SIMONE PARADISO

1 Brookdale Ave ⋄ Toronto, ON, M5M 1P2
+1 (548) 577 2892 ⋄ simone.paradiso@uwaterloo.ca ⋄ simone.paradiso@outlook.it

EDUCATION

University of Milan, Milan *October 2021*
Ph.D. in Physics, Astrophysics and Applied Physics
Thesis advisor: Davide Maino
Thesis co-advisor : Loris Colombo
Thesis title : CMB Likelihood and Cosmological Parameter estimation in a Bayesian end-to-end framework

University of Rome "La Sapienza", Rome *October 2016*
MS in Astronomy and Astrophysics
Thesis advisor: Alessandro Melchiorri
Thesis title : Constraints on Cosmological Parameters from CMB and Weak Lensing surveys
Grade: 110 cum laude - 1st class honours equivalent

University of Rome "La Sapienza", Rome *December 2014*
BS in Physics and Astrophysics
Thesis advisor: Paolo De Bernardis
Thesis title : Astrophysical evidence of Dark Matter

RESEARCH EXPERIENCE

Waterloo Centre for Astrophysics - University of Waterloo January 2023 - current
Postdoctoral Fellow *Waterloo, ON, Canada*

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University of Milan October 2021 - December 2022
Postdoc *Milan, Italy*

· Large Scale Polarisation Explorer (LSPE) project data analysis: forecasts on cosmological parameters constraints and component separation using a Bayesian approach (commander).
· LSPE-STRIP data analysis: atmospheric contribution characterisation, mapmaking, forecasts on cosmological parameters constraints.

University of Milan March 2018 - October 2021
Research fellow - BeyondPlanck *Milan, Italy*

· CMB maps production and quality assessment; CMB mask definition.
· Reionisation history modelling from CMB polarisation data.
· Angular power spectrum estimation from CMB maps.
· Likelihood implementation for CMB data within the BeyondPlanck framework.
· Cosmological parameter estimation.

University of Rome "La Sapienza" 2016
MS thesis *Rome, Italy*

· Cosmological parameters forecasts for the CORE project proposal.

TEACHING EXPERIENCE

University of Milan 2019 - 2022
Graduate teaching assistant *Milan, Italy*

· Numerical data treatment laboratory.
· Astronomy laboratory.
· Data modelling laboratory.

THESIS MENTORING

University of Milan 2022
Undergraduate thesis co-advisor *Milan, Italy*

· Title: Characterization of Planck-LFI detector behaviour using the final BeyondPlanck data release.

University of Milan 2022
Master thesis co-advisor *Milan, Italy*

· Title: Component separation in Cosmic Microwave Background B-modes experiments involving Bolometric Interferometry.

University of Milan 2021
Undergraduate thesis co-advisor *Milan, Italy*

· Title: Study of time dependance of Planck-LFI detector properties.

TECHNICAL STRENGTHS

Coding Languages	Fortran, IDL, Python
Tools	Vim, Emacs
Cosmology tools	CAMB, CosmoMC, Commander1, Commander3, Healpix, PySM

PRESENTATIONS

CMB constraints with end-to-end error propagation 7/6/2021
Cosmoglobe Kick-off meting *Online*

· Invited speaker - Presentation of BeyondPlanck results.

CMB analysis with end-to-end error propagation: Likelihood and cosmological parameters 19/11/2020
BeyondPlanck release conference *Online*

· Invited speaker - Presentation of BeyondPlanck results.

CMB likelihood implementation for BeyondPlanck September 2020
Ph.D. seminar *Dept. of Physics, University of Milan, MIlan, Italy*

· Presentation of the BeyondPlanck likelihood implementation (methodological aspects).

Probing the reionisation history of the universe with CMB polarisation data September 2019
Ph.D. seminar *Dept. of Physics, University of Milan, MIlan, Italy*

· A review of methodologies to probe the reionisation history of the Universe through CMB data, including an original technique.

Poster: Models for studying the reionisation history of the Universe with CMB polarisation data 18/6/2019
10th Young researcher meeting *Rome, Italy*

· A review of methodologies to probe the reionisation history of the Universe through CMB data, including an original technique.

