

# Erika Korb

Astrophysicist | Staff Research Scientist

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## RESEARCH EXPERIENCE

CURRENT	<b>Staff Research Scientist</b> <b>Astronomical Observatory Valle d'Aosta (OAVdA) - Fondazione Clément-Fillietroz (FCF)</b>
Nov 2025	➤ Developer of AI solutions for <a href="#">Technology Transfer</a> for ecological transition and environmental monitoring. ➤ Astrophysical researcher in stellar, binary evolution, and gravitational waves. Maintainer of the <a href="#">SEVN</a> code.
DEC 2025	<b>Visiting Researcher</b>
FEB 2024	<b>University of Heidelberg - Institute for Theoretical Astrophysics (ITA-ZAH)</b> ➤ Collaboration with <a href="#">ERC-funded group</a> of Prof. M. Mapelli. 9 months spent in presence (non-consecutive). ➤ Prosecution of the PhD thesis on gravitational wave progenitors and co-development of the <a href="#">SEVN</a> code.

## EDUCATION

DEC 2025	<b>PhD in Astrophysics, University of Padua</b>	
OCT 2022	Thesis: <i>Binary compact object populations</i> Supervisor: Prof. Giuliano Iorio; Co-Supervisors: Prof. Michela Mapelli, Prof. Giovanni Carraro	
SEP 2022	<b>Master in Astrophysics and Cosmology, University of Padua</b>	110/110 cum laude
OCT 2020	Thesis: <i>Wolf-Rayet – black hole binaries as progenitors of binary black holes</i> Supervisor: Prof. Michela Mapelli; Co-Supervisor: Prof. Giuliano Iorio	
SEP 2020	<b>Bachelor in Astronomy, University of Padua</b>	110/110 cum laude
OCT 2017	Thesis: <i>Impact of mass transfer efficiency on the formation of binary compact objects</i> Supervisor: Prof. Michela Mapelli; Co-Supervisor: Prof. Giuliano Iorio	

## PRIZES AND GRANTS

2024	<b>Fondazione Gini Scholarship by the Fondazione Aldo Gini</b> ➤ 4600 € scholarship to support a 6 months STEM research project in Heidelberg.	<a href="#">Info</a>
2023	<b>Geppina Coppola Prize by the Geppina Coppola Association, INAF-OACN</b> ➤ 1500 € prize for best master thesis in astronomy in Italy (~ 2.5% success rate). 2 invited talks.	<a href="#">Info</a>
2020	<b>Mille e una lode</b> by the <b>University of Padua</b> ➤ 1000 € scholarship awarded to the ≤ 3% of students with the highest average grade in my bachelor.	<a href="#">Info</a>

## TEACHING EXPERIENCE

APR-JUN 2024	<b>Laboratory of Computational Physics (Mod B.)</b>	Teaching assistant
APR-JUN 2023	<i>University of Padua, Master in Physics of Data</i> (Prof. Giuliano Iorio)	24 h.
	➤ Machine learning and optimization techniques with Python for astrophysical numerical simulations	<a href="#">Info</a>
NOV-JAN 23/4	<b>The sky as a laboratory</b> <i>High School “Benedetti-Tommaseo”, Venice</i>	Main teacher 16 h.
	➤ Outreach course to introduce astrophysics to high school students	<a href="#">Info</a>

## MENTORING EXPERIENCE

MASTER	<b>Juan Manuel Pacheco Arias</b> - <i>Hydrodynamical simulations of massive stars collisions</i>	2023
BACHELOR	<b>Alberto Casellato</b> - <i>Study on the effect of mass transfer stability on binary black hole properties</i>	2024

## SCHOOLS

OCT 2024	<b>MWGaiaDN School: Frontiers of Stellar Evolution, INAF-OAPD (online)</b>	Program
JULY 2024	› Gaia catalogue, galactic surveys, population synthesis tools for stars (e.g. Trilegal code) <b>Astrostatistics Summer School, University of Crete, Heraklion</b>	Program
AUG 2023	› Machine and Deep Learning, Simulation Based Inference, MCMC, Optimization (Python) <b>MESA Summer School 2023, Konkoly Observatory, Budapest</b>	Program
OCT 2022	› MESA stellar evolution software. Binary and asteroseismology tutorials. <b>3rd Astrostatistics School, INAF Brera, Milan</b>	Program
	› Bayesian statistics applied to the astrophysical context (JAGS software)	

