

STEFANELLI – CURRICULUM VITAE

PERSONAL INFORMATION	
Last Name	STEFANELLI
First Name	MARCO
Date of birth	11/02/1990
Nationality(ies)	ITALIAN
Address	VIA ISTRIA, 48
City	VEGLIE (LECCE)
Country	ITALY
Personal Email	marko.stefanelli@gmail.com
Personal Web Page	https://stfmrc.github.io/MarcoStefanelli/

LANGUAGES	
Native language(s):	ITALIAN
Other Languages:	English, fluent Croatian, beginner

TECHNICAL SKILLS		
Physics	Earth System Physics	Atmospheric modelling (Climate, Numerical Weather Prediction) Ocean modelling (coastal and open sea environment) Climate change processes Multiscale processes Urban-Climate interactions

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Mathematics	Applied mathematics & Statistics	<p>Numerical modelling and simulations</p> <p>Numerical model validation</p> <p>Numerical methods</p> <p>Statistical modelling</p> <p>Multivariate analysis</p> <p>Data assimilation techniques</p> <p>Model skill quantification</p> <p>Uncertainty quantification</p> <p>Structured and Unstructured grid modelling</p> <p>Partial differential equations</p>
Observational data	Sources and variables	<p>In situ observations for atmosphere and ocean (Temperature, Salinity, Precipitation, Wind)</p> <p>Weather radar data (Reflectivity)</p> <p>Satellite observations for atmosphere and ocean (Sea Level Anomaly, Sea Surface Temperature, Cloud)</p>
Programming Skills	Programming Languages	<p>Python, advanced (xarray, geopandas, rasterio, numpy, PyTorch, TensorFlow,...)</p> <p>Fortran, advanced</p> <p>Linux/Unix, advanced</p> <p>LaTeX, advanced</p>
	NetCDF libraries	NCO, CDO, NCAP (advanced)
	HPC	SLURM, PBS, LSF (advanced)
	Informatic tools	Jupyter, Github
	Data Type	GRIB, HDF5, NetCDF, Binary, CSV
Technical Skills	Big Data and Machine Learning Python (PyTorch, TensorFlow)	<p>Atmosphere/Ocean ML applications</p> <p>ML for environmental prediction</p> <p>Observations-Model integration</p>
	Visualization & Reporting	<p>Python (Matplotlib, Seaborn, Cartopy, Jupyter Notebook)</p> <p>Keynote presentations and Talks (highly advanced)</p> <p>Writing (highly advanced)</p>

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EDUCATION	
Start & End date	Degree (highest degree first)
01/11/2019 - 31/01/2023	<p>PhD in FUTURE EARTH, CLIMATE CHANGE AND SOCIETAL CHALLENGES, University of Bologna & CMCC, Italy</p> <p>(Inter-disciplinary programs involving natural sciences, mathematics and statistics, Physics, Earth sciences, Data Science, Machine Learning and Climate Science)</p> <p>Dissertation title: Data assimilation for advanced cross-scale unstructured-grid ocean modeling, Supervisor: Dr. Ivan Federico, Co-supervisors: Dr. Eric Jansen, Dr. Ali Aydogdu and Prof. Nadia Pinardi.</p> <p>Abstract: https://amsdottorato.unibo.it/id/eprint/10785/</p> <p>Download: https://amsdottorato.unibo.it/id/eprint/10785/1/Thesis_Stefanelli.pdf</p> <p>Related publication: https://doi.org/10.3389/fmars.2025.1656879</p>
01/09/2014 - 19/03/2018	<p>MASTER'S DEGREE in EARTH SYSTEM PHYSICS, University of Trieste, Italy</p> <p>Dissertation title: A study of urbanization effects on the West-Africa monsoon, Supervisor: Prof. Filippo Giorgi</p>
28/10/2009 - 12/12/2013	<p>BACHELOR GRADUATION in PHYSICS, University of Salento, Italy</p> <p>Dissertation title: Mean Sea Level: processes, observations and its course in the Mediterranean Sea, Supervisor: Prof. Piero Lionello</p>

PROFESSIONAL EXPERIENCE	
Start & End date	Job position and description
03/04/2024 - 03/04/2026	SMASH (MSCA COFUND) postdoctoral researcher at the Faculty of Mathematics and Physics (FMF) at the University of Ljubljana (Slovenia). My research involves Data assimilation, Artificial Intelligence and Weather forecasting. The primary objective is to develop a neural network-based observation operator for variational data assimilation, aiming to enhance the forecast of severe precipitation events using weather radar data.
01/02/2023 - 01/03/2024	<p>RESEARCHER, Euro-Mediterranean Centre on Climate Change (CMCC), Italy</p> <p>Finalize the papers based on the PhD results, continue the research in collaboration with Imperial College, improve the work done during the PhD and build products to validate ocean models output against observations.</p>
03/04/2018 - 16/04/2019	<p>RESEARCHER, The Abdus Salam International Centre for Theoretical Physics (ICTP), Italy</p> <p>Research on the urbanization effects on the West Africa Monsoon, supervised by Prof. Filippo Giorgi in the Earth System Physics research group.</p>

