

Arthur Loureiro

RESEARCHER · ASTROPHYSICS & COSMOLOGY

The Oskar Klein Centre for Cosmoparticle Physics, Department of Physics, Stockholm University, Stockholm SE-106 91, Sweden

Visitor at Imperial Centre for Cosmology and Inference, Imperial College London, Physics Department, London, UK

✉ arthur.loureiro@fysik.su.se | 🏷 arthurmloureiro.github.io | ☎ 0000-0002-4371-0876 | 📺 arthurmloureiro | 🐦 @cosmonist

Research & Work Experience

Stockholm University

RESEARCHER

Researcher working with Prof. Jens Jasche, Prof. Hiranya Peiris, and LSST DESC Pipeline Scientist.

Stockholm, Sweden

March. 2023 - PRESENT

Imperial College London

POST-DOCTORAL RESEARCH ASSOCIATE (CURRENTLY VISITING RESEARCHER)

London, United Kingdom

PDRA (2019-2020) and visiting researcher (currently) working with Profs. Heavens & Jaffe on Field Level Inference for Cosmic Shear on the sphere.

Dec. 2019 - PRESENT

University of Edinburgh

SENIOR SCIENTIST/DEVELOPER (50% FTE UNTIL OCT. 2022)

Edinburgh, United Kingdom

Sept. 2021 - Feb. 2023

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

University College London

RESEARCH FELLOW (50% FTE FROM SEPT. 2021)

London, United Kingdom

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

Apr. 2020 - Sept. 2022

University College London

POST-DOCTORAL RESEARCH ASSISTANT

London, United Kingdom

Dec. 2018 - Dec. 2019

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

Education

University College London

PHD IN ASTROPHYSICS

London, United Kingdom

2015 - 2019

Advisors: Dr. Filipe Abdalla and Prof. Ofer Lahav

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

University of São Paulo

MASTERS IN MATHEMATICAL PHYSICS

São Paulo, Brazil

2013 - 2015

Advisor: Prof. L. Raul Abramo

Thesis: Galaxy Power Spectrum: A Monte-Carlo Approach

Université de Montréal

UNDERGRADUATE EXCHANGE

Montréal, Canada

2012

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

Universidade Federal do Rio Grande do Sul

UNDERGRADUATE DEGREE IN PHYSICS WITH EMPHASIS IN ASTROPHYSICS

Porto Alegre, Brazil

2010 - 2013

Advisor: Prof. Silvio R. Dahmen

Dissertation: Relativistic Thermodynamics applied to Cosmological Models

Grants & Awards

UKRI, EDINBURGH PARALLEL COMPUTING CENTRE

2024-2026 (Co-I) ARCHER2 eCSE: “**GLASS: A GPU-enable ecosystem for simulating the universe**”, UCL

£284 000

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

2013-2015 CNPq Masters Scholarship, University of São Paulo

R\$30 000

2012 Science without Borders Exchange Scholarship, Université de Montréal

CAN\$6700

Skills & Professional Services

Programming Advanced Python, Jupyter, Bash, and Slurm for HPC; intermediate C/C++, Julia, jax, torch, SQL.

Cosmological Codes CLASS, Hi-CLASS, CAMB, Monte Python, CCL, Healpix, BORG, and Glass (co-developer)

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

Scientific Collaborations LSST Dark Energy Science Collaboration, Euclid Consortium (3.4 FTE), Kilo Degree Survey, Aquila Consortium

PDRA Representative at UCL's Astro Group (2020-2022),

Co-Lead Euclid LE3 Weak Lensing Pre-Launch Key Project (2021-2022)

Pipeline Scientist for the Dark Energy Science Collaboration (2023-)

Languages **English:** Fluent (speaking, reading, writing); **Portuguese:** Native;
French: Intermediate (speaking, reading) and basic (writing); **Spanish:** Basic (writing, speaking, reading);

Selected Publications

49 Publications, 29 of which are refereed, of those **6 as first author or corresponding author**.

Total citations: 513, **h-index: 12**. An up-to-date list of publications and citations can be found in [ADS here](#).

