

Contact: boris.leistedt@gmail.comHomepage: <http://www.ixkael.com>**RESEARCH INTERESTS**

Data-driven observational cosmology, astrophysics, and fundamental physics.

- [2,5,7,10,12] Analysis of galaxy survey data. Optimal statistical estimators & systematics mitigation.
- [8,9] Novel precision observables: CMB polarisation, cosmic voids, 3D weak lensing
- [1,3] Cosmological parameters & combined probes, neutrino masses, primordial non-Gaussianity
- [4,6,13] 2D/3D spherical wavelets and sparsity. Applications to cosmology and geophysics.

The numbers in brackets refer to publications on these topics, see list below.

RESEARCH RECORD

- 2015 – present Postdoctoral Researcher (Fellow of the Simons Foundation)
Center for Cosmology & Particle Physics, NYU – New York University (USA)
- 2014 – 2015 Postdoctoral Researcher, **Dept of Physics & Astronomy, University College London (UK)**
- Summer 2010 Research internship, **Cosmo-stat group, Astrophysics Dept, CEA Saclay (France)**
- Summer 2009 Factory internship (assembly of servers & mainframes), **IBM Montpellier (France)**

EDUCATION

- 2011 – 2014 Doctor of Philosophy (Ph.D.) in Physics and Astronomy
Dept of Physics & Astronomy, University College London (UK)
Thesis: *Accurate cosmology with galaxy and quasar surveys*. Advisor: Hiranya Peiris
- 2006 – 2011 Double Diplôme d'Ingénieur (equiv. dual MSc in Electrical Engineering / Computer Science)
University of Mons (Belgium) and Supélec – École Supérieure d'Électricité (France)
Thesis: *Selection of optimal learning sets for preference modeling and decision making*
Advisors: Marc Pirlot (UMons) and Vincent Mousseau (École Centrale Paris)
- 2008 – 2011 Master de Physique Fondamentale, **Paris 11 – Université Orsay Paris-Sud (France)**
(equiv. MSc in Physics, in parallel with engineering degree)

AWARDS AND HONORS

- 2015 – present Simons Foundation Society of Fellows & Research Fellowship (held at NYU)
- 2015 UCL Jon Darius Memorial Prize 2014-15 (outstanding postgraduate research in astrophysics)
- 2015 Runner-up, RAS Michael Penston Thesis Prize 2014 (best UK PhD thesis in astrophysics)
- 2011 – 2014 Perren & Impact studentships, supporting the PhD at UCL
- 2011 High Octane award (top of MSc class), Faculty of Engineering, University of Mons
- 2011 ORBEL award finalist (best MSc thesis in Operational Research in Belgium)
- 2008 – 2011 T.I.M.E. scholarship awarded by UMons and held at Supélec/Paris 11 (competitive exchange program between top European universities leading to a joint MSc degree)

COMPUTING SKILLS

High performance computing on heterogenous systems (OpenMP, MPI, OpenCL).
 Fluent in C, Fortran, IDL, Matlab, Python. Notions of C++, Java, R, Scala, SQL, XML.

ACADEMIC SERVICE AND ORGANISATION OF WORKSHOPS

2012 – present Member (incl. data-rights), **Dark Energy Survey collaboration**
 2011 – present Member, **Royal Astronomical Society, U.K.**
 2012 – present Referee for MNRAS, JOSA
 2013 – 2015 Seminar organiser for the UCL *Certificate in Astronomy* course
 2013 & 2015 Co-organiser of two interdisciplinary [BASP Frontiers workshops](#)
 2014 Co-organiser of the [Cross-correlating cosmic probes](#) conference in UCL

SELECTED SEMINARS AND CONFERENCE TALKS

2015 *BASP Frontiers Workshop 2015*, Villars, Switzerland (**best presentation prize**)

