



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE 6214

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di** Scienze e Politiche Ambientali

Scientist- in - charge: Prof. Maurizio Maugeri

CURRICULUM VITAE

PERSONAL INFORMATION	
Surname	Lorenzo
Name	Matteo

PRESENT OCCUPATION	
Appointment	Structure
PhD student	Dipartimento di Fisica, Università degli Studi di Torino

EDUCATION AND TRAINING			
Degree	Course of studies	University	year of achievement of the degree
Master Degree	Physics (LM-17)	Università degli Studi di Torino	2019

FOREIGN LANGUAGES	
Languages	level of knowledge
English	B2

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS	
Year	Description of award
2020	PhD scholarship within "Dipartimento di Eccellenza"

TRAINING OR RESEARCH ACTIVITY	
2020	Ongoing: PhD research. I deepened my skills in the field of fluid dynamics. Initially, I engaged in an experimental campaign focusing on studying a metamaterial-based device designed to attenuate surface gravity waves. This involved constructing the experimental setup within the wave flume and developing wave analysis techniques, which included coding the decomposition of the wave signal in the



incident and reflected fields. Additionally, on larger scale, I delved into the wave phenomenon from a climate perspective, evaluating the historical performances of regional climate modeling in response to different wind forcings (with high- and low-resolution datasets) off the coast of South-East Australia. I also dedicated a period to visiting the wave climate group at the University of Melbourne (AU), to advance our collaboration.

4 - 28 July 2023: Wave Turbulence Summer School, MIT, Boston (USA).

20-30 June 2023: 2nd Advanced Summer School in Mathematical Fluid Dynamics, Institut d'études scientifiques de Cargèse, Corsica (FR).

27 June-1 July 2022: Observation and modeling for the hydraulics risk reduction, Senigallia (IT).

13-21 August 2021: 1st Advanced Summer School in Mathematical Fluid Dynamics, Institut d'études scientifiques de Cargèse, Corsica (FR).

June - September 2020: Independent collaboration, BlueFarm s.r.l. - Spin off SME Ca' Foscari Università di Venezia - Centro VEGA ed. Pegaso, Via delle Industrie 13 - 30175 Venezia Marghera (Italy). Data analysis of water temperature, dissolved oxygen concentration, salinity in the Venice lagoon and development of site-specific, short-term forecasts of water quality parameters relevant for aquaculture. Project leader: Prof. Roberto Pastres.

June 2015 - August 2016: Bachelor's degree traineeship, ARPA Piemonte - Dipartimento di Sistemi Previsionali, Via Pio VII 9 - 10135 Torino (Italy). Statistical analysis of regional models' outputs, specifically using indices for Severe Convective Events forecast (K Index, CAPE, Sweat Index) and draft of Bachelor's Degree thesis. Company supervisor: Dr. Paolo Bertolotto.

PROJECT ACTIVITY

Year	Project
September 2020 - Ongoing	BOHEME, Bio-Inspired Hierarchical MetaMaterials, European-funded under the FET-Open scheme. Development of an experimental study on mechanical metamaterials.
December 2020 - October 2021	PoC Instrument, Proof of Concept, funded by Compagnia di San Paolo Progetto d'Ateneo/Fondazione San Paolo. Contributed with experiments on the interactions between surface gravity waves and a mechanical metamaterial device, aiming to attenuate incident waves
June - September 2020	Early warning system for mass mortality and contamination risk in aquaculture farms, funded by Coldiretti. Contributed with expertise in programming, optimization, forecast verification and uncertainty analysis.
January 2019 - November 2019	ECOPOTENTIAL, improving future ecosystem benefits through Earth observations, EU-funded H2020 project. Contributed with experiments on the interactions between surface gravity waves and a mechanical metamaterial device, aiming to attenuate incident waves

CONGRESSES AND SEMINARS

Date	Title	Place
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2-3 November 2023	BOHEME-METAVEH joint workshop	Imperial College, London (UK)
1-6 October 2023	3rd International Workshop on Waves, Storm Surges, and Coastal Hazards	University of Notre Dame, South Bend (USA).
23-28 April 2023	EGU23 General Assembly	Vienna, Austria (attended online)
14 February 2023	Climate Change Communication workshop	Università degli Studi di Milano-Bicocca, Milano (IT)
4-9 December 2022	37th International Conference on Coastal Engineering	Sydney (AU)
10-13 April 2022	International Workshop on Water Waves and Floating Bodies	Giardini Naxos (IT)

PUBLICATIONS

Articles in reviews
M. Lorenzo, P. Pezzutto, F. De Lillo, F.M. Ventrella, F. De Vita, F. Bosia and M. Onorato. Attenuating surface gravity waves with an array of submerged resonators: an experimental study, <i>Journal of Fluid Mechanics</i> , 973, Cambridge Press, 2023. https://doi.org/10.1017/jfm.2023.741 .
A. Pezzi, G. Deng, Y. Lvov, M. Lorenzo and M. Onorato. Three-wave resonant interactions in the diatomic chain with cubic anharmonic potential: theory and simulations. <i>arXiv preprint</i> , arXiv:2103.08336, 2021.

Articles in preparation
M. Lorenzo, P. Pezzutto, F. De Lillo, F. De Vita, F. Bosia and M. Onorato. On the behavior of a submerged metamaterial array under irregular waves, on <i>Coastal engineering</i> .
M. Lorenzo, A. Meucci, J. Liu, Ian R. Young and M. Onorato. Evaluation of CMIP6 global high-resolution wind forcing performance for regional wave climate modeling off the coast of South-East Australia, on <i>Journal of Geophysical Ocean</i> .

Congress proceedings
M. Lorenzo, P. Pezzutto, F. De Lillo, F.M. Ventrella, F. De Vita, P. Ruol, F. Bosia and M. Onorato - An experimental study on a tethered floating metamaterial breakwater to attenuate surface gravity waves in a shallow water environment, <i>EGU General Assembly 2023</i> , Vienna (Austria), 24-28 Apr 2023. https://doi.org/10.5194/egusphere-egu23-13657 .
M. Lorenzo, P. Pezzutto, F. De Lillo, F.M. Ventrella, F. De Vita, P. Ruol, F. Bosia and M. Onorato - On the behavior of a tethered cylinder array under irregular waves, <i>Proc. of the 37th International Conference on Coastal Engineering</i> , Sydney (AU), 2022. https://doi.org/10.9753/icce.v37.structures.31 .
M. Lorenzo, P. Pezzutto, F. Bosia, C. Camporeale, F. De Lillo, F. De Vita, C. Manes, F.M. Ventrella and M. Onorato - METAREEF, a sustainable submerged floating metamaterial structure to attenuate surface gravity waves, <i>Proc. of the 37th International Workshop on Water Waves and Floating Bodies</i> , Giardini Naxos (IT), 2022.



OTHER INFORMATION

Computer skills: macro (Environmental data processing, water waves generation and analysis, climate data analysis), programming languages (Fortran, Python, R, C++), Software (CDO, LaTeX, Office)

Thesis supervision: FM. Ventrella - Master thesis, Università degli Studi di Torino. Thesis title: Design and implementation of a gravity wave attenuating device

Referees:

1. Prof. Miguel Onorato, Full Professor, Department of Physics, Università degli studi di Torino, miguel.onorato@unito.it
2. Dr. Paolo Pezzutto, Researcher, CNR-IRBIM Ancona, paolo.pezzutto@cnr.it
3. Dr. Alberto Meucci, Researcher, University of Melbourne, alberto.meucci@unimelb.edu.au

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

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Place and date: Cuneo _____, 19 Dicembre 2023