PUBLICATIONS

Identifying frequency decorrelated dust residuals in B-mode maps by exploiting the spectral capability of bolometric interferometry
M. Regnier, E. Manzan, J. -Ch Hamilton, A. Mennella, J. Errard, L. Zapelli, S. A. Torchinsky, **S. Paradiso** +16 co-authors
arXiv e-prints, arXiv:2309.02957 (2023)

BeyondPlanck I. Global Bayesian analysis of the Planck Low Frequency Instrument data
[BeyondPlanck Collaboration], K. J. Andersen, R. Aurlien, R. Banerji, A. Basyrov, M. Bersanelli, S. Bertocco, M. Brilenkov +37 co-authors
Astronomy and Astrophysics, 675, A1 (2023)

BeyondPlanck II. CMB map-making through Gibbs sampling
E. Keihänen, A. -S. Suur-Uski, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov +32 co-authors
Astronomy and Astrophysics, 675, A2 (2023)

BeyondPlanck VII. Bayesian estimation of gain and absolute calibration for CMB experiments
E. Gjerløw, H. T. Ihle, S. Galeotta, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco +30 co-authors
Astronomy and Astrophysics, 675, A7 (2023)

BeyondPlanck VI. Noise characterization and modelling
H. T. Ihle, M. Bersanelli, C. Franceschet, E. Gjerløw, K. J. Andersen, R. Aurlien, R. Banerji, S. Bertocco +33 co-authors
Astronomy and Astrophysics, 675, A6 (2023)

BeyondPlanck XIV. Polarized foreground emission between 30 and 70GHz
T. L. Svalheim, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov, M. Carbone +30 co-authors
Astronomy and Astrophysics, 675, A14 (2023)

BeyondPlanck X. Bandpass and beam leakage corrections
T. L. Svalheim, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov, M. Carbone +31 co-authors
Astronomy and Astrophysics, 675, A9 (2023)

BeyondPlanck III. Commander3
M. Galloway, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov, M. Carbone +30 co-authors
Astronomy and Astrophysics, 675, A3 (2023)

BeyondPlanck XII. Cosmological parameter constraints with end-to-end error propagation
S. Paradiso, L. P. L. Colombo, K. J. Andersen, R. Aurlien, R. Banerji, A. Basyrov, M. Bersanelli, S. Bertocco +33 co-authors
Astronomy and Astrophysics, 675, A12 (2023)

BeyondPlanck VIII. Efficient Sidelobe Convolution and Correction through Spin Harmonics
M. Galloway, M. Reinecke, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov +30 co-authors
Astronomy and Astrophysics, 675, A8 (2023)

BeyondPlanck XVI. Limits on Large-Scale Polarized Anomalous Microwave Emission from Planck LFI and WMAP
D. Herman, B. Hensley, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli, S. Bertocco, M. Brilenkov +30 co-authors
Astronomy and Astrophysics, 675, A15 (2023)

BeyondPlanck XIII. Intensity foreground sampling, degeneracies, and priors
K. J. Andersen, D. Herman, R. Aurlien, R. Banerji, A. Basyrov, M. Bersanelli, S. Bertocco, M. Brilenkov +36 co-authors
Astronomy and Astrophysics, 675, A13 (2023)

From BeyondPlanck to Cosmoglobe: Preliminary WMAP Q-band analysis
D. J. Watts, M. Galloway, H. T. Ihle, K. J. Andersen, R. Aurlien, R. Banerji, A. Basyrov, M. Bersanelli +35 co-authors
Astronomy and Astrophysics, 675, A16 (2023)

BeyondPlanck V. Minimal ADC Corrections for Planck LFI
D. Herman, R. A. Watson, K. J. Andersen, R. Aurlien, R. Banjeri, M. Bersanelli, S. Bertocco, M. Brilenkov +31 co-authors
Astronomy and Astrophysics, 675, A5 (2023)

BeyondPlanck X. Planck LFI frequency maps with sample-based error propagation
A. Basyrov, A. -S. Suur-Uski, L. P. L. Colombo, J. R. Eskilt, **S. Paradiso**, K. J. Andersen, R. Aurlien, R. Banerji +32 co-authors
Astronomy and Astrophysics, 675, A10 (2023)

