

# GIORGIA BROSIO

*Computational  
physicist*



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## SOFT SKILLS

- Problem solving
- Teamwork
- Scientific writing
- Public speaking
- Adaptability

## LANGUAGE AND COMPUTER SKILLS

Italian: Mother tongue

English: Fluent | Spanish: Basic

Operating System: Microsoft Windows and Unix/Linux.

Programming languages: Python, C/C++, MATLAB, tcl and Bash.

Software and libraries: Advanced use of Microsoft Office (Word, Excel, PowerPoint). AMBER24, Schrodinger Maestro, GROMACS, PLUMED and ORCA 6.0. Good knowledge of Tensorflow, Keras and scikit-learn.

## INTERESTS

- Computational Biophysics and Biology
- AI/ML/DL
- Proteins and Genomic properties
- Molecular Simulations and Enhanced Sampling Techniques
- Drug Discovery and Molecular Design
- Quantum Chemistry and DFT Applications in Biology

I am a computational physicist with particular interest in exploiting computational and theoretical methods for studying biosystems and biological processes. My experience spans from the simulation of complex biological phenomena to the development of machine learning models for molecular systems and small molecules. Throughout these projects, I've developed good skills in project development, interdisciplinary collaboration, and problem-solving within research teams.

## EDUCATION AND TRAINING

### PhD in Data Science and Computation

2023-current

University of Bologna (Italy) and Italian Institute of Technology

Supervisor: Dr. Marco De Vivo

Co-Supervisor: Dr Andrea Cavalli

Development of a Neural Network Potential for Magnesium binding sites in proteins and nucleic acids: from the creation of the dataset using DFT to the NN training. Use of the Neural Network for molecular modeling: perform conformational analysis and parametrize dihedral angles in small drug-like molecules.

### Research fellowship

2022-2023

University of Genoa, Genoa (Italy)

Study membrane fusion with Molecular Dynamics and enhanced sampling focusing on nanoparticle size and membrane curvature effects

### Master Degree in Physics

2020-2022

University of Genoa, Genoa (Italy)

Thesis: "Nanoparticle induced biomembrane fusion: size and composition effects"

Supervisor Dr Davide Bochicchio.

Co-supervisor: Prof. Claudio Canale

Final grade: 110 cum Laude

Study membrane fusion induced by small gold nanoparticles (Au NPs) with Molecular Dynamics and enhanced sampling (in particular Umbrella Sampling). Modify Gromacs source code to study the NP size effects and the cholesterol impact on the process with a specific collective variable

### Bachelor Degree in Physics

2017-2020

University of Genoa, Genoa (Italy)

Thesis: "Shock Waves"

Field of Study: Theoretical fluid dynamics/thermodynamics

Final Grade: 102/110

## PUBLICATIONS

1. Cholesterol-Containing Liposomes Decorated With Au Nanoparticles as Minimal Tunable Fusion Machinery

E Canepa, D Bochicchio, **G Brosio**, PHJ Silva, F Stellacci, S Dante, Giulia Rossi, Annalisa Relini  
Small 19 (23), 2207125

2. Nanoparticle-induced biomembrane fusion: unraveling the effect of core size on stalk formation

**G Brosio**, G Rossi, D Bochicchio  
Nanoscale Advances 5 (18), 4675-4680

## CONFERENCES AND SCHOOLS

31 July- 4 August 2023 Stockholm, **14th EBSA (European Biophysical Societies's Associon) Congress**

4-8 September 2023 Milan **CMD30 FisMat 2023: Joint Conference of the Italian and European Community of Condensed Matter Physics** (*oral presentation*)

26-30 August 2024 Milan **SCI 2024 – XXVIII National Congress (Conference & Exhibition)**

10-12 October 2024, Sorrento **Expanding the Impact of Molecular Simulations by Integrating Machine Learning with Statistical Mechanics, Flagship Workshop Cecam**

26-28 November 2024, on-line, **BioExcel / EuroCC workshop**

6-17 January 2025, University of Amsterdam, **Molsim-2025**