

# Contents

## Foreword

*Volker Schönfelder, Giselher Lichti, Christoph Winkler*

3

## Opening Session

### INTEGRAL - Overview and Current Status

*C. Winkler*

7

## Nucleosynthesis and Gamma-Ray Line Spectroscopy

### Astrophysical Gamma-Ray Lines: A Probe of Stellar Nucleosynthesis and Star Formation

*N. Prantzos*

15

### $^{26}\text{Al}$ Studies with INTEGRAL's Spectrometer SPI

*R. Diehl*

27

### SPI/INTEGRAL Observation of 1809 KEV Gamma-Ray Line Emission from the CYGNUS X Region

*J. Knödseder*

33

### Search For $^{26}\text{Al}$ in Gamma Velorum

*N. Mowlavi*

39

### Gamma-Ray Line Observations with RHESSI

*D. M. Smith*

45

### Status of the 511 KEV Line from the Galactic Centre Region

*P. Jean*

51

### Modeling the Early Annihilation Radiation Spectrum from INTEGRAL/SPI

*N. Guessoum*

57

### INTEGRAL and Light Dark Matter

*M. Cassé*

65

### Hypernovae as Possible Sources of Galactic Positrons

*S. Schanne*

73

<b>A Search for <math>^{44}\text{Ti}</math> Lines from Young Galactic Supernova Remnants with IBIS/ISGRI</b>	81
<i>M. Renaud</i>	

<b>Search for <math>^{44}\text{Ti}</math> Gamma-Ray Line Emission from GRO J0852-4642 with INTEGRAL/SPI</b>	87
<i>A. Von Kienlin</i>	

## Posters

<b>Updated Prospects for Detectability of Classical Novae with INTEGRAL</b>	95
<i>M. Hernanz</i>	

<b>Close Binary SNIB/C <math>^{26}\text{Al}</math> in Nearby OB Associations</b>	99
<i>J. C. Higdon</i>	

<b>Line Shape Diagnostics of Galactic <math>^{26}\text{Al}</math></b>	103
<i>K. Kretschmer</i>	

<b>Search for <math>^{26}\text{Al}</math> Emission in the Vela Region with INTEGRAL/SPI</b>	107
<i>D. Maurin</i>	

<b>Nucleosynthesis of <math>^{26}\text{Al}</math> in Rotating Wolf-Rayet Stars</b>	111
<i>A. Palacios</i>	

<b>3D-Simulations of Type IA Supernovae</b>	115
<i>A. Hirschmann</i>	

<b>Search for Galactic 1275 KEV Line Emission with SPI/INTEGRAL</b>	119
<i>P. Jean</i>	

<b>Search for Gamma-Ray Line Emission from the Radioactive Decay of <math>^{60}\text{Fe}</math> with SPI</b>	123
<i>J. Knödlseder</i>	

<b>SPI Observations of Positron Annihilation Radiation from the 4<sup>th</sup> Galactic Quadrant: Spectroscopy</b>	129
<i>V. Lonjou</i>	

<b>SPI Observations of Positron Annihilation Radiation from the 4<sup>th</sup> Galactic Quadrant: Sky Distribution</b>	133
<i>G. Weidenspointner</i>	

## Surveys

<b>The Sky Behind Our Galaxy as seen by IBIS on INTEGRAL</b>	
<i>L. Bassani</i>	139
<b>The SPI/INTEGRAL Survey of the Galactic Plane After One Year</b>	
<i>L. Bouchet</i>	147
<b>A JEM-X Survey for Weak Sources</b>	
<i>N. J. Westergaard</i>	153

## Posters

<b>From BEPOSAX to INTEGRAL: PDS Observations of Hard X-Ray Sources Detected in the IBIS Survey</b>	
<i>A. Malizia</i>	161
<b>Optically Variable Sources Monitored by the OMC</b>	
<i>A. Domingo</i>	165
<b>Gamma-Ray All-Sky Imaging with BATSE</b>	
<i>A. B. Hill</i>	169