1. *Upper Bound of Neutrino Masses from Combined Cosmological Observations and Particle Physics Experiments*
A. Loureiro, A. Cuceu, et al., *Physical Review Letters*, 123, 2019 (67 citations)
2. *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 Collab., *A & A*, 665, 2022 (45 citation)
3. *Almanac: Weak Lensing power spectra and map inference on the masked sphere*
A. Loureiro, L. Whiteway, E. Sellentin, et al., *The Open J. of Astrop.*, 6, 6, 2023 (10 citations)
4. *Cosmological measurements from angular power spectra analysis of BOSS DR12 tomography*
A. Loureiro, B. Moraes, et al., *MNRAS*, 485, 2019 (49 citations)
5. *GLASS: Generator for Large Scale Structure*
N. Tessore, **A. Loureiro***, B. Joachimi et al., *The Open Journal of Astrop.*, 6, 11, 2023 (6 citations)

Research Supervision

2023	Ivan Sladoljev (MSc Erasmus) , Supervisor for Erasmus Exchange Research Trainee from U. of Zagreb on a project “Field Level Inference for PNGs in the CMB”	<i>Stockholm University</i>
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”	<i>UCL</i>
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)	<i>UCL</i>
2018	Marion Thomas (undergrad) , Co-supervisor on a Summer Internship (12 weeks) project “Synergies between Spectroscopic and Photometric Galaxy Surveys” (Funded by RAS)	<i>UCL</i>
2018	Joshua Lawton (undergrad) , Co-supervisor on a Summer Internship (12 weeks) project “Creating a Galaxy Clustering Catalogue with PanSTARRS”	<i>UCL</i>
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”	<i>UCL</i>

Teaching Experience

Stockholm University

SUBSTITUTE LECTURER - MASTERS AND PHD LEVEL

Stockholm, Sweden

Substitute Lecturer for two lectures on “Statistical Methods for Physics” (2023)

2023

University of Edinburgh

TEACHING ASSISTANT - PHD LEVEL

Edinburgh, UK

Teaching assistant at the PhD Hackathon on data analysis (2022)

2022

University College London	<i>London, UK</i>
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	<i>São Paulo, BR</i>
TEACHING ASSISTANT - UNDERGRADUATE LEVEL	2014 - 2015
Physical Cosmology (2014/2), Advanced Quantum Mechanics (2014/1)	
Universidade Federal do Rio Grande do Sul	<i>Porto Alegre, BR</i>
TEACHING ASSISTANT - UNDERGRADUATE LEVEL	2010 - 2013
Basic Astronomy (2011, 2013), Psychology of Education (2010)	
Private	<i>Porto Alegre, BR</i>
TUTOR - HIGH-SCHOOL LEVEL	2011 - 2013
Physics & Mathematics for high-school	

Outreach

Cover Article about the Euclid Telescope

Cover Article about the Euclid Telescope and the Early Released Images for the Brazilian Astronomy Magazine, organised by the Brazilian Astronomical Society. [Link](#) *Brazil* 2023

Guest on the Podcast “Missão Exoplaneta”

Guest scientist in the Brazilian astronomy podcast Missão Exoplaneta (Exoplanet Mission) communicating about the Euclid Satellite Launch and my experience attending it at ESA Mission Control Centre. [Link](#) *Spotify* 2023

Project Collaborator for #AstroThreadBR and #AstroMiniBR

Social Media engagement with the science enthusiasts community in Brazil via the #AstroThreadBR and #AstroMiniBR projects to educate the general public about astronomy. Some threads reaching around 10-20k impressions. *Twitter* 2019-2022

Public Engagement Talk: “Weighing Ghost Particles with the Universe”

Public outreach talk for Astronomy on Tap London, live on YouTube due to COVID restrictions. URL: <https://youtu.be/MLwBvdc675A> *YouTube* 2020

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

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

Public Engagement Talk: “Hunting Ghosts with Galaxies”

Outreach talk at a high school about Cosmology, Neutrinos, and careers in academia and data science. *Porto Alegre, BR* 2018

Art Exhibition: If a Tree falls in the Forrest, Cosmology meets Art

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> *Grizedale Forest, UK* 2018

Royal Academy of Arts Lates: L'Observatoire Bizarre

Public engagement in collaboration with the Royal College of Arts at the Dada & Surrealism RA Late. Organised by Dr. Andrew Pontzen and Michaela French. *London, UK* 2018

Public Engagement Talk at Physics Club: “Time in Cosmology”

Outreach talk at the Physics Club about how time is perceived in Cosmology, Universidade Federal do Rio Grande do Sul. *Porto Alegre, BR* 2015

Event Organisation

Statistical Challenges on 21st Century Cosmology (Cosmo21)

SCIENTIFIC ORGANISING COMMITTEE *Chania, Greece*
May/2024

Euclid Collab. Meeting, Session on Field Level Inference

CO-ORGANISER *Copenhagen, DN*
May/2023

Euclid Weak Lensing Science Working Group Meeting

CO-ORGANISER *Edinburgh, UK*
Dec/2022

London Cosmology Discussion Meeting - “Breaking LCDM” *(online) London, UK*
Feb/2021

