

# Federico Bianchini

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*"Science is the belief in the ignorance of experts."  
Richard Feynman*

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## PERSONAL INFORMATION

Date of Birth June 19, 1988  
Birthplace Rome, Italy  
Citizenship Italian

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## RESEARCH INTERESTS

Data-oriented observational and theoretical cosmology, astrophysics

- Cosmic Microwave Background (CMB) science: temperature/polarization anisotropies, CMB lensing, Sunyaev-Zel'dovich effect and other secondary anisotropies
- Large scale structure (LSS): statistics of the galaxy distribution, interplay with CMB
- Cosmostatistics: cross-correlation methods, parameters estimation, Monte Carlo Markov Chain methods
- Cosmological tests of gravity

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## PROFESSIONAL EXPERIENCE

2016-present **Postdoctoral Researcher**, *School of Physics*, University of Melbourne.

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## EDUCATION

- 2012 – 2016 **Ph.D. in Astrophysics**, *Astrophysics Sector, SISSA/ISAS - International School for Advanced Studies*, Trieste (Italy).  
Title: *Cosmic Microwave Background and Large Scale Structure: Cross-correlation as seen from Herschel and Planck Satellites*  
Advisors: Prof. Carlo Baccigalupi, Dr. Pawel Bielewicz, Prof. Andrea Lapi
- 2010 – 2012 **M.Sc. in Astronomy and Astrophysics**, *Department of Physics, La Sapienza University*, Rome (Italy), 110/110 cum laude.  
Title: *Gravitational Lensing of Cosmic Microwave Background Anisotropies and Dark Energy Equation of State*  
Advisor: Prof. Alessandro Melchiorri
- 2007 – 2010 **B.Sc. in Physics and Astrophysics**, *Department of Physics, La Sapienza University*, Rome (Italy), 110/110.  
Title: *Cosmic Microwave Background*  
Advisors: Prof. Alessandro Melchiorri, Prof. Marco de Petris

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## HONORS & AWARDS

- 2015 Erasmus Job Placement Fellowship  
2012/16 SISSA, Italy, PhD Fellowship in Astrophysics curriculum

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## OTHER PROFESSIONAL ACTIVITIES

- Referee for Monthly Notices of the Royal Astronomical Society (MNRAS)
- Member of the EUCLID CMB-LSS cross-correlation working group
- Member of the National Institute for Nuclear Physics (INFN) 2013-present
- Member of the National Institute for Astrophysics (INAF) 2015-present

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## PUBLICATIONS

### Refereed Journal Articles

- 4) *Needlet estimation of cross-correlation between CMB lensing maps and LSS*  
**F. Bianchini**, A. Renzi, D. Marinucci, JCAP **11**, 50 (2016), [arXiv:1607.05223 [astro-ph.CO]]
- 3) *Toward a tomographic analysis of the cross-correlation between Planck CMB lensing and H-ATLAS galaxies*  
**F. Bianchini**, A. Lapi, M. Calabrese, P. Bielewicz, J. Gonzalez-Nuevo, C. Baccigalupi, L. Danese, G. de Zotti, N. Bourne, A. Cooray, L. Dunne, S. Eales, E. Valiante, ApJ **825**, 1 (2016) [arXiv:1511.05116 [astro-ph.CO]]
- 2) *The kinetic Sunyaev Zel'dovich effect in modified gravity*  
**F. Bianchini**, A. Silvestri, Phys. Rev. D **93**, 064026 (2016) [arXiv:1510.08844 [astro-ph.CO]]
- 1) *Cross-correlation between the CMB lensing potential measured by Planck and high- $z$  sub-mm galaxies detected by the Herschel-ATLAS survey*  
**F. Bianchini**, P. Bielewicz, A. Lapi, J. Gonzalez-Nuevo, C. Baccigalupi, G. de Zotti, L. Danese, et al., ApJ **802**, 64 (2015) [arXiv:1410.4502 [astro-ph.CO]]

### Preprints

- 2) *A Measurement of the Cosmic Microwave Background BB-Mode Polarization Power Spectrum at Sub-Degree Scales from 2 years of POLARBEAR Data*  
POLARBEAR Collaboration [arXiv:1705.02907 [astro-ph.CO]]
- 1) *Measuring galaxy cluster masses with CMB lensing using a Maximum Likelihood estimator: Statistical and systematic error budgets for future experiments*  
S. Raghunathan, S. Patil, E. J. Baxter, **F. Bianchini**, L. E. Bleem, T. M. Crawford, G. P. Holder, A. Manzotti, C. L. Reichardt [arXiv:1705.00411 [astro-ph.CO]]

### Proceedings

- 2) *Cross-correlation between cosmological and astrophysical datasets: the Planck and Herschel case*  
**F. Bianchini**, and A. Lapi, SCCC21/IAU306 (2014)
- 1) *H-ATLAS High- $z$  Sources: An Optimal Sample for Cross-Correlation Analysis*  
J. Gonzalez-Nuevo, A. Lapi, and **F. Bianchini**, 49th Rencontres de Moriond: Cosmology, La Thuile, Italy, 22 - 29 Mar 2014, pp.121-126, (2014)