## X-Ray Binaries (with Neutron Stars and Black Holes)

<b>MICROQUASAR-AGN-GRB Connections</b>	
<i>I. F. Mirabel</i>	175
<b>X-Ray Binaries and their Descendants: Binary Radio Pulsars; Evidence for Three Classes of Neutron Stars?</b>	
<i>E. P. J. Van Den Heuvel</i>	185
<b>First Observations of CYGNUS X-1 with SPI/INTEGRAL</b>	
<i>E. Jourdain</i>	195
<b>INTEGRAL Monitoring of the Black-Hole Candidate 1E 1740.7-2942</b>	
<i>M. Del Santo</i>	201
<b>Coordinated INTEGRAL and Optical Observations of SS433</b>	
<i>A. M. Cherepashchuk</i>	207
<b>INTEGRAL, XMM-NEWTON and ROSSI-XTE Observations of the State Transition of X-Ray Transient and Black-Hole Candidate XTE J1720-318</b>	
<i>M. Cadolle Bel</i>	215

<b>INTEGRAL Observations of CYGNUS X-3</b>	
<i>L. Hjalmarsson</i>	223
<b>The INTEGRAL LMXRB Monitoring Programme</b>	
<i>A. Paizis</i>	229
<b>The INTEGRAL View of the Galactic Nucleus</b>	
<i>A. Goldwurm</i>	237
<b>IGR J19140+098: A New INTEGRAL Transient</b>	
<i>J. Schultz</i>	243
<b>High-Energy Emission from IGR J16320-4751</b>	
<i>L. Foschini</i>	247
<b>Variability of X-Ray Pulsars in a Hard Energy Band Observed with INTEGRAL</b>	
<i>A. Lutovinov</i>	253
<b>INTEGRAL/IBIS Observations of VELA X-1 in a Flaring State</b>	
<i>R. Staubert</i>	259
<b>INTEGRAL Broadband Spectroscopy of VELA X-1</b>	
<i>P. Kretschmar</i>	267
<b>SAX J2103.5+4545, A Peculiar HMXRB Observed by INTEGRAL</b>	
<i>P. Blay</i>	273
<b>INTEGRAL Observations of EXO 2030+375 During Outburst</b>	
<i>A. Camero</i>	279
<b>Observations of the X-Ray Transient EXO 2030+375 with IBIS/ISGRI</b>	
<i>S. Kuznetsov</i>	285
<b>INTEGRAL/XMM-NEWTON Observation of the Accreting Millisecond Pulsar XTE J1807-294 in Outburst</b>	
<i>M. Falanga</i>	289
<b>INTEGRAL Observations of the Accreting Pulsar 4U 1626-67</b>	
<i>M. Denis</i>	295
<b>GRS 1915+105: The First Three Months with INTEGRAL</b>	
<i>D. Hannikainen</i>	299

## Posters

<b>First Results on X-Ray Bursters with INTEGRAL</b> <i>A. Bazzano</i>	309
<b>High-Energy Behaviour of the BHC IGR J17464-3213</b> <i>F. Capitanio</i>	313
<b>INTEGRAL Observations of Four Neutron-Star Low Mass X-Ray Binaries: GX 3+1, GX 354-0, GX 349+2 and the Rapid Burster</b> <i>R. Farinelli</i>	317
<b>Multi-Wavelength INTEGRAL Network (Mine) Observations of the MICROQUASAR GRS 1915+105</b> <i>Y. Fuchs</i>	321
<b>IBIS/ISGRI CYG X-3 Monitoring During the INTEGRAL Performance and Verification Phase</b> <i>P. Goldoni</i>	325
<b>XMM-NEWTON Observations of the BE/X-Ray Transient A0538-66 in Quiescence</b> <i>P. Kretschmar</i>	329
<b>GX 301-2 as Seen by INTEGRAL</b> <i>I. Kreykenbohm</i>	333
<b>A Study of CEN X-3 as Seen by INTEGRAL</b> <i>A. La Barbera</i>	337
<b>INTEGRAL Observation of CYG X-1 in an Intermediate State</b> <i>J. Malzac</i>	341
<b>INTEGRAL-RXTE Observations of CYGNUS X-1</b> <i>K. Pottschmidt</i>	345
<b>Hard X-Ray Emission from SERPENS X-1 as Observed by INTEGRAL</b> <i>N. Masetti</i>	349
<b>Spectral States and Transient Behaviour of a Sample of X-Ray Bursters Observed by BEPOSAX</b> <i>L. Natalucci</i>	353
<b>Extensive INTEGRAL Observations of the HMXB 4U 1700-377</b> <i>A. Orr</i>	357

