

# Arthur Loureiro

PhD Candidate  
University College London  
Physics & Astronomy Dep,  
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## Research Interests

**Observational Cosmology:** Fourier analysis of Large Scale Structure surveys, cross-correlations between photometric and spectroscopic surveys, cosmological parameters estimation, log-normal simulations, covariance matrix estimation, and clustering redshift estimation, cosmological neutrinos, and non-gaussianities.

**Bayesian methods for Cosmological Applications:** Generic Bayesian Power Spectrum estimators for galaxy clustering, weak lensing, CMB, and cross-correlations between probes, and nested sampling for cosmological parameters estimation.

## Professional

**University College London / Post-Doctoral Research Associate**

Dec. 2018 - Current / London, UK

PDRA working with Dr. Benjamin Joachimi in Euclid Weak Lensing pipeline development, testing, implementation, and validation.

## Education

**University College London / PhD Candidate**

2015 - Current / London, UK

PhD candidate at the Department of Physics & Astronomy, working with Cross-correlations between photometric and spectroscopic data sets, angular power spectra estimators, and cosmological parameters estimation.

Advisors: Dr. Filipe Abdalla & Prof. Ofer Lahav

**University of Sao Paulo / Masters**

2013 - 2015 / Sao Paulo, Brazil

Masters in Sciences awarded by the Department of Mathematical Physics

Dissertation: "Galaxy Power Spectrum: A Monte-Carlo Approach"

Advisor: Prof. L. Raul Abramo

**Université de Montréal / Undergraduate Exchange**

2012 / Montréal, Canada

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

**Universidade Federal do Rio Grande do Sul / Undergraduate Degree**

2010 - 2013 / Porto Alegre, Brazil

Bachelors in Physics with emphasis in Astrophysics

Dissertation: Relativistic Thermodynamics applied to Cosmological Models

Advisor: Prof. Silvio R. Dahmen

## Grants and Awards

**Science without Borders PhD Fellowship**

2015 - Current

Awarded by the Brazilian Funding Agency CNPq to fully fund a PhD at University College London. (Total amount: £131,378/€150,425 - including a 5 months extension)

## **Science without Borders Scholarship for Undergraduates**

2012

Awarded by the Brazilian Funding Agency CNPq to pursue a semester at the Université de Montréal, Canada. (Total amount: CAN\$6700)

### **Computing Skills**

Advanced Python, Jupiter Notebook, and Shell/TCShell; intermediate C/C++, Fortran, Mathematica, SQL and HPC using PBS Clusters.  
Cosmological codes: CLASS, Hi-CLASS, CAMB, CosmoMC, Flask, and Healpix.

### **Languages**

**English:** fluent (speaking, reading, writing); **Portuguese:** native language; **French:** intermediate (speaking, reading) and basic (writing); **Spanish:** basic (writing, speaking, reading).

### **Event Organisation**

#### **Euclid CalWG, Garage Day & OU-LE3 Meeting**

2017 / London, UK

Co-organiser with Dr. F. Abdalla of a 4 day meeting at the Royal Astronomical Society and University College London.

#### **Euclid Consortium Meeting**

2017 / London, UK

Part of the organisational group.

#### **Euclid Level 3 Simulations Meeting**

2017 / London, UK

Organiser of a one day meeting at University College London.

#### **CosmoClub**

2014 / Sao Paulo, BR

Co-organiser of journal club and weekly seminars, at the Department of Mathematical Physics, USP.

#### **Physics Academic Week**

2011 / Porto Alegre, BR

Co-organiser of the 2011 Physics Academic Week at UFRGS.

### **Teaching**

#### **University College London**

2016 - 2018

Demonstrator for Practical Astronomy 2 (2018, 2017), Observational Astronomy 1 (2017), Practical Physics 2 (2017), Practical Skills for Astronomy (2016), undergraduate level.

#### **University of Sao Paulo**

2014 - 2015

Demonstrator for Advanced Quantum Mechanics (2014) and Physical Cosmology (2015), undergraduate level.

#### **Universidade Federal do Rio Grande do Sul**

2010 - 2013

Demonstrator for Psychology of Education (2010) and Basic Astronomy (2011, 2013), undergraduate level.

### **Outreach**

#### **If a Tree falls in the Forrest: Cosmology meets Art**

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.

## **L'Observatoire Bizarre / Royal Academy of Arts Lates**

2017

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

## **Talk at the Physics Club: "Time in Cosmology"**

2015

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

## **Selected Talks:**

### **Lunch Talks / University College London - 2018**

Title: "From the Largest Spectroscopic Galaxy Survey to the Lightest Neutrino"

### **TESTDE Final Workshop / Royal Astronomical Society - 2018**

Title: "From Catalogues to Dark Energy"

### **Dark Energy Survey Collaboration Meeting / University of Chicago - 2017**

Title: "Bayesian C(l) Estimator for Cross-Correlations"

### **Euclid UK Collaboration Meeting / University of Portsmouth - 2017**

Title: "LogNormal Simulations for Galaxy Clustering Covariances"

### **Euclid OU-LE3 Meeting / Royal Astronomical Society - 2017**

Title: "Bayesian Estimator: BlackPearl"

### **Euclid Level 3 Simulations Meeting / University College London - 2017**

Title: "Using Flask for Level 3 Simulations"

### **Dark Energy Survey Collaboration Meeting / Cambridge University - 2016**

Title: "Angular Power Spectra with BOSS DR12"

### **J-PAS Warm up meeting / University of Sao Paulo - 2015**

Title: "A Monte-Carlo Method to probe cosmology under a survey's geometry"

## **Publications**

### **Refereed Journal Articles:**

*"Fourier Analysis of multi-tracer cosmological surveys"*

Abramo, L. R.; Secco, L. F.; **Loureiro, Arthur**, *MNRAS*, v455, 3871-3889, 2015

### **Submitted Articles:**

*"ZXCorr: Cosmological Measurements from Angular Power Spectra Analysis of BOSS DR12 Tomography"*

**Loureiro, Arthur**; Moraes, B.; Abdalla, F. B.; et al., *Submitted to MNRAS*, 2018

*Arxiv:1809.07204*

## **References**

### **Prof. Ofer Lahav**

Professor at the Department of Physics and Astronomy, University College London

Contact: [o.lahav@ucl.ac.uk](mailto:o.lahav@ucl.ac.uk)

### **Dr. Benjamin Joachimi**

Reader in Astronomy, University College London

Contact: [b.joachimi@ucl.ac.uk](mailto:b.joachimi@ucl.ac.uk)

### **Prof. L. Raul Abramo**

Professor at the Mathematical Physics Department at University of Sao Paulo

Contact: [abramo@if.usp.br](mailto:abramo@if.usp.br)

### **Dr. Filipe Abdalla**

Reader in Astronomy, University College London

Contact: [fba@star.ucl.ac.uk](mailto:fba@star.ucl.ac.uk)