

	v
<b>Table of Contents</b>	
Preface . . . . .	xii
The Organizing Committee . . . . .	xiii
Conference Photograph . . . . .	xiv
Participants . . . . .	xv
Address by the Scientific and Local Organizing Committees . . . . .	xviii
<b>Bayes Section</b>	
Bayesian large-scale structure inference: initial conditions and the cosmic web . . . . . <i>F. Leclercq &amp; B. Wandelt</i>	1
Bayesian model comparison in cosmology . . . . . <i>D. J. Mortlock</i>	5
What we talk about when we talk about fields . . . . . <i>E. Cameron</i>	9
Back to Normal! Gaussianizing posterior distributions for cosmological probes . . . . . <i>R. L. Schuhmann, B. Joachimi &amp; H. V. Peiris</i>	13
Bayesian CMB foreground separation with a correlated log-normal model . . . . . <i>N. Oppermann &amp; T. A. Enßlin</i>	16
Searching for bias and correlations in a Bayesian way - Example: SN Ia data . . . . . <i>C. Heneka, A. Posada, V. Marra &amp; L. Amendola</i>	19
A Bayesian Method for the Extinction . . . . . <i>H.-J. Tian, C. Liu, J.-Y. Hu, Y. Xu, X.-L. Chen</i>	22
The Value of $H_0$ from Gaussian Processes . . . . . <i>V. C. Busti, C. Clarkson &amp; M. Seikel</i>	25
<b>Statistics Section</b>	
Nonparametric kernel methods for curve estimation and measurement errors . . . . . <i>A. Delaigle</i>	28
Galaxy and Mass Assembly (GAMA): luminosity function evolution . . . . . <i>J. Loveday &amp; the GAMA team</i>	40
Detecting multi-scale filaments in galaxy distribution . . . . . <i>E. Tempel</i>	45
The Needle CMB Trispectrum . . . . . <i>A. Troja, S. Donzelli, D. Maino &amp; D. Marinucci</i>	48
Generic inference of inflation models by local non-Gaussianity . . . . . <i>S. Dorn, E. Ramirez, K. E. Kunze, S. Hofmann &amp; T. A. Enßlin</i>	51

vi	<i>Contents</i>	
Extreme-Value Statistics for Testing Dark Energy . . . . .		54
	<i>S. Aiola, A. Kosowsky &amp; B. Wang</i>	
Transformed Auto-correlation . . . . .		57
	<i>J. Zhou &amp; Y. Gao</i>	
<b>Sparsity section</b>		
PRISM: Sparse recovery of the primordial spectrum from WMAP9 and Planck datasets . . . . .		60
	<i>P. Paykari, F. Lanusse, J.-L. Starck, F. Sureau &amp; J. Bobin</i>	
On spin scale-discretised wavelets on the sphere for the analysis of CMB polarisation . . . . .		64
	<i>J. D. McEwen, M. Büttner, B. Leistedt, H. V. Peiris, P. Vanderghenst &amp; Y. Wiaux</i>	
Estimating the distribution of Galaxy Morphologies on a continuous space . . . . .		68
	<i>G. Vinci, P. Freeman, J. Newman, L. Wasserman &amp; C. Genovese</i>	
Darth Fader: Analysing galaxy spectra at low signal-to-noise . . . . .		72
	<i>A. Leonard, D. P. Machado, F. B. Abdalla &amp; J.-L. Starck</i>	
Radial 3D-Needlets on the Unit Ball . . . . .		75
	<i>C. Durastanti, Y. T. Fantaye, F. K. Hansen, D. Marinucci &amp; I. Z. Pesenson</i>	
<b>Weak lensing section</b>		
Statistical challenges in weak lensing cosmology . . . . .		78
	<i>M. Takada</i>	
The potential of likelihood-free inference of cosmological parameters with weak lensing data . . . . .		90
	<i>M. Vespe</i>	
The probability distribution of ellipticity: implications for weak lensing measurement . . . . .		94
	<i>M. Viola</i>	
Errors on errors – Estimating cosmological parameter covariance . . . . .		99
	<i>B. Joachimi &amp; A. Taylor</i>	
Density reconstruction from 3D lensing: Application to galaxy clusters . . . . .		104
	<i>F. Lanusse, A. Leonard &amp; J.-L. Starck</i>	
A New Model to Predict Weak Lensing Peak Counts . . . . .		107
	<i>C.-A. Lin &amp; M. Kilbinger</i>	
Detecting Particle Dark Matter Signatures via Cross-Correlation of Gamma-Ray Anisotropies and Cosmic Shear . . . . .		110
	<i>S. Camera</i>	
Cluster strong lensing: a new strategy for testing cosmology with simulations . . . . .		113
	<i>M. Killedear, S. Borgani, D. Fabjan, K. Dolag, G. Granato, M. Meneghetti, S. Planelles &amp; C. Ragone-Figueroa</i>	