BeyondPlanck XI. Bayesian CMB analysis with sample-based end-to-end error propagation
L. P. L. Colombo, J. R. Eskilt, **S. Paradiso**, H. Thommesen, K. J. Andersen, R. Aurlien, R. Banerji, M. Bersanelli +31 co-authors
Astronomy and Astrophysics, 675, A11 (2023)

BeyondPlanck IV. On end-to-end simulations in CMB analysis – Bayesian versus frequentist statistics
M. Brilenkov, K. S. F. Fornazier, L. T. Hergt, G. A. Hoerning, A. Marins, T. Murokoshi, F. Rahman, N. -O. Stutzer +43 co-authors
Astronomy and Astrophysics, 675, A4 (2023)

Cosmoglobe: Towards end-to-end CMB cosmological parameter estimation without likelihood approximations
J. R. Eskilt, K. Lee, D. J. Watts, V. Anshul, R. Aurlien, A. Basyrov, M. Bersanelli, L. P. L. Colombo +15 co-authors
arXiv e-prints, arXiv:2306.15511 (2023)

Cosmoglobe DR1 results. II. Constraints on isotropic cosmic birefringence from reprocessed WMAP and Planck LFI data
J. R. Eskilt, D. J. Watts, R. Aurlien, A. Basyrov, M. Bersanelli, M. Brilenkov, L. P. L. Colombo, H. K. Eriksen +23 co-authors
arXiv e-prints, arXiv:2305.02268 (2023)

From BeyondPlanck to Cosmoglobe: Open Science, Reproducibility, and Data Longevity
S. Gerakakis, M. Brilenkov, M. Ieronymaki, M. San, D. J. Watts, K. J. Andersen, R. Aurlien, R. Banerji +34 co-authors
The Open Journal of Astrophysics, 6, 10 (2023)

Cosmoglobe DR1 results. I. Improved Wilkinson Microwave Anisotropy Probe maps through Bayesian end-to-end analysis
D. J. Watts, A. Basyrov, J. R. Eskilt, M. Galloway, L. T. Hergt, D. Herman, H. T. Ihle, **S. Paradiso**

+25 co-authors
arXiv e-prints, arXiv:2303.08095 (2023)

Status of QUBIC, the Q&U Bolometer for Cosmology
L. Mousset, P. Ade, A. Almela, G. Amico, L. H. Arnaldi, J. Aumont, S. Banfi, E. S. Battistelli +103 co-authors
arXiv e-prints, arXiv:2210.03161 (2022)

The large scale polarization explorer (LSPE) for CMB measurements: performance forecast
The LSPE collaboration, G. Addamo, P. A. R. Ade, C. Baccigalupi, A. M. Baldini, P. M. Battaglia, E. S. Battistelli, A. Baù +97 co-authors
Journal of Cosmology and Astroparticle Physics, 2021, 008 (2021)

Exploring Cosmic Origins with CORE: Survey requirements and mission design
J. Delabrouille, P. de Bernardis, F. R. Bouchet, A. Achúcarro, P. A. R. Ade, R. Allison, F. Arroja, E. Artal +196 co-authors
Journal of Cosmology and Astroparticle Physics, 2018, 014 (2018) (**134 citations** on NASA ADS)

Exploring Cosmic Origins with CORE: Cosmological Parameters
Eleonora Di Valentino, Thejs Brinckmann, Martina Gerbino, Vivian Poulin, François R. Bouchet, Julien Lesgourgues, Alessandro Melchiorri, Jens Chluba +121 co-authors
Journal of Cosmology and Astroparticle Physics, 2018, 017 (2018) (**136 citations** on NASA ADS)

REFERENCES

Hans Kristian Kamfjord Eriksen,
Full professor, University of Oslo, Sem Sælands vei 13, Svein Rosselands hus, 0371, Oslo
h.k.k.eriksen@astro.uio.no

Marco Bersanelli,
Full professor, University of Milan, Via Celoria 16, 20133, Milan
marco.bersanelli@unimi.it

Davide Maino,
Associate professor, University of Milan, Via Celoria 16, 20133, Milan
davide.maino@mi.infn.it

Loris Colombo,
Researcher, University of Milan, Via Celoria 16, 20133, Milan
loris.colombo@unimi.it

Maurizio Tomasi,
Associate professor, University of Milan, Via Celoria 16, 20133, Milan
maurizio.tomasi@unimi.it