

MEMORIE DELLA SOCIETÀ ASTRONOMICA ITALIANA

Vol.83 n.1 2012

## Workshop on Multifrequency Behaviour of High Energy Cosmic Sources

Vulcano, May 23-28, 2011

editors: F. Giovannelli and L. Sabau-Graziati

## TABLE OF CONTENTS

|   |    |
|---|----|
| <i>Index</i>  | 5  |
| <i>Foreword</i>   | 10 |
| <i>List of participants</i>   | 13 |
| <b>Session I: Opening remark</b>  |    |
| Franco Giovannelli and Lola Sabau-Graziati<br><i>Multifrequency behaviour of high energy cosmic sources</i>   | 17 |
| Wolfgang Kundt<br><i>ISM, Cosmic Rays, and the Shape of the Heliosphere</i>   | 38 |
| S. Iglesias-Groth<br><i>Fullerenes and PAHs in space</i>  | 45 |
| <b>Session II: Cosmology</b>  |    |
| G.S. Bisnovatyi-Kogan1 and O.Yu. Tsupko<br><i>Gravitational lens</i>  | 54 |
| Marco Regis<br><i>The cosmic microwave background in an inhomogeneous universe</i>  | 67 |
| J.A. Tauber, on behalf of the Planck Collaboration<br><i>The Planck mission</i>   | 72 |
| T. Nozawa, T. Kozasa, H. Umeda, K. Maeda, K. Nomoto, N. Tominaga, D. Yamasawa,<br>A. Habe, and H. Hirashita<br><i>Supernovae as sources of dust in the early universe</i> | 77 |
| Keiichi Maeda<br><i>Type Ia supernova explosion mechanism and implications for cosmology</i>  | 82 |

|  |     |
|--|-----|
| P. Bordas<br><i>Large-scale emission from Fanaro-Riley galaxies</i>  | 87  |
| <b>Session III: Astrophysics of high energy cosmic sources</b>   |     |
| Paolo Persi<br><i>The Crab Nebula in the infrared: a review</i>  | 92  |
| N. Schartel<br><i>XMM-Newton highlights</i>  | 97  |
| G. Di Sciascio on behalf of the ARGO-YBJ Collaboration<br><i>Gamma-ray astronomy with ARGO-YBJ</i>                   | 105 |
| Todor Stanev<br><i>Explosions of massive stars with magnetic winds: (cosmic ray acceleration)</i>                    | 110 |
| Roland Crocker<br><i>Fermi bubbles: Galactic centre star formation writ large</i>                                    | 117 |
| I. Donnarumma on behalf of the AGILE Team<br><i>The blazar Mrk 421: a short multifrequency review</i>                | 122 |
| Frank M. Rieger<br><i>Cen A as gamma- and UHE cosmic-ray source</i>  | 127 |
| Th. Boller<br><i>Inner disc reflection and AGN accretion states AGN Review</i>                                       | 132 |
| L. Costamante<br><i>AGNs in the VHE gamma-ray era: a review</i>  | 138 |
| K. Hryniewicz and B. Czerny<br><i>The origin of the broad line region in active galactic nuclei</i>                  | 146 |
| J.K. Becker, F. Schuppan, and S. Schoeneberg<br><i>A multifrequency view of starburst galaxies</i>                   | 154 |
| M. Tluczykont for the H.E.S.S. Collaboration<br><i>Multi-wavelength observations of H.E.S.S. AGN</i>                 | 162 |
| M.J. Church and M. Bałucińska-Church<br><i>A review of the Z-track sources</i>                                       | 170 |
| M. Bałucińska-Church and M.J Church<br><i>Dipping - versus flaring in Z-track sources: resolving the controversy</i> | 178 |
| C. Pittori, on behalf of the AGILE Collaboration<br><i>AGILE highlights</i>  | 186 |
| V. Bosch-Ramon<br><i>Multifrequency behavior of microquasars in the GeV-TeV era: a review</i>                        | 194 |

|   |     |
|---|-----|
| M.A. Nowak, J. Wilms, M. Hanke, K. Pottschmidt, and S. Markoff<br><i>The microquasar Cyg X-1: a short review</i>                                  | 202 |
| S. Sabatini, on behalf of the AGILE team<br><i>Gamma-ray monitoring of Cygnus X-1 with the AGILE satellite</i>                                    | 207 |
| J. Ziolkowski<br><i>Black holes in dormant X-ray transients</i>   | 213 |
| M. Valtonen and S. Ciprini<br><i>OJ287 binary black hole system</i>   | 219 |
| M. De Laurentis, S. Capozziello, Ivan De Martino and Michelangelo Formisano<br><i>Cosmological distance indicators by coalescing binaries</i>     | 225 |
| I. Caballero and J. Wilms<br><i>X-ray pulsars: a review</i>   | 230 |
| V. Simon<br><i>Optical monitoring of binary X-ray sources</i>   | 238 |
| P.J. Meintjes and B. van Soelen<br><i>Modeling the IC gamma-ray emission in the Be-pulsar binary PSR B1259-63</i>                                 | 246 |
| P. Blay, I. Negueruela and V. Reglero<br><i>Supergiant Fast X-ray Transients: an INTEGRAL view.</i>   | 251 |
| N. Lewandowska, C. Wendel, V. Kondratiev, D. Elsaesser and K. Mannheim<br><i>Giant radio pulses of the Crab Pulsar - A multifrequency study -</i> | 259 |
| Keiichi Maeda<br><i>Core-collapse supernova diversities From the weakest to most powerful explosions</i>  | 264 |
| R. Napiwotzki and M.D.V. Silva<br><i>Runaway and hypervelocity stars - The supernova connection</i>   | 272 |
| Satoru Katsuda and Hiroshi Tsunemi<br><i>Violent evolution of supernova remnants as revealed by Chandra and XMM-Newton</i>                        | 277 |