<i>Contents</i>		vii
<b>CMB section</b>		
Statistics of cosmological fields . . . . .		116
<i>S. Matarrese</i>		
Considerations in the Interpretation of Cosmological Anomalies . . . . .		124
<i>H. V. Peiris</i>		
From data to science: Planck data and the CMB non-Gaussianity . . . . .		131
<i>A. Mangilli, on behalf of the Planck collaboration</i>		
Cosmological Applications of the Gaussian Kinematic Formula . . . . .		135
<i>Y. T. Fantaye &amp; D. Marinucci</i>		
Detectability of Torus Topology . . . . .		139
<i>O. Fabre, S. Prunet &amp; J.-P. Uzan</i>		
Cosmic infrared background measurements and star formation history from <i>Planck</i>		144
<i>P. Serra, on behalf of the Planck Collaboration</i>		
Searching for non-Gaussianity in the Planck data. . . . .		147
<i>M. J. Rebouças &amp; A. Bernui</i>		
A Close Examination of CMB Mirror-Parity . . . . .		150
<i>A. Ben-David &amp; E. D. Kovetz</i>		
A Supervoid Explanation of the Cosmic Microwave Background Cold Spot . . . .		153
<i>F. Finelli, J. García-Bellido, A. Kovács, F. Paci &amp; I. Szapudi</i>		
Simulation of the analysis of interferometric microwave background polarization		156
data . . . . .		
<i>E. F. Bunn, A. Karakci, P. M. Sutter, L. Zhang, G. S. Tucker,</i>		
<i>P. T. Timbie &amp; B. D. Wandelt</i>		
Effects of primordial magnetic fields on CMB . . . . .		159
<i>H. J. Hortúa &amp; L. Castañeda</i>		
The impact of superstructures in the Cosmic Microwave Background . . . . .		162
<i>S. Ilić, M. Langer &amp; M. Douspis</i>		
<b>Radio section</b>		
21cm Cosmology . . . . .		165
<i>M. G. Santos, D. Alonso, P. Bull, S. Camera &amp; P. G. Ferreira</i>		
Deep Source-Counting at 3 GHz . . . . .		177
<i>T. Vernstrom, J. Wall &amp; D. Scott</i>		
The cosmic radio dipole and local structure effects . . . . .		182
<i>M. Rubart, D. Bacon &amp; D. J. Schwarz</i>		
Bayesian Inference for Radio Observations - Going beyond deconvolution . . . . .		185
<i>M. Lochner, B. Bassett, M. Kunz, I. Natarajan, N. Oozeer, O. Smirnov &amp; J. Zwart</i>		
The impact of small absorbers, galactic neutral hydrogen & X-rays on 1-point		
statistics of the 21-cm line. . . . .		189
<i>C. A. Watkinson, J. R. Pritchard, A. Mesinger &amp; E. Sobacchi</i>		

**Joint probes section**

Combining Probes . . . . .	192
<i>A. Rassat, F. Lanusse, D. Kirk, O. Host &amp; S. Bridle</i>	
Cross-correlation between cosmological and astrophysical datasets: the Planck and Herschel case. . . . .	202
<i>F. Bianchini &amp; A. Lapi</i>	
Information Gains in Cosmological Parameter Estimation. . . . .	206
<i>S. Seehars, A. Amara, A. Refregier, A. Paranjape &amp; J. Akeret</i>	
Cosmography with high-redshift probes. . . . .	210
<i>V. Vitagliano</i>	
Cross-correlating spectroscopic and photometric galaxy surveys. . . . .	213
<i>M. B. Eriksen &amp; E. Gaztañaga</i>	
Combining cosmological constraints from cluster counts and galaxy clustering . .	216
<i>F. Lacasa</i>	
How well can the evolution of the scale factor be reconstructed by the current data?	219
<i>S. D. P. Vitenti &amp; M. Penna-Lima</i>	

