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Proceedings of the International Astronomical Union

Jets at All Scales

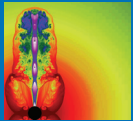
Jets at

All Scales

Edited by

Romero
Sunyaev
Belloni

Gustavo E. Romero
Rashid A. Sunyaev
Tomaso Belloni



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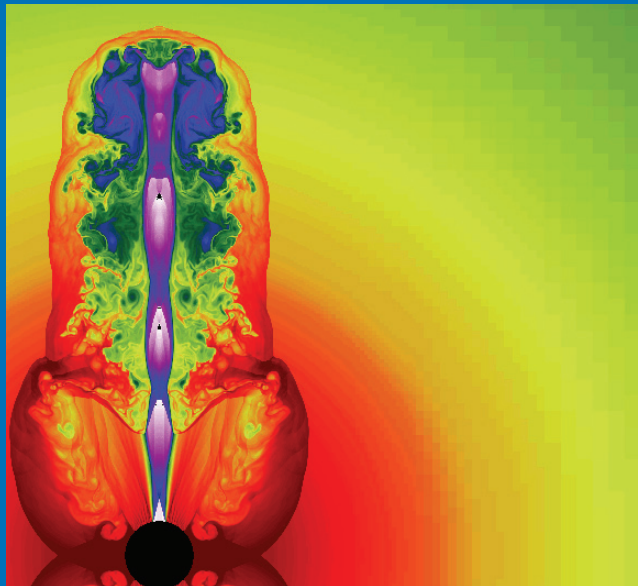


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COVER ILLUSTRATION:

The picture shows a relativistic jet propagating through a massive star in a simulation of the collapsar model for gamma-ray bursts. The jet has Lorentz factor of 50 in its core. The red flow to either side of the jet is a non-relativistic flow originating from an accretion disk wind. In the collapsar case, this wind is rich in radioactive Nickel-56 and may be responsible for the bright supernovae observed to accompany long gamma-ray bursts.

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thierry.montmerle@obs.ujf-grenoble.fr*

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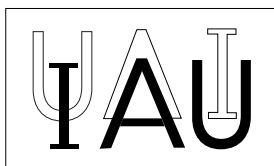
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JETS AT ALL SCALES

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Edited by

Gustavo E. Romero

*Instituto Argentino de Radioastronomía (CCT La Plata-CONICET), Villa
Elisa, Argentina*

Rashid A. Sunyaev

MPI for Astrophysik, Germany, and Space Research Institute, Russia

and

Tomaso M. Belloni

INAF, Osservatorio Astronomico di Brera, Italy



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Preface

The IAU Symposium No. 275 on *Jets at all Scales* was held in Buenos Aires city, Argentina, in September 2010. Out of 187 registered participants, more than 150 from 31 countries met at the Novotel in the traditional Calle Corrientes of Buenos Aires to discuss the latest results on astrophysical jets and outflows.

The first ideas for this Symposium appeared at discussions among participants of the 7th Microquasar Workshop, entitled *Microquasars and Beyond*, held in Foca, Izmir, Turkey, on September, 2008. The series of Microquasar Workshops had by then extended over more than a decade and started to attract participants from far beyond the relatively small community of researchers on galactic binary systems. Comparisons between the jets of microquasars and those presented by other astrophysical objects like gamma-ray bursts, active galactic nuclei, and young stellar objects were becoming more and more common in these meetings. The time seemed to have arrived for a much larger meeting that could gather outstanding researchers from all these different fields to discuss in length the similarities and differences among all types of jets, as well as the underlying physics.

The opportunity came in 2009 with the endorsement and sponsoring by IAU Commissions and Divisions and subsequent approval by the IAU Executive Committee. The final proposal was written during rainy and cold days in Paris, with the input and help of several members of the by-then proposed SOC. The task of assembling the programme was a challenge that required many consultations to many members of the different research fields involved. The final result reflects, I think, a good balance of different topics related to the production, collimation, propagation, interaction, and radiative properties of jets on all scales. Both new theoretical and observational results of high impact were presented at the Symposium. The discussions, in part reflected in this book, were highly motivating and constructive. Many of them occurred during extensive coffee breaks, posters sessions, and in the nearby cafés of Buenos Aires. Their effect, I am sure, will appear in many forthcoming publications.

The meeting was also an occasion to celebrate Félix Mirabel's 65th birthday and pay tribute to his outstanding contributions to our current knowledge of jets. Félix has been a source of inspiration for all of us that have worked with him and had the privilege to share long scientific discussions on the most varied topics. His permanent action fostering high-energy astrophysics in South America deserves a particular mention.

