Dario Maggiolo (PhD)

Nationality: **Italian** Date of Birth: **09/09/1985**

@ *E-mail*: maggiolo@chalmers.se

✉ *Permanent Adress*: 1 Dirigentgatan, 42317, Västra Frölunda, Göteborg, Sweden

☎ *Telephone*: 0046 790449474

ACTUAL REASEARCH INTERESTS

Computational Fluid Dynamics applied to Industrial and Environmental Engineering.
Presently working as postoctoral researcher at Chalmers University of Technology, in Gothenburg, Sweden, with main focus on liquid-vapour flow systems in biomass gasification process. Award winner of the 2019-2020 Marie Skłodowska-Curie Actions - European Fellowship funded by EU with the project *HyPoStruct*: "A key breakthrough in hydrogen fuel cells: enhancing macroscopic mass transport properties by tailoring the porous microstructure". The PhD in *Industrial Engineer* has been earned at the University of Padova, Italy, and it has been partially carried out at the *Applied Physics Department* of Eindhoven University of Technology, Netherlands. Other research interests are multi-phase and multi-component complex flows in porous media and liquid-vapour phase change phenomena upon hydrophilic/hydrophobic surfaces, numerically investigated by means of the Lattice-Boltzmann Method (LBM). Numerical simulations are used for supporting innovative engineering solutions for energy converter and storage systems, e.g. for Redox Flow Batteries [1,2,5,6] and Polymer Electrolyte Membrane Fuel Cells [3,6,7] applications. The Master's Thesis Work was completed at the University of Southampton, UK, and it concerned laminar flows in channels with rough walls for industrial and biomedical applications [4].

PROJECTS

Personal Investigator of HYPOSTRUCT project funded by the Marie Skłodowska-Curie Actions (EU).

Personal Investigator of EDIPO (Estimation of DIspersion in real POrous media) project of CINECA with 50k core hours with the supercomputer *Galileo*, as part of the ISCRA national project, in order to study the fluid-dynamic features of real reconstructed porous materials by means of computational technique.

RESEARCH SKILLS

Excellent knowledge of **Fluid Dynamics** and Hydraulics. Excellent knowledge of physics of three-phase liquid-vapour-solid flows and phase-change phenomena. Keen interest and knowledge in the **Lattice Bolzmann Method** (LBM) for fluid flows. Good knowledge of other CFD Methods, such as Lagrangian Particle Tracking (LPT) and Direct Simulation Monte-Carlo (DSMC). Good knowledge of computer science and **parallel computing**. Good knowledge of **Polymer Electrolyte Fuel Cell**.

COMPUTING SKILLS

Excellent skills in **Fortran**, **C**, **C++**, **Matlab/Octave**, **LaTex**, Bash Shell, **Git** and **Linux** operative systems. Good skills in Autocad, Hsh Strauss and Ansys (structural-fluid-thermal analysis).

INVITATION at CONFERENCES

Invited speaker at the Energy Materials and Nanotechnology Meeting on Droplets 2016. Title of the speech: "Lattice-Boltzmann simulations of two-phase flows in fibrous porous media".

EFMC11 Young Researcher Grant Winner. The grant purpose was to support young researchers to attend specific symposia inside the 11th European Fluid Mechanics Conferences.

TEACHING and PEDAGOGICAL EXPERIENCES

Phd and Master Thesis co-advisor at the Mechanics and Maritime Department of Chalmers Univesrity of Technology.

Master Thesis co-advisor at the Industrial Department, University of Padova.

Seminar speaker: *A brief introduction to the Lattice-Boltzmann Method*, November 15, 2013, at the University of Padova.

EDUCATION (please see the attached file for a complete description)

PhD in ENERGY INDUSTRIAL ENERGY ENGINEER
University of Padova, 30th April 2017
MASTER DEGREE IN HYDRAULIC ENGINEERING
University of Padova, 13th March 2013
BACHELOR DEGREE IN CIVIL ENGINEERING
University of Padova, 29th April 2009
SCIENTIFIC HIGH SCHOOL DIPLOMA

LANGUAGES

Mother Tongue	**Italian**		
Other Languages	**English**	**Spanish**	**French**
Reading skills	Advanced	Intermediate	Beginner
Writing skills	Advanced	Intermediate	Beginner
Verbal skills	Advanced	Advanced	Beginner

PAST WORK EXPERIENCE

NGO Engim Volunteer in Buenos Aires (Argentina) for five months (05/2009-10/2009). The aim of the project was to build a new school in a underdeveloped district in Buenos Aires.

Occasional employee in a manufacturing company (*Video Marine International S.r.l. Vicenza*). Main duties: assembly, cabling, testing marine cameras.

Private tutor - Maths and Physics (10/2010 - 06/2012).

Waiter for several catering companies in the North East of Italy (12/2009 - 12/2011).

Occasional music and documentary soundtrack composer during the last 10 years.

HOBBIES and INTERESTS

I am fascinated by music. During the last fifteen years I have played several instruments in several groups of musicians, from drums to piano. My experience as a musician trained me to work in a team, and I enjoy very much to do so. Other hobbies and interests of mine are: gardening, cooking, biking, hiking, swimming and playing outside sports.

PUBLICATIONS

Journal articles:

[1] D. Maggiolo, F. Zanini, F. Picano, A. Trovò, S. Carmignato, and M. Guarnieri. *Particle based method and X-ray computed tomography for pore-scale flow characterization in VRFB electrodes*. Journal: Energy Storage Materials, **16**, 91-96, 2018, DOI: 10.1016/j.ensm.2018.04.02.

[2] D. Maggiolo, F. Picano and M. Guarnieri, *Flow and disperion in anisotropic porous media: a lattice-Boltzmann study*. Journal: Physics of Fluids **28**, 102001, 2016, DOI: 10.1063/1.4963766.

[3] D. Maggiolo, A. Marion and M. Guarnieri, *Lattice Boltzmann Modeling of Water Cumulation at the Gas Channel-Gas Diffusion Layer Interface in Polymer Electrolyte Membrane Fuel Cells*. Journal: Journal of Fuel Cell Science and Technology **11**(6), 2014. DOI: 10.1115/1.4028952.

[4] D. Maggiolo, C. Manes and A. Marion, Momentum transport and laminar friction in rough-wall duct flows. Journal: Physics of Fluids **25** (9), 2013. DOI: 10.1063/1.4818453.

Conference articles:

[5] S. Bortolin, P. Toninelli, D. Maggiolo, M. Guarnieri and D. Del Col, *CFD study on electrolyte distribution in redox flow batteries*. Journal: Journal of Physics: Conference Series **655**, 2015, DOI: 088/1742-6596/655/1/012049.

[6] D. Maggiolo, F. Picano, A. Marion and M. Guarnieri, *Application of the Lattice-Boltzmann Method for Modeling All-Vanadium Redox Flow Batteries*. Proceedings of the 4th International Conference on Particle-Based Methods - Fundamentals and Applications, PARTICLES 2015, Pages 579-589, 2015, ISBN: 978-849442447-2.

[7] D. Maggiolo, F. Picano, F. Toschi and M. Guarnieri, *Lattice-Boltzmann simulations of two-phase flows in fibrous porous media*. Conference: EMN Meeting On Droplets 2016, San Sebastian, Spain, May 9-13, 2016 (invited speaker).