**LSS section**

Precision cosmology, Accuracy cosmology and Statistical cosmology . . . . .	223
<i>L. Verde</i>	
Optimal observables in galaxy surveys. . . . .	235
<i>J. Carron &amp; I. Szapudi</i>	
Morpho-statistical characterization of the cosmic web using marked point processes	239
<i>R. S. Stoica</i>	
Measuring the clustering of photometric quasars through blind mitigation of systematics. . . . .	243
<i>B. Leistedt, H. V. Peiris &amp; N. Roth</i>	
Internal errors: a valid alternative for clustering estimates? . . . . .	247
<i>P. Arnalte-Mur &amp; P. Norberg</i>	
Transformationally decoupling clustering and tracer bias. . . . .	251
<i>M. C. Neyrinck</i>	
Constraints on Growth Index from LSS. . . . .	255
<i>A. Pouri, S. Basilakos &amp; M. Plionis</i>	
Non-Gaussian inference from non-linear and non-Poisson biased distributed data	258
<i>M. Ata, F.-S. Kitaura &amp; V. Müller</i>	
A Monte Carlo study of cosmological parameter estimators from galaxy cluster number counts . . . . .	262
<i>M. Penna-Lima, M. Makler &amp; C. A. Wuensche</i>	

<i>Contents</i>		ix
Understanding Cosmological Measurements with a large number of mock galaxy catalogues.....		266
<i>M. Manera, W. J. Percival, A. Ross, R. Tojeiro, L. Samushia, C. Howlett M. Vargas-Magaña &amp; A. Burden, for the SDSS-III BOSS Galaxy Working Group.</i>		
Supervoid Origin of the Cold Spot in the Cosmic Microwave Background.....		269
<i>A. Kovács, I. Szapudi, B. R. Granett, Z. Frei, J. Silk, W. Burgett, S. Cole, P. W. Draper, D. J. Farrow, N. Kaiser, E. A. Magnier, N. Metcalfe, J. S. Morgan, P. Price, J. Tonry &amp; R. Wainscoat</i>		
Towards a better understanding of galaxy clusters.....		273
<i>P. T. P. Viana</i>		
A new test of uniformity for object orientations in astronomy.....		276
<i>V. Pelgrims</i>		
<b>Data mining section</b>		
Machine-learning in astronomy.....		279
<i>M. Hobson, P. Graff, F. Feroz &amp; A. Lasenby</i>		
Machine Classification of Transient Images.....		288
<i>L. du Buisson, N. Sivanandam, B. A. Bassett &amp; M. Smith</i>		
Data-mining Based Expert Platform for the Spectral Inspection.....		292
<i>H. Tian, Y. Xu, Y. Tu, Y. Zhang, Y. Zhao, G. Lei, B. He, C. Cui &amp; X. Chen</i>		
Robust Constraint of Luminosity Function Evolution through MCMC Sampling		295
<i>N. Kurinsky &amp; A. Sajina</i>		
OCAAT: automated analysis of star cluster colour-magnitude diagrams for gauging the local distance scale.....		298
<i>G. I. Perren, R. A. Vázquez, A. E. Piatti &amp; A. Moitinho</i>		
Quantifying correlations between galaxy emission lines and stellar continua using a PCA-based technique.....		301
<i>R. Beck, L. Dobos &amp; I. Csabai</i>		
Modelling Galaxy Populations in the Era of Big Data.....		304
<i>S. G. Murray, C. Power &amp; A. S. G. Robotham</i>		
Data-Rich Astronomy: Mining Sky Surveys with PhotoRAPToR.....		307
<i>S. Cavaoti, M. Brescia &amp; G. Longo</i>		
Density field projection analysis in search for WHIM.....		310
<i>L. J. Liivamägi</i>		
Application of Statistical Methods on Automated Recognition of Solar Activity Phenomena and Analysis of Their Correlation.....		313
<i>G. Lin</i>		
ANNz2 - Photometric redshift and probability density function estimation using machine-learning.....		316
<i>I. Sadeh</i>		

