

# Bastien Carreres

## PhD in Astrophysics and Cosmology

✉ [bastien.carreres@duke.edu](mailto:bastien.carreres@duke.edu) | 🏠 [Homepage](#) | 🐙 [GitHub Profil](#) | 🆔 [ORCID Profil](#)

### Education

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<b>PhD - Astrophysics and Cosmology</b>	2023
<i>Aix-Marseille Université</i>	
Thesis title : Measurement of the growth rate of structures with type Ia supernovae of the ZTF photometric survey.	
<b>Master's degree - Subatomic Physics and Cosmology</b>	2020
<i>Université Grenoble-Alpes</i>	
Graduated with honors	
<b>Bachelor's degree - Fundamental Physics</b>	2018
<i>Université de Montpellier</i>	
Graduated with high honors	

### Research Experiences

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<b>Post-doctoral Associate</b>	2023–Present
<i>Duke University, Durham, NC, USA</i>	
Supervisor : Pr. Dan Scolnic	
Subject : Cosmology with low-z SNe Ia, peculiar velocities, survey simulation, data analysis	
<b>PhD candidate</b>	2020–2023
<i>Centre de Physique des Particules de Marseille, Marseille, France</i>	
Supervisor : Drs. Dominique Fouchez, Benjamin Racine et Julian Bautista	
Sujet : SNe Ia cosmology, growth rate of structure measurement, peculiar velocities, survey simulation	

### Teaching Experiences

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<b>PhD candidate with teaching duties</b>	2020–2023
<i>Université Aix Marseille</i>	
64h / year	
<b>Calculus tutoring</b>	2017–2018
<i>Université de Montpellier</i>	
Tutoring for first year college students	
<b>Math tutoring</b>	2016–2018
<i>Indépendant</i>	
Tutoring for middle-school and high-school students	

## Responsibilities

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<b>Member of the SOC of the 2025 DESC summer meeting</b>	2025
<b>Member of the DESC Collaboration Council</b> <i>Elected for a 2 year term.</i>	2024–Present
<b>Reviewer for MNRAS</b> <i>Review of 1 publication.</i>	2025–Present
<b>Co-organisator of the CPPM cosmology group' journal club</b>	2021–2023
<b>Co-organisator &amp; Volunteer of the CPPM cosmology “Fête de la Science” stands</b>	2021–2023

## Student supervision

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<b>Graduate student project supervision</b> <i>Duke University</i> Subject : Estimation of the velocity power spectrum in a N-body simulation.	2024–Present
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## Research interest

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**Keywords : Cosmology, dark energy, large-scale structures, type Ia supernovae.**

My field of research is observational cosmology. My research focuses on using Type Ia Supernovae 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

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- 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

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- LSSTC Enabling Science Program Award 2021 - \$5000
- National PhD fellowship - 3 years contract (ED352 - Aix-Marseille Université)

## Technical skills

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### Programing languages :

- Python 🐍 (Expert)
- $\text{\LaTeX}$  (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)