Fabio Guglietta - Curriculum Vitae

(Updated on June 2021)

Personal Data

Given and family name: Fabio Guglietta
Date and place of birth: 8 June 1994, Rome (Italy)
E-mail address: fabio.guglietta@roma2.infn.it

Professional Experience

2018–today	**Graduate Research Fellow** (The Cyprus Institute)
2018–toady	**Associate member of INFN** (Istituto Nazionale Fisica Nucleare, Italy)
2017–2020	**Teaching Assistant** in classical electrodynamics (University of Rome "Tor Vergata")

Scientific Education

11/2018–toady	**PhD student** (Marie Sklodowska-Curie fellowship) in theoretical and computational physics Institutions: University of Rome "Tor Vergata", The Cyprus Institute, RWTH Aachen University. Supervisors: Prof. Mauro Sbragaglia, Prof. Giannis Koutsou, Prof. Marek Behr.
03/2021–05/2021	**Secondment at NVIDIA** (Jülich Applications Lab) Supervisor: Jiri Kraus.
07/2018	**Master's degree** Topic: theoretical physics Institution: University of Rome "Tor Vergata" Grade: 110/110 (cum laude) Thesis title: Probabilistic Cellular Automata in Statistical Mechanics on GPU computing platforms
10/2016–07/2018	Studies of theoretical physics at University of Rome "Tor Vergata"
2018	**Visiting Student** (Cranfield University)
2016–2017	**Stage** (Research activity in Theoretical Physics) University of Rome "Tor Vergata" Topic: Irreversible Dynamics on One Dimensional Ising-type Spin System
10/2016	**Bachelor's degree** Topic: physics Institution: University of Rome "Tor Vergata"
10/2013–10/2016	Studies of physics at University of Rome "Tor Vergata"

Research Interest

My research interest mainly concerns the study of the dynamics of *suspensions* and *droplets* immersed in Newtonian *fluids*, with a focus on simulating and modelling *red blood cells*. I developed a code to simulate such systems by using *Finite Element Method*s (to compute the viscoelastic forces on the membrane) coupled with the *Lattice Boltzmann Method* (to simulate the fluid) and with the *Immersed Boundary Method* (to handle the fluid-structure interaction). I also parallelised this code both on CPUs (by using *MPI*) and on GPUs (by using *CUDA* language).

Computer Skills

Operating systems	Linux, macOS and Microsoft Windows *(expert user)*.
Programming languages	Fortran, C, awk *(expert user)*; Python, Julia *(user)*.
Parallel computing	MPI, OpenMP, CUDA C, CUDA Fortran *(expert user)*.
Open source libraries	LAPACK, BLAS *(user)*.
Visualisation software	gnuplot, paraview *(expert user)*.
Packages	Office, LibreOffice, LaTeX*(expert user)*.

Publications

3. **Fabio Guglietta**, Marek Behr, Giacomo Falcucci & Mauro Sbragaglia, "Loading and relaxation dynamics for a red blood cell", *Soft matter*, 2021, DOI: 10.1039/D1SM00246E.
2. **Fabio Guglietta**, Marek Behr, Luca Biferale, Giacomo Falcucci & Mauro Sbragaglia, "Lattice Boltzmann simulations on the tumbling to tank-treading transition: effects of membrane viscosity", *Philosophical Transaction A*, in press, 2021.
1. **Fabio Guglietta**, Marek Behr, Luca Biferale, Giacomo Falcucci & Mauro Sbragaglia. "On the effects of membrane viscosity on transient red blood cell dynamics", *Soft matter*, 16(26), 6191-6205, 2020.

Awards, Funding & Fellowship

2019 | - Funding from University of Rome "Tor Vergata" for "Detailed Simulation of Red blood Cell Dynamics accounting for membRane viscoElastic propertieS" (SorCeReS, CUP No. E84I19002470005), "Beyond Borders 2019" call (PI: Prof. G. Falcucci).

2018 | - Fellow of the "SimulaTIon in MUltiscaLe physicAl and biological sysTEms" (STIMULATE) European joint doctorate under the European Union's Horizon 2020 research and innovation programme, grant agreement No. 765048.

Contributed Presentations, Posters & Schools

2020
- Discrete Simulations in Fluid Dynamics (DSFD) 2020, Viterbo, Italy (Talk)
- Machine and Reinforcement Learning, Rare Events and Tensor Networks, Rome, Italy (School)
- Fields and Particles in Turbulence, Rome, Italy (Talk)

2019
- APS: Discrete Fluid Dynamics (DFD) 2019, Seattle, USA (Talk)
- Discrete Simulations in Fluid Dynamics (DSFD) 2019, Bangalore, India (Talk)
- Multiscale, multilevel algorithms and uncertainty quantification, Wuppertal, Germany (School)
- Mathematical Modeling and Numerical Analysis for Exascale, Berlin, Germany (School)
- School on Computational Modelling, Geilo, Norway (School)
- School on Fundamentals of Data Science, Ferrara, Italy (School)
- Young Researcher Meeting (YRM) 2019, Rome, Italy (Poster)

2018
- Workshop in High performance computing and simulation, Jülich, Germany (School)

Organisation of Conferences/Workshops/Schools

2020
- Machine and Reinforcement Learning, Rare Events and Tensor Networks, Rome, Italy (School)

Peer Review

Microfluidics and Nanofluidics, Journal of computational science.

Students Supervision

2021
- Diego Taglienti: Master Thesis in Physics, Univeristy of Rome “Tor Vergata”.
- Gianmarco Parise: Master Thesis in Physics, Univeristy of Rome “Tor Vergata”.

2019
- Diego Taglienti: Bachelor Thesis in Physics, Univeristy of Rome “Tor Vergata”.