

Emilio Bellini | Curriculum Vitae

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11/03/2021

Working Experience

Present.....

Postdoctoral Researcher **Genève, Switzerland**
Department of Physics, University of Genève 2020–present

Past.....

Beecroft fellow (Postdoctoral Researcher) **Oxford, UK**
Department of Physics, BIPAC, University of Oxford 2016–2020
Supervisor: Prof. Pedro Gil Ferreira

Postdoctoral Researcher **Barcelona, Spain**
Institute of Cosmos Sciences, University of Barcelona 2014–2016
Supervisor: Prof. Licia Verde

Visiting Postdoc **Heidelberg, Germany**
Institute for Theoretical Physics, University of Heidelberg 2013–2014
Supervisor: Prof. Luca Amendola
Position funded by “Fondazione Ing. Aldo Gini” and “Fondazione Angelo Della Riccia”.

Education

Ph.D. in Physics **Padova, Italy**
Department of Physics and Astronomy, University of Padova 2010–2013
Supervisors: Prof. Sabino Matarrese and Prof. Nicola Bartolo
Thesis title: On the growth of structures in Galileon cosmologies

Master degree in Physics, Theoretical and Computational Physics **Trento, Italy**
Department of Physics, University of Trento 2006–2009
Supervisor: Prof. Sergio Zerbini.

Bachelor degree in Physics **Trento, Italy**
Department of Physics, University of Trento 2003–2006
Supervisor: Prof. Sergio Zerbini.

Fellowships and Awards

- **Accreditation Professor Agregat:** Catalan (AQU, Agencia per a la Qualitat del Sistema Universitari de Catalunya) recognition to become associate professor;
- **Accreditation Professorat Lector:** Catalan (AQU, Agencia per a la Qualitat del Sistema Universitari de Catalunya) recognition to become lecturer;
- **Abilitazione Scientifica Nazionale FIS02/A2:** Italian recognition to become Associate professor

in Theoretical Physics (valid until 2024);

- **Extraordinary Research Fellowship:** Queen's College, University of Oxford, UK (2017). £3k/year for subsistence, £2k/year for research;
- **Beecroft Fellowship:** Department of Physics, University of Oxford, UK (2016). £35k/year;
- **Fondazione Angelo Della Riccia Fellowship:** spent at the Institute for Theoretical Physics, University of Heidelberg, Germany (2014). €14k;
- **Fondazione Ing. Aldo Gini Fellowship:** spent at the Institute for Theoretical Physics, University of Heidelberg, Germany (2013). €7k.

Teaching Statement

Supervision of students.....

2017 – present: PhD Student: Dina Traykova. Topic: *Tests of dark energy and modified gravity*. Department of Physics, University of Oxford (UK);

2017: Master Student: Alessandro Casalino. Now PhD at University of Trento, Italy. Title: *Cosmological perturbation in Horndeski gravity: a case study*. Department of Physics, University of Oxford (UK).

Teaching Activities.....

2020 – 2021: Tutor of "Laboratoire IV Théorique". Master degree course. University of Geneva (Switzerland);

2018 – 2020: Co-lecturer of "Cosmology". Master degree course. University of Oxford (UK);

2017 – 2020: Tutor of "Cosmology". Master degree course. University of Oxford (UK);

2017 – 2020: Tutor of "General Relativity and Cosmology". Bachelor's degree course. Queen's College, University of Oxford (UK);

2016: Manipulation of tensors with xAct. Course to students and faculty members, University of Barcelona (Spain).

Organization of Scientific Meetings

2019: Local Organizing Committee. *Theory Working Group Meeting* of the Euclid consortium. 50+ people. University of Oxford (UK);

2017, Feb: Organizer. *EFTCAMB/hi_class meeting*. 20+ people. University of Oxford (UK);

2016, June: Local Organizing Committee. *Meeting on Fundamental Cosmology*. 80+ people. University of Barcelona (Spain);

2016, March: Organizer. *Manipulation of tensors with xAct*. 30+ people. University of Barcelona (Spain).

