

Louis Legrand

Ph. D.

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Personal Information

date of birth 5 August 1993
nationality French

Current position

Nov 2020–present **Postdoctoral researcher at the University of Geneva**, Department of theoretical physics, within SNSF Eccellenza Professorial Fellowship of J. Carron (No. 186879).

Education

- 2017–2020 **PhD in Astronomy and Astrophysics**
Université Paris-Saclay, Institut d'Astrophysique Spatiale
- Thesis title: Large surveys: from galaxy evolution to cosmological probes
 - Supervisors: M. Douspis and N. Aghanim
 - Graduated with honours and congratulations of the jury (*avec les félicitations du jury*)
- 2016–2017 Master's Degree in Astronomy and Astrophysics
Université Paul Sabatier, Toulouse
- 2016–2017 Engineering degree
ISAE-SUPAERO, Toulouse
- 2013–2016 Engineering degree
École polytechnique, Palaiseau
- 2011–2013 Classes préparatoires aux grandes écoles
Lycée Louis-le-Grand, Paris

Experiences

- Nov–Dec 2018 Visiting student at CEFCA, Teruel, Spain
Supervisor: Carlos Hernandez-Monteagudo
Development and forecasts for a new cosmological statistics: the angular redshift fluctuations
- Apr–Sep 2017 Master thesis at the Institut d'Astrophysique de Paris
Supervisor: Henry Joy McCracken
Measurement of the stellar to halo mass ratio of galaxies in COSMOS
- Mar–Jul 2016 Internship at the Institut d'Astrophysique Spatiale
Supervisor: Pr. Hervé Dole
Study of high redshift galaxy clusters and predictions for JWST and Euclid

Collaboration Membership

- 2020–present **CMB-S4 collaboration**
- Map to other statistics working group, involved in the CMB lensing spectrum estimation
 - Low-ell BB working group, involved in the delensing of the CMB maps

2017–present **Euclid collaboration**

- CMB cross-correlations working group: involved in the “Forecasts” work package, in the “Likelihood” work package and in the “CMB lensing covariance” work package
- Galaxy clustering working group: involved in the “Additional probes” work package and in the “Super sample covariance” key project

2016–2020 **COSMOS collaboration**

- Participated in the measurement of the stellar to halo mass ratio

Grants

- Aug. 2022 Grant from the Academic Society of Geneva, to attend the COSMOS'22 conference and a three weeks stay at the Federal University of Rio de Janeiro (1370 CHF)
- Feb. 2020 Conference grant to participate to Cosmic Flows 2020 (200 EUR)
- 2017-2020 Doctoral grant provided by the Centre National d'Etudes Spatiales (CNES) (~ 45000 EUR)

Supervised students

- Nov. 2022 – Mar. 2023 Angelo Ferrari, visiting PhD student, *Development of the Euclid and CMB lensing joint likelihood*
- Feb.–June 2022 Samuel Simko, Bachelor degree, *Deep learning techniques to estimate the mass of galaxy clusters through CMB lensing*

Invited talks and seminars

- Sep. 2022 Federal University of Rio de Janeiro, Brazil, *Next generation of CMB lensing estimation*, invited seminar
- July 2022 International workshop: Key challenges in galaxy and CMB lensing, held in Centre for Theoretical Cosmology, Cambridge UK, *Iterative CMB lensing power spectrum estimation*, invited talk
- May 2022 Institute for Particle Physics and Astrophysics, ETH-Zurich, Switzerland, *Next generation of CMB lensing estimation*, invited seminar
- Mar. 2022 Institut d'Astrophysique Spatiale, University Paris-Saclay, Orsay, France, *CMB lensing with deep polarization surveys*, invited seminar
- Oct 2021 Scuola internazionale superiore di studi avanzati (SISSA), Trieste, Italy, *CMB lensing power spectrum with deep polarisation experiments*, invited seminar