It has past a while since the last IAU Symposium was held in Argentina. This new occasion helped to promote a research field that is growing very fast in several South American countries. It was also a good opportunity to show how strong is the female astrophysical community in Argentina: 17 out of 25 Argentinians that attended the Symposium were women. I doubt that such a rate can be matched in any other country!

It is a great pleasure to acknowledge the financial support of our sponsors listed on page *xiv* of these Proceedings, and the active support of the members of the LOC in realizing the numerous details always associated with such a symposium, in particular Ileana Andruchow (FCAyG, UNLP) and Florencia L. Vieyro (IAR, CONICET). Both were far beyond their duty to take care of every detail of the meeting. Very special thanks go to Matías M. Reynoso (IFIMAR, CONICET) for his essential help to prepare the manuscript of this book and the careful transcription of the discussion sheets. I, personally, remain grateful to Carlos Hatcherian and Marina Piranian, from Booking Travel SRL, for their help and kind assistance. I want also to thank all the members of

my group for their participation and support. The strongest support, nonetheless, came from my family: thanks Paula and Blumi. Probably my daughter will never forget that she spent her 12th birthday in the Welcome Cocktail of a Symposium on astrophysics.

Let us hope that this book will help to motivate further discussions on astrophysical jets and inspire new symposia devoted to the topic, initiating a new series.

*Gustavo E. Romero, chair, SOC and LOC
Heidelberg, December 8, 2010*

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CONFERENCE PHOTOGRAPH



Participants

Ileana **Andruchow**, IALP/FCAGLP - CONICET/UNLP, Argentina andru@fcaglp.unlp.edu.ar
 Anabella **T. Araudo**, IAR - CONICET, Argentina aaraudo@fcaglp.unlp.edu.ar
 Keiichi **Asada** ASIAA, Taiwan asada@asiaa.sinica.edu.tw
 Maarten **Baes**, Universiteit Gent, Belgium maarten.baes@ugent.be
 Tiara **Battich**, FCAGLP-UNLP, Argentina battich@carina.fcaglp.unlp.edu.ar
 Wlodek **Bednarek**, University of Lodz, Department of Astrophysics, Poland bednar@astro.phys.uni.lodz.pl
 Paula **Benaglia**, Instituto Argentino de Radioastronomía, Villa Elisa, Argentina paula@irma.iar.unlp.edu.ar
 Valenti **Bosch-Ramon**, Universitat de Barcelona, Spain vbrcat@yahoo.com
 Omer **Bromberg**, The Hebrew University Jerusalem, Israel omer@wise.tau.ac.il
 Leila Magdalena **Calcaferro**, FCAGLP-UNLP, Argentina leila_1385@hotmail.com
 Anderson **Caproni**, Universidade Cruzeiro do Sul, Brazil anderson.caproni@cruzeirodosul.edu.br
 Alberto J. **Castro-Tirado**, IAA-CSIC, Spain ajct@iaa.es
 Sergio **Cellone**, FCAGLP, UNLP & IALP, CONICET-UNLP Argentina scellone@fcaglp.unlp.edu.ar
 Anna Lisa **Celotti**, SISSA, Italy celotti@sisssa.it
 Tao **Chen**, CEA Service d'Astrophysique, France tao.chen@cea.fr
 Yoon Young **Chun**, Sabanci University, Turkey cimo@jive.nl
 Giuseppe **Cimo**, Joint Institute for VLBI in Europe, Netherlands jcombi@fcaglp.unlp.edu.ar
 Jorge Ariel **Combi**, IAR, Argentina sacora@fcaglp.unlp.edu.ar
 Sofía Alejandra **Cora**, Instituto de Astrofísica de La Plata, Argentina stephane.corbel@cea.fr
 Stephane **Corbel**, University Paris Diderot & CEA Saclay, France mickael.coriat@cea.fr
 Mickael **Coriat**, CEA-Saclay / Univ. Paris Diderot, France camilacorrea@carina.fcaglp.unlp.edu.ar
 Camila Anahi **Correa**, FCAGLP-UNLP, Argentina david.cseh@cea.fr
 David **Cseh**, CEA Service d'Astrophysique, France Thomas.Dauser@sternwarte.uni-erlangen.de
 Thomas **Dauser**, Remeis-Observatory & ECAP, Bamberg, Germany fabio@ucolick.org
 Fabio **De Colle**, