MGA Workshop IV: Multiscale Geometric Methods in Astronomical Data Analysis

Monday November 8, 2004

8:30–9:15 *Check-In/Light Breakfast (Hosted by IPAM)*

9:15–9:30 *Welcome and Opening Remarks*

9:30–10:30 **Peter Coles** (University of Nottingham)
Phase Correlations in Harmonic Analysis of Cosmological Fluctuations

10:30–11:00 *Break*

11:00–12:00 **Marc Lachieze-Rey** (CEA Saclay, France)
Multipole vectors and Harmonic analysis on the sphere

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Jean-Luc Starck** (CEA Saclay, France)
Weak Shear Mass Reconstruction using Wavelets

3:00–3:30 *Break*

3:30–4:30 **Rien van de Weygaert** (University of Groningen/Kapteyn Institute,)
Analyzing Cosmic Structure Formation with the Delaunay Tessellation Field Estimator

4:30–4:45 *Break*

4:45–5:45 **Kevin Pimbblet** (University of Queensland)
Filaments of Galaxies: An Observational Viewpoint.

5:45–7:15 *Wine/Cheese Reception (Hosted by IPAM)*

Tuesday November 9, 2004

8:30–9:30 *Continental Breakfast*

9:30–10:30 **Sergei Shandarin** (University of Kansas)
Morphological Analysis of the Large-Scale Structure in the Universe

10:30–11:00 *Break*

(Tuesday schedule continued on next page)

(Tuesday schedule continued from previous page)

11:00–12:00 **Marc Lachieze-Rey** (CEA Saclay, France)

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Vicent Martinez** (University of Valencia, Spain)
Cosmological fields and the distribution of galaxies: Multiresolution morphology

3:00–3:30 *Break*

3:30–4:30 **Andrei Doroshkevich** (Theoretical Astrophysics Center)
Separation of the Large Scale Structure elements in observed and simulated catalogues.

4:30–4:45 *Break*

4:45–5:45 **Alexander Gray** (Carnegie Mellon University)
Recent Geometric Multiscale Algorithms for n-point Correlations

Wednesday November 10, 2004

8:30–9:30 *Continental Breakfast*

9:30–10:30 **Enrique Martinez-Gonzalez** (Instituto de Fisica de Cantabria (Spain))
Spherical Wavelets Applied to the Analysis of the Cosmic Microwave Background

10:30–11:00 *Break*

11:00–12:00 **Keith Worsley** (McGill University)
New results in the geometry of random fields, with applications to CMB and galaxy density.

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Li-Zhi Fang** (University of Arizona)
Probing cosmic structure formation in the wavelet representation

3:00–3:30 *Break*

3:30–4:30 **Yassir Moudden** (CEA Saclay, France)
Blind Component Separation From Incomplete Data Using Wavelets Application to CMB Data Analysis.

4:30–4:45 *Break*

4:45–5:45 **Olivier Forni** (University of Paris Sud)
Multiscale transforms: application to CMB secondary anisotropies and infrared spectra of Mars surface

5:45–7:15 *Dinner (Hosted by IPAM)*

Thursday November 11, 2004

8:30–9:30 *Continental Breakfast*

9:30–10:30 **Louis Lyons** (Oxford University)
Statistical Problems in Particle Physics

10:30–11:00 *Break*

11:00–12:00 **Emmanuel Candes** (California Institute of Technology)
Chirplets: Multiscale Detection and Recovery of Chirps.

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **Pierre Kestener** (CEA Saclay, France)
Generalizing the wavelet-based multifractal formalism to vector-valued random fields: application to turbulent velocity and vorticity 3D numerical data.

3:00–3:30 *Break*

3:30–4:30 **Rebecca Willett** (Rice University)
Multiscale Analysis of Photon-Limited Astronomical Signals and Images

4:30–4:45 *Break*

4:45–5:45 **Jeff Scargle** (NASA Ames Research Center)
Multiscale Data Analysis through Optimal Segmentation: From Photons and Stars to Galaxies and the Large Scale Structure of the Universe

Friday November 12, 2004

8:30–9:30 *Continental Breakfast*

9:30–10:30 **Pia Mukherjee** (University of Sussex)
Early Universe Physics with Wavelets

10:30–11:00 *Break*

11:00–12:00 **Richard Massey** (California Institute of Technology)
Shapelet Measurement of Weak Gravitational Lensing and Galaxy Morphologies.

12:00–2:00 *Lunch (on your own)*

2:00–3:00 **David Donoho** (Stanford University)

3:00–3:30 *Conclusion*