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## TALKS

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| 11/2016     | <b>Swinburne University of Technology</b> , Melbourne (AU)                                   |
| Seminar     | Title: <i>Cross-correlations in the high-redshift sky: the Planck and Herschel case</i>      |
| 01/2016     | <b>University of California, Irvine</b> , Irvine (US)  |
| Seminar     | Title: <i>Investigating the universe with CMB-LSS</i>  |
| 01/2016     | <b>Statistical sampling and non-sampling methods in cosmology</b> , BCCP, Berkeley (US)      |
| Contributed | Title: <i>Toward a tomographic analysis of Planck CMB lensing-Herschel cross-correlation</i> |
| 12/2015     | <b>CMBXC Meeting Italia</b> , IASFBO, Bologna (Italy)  |
| Invited     | Title: <i>Methods and algorithms for CMB-LSS cross-correlation</i>                           |
| 09/2015     | <b>Workshop on Science with LSS and CMB cross-correlations</b> , Merate (Italy)              |
| Invited     | Title: <i>Toward a tomographic analysis of Planck CMB lensing-Herschel cross-correlation</i> |
| 07/2015     | <b>14<sup>th</sup> Marcel Grossmann Meeting</b> , La Sapienza University, Rome (Italy)       |
| Contributed | Title: <i>Cross-correlations in the high-redshift sky: the Planck and Herschel case</i>      |
| 06/2015     | <b>Imperial Centre for Inference and Cosmology (ICIC)</b> , Imperial College, London (UK)    |
| Seminar     | Title: <i>Cross-correlations in the high-redshift sky: the Planck and Herschel case</i>      |
| 06/2015     | <b>Euclid Consortium Meeting 2015</b> , EPFL, Lausanne (Switzerland)                         |
| Contributed | Title: <i>Cross-correlations in the high-redshift sky: the Planck and Herschel case</i>      |
| 06/2015     | <b>ASTRO@TS 2015</b> , SISSA, Trieste (Italy)  |
| Invited     | Title: <i>Cross-correlations in the high-redshift sky: the Planck and Herschel case</i>      |

- 02/2015 **de Sitter Club**, Instituut-Lorentz for theoretical physics, Leiden (Netherlands)  
Seminar Title: *Cross-correlations in the high-redshift sky: the Planck and Herschel case*
- 06/2014 **Cross-correlations in the high-redshift sky**, University College London, London (UK)  
Contributed Title: *Cross-correlation between Planck CMB lensing and high- $z$  H-ATLAS galaxies*
- 05/2014 **Statistical Challenges in 21<sup>st</sup> Century Cosmology**, Lisbon (Portugal)  
Contributed Title: *Cross-correlation between cosmological and astrophysical data sets*

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## POSTER PRESENTATIONS

- 12/2014 **PLANCK 2014 - The microwave sky in temperature and polarization**, Ferrara (Italy)  
Title: *Cross-correlating Planck CMB Lensing with high- $z$  sub-mm H-ATLAS galaxies*

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## CONFERENCES & WORKSHOPS

- 01/2016 **Statistical sampling and non-sampling methods in cosmology\***, BCCP, Berkeley (US)
- 12/2015 **CMBXC Meeting Italia**, IASFBO, Bologna (Italy)
- 09/2015 **Workshop on Science with LSS and CMB cross-correlations**, Merate (Italy)
- 07/2015 **14<sup>th</sup> Marcel Grossmann Meeting**, La Sapienza University, Rome (Italy)
- 06/2015 **Euclid Consortium Meeting 2015**, EPFL, Lausanne (Switzerland)
- 06/2015 **ASTRO@TS 2015 Workshop**, SISSA, Trieste (Italy)
- 12/2014 **PLANCK 2014 - The microwave sky in temperature and polarization**, Ferrara (Italy)
- 06/2014 **Cross-correlations in the high-redshift sky\***, University College London, London (UK)
- 05/2014 **Statistical Challenges in 21<sup>st</sup> Century Cosmology\***, Lisbon (Portugal)
- 10/2013 **Workshop on Galaxy Bias: Non-linear, Non-local and Non-Gaussian**, ICTP, Trieste (Italy)
- 07-08/2013 **Workshop on New Light in Cosmology from CMB**, ICTP, Trieste (Italy)  
\*=awarded travel grant

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## VISITED INSTITUTES

- 06-09/2015 **ICIC, Imperial College London**, London (UK)
- 02/2015 **Instituut-Lorentz for theoretical physics**, Leiden (Netherlands)

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## SCHOOLS ATTENDED

- 09/2013 **School of Astrophysics Francesco Lucchin**, Gaeta (Italy)
- 06/2013 **School on New Light in Cosmology from CMB**, ICTP, Trieste (Italy)

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## LANGUAGES

- Italian Mother tongue
- English Fluent both written and spoken
- German Basic level

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## COMPUTER SKILLS

- Languages Python, IDL, C (basis), Fortran (basis)
- Scientific CAMB, CosmoMC, CLASS, MontePython, HEALPix, LensPix, PolSpice, emcee
- Others Adobe Photoshop<sup>TM</sup>(basis), Garage Band

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## OTHER INTERESTS

Guitars, Vinyl records, DIY guitar pedals & electronics, Freestyle Frisbee, Politics

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## REFERENCES

**Carlo Baccigalupi**

Astrophysics Sector

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Via Bonomea 265, 34136 Trieste, Italy

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## UPDATED

May 30, 2017