2014 Lawrence Berkeley Laboratory, Berkeley, USA (**invited**)
 Perimeter Institute, Waterloo, Canada (**invited**)
 Institute of Astronomy & DAMPT, University of Cambridge, UK (**invited**)
 Institute for Advanced Study / Princeton University, USA.
 Institute for Strings, Cosmology & Astroparticle Physics, Columbia University, USA
 Institute for Theory and Computation, Harvard University, USA.
 Center for Cosmology and AstroParticle Physics, Ohio State University, USA
 COSMO 2014, Kavli Institute for Cosmological Physics, University of Chicago, USA.
 Laboratório Interinstitucional de e-Astronomia, Rio de J., Brazil (webinar, **invited**)
Science on the Sphere, Royal Society Seminar, Chicheley Hall, UK (**invited**)
Statistical Challenges in 21st Century Cosmology, Lisbon, Portugal.
Progress on Old and New Themes in Cosmology, Avignon, France.
49th Rencontres de Moriond, La Thuile, Italy.

2013 London Cosmology Discussion Meeting (LCDM), UK.
 Department of Physics, University of Oxford, UK (**invited**)
Wavelet and Sparsity XV, SPIE 2013, San Diego, USA (**invited**)
 Institute of Cosmological Sciences, University of Barcelona, Spain.
Challenges for Next Gen. LSS Surveys, Ascona, Switzerland (**best presentation prize**)

REFERENCES

Prof Hiranya Peiris Dept of Physics & Astronomy, University College London, U.K.
Prof Joshua Frieman Kavli Institute for Cosmological Physics, University of Chicago, USA.
Prof Bhuvnesh Jain Dept of Physics and Astronomy, University of Pennsylvania, USA.
Prof Ofer Lahav Dept of Physics & Astronomy, University College London, U.K.
Prof Jason McEwen Mullard Space Science Laboratory, University College London, U.K.
Prof Licia Verde Institute of Cosmological Sciences, University of Barcelona, Spain.

PUBLICATIONS

Journal names are abbreviated as follows:

MNRAS : Monthly Notices of the Royal Astronomical Society
IEEE TSP : IEEE Transactions on Signal Processing

ApJ: the Astrophysical Journal
A&A : Astronomy & Astrophysics

PRD : Physics Review D
PRL : Physics Review Letters

REFEREED JOURNAL ARTICLES (FIRST AUTHOR ONLY):

1. [Constraints on primordial non-Gaussianity from 800,000 photometric quasars.](#)
B. Leistedt, H. V. Peiris, N. Roth, 2014, PRL, 113, 221301, 2014.
2. [Exploiting the full potential of photometric quasar surveys: Optimal power spectra through blind mitigation of systematics.](#)
B. Leistedt, H. V. Peiris, MNRAS, 444(1): 2-14, 2014.
3. [No new cosmological concordance with massive sterile neutrinos.](#)
B. Leistedt, H. V. Peiris, L. Verde, PRL, 113, 041301, 2014.
4. [S2LET: a code to perform fast wavelet analysis on the sphere.](#)
B. Leistedt, J. D. McEwen, P. Vanderghenst, Y. Wiaux, A&A, 558, A128, 2013.
5. [Estimating the large-scale angular power spectrum in the presence of systematics: a case study of Sloan Digital Sky Survey quasars.](#)
B. Leistedt, H. V. Peiris, D. Mortlock, A. Benoit-Lévy, A. Pontzen, MNRAS, 435(3): 1857-73, 2013.
6. [Exact Wavelets on the Ball.](#)
B. Leistedt, J. D. McEwen, IEEE TSP, 60, 6257-6269, 2012.
7. [3DEX: a code for Fast Fourier-Bessel Decomposition of All-Sky 3D Surveys.](#)
B. Leistedt, A. Rassat, J-L Starck, A. Refregier, A&A, 540, A60, 2011.

