

## CURRICULUM VITAE ET STUDIORUM

Nicola Pellicciotta

### EDUCATION AND TRAINING

2012 - 2013

**Master's Degree in Physics 110/110 cum Laude.**

La Sapienza University, Rome.

Thesis: "*Stochastic dynamics of colloids in active baths of swimming bacteria*".

Supervisor Prof. Roberto Di Leonardo, Sapienza University.

2008-2011

**Bachelor's Degree in Physics 110/110 cum Laude.**

**La Sapienza University, Rome.**

Thesis: "*Elettromagnetic waves that drive current in plasma*".

Supervisors Prof. G. Montani, Sapienza University and Prof. R. Cesario, ENEA .

### RESEARCH EXPERIENCES

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October 2015 - present

**Candidate PhD student at Cavendish Laboratory,  
University of Cambridge.**

**Supervisor Dr. Pietro Cicuta, University of Cambridge .**

- ⤴ Understanding the role of hydrodynamic interactions in metachronal waves of human airway and mouse brain epithelia.
- ⤴ Assessing the fluid flow as regulator for planar polarity of cilia in epithelial cells.

Research topic: Biological and Soft Matter.

July 2014 – July 2015

**Research Fellow at LINV institute.**

**Supervisor Prof. S. Mancuso, Florence University.**

- ⤴ Studying the effect of hyper-gravity on the electrical activity of the *Dionaea Muscipula* by using modern techniques of extracellular electrophysiology.
- ⤴ Investigating the circumnutation movement in beans with time-lapses photography and image analysis codes.

Research topic: Electrophysiology, Plant biology.

January- December 2014

**Master thesis.**

**Supervisor Dr. R. Di Leonardo, La Sapienza University, Rome.**

**Title:** "*Stochastic dynamics of colloids in active baths of swimming bacteria*".

Studying the dynamics of colloidal beads while subject to an harmonic potential and suspended in a bath of swimming *E. coli* cells.

Research topic: Active matter, Biophysics, Microfluidics, Statistical Mechanics.

October – December 2012

**Internship.**

**Supervisor Dr L. Guidoni, La Sapienza University, Rome.**

Simulations of the dynamics of the Fenna-Matthew-Olson (FMO) pigment-protein complex in a water solution using Classic Molecular Dynamics software GROMACS .

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Research topic: Biophysics, Molecular Dynamics.

August – October 2012

**Internship: European META project**

**Oak Ridge National Laboratory (TN,USA)**

**Supervisors Dr P. Morales, Dr M. Celino (ENEA casaccia).**

- ▲ Density Functional Theory calculation of the electronic structure of a methanethiol molecule on a gold surface using the software QUANTUM ESPRESSO.
- ▲ Measurements of nano-metric DNA grids with the Atomic Force Microscope.

Research topic: Biophysics, DFT calculation, Molecular Dynamics.

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**PUBLICATIONS:**

Maggi C., Paoluzzi M., Pellicciotta N., Lepore A., Angelani L., & Di Leonardo R. (2014).

**Generalized energy equipartition in harmonic oscillators driven by active baths.** *Physical review letters*, 113(23),238303

Pellicciotta, N., Hamilton, E., Kotar, J., Faucourt, M., Degehyr, N., Spassky, N., & Cicuta, P. (2019). **Synchronization of mammalian motile cilia in the brain with hydrodynamic forces.** *bioRxiv*, 668459.

Hamilton E., Pellicciotta N., Feriani L., Cicuta P. 2019. **Motile cilia hydrodynamics: Entrainment versus synchronisation when coupling through flow.** *Submitted.*

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**AWARDS**

October 2015

3- years scholarship Early Stage Researcher position,  
Marie Curie Innovative Training Network BIOPOL

**Supervisor Dr. Pietro Cicuta, University of Cambridge .**

February 2015

**Selected proposal for Spin You Thesis! 2015 programme**  
by European Space Agency (ESA)

**Supervisor Dr E. Masi, University of Florence.**

Date 1/9/2020