Antón Baleato Lizancos ab2368@cam.ac.uk • IoA, Madingley Road, CB3 0HA Cambridge, UK

DOB: 16/04/1993 – Citizenship: Spanish

Research Interests

Theoretical and data-driven cosmology. Weak gravitational lensing of the cosmic microwave background and the large scale structure of the Universe.

Education

University of Cambridge, Institute of Astronomy, Cambridge, UK **Oct, 2017 -**

- PhD candidate in Cosmology supervised by Prof. Anthony Challinor.
- Isaac Newton Scholar

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

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

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

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

Lester B. Pearson UWC of the Pacific, BC, Canada **Sep, 2010 - June, 2012**

- International Baccalaureate & UWC Diplommas.

Awards

- *Rouse Ball research bursary, Trinity College Cambridge (June 2019, December 2019)*
- *Isaac Newton Studentship at the 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 Experience

Alan Turing Institute, London, UK **Dec, 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. (Report)

Simons Observatory **Jan, 2018 -**

- Member of the delensing working group
- Development of a pipeline for B-mode delensing using internal reconstructions of the lensing potential as well as external tracers.

Institute of Astronomy and Kavli Institute for Cosmology, University of Cambridge **Oct, 2017 -**

- Supervisor: Prof. Anthony Challinor
- Lensing (and delensing) of the Cosmic Microwave Background with a focus on detection of gravitational waves from cosmic inflation.

Instituto de Astrofísica de Canarias, Tenerife, Spain **July, 2017 - Sep, 2017**

- Supervisor: Dr. Claudio Dalla Vecchia

- Studied the origin and evolution of massive compact relic galaxies by means of the EAGLE suite of cosmological simulations.

Columbia University Experimental Cosmology group, NY, USA **Oct, 2013 - May, 2016**

- Supervisor: Prof Amber Miller
- Developed feature-recognition and cross-correlation algorithms to study velocity field dynamics, vorticity and turbulence in Mesospheric Polar Clouds. (Abstract)

Oxford University Astrophysics, Radio Astronomy group, Oxford, UK **June,2014 - Aug, 2014**

- Supervisors: Dr Gemma Anderson and Dr Jess Broderick
- Searched for Supernova remnants using LOFAR data, aiming to understand and test selection effects in their identification.

Selected publications

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

- A. Baleato Lizancos, A. Challinor and J. Carron *Impact of internal-delensing biases on searches for primordial B-modes of CMB polarisation*, *submitted to JCAP (under review)*, [arXiv:2007.01622]
- A. Baleato Lizancos and A. Challinor *Limitations of CMB B-mode delensing using a leading-order template*, *to be submitted*
- A. Baleato Lizancos, A. Challinor, B. Sherwin and T. Namikawa *Delensing the CMB with the cosmic infrared background: the impact of foregrounds*, *to be submitted*
- T. Namikawa, A. Baleato Lizancos, N. Robertson, B. Sherwin and A. Challinor *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*

Technical Talks

- "Biases to CMB lensing and delensing" *9/20 Royal Astronomical Society's Early Career Poster Exhibition*
- "Delensing CMB B-modes with Stage-3 experiments" *4/20 Invited talk. Sussex workshop on CMB lensing. Sussex, UK*
- "Delensing CMB B-modes: prospects & challenges for the next generation of experiments" *12/19 Contributed talk. 30th Texas symposium on relativistic astrophysics. Portsmouth, UK*
- "Detecting threats to biodiversity from news articles using Machine Learning" *12/19 Data Study Group. Alan Turing Institute, London, UK*
- "Delensing the Simons Observatory data" *11/19 Working group summary talk. Simons Observatory analysis working group zoom-day. Cardiff, UK.*
- "Biases to B-mode delensing on large angular scales" *10/19 Invited contribution. Delensing cross-cut session. CMB-S4 San Diego meeting.*
- "CMB B-mode delensing: prospects & challenges for the next generation of experiments" *9/19 Flash talk & poster. KICC 10th Anniversary Symposium. Kavli Institute for Cosmology. Cambridge, UK*
- "CMB B-mode delensing: prospects & challenges for the next generation of experiments" *9/19 Student talk. Workshop on the non-Gaussian Universe. Centre for Theoretical Cosmology, DAMTP, Cambridge, UK*
- "Prospects for CMB polarisation B-mode delensing with the Simons Observatory" *3/19 Flash talk & poster. Cosmogold 2019 conference: The golden age of cosmology from Planck to Euclid. IAP, Paris*
- "Prospects for CMB polarisation B-mode delensing with the Simons Observatory" *3/19 Wednesday seminar series. Institute of Astronomy, University of Cambridge.*
- "Massive Compact Relic Galaxies in the EAGLE simulation" *11/17 First year graduate student presentation series. Institute of Astronomy, University of Cambridge.*
- "Massive Compact Relic Galaxies in the EAGLE simulation" *9/17 Summer project presentation series. IAC, Tenerife.*
- "Primordial gravitational waves from inflation" *3/17. Part III seminar series, DAMTP, University of Cambridge.*
- "Issues with cosmic inflation" *11/16. Part III seminar series, DAMTP, University of Cambridge.*

- "Lofar-discovered supernova remnants" poster display *2/15. Summer research symposium, Columbia University.*

Membership

- Fellow of the Royal Astronomical Society
- Member of Trinity College, University of Cambridge
- Member of the Simons Observatory collaboration

Teaching

- Supervised *Introduction to Cosmology.* Final year undergraduate course taught by Prof. Max Pettini. *10/2018-1/2019, University of Cambridge.*
- Supervised *The Physics of Cosmology.* Final year undergraduate course taught by Prof. George Efstathiou. *1/2020-4/2020, University of Cambridge.*

Public engagement

- "Campus de estrelas" Developed virtual reality visualisations (Galician/English) for cosmology outreach for the *Aulas Galegas* teaching platform.
- "Gravitational lensing: a window to the invisible Universe" *2/2020 Public outreach talks. 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. Institute of Astronomy, Cambridge, UK.*
- Institute of Astronomy Outreach program staff. 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 immigrant teenagers *7-9/2016, Ecodesarrollo Gaia NGO, A Coruña, Spain*

Additional information

Computing skills:

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

Programming languages:

- Bash (advanced), Python (advanced), Mathematica (advanced), Tensorflow & PyTorch (elementary)

Languages:

- Full Professional competence: Galician, Spanish, English (TOEFL 119/120)
- Intermediate: French, Portuguese
- Elementary: German

References

Prof. Anthony Challinor, DAMTP and Institute of Astronomy, University of Cambridge

Dr. Blake Sherwin, DAMTP, University of Cambridge

Dr. Claudio Dalla Vecchia, Instituto de Astrofísica de Canarias

Prof. Amber Miller, Department of Physics, Columbia University