



Mattia Boldrini

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● WORK EXPERIENCE

12/2019 – CURRENT – Cascina (PI), Italy

ENGINEERING PHD STUDENT, PART OF VIRGO ISC TEAM – EGO – VIRGO, VIA AMALDI 3

I am part of the Interferometer Sensing & Control subsystem, responsible to find and maintain the optimal working point of the instrument.

I have developed simulations with Finesse that helped in finding the optimal error signals for the automatic alignment of the mirrors of the interferometer. I have worked with the ISC team to implement the relative control loops in the commissioning of the actual machine.

I am working side by side with researchers coming from different nation, both in and out of the EU.

During my PhD I have been a speaker at the following conferences:

- Virgo Week, November 2021, talk: "ISC Status & Updates"
- Virgo Week, January 2022, talk: "Alignment Simulations and Commissioning for Advanced Virgo+ phase I"
- LVK, March 2022, talk: "Simulation and Commissioning status of AdV+ Alignment"

2012 – CURRENT

PRIVATE MATH AND PHYSICS LESSONS TO HIGH SCHOOL STUDENTS

- I have been giving private lessons to high schoolers for years, with good outcomes for my students.

● EDUCATION AND TRAINING

11/2019 – CURRENT

DOCTORAL SCHOOL – La Sapienza Università di Roma

My PhD revolve around the automatic alignment of the mirrors of Advanced Virgo+. Given the strongly non linear behaviour of the inteferometer and the extraordinary precision required for the success of this experiment, the control of such a machine is a unique challenge. I am involved with the Interferometer Sensing & Control (ISC) team to pursue this goal.

During my PhD I have attended the following seminars and courses:

- Course: "Multiscale Modeling of Rubber-Like Materials", prof. Giuseppe Saccomandi, Università degli Studi di Perugia
- Course: "Non-Linear Elasticity", prof. Giuseppe Zurlo, National University of Ireland
- Winter School "SIGRAV 2021" on Gravitational Waves and General Relativity.
- Course: "Hands on Continuum Mechanics with COMSOL", prof. Luciano Teresi, Università Roma Tre
- Seminar: "Seismic Upgrading of Existing R.C. Frames by Buckling Restrained Braces", prof. Francesca Barbagallo, Università di Catania
- Seminar: "Origami Engineering: Mutimaterial, Structure and Robots", prof. Glaucio Paulino, Georgia Institute of Technology, Atlanta, USA.

Field(s) of study

- Optics, Control of complex systems, Gravitational Waves

My academic curriculum is composed by the following exams:

- Quantum Relativistic Mechanics (26/30)
- Quantum Electrodynamics (27/30)
- Quantum Field Theory (27/30)
- General Relativity (30/30)
- Gravitational Waves, Neutron Stars and Black Holes (29/30)
- Physics Laboratory (30 cum laude/30)
- Methods of Space Astrophysics (30/30)
- Experimental Gravitation (30/30)
- Computational Methods for Physics (30/30)
- condensed Matter (19/30)
- Rational Mechanics (29/30)

Thesis: Optomechanical Frequency Response of Advanced Virgo with Signal Recycling Mirror
110/110

● LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	B1

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

● DIGITAL SKILLS

Microsoft Office | MATLAB | Python | LaTeX | C

Optical Simulations

Finesse v2 | Pykat