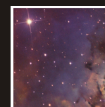




Astronomical Data Analysis

6th Conference 3-7 May 2010, Monastir, Tunisia

In Honor of Albert Bijaoui



Astronomical Data Analysis VI BOOK OF ABSTRACTS

Organized and supported by



Observatoire
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For further information, contact us at: ada6.conference@aset.org.tn

FOREWORD

Held regularly since 2001, the ADA conference series is focused on algorithms and information extraction from astrophysics data sets. The program includes keynote, invited and contributed talks, as well as posters. This conference series has been characterized by a range of innovative themes, including curvelet transforms, compressed sensing and clustering in cosmology, while at the same time remaining closely linked to front-line open problems and issues in astrophysics and cosmology.

The ADA VI conference is organized in honor of Albert Bijaoui, and is held in Monastir (where Albert was born). One session will be dedicated to the GAIA project. Other sessions will include asteroseismology, exoplanet detection, large scale structures (weak lensing, galaxy catalogs), CMB (source separation, polarization), restoration (map-making, deconvolution, modeling), hyperspectral data analysis, compressed sensing.

ADA VI KEYNOTE SPEAKERS

Adam Amara, ETH, Switzerland
Albert Bijaoui, Observatoire de la Cote d'Azur, France
Angelica de Oliveira-Costa, CfA-Harvard, USA
Farzad Kamalabadi, Univ. of Illinois, USA
Tom Loredo, Cornell University, USA
Francois Mignard, Observatoire de la Cote d'Azur, France
Herbert Edelbrunner, IST, Austria
Michael Unser, EPFL, Switzerland

ADA VI INVITED SPEAKERS

Pierre Chainais, Clermond-Ferrand University, France
Christophe Collet, Louis Pasteur University, Strasbourg, France
Jalal Fadili, University of Caen, France
Jean-Francois Hochedez, Royal Observatory of Belgium
Alberto Krone-Martins, University of Sao Paulo, Brazil
Pablo Arnalte-Mur, Valencia Observatory, Spain
Eric Pantin, CEA/Saclay, France
Anais Rassat, CEA/Saclay, France
Rien van de Weygart, Kapteyn Institute The Netherlands
Yves Wiaux, EPFL, Switzerland

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Enrique Martinez-Gonzales, IFCA Santander, Spain
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Liadh Tebourbi, URISA-SUPCOM, Tunisia

LOCAL ORGANIZING COMMITTEE

Mohamed Saber Naceur, LTSIRS-ENIT, Tunisia

POSTER PRESENTATIONS

The following 26 posters will be displayed throughout the duration on the conference.

First Name	Last Name	Poster Title
Sezer	Aytap	Suzaku Analysis of Galactic Supernova Remnant G348.5+0.1 (CTB 37A)
Byron	Bell	The 1905 Einstein equation in a general mathematical analysis model of Quasars
Herve	Bourdin	Investigating the isoradial thermal structure of gas within Clusters of Galaxies: a multiscale approach
Mustafa	Bozkurt	Chandra study of X-ray point sources from the outskirts of A2534
Atul	Deep	Data Reduction of AO Images in Crowded Stellar Fields
François-Xavier	Dupé	Deconvolution of Poisson noisy images using proximal iteration and sparse representations
Pascal	Guterman	Correcting Corot Ligth Curves from Collective Effects
Lila	Hadji	The Adogram Transform: a fully adaptive time
Diego	Herranz	Multifrequency detection of sub Classification Results of Fused Multi-wavelength Data
Susan	Hojnacki	Containing Imputed Missing Values
Murat	Hudaverdi	Dynamics of Supercluster Environments
Murat	Hudaverdi	Hunting for clusters in the CFHTLS Deep Fields
Emma	Karray	Parcimonious analysis of hyperspectral Data
Koray	Kayabol	Astrophysical Map Reconstruction from Convolutional Mixtures
Chris	Koen	Estimation of the coherence time of stochastic pulsations
Antoine	Labatie	Volumic effects in the correlation function estimation of SDSS galaxy catalogues
Patrick	de Laverny	Automated stellar parametrization with MATISSE: application to the galactic populations
Arturo	Lopez Ariste	Pattern recognition for the measurement of solar magnetic fields
Mireille	Louys	QuickViz: A 3D visualiser for IFU data cubes
Fionn	Murtagh	Redshift Estimation
Pierre	Ocvirk	Data First Look and Background modeling for the Gaia/Radial Velocity Spectrograph Data Reduction pipeline
Walid	Ouerghemmi	BSS contribution in soil properties mapping
Sandrine	Pires	Algorithm for bispectral Analysis of CMB data
Jeremy	Schmitt	A new method for Poisson noise removal on the sphere: Application to the Fermi Space Telescope
Florent	Sureau	An Iterative Constrained Deconvolution Algorithm for CMB Map Reconstruction
Arnaud	Woiselle	Inpainting in Fourier : Application to astronomical radio-interferometric image reconstruction

Multifrequency detection of sub-mm extragalactic point sources

Diego Herranz, Jose Luis Sanz, Marcos Lopez-Caniego and Joaquin Gonzalez-Nuevo

In this work we address the problem of simultaneous multifrequency detection of extragalactic point sources in the maps of the cosmic microwave background. We apply a new linear filtering technique, the 'matched matrix filters', that incorporates full spatial information, including the cross-correlation among channels, without making any a priori assumption about the spectral behaviour of the sources. A substantial reduction of the background is achieved thanks to the optimal combination of filtered maps. In this contribution we will illustrate the applicability of this filtering technique to CMB and infrared astronomical images, such as the ones that are being obtained by the ESA's Planck and Herschel missions.

Astrophysical Map Reconstruction from Convolutional Mixtures

Koray Kayabol, Jose Luis Sanz, Diego Herranz, Ercan E. Kuruoglu and Emanuele Salerno

We propose an astrophysical map reconstruction method for multi-channel blurred and noisy observations. We define the problem under Bayesian framework. We use the t-distribution to model the image gradients as a prior and resort the Monte Carlo simulation to estimate the maps and error both in the pixel and frequency domain. We test our method in five different sky patch located at varying positions from galactic plane to high altitude. We give the estimated maps along with the power spectrums and the numerical performance measures.

Data Reduction of AO Images in Crowded Stellar Fields

Atul Deep, Giuliana Fiorentino and Eline Tolstoy

It is expected that several new Extremely Large Telescopes (E-ELT, TMT & GMT) will see first light towards the end of this decade. The large aperture size of these telescopes ($> 20\text{m}$) along with their adaptive optics systems (like MCAO, GLAO, SCAO etc) will allow us to image astrophysical objects with unprecedented very high angular resolution. However, to extract full scientific information from these systems is going to a very challenging task because of complex shape of AO point spread function (PSF) and will therefore require careful data reduction techniques. The main complexity of AO images is that the correction is never perfect and the PSF always has a complex residual halo around the central core which contains a large fraction of the light. The variations in seeing over short periods of time and anisoplanatism effects create strongly time dependent effects in the PSF. We create simulations of crowded stellar fields using PSFs from a MCAO (multi-conjugate AO) system MAORY (a Multi-Conjugate AO system, currently a Phase A study at ESO) to perform our analysis. For SCAO (single-conjugate AO) mode we use analytic code PAOLA to obtain our PSFs. Photometry is then performed on these simulated images using current photometric packages like Starfinder and Daophot to test photometric accuracy achieved in different crowding regimes, effect of anisoplanatism and seeing conditions.

Chandra study of X-ray point sources from the outskirts of A2534

Mustafa Bozkurt, Murat Hudaverdi and E. Nihal Ercan

We present an analysis of Chandra observations of the A2534 (RA=23h07m34.3s, Dec= -22d39m45s). It locates in the local universe ($z=0.2014$) in the SCC100 concentration. ICM gas temperature and metal abundances are estimated within