | **PhD in Astrophysics**, **University of Padua**
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 and contributing to the science case for Einstein Telescope.

MESA Einstein Telescope

**Sep 2022 – Oct 2020** | **Master in Astrophysics and Cosmology**, **University of Padua**
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.

SEVN Thesis PDF erikakorb/masterthesis

**Sep 2020 – Oct 2017** | **Bachelor in Astronomy**, **University of Padua**
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.

SEVN Thesis PDF

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

- I calculated the distance of the Pleiades open cluster with the parallax method.

## Awards and Prizes

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

- 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 – 2015** | **Il cielo come laboratorio** by the **University of Padua** Website

- 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** Website
Teacher: Prof. Stefano Andreon

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

## Teaching

Apr-Jun 2023 | **Laboratory of Computational Physics (Mod B.)**
*University of Padua, Master in Physics of Data* - Teaching assistant

## Outreach

16 Jul 2019 | **Telescope observations open to the public, Padua**
› I collaborated with the amateur astronomers of Padua, using their telescopes to illustrate celestial objects in the public event organized for the partial lunar eclipse.

## 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

## 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

## 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

## Memberships & Collaborations

2022 - now **LISA** - Associate member of the Laser Interferometer Space Antenna consortium Website
2022 - now **ET** - Member of the Einstein Telescope collaboration Website
2022 - now **TEONGRAV** - Member of the Theory of Gravitational Wave Sources collaboration Website
2022 - now **INFN** - Affiliated to the Italian Institution for Nuclear Physics; Section of Padua Website
2020 - now **DEMOBLACK** - Member of the ERC-funded research group led by Michela Mapelli Website

## 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 | ● | ● | ○ | ○ | ○ | ○ | |

*I authorize the processing of personal data contained in my curriculum vitae according to art. 13 GDPR 679/16.* (February 2023)