

# Bruno Loureiro

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Website <https://brloureiro.github.io/>.

## Currently

- 2019 – **Postdoctoral researcher**, *Institut de Physique Théorique*, Lenka Zdeborová group.  
My current research interests lie in the crossroads between Statistical Physics and Machine Learning. I apply the toolbox of statistical physics to high-dimensional problems relevant to modern machine learning - a regime for which the classical statistical learning tools fail. In particular, I am interested in Bayesian methods for inference and learning problems, graphical models, approximate message passing algorithms and deep learning.

## Education

- 2014 – 2018 **PhD in Physics**, *University of Cambridge*, Advisor: A.M. García-García.  
2013–2014 **MASt in Applied Mathematics**, *University of Cambridge*.  
Merit  
2011–2013 **BSc Mathematics and Physics**, *King's College London*, Result – 89/100.  
First Class Honours  
2010–2011 **BSc Physics**, *University of Paris 7 – Denis Diderot*, Result – 16.674/20.

## Publications

- Precise asymptotics for phase retrieval and compressed sensing with random generative priors**, *B Aubin, B Loureiro, A Baker, F Krzakala, L Zdeborová*, arXiv: 1912.02008 [math.ST] (Accepted at NeurIPS 2019 DeepInverse workshop).  
**The spiked matrix model with generative priors**, *B Aubin, B Loureiro, A Maillard, F Krzakala, L Zdeborová*, arXiv: 1905.12385 [math.ST] (Accepted at NeurIPS 2019).  
**Coherence effects in disordered geometries with a field-theory dual**, *AM Garcia-Garcia, B Loureiro, T Andrade*, *J. High Energ. Phys.* (2018) 2018: 187.  
**Stability and Chaos in a generalised Sachdev-Ye-Kitaev model**, *AM Garcia-Garcia, B Loureiro, A Romero-Bermudez and T Masaki*, *Phys. Rev. Lett.* (2018) - Accepted.  
**Transport in a gravity dual with a varying gravitational coupling constant**, *AM Garcia-Garcia, B Loureiro and A Romero-Bermudez*, *Phys. Rev. D* 94 086007 (2016).  
**Marginal and irrelevant disorder in Einstein-Maxwell backgrounds**, *AM Garcia-Garcia and B Loureiro*, *Phys. Rev. D* 93 065025 (2016).

## Professional Experiences

- 2018 **BTG Pactual UK**, *Data Science Intern*.  
During this internship I applied standard natural language processing algorithms to study the correlation between news articles and the movement of stock classes. As a result, I developed a dashboard to help traders keeping track of relevant news and giving a specialised indicator for the fluctuations of market mood.

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## Awards and Distinctions

- 2013-2017 CAPES/Cambridge Overseas Trust Science Without Borders Scholarship
- 2013 Nikon Prize for the best Physics Project, King's College London
- 2012 Prize for the best performance in Mathematics modules by a Joint Honours student, King's College London
- 2011 Ranked 2/209 in the general rank of the Natural Sciences Department, University of Paris 7 – Denis Diderot
- 2010 Selected among best projects in the Program of Scientific Vocation (PROVOC) FioCruz

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## Presentations and Participations

- 2019 Poster at Workshop on Science of Data Science, ICTP, Trieste
- 2019 Visitor at Machine Learning for Quantum Many-Body Physics, KITP, Santa Barbara
- 2017 Short Visit, Brazilian Centre for Research in Physics (CBPF)  
Presented seminar *All you wanted to know on the SYK model*.
- 2017 School on AdS/CMT Correspondence, ICTP-SAIFR  
Short Talk *Disorder in AdS/CMT*
- 2017 Disorder in Condensed Matter and Black Holes, Lorentz Center, Leiden University
- 2016 Condensed Matter and Beyond, University of Oxford
- 2016 Quantum Information in String Theory and Many-body Systems, Yukawa Institute for Theoretical Physics, Kyoto University
- 2015 Poster at Physics by the Lake, Cumberland Lodge
- 2015 Eurostrings, University of Cambridge
- 2015 Holographic Methods for Strongly Coupled Systems, Galileo Galilei Institute for Theoretical Physics
- 2013 Tomorrow's Mathematicians Today, University of Greenwich
- 2011 28th Brazilian Colloquium of Mathematics, IMPA
- 2010 VIII School of the Brazilian Centre for Research in Physics (CBPF)
- 2010 XV Week of Scientific Vocation  
Presented project *Localization of the Oligopeptidase B2 of Leishmania Amazonensis*
- 2009 XXIV International Meeting of the Federation of Experimental Biology (FeSBE).  
Presented project *Identification and Cellular Localization of the Oligopeptidase B2 of Leishmania Amazonensis*
- 2008 XIII Week of Scientific Vocation, FioCruz  
Presented project *Cloning and Characterization of the Oligopeptidase B2 of Leishmania Amazonensis*

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## Numerical Skills

PYTHON (Intermediate), MATHEMATICA (Intermediate), MATLAB (Intermediate),  $\text{\LaTeX}$  (Advanced).

## Languages

English (Fluent), French (Fluent), Italian (Intermediate), Portuguese (Native).

## Past Projects

- 2014 Integrability and Self-Duality, *Advisor: Dr Maciej Dunajski*, University of Cambridge
- 2013 Non-gaussianities in the CMB, *Advisor: Dr Eugene Lim*, King's College London
- 2012 A study on the LSST filters, *Advisor: Dr Pierre Astier*, LPNHE Paris
- 2008-2010 Characterization of the Oligopeptidase B2 of *Leishmania Amazonensis*, *Advisor: Dr Herbert Guedes*, FioCruz