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TEACHING EXPERIENCE		
Period	Organisation	Course, level & subject
12/04/2018 - 14/06/2018	ISIS Leonardo Da Vinci, Italy	Secondary school head teacher in computer and energetic science
01-01-2025 - CURRENT	Liceo Artistico G. Romano di Mantova, Italy	In collaboration with Prof. Simone Napolitano, I designed a project titled “Dal Meteo all'Emergenza Climatica: un percorso educativo tra scienza, consapevolezza e futuro” (From Weather to the Climate Emergency: An Educational Journey Through Science, Awareness, and the Future). The goal is to increase awareness and scientific knowledge of weather and climate change in new generations.

Awards, grants & fellowships

- Puglia Region Youth Fund (PIN) Ref. 2192.
- Second place at Sergio Borghi award – Fondazione Osservatorio Meteorologico Milano Duomo
<https://www.youtube.com/watch?v=R5q-pwXo9dY&t=7s>
- Marie Curie cofunded postdoctoral grant in Slovenia (SMASH)

Academic co-operations

- Imperial College London in the Data Science group

Non-academic co-operations

- Euro-Mediterranean Centre on Climate Change
- Italian high school teacher society

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Conference presentations

- 27/09/2022 - 28/09/2022: Interreg Italia-Croatia, Ocean modelling workshop, Venice, Italy
- 23/05/2022 - 27/05/2022: EGU (European Geoscience Union, Wien, Austria)
<https://meetingorganizer.copernicus.org/EGU22/EGU22-4741.html>
- 07/10/2024 - 11/10/2024: First SMASH workshop, Vipava, Slovenia
- 16/10/2024: Order and Chaos: the link between art and science, Mantova, Italy
- 30/01/2025: SLOVENSKO ZDRUŽENJE ZA GEODEZIJO IN GEOFIZIKO, Ljubljana, Slovenia
- 25/03/2025: Italian Society for the teaching of Physics, Mantova, Italy
- 28/04/2025-02/05/2025: EGU (European Geoscience Union, Wien, Austria)
<https://meetingorganizer.copernicus.org/EGU25/EGU25-420.html>
- 08/09/2025-12/09/2025: EMS (Ljubljana, Slovenia)
Video: <https://meetingorganizer.copernicus.org/EMS2025/EMS2025-28.html>
- 22/09/2025-26/09/2025: SMASHING workshop (Ljubljana, Slovenia)
- 29/09/2025-03/10/2025: ICAM (Porec, Croatia)
- 13/10/2025: Slovenian Meteorology Society (Ljubljana, Slovenia)
Video: <https://www.youtube.com/watch?v=kIYwkgOSsGA>

Publications

1. **Data Assimilation For Advanced Cross-Scale Unstructured-Grid Ocean Modelling.**
M. Stefanelli, E. Jansen, A. Aydogdu, I. Federico, G. Coppini
Journal: Frontiers | Marine Science Editorial Office. Sec. Coastal Ocean Processes.
Volume 12 - 2025 | <https://doi.org/10.3389/fmars.2025.1656879>
2. Preprint - **A Neural Network-Based Observation Operator For Weather Radar Data Assimilation**
M. Stefanelli, Z. Zaplotnik, G. Skok
Preprint: <https://doi.org/10.48550/arXiv.2512.18289>. Under review on the GMD journal.

Personal note

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My work has spanned climate dynamics, ocean dynamics, severe precipitation events, and atmospheric processes, using structured and unstructured numerical modelling, data assimilation, artificial intelligence and post-event analysis to deliver actionable insights in complex, evolving contexts. Furthermore, I used different observational data source including satellite data from different missions (ALTIKA, CRYOSAT, JASON3, SENTINEL3A).

I am a proactive self-starter who thrives in dynamic environments, consistently taking the initiative to define research objectives, design methodologies, and deliver impactful results without direct supervision. This experience directly translates into high adaptability, problem-solving abilities, and a strong sense of ownership of outcomes in professional settings.

I have extensive experience working with large, complex datasets and machine learning in Python (7+ years).

Fluent in English, I am dedicated to transforming complex data into actionable insights that inform decision-making and drive informed decisions.