Matteo Bottacchiari

PROFESSIONAL QUALIFICATION

Qualification to practise the profession of Industrial Engineer

[01/07/2021 – Current]

Mechanics - "Albo A"

EDUCATION AND TRAINING

Ph.D. in Theoretical and Applied Mechanics

Sapienza University of Rome - Department of Mechanical and Aerospace Engineering [01/11/2020 – 31/10/2023]

My research activity has focused on phase-field models for biological membranes with particular regard to their topological transitions in fusion and fission events. I have also been Guest Student at the Center for Life Nano- & Neuro-Science of the Italian Institute of Technology in Rome.

Master's degree in Mechanical Engineering

Sapienza University of Rome [11/01/2018 – 13/01/2020]

Final grade: 110 cum laude/110

Thesis: Interaction between the two leaflets in the dynamics of lipid bilayers (Subject: Fluid dynamics)

Specialization in Energy

Bachelor degree in Physics

Sapienza University of Rome [20/09/2016 – 10/01/2018]

Bachelor degree in Mechanical Engineering

Sapienza University of Rome [20/09/2012 – 23/03/2016]

WORK EXPERIENCE

Research scholarship

Sapienza University of Rome - Department of Mechanical and Aerospace Engineering [01/06/2020 – 01/10/2020]

Numerical and experimental study of a microfluidic system for Hospital on a Needle applications

RESEARCH GRANTS

Principal Investigator

FUNDING

- Progetti per Avvio alla Ricerca Sapienza di Tipo 1 - *Proteins and fusion of fluid lipid vesicles: exploration of a possible mechanism to lower the energy barrier* [2022] (1332€)

HIGH PERFORMANCE COMPUTING RESOURCES

- Italian SuperComputing Resource Allocation (ISCRA) - Class C projects: *ToTraVes* [2022] (86400 core hours on GALILEO100), *GaVesFu* [2023] (100000 core hours on GALILEO100)

Collaborator

HIGH PERFORMANCE COMPUTING RESOURCES

- Italian SuperComputing Resource Allocation (ISCRA) - PRACE tier 0 call 23: *HPC simulations of natural and bio-inspired micro-cavitating systems* (45 M core hours on MARCONI 100 - 2021/2022)
- Italian SuperComputing Resource Allocation (ISCRA) - Class B projects: *FHDAS* (1.2 M core hours on MARCONI100 - 2021/2022)

TEACHING ACTIVITY

Teaching assistant (tutorship) for "Mathematical Analysis I"

Bachelor degree in Mechanical Engineering - Sapienza University of Rome

AY 2020/2021 - 2021/2022 - 2022/2023

Teaching assistant (tutorship) for "Engineering Dynamics"

Temple University, Rome Campus

AY 2021/2022 - 2022/2023

Teaching assistant (tutorship) for "Physics I"

Bachelor degree in Energy Engineering - Sapienza University of Rome

AY 2020/2021 - 2021/2022

Teaching assistant (tutorship) for "General Mathematics"

Bachelor degree in Business Administration - Tuscia University, Civitavecchia Campus

AY 2021/2022 - 2022/2023

PUBLICATIONS

Activation energy and force fields during topological transitions of fluid lipid vesicles

[2022]

Bottacchiari M., Gallo M., Bussoletti M., & Casciola C. M., Communications physics, 5(1), 283

CONFERENCES AND SEMINARS

Contributed talks

- **12th European Conference on Mathematical and Theoretical Biology**, *Topological transitions in fluid lipid membranes: activation energy and force fields***,** Heidelberg, Germany [18/09/22 - 23/09/22]
- **5th Biophysics@Rome Conference**, *The local variation of the Gaussian modulus enables different pathways for fluid lipid vesicle fusion*, Rome, Italy [19/04/2023 - 20/03/2023]

Posters

- **Metastability and multiscale effects in interfacial phenomena**, *Topological transitions of fluid lipid vesicles*, CECAM-HQ-EPFL, Lausanne, Switzerland [13/03/2023 - 15/03/2023]

DIGITAL SKILLS

Computational Fluid Dynamics

ANSYS Fluent / ANSYS CFX

Computer programming

C language / Wolfram Mathematica programming / PETSc library / Basics of Julia / FFTW

LANGUAGE SKILLS

Mother tongue(s): **Italian**

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

---

18/11/2023