Corentin **Cadiou**

Post-Doctoral Research Assistant at University College London (UCL)

Contact

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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++, OpenCL

− Data analysis −
yt
Python, Cython, Linux

− General skills −
Linux, bash, javascript
LaTeX

Research experience

| 2019–now | **Post-doctoral research** | University College London |
| | Working with A. Pontzen on the origin of galactic angular momentum using simulations and theory. | |

2016–2019 **Post-graduate research** — IAP, Paris, France
"The impact of the large-scale structures of the Universe on dark matter halo and galaxy formation". Supervisors: C. Pichon and Y. Dubois, funded by ENS.

2016–2018 **Member of the project SPIN(E)** — Agence Nationale de la Recherche (ANR), France
Funded by the French ANR (PI : C. Pichon).

2016 **Kavli Summer Program in Astrophysics** — UCSC, California, USA
"Evolution of the atmosphere of close-by Kepler exoplanets", supervisors: J. Owen and F. Adams.

2014 **Research internship** — UCSC, California, USA
"Angular momentum mixing processes in red giants to explain the slow-rotating cores problem", supervisor: P. Garaud.

Education

2016–2019 **PhD in Astrophysics** — Sorbonne Université & IAP, Paris France
Refereed by S. White and A. Dekel, examined by O. Hahn, A. Slyz, D. Pogosyan and B. Sémelin

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

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.

2016 Offered Clarendon fellowship for a Ph.D. in Oxford

2012–2019 **ENS scholarship & ENS doctoral fellowship**
Prestigious full stipend awarded nationwide to 20 fellows.

Publications

2019   **Dense gas formation and destruction in a simulated Perseus-like galaxy cluster with spin-driven black hole feedback**   Accepted for publication in A&A
R. S. Beckmann, Y. Dubois, P. Guillard, P. Salome, V. Olivares, F. Polles, **C. Cadiou**, et al., arXiv:1909.01329.
About: The origin of clumpy gas cooling in galaxy clusters.
Contribution: provided numerical code.

2018   **Accurate tracer particles of baryon dynamics in the adaptive mesh refinement code Ramses**
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**   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.

Visiting programs, schools and invited conference

03/2019	Invited at the yt workshop	University of Illinois, Urbana, USA
12/2018	Visiting program at Oxford	Oxford, Germany
12/2018	Visiting program at MPA Garching	Garching, Germany
09/2018	**Analytics, Inference and Computation in Cosmology: Advanced methods** Introduction to effective field theory, bayesian inference, computational methods and machine learning for cosmology.	Cargèse, France
04/2018	Visiting program at Edinburgh	Edinburgh, Scotland
01/2018	Visiting program at MPA Garching	Garching, Germany
11/2017	Visiting program at KIAS	Seoul, South Korea
06/2017	**Astrosim Summer School** Introduction to numerical codes used in astrophysics (Ramses, Phantom, …) and programming techniques (MPI, OpenMP, Cuda).	Lyon, France
05/2017	Visiting program at CITA	Toronto, Canada
08/2016	Kavli Summer Program in Astrophysics	UCSC, California, USA

Teaching

2016–2019	**Teaching Assistant** 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.	Sorbonne Université, Paris, France

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.

2019 Speaker at the "Pint of Science" festival
Public outreach festival to present the work of researchers and raise awareness about science.

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