## OUTREACH

PHYSICS MUSEUM	<b>Museum guide, Physics museum “Giovanni Poleni”, Padua</b>	Jul 2023 - Oct 2025
	› Guide at the physics museum of historical (18-19-20th century) scientific instruments.	
	<b>Project “Science from the Islamic world to today’s Europe”</b>	Nov 2022 - Jun 2023
	› Communicating scientific researches and teaching practices brought from the Islamic world.	
FESTIVAL ACTIVITIES	<b>Activity designer and facilitator for multisensorial astronomical festivals</b> , Castellaro Lagusello	
	› Light pollution activity: <a href="https://play.inaf.it/alla-ricerca-del-buio/">https://play.inaf.it/alla-ricerca-del-buio/</a>	Jan - Jun 2025
	› Astrolabe activity: <a href="https://play.inaf.it/caccia-al-ladro-fra-le-stelle/">https://play.inaf.it/caccia-al-ladro-fra-le-stelle/</a>	Feb - Jun 2024
	<b>Facilitator at European Researcher’s Night - Science4All</b> , Padua	Sep 2024, Sep 2025
	› Facilitator in the hand-on activity “Cartoline Stellari”, to introduce kids to constellations.	
	<b>Activity designer and facilitator for the “Girl’s Day”, Heidelberg</b>	Apr 2024, Apr 2025
	› Gravitational wave-themed activity “A dance of stars and black holes” for the Girl’s Day event in Heidelberg.	
	<b>Facilitator with amateur astronomers</b> , Padua	Jul 2019
LECTURE COURSES	<b>Main teacher of the course “The sky as a laboratory”, Venice</b>	Oct 2023 - Jan 2024
	› University-orientation course in scientific subjects to high school students, with final exam.	
	<b>Lecture on “Science and mythology of constellations”, Venice</b>	Mar 2023
	› Linking constellation’s mythology and astronomical phenomena with an ad-hoc scripted <i>Stellarium</i> plugin.	
PUBLIC TALKS	<b>Research activity presentations to the general public</b>	
	› To the amateur astronomers of Treviso (Italy)	Jan 2025
	› For the “Geppina Coppola” prize at INAF-OACN, Naples	Nov 2023
	› For the European Researcher’s Night - Science4All in Padua	Sep 2023

## CONFERENCES & TALKS

PANELIST	<b>Gravitational Wave Snowballs (Workshop) - Sexten Center for Astrophysics, Sexten</b>	<a href="#">Info</a> - Jan 2025
INVITED	<b>IGR Student Seminar - Institute for Gravitational Research, Glasgow (online)</b>	Jun 2025
	<b>Heraeus Summer School - Friedrich Schiller Universität Jena, Jena</b>	<a href="#">Info</a> - Sep 2024
	<b>Astromeeting INAF-OACN (“Geppina Coppola” prize) - INAF - OACN, Naples</b>	<a href="#">Video</a> - Nov 2023
	<b>Spring Workshop on Physics of Data - AI Society - University of Padua, Venice</b>	<a href="#">Info</a> - Apr 2023
CONTRIBUTED	<b>EAS 2025 (2 talks) - University College, Cork</b>	<a href="#">Info</a> - Jun 2025
	<b>Stars II: current challenges, upcoming solutions - CNR Research Area, Bologna</b>	<a href="#">Info</a> - Jun 2025
	<b>XV Einstein Telescope Symposium - CNR Research Area, Bologna (online)</b>	<a href="#">Info</a> - May 2025
	<b>Galaxy Coffee - Max Planck Institute for Astronomy, Heidelberg</b>	<a href="#">Info</a> - Mar 2025
	<b>National Congress on Compact Objects (CNOC XIII) - INAF-OAC, Alghero</b>	<a href="#">Info</a> - Sep 2024
	<b>1st TEONGRAV workshop - Sapienza University of Rome, Rome</b>	<a href="#">Info</a> - Sep 2024
	<b>41st LIAC: The eventful life of massive star multiples - Université De Liège, Liège</b>	<a href="#">Info</a> - Jul 2024
	<b>The Renaissance of Stellar Black-Hole Detections - Lorentz Center, Leiden</b>	<a href="#">Info</a> - Jun 2023

POSTERS	<b>59th Rencontres de Moriond - Gravitation - Rencontres de Moriond</b> , La Thuile <b>360° Approach to Common Envelope Evolution - ICCUB</b> , Barcelona (online) <b>Post-PAX meeting - Harvard-Smithsonian Center for Astrophysics</b> , Boston (online)	<a href="#">Info</a> - Apr 2025 <a href="#">Info</a> - Jun 2024 Aug 2022
ATTENDED	<b>First ACME workshop - ACME Center</b> , Toulouse (online) <b>EAS 2024 - Padova Congress</b> , Padua <b>Machine Learning 4 Astrophysics (Workshop)</b> - Studio Villa Bosch, Heidelberg <b>Spring Workshop on Physics of Data - AI Society</b> - University of Padua, Venice	<a href="#">Info</a> - Apr 2025 <a href="#">Info</a> - Jul 2024 <a href="#">Info</a> - Jun 2024 <a href="#">Info</a> - Apr 2022