Institutional Responsibilities

2017 – 2019: Organizer, *Cosmology Seminars*, 20+ people, University of Oxford, UK;

2017 – present: Graduate Student Advisor, University of Oxford, UK.

Comissions of Trust

Journal referee for Physical Review D (**PRD**), Journal of Cosmology and Astroparticle Physics (**JCAP**), Journal of High Energy Physics (**JHEP**), **Physics of the Dark Universe**, European Physical Journal C (**EPJC**), General Relativity and Gravitation (**GERG**), Monthly Notices of the Royal Astronomical Society (**MNRAS**), Physical Review Letters (**PRL**).

Referee for **REPRISE**, the Register of Scientific Experts set up at the MIUR (Italian Ministry of Instruction, University and Research).

Professional Affiliations

Major Collaborations.....

2019 – present: Member of LISA Mission, Cosmology Working Group, www.elisascience.org;

2016 – present: Member of Euclid Consortium, Theory Working Group, www.euclid-ec.org.

Membership of Scientific Societies.....

2011 – 2016: Member, Research Network “CosmoClassic”. Collaborative project between: ICC (University of Barcelona), ICIC (Imperial College, London), University of Padova, Institute Lagrange de Paris and IFIC and Canfranc Laboratory;

2010 – 2013: Associated Member, INFN (National Institute of Nuclear Physics), University of Padova, Italy.

Computer skills

- **hi_class** (www.hiclass-code.net): main developer. Modified version of the Boltzmann code CLASS created in order to include non standard gravity scenarios as the Horndeski class of models;
- **CLASS, MontePython, Cosmosis, CCL, GetDist, ...**: detailed knowledge and experienced user of astrophysics and cosmology tools to get accurate predictions on the evolution of the universe and to relate theory with observations;
- **Mathematica**: detailed knowledge and experienced user;
- **xAct**: detailed knowledge and experienced user. Mathematica package for tensorial manipulation;
- **Python (numpy, scipy, astropy, matplotlib, ...)**: experienced user;
- **C, C++**: experienced user;

Languages

English: Proficient

Italian: Mother tongue

Spanish: Proficient

French: Basic

Conferences and Talks

Talks Given.....

2020, Jan: Invited. University of Nottingham (UK). *The hi_class way for testing gravity*;

2019, Nov: Invited. Queen Mary University of London, London (UK). *The hi_class way for testing gravity*;

2019, Nov: Invited. University of Torino, Torino (Italy). *The hi_class way for testing gravity*;

2019, April: Invited. Theoretical Cosmology meetings, Institute Lorentz, Leiden (The Netherlands). *Sheer shear: weak lensing with one mode*;

2019, March: Invited. Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste (Italy). *Maximal freedom at minimum cost: on the future of general scalar-tensor theories in cosmology*;

2018, Dec: Department of Physics and Astronomy, University of Padova, Padova (Italy). *Sheer shear: Cosmic shear with 2 modes*;

2017, Oct: Invited. University of Aachen, Aachen (Germany). *Maximal freedom at minimum cost: efficient description of general scalar-tensor theories*;

2017, Sept: Invited. "Dark Energy and Modified-Gravity cosmologies: DARKMOD" workshop, Paris (France). *Towards a unified description of theories with a single scalar degree of freedom*;

2017, Apr: Invited. University of Trento, Trento (Italy). *Maximal freedom at minimum cost: efficient description of general scalar-tensor theories*;

2016, Feb: Invited. University of Valencia, Valencia (Spain). *Maximal freedom at minimum cost: Horndeski in Class*;

2016, Jan: Invited. Institut de Physique Théorique, Saclay, Paris (France). *Signatures of Horndeski gravity on the Dark Matter Bispectrum*;

2015, Nov: Invited. "Cosmological tests: mini-workshop". Lorentz Center, Leiden (The Netherlands). *Hi-Class*;

2015, Sept: "From inflation to galaxies: A workshop in honour of Sabino Matarrese", Castiglioncello (Italy). *Signatures of Horndeski gravity on the Dark Matter Bispectrum*;

2015, June: Invited. Centre de Physique Théorique, Marseille (France). *Signatures of Horndeski gravity on the Dark Matter Bispectrum*;

