

Arthur Loureiro

SENIOR SCIENTIST & RESEARCH FELLOW · ASTROPHYSICS & COSMOLOGY

Royal Observatory of Edinburgh, University of Edinburgh, Edinburgh, UK
Physics & Astronomy Department, University College London, London, UK

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Research & Work Experience

University of Edinburgh

Edinburgh, United Kingdom

SENIOR SCIENTIST/DEVELOPER (50% FTE)

Sept. 2021 - PRESENT

Euclid SGS Senior Scientist/Developer working with Prof. Andy Taylor on weak lensing shape measurement calibration and sensitivity.

University College London

London, United Kingdom

RESEARCH FELLOW (50% FTE FROM SEPT. 2021)

Mar. 2020 - PRESENT

UCL Research Fellow working with Dr. Benjamin Joachimi on Bayesian methods for cosmological galaxy surveys such as the Euclid Satellite.

Imperial College London

London, United Kingdom

POST-DOCTORAL RESEARCH ASSOCIATE (CURRENTLY VISITING RESEARCHER)

Dec. 2019 - PRESENT

PDRA working with Prof. Alan Heavens and Prof. Andrew Jaffe on Bayesian Hierarchical Models for Cosmic Shear on the sphere.

University College London

London, United Kingdom

POST-DOCTORAL RESEARCH ASSISTANT

Dec. 2018 - Dec. 2019

Euclid SGS PDRA working with Dr. Benjamin Joachimi on pipeline development, testing, and validation for Weak Lensing power spectra.

Education

University College London

London, United Kingdom

PHD IN ASTROPHYSICS

2015 - 2019

Advisors: Dr. Filipe Abdalla and Prof. Ofer Lahav

Thesis: The Universe in Harmonic Space: Neutrinos and Dark Energy

University of São Paulo

São Paulo, Brazil

MASTERS IN MATHEMATICAL PHYSICS

2013 - 2015

Advisor: Prof. L. Raul Abramo

Thesis: Galaxy Power Spectrum: A Monte-Carlo Approach

Université de Montréal

Montréal, Canada

UNDERGRADUATE EXCHANGE

2012

Exchange program as a bachelor student in Physics under the Science without Borders Scholarship.

Universidade Federal do Rio Grande do Sul

Porto Alegre, Brazil

UNDERGRADUATE DEGREE IN PHYSICS WITH EMPHASIS IN ASTROPHYSICS

2010 - 2013

Advisor: Prof. Silvio R. Dahmen Dissertation: Relativistic Thermodynamics applied to Cosmological Models

Skills & Professional Services

Programming Advanced Python, Jupyter Notebook, Bash/TCSHELL and Slurm for HPC; intermediate C/C++, Mathematica, SQL.

Cosmological Codes CLASS, Hi-CLASS, CAMB, Monte Python, Flask, CCL, Healpix.

Peer Reviewer Journal of Cosmology and Astroparticle Physics, Monthly Notices of the Royal Astronomical Society

Leadership Roles PDRA Representative at UCL's Astro Group (2020-2022), Co-Leading Euclid LE3 Weak Lensing Pre-Launch Key Project

Languages

English Fluent (speaking, reading, writing)

Portuguese Native speaker

French Intermediate (speaking, reading) and basic (writing)

Spanish Basic (writing, speaking, reading)

Grants & Awards

UNIVERSITY COLLEGE LONDON (UNITED KINGDOM)

2020-2022 **UCL Provost Strategic Fund Fellowship**, University College London £112,554

NATIONAL COUNCIL FOR SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT (BRAZIL)

2015-2018 **Science without Borders PhD Fellowship**, University College London £131,378

2012 **Science without Borders Exchange Scholarship**, Université de Montréal CAN\$6700

