

PERSONAL INFORMATION **Lorenzo Melchiorri**

WORK EXPERIENCE

2023 - 2024 **Fellow Researcher**

Sapienza University of Rome - Nuclear Energy Research Group (N.E.R.G.)

The one-year experience as a fellow researcher has been focused on supporting the department activities. Code development for tritium diffusion, CFD calculations for magnetohydrodynamic flows and two-phase compressible flows have been the main tasks accomplished.

22/23 - 23/24 **Teaching Assistant**

Sapienza University of Rome - Engineering Thermofluids

Teaching assistant of the course Engineering Thermofluids, which belongs to the Energy Engineering Master (English curriculum) at Sapienza. I was primarily responsible for the course site and studying material. Furthermore, I've assisted the students during the Laboratory experimental activities.

2019 - 2020 **Fellow Researcher**

Sapienza University of Rome - Nuclear Energy Research Group (N.E.R.G.)

The one-year experience as a fellow researcher has been focused on developing a set of sub-routines that could extend RELAP5 capabilities. Liquid metals magnetohydrodynamic fundamentals and programming basis have been the main topics studied during the activity.

EDUCATION AND TRAINING

2020 - 2023 **Ph. D. in Energy & Environment**

Sapienza University of Rome - Rome, Italy

Passed with *Excellent*. *Thesis*: Development of a System Magneto-Thermal-Hydraulics code for the modelling of nuclear fusion reactor.

2015 - 2018 **Master Degree in Energy Engineering - Nuclear curriculum**

Sapienza University of Rome - Rome, Italy

Passed with **110/110**. *Thesis*: Numerical characterization of a magnetohydrodynamic liquid metal flow through an electroconductive orifice.

2012 - 2015 **Bachelor Degree in Energy Engineering**

Sapienza University of Rome - Rome, Italy

Passed with **96/110**. *Thesis*: Neutronic flux measurement on Thermic column of TRIGA RC-1 reactor (ENEA). Preliminary analysis of materials (Indium) activation.

PERSONAL SKILLS

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	B2	C1	C2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

Computer skills – Microsoft Office package - Proficient User
 – Latex - Independent User
 – MATLAB - Independent User
 – Fortran - Independent User
 – Linux/BASH - Independent User
 – ANSYS CFX - Independent User
 – OpenFOAM - Basic User

REFERENCES

- [1] Lorenzo Melchiorri, Simone Siriano, and Alessandro Tassone. “RELAP5/Mod3.3 MHD module development and validation: WCLL-TBM mock-up model”. In: *Fusion Engineering and Design 202* (2024).
- [2] Simone Siriano, Lorenzo Melchiorri, Sonia Pignatiello, and Alessandro Tassone. “A multi-region and a multiphase MHD OpenFOAM solver for fusion reactor analysis”. In: *Fusion Engineering and Design 200* (2024).
- [3] Gaetano Bongiovì, Ilenia Catanzaro, Pietro Alessandro Di Maio, Salvatore Giambro, Alberto Gioè, Pietro Arena, and Lorenzo Melchiorri. “Exploratory Thermo-Mechanical Assessment of the Bottom Cap Region of the EU DEMO Water-Cooled Lead Lithium Central Outboard Blanket Segment”. In: *Applied Sciences (Switzerland) 13.17* (2023).
- [4] Pietro Arena, Gaetano Bongiovì, Ilenia Catanzaro, Cristiano Ciurluini, Aldo Collaku, Alessandro Del Nevo, Pietro Alessandro Di Maio, Matteo D’Onorio, Fabio Giannetti, Vito Imbriani, Pietro Maccari, Lorenzo Melchiorri, Fabio Moro, Rocco Mozzillo, Simone Noce, Laura Savoldi, Simone Siriano, Alessandro Tassone, and Marco Utili. “Design and Integration of the EU-DEMO Water-Cooled Lead Lithium Breeding Blanket”. In: *Energies 16.4* (2023).
- [5] Marica Eboli, Pietro Arena, Nicolò Badodi, Antonio Cammi, Cristiano Ciurluini, Vittorio Cossu, Nicola Forgone, Francesco Galleni, Fabio Giannetti, Bruno Gonfiotti, Daniele Martelli, Lorenzo Melchiorri, Carmine Risi, Alessandro Tassone, and Alessandro Del Nevo. “PbLi/Water Reaction: Experimental Campaign and Modeling Advancements in WPBB EUROfusion Project”. In: *Energies 16.23* (2023).
- [6] Alessandro Tassone, Lorenzo Melchiorri, and Simone Siriano. “Magnetohydraulic flow in a rectangular channel filled with stream-wise obstacles”. In: *Fusion Engineering and Design 197* (2023).
- [7] Lorenzo Melchiorri, Alessandro Tassone, and Gianfranco Caruso. “Three-dimensional MHD flow in moderate change ratio orifice”. In: *Journal of Physics: Conference Series 2177.1* (2022).
- [8] L. Melchiorri, V. Narcisi, C. Ciurluini, F. Giannetti, G. Caruso, and A. Tassone. “Preliminary MHD pressure drop analysis for the prototypical WCLL TBM with RELAP5/MOD3.3”. In: *Fusion Engineering and Design 176* (2022).
- [9] Lorenzo Melchiorri, Vincenzo Narcisi, Fabio Giannetti, Gianfranco Caruso, and Alessandro Tassone. “Development of a RELAP5/MOD3.3 module for MHD pressure drop analysis in liquid metals loops: Verification and validation”. In: *Energies 14.17* (2021).

- [10] Vincenzo Narcisi, Lorenzo Melchiorri, and Fabio Giannetti. “Improvements of RELAP5/Mod3.3 heat transfer capabilities for simulation of in-pool passive power removal systems”. In: *Annals of Nuclear Energy* 160 (2021).
- [11] Vincenzo Narcisi, Lorenzo Melchiorri, Fabio Giannetti, and Gianfranco Caruso. “Assessment of relap5-3d for application on in-pool passive power removal systems”. In: *Proceedings of the 30th European Safety and Reliability Conference and the 15th Probabilistic Safety Assessment and Management Conference* (2020), pp. 1135–1142.