

# 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.

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## 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*

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## Fellowships & Awards

BCCP (Berkeley Center for Cosmological Physics) Fellowship

Isaac Newton PhD Scholarship, University of Cambridge

Marie Skłodowska-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

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## 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

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## Selected publications

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For a complete, up-to-date list, please see my ORCID page ([0000-0002-0232-6480](https://orcid.org/0000-0002-0232-6480))

- **A. Baleato Lizancos** and S. Ferraro *The impact of extragalactic foregrounds on internal delensing of CMB B-mode polarization*, submitted to Phys. Rev. D. [[arXiv:2205.09000](https://arxiv.org/abs/2205.09000)]
- T. Namikawa, **A. Baleato Lizancos** et al. (2022) *The Simons Observatory: Constraining inflationary gravitational waves with multi-tracer B-mode delensing*, Phys. Rev. D 105(2), 023511. [[arXiv:2110.09730](https://arxiv.org/abs/2110.09730)]
- **A. Baleato Lizancos**, A. Challinor, B. Sherwin and T. Namikawa (2021) *Delensing the CMB with the cosmic infrared background: the impact of foregrounds*, Accepted by MNRAS [[arXiv:2102.01045](https://arxiv.org/abs/2102.01045)]
- **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](https://arxiv.org/abs/2007.01622)]
- **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](https://arxiv.org/abs/2010.14286)]

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## Selected Talks

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- *The impact of galaxies and clusters on delensing of CMB B-mode polarization*
  - 6/22 Stanford University. Cosmology seminar.
  - 5/22 Poster. Ferrara, Italy. From Planck to the Future of CMB conference.
- *CMB lensing & delensing for fundamental physics: the good, the bad & the systematics*
  - 3/22 University of Hawaii. Cosmology seminar.
  - 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.
  - 9/20 Online Poster. 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 CMB B-modes: prospects & challenges for the next generation of experiments*
  - 12/19 Contributed talk. Portsmouth, UK. 30th Texas symposium on relativistic astrophysics.
  - 9/19 Flash talk & poster. University of Cambridge. KICC 10th Anniversary Symposium.
  - 9/19 Student talk. DAMTP, University of Cambridge. Workshop on the non-Gaussian Universe.
- *Prospects for CMB polarisation B-mode delensing with the Simons Observatory*
  - 3/19 Flash talk & poster. 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

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- Member of the Simons Observatory and DESI collaborations
- Fellow of the Royal Astronomical Society. Member of the European and American Astronomical Societies

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## Teaching

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- 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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## Mentoring

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- 6/22-8/22 Co-supervised undergraduate Kennedy Sleet on a summer project in collaboration with the National Society of Black Physicists and the Simons Foundation.

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## Public engagement

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- “Noites escuras, ideas brillantes: as revolucións cosmológicas do s.XX”. Public talk. III Encontro da Noite. A Coruña, Spain. 5/2022.
- “Earendel, a estrela máis lonxana”. Interviewed at the “Efervescencia” radio show, episode #591, Radio Galega. 3/2022. Galicia, Spain
- “O Universo é un panettone”. Interviewed at the “Efervescencia” radio show, episode #584, Radio Galega. 2/2022. Galicia, Spain
- “A Cosmoloxía: pasado, presente e futuro do Universo”. 12/2021. Public talk. Planetario da Casa das Ciencias. A Coruña, Galicia, Spain
- Twice interviewed at the “A noite é necesaria” section of the “Con Voz” radio show, RadioVoz. 11/2021 and 12/2021. 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 Astronomy, University of Cambridge
- “Un Universo en evolución” 11/2016. Área de Galego. Instituto Español Cañada Blanch. London, UK

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## Additional information

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### 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