

Series Editor: A. Zichichi

Proceedings of the Fifth Workshop

DATA ANALYSIS IN

ASTRONOMY

Ettore Majorana Centre for Scientific Culture,
Erice, Italy 27 October – 3 November 1996

■ edited by

V. Di Gesù

University of Palermo, Palermo, Italy

M.J.B. Duff

University College London, London, UK

A. Heck

Astronomical Observatory, Strasbourg, France

M.C. Maccarone

Institute of Cosmic Physics and Informatics/CNR, Palermo, Italy

L. Scarsi

University of Palermo, and Institute of Cosmic Physics and Informatics/CNR, Palermo, Italy

H.U. Zimmermann

Max Planck Institute for Extraterrestrial Physics, Garching-Munich, Germany



World Scientific

Singapore • New Jersey • London • Hong Kong

Table of Contents

Preface	xi
Conference photograph	xiii

Astronomical Data Analysis

Radio Astronomy

Methods and Problems in Radio Astronomy Data Analysis <i>L. Padrielli</i>	3
--	---

Infrared Astronomy

Methods of Analysis for the ISO-LWS Data <i>L. Spinoglio</i>	15
---	----

ISOCAM Data Processing

<i>J.-L. Starck, A. Claret</i>	25
--------------------------------	----

Optical Astronomy

Methods and Problems in Optical Astronomy Data Management and Analysis <i>R. J. Hanisch</i>	31
---	----

Artificial Neural Networks as a Tool for Galaxy Classification <i>O. Lahav</i>	43
---	----

X-Ray Astronomy

Methods and Problems of Data Analysis in X-Ray Astronomy <i>H. U. Zimmermann</i>	53
---	----

The BeppoSAX Mission <i>L. Scarsi</i>	65
--	----

Science with BeppoSAX	79
<i>L. Piro</i>	
The BeppoSAX Ground Support System	87
<i>L. Bruca, M. C. Falvella, M. B. Negri</i>	
The BeppoSAX Science Data Center	93
<i>P. Giommi, F. Fiore</i>	
The XAS Data Analysis System	101
<i>L. Chiappetti, D. Dal Fiume</i>	
The High Energy Experiment PDS on Board the BeppoSAX Satellite: Data Analysis and First Results	111
<i>D. Dal Fiume, F. Frontera, L. Nicastro, M. Orlandini, E. Palazzi, E. Costa, M. Feroci, G. Zavattini</i>	
The High Pressure Gas Scintillation Proportional Counter Experiment on Board BeppoSAX Satellite: Data Analysis and First Results	121
<i>A. Segreto, S. Piraino, A. Santangelo, G. Fazio, S. Giarrusso</i>	
The Medium Energy Experiment MECS on Board the BeppoSAX Observatory: Data Analysis and First Results	133
<i>B. Sacco, G. Cusumano, S. Del Sordo, G. La Rosa, M. C. Maccarone, T. Mineo, L. Chiappetti, G. Conti, S. Molendi, D. Ricci</i>	
The LECS Instrument on Board BeppoSAX: Methods and Problems in Data Analysis	143
<i>F. Favata, A. N. Parmar, U. Lammers, G. Vacanti, G. Thörner</i>	
The BeppoSAX WWW Catalog Browser	151
<i>P. Giommi, L. A. Antonelli, F. Fiore, A. Matteuzzi, S. Signorile</i>	

Some Early Results from the Rossi X-Ray Timing Explorer (RXTE)	157
<i>H. V. D. Bradt</i>	
ASCA Results on Galaxies and Clusters of Galaxies	179
<i>T. Ohashi</i>	
The All-Sky Survey and Pointing Catalogues of ROSAT	189
<i>W. Voges</i>	
Producing the ROSAT Bright Source Catalogue: The Screening Process	197
<i>R. Gruber, Th. Boller, J. Englhauser, F. Haberl, W. Pietsch, W. Voges, H.-U. Zimmermann</i>	
Source Detection with the Scaling Index Method	203
<i>G. Wiedenmann, H. Scheingraber, W. Voges</i>	
Aperiodic Variabilities and kHz QPOs in Low Mass X-Ray Binaries	213
<i>L. Burderi, N. R. Robba, T. Di Salvo, N. La Barbera, A. King, G. A. Wynn</i>	
The AXAF Data Analysis System: Infrastructure and New Features	221
<i>A. Fruscione</i>	
The AXAF Data Analysis System: Algorithms, Modelling and Fitting	227
<i>A. Siemiginowska</i>	
The XMM/EPIC EGSE Science Console Software	233
<i>M. Trifoglio, F. Gianotti, J. B. Stephen, L. Chiappetti</i>	
 Gamma-Ray Astronomy	
Methods and Problems in the Analysis of Gamma-Ray Burst Data	239
<i>K. Hurley</i>	

Periodic Analysis of Time Series Data as an Exemplar of Bayesian Methods <i>A. Connors</i>	251
The INTEGRAL Science Data Center <i>S. Mereghetti</i>	261
Advanced Methods	
Data Fusion in Remote Sensing <i>T. Taxt, A. H. Schistad Solberg</i>	269
Improving the Statistical Methodology in Astronomy <i>E. D. Feigelson, G. J. Babu</i>	281
Bayesian Deconvolution Methods in Astronomy <i>R. Molina, A. K. Katsaggelos, J. Mateos</i>	289
Cluster and Wavelet Analysis for Detachment of the Structure of Galaxy Cluster: Comparison <i>I. B. Vavilova</i>	297
A Regression Model Contribution to Astronomical Image Reconstruction <i>M. Haindl, S. Šimberová</i>	303
Two Approaches for Controlling Noise Amplification in Image Reconstruction <i>J. Núñez, J. Llacer, X. Otazu</i>	311
Wiener Reconstruction of the IRAS Galaxy Redshift Survey <i>M. Webster, O. Lahav, K. Fisher</i>	317
Progress in Computer Vision <i>A. K. Jain, C. Dorai</i>	325

Multiscale Vision and Its Application to Astronomy <i>A. Bijaoui, F. Rué, B. Vandame</i>	337
Signal Entropy Estimation from Noise Modeling <i>J.-L. Starck, F. Murtagh, R. Gastaud</i>	345
The Impact of Nanoelectronics on High-Speed Computing <i>M. J. B. Duff</i>	353
Electronic Astronomical Information Handling and Flexible Publishing <i>A. Heck</i>	365
Video Databases: Automatic Retrieval Based on Content <i>R. M. Bolle, B.-L. Yeo, M. Yeung</i>	377
The ALADIN Project: A Tool for Multiwavelength Cross-Identifications <i>J. G. Bartlett, F. Bonnarel, D. Egret, F. Genova, H. Ziaeepour, O. Bienaymé, F. Ochsenbein, M. Crézé, J. Florsch, M. Louys, P. Paillou</i>	385
Astronomical Virtual Observatory: The Astronomical Archives in the Network Age <i>M. Nanni</i>	391
Managing Very Large Astronomical Databases: A Pilot Project <i>A. Baruffolo, L. Benacchio</i>	397
Content-Based Information Retrieval in Astronomy: From Image Icons to Derived Attributes <i>A. Csillaghy</i>	403

Development and Capabilities of the ISOPHOT Interactive Analysis (PIA), A Package for Calibration and Astronomical Analysis	409
<i>C. Gabriel, J. Acosta-Pulido, I. Heinrichsen, H. Morris, D. Skaley, W.-M. Tai</i>	
datOZ: Scientific Databases Readily Accessible over the WWW	415
<i>P. F. Ortiz</i>	
Author Index	421