

Bastien Carreres | Ph.D

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Research Experience

- 2023-Present **Postdoctoral Associate**, *Duke University*, Durham, NC, USA, with Dr D. Scolnic.
Cosmology with SNe Ia, survey simulations, peculiar velocities
- 2020-2023 **PhD candidate**, *CPPM*, Marseille, with Drs D. Fouchez, B. Racine and J. E. Bautista.
Cosmology with SNe Ia, growth rate measurement with ZTF data

Education

- 2020-2023 **PhD - Astrophysics & Cosmology**, *ED 352, Aix-Marseille Université*, Marseille.
Thesis project: *Measuring the growth rate of structures with type Ia supernovae*.
- 2019-2020 **Master's degree 2nd year - Subatomic Physics and Cosmology**, *UFR PhiTEM, Université Grenoble-Alpes*, Grenoble, France.
Graduated with honors
- 2019-2020 **Magister of Physics 3rd year**, *UFR PhiTEM, Université Grenoble-Alpes*, Grenoble, France.
Graduated
- 2018-2019 **Master's degree 1st year - Physics, Fundamental Research**, *UFR PhiTEM, Université Grenoble-Alpes*, Grenoble, France.
Graduated with honors
- 2018-2019 **Magister of Physics 2nd year**, *UFR PhiTEM, Université Grenoble-Alpes*, Grenoble, France.
Graduated
- 2017-2018 **Bachelor's degree - Fundamental Physics**, *Faculté des Sciences, Université de Montpellier*, Montpellier, France.
Graduated with high honors

Selected Publications

First Author

1. **B. Carreres**, D. Rosselli, J. E. Bautista, F. Feinstein, D. Fouchez, et al. 2024. *ZTF SN Ia DR2: Peculiar velocities impact on the Hubble diagram*
In: arXiv e-prints. DOI: 10.48550/arXiv.2405.20409
2. **Bastien Carreres**, Julian E. Bautista, Fabrice Feinstein, Dominique Fouchez, Benjamin Racine, et al. 2023. *Growth-rate measurement with type-Ia supernovae using ZTF survey simulations*
In: Astronomy & Astrophysics. DOI: 10.1051/0004-6361/202346173

Significant contribution

1. Erik R. Peterson, **Bastien Carreres**, Anthony Carr, Daniel Scolnic, Ava Bailey, et al. 2024. *The Impact from Galaxy Groups on Cosmological Measurements with Type Ia Supernovae*
In: arXiv e-prints. DOI: 10.48550/arXiv.2408.14560

Talks & Posters

1. Sept. 2023 - **Possible velocity systematic on the Hubble diagram fit** at *ZTF France*, LPC, Clermont-Ferrand, France [link]
2. Aug. 2023 - **$f\sigma_8$ measurement with type Ia supernovae** at *DESC-TD biweekly meeting*, online [link]
3. May 2023 - **Growth-rate measurement with type Ia supernovae** at the *Duke cosmology group' seminar* [link]
4. Nov. 2022 - **Cosmology with the growth rate using type Ia supernovae** at *Action Dark Energy 2022*, Marseille, France [link]
5. May 2022 - **Measuring $f\sigma_8$ with the ZTF SN Ia sample** at *Rubin-LSST France 2022*, LAPP, Annecy, France [link]
6. May 2022 - **Measuring $f\sigma_8$ with the ZTF SN Ia sample** at *ZTF spring meeting*, LPNHE, Paris, France [link]
7. June 2021 - **Peculiar velocities with Type Ia Supernovae** at *Rubin-LSST France 2021*, LPSC, Grenoble, France [link]
8. July 2022 - **Peculiar velocities with SNe Ia** at *DESC Summer Meeting 2022*, University of Chicago
9. Feb. 2022 - **Cosmology with the growth rate of structures using type Ia supernovae** at *Rencontres de Moriond + Proceedings* [link]

Teaching

Academic

- 2022-2023 **Introduction to the scientific method (L2)**, Lab (12h), Aix-Marseille Université.
- 2021-2023 **Methodology (L1)**, Tutorials (62h), Aix-Marseille Université.
- 2020-2023 **Energy in Physics and Chemistry (L3)**, Lab (36h), Aix-Marseille Université.
- 2020-2023 **Basic physics: optics & electricity (L1)**, Lab (42h), Aix-Marseille Université.
- 2021-2022 **Color and Photography (L3)**, Lab (6h), Aix-Marseille Université.
- 2020-2021 **Physics (L1/AMNS)**, Lab (15h), Aix-Marseille Université.
- 2020-2021 **Optics (L1)**, Lab (8h), Aix-Marseille Université.
- 2020-2021 **Thermodynamics (L1)**, Lab (12h), Aix-Marseille Université.

Student advising

- 2024-Present **Undergrad project advising**, Duke University.

Schools & Internships

- August 2020-21-22 **Euclid Summer School - 2 weeks / year lectures**, *Euclid France*, Hyères, Biarritz and Banyuls.
Subject: Science of future cosmological surveys
- March-July 2020 **Pre-Thesis Internship**, *Centre de Physique des Particules de Marseille*, Marseille.
Subject: Cosmology with type Ia supernovae
- May-June 2019 **Master's degree 1st year Internship**, *Laboratoire de Physique Subatomique et Cosmologie*, Grenoble.
Subject: Search for new particles that decay into top-antitop pair
- June 2017 **OCEVU summer school**, *Labex OCEVU*, Montpellier.
One week of seminars and one week-end of observations at the *Haute-Provence Observatory*

Responsibilities & Outreach

Academic

- 2021-2023 **Co-organisator of the cosmology group journal club**, CPPM.

2021-2022 **Co-organisator & Volunteer of the CPPM cosmology "Fête de la Science" stands,**
Marseille Townhall.

Others

2021-Present **Co-creator of an outreach website.**

2016-2017 **Maths tutoring for high-school students.**

Grants & Fellowships

2020-2023 **PhD fellowship - 3 year contract,** ED 352, Aix-Marseille Université.

2021 **LSSTC Enabling Science Program Award,** \$5000 award.

Technical Skills

Programming languages

- **Python:** Advanced
- **C/C++:** Basic
- **HTML/CSS:** Beginner

Public codes

- SNSim: Principal Maintainer
- OpSimSummaryV2: Principal Maintainer
- flip: Co-Maintainer
- SNCosmo: Contributor
- SNANA: Contributor

Languages

- **French:** Native
- **English:** Fluent