Publications

- 1 *KiDS & Euclid: Cosmological implications of a pseudo- C_ℓ analysis of KiDS-1000 cosmic shear tomography*
A. Loureiro, L. Whittaker, A. Spurio Mancini, KiDS Collaboration & Euclid Consortium – ArXiv:2110.06947 (*Submitted to A&A*)
- 2 *Upper Bound of Neutrino Masses from Combined Cosmological Observations and Particle Physics Experiments*
A. Loureiro, A. Cuceu, et al., *Physical Review Letters*, 123 (8), 2019
- 3 *Cosmological measurements from angular power spectra analysis of BOSS DR12 tomography*
A. Loureiro, B. Moraes, et al., *Mon. Notices of the Royal Astronomical Soc.*, 485 (1), 2019
- 4 *Fourier analysis of multitracer cosmological surveys*
L. R. Abramo, L. F. Secco & **A. Loureiro**, *Mon. Notices of the Royal Astronomical Soc.*, 455 (4), 2016
- 5 *Euclid: Covariance of weak lensing pseudo- C_ℓ estimates. Calculation, comparison to simulations, and dependence on survey geometry*
R. Upham, M. Brown, L. Whittaker & Euclid Consortium (incl. **A. Loureiro**) – ArXiv:2112.07341 (*Submitted to A&A*)

Teaching Experience

University College London

London, UK

TEACHING ASSISTANT - UNDERGRADUATE LEVEL

2016 - 2018

Practical Astronomy 2 (2017, 2018), Observational Astronomy 1 (2017), Practical Physics 2 (2017), Practical Skills for Astronomy (2016)

University of São Paulo

São Paulo, BR

TEACHING ASSISTANT - UNDERGRADUATE LEVEL

2014 - 2015

Physical Cosmology (2015), Advanced Quantum Mechanics (2014)

Universidade Federal do Rio Grande do Sul

Porto Alegre, BR

TEACHING ASSISTANT - UNDERGRADUATE LEVEL

2010 - 2013

Basic Astronomy (2011, 2013), Psychology of Education (2010)

Research Supervision

2020 - 2021 **Lisa Goh (MSc)**, Co-supervisor together with Dr Lee Whittaker and Dr Benjamin Joachimi on a project “Pseudo- C_ℓ likelihood for the Euclid galaxy survey” UCL

Summer 2018 **Andrei Cuceu (undergrad)**, Co-supervisor with Dr Bruno Moraes on a Summer Internships (12 weeks) project “Simultaneous constraints of Cosmology and redshift distribution from galaxy surveys and CMB data” (Funded by RAS) UCL

Summer 2018 **Marion Thomas (undergrad)**, Co-supervisor on a Summer Internship (12 weeks) project “Synergies between Spectroscopic and Photometric Galaxy Surveys” (Funded by RAS) UCL

Summer 2018 **Joshua Lawton (undergrad)**, Co-supervisor on a Summer Internship (12 weeks) project “Creating a Galaxy Clustering Catalogue with PanSTARRS” UCL

Summer 2017 **Andrei Cuceu (undergrad)**, Co-supervisor with Dr Bruno Moraes on a Summer Internship (12 weeks) project “Cosmological Constraints from Supernova Surveys and Planck CMB data” UCL

Outreach

Project Collaborator for #AstroThreadBR and #AstroMiniBR

Twitter

SOCIAL MEDIA ENGAGEMENT

2019-PRESENT

Engagement with the science enthusiasts community in Brazil via the #AstroThreadBR and #AstroMiniBR projects using twitter threads to educate the general public about astronomy. Threads have, on average, a reach of 10-20k impressions.

Talk: “Weighing Ghost Particles with the Universe”

YouTube

PUBLIC ENGAGEMENT TALK

2020

Outreach talk for Astronomy on Tap London, live on YouTube. URL: <https://youtu.be/MLwBvdc675A>

Article: “Ghost particles: how galaxies helped us weigh the lightest neutrino”

The Conversation

PRESS RELEASE

2019

Article published at The Conversation portal related to Loureiro et al. 2019b, informing the general public about the main results in the paper.

Talk: “Hunting Ghosts with Galaxies”

Porto Alegre, BR

PUBLIC ENGAGEMENT TALK

2018

Outreach talk at a high school about Cosmology, Neutrinos, and data science.

If a Tree falls in the Forrest: Cosmology meets Art

Grizedale Forest, UK

ART EXHIBITION

2018

Art exhibition in collaboration with the Royal College of Arts. Presentation of a workpiece "Confirmation of Time" in collaboration with the artist Franziska Hatton. URL: <http://ifatreefalls.rca.ac.uk>

L'Observatoire Bizarre

London, UK

ROYAL ACADEMY OF ARTS LATES

2018

Public engagement in collaboration with the Royal College of Arts at the Dada & Surrealism RA Late. Organised by Dr. Andrew Pontzen and Michaela French.