#### **Session IV: Jet sources and Gamma-Ray Bursts**

|  |     |
|--|-----|
| J.H. Beall<br><i>The interaction of astrophysical jets with the ambient medium: a review</i> | 283 |
| J.H. Beall, J. Guillory and D.V. Rose<br><i>Large scale modeling of astrophysical jets</i>   | 291 |
| M. Perucho<br><i>Jets in high-mass microquasars</i>  | 297 |

|   |     |
|---|-----|
| E. Del Monte, G. Barbiellini, F. Fuschino, A. Giuliani, F. Longo, M. Marisaldi, M. Trifoglio, A. Argan, A. Bulgarelli, P. Caraveo, P.W. Cattaneo, A. Chen, E. Costa, G. DiCocco, I. Donnarumma, Y. Evangelista, M. Galli, F. Gianotti, C. Labanti, I. Lapshov, F. Lazzarotto, P. Lipari, S. Mereghetti, A. Morselli, L. Pacciani, A. Pellizzoni, F. Perotti, P. Picozza, M. Pilia, M. Prest, G. Pucella, M. Rapisarda, A. Rappoldi, P. Soffitta, M. Tavani, A. Trois, S. Vercellone, V. Vittorini and C. Pittori<br><i>The observation of Gamma Ray Bursts with AGILE</i> | 302 |
| L. Milano, E. Calloni, R. De Rosa, M. De Laurentis, L. Di Fiore ,L. Forte , F. Garufi, S. Mosca, M. Parisi<br><i>Upper limits of gravitational-wave bursts associated with Gamma-Ray Bursts</i>   | 307 |
| D. Fargion<br><i>GRBs by thin persistent precessing lepton Jets: the long life GRB110328 and the Neutrino signal</i>  | 312 |
| R. Salvaterra<br><i>The farthest GRBs similar to the closest</i>  | 319 |
| S. Capozziello, V.F. Cardone, M.G. Dainotti, M. De Laurentis, L. Izzo M. Perillo<br><i>The Gamma Ray Bursts Hubble diagram</i>  | 324 |

## Session V: Ongoing experiments

|  |     |
|--|-----|
| J. Clavel<br><i>Cosmic Vision 2015-2025: ESA's long term programme in space sciences</i>   | 329 |
| M.D. Rodríguez Frías for the JEM-EUSO Consortium<br><i>The JEM-EUSO Space Mission @ forefront of the highest energies never observed from Space</i>  | 337 |
| R. Hudec, V. Simon, L. Hudec and V. Hudcova<br><i>ESA Gaia &amp; the multifrequency behavior of high-energy sources with ultra-low dispersion spectroscopy</i>                                 | 342 |
| Manuel Reina, Lola Sabau-Graziati, Juana Maria Rodrigo and Victor Reglero<br><i>Modular X and gamma rays sensor, a space-based instrument for transient lighting events in high atmosphere</i> | 347 |
| E. Del Monte and I. Donnarumma on behalf of the LOFT consortium<br><i>Strong gravity studies with the Large Observatory For X-ray Timing (LOFT)</i>  | 352 |
| G. Tagliaferri, on behalf of the NHXM consortium<br><i>NHXM: a New soft and Hard X-ray imaging and polarimetric Mission</i>  | 360 |
| R. Hudec, V. Simon and V. Tichy<br><i>Lobster-eye X-ray monitors: astrophysical aspects</i>  | 365 |
| J.M. Rodrigo, J.M. Macian, J.T. Biosca, M. Reina, L. Sabau-Graziati and V.Reglero<br><i>UFFO Burst Alert &amp; Trigger Telescope (UBAT): a new instrument for GRBs detection</i>               | 370 |

|  |     |
|--|-----|
| B.L. Martino and M. Federici<br><i>An high availability data storage subsystem for the INTEGRAL data analysis</i>  | 377 |
| M. Garattini, C. Lops, S. Dell'Agnello, A. Boni, S. Berardi, C. Cantone, G.O. Delle Monache, N. Intaglietta, M. Maiello, M. Martini, G. Patrizi, L. Porcelli, M. Tibuzzi, D.G. Currie, R. Vittori, G. Bianco, T. Murphy, A. Coradini, C. Dionisio, R. March, G. Bellettini and R. Tauraso<br><i>Probing gravity with the proposed MAGIA and ILN lunar missions</i> | 382 |
| M. Hamuy, G. Pignata, J. Maza, A. Clocchiatti, J. Anderson, M. Bersten, G. Folatelli, F. Forster, C. Gutierrez, J. Quinn, M. Stritzinger, P. Zelaya<br><i>The CHilean Automatic Supernova sEarch</i>   | 388 |
| <b>Special night session</b>   |     |
| N. Panagia<br><i>The Hubble Space Telescope: 21 years and counting</i>   | 393 |
| <b>Concluding remarks</b>  |     |
| G.S. Bisnovatyi-Kogan<br><i>Concluding remarks</i>   | 401 |
| J. Ziolkowski<br><i>Concluding remarks</i>   | 403 |
| <b>Concluding address</b>  |     |
| F. Giovannelli<br><i>Concluding address</i>  | 407 |
| R. C. Henry<br><i>Progress in understanding the diffuse UV cosmic background</i>   | 409 |