<b>An INTEGRAL Open Time Observation of the HMXRB 4U 1700-377</b>	
<i>A. Orr</i>	361
<b>Revealing the Nature of the Highly Obscured Galactic Source IGR J16318 – 4848</b>	
<i>S. Chaty</i>	365
<b>INTEGRAL Monitoring of the Bright Neutron-Star Low-Mass X-Ray Binaries: Preliminary Results on GX 17+2</b>	
<i>S. Piraino</i>	369
<b>The Optical Counterpart to the X-Ray Transient Sax J2103.5+4545</b>	
<i>P. Reig</i>	373
<b>Strong QPOS and Hard Energy Tail in Simultaneous RXTE/INTEGRAL Observations of GRS 1915+105</b>	
<i>J. Rodriguez</i>	378
<b>Effects of Comptonization by Outflowing Plasma in Compact X-Ray Sources</b>	
<i>C. R. Shrader</i>	381
<b>The First Broad-Band Persistent X-Ray Spectrum of the Dipping Low Mass X-Ray Binary EXO 0748-676</b>	
<i>L. Sidoli</i>	385
<b>XMM-NEWTON Results on the Ultracompact Low Mass X-Ray Binary 4U 1850-087 in the Globular Cluster NGC 6712</b>	
<i>L. Sidoli</i>	389
<b>High-Energy Gamma Rays from Electromagnetic Cascades Inside Massive Binaries</b>	
<i>A. Sierpowska</i>	391
<b>INTEGRAL Instrument Capabilities: Analysis of Cataclysmic Variables and Related Objects</b>	
<i>V. Simon</i>	395
<b>Long-Term Activity of the Neutron Star Soft X-Ray Transients</b>	
<i>V. Simon</i>	399
<b>Light Curve Modelling of Time-Dependent Accretion Disks in X-Ray Novae with General Relativity Effects Taken Into Account</b>	
<i>V. F. Suleimanov</i>	403
<b>High Energy Emission from the Stellar Wind Collision in G-2 Velorum</b>	
<i>V. Tatischeff</i>	409

<b>An INTEGRAL Observation of the Black Hole Transient 4U 1630-47 and the Norma Region of the Galaxy</b>	413
<i>J. A. Tomsick</i>	
<b>IGR J16318-4848 &amp; Co: A New Population of Hidden High-Mass X-Ray Binaries in the Norma Arm of the Galaxy</b>	417
<i>R. Walter</i>	
<b>Three INTEGRAL Observations of X 1822-371</b>	423
<i>O. R. Williams</i>	
<b>A BEPPOSAX-WFC Viewpoint of New INTEGRAL Sources, Particularly IGR J17544-2619</b>	427
<i>J. in't Zand</i>	
<b>Evolutionary Constraints on the Masses of the Components of HDE 226868/CYG X-1 Binary System</b>	433
<i>J. Ziolkowski</i>	

## Pulsars

<b>The CRAB Nebula: Linking MEV Synchrotron and 50 TEV Inverse Compton Photons</b>	439
<i>D. Horns</i>	

## Posters

<b>Production of Gamma-Rays in the Pulsar Wind Nebulae</b>	449
<i>W. Bednarek</i>	
<b>INTEGRAL Observations of the Accreting Pulsar OAO 1657- 415</b>	453
<i>M. Denis</i>	
<b>ISGRI Observation of the CRAB Pulsar</b>	459
<i>G. Di Cocco</i>	
<b>Study of the CRAB Pulsar with the IBIS COMPTON Mode Data</b>	463
<i>M. Forot</i>	
<b>A Search for Cyclotron Resonance Features with INTEGRAL</b>	467
<i>Y. Okada</i>	
<b>A Study of the Variable Anomalous X-Ray Pulsar 1RXS J170849-400910 using XMM-NEWTON Data</b>	471
<i>T. Oosterbroek</i>	
<b>First Results on the HMXRB Pulsar Sax J2103.5+4545 with INTEGRAL</b>	475
<i>L. Sidoli</i>	

<b>Observations of PSR B1509-58 using INTEGRAL Core Program Data</b>	
<i>S. J. Sturmer</i>	479

## Supernova Remnants

<b>Cosmic Explosions</b>	
<i>W. Hillebrandt</i>	485

## Posters

<b>INTEGRAL Studies of Nonthermal Emission from Supernova Remnants Cassiopeia A, CTA 1, and MSH 11-61A</b>	
<i>S. J. Sturmer</i>	497

<b>Supernova Remnants in the Galactic Central Regions with INTEGRAL</b>	
<i>R. Terrier</i>	501

## Continuum Emission from the Galactic Disk

<b>SPI Measurements of the Diffuse Galactic Hard X-Ray Continuum</b>	
<i>A. W. Strong</i>	507

<b>Contribution of Point Sources to the Soft Gamma-Ray Galactic Emission</b>	
<i>R. Terrier</i>	513

## Posters

<b>Sources of Cosmic Rays and Galactic Diffuse Gamma Radiation</b>	
<i>S. Casanova</i>	521

<b>The INTEGRAL Milky Way</b>	
<i>R. Walter</i>	525

## Active Galactic Nuclei (Seyferts and Blazars)

<b>INTEGRAL Observations of the Bright QUASAR 3C 273</b>	
<i>T. J.-L. Courvoisier</i>	531

<b>NGC 4388 - Spectral Studies of the First Seyfert 2 seen by INTEGRAL</b>	
<i>V. Beckmann</i>	535

<b>Coordinated Multiwavelength Observations and Spectral Variability Modeling of Gamma-Ray Blazars</b>	
<i>M. Boettcher</i>	543

