

# Edoardo Maria Mollica - Curriculum Vitae

**Date of Birth:** Rome, 2<sup>nd</sup> Novembre 1997

**Address:** Via Andrea Cascella 29, 00127 Rome (RM), Italy

**Telephone:** +39 3932111997

**Personal Email:** edoardomaria.mollica@gmail.com

## Education

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### Università di Studi di Roma "La Sapienza":

(Sept 2019 - Sept 2021)

Master's degree in Physics, Faculty of Mathematical , Physics and Natural Science of "Sapienza University di Roma" (September 2021).

*Track:* Physics of Bio-systems

*Description:* The degree consists in advanced courses in theoretical physics such as condensed matter physics; relativistic quantum physics; non-equilibrium statistical mechanics; physics of liquids; theoretical biophysics; photonics; soft and biological matter; as well as laboratory and computational courses, for instance atomistic simulations and machine learning.

*Thesis title:* "Passing by the Liquid-Liquid Transition in Supercooled Water Under Pressure: a Numerical Simulation of a Recent Experiment"

*Area:* Physics of Liquids

*Thesis advisors:* Prof. John Russo, Prof. Francesco Sciortino

*Final grade:* 110/110 *with honours*

*Thesis description:* The thesis project revolved around a numerical reproduction of an experiment regarding Liquid-Liquid transition in water, published by A. Nilsson *et al.* on Science in 2020. The thesis project was focused on molecular simulation of supercooled liquid water undergoing an apparent first order transition. Structural analysis were performed on the molecules to study the phase transition showing unexpected results at higher temperatures, implying the need for different interpretations of the original experiment.

*Research Interest:* Living Matter physics, Biophysics, Phase Transitions, Non-equilibrium Statistical Mechanics, Collective Behaviour, Synthetic Biology.

### Università di Studi di Roma "La Sapienza":

(Sept 2016 - Sept 2019)

Bachelor's degree in Physics, Faculty of Mathematical , Physics and Natural Science of "Sapienza University di Roma" (October 2019).

*Thesis title:* "Synthetic Genetic Circuits to Control Bacterial Colony Morphogenesis" (original title: "Circuiti genetici sintetici per il controllo della morfogenesi in colonie batteriche")

*Area:* Biophysics

*Thesis supervisor:* Prof. Roberto Di Leonardo

*Final grade:* 110/110 *with honours*

*Thesis description:*

My thesis was focused on the analytical and computational analysis of a synthetically engineered bacterial colony's growth. I studied how to create such bacteria and how the promotion of genes could be

controlled. Various model were developed to reproduce the patterns formed by real colonies where the motility of the bacteria was dependent on the density of the colony itself.  
In order to study these results I used numerical simulations in Python.

### **Liceo Scientifico statale "Stanislao Cannizzaro":**

(Sept 2011 - July 2016)

High school diploma, liceo scientifico statale "Stanislao Cannizzaro" Roma (RM).  
Studied Mathematics, Chemistry, Physics, Biology, History, Arts, Italian, English and Latin.  
Final grade: 100/100

## **Honours & Awards**

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### **Percorso d'eccellenza, Physics Bachelor degree:**

(1 oct 2019)

Award by Physics Department of "La Sapienza Università di Roma" given to 30 students for excellent academic results. Students have to pass all exams within October of the third year of enrolment with average grades greater than 27/30 and to do personal research activity.

*Additional courses followed:* Advanced electromagnetism, Micro hydrodynamics, Real analysis.

## **Useful Skills**

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Programming Languages:	C, Python	(Advanced)
	R, C++, MATLAB, GROMACS	(Intermediate)
Markup Language:	LaTeX	(Advanced)
Microsoft Office:		(Advanced)
Operating Systems	Windows, MacOS, Linux	(Advanced)
Language	Italian	Native Speaker
	English	Fluent (C1)
	Spanish	Basic Knowledge

## **Languages**

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Cambridge FCE ESOL(17 June 2014): FCE certificate (B2), grade A.

## Extracurricular Skills

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### **Mentoring high schools students:**

(Sept 2016 - Ongoing)

Helping high schools students in Mathematics and Physics Classes.

### **Project management course:**

(2015)

I was selected for project management course organised by "*Procter & Gamble*" for deserving high school students.

*Main activities:* Efficient communication with members of the team, development of strategy for commercial activities.

### **Sci-Tech Challenge Italy:**

(2014)

I was selected for a teamwork challenge organised by "*JA Italia*" and "*ExxonMobil*" amongst various Italian schools to prepare a project on renewable energy for communication networks and my team was awarded first place.

### **Sci-Tech Challenge Europe:**

(2014)

I was selected for a teamwork challenge organised by "*JA Europe*" and "*ExxonMobil*" amongst various European schools to prepare a project on renewable energy for car racing and my team was awarded first place.

### **Filming and production of short movies:**

(2015 - Ongoing)

Creating short movies and editing videos at an amateur level.

I developed editing and filming skills.

## Personal Profile

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*Soft skills:* curiosity; empathy; problem solving; teamwork; critical thinking; resourcefulness.

*Interests:* mathematics; science; art; cinematography; Aikido; philosophy; music; playing guitar, drums and trumpet; scuba diving; comics; roleplaying tabletop gaming.