

Antón Baleato Lizancos (*he/him/his*)

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Research Interests

Theoretical and data-driven cosmology via stochastic observables. In particular, lensing (and delensing) of the cosmic microwave background as a probe of fundamental physics.

Education

University of Cambridge, Institute of Astronomy, Cambridge, UK **10/2017 - 6/2021**

PhD candidate in Cosmology supervised by Prof. Anthony Challinor.

Thesis title: *Understanding biases to CMB lensing and delensing on the road to precision science*

University of Cambridge, DAMTP, Cambridge, UK **2016 - 2017**

MASt in Applied Mathematics & Theoretical Physics (*Part III of the Mathematical Tripos*)

Essay title: *Primordial gravitational waves from cosmic inflation*

Columbia University, New York, USA **2012 - 2016**

B.Sc. Applied Physics, minor in Applied Mathematics. *Magna Cum Laude*

Fellowships & Awards

Isaac Newton PhD Scholarship, University of Cambridge

Prize scholarship for graduate studies

Marie Skłodowska-Curie/ Inphinit La Caixa graduate fellowship (declined)

Prize scholarship for graduate studies

Trinity College Cambridge Studentship in Mathematics

Covering full cost of tuition and maintenance for M.ASt. studies

Perimeter Institute PSI scholarship (declined)

Covering full cost of tuition and maintenance for M.Sc. studies

Columbia University Egleston Scholar

Top 1% of applicants to School of Engineering & Applied Science

Davis UWC Scholar at Columbia University

In support of undergraduate tuition costs

United World Colleges Scholarship

Full scholarship for two years. Elected among 700 applicants

Research Positions & Collaborations

Alan Turing Institute, London, UK **12/2019**

Data Study Group in collaboration with the World Wildlife Fund

In a team, built a pipeline to detect threats to a network of 200,000+ protected sites by applying Natural Language Processing and Machine Learning techniques to news articles. [[Link to published report](#)]

Simons Observatory **1/2018 -**

Member of the analysis working group

Development of a pipeline to delens CMB B-mode polarisation using internal reconstructions of the lensing potential as well as external tracers.

Instituto de Astrofísica de Canarias, Tenerife, Spain **7/2017 - 9/2017**

Summer project supervised by Dr. Claudio Dalla Vecchia

Studied the origin and evolution of massive compact relic galaxies using the EAGLE suite of cosmological simulations. [[Link to summary](#)]

Undergraduate research supervised by Prof Amber Miller

Developed feature-recognition and cross-correlation algorithms to study velocity field dynamics, vorticity and turbulence in Mesospheric Polar Clouds. [\[Link to abstract\]](#)

Summer project supervised by Dr Gemma Anderson and Dr Jess Broderick

Searched for Supernova remnants in LOFAR data. [\[Link to abstract\]](#)

Selected publications

For a complete, up-to-date list, please see my ORCID page ([0000-0002-0232-6480](#))

- **A. Baleato Lizancos**, A. Challinor and J. Carron (2021) *Limitations of CMB B-mode template delensing*, Phys. Rev. D 103, 023518. Selected as Editor's suggestion. [\[arXiv:2010.14286\]](#)
- **A. Baleato Lizancos**, A. Challinor and J. Carron (2021) *Impact of internal-delensing biases on searches for primordial B-modes of CMB polarisation*, JCAP (in press), [\[arXiv:2007.01622\]](#)
- **A. Baleato Lizancos**, A. Challinor, B. Sherwin and T. Namikawa (2021) *Delensing the CMB with the cosmic infrared background: the impact of foregrounds*, submitted to MNRAS [\[arXiv:2102.01045\]](#)
- T. Namikawa, **A. Baleato Lizancos**, N. Robertson, B. Sherwin and A. Challinor (2021) *Constraining Primordial Gravitational Waves by Delensing B-modes with the Simons Observatory*, to be submitted
- **A. Baleato Lizancos**, W. Coulton, A. Challinor and B. Sherwin *CosmoBLENDER: fast modeling of biases from galaxies and clusters to CMB lensing spectra and cross-correlations*, in preparation [\[Link to abstract\]](#)

