

# Julien Froustey

PHD STUDENT — INSTITUT D'ASTROPHYSIQUE DE PARIS  
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## Education

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### PhD in Theoretical Physics

*Institut d'Astrophysique de Paris*

“SPECTRAL DISTORTIONS OF RELATIVISTIC SPECIES IN COSMOLOGY”  
under the supervision of Dr. Cyril Pitrou.

2019 –

### Agrégation de physique-chimie option physique

*Sorbonne Université*

RANK 1/78

2018 – 2019

High-level competitive examination for teachers, with a major in physics and chemistry.

### Master 2 ICFP – Theoretical Physics

*Ecole Normale Supérieure*

INTERNATIONAL CENTRE FOR FUNDAMENTAL PHYSICS

2017 – 2018

- *Courses taken included:* Quantum field theory, General relativity, Advanced statistical physics, Numerical physics, Invariances in physics and Group theory, Renormalization group theory, Cosmology, String theory.
- Obtained with First Class Honors (18.04/20).

### Master 1 ICFP

*Ecole Normale Supérieure*

INTERNATIONAL CENTRE FOR FUNDAMENTAL PHYSICS

2016 – 2017

- *Courses taken included:* Introduction to General relativity, Fundamental structure of matter, Cosmology, Quantum fluids, Statistical physics, Advanced mathematics for physicists.
- Obtained with First Class Honors (17.68/20).

### B.Sc. in Physics

*Ecole Normale Supérieure,  
Université Paris-Diderot*

LICENCE FIP (“FORMATION INTERUNIVERSITAIRE DE PHYSIQUE”)

2015 – 2016

- *Courses taken included:* Equilibrium statistical physics, Quantum mechanics, Hydrodynamics, Special relativity and Electromagnetism, Solid state physics, Analytical mechanics, Introduction to Astrophysics.
- Obtained with First Class Honors (18.98/20).

## Publications

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- [3] **J. Froustey and C. Pitrou**, *Primordial neutrino asymmetry evolution with full mean-field effects and collisions*, arXiv:2110.11889.
- [2] **J. Froustey, C. Pitrou and M.C. Volpe**, *Neutrino decoupling including flavour oscillations and primordial nucleosynthesis*, JCAP **12**, 015 (2020), [2008.01074].
- [1] **J. Froustey and C. Pitrou**, *Incomplete neutrino decoupling effect on big bang nucleosynthesis*, Phys. Rev. D **101**, 043524 (2020), [1912.09378].

### CONFERENCE PROCEEDINGS

- [1] **J. Froustey**, “Precision calculation of neutrino evolution in the early Universe”, in *17th International Conference on Topics in Astroparticle and Underground Physics*, 10, 2021, arXiv:2110.11296.

## Presentations

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- 10/21 **Sydney-CPPC seminar**, “Primordial neutrino asymmetries evolution in the early Universe”, [Video](#) *Virtual*
- 08/21 **TAUP 2021**, “Precision calculation of neutrino evolution in the early Universe”, [Video](#) *Virtual*
- 06/21 **WIN 2021**, “Precision calculation of neutrino evolution in the early Universe”, Poster *Virtual*

04/21	<b>Workshop: Latest Advances in the Physics of BBN and Neutrino Decoupling</b> , Invited Speaker	<i>Virtual</i>
12/20	<b>ICAP meeting</b> ,	<i>Virtual</i>
12/20	<b>APC Theory seminar</b> , Université de Paris	<i>Virtual</i>
11/20	<b>GDR Neutrino meeting</b> , WG 3: Neutrinos in the Universe	<i>Virtual</i>
11/20	<b>LUTH seminar</b> , Observatoire de Paris	<i>Virtual</i>
10/20	<b>GReCO seminar</b> , Institut d'Astrophysique de Paris	<i>IAP, Paris</i>

## Experience

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### INTERNSHIPS

#### Graduate (M2) Research internship

*Institut d'Astrophysique de Paris  
(Paris, France)*

"NEUTRINO SPECTRAL DISTORTIONS IN THE EARLY UNIVERSE"  
supervised by Dr. CYRIL PITROU.

*Apr. 2018 – Jun. 2018*

#### Graduate (M1) Research internship

*University of British Columbia  
(Vancouver, Canada)*

"DYNAMICS OF VORTICES IN 2D BOSE SUPERFLUIDS"  
supervised by Pr. P.C.E. STAMP.

*Feb. 2017 – Jul. 2017*

### TEACHING ACTIVITIES

2020–2021 **Teaching assistant**, Teaching students taking the Agrégation competitive exam in physics.

*Sorbonne  
Université, ENS-PSL*

2020–2021 **Teaching assistant**, *Mechanics-Physics* and *Waves and Electromagnetism* courses.

*Sorbonne Université*

2016–2018 **Oral examiner**, Training for oral examinations in physics in the classes of Professors A. Perrin, N. Schlosser and J. Llodra-Perez.

*Lycée  
Louis-le-Grand*

## Skills

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### LANGUAGES

**French**, Mothertongue

**English**, Fluent

**Spanish**, Written and spoken

### IT SKILLS

**Intermediate**, Mathematica, Python

**Advanced**, Microsoft Office,  $\LaTeX$

## Interests and Activities

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### RESPONSIBILITIES

2021-2022 **Institut d'Astrophysique de Paris**, PhD representative.

2019-2020 **Institut d'Astrophysique de Paris**, Organiser of a series of PhD seminars in an informal setting.

### ASSOCIATIONS

2016 **Sportive association**, Ecole Normale Supérieure (Treasurer).

2018–2021 **Festivities Committee**, Bias, 40170 France (Treasurer).

### LEISURE

**Music**, Trumpet player in amateur marching bands and orchestra.