

BORIS BOLLIET

Columbia Astrophysics Laboratory

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Current Positions:

Research Associate at Columbia University

September 2020 - Present

Guest Researcher at the *Center for Computational Astrophysics*

Co-Leading the SZ analysis working group in *The Simons Observatory*

Member of ACT, SO and LSST DESC

Previous Position:

Research Associate at the University of Manchester

September 2017 - August 2020

ERC-funded position in Jens Chluba's group

Research Interests: Theoretical, Observational, Computational Cosmology and Astrophysics. Thermal and kinetic Sunyaev Zeldovich Effects, CMB Spectral Distortions, Dark Matter, Dark Energy, Inflation

EDUCATION

Université Grenoble Alpes

September 2013 - August 2017

Grenoble, France

Ph.D. (2017), M.A. Phys. (2014)

Ph.D. Thesis: *Beyond Einstein's Theory of Gravitation: Some Aspects of Loop Quantum Cosmology, Black Holes and the Dark Universe*

Thesis Advisor: Aurélien Barrau

École Normale Supérieure de Lyon

September 2009 - August 2014

Lyon, France

S.B. Phys. (2010), M.A. Phys. (2014)

Lycée Louis-Le-Grand

September 2007 - August 2009

Paris, France

Classes Préparatoires in Physics (Selective scientific studies for the French Grandes Écoles)

OTHER POSITIONS HELD

Fulbright Fellow at Louisiana State University

August - December 2016

Baton Rouge, LA, USA

Fulbright Visiting Student Researcher

Research Project: *Non-Gaussianity in Loop Quantum Cosmology*

Advisor: Ivan Agullo

Intern at The University of Manchester

March - August 2014

Manchester, UK

Master's Thesis: *The Equation of State Approach to Cosmological Perturbations in Dark Energy*

Thesis Advisor: Richard Battye

Consultant at the French Embassy in India

July - December 2012

New Delhi, India

Project: *Report on the Scientific Landscape and Higher Education in India*

Advisor: Véronique Briquet-Laugier

Intern at Brookhaven National Laboratory

Upton, NY, USA

Bachelor's Thesis: *Two-particle correlations in heavy ion collisions at RHIC*

Thesis Advisor: Paul Sorensen

June - August 2010

HONORS AND AWARDS

Selected Participant at the Aspen Center for Physics workshop on CMB	2021
Fulbright Fellowship (~15 Grantees/year in France)	2016
Invited Young Scientist at the Lindau Nobel Laureate Meeting	2016
Diplôme de l'ENS Lyon, awarded for my work at the French Embassy in India	2014
Élève de l'ENS Lyon (~30 positions/year in Physics)	2009-2014

TEACHING EXPERIENCE

Modern Cosmology - Columbia Science Honors Program New York, USA Saturday morning program specifically designed for selected high school students Teaching the full course (2h weekly)	Since September 2021
Invited Lecturer at the Bard Summer School On Quantum Gravity Bard College, Annandale-On-Hudson, NY, USA Lecture and Computing Lab on CMB phenomenology (~6h)	June 2019
Assistant in Instruction at Université Grenoble Alpes Grenoble, France - Numerical Methods in Physics (Lecture and Computing Lab ~40h) - Special Relativity (Exercise Classes ~20h) - Nuclear Physics (Lab and Exercise Classes ~40h) - Data Analysis (Computing Lab ~20h)	2015-2017

SEMINARS & CONFERENCE PRESENTATIONS

Below are the main topics I have covered in my talks and the list of places I visited.

Cosmological Constraints with the thermal and kinetic Sunyaev Zeldovich effects Talks given at Yale, Princeton, Stony Brook, NYU/CCA, Oxford (invited), Grenoble (invited), Geneva, Munich, Marcel Grossmann, Moriond, MPA, IAS Paris, Sesto, Aspen in 2017-2021.

CMB Spectral Distortions from Photon Injection Processes

Talks given at Marcel Grossmann Meetings, Barcelona, CCA, Cambridge in 2018-2021.

Cosmological Perturbations in Dark Energy and Modified Gravity

Talks given at Radboud University, ENS Lyon, Marcel Grossmann, Geneva, Manchester, in 2014-2017.

Phenomenology of Loop Quantum Cosmology

Talks given at Perimeter Institute, Penn State, LSU, Erlangen, CPT Marseille, Krakow, in 2013-2017.

SERVICES TO THE PROFESSION & OUTREACH

Referee for *Physical Review*, *Reviews of Modern Physics* and *Classical and Quantum Gravity*.

Organizer of the theory seminars at Columbia (since September 2021).

Organizer of the weekly Journal Club at JBCA, Manchester (2018-19).

Organizer of the weekly Student Seminars at Université Grenoble Alpes (2015-17).

Outreach Talks in schools, community centers and at private events.

SKILLS

Languages	French (Native); English (Fluent); Spanish (Conversational); Italian, Romanian, Hindi (Basics).
Coding	C/C++, Python, Jupyter Notebook, Mathematica, Git, Latex (Expert); Fortran, HTML (Advanced);
Astrophysics Software	CLASS, Cobaya, MontePython, CCL, SZFAST, CAMB, CosmoMC.

COMPUTING PROJECTS

Main Author

- CLASS_SZ: Full-fledged parallelized halo model code
- CLASS_EOS: Cosmological perturbations in Horndeski theory
- CLASS_LQC: Primordial power spectrum and non-gaussianity in loop quantum cosmology

Co-Author

- CosmoTherm: CMB Spectral Distortions (lead: Jens Chluba, *unreleased*)
- BremsstrahlungPKG: Gaunt Factors in Astrophysics (lead: Jens Chluba, *unreleased*)
- EOS_CLASS: Cosmological Perturbations in Horndeski Models (lead: Francesco Pace)