GR effects in observing the Large-Scale Structure of the Universe

SESSION CHAIR *Porto, PT*
Jun/2022

Cosmology and Extragalactic Seminars at UCL	<i>London, UK</i>
ORGANISER	<i>Jan/2019 - Jan/2021</i>
Euclid CalWG, Garage Day & OU-LE3 Meeting	<i>London, UK</i>
ORGANISER	<i>2017</i>
Euclid Consortium Meeting	<i>London, UK</i>
ORGANISATIONAL GROUP	<i>2017</i>
CosmoClub	<i>São Paulo, BR</i>
ORGANISER	<i>2014</i>

Selected Talks

2023	Dark Sector Cosmology Talk , Jet Propulsion Lab, NASA/Caltech	<i>Passadena, US</i>
2023	Cosmology Talk , The Oskar Klein Centre, Stockholm University	<i>Stockholm, SE</i>
2022	Talk at GR effects in observing the Large-Scale Structure of the Universe , Universidade do Porto	<i>Porto, PT</i>
2022	Cosmology Seminar , Queen Mary University of London	<i>London, UK</i>
2022	Cosmology Seminar , University of Portsmouth	<i>Portsmouth, UK</i>
2021	Cosmology Group Talk , University of São Paulo	<i>São Paulo, BR</i>
2021	Stobie Talk on Science Funding Crisis in Brazil , University of Edinburgh	<i>Edinburgh, UK</i>
2021	Cosmology Seminar at the PPGCosmo , Federal University of Espírito Santo	<i>Vitória, BR</i>
2021	Talk at the DES Harmonic Space Working Group , Dark Energy Survey	<i>Online</i>
2021	Cosmology Seminar , CosmoStat, Commissariat à l'énergie atomique (CEA)	<i>Saclay, FR</i>
2021	Cosmology Seminar , Max Planck Institute for Astrophysics	<i>Munich, GE</i>
2020	Talk at the Kilo Degree Survey Busy Week , German Centre for Cosmological Lensing	<i>Bochum, GE</i>
2019	Seminar at the Royal Observatory's Coffee Talks , University of Edinburgh	<i>Edinburgh, UK</i>
2019	Seminar at the EEP Group Meeting , University of Sussex	<i>Brighton, UK</i>
2019	Talk at the Euclid Consortium Meeting , University of Helsinki	<i>Helsinki, FN</i>
2018	Astrophysics Seminar , Universidade Federal do Rio Grande do Sul	<i>Porto Alegre, BR</i>
2018	Department of Mathematical Physics Seminar , University of São Paulo	<i>São Paulo, BR</i>
2018	Astrophysics Seminar , National Institute for Space Research	<i>SJ dos Campos, BR</i>
2018	Seminar for UCL's Lunch Talks , University College London	<i>London, UK</i>
2017	Talk at the Dark Energy Survey Collaboration Meeting , University of Chicago	<i>Chicago, US</i>
2018	Talk at the Euclid Consortium Meeting , University College London	<i>London, UK</i>
2017	Talk at the Euclid UK Collaboration Meeting , University of Portsmouth	<i>Portsmouth, UK</i>
2017	Talk at the Euclid OU-LE3 Meeting , Royal Astronomical Society	<i>London, UK</i>
2016	Talk at the Dark Energy Collaboration Meeting , Cambridge University	<i>Cambridge, UK</i>
2015	Talk at the J-PAS Warm-up Meeting , University of São Paulo	<i>São Paulo, BR</i>

References

Prof. Alan Heavens	<i>Imperial College London</i>
CHAIR IN ASTROSTATISTICS	
Contact: a.heavens@imperial.ac.uk	
Prof. Benjamin Joachimi	<i>University College London</i>
READER IN ASTRONOMY	
Contact: b.joachimi@ucl.ac.uk	
Prof. Andrew Jaffe	<i>Imperial College London</i>
PROFESSOR OF ASTROPHYSICS AND COSMOLOGY AND DIRECTOR OF IMPERIAL CENTER FOR COSMOLOGICAL INFERENCE	
Contact: a.jaffe@imperial.ac.uk	
Prof. Jens Jasche	<i>Stockholm University</i>
ASSOCIATE PROFESSOR OF PHYSICS	
Contact: jens.jasche@fysik.su.se	
Prof. L. Raul Abramo	<i>University of São Paulo</i>
PROFESSOR AT THE MATHEMATICAL PHYSICS DEPARTMENT	
Contact: abramo@if.usp.br	