

# Corentin Cadiou


PhD student in Astrophysics at Institut d'Astrophysique de Paris (IAP)

## Contact

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cphyc.github.io  
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## Science Interests

### Astrophysics

galaxy formation  
cosmic web  
numerical simulations  
cosmology

## Languages

French – native  
English – fluent  
(114/120 at TOEFL)  
German – medium

## Programming

– HPC –  
RAMSES

MPI, OpenMP, Fortran,  
C++

– Data analysis –  
yt

Python, NumPy, Linux

– General skills –  
Linux, bash, javascript  
L<sup>A</sup>T<sub>E</sub>X

## Education

- 2016–2019 **PhD in Astrophysics** Sorbonne Université & IAP, Paris France  
Defense expected in September 2019.
- 2015–2016 **Master's degree in Astrophysics** IAP, Paris Observatory & École Normale Supérieure (ENS), France  
Specialization in cosmology and numerical astrophysics, *summa cum laude*.
- 2015 **Diploma of the ENS** ENS, Paris, France  
Physics and Computer Sciences.
- 2012–2014 **Bachelor's degree, Physics** ENS, Paris, France
- 2012 Admitted to the ENS (most selective higher education school in France), *summa cum laude*.
- 2010–2012 Preparatory school in PCSI/PC\* Lycée Sainte-Geneviève, Versailles, France  
Two-year intensive program in advanced mathematics and physics to prepare the national competitive exam for entry to engineering schools. Equivalent to two years of Bachelor's degree, *magna cum laude*.
- 2010 French Baccalauréat (High school diploma), *summa cum laude* Saverne, France

## Research experience

- 2016–2018 **Member of the project SPIN(E)** Agence Nationale de la Recherche (ANR), France  
Funded by the French ANR (PI : C. Pichon).
- 2016–2019 **Post-graduate research** IAP, Paris, France  
"The Origin of the Hubble Sequence" supervisors: Christophe Pichon and Yohan Dubois, funded by the ENS.
- 2016 **Kavli Summer Program in Astrophysics** UCSC, California, USA  
"Evolution of the atmosphere of close-by Kepler exoplanets", supervisors: James Owen and Fred Adams.
- 2014 **Research internship** UCSC, California, USA  
"Angular momentum mixing processes in red giants to explain the slow-rotating cores problem", supervisor: Pascale Garaud.

## Awards

- 2018 **NumFOCUS New Contributor Award**  
Awarded for developing and extending the RAMSES frontend of the yt project, a Python package for analyzing and visualizing astrophysical simulations.
- 2017–now **yt team member**  
Nominated for continuous and significant contributions to the yt project.
- 2016–2019 **ILP fellowship**  
5000€ grant per annum for research expenses, including travel.
- 2012–2019 **ENS scholarship & ENS doctoral fellowship**  
Prestigious full stipend awarded nationwide to 20 fellows.

## Publications

- 2018 **Accurate tracer particles of the baryons dynamics in the adaptive mesh refinement code Ramses** Submitted to A&A  
C. Cadiou, Y. Dubois & C. Pichon, arXiv:1810.11401  
**About:** A new numerical method to track the accretion of baryons onto galaxies.  
**Contribution:** Main author.
- 2018 **Galaxies flowing in the oriented saddle frame of the cosmic web** Submitted to MNRAS  
K. Kraljic, C. Pichon, Y. Dubois, S. Codis, C. Cadiou, et al., arXiv:1810.05211.  
**About:** The effect of the cosmic web on galaxy formation in numerical simulations.  
**Contribution:** Co-author of the theory section.
- 2017 **Galaxy evolution in the metric of the Cosmic Web** MNRAS  
K. Kraljic, S. Arnouts, C. Pichon, C. Laigle, S. de la Torre, D. Vibert, C. Cadiou, et al., arXiv:1710.02676  
**About:** The effect of the cosmic web on galaxy formation in observations.  
**Contribution:** Provided theory part.
- 2017 **How does the cosmic web impact assembly bias?** MNRAS  
M. Musso, C. Cadiou, C. Pichon, S. Codis, K. Kraljic & Y. Dubois, arXiv:1709.00834  
**About:** The effect of the cosmic web on dark matter halo formation, theoretical.  
**Contribution:** Co-author of the paper.

## Talks and Posters

### Seminars and workshops

- |            |                            |                    |
|------------|----------------------------|--------------------|
| Sept. 2016 | Ramses User Meeting        | Lyon, France       |
| May 2017   | CITA journal club          | Toronto, Canada    |
| Sept. 2017 | Ramses User Meeting        | Nice, France       |
| Sept. 2017 | SPIN(E) ANR Meeting        | Agay, France       |
| Nov. 2017  | KIAS journal club          | Seoul, South Korea |
| April 2018 | CRAL journal club          | Lyon, France       |
| May. 2018  | SPIN(E) ANR Meeting        | Edinburgh, UK      |
| Sept. 2018 | West Coast Swings workshop | Perth, Australia   |

### Internal seminars

- |            |                           |               |
|------------|---------------------------|---------------|
| 2016, 2017 | ED127 PhD day             | Paris, France |
| 2016, 2017 | IAP PhD day               | Paris, France |
| 2016, 2017 | YMCA, IAP student seminar | Paris, France |

### Posters

- |            |  |                 |
|------------|--|-----------------|
| Sept. 2018 | Analytics, Computation and Inference in Cosmology                      | Cargese, France |
| Oct. 2018  | Highlights & prospects for numerical astrophysics in France (Astrosim) | Lyon, France    |

## Teaching

- 2016–2019 **Teaching Assistant** Sorbonne Université, Paris, France  
Courses included: concept and methods of Physics at B.Sc. level (192 hours).  
Graded all written work, oral and final written exams and assisted with labs.

## Responsibilities and outreach

- 2016–2017 Organizer of the IAP pre-seminar.  
Weekly meeting with the invited speaker with all the PhD students.
- 2018 Organizer of the “Mystery Science Picture” (MSciPic)  
Monthly release of a scientific picture for public outreach for the Société Française de Physique (SFP).
- 2017–2019 Journée de la Science (Open House day)  
Yearly public outreach event about general astronomy at IAP and Sorbonne Université.

## Other Experiences

- 2015 6-months internship in an IT company Linagora, Paris, France  
Development of a real-time peer-to-peer collaborative text editor.
- 2015 Ranked 2/130th team at the **Google Hashcode** programming competition. Paris, France
- 2012–2013 Team member of the ENS student association. Paris, France
- 2008–now Member of the BECD (Bénin Europe Coopération et Développement) an NGO to foster development in Benin. France & Benin