2015, June: Invited. COBESIX collaboration, Toulouse (France). *From Class to Hi-Class*;

2015, March: "Extended Theories of Gravity" workshop at Nordita, Stockholm (Sweden). *Maximal freedom at minimum cost in general scalar-tensor theories*;

2014, Dec: Invited. ICC-University of Barcelona Christmas Meeting (Spain). *Minimal description for general scalar-tensor theories*;

2014, July: Invited. University of Nottingham (UK). *Maximal freedom in general scalar-tensor theories*;

2014, May: Institute for Theoretical Physics - University of Heidelberg (Germany). *Maximal freedom in general scalar-tensor theories*;

2014, March: Institute for Theoretical Physics - University of Heidelberg (Germany). *Basics of the xAct package*;

2014, Feb: University of Geneva (Switzerland). *Minimal description for Large-Scale Structure in general scalar-tensor theories*;

2014, Feb: Invited. GRavitation AstroParticle Physics Amsterdam (GRAPPA) Institute - University of Amsterdam (The Netherlands). *Non-linearities in cosmology: the Dark Matter bispectrum*;

2013: Institute for Theoretical Physics - University of Heidelberg (Germany). *The Dark Matter Bispectrum in Galileon cosmologies*;

2012: Invited. University of Insubria (Italy). *On the problem of the late-time cosmic acceleration*;

2012: *CosmoClassic* meeting. Imperial College, London (UK). *Matter bispectrum in Galileon Cosmologies*;

2012: *PhenoCoffe* meeting. University of Padova (Italy). *Screening mechanisms in cosmology*.

Conferences.....

2019, Apr: "Theory Working Group Euclid meeting", at the University of Oxford, Oxford (UK);

2018, Apr: "Statistical challenges for large-scale structure in the era of LSST", at the University of Oxford, Oxford (UK);

2017, Sept: "Dark Energy and Modified-Gravity cosmologies: DARKMOD", at the Institut de Physique Théorique, CEA Saclay, Paris (France);

2017, June: "Euclid meeting", at the University College, London (UK);

2017, May: "Theory Working Group Euclid meeting", at the University of Heidelberg, Heidelberg (Germany);

2017, Apr: "BritGrav17", at the University of Oxford, Oxford (UK);

2016, June: "Meeting on Fundamental Cosmology", at the Institute of Cosmos Sciences, Barcelona (Spain);

2015, Nov: "Cosmological tests: mini-workshop", at the Lorentz Center in Leiden (The Netherlands);

2015, Oct: "The vacuum of the Universe: from cosmology to particle physics", University of Barcelona ICC (Spain);

2015, Sept: "From inflation to galaxies: A workshop in honour of Sabino Matarrese", Castiglioncello (Italy);

2015, March: "Extended Theories of Gravity" workshop at Nordita, Stockholm (Sweden);

2015, Jan: "Beyond Λ CDM" conference in Oslo (Norway);

2014, Oct: "Barcelona Workshop on Tools for Cosmology: The CLASS and Monte Python codes" at the University of Barcelona (Spain);

2014, July: "Non-Linear Structure in the Modified Universe" at the Lorentz Center in Leiden (The Netherlands);

2014, March: "Special workshop on CLASS and MontePython" at the Garching Max Planck Institute, Munich (Germany);

2012, Aug: "Workshop on large scale structure" at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste (Italy);

2012, July: "Summer school on Cosmology" at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste (Italy);

2011, Sept: "Workshop on Infrared Modifications of Gravity" at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste (Italy);

2011, July: Summer school "Prospect in Theoretical Physics (PiTP) - Frontiers of Physics in Cosmology", Princeton (US);

2010, Sept: "XIX Sigrav conference" at Scuola Normale Superiore, Pisa (Italy).

Outreach.....

2019, May: *Testing gravity at cosmological scales*, Queen's College Symposium, Oxford, UK;

2013, April: *Introduction to Astrophysics*, Scuola Secondaria Cappelletti-Turco, Verona, Italy.

References

○ **Prof. Pedro Gil Ferreira**

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References

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