Selected Talks

- *Limitations of CMB B-mode template delensing*
 - 1/21 CCA & NYU. Joint cosmology group meeting.
 - 1/21 Cambridge-LMU workshop on Large-scale structure cosmology.
- *Understanding biases to CMB lensing and delensing on the road to precision science*
 - 2/21 (upcoming). UC Berkeley & LBNL. BCCP cosmology / RPM colloquium.
 - 1/21 237th annual meeting of the AAS. Dissertation talk.
 - 12/20 IAS & Princeton University. Joint cosmology lunch.
 - 11/20 Harvard University. Cosmology journal club.
 - 11/20 Stanford University. Cosmology group meeting.
 - 11/20 IAP, Paris. Cosmology group meeting.
 - 11/20 UC Berkeley & LBNL. Special INPA seminar.
 - 11/20 University of Geneva. Cosmology seminar.
 - 10/20 ICCUB, Barcelona. Cosmology group meeting.
 - 10/20 University of Oxford. Cosmology journal club.
 - 10/20 UCL. Cosmology and extragalactic astrophysics seminar.
 - [Online Poster](#). 9/20 The Royal Astronomical Society's Early Career Poster Exhibition.
- *Biases to CMB B-mode delensing on large angular scales*
 - Invited talk. 4/20. University of Sussex. Workshop on CMB lensing.
 - Invited talk. 10/19. CMB-S4 San Diego meeting. Delensing cross-cut session.
- *Delensing the Simons Observatory data: pipeline updates*
 - Delensing group summary talk. 11/19. Simons Observatory analysis working group zoom-day.
- *Delensing CMB B-modes: prospects & challenges for the next generation of experiments*
 - Contributed talk. 12/19. Portsmouth, UK. 30th Texas symposium on relativistic astrophysics.
 - Flash talk & poster. 9/19. University of Cambridge. KICC 10th Anniversary Symposium.
 - Student talk. 9/19. DAMTP, University of Cambridge. Workshop on the non-Gaussian Universe.

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- *Prospects for CMB polarisation B-mode delensing with the Simons Observatory*
 - Flash talk & poster. 3/19. IAP, Paris. Cosmogold 2019 conference.
 - 3/19 . Institute of Astronomy, University of Cambridge. Wednesday seminar series.
 - *Massive, compact, relic galaxies in the EAGLE simulation*
 - 9/17. Instituto de Astrofísica de Canarias. Summer project presentation series.
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Membership

- Member of the Simons Observatory and CMB-S4 collaborations
 - Fellow of the Royal Astronomical Society. Member of the European and American Astronomical Societies
 - Member of Trinity College, Cambridge, UK
 - Member of the Sustainability Committee at the Institute of Astronomy, Cambridge, UK
 - Member of the Forum on Racial Equality in Astronomy, Institute of Astronomy, Cambridge, UK
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Teaching

- Supervised Prof Pettini's *Introduction to Cosmology* undergraduate course. 10/18-1/19, U. of Cambridge.
 - Supervised Prof Efstathiou's *The Physics of Cosmology* undergraduate course. 1/20-4/20, U. of Cambridge.
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Public engagement

- “Revealing the origin and fate of our Universe with gravitational lensing” 2/2021. *Cambridge University Astronomical Society talks series*.
 - “Campus de estrelas” Developed virtual reality visualisations ([Galician](#)/[English](#)) for cosmology outreach for the *Aulas Galegas* teaching platform.
 - “Testigos no tempo” podcast participant. 5/20. Luis Seoane Foundation. A Coruña, Spain.
 - “[Gravitational lensing: a window to the invisible Universe](#)” 2/2020 *Public outreach talks series*. *Institute of Astronomy, Cambridge, UK*.
 - “Our Utterly Wonderful Cosmos” 11/2019 *Friday Night Lecture*. *Atlantic College UWC. Wales, UK*.
 - “[Telescopes as time machines](#)” 5/2019 *Public outreach talks series*. *Institute of Astronomy, Cambridge, UK*.
 - Outreach program volunteer. 11/2017- *Institute of Astronomy, University of Cambridge*
 - “[Un Universo en evolución](#)” 11/2016. *Área de Galego. Instituto Español Cañada Blanch. London, UK*
 - Volunteer STEM teacher for immigrant teenagers 7-9/2016, *Ecodesarrollo Gaia NGO, A Coruña, Spain*
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Additional information

Computing skills:

- High-performance computing (experience on NERSC and Cambridge clusters)
- Natural Language Processing – topic modelling, sentiment analysis
- Neural networks – basic implementations of deep learning and active learning

Languages:

- Bash (advanced), Python (advanced), Mathematica (advanced), C (elementary)
- Full professional competence in Galician, Spanish and English (TOEFL 119/120)