## PUBLICATIONS

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FIRST-AUTHOR	<b>Wolf-Rayet – compact object binaries as progenitors of binary compact objects</b> <b>Korb E.</b> , Mapelli M., Iorio G., Costa G., Dall'Amico M. Mar 2025 - <i>A&amp;A</i> , 695, A199	 <a href="https://doi.org/10.1051/0004-6361/202452585">doi.org/10.1051/0004-6361/202452585</a>
CO-AUTHOR	<b>Optically thick winds of very massive stars suppress intermediate-mass black hole formation</b> Torniamenti S. et al. (incl. <b>Korb E.</b> ) Oct 2025 - Accepted for publication on <i>A&amp;A</i>  <b>Metal-poor single Wolf-Rayet stars: the interplay of optically thick winds and rotation</b> Boco L. et al. (incl. <b>Korb E.</b> ) Nov 2025 - <i>A&amp;A</i> , 703, A243  <b>Impact of accretion-induced chemically homogeneous evolution on stellar and compact binary populations</b> Dall'Amico M. et al. (incl. <b>Korb E.</b> ) Mar 2025 - <i>A&amp;A</i> , 695, A221	 <a href="https://arxiv.org/abs/2510.12465">arxiv.org/abs/2510.12465</a>
	 <b>The boring history of Gaia BH3 from isolated binary evolution</b> Iorio G. et al. (incl. <b>Korb E.</b> ) Oct 2024 - <i>A&amp;A</i> 690, A144  <b>Compact object mergers: exploring uncertainties from stellar and binary evolution with SEVN</b> Iorio G. et al. (incl. <b>Korb E.</b> ) Sep 2023 - <i>MNRAS</i> 524, 426	 <a href="https://doi.org/10.1051/0004-6361/202450531">doi.org/10.1051/0004-6361/202450531</a>
PROCEEDING	<b>Compact objects with Wolf-Rayet companions: a key binary configuration to produce gravitational wave mergers</b> <b>Korb E.</b> Dec 2024 - <i>Bulletin de la Société Royale des Sciences</i> , 93, 3, 363-373 Contribution to 41st LIAC conference	 <a href="https://doi.org/10.25518/0037-9565.12414">doi.org/10.25518/0037-9565.12414</a>
ET COLLAB.	<b>The Science of the Einstein Telescope (ET blue book)</b> Einstein Telescope collaboration (incl. <b>Korb E.</b> ) Mar 2025 - Submitted to <i>JCAP</i>	 <a href="https://arxiv.org/abs/2503.12263">arxiv.org/abs/2503.12263</a>
LISA UCBCG	<b>BinCodex. LISA BPS Common Output Format v. 1.1.0</b> Valli R., Graziani L., and the LISA Synthetic UCB Catalogue Group (incl. <b>Korb E.</b> ) Apr 2024 - Non refereed	 <a href="https://arxiv.org/abs/2311.03431">arxiv.org/abs/2311.03431</a>

## REVIEWER EXPERIENCE

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## MEMBERSHIPS & COLLABORATIONS

2022 - NOW	<b>LISA</b> - Core member of the Laser Interferometer Space Antenna Consortium	<a href="#">Info</a>
2022 - NOW	<b>LISA Synthetic UCB Catalogue Group</b> - Contributor for the SEVN catalogues	<a href="#">Info</a>
2022 - 2025	<b>ET</b> - Past member of the Einstein Telescope collaboration	<a href="#">Info</a>
2022 - 2025	<b>TEONGRAV</b> - Past member of the Theory of Gravitational Wave Sources collaboration	<a href="#">Info</a>
2022 - 2025	<b>INFN</b> - Formerly affiliated to the Italian Institution for Nuclear Physics; Section of Padua	<a href="#">Info</a>
2020 - 2025	<b>DEMOBLACK</b> - Former member (now external collaborator) of the ERC-funded group of M. Mapelli	<a href="#">Info</a>

## SOFTWARE SKILLS

ADVANCED	Python ( <i>Numpy, Matplotlib, Seaborn, Plotly, Pandas, Dask, Polars, Scipy, Sklearn, Pytorch, Keras, Tensorflow, Emcee, RegEx, Streamlit, Altair</i> ; Jupyter, IDLE), L <sup>A</sup> T <sub>E</sub> X(TeXstudio, Overleaf), Slurm (Queue scheduler for HPC), Conda, Git, Linux, Windows, SEVN (Population-synthesis; C++), MESA (Stellar evolution)
INTERMEDIATE	C++, Fortran90, Markdown, Bash, Stellarium (scripting plugins for outreach), Inkscape/GIMP (Graphics)
BASIC	SIMBAD, NED, ALADIN, SAOImage DS9, TOPCAT, JAGS (Gibbs sampler), Olive (video editing)

## SOFTWARE DEVELOPMENT PORTFOLIO

SINCE 2020	Open-source population-synthesis code <b>SEVN</b> (co-developer & maintainer)	<a href="#">SEVN project</a>	<a href="#">Repository</a>
SINCE 2019	Live-dashboard to monitor high-tides in Venice lagoon	<a href="#">Dashboard</a>	<a href="#">erikakorb/AcquaAlta</a>
2023	Stellarium plugin to illustrate equinox precession for outreach purposes	<a href="#">erikakorb/stellarium</a>	

## LANGUAGES