## Posters

### **Blazars seen by INTEGRAL**

*F. Munz* 553

### **Multifrequency Observations of the Gamma-Ray Blazar 3C 279 in Low-State During INTEGRAL AO-1**

*W. Collmar* 555

### **VLBA Monitoring of 3C 273 and 3C 279 During INTEGRAL Campaigns**

*T. Savolainen* 559

### **INTEGRAL and RXTE Observations of Broad-Line Radio Galaxy 3C 111**

*M. Chernyakova* 563

### **The BATSE 9 Year Histories of the Brightest AGN**

*A. B. Hill* 567

### **Intermittent Activity in AGN**

*A. Janiuk & B. Czerny* 571

### **Combining VLBI and Gamma-Ray Satellite Observations in Blazar Research**

*K. Wiik* 575

## **External Galaxies, Clusters of Galaxies, Cosmic Background Radiation Posters**

### **Search For a Light Dark Matter Annihilation Signal in the Sagittarius Dwarf Galaxy**

*B. Cordier* 581

### **INTEGRAL Observations of the Large Magellanic Cloud Region**

*S. Mereghetti* 585

### **2-100 KEV Spectrum of an Actively Star Forming Galaxies**

*M. Persic* 589

### **Predictions on the High-Energy Emission from the Coma Cluster**

*A. Reimer* 593

## **Gamma-Ray Bursts**

### **The INTEGRAL Burst Alert System: Results and Future Perspectives**

*S. Mereghetti* 599

**The Samples of Gamma-Ray Bursts Observed with SPI-ACS**  
*A. Rau* 607

**The INTEGRAL View of the Soft Gamma-Ray Repeater 1806-20**  
*D. Gotz* 615

**Gamma-Ray Bursts and X-Ray Melting of Material as a Potential Source of Chondrules and Planets**  
*P. Duggan* 623

## Posters

**Search for GRBS and X-Ray Flashes in the X-Ray Monitor on INTEGRAL**  
*S. Brandt* 633

**BOOTES: A Stereoscopic and Robotic Ground-Support Facility for the INTEGRAL Era**  
*A. J. Castro-Tirado* 637

**Investigating the Nature of Very Short Bursts Detected in the Anti-Coincidence Shield of INTEGRAL/SPI**  
*S. Deluit* 641