x	<i>Contents</i>	
Adapting Predictive Models for Cepheid Variable Star Classification Using Linear Regression and Maximum Likelihood . . . . .		319
	<i>K. D. Gupta, R. Vilalta, V. Asadourian &amp; L. Macri</i>	
<b>Supernovae section</b>		
Testing the mutual consistency of different supernovae surveys. . . . .		322
	<i>N. V. Karpenka, F. Feroz &amp; M. P. Hobson</i>	
Improved KPCA for supernova photometric classification . . . . .		326
	<i>E. E. O. Ishida, F. B. Abdalla &amp; R. S. de Souza</i>	
Principal Component Analysis of type II supernova <i>V</i> band light-curves . . . . .		330
	<i>L. Galbany</i>	
Photometric typing of normal and peculiar type Ia supernovae. . . . .		333
	<i>S. González-Gaitán &amp; F. Bufano</i>	
<b>Survey section</b>		
Photometric classification of Supernovae from the SUDARE survey. . . . .		337
	<i>G. Pignata</i>	
Automatic stellar spectral parameterization pipeline for LAMOST survey . . . . .		340
	<i>Yue, Wu, Ali, Luo, Bing, Du, Yongheng, Zhao &amp; Hailong, Yuan</i>	
New Challenges in Cosmology Posed by the Sloan Digital Sky Survey Quasar Data		343
	<i>A. Banerjee &amp; A. K. Pal</i>	
Semi-analytical study on the generic degeneracy for galaxy clustering measurements		347
	<i>A. Guarnizo, L. Amendola, M. Kunz &amp; A. Vollmer</i>	
Distribution of Maximal Luminosity of Galaxies in the Sloan Digital Sky Survey		351
	<i>E. Regós, A. Szalay, Z. Rácz, M. Taghizadeh &amp; K. Ozogany</i>	
Reconstructing light curves from HXMT imaging observations . . . . .		355
	<i>Z.-X. Huo, J. Zhang, Y.-M. Li &amp; J.-F. Zhou</i>	
Statistical Challenges in the Photometric Calibration for 21st Century Cosmology: The J-PAS case. . . . .		359
	<i>J. Varela, D. Cristóbal-Hornillos, J. Cenarro, A. Ederoclite, D. Muniesa, H. V. Ramió, N. Gruel &amp; M. Moles</i>	
Statistical assessment of the relation between the inferred morphological type and the emission-line activity type of a large sample of galaxies. . . . .		362
	<i>R. A. Ortega-Minakata, J. P. Torres-Papaqui, H. Andernach &amp; J. M. Islas-Islas</i>	
Low/High Redshift Classification of Emission Line Galaxies in the HETDEX survey		365
	<i>V. Acquaviva, E. Gawiser, A. S. Leung &amp; M. R. Martin</i>	
A high-dimensional look at VIPERS galaxies . . . . .		369
	<i>B. R. Granett &amp; the VIPERS Team</i>	
Statistical analysis of cross-correlation sample of 3XMM-DR4 with SDSS-DR10 and UKIDSS-DR9 . . . . .		372
	<i>Y.-X. Zhang, Y.-H. Zhao, X.-B. Wu &amp; H.-J. Tian</i>	

## Contents

xi

**Future project**

Euclid space mission: a cosmological challenge for the next 15 years . . . . .	375
<i>R. Scaramella, Y. Mellier, J. Amiaux, C. Burigana, C. S. Carvalho, J. C. Cuillandre, A. da Silva, J. Dinis, A. Derosa, E. Maiorano, P. Franzetti, B. Garilli, M. Maris, M. Meneghetti, I. Tereno, S. Wachter, L. Amendola, M. Cropper, V. Cardone, R. Massey, S. Niemi, H. Hoekstra, T. Kitching, L. Miller, T. Schrabback, E. Semboloni, A. Taylor, M. Viola, T. Maciaszek, A. Ealet, L. Guzzo, K. Jahnke, W. Percival, F. Pasian, M. Sauvage &amp; the Euclid Collaboration</i>	

Euclid Space Mission: building the sky survey . . . . .	379
<i>I. Tereno, C. S. Carvalho, J. Dinis, R. Scaramella, J. Amiaux, C. Burigana, J. C. Cuillandre, A. da Silva, A. Derosa, E. Maiorano, M. Maris, D. Oliveira, P. Franzetti, B. Garilli, P. Gomez-Alvarez, M. Meneghetti, S. Wachter &amp; the Euclid Collaboration</i>	

Testing the Equivalence Principle in space with MICROSCOPE: the data analysis challenge . . . . .	382
<i>J. Bergé, Q. Baghi &amp; S. Pires</i>	

Fundamental Cosmology with the E-ELT . . . . .	385
<i>C. J. A. P. Martins, A. C. O. Leite &amp; P. O. J. Pedrosa</i>	

**Other**

Entropy in universes evolving from initial to final de Sitter eras . . . . .	388
<i>J. P. Mimoso &amp; D. Pavón</i>	

The Stochastic Gravitational Wave Background Generated by Cosmic String Networks . . . . .	391
<i>L. Sousa &amp; P. P. Avelino</i>	

Shape estimation for Košice, Almahata Sitta and Bassikounou meteoroids . . . . .	394
<i>V. Vinnikov, M. Gritsevich &amp; L. Turchak</i>	

X-ray cross-correlation analysis of low-mass X-ray binary 4U 1636-53 . . . . .	397
<i>Y.-J. Lei</i>	

**Conclusions**

The Role of Statistics and Statisticians in the Future of Astrostatistics . . . . .	400
<i>J. M. Hilbe</i>	

Concluding Remarks from a Cosmologist . . . . .	407
<i>A. H. Jaffe</i>	

Author Index . . . . .	412
------------------------	-----