Contributed talks and posters

- Aug. 2022 COSMO'2022, Rio de Janeiro, Brazil, *CMB lensing with next generation surveys*, talk
- Jul. 2022 Cosmology from home 2022, *CMB lensing with next generation surveys*, talk
- May 2022 From Planck to the future of CMB, held in Ferrara, Italy, *CMB lensing power spectrum with deep surveys*, poster
- May. 2022 CMB-S4 consortium meeting, *CMB lensing spectrum for next generation surveys*, flashtalk
- Feb. 2022 56th Rencontres de Morion, held in La Thuile, Italy *Next generation CMB lensing power spectrum*, poster
- Jul. 2021 Cosmology from home 2021, *Optimal CMB lensing power spectrum estimation*, flashtalk
- Jun 2021 Euclid additional probes working group, held in remote, *Angular redshift fluctuations: A new statistic to probe the dark sector*, talk
- Apr. 2021 Réunion Euclid-France Clustering, *Angular redshift fluctuations: A new statistic to probe the dark sector*, talk
- Mar. 2021 CMB-S4 consortium meeting, *Optimal CMB lensing power spectrum estimation*, flashtalk

- Nov. 2020 9th Euclid France Symposium, *Probing the dark sector with Angular Redshift Fluctuations*, talk
- Feb. 2020 Cosmic Flows conference, held in Stellenbosch Institute for Advanced Study, South Africa, *Angular redshift fluctuations and CMB lensing*, talk
- Jun. 2019 The golden age of cosmology from Planck to Euclid, held in Institut d'Astrophysique de Paris, France, *Angular redshift fluctuations and CMB lensing*, poster
- May 2019 COSMOS collaboration annual meeting 2019, held in Flatiron Institute, New York, *The stellar to halo mass relationship in the COSMOS field*, talk
- Feb. 2019 Conférence Elbereth 2019, held in IAP, Paris, *Euclid and CMB lensing*, talk
- Nov. 2018 7th Euclid France Symposium, held in Observatoire de la Côte d'Azur, Nice, France, *Cross correlations between CMB lensing and Euclid*, talk
- Oct. 2018 Journées Nationales du PNCG 2018, held in Institut d'Astrophysique de Paris, France, *Stellar to halo mass relationship*, talk
- Apr. 2018 Statistical challenges for large-scale structures, held in Oxford, *Stellar to halo mass relationship*, talk
- Nov. 2017 Conférence Elbereth 2017, held in Institut d'Astrophysique de Paris, France, *Dark matter and evolution of galaxies*, talk

Teaching and outreach experience

- 2022–present Teaching assistant *Thermodynamics*, bachelor of physics, University of Geneva, *2 hours/week*
- June 2022 International Euclid advanced school, held in Les Houches, France, *Cross correlations between Euclid and CMB lensing*, lecturer, *1.5 hours*
- 2021–2022 Outreach science talks at University of Geneva for school students (from 6 to 18 years old), *2 hours/week*
- 2020–2021 Teaching assistant *Mathematical methods for physicists*, bachelor of physics, University of Geneva, *2 hours/week*
- Dec 2019 Teaching assistant *Data analysis*, master of physics, Université Paris Saclay, *15 hours*
- 2017–2020 Outreach science talks at the *Palais de la Découverte* museum in Paris, *62 hours/year*

Academic service

- 2021–present Member of the Euclid Early Career Committee, involved in the organization of
 - Early career workshop of the Euclid consortium meeting 2022
 - Flash talk sessions of the Euclid consortium meeting 2022
 - Bi-annual Question/Answering sessions with the Euclid board
- 2019 Co-organizer of the PhD students day of the Institut d'Astrophysique Spatiale (IAS), held on Dec. 9 2019
- 2019 Member of the Local Organisation Committee for the 8th Euclid France Symposium, held at IAS, Nov. 27-29 2019
- 2018–2020 Representative of the PhD students of the Institut d'Astrophysique Spatiale
- 2018–2019 Co-organizer of monthly PhD student seminars at IAS
- Mar. 2018 Co-organizer of a career meeting for PhD students in Astronomy and Astrophysics, held in Paris

Languages

- French Native
- English Fluent
- Italian Advanced level
- Portuguese Beginner level