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 in Cosmology supervised by Prof. Anthony Challinor.
Thesis title: *Polishing the Lenses: Precise Modelling of Gravitational Lensing and Delensing of the Cosmic Microwave Background.* Examined by Prof. George Efstathiou and Prof. Antony Lewis.

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

BCCP (Berkeley Center for Cosmological Physics) Fellowship

Isaac Newton PhD Scholarship, University of Cambridge

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

Instituto de Astrofísica de Canarias Summer Studentship

Trinity College Cambridge Studentship in Mathematics

Perimeter Institute PSI scholarship (declined)

Columbia University Egleston Scholar

Davis UWC Scholar at Columbia University

United World Colleges Scholarship

Research Positions & Collaborations

UC Berkeley & Lawrence Berkeley National Laboratory, CA, USA **9/2021-**

Berkeley Center for Cosmological Physics Postdoctoral Fellow

Simons Observatory **1/2018 -**

Member of the analysis working group

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

Data Study Group in collaboration with the World Wildlife Fund

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

Summer project supervised by Dr. Claudio Dalla Vecchia

Columbia University Experimental Cosmology group, NY, USA **10/2013 - 5/2016**

Undergraduate research supervised by Prof Amber Miller

Oxford University Astrophysics, Radio Astronomy group, Oxford, UK **6/2014 - 8/2014**

Summer project supervised by Dr Gemma Anderson and Dr Jess Broderick

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 03(2021)016, [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, A. Challinor et al. (2021) *The Simons Observatory: Constraining inflationary gravitational waves with multi-tracer B-mode delensing*, [arXiv:2110.09730]
- **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

- *CMB lensing & delensing for fundamental physics: the good, the bad & the systematics*
  - 10/21. Institute of Physics of the Czech Academy of Sciences. Physics seminar.
  - 2/21. LBNL & UC Berkeley. RPM colloquium / BCCP seminar.
- *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*
  - 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. 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*
  - 4/20 University of Sussex. Workshop on CMB lensing.
  - 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.
- *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.

Membership

- Member of the Simons Observatory collaboration
- 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

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.*

Public engagement

- "A Cosmoloxía: pasado, presente e futuro do Universo´´ 12/2021. *Public talk. Planetario da Casa das Ciencias. A Coruña, Galicia, Spain*
- Interview at the "A noite é necesaria" section of the "Con Voz" radio show, RadioVoz. 11/2021. *Galicia, Spain*
- "Revealing the origin and fate of the Universe with gravitational lensing" 11/2021. *Lester B. Pearson United World College. BC, Canada*
- "Nuevos horizontes en la investigación del fondo cósmico de microondas" 10/2021. *XXIV Congreso Estatal de Astronomía. A Coruña, Galicia, Spain*
- "Revealing the origin and fate of our Universe with gravitational lensing" 2/2021. *Cambridge University Astronomical Society talks series. Cambridge, UK*
- "Campus de estrelas" Developed virtual reality visualisations (Galician/English) for cosmology outreach for the *Aulas Galegas* teaching platform.
- "Testigos no tempo" podcast participant. 5/2020. *Luis Seoane Foundation. A Coruña, Galicia, 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 Astrononomy, University of Cambridge*
- "Un Universo en evolución" 11/2016. *Área de Galego. Instituto Español Cañada Blanch. London, UK*
- Volunteer STEM teacher for migrant teenagers *7-9/2016, Ecodesarrollo Gaia. A Coruña, Galicia, Spain*

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)