Physics Club: “Time in Cosmology”

Porto Alegre, BR

PUBLIC ENGAGEMENT TALK

2015

Outreach talk at the Physics Club, Universidade Federal do Rio Grande do Sul.

Invited Talks

2021	Cosmology Group Talk , University of São Paulo	São Paulo, BR
2021	Stobie Talk on Science Funding Crisis in Brazil , University of Edinburgh	Edinburgh, UK
2021	Cosmology Seminar at the PPGCosmo , Federal University of Espírito Santo	Vitória, BR
2021	Talk at the DES Harmonic Space Working Group , Dark Energy Survey	Online
2021	Cosmology Seminar , CosmoStat, Commissariat à l'énergie atomique (CEA)	Saclay, FR
2021	Cosmology Seminar , Max Planck Institute for Astrophysics	Munich, GE
2020	Talk at the Kilo Degree Survey Busy Week , German Centre for Cosmological Lensing	Bochum, GE
2019	Seminar at the Royal Observatory's Coffee Talks , University of Edinburgh	Edinburgh, UK
2019	Seminar at the EEP Group Meeting , University of Sussex	Brighton, UK
2019	Talk at the Spectroscopic Surveys Meeting , University College London	London, UK
2019	Talk at the Euclid Consortium Meeting , University of Helsinki	Helsinki, FIN
2018	Talk at the Dark Energy Survey Collaboration Meeting , University of Campinas	Campinas, BR
2018	Astrophysics Seminar , Universidade Federal do Rio Grande do Sul	Porto Alegre, BR
2018	Department of Mathematical Physics Seminar , University of São Paulo	São Paulo, BR
2018	Astrophysics Seminar , National Institute for Space Research	SJ dos Campos, BR
2018	Seminar for UCL's Lunch Talks , University College London	London, UK
2018	Talk at TESTDE Final Workshop , Royal Astronomical Society	London, UK
2017	Talk at the Dark Energy Survey Collaboration Meeting , University of Chicago	Chicago, US
2018	Talk at the Euclid Consortium Meeting , University College London	London, UK
2017	Talk at the Euclid UK Collaboration Meeting , University of Portsmouth	Portsmouth, UK
2017	Talk at the Euclid OU-LE3 Meeting , Royal Astronomical Society	London, UK
2016	Talk at the Dark Energy Collaboration Meeting , Cambridge University	Cambridge, UK
2015	Talk at the J-PAS Warm-up Meeting , University of São Paulo	São Paulo, BR

Event Organisation

London Cosmology Discussion Meeting (LCDM)

London, UK

ORGANISER

2021

Organiser for a London Cosmology Discussion Meeting online with the theme: “Breaking LCDM” - *online*

Cosmology and Extragalactic Seminars at UCL

London, UK

ORGANISER

Jan/2019 - Jan/2021

UCL's Cosmology and Extragalactic weekly seminars - *In person & online*

Euclid CalWG, Garage Day & OU-LE3 Meeting

London, UK

ORGANISER

2017

Four day meeting at the Royal Astronomical Society and University College London.

Euclid Consortium Meeting

London, UK

ORGANISATIONAL GROUP

2017

Meeting at University College London

Euclid Level 3 Simulations Meeting

London, UK

ORGANISER

2017

One day meeting at University College London

CosmoClub

São Paulo, BR

ORGANISER

2014

Journal club and weekly seminars at the Department of Mathematical Physics, University of São Paulo

References

Prof. Alan Heavens

Imperial College London

CHAIR IN ASTROSTATISTICS AND DIRECTOR OF IMPERIAL CENTER FOR COSMOLOGICAL INFERENCE

Contact: a.heavens@imperial.ac.uk

Prof. Benjamin Joachimi

University College London

READER IN ASTRONOMY

Contact: b.joachimi@ucl.ac.uk

Prof. Andrew Jaffe

Imperial College London

PROFESSOR OF ASTROPHYSICS AND COSMOLOGY

Contact: a.jaffe@imperial.ac.uk

Prof. L. Raul Abramo

University of São Paulo

PROFESSOR AT THE MATHEMATICAL PHYSICS DEPARTMENT

Contact: abramo@if.usp.br