Erika **Korb**

Astrophysicist | Staff scientist

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Research Experience

Current — **Staff Scientist**
Nov 2025 — **Astronomical Observatory Valle d'Aosta (OAVdA) - Fondazione Clément-Fillietroz (FCF)**

- Developer of AI solutions for Technology Transfer for ecological transition and environmental monitoring.
- Astrophysical researcher in stellar, binary evolution, and gravitational waves. Maintainer of the SEVN code.

Dec 2025 — **Visiting Researcher**
Feb 2024 — **University of Heidelberg - Institute for Theoretical Astrophysics (ITA-ZAH)**

- Collaboration with ERC-funded group 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 SEVN code.

Education

Dec 2025 — **PhD in Astrophysics**, **University of Padua**
Oct 2022 — Thesis: *Binary compact object populations*
Supervisor: Prof. Giuliano Iorio; Co-Supervisors: Prof. Michela Mapelli, Prof. Giovanni Carraro

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

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

Prizes and Grants

2024 — **Fondazione Gini Scholarship** by the **Fondazione Aldo Gini** — Info
- 4600 € scholarship to support a 6 months STEM research project in Heidelberg.

2023 — **Geppina Coppola Prize** by the **Geppina Coppola Association, INAF-OACN** — Info
- 1500 € prize for best master thesis in astronomy in Italy ($\sim 2.5\%$ success rate). 2 invited talks.

2020 — **Mille e una lode** by the **University of Padua** — Info
- 1000 € scholarship awarded to the $\leq 3\%$ of students with the highest average grade in my bachelor.

Teaching experience

Apr-Jun 2024 — **Laboratory of Computational Physics (Mod B.)** — Teaching assistant
Apr-Jun 2023 — *University of Padua, Master in Physics of Data* (Prof. Giuliano Iorio) — 24 h.
- Machine learning and optimization techniques with Python for astrophysical numerical simulations — Info

Nov-Jan 23/4 — **The sky as a laboratory** — Main teacher
High School "Benedetti-Tommaseo", Venice — 16 h.
- Outreach course to introduce astrophysics to high school students — Info

Mentoring experience

Master — **Juan Manuel Pacheco Arias** - *Hydrodynamical simulations of massive stars collisions* — 2023
Bachelor — **Alberto Casellato** - *Study on the effect of mass transfer stability on binary black hole properties* — 2024

Schools

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

Outreach

Physics Museum	**Museum guide**, Physics museum "Giovanni Poleni", Padua	Jul 2023 - Oct 2025
	› Guide at the physics museum of historical (18-19-20th century) scientific instruments.	
	Project "Science from the Islamic world to today's Europe"	Nov 2022 - Jun 2023
	› Communicating scientific researches and teaching practices brought from the Islamic world.	
Festival Activities	**Activity designer and facilitator for multisensorial astronomical festivals**, Castellaro Lagusello	
	› Light pollution activity: https://play.inaf.it/alla-ricerca-del-buio/	Jan - Jun 2025
	› Astrolabe activity: https://play.inaf.it/caccia-al-ladro-fra-le-stelle/	Feb - Jun 2024
	Facilitator at European Researcher's Night - Science4All, Padua	Sep 2024, Sep 2025
	› Facilitator in the hand-on activity "Cartoline Stellari", to introduce kids to constellations.	
	Activity designer and facilitator for the "Girl's Day", Heidelberg	Apr 2024, Apr 2025
	› Gravitational wave-themed activity "A dance of stars and black holes" for the Girl's Day event in Heidelberg.	
	Facilitator with amateur astronomers, Padua	Jul 2019
Lecture Courses	**Main teacher of the course "The sky as a laboratory"**, Venice	Oct 2023 - Jan 2024
	› University-orientation course in scientific subjects to high school students, with final exam.	
	Lecture on "Science and mythology of constellations", Venice	Mar 2023
	› Linking constellation's mythology and astronomical phenomena with an ad-hoc scripted *Stellarium* plugin.	
Public Talks	**Research activity presentations to the general public**	
	› 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	**Gravitational Wave Snowballs (Workshop)** - *Sexten Center for Astrophysics*, Sexten	Info - Jan 2025
Invited	**IGR Student Seminar** - *Institute for Gravitational Research*, Glasgow (online)	Jun 2025
	Heraeus Summer School - *Friedrich Schiller Universität Jena*, Jena	Info - Sep 2024
	Astromeeting INAF-OACN ("Geppina Coppola" prize) - *INAF - OACN*, Naples	Video - Nov 2023
	Spring Workshop on Physics of Data - *AI Society - University of Padua*, Venice	Info - Apr 2023
Contributed	**EAS 2025 (2 talks)** - *University College*, Cork	Info - Jun 2025
	Stars II: current challenges, upcoming solutions - *CNR Research Area*, Bologna	Info - Jun 2025
	XV Einstein Telescope Symposium - *CNR Research Area*, Bologna (online)	Info - May 2025
	Galaxy Coffee - *Max Planck Institute for Astronomy*, Heidelberg	Info - Mar 2025
	National Congress on Compact Objects (CNOC XIII) - *INAF-OAC*, Alghero	Info - Sep 2024
	1st TEONGRAV workshop - *Sapienza University of Rome*, Rome	Info - Sep 2024
	41st LIAC: The eventful life of massive star multiples - *Université De Liège*, Liège	Info - Jul 2024
	The Renaissance of Stellar Black-Hole Detections - *Lorentz Center*, Leiden	Info - Jun 2023