**INTEGRAL Joins the 3<sup>rd</sup> Interplanetary Network**  
*K. Hurley* 645

**The Background of the INTEGRAL SPI Anticoincidence Shield and the Observations of GRBS**  
*S. Larsson* 649

**Preliminary INTEGRAL Analysis of GRB 040106**  
*L. Moran* 653

**Total Radiated Energy Versus Redshift in Gamma-Ray Bursts**  
*G. Pizzichini* 657

**Impact of Colour Indices of Optical Afterglows of GRBS on the Analysis of their Physical Properties**  
*V. Simon* 659

**GRB 030913: Hunting the Afterglow**  
*A. De Ugarte Postigo* 663

## **Solar Flares Posters**

### **INTEGRAL/SPI Observation of the 2003 Oct 28 Solar Flare**

*M. Gros*

669

### **Solar Flare and CME Correlations seen by IREM and RHESSI**

*A. Mchedlishvili*

677

## **Unidentified Gamma-Ray Sources Posters**

### **Study of Unidentified Egret Sources with INTEGRAL: First Results and Future Prospects**

*G. Di Cocco*

683

### **A Chandra Deep X-Ray Exposure on the Galactic Plane and Near Infrared Identification**

*K. Ebisawa*

687

### **Systematic Search for Short-Transient and Pulsation Events from INTEGRAL Survey Data**

*K. Ebisawa*

691

### **Egret Unidentified Sources and the Galactic Spiral Arms**

*T. Miyagi*

695

### **GMRT Observations of X-Ray Binaries Including New INTEGRAL Sources**

*M. D. Pandey*

699

### **Unidentified Gamma-Ray Sources and Microquasars**

*G. E. Romero*

703

### **On the Nature of the Unidentified MEV Gamma-Ray Source GRO J1411-64**

*G. E. Romero*

707

## **Performance of INTEGRAL Instruments**

### **SPI Energy Calibration**

*V. Lonjou*

713

### **IBIS In Flight Performance**

*P. Ubertini*

717

### **Performance of JEM-X on INTEGRAL**

*N. Lund*

723

**OMC: An Optical Monitoring Camera for INTEGRAL**

*J. M. Mas-Hesse*

729

**Other Instruments**

**Gamma-Ray Astronomy starts to see CLAIRE: First Light for a Crystal Diffraction Telescope**

*H. Halloin*

739

**The MAX Mission: Focusing on High-Sensitivity Gamma-Ray Spectroscopy**

*P. Von Ballmoos*

747

**Posters**

**Long Distance Test of the CLAIRE Gamma-Ray Lens**

*J. M. Alvarez*

757

**Calibration of the Mega Prototype**

*R. Andritschke*

761

**Pixelized Gas Micro-Well Detector for Advanced Gamma-Ray Telescope**

*P. F. Bloser*

765

**PICSIT, the IBIS High-Energy Detection Plane: Instrument Status and Scientific Performance Results**

*G. Di Cocco*

769

**INTEGRAL: the Identification, Isolation and Recovery of the Instruments Anomalies Conditions**

*F. Di Marco*

773

**The Swift Gamma-Ray Burst Mission**

*N. Gehrels*

777

**Light-Weight X-Ray Optics for Future Space Projects**

*R. Hudec*

781

**Lobster-Eye X-Ray Telescope**

*R. Hudec*

785

**The OMC on INTEGRAL: Object Selection and Astrometry**

*V. Hudcova*

789

**Lobster All-Sky Monitor**

*L. Sveda*

793

<b>The System for Autofocusing of Wide-Field Cameras</b>	
<i>S. Vitek</i>	797
<b>Analysis of Transfer Function of Image Sensors</b>	
<i>S. Vitek</i>	801
<b>RHESSI Satellite as Efficient Gamma Ray Burst Detector</b>	
<i>W. Hajdas</i>	805
<b>Can RHESSI be used as GRB Polarimeter?</b>	
<i>C. Wigger</i>	809
<b>Data Analysis Posters</b>	
<b>The INTEGRAL/SPI Response and the CRAB Observations</b>	
<i>P. Sizun</i>	815
<b>Characterization and Prediction of the SPI Background</b>	
<i>B. J. Teegarden</i>	819
<b>Bayesian Imaging Reconstruction Methods for INTEGRAL/SPI</b>	
<i>M. Allain</i>	823
<b>Lossy Compression of Astronomical Images</b>	
<i>M. Bernas</i>	829
<b>Systematics of ISGRI and JEM-X Mosaic Images</b>	
<i>A. Bodaghee</i>	833
<b>Improved Mosaicking Capabilities with JEMX</b>	
<i>J. Chenevez</i>	837
<b>Performance of SPI Point-Source Data Analysis</b>	
<i>P. Dubath</i>	841
<b>Source Detection and Background Estimation with Bayesian Inference</b>	
<i>F. Guglielmetti</i>	847
<b>Astronomical Plate Archives as Supplementary Data for INTEGRAL Science</b>	
<i>R. Hudec</i>	851

<b>Background in the Multiple Events (ME) of INTEGRAL/SPI</b>	855
<i>E. Kalemci</i>	
<b>Measuring Polarization with SPI on INTEGRAL</b>	859
<i>E. Kalemci</i>	
<b>Cross Calibration of Instruments on Board XMM-NEWTON and INTEGRAL with the CRAB</b>	863
<i>M. G. F. Kirsch</i>	
<b>SPI Data Analysis: The CESR/Toulouse Approach</b>	867
<i>J. Knödlseeder</i>	
<b>INTEGRAL Cross-Calibration Status</b>	871
<i>P. Lubinski</i>	
<b>OMC-INTEGRAL: Optical Observations of X-Ray Sources</b>	875
<i>M. D. Caballero</i>	
<b>Correcting for the Unexpected: Dead Anodes, Glitches, Hotspots and Gain Drift in JEM-X Data Processing</b>	879
<i>C. A. Oxborrow</i>	
<b>PCA Based Compression Technique for the BOOTES Image Data</b>	883
<i>P. Pata</i>	
<b>IBIS Compton Mode: Subtraction of the Random Coincidences</b>	887
<i>A. Segreto</i>	
<b>IBIS Compton Mode: Analysis of the Random Coincidences</b>	893
<i>A. Segreto</i>	
<b>Scientific Performance of the ISDC Quick Look Analysis</b>	897
<i>S. E. Shaw</i>	
<b>XSPEC 12: Capabilities for Coded-Mask Spectral Analysis</b>	901
<i>C. R. Shrader</i>	
<b>MGGPOD: A Monte Carlo Suite for Gamma-Ray Astronomy</b>	905
<i>G. Weidenspointner</i>	
<b>A Preliminary Exposure-Map Based Comparison of SPI and RHESSI <sup>26</sup>AL FLUX Measurements</b>	909
<i>C. B. Wunderer</i>	

**Modelling of the Detector Background Spectrum for the Low-Earth Orbit GE Spectrometer RHESSI  
with MGGPOD**

*C. B. Wunderer*

913

**Image Reconstruction for the Mega Telescope**

*A. Zoglauer*

917

**Polarization Measurements with the Mega Telescope**

*A. Zoglauer*

921