PRE-PRINTS (FIRST AUTHOR ONLY)

8. [Analysing CMB polarisation with spin directional wavelets.](#)
B. Leistedt, J. D. McEwen, M. Büttner, H. V. Peiris, in prep.
9. [3D weak lensing with spin wavelets on the ball.](#)
B. Leistedt, J. D. McEwen, T. Kitching, H. V. Peiris, submitted to PRD.
10. [Mapping and simulating systematics due to spatially-varying observing conditions in DES SV data.](#)
B. Leistedt, H. V. Peiris, F. Elsner, A. Benoit-Lévy *et al* (DES collaboration), submitted to PRD.

REFEREED JOURNAL ARTICLES (COLLABORATION WITH SIGNIFICANT CONTRIBUTIONS)

11. [Modelling the Transfer Function for the Dark Energy Survey.](#)
C. Chang *et al.* (DES collaboration, including **B. Leistedt**), ApJ, 801, 73, 2015.

PRE-PRINTS (COLLABORATION WITH SIGNIFICANT CONTRIBUTIONS)

12. [Debiasing systematics mitigation methods in galaxy angular clustering estimators.](#)
F. Elsner, **B. Leistedt**, H. V. Peiris, in prep.
13. [Spin scale-discretised wavelets on the sphere.](#)
J. D. McEwen, M. Büttner, **B. Leistedt**, H. V. Peiris, Y. Wiaux, P. Vanderghenst, IEEE TSP submitted
14. [A novel sampling theorem on the rotation group.](#)
J. D. McEwen, M. Büttner, **B. Leistedt**, H. V. Peiris, Y. Wiaux, submitted to IEEE Sig. Proc. Letters.

15. [No galaxy left behind: Accurate clustering for incomplete galaxy samples in the Dark Energy Survey.](#)
E. Suchyta, E. Huff *et al.* (DES collaboration, including **B. Leistedt**), submitted to PRD.
16. [Cosmology from Cosmic Shear with DES Science Verification Data.](#)
DES collaboration (including **B. Leistedt**), submitted to PRD.
17. [Cosmic Shear Measurements with DES Science Verification Data.](#)
M. Becker *et al.* (DES collaboration, including **B. Leistedt**), submitted to PRD.
18. [Redshift distributions of galaxies in the DES SV shear catalogue and implications for weak lensing.](#)
C. Bonnett *et al.* (DES collaboration, including **B. Leistedt**), submitted to PRD.
19. [Galaxy clustering, photometric redshifts & diagnosis of systematics in the DES Science Verification data.](#)
M. Crocce *et al.* (DES collaboration, including **B. Leistedt**), submitted to MNRAS.
20. [CMB lensing tomography with the DES Science Verification galaxies.](#)
T. Giannantonio *et al.* (DES collaboration, including **B. Leistedt**), submitted to MNRAS.
21. [redMaGiC: Selecting Luminous Red Galaxies from the DES Science Verification Data.](#)
E. Rozo *et al.* (DES collaboration, including **B. Leistedt**), submitted to MNRAS.

PROCEEDINGS ARTICLES (POSTED ON ARXIV ONLY)

22. [Analysing the polarisation of the CMB with spin scale-discretised wavelets.](#)
B. Leistedt, J. D. McEwen, M. Büttner, H. V. Peiris, Y. Wiaux, P. Vanderghelynst., 2015, BASP Frontiers 2015.
23. [On spin scale-discretised wavelets on the sphere for the analysis of CMB polarisation.](#)
J. McEwen, M. Büttner, **B. Leistedt**, H. V. Peiris, Y. Wiaux, P. Vanderghelynst, 2014, SCCC21/IAU306.
24. [Flaglets on the ball for studying the large-scale structure of the Universe.](#)
B. Leistedt, H. V. Peiris, J. D. McEwen, 2013, Wavelets & Sparsity XV, SPIE 2013.
25. [Fourier-Laguerre Transform, Convolution and Wavelets on the Ball.](#)
J. D. McEwen, **B. Leistedt**, 2013, International Conference on Sampling Theory and Applications.
26. [Flaglets: Exact Wavelets on the Ball.](#) **B. Leistedt**, J. D. McEwen, 2013, BASP Frontiers 2013.