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

Publications

First-author

Wolf-Rayet – compact object binaries as progenitors of binary compact objects
Korb E., Mapelli M., Iorio G., Costa G., Dall'Amico M.
Mar 2025 - *A&A, 695, A199* doi.org/10.1051/0004-6361/202452585

Co-author

Optically thick winds of very massive stars suppress intermediate-mass black hole formation
Torniamenti S. et al. (incl. **Korb E.**)
Oct 2025 - *Accepted for publication on A&A* arxiv.org/abs/2510.12465

Metal-poor single Wolf-Rayet stars: the interplay of optically thick winds and rotation
Boco L. et al. (incl. **Korb E.**)
Nov 2025 - *A&A, 703, A243* doi.org/10.1051/0004-6361/202556187

Impact of accretion-induced chemically homogeneous evolution on stellar and compact binary populations
Dall'Amico M. et al. (incl. **Korb E.**)
Mar 2025 - *A&A, 695, A221* doi.org/10.1051/0004-6361/202453543

The boring history of Gaia BH3 from isolated binary evolution
Iorio G. et al. (incl. **Korb E.**)
Oct 2024 - *A&A 690, A144* doi.org/10.1051/0004-6361/202450531

Compact object mergers: exploring uncertainties from stellar and binary evolution with SEVN
Iorio G. et al. (incl. **Korb E.**)
Sep 2023 - *MNRAS 524, 426* doi.org/10.1093/mnras/stad1630

Proceeding

Compact objects with Wolf-Rayet companions: a key binary configuration to produce gravitational wave mergers
Korb E.
Dec 2024 - *Bulletin de la Société Royale des Sciences, 93, 3, 363-373*
Contribution to 41st LIAC conference doi.org/10.25518/0037-9565.12414

ET collab.

The Science of the Einstein Telescope (ET blue book)
Einstein Telescope collaboration (**incl. Korb E.**)
Mar 2025 - *Submitted to JCAP* arxiv.org/abs/2503.12263

LISA UCBCG

BinCodex. LISA BPS Common Output Format v. 1.1.0
Valli R., Graziani L., and the LISA Synthetic UCB Catalogue Group (**incl. Korb E.**)
Apr 2024 - *Non refereed* arxiv.org/abs/2311.03431

Reviewer experience

ApJ & ApJS	**Astrophysical Journal & Astrophysical Journal Supplement Series**	Articles reviewed: 2

Memberships & Collaborations

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

Software skills

Advanced	Python (*Numpy, Matplotlib, Seaborn, Plotly, Pandas, Dask, Polars, Scipy, Sklearn, Pytorch, Keras, Tensorflow, Emcee, RegEx, Streamlit, Altair*; Jupyter, IDLE), LaTeX(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 `SEVN` (co-developer & maintainer)	SEVN project Repository
Since 2019	Live-dashboard to monitor high-tides in Venice lagoon	Dashboard erikakorb/AcquaAlta
2023	`Stellarium` plugin to illustrate equinox precession for outreach purposes	erikakorb/stellarium

Languages

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

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