

PERSONAL INFORMATION

Simone Siriano



WORK EXPERIENCE

Dec. 2021 - present

Postdoctoral research fellow

Nuclear Engineering Research Group - DIAEE, Sapienza University of Rome

Main responsibilities:

- Principal investigator of the research project *Multiphase magnetohydrodynamic modelling of helium transport*, EUROfusion Researcher Grant (ERG), May 2023 - May 2025
- Analyst for computational MHD and CFD simulations
- Code development for OpenFoam MHD codes
- Teaching at undergraduate (MEng) and graduate (Ph.D.) level: *Liquid Metal Magnetohydrodynamics*, 1.5 ETCS. Academic years 2021-2022, 2022-2023, 2023-2024, 2024-2025
- Teaching at graduate (Ph.D.) level: *Practical CFD: A Step-by-Step Guide to Computational Fluid Dynamics with OpenFOAM*, 3 ETCS. Academic years 2023-2024 and 2024-2025
- Co-supervision of Master's (4) and Doctoral students (2)

European and international projects:

- EUROfusion FP9 Horizon Europe, 2021-2027, Work Package Breeding Blanket

EDUCATION AND TRAINING

Nov. 2018 - Nov. 2021

Ph.D. in Energy and Environment

Sapienza University of Rome

Dissertation *Numerical simulation of MHD flows in breeding blanket and plasma-facing components*, defended 14/02/2022 with grade Excellent

European and international projects:

- EUROfusion FP9 Horizon Europe, 2021-2027, Work Package Breeding Blanket
- EUROfusion FP8 H2020, 2014-2020, Work Package Breeding Blanket

European and international collaborations:

- Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT) - Madrid, project *"3D MHD analysis of prototypical manifold for liquid metal blankets"*
- Universitat Politècnica de Catalunya (UPC) - Barcelona, project *"Simulation of high-density ratio mixture"*

Sep. 2015 - Oct. 2018

MEng in Energy and Nuclear Engineering

Sapienza University of Rome

Thesis *Numerical study of MHD thin-film flows for Plasma Facing Components: fundamental phenomena and code validation*, thesis defended 22/10/2018 with grade 110 with Honour/110

Final GPA 28.8/30

Sep. 2011 - Dec. 2014 BEng in Energy Engineering

Sapienza University of Rome

Thesis *Reprocessing for closed nuclear fuel cycle*, thesis defended 09/01/2015 with grade 110 with Honour/110

Final GPA 27.8/30

GRANTS AND AWARDS

- *Start-up Research Grant*, Sapienza University of Rome, Investigation of a MHD capillary flow for nuclear fusion applications, €3000, Nov. 2024
- *Italian PhD Nuclear Talent Award 2023*, Associazione Italiana Nucleare, Dic. 2023
- *ENS Laureate 2023*, The European Nuclear Society High Scientific Council 2023, Nov. 2023
- *Small-size Research Grant*, Sapienza University of Rome, Nucleation and transport of immiscible gas bubbles within a heavy liquid metal in hydrodynamic and magnetohydrodynamic conditions, €3200, Jun. 2023
- *EUROfusion "Bernard Bigot" Researcher Grant (ERG2023/AWP23)*, EUROfusion, €120000, Nov. 2022
- *Finalist for ENEN Ph.D. Prize 2022*, European Nuclear Education Network, Jun. 2022
- *Cover Story for Fluids, Volume 7, Issue 5 (May 2022)*, Fluids journal - MDPI, May. 2022
- *Best Poster Award of the 18th Multiphase Flow Conference and Short Course*, Helmholtz-Zentrum Dresden–Rossendorf, 18th Multiphase Flow Conference, Dresden (Germany), Nov. 2021
- *Start-up Research Grant*, Sapienza University of Rome, Development of an OpenFOAM solver for MHD multiphase flows in fusion applications, €2700, Nov. 2021
- *Start-up Research Grant*, Sapienza University of Rome, 3D MHD analysis of prototypical manifold for liquid metal blankets, €1500, Oct. 2020
- *ENEN+ mobility grant*, European Nuclear Education Network, €3800, Jan. 2020

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2
EF English Level 10 - CEFR Level B2, EF English Live, Jan. 2020					

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

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Basic user	Independent user	Proficient user	Independent user	Basic user

[Digital competences - Self-assessment grid](#)

- Computer skills**
- Programming, proficient: C++, MATLAB, Unix shell, LaTeX
 - Programming, basic: Python, Fortran, Visual Basic for Application
 - CFD Codes, proficient: Ansys CFX, OpenFoam
 - Others, proficient: Ansys Design Modeler, Ansys Meshing, Paraview, Excel
 - Others, basic: AutoCAD, High Performance Computing

Driving licence B

PUBLICATIONS

- [1] Pietro Arena, Alessandro Del Nevo, Fabio Moro, Simone Noce, Rocco Mozzillo, Vito Imbriani, Fabio Giannetti, Francesco Edemetti, Antonio Froio, Laura Savoldi, Simone Siriano, Alessandro Tassone, Fernando Roca Ugorri, Pietro Alessandro Di Maio, Ilenia Catanzaro, and Gaetano Bongiovì. "The DEMO Water-Cooled Lead–Lithium Breeding Blanket: Design Status at the End of the Pre-Conceptual Design Phase". In: *Applied Sciences* 11.24 (Dec. 7, 2021), p. 11592. URL: <https://www.mdpi.com/2076-3417/11/24/11592>.
- [2] 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 (4 Jan. 2023), p. 2069. URL: <https://www.mdpi.com/1996-1073/16/4/2069>.
- [3] Francesco Colliva, Federico Hattab, Simone Siriano, Gabriele Ferrero, Samuele Meschini, Raffaella Testoni, Massimo Zucchetti, Andrea Iaboni, Giulia Valeria Centomani, Antonio Trotta, and Cristiano Ciurluini. "Conceptual Design and Supporting Analysis of a Double Wall Heat Exchanger for an ARC-class Fusion Reactor Primary Cooling System". In: *Fusion Engineering and Design* 201 (Apr. 2024), p. 114261. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379624001145>.
- [4] Federico Hattab, Simone Siriano, and Fabio Giannetti. "An OpenFOAM Multi-Region Solver for Tritium Transport Modeling in Fusion Systems". In: *Fusion Engineering and Design* 202 (May 2024), p. 114362. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379624002151>.
- [5] Lorenzo Melchiorri, Pietro Arena, Fabio Giannetti, Simone Siriano, and Alessandro Tassone. "CFD Analysis and Optimization of the DEMO WCLL Central Outboard Segment Bottom-Cap Elementary Cell". In: *Journal of Nuclear Engineering* 3.4 (Dec. 1, 2022), pp. 409–420. URL: <https://www.mdpi.com/2673-4362/3/4/27>.
- [6] 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 (May 1, 2024), p. 114380. URL: <https://www.sciencedirect.com/science/article/pii/S0920379624002333>.
- [7] Lorenzo Melchiorri, Simone Siriano, and Alessandro Tassone. "A Magnetohydrodynamic Method of Characteristics for the Study of Pressure Transients in Liquid Metal Piping Systems". In: *Fusion Engineering and Design* 215 (June 1, 2025), p. 114983. URL: <https://www.sciencedirect.com/science/article/pii/S0920379625001838>.
- [8] Simone Siriano. "Numerical Study of MHD Thin-Film Flows for Plasma Facing Components: Fundamental Phenomena and Code Validation". MA thesis. Sapienza University of Rome, 2018.
- [9] Simone Siriano, Alessandro Tassone, Gianfranco Caruso, and Alessandro Del Nevo. "Electromagnetic Coupling Phenomena in Co-Axial Rectangular Channels". In: *Fusion Engineering and Design* 160 (Nov. 2020), p. 111854. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379620304026>.

- Simone Siriano, Alessandro Tassone, Gianfranco Caruso, and Alessandro Del Nevo.
- [10] “MHD Forced Convection Flow in Dielectric and Electro-Conductive Rectangular Annuli”. In: *Fusion Engineering and Design* 159 (Oct. 2020), p. 111773. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379620303215>.
- S. Siriano, A. Tassone, and G. Caruso. “Numerical Simulation of Thin-Film MHD Flow for Nonuniform Conductivity Walls”. In: *Fusion Science and Technology* 77.2 (Feb. 17, 2021), pp. 144–158. URL: <https://doi.org/10.1080/15361055.2020.1858671>.
- Simone Siriano. “Numerical Simulation of MHD Flows in Breeding Blanket and Plasma-Facing Components”. PhD thesis. Sapienza University of Rome, Feb. 14, 2022. URL: <https://iris.uniroma1.it/handle/11573/1612721>.
- Simone Siriano, Néstor Balcázar, Alessandro Tassone, Joaquim Rigola, and Gianfranco Caruso. “Numerical Simulation of High-Density Ratio Bubble Motion with interIsoFoam”. In: *Fluids* 7.5 (5 May 2022), p. 152. URL: <https://www.mdpi.com/2311-5521/7/5/152>.
- Simone Siriano, Fernando Roca Ugorri, Alessandro Tassone, and Gianfranco Caruso. “3D MHD Analysis of Prototypical Manifold for Liquid Metal Blankets”. In: *Nuclear Fusion* 63.8 (June 2023), p. 086005. URL: <https://dx.doi.org/10.1088/1741-4326/acdc14>.
- 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 (Mar. 2024), p. 114216. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379624000693>.
- Simone Siriano, Alessandro Tassone, Lorenzo Melchiorri, and Gianfranco Caruso.
- [16] “Numerical Investigation of Liquid Metal Magneto-Convection at High Grashof and Hartmann Number in a Prototypical Water-Cooled Breeding Blanket for Fusion Reactors”. In: *International Journal of Heat and Mass Transfer* 242 (June 2025), p. 126840. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0017931025001814>.
- Alessandro Tassone, Simone Siriano, Gianfranco Caruso, Marco Utili, and Alessandro Del Nevo.
- [17] “MHD Pressure Drop Estimate for the WCLL In-Magnet PbLi Loop”. In: *Fusion Engineering and Design* 160 (Nov. 2020), p. 111830. URL: <https://linkinghub.elsevier.com/retrieve/pii/S0920379620303781>.
- Alessandro Tassone, Lorenzo Melchiorri, and Simone Siriano. “Magnetohydraulic Flow in a Rectangular Channel Filled with Stream-Wise Obstacles”. In: *Fusion Engineering and Design* 197 (Dec. 1, 2023), p. 114066. URL: <https://www.sciencedirect.com/science/article/pii/S0920379623006464>.

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".