Armand LECLERC

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Education

Ecole Normale Supérieure de Lyon **September 2019 – August 2021**

Master in Theoretical Physics (grade of 16.7/20, "Très bien")

Relevent Coursework followed:

- Nonlinear physics and instabilities
- General relativity and cosmology
- Advanced aspects of symmetries
- Topological phases
- Large deviation theory
- Interacting quantum fields
- Phase transitions and critical phenomena
- Advanced statistical mechanics
- Path integrals and applications
- Green's functions
- Nuclear physics
- Advanced quantum mechanics
- Dynamical systems and chaos
- Nonlinear dynamics and statistical theories for geophysical flows
- Condensed matter
- Tensors, geometry and general relativity
- Astrophysics
- Introduction to particle physics
- Quantum Field Theory
- Supraconductivity
- Symetries and groups

Ecole Normale Supérieure de Lyon **September 2018 – June 2019**

Degree in Physics (Mention: "Très Bien")

Relevent Coursework followed:

- Theoretical mechanics and special relativity
- Mathematical methods
- Atoms, molecules and bonds
- Statistical thermodynamics
- Electromagnetism

Victor Hugo High School **September 2015 – June 2018**

CPGE attestation (Top of the class)

Content:

- Three-year training in Physics, Mathematics and Chemistry
- Success at the competition to enter the ENS de Lyon

Research experience and Projects

5-month Internship (University of Exeter): (yet to come) **March 2022-July 2022**

- I will be an intern in the Astrophysics group, under the direction of Isabelle Baraffe.
- I will study the processes of g-modes excitations in the core of the sun.

6-month Internship (CRAL, Lyon): Topological properties of convection **Sept.2021-Feb.2022**

- Generalized the problem of asteroseismo-topology to the problem of stellar convection.
- Derived analytical results on the non-hermitian topological properties of the problem.

5-month Internship (Obs. de Strasbourg): Instabilities in anisotropic galaxies **Summer 2021**

- Numerical study of instabilities in anisotropic spheroidal galaxies.
- Built new functions on existing code to study more general profiles of anisotropies.

Writing of a scientific paper: **2021**

- Participated actively in the writing process of a scientific paper, presenting the results of the study of the internship on asteroseismo-topology.
- The paper is currently re-submitted to Nature Communications after major revision.

3-month Internship (CRAL, Lyon): Asteroseismo-topology **Summer 2020**

- Bringing the tools of topological physics from condensed matter to the astrophysics domain of asteroseismology.
- Developed both analytical and numerical tools for analysis of the topological mode in the wave problem.

International Physics Tournament **2019-2020**

- Participation with a team of 10 students to the IPT, learn to work as a team.
- Confrontation to two open questions, and work the bibliography, theoretical model and experimental confirmations (worked on non-circular vortex rings and optical compass).

2-month Internship (ILM, Lyon): Quantum Dots on ferroelectric crystals **Summer 2019**

- Study of the interaction of nano-objects and ferroelectric crystals.
- Practiced my skills experimental optics, clean room, Scanning Electron Microscope, and data processing.

Laboratory Project (ENS de Lyon Physics Laboratory) : Quantum Circuits **March 2019**

- Developed a method of electronic litography with a SEM, learned to handle the SEM and its software.

Other skills and interests

Languages written and spoken

- French, natural speaker
- English, C1 (Cambridge Advanced English attestation)

Extracurriculars

- Travels: UK (England and Scotland multiple times, week-long bike trip in Southern Ireland), biking trip in the Loire region, and others in Europe
- Music: practiced the drums since I was 10, played in bands. Also go regularly to concerts and festivals.
- Cooking: I take cooking lessons, and often prepare dinners at home.