Bastien Carreres

PhD in Astrophysics and Cosmology

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Education

PhD - Astrophysics and Cosmology 2023
Aix-Marseille Université
Thesis title : Measurement of the growth rate of structures with type Ia supernovae of the ZTF photometric survey.

Master's degree - Subatomic Physics and Cosmology 2020
Université Grenoble-Alpes
Graduated with honors

Bachelor's degree - Fundamental Physics 2018
Université de Montpellier
Graduated with high ho nors

Research Experiences

Post-doctoral Associate 2023–Present
Duke University, Durham, NC, USA
Supervisor : Pr. Dan Scolnic
Subject : Cosmology with low-z SNe Ia, peculiar velocities, survey simulation, data analysis

PhD candidate 2020–2023
Centre de Physique des Particules de Marseille, Marseille, France
Supervisor : Drs. Dominique Fouchez, Benjamin Racine et Julian Bautista
Sujet : SNe Ia cosmology, growth rate of structure measurement, peculiar velocities, survey simulation

Teaching Experiences

PhD candidate with teaching duties 2020–2023
Université Aix Marseille
64h / year

Calculus tutoring 2017–2018
Université de Montpellier
Tutoring for first year college students

Math tutoring 2016–2018
Independant
Tutoring for middle-school and high-school students

Responsibilities

Member of the SOC of the 2025 DESC summer meeting 2025

Member of the DESC Collaboration Council 2024–Present
Elected for a 2 year term.

Reviewer for MNRAS 2025–Present
Review of 1 publication.

Co-organisator of the CPPM cosmology group' journal club 2021–2023

Co-organisator & Volunteer of the CPPM cosmology "Fête de la Science" stands 2021–2023

Student supervision

Graduate student project supervision 2024–Present
Duke University
Subject : Estimation of the velocity power spectrum in a N-body simulation.

Research interest

Key words : Cosmology, dark energy, large-scale structures, type Ia supernovae.
My field of research is observational cosmology. My research focuses on using Type Ia Supernovæ to study the nature of dark energy. Particularly, I work on the estimation of peculiar velocities in the near universe to constrain the growth rate of structures.

Collaborations

— Full member of the Dark Energy Science Collaboration (DESC) of the Legacy Survey of Space and Time (LSST).

— External collaborator of the cosmology group of the Zwicky Transient Facility (ZTF) survey.

Grants and awards

— LSSTC Enabling Science Program Award 2021 - $5000

— National PhD fellowship - 3 years contract (ED352 - Aix-Marseille Université)

Technical skills

Programing languages :

- Python (Expert)
- LaTeX (Intermediate)
- C/C++ (Novice)
- CSS/HTML (Novice)

Contributions to public codes :

- `SNSim` (Creator and main developer)
- `flip` (Creator of a previous version, Co-developer)
- `OpSimSummaryV2` (Principal maintainer, developer)
- `SNCosmo` (Contributor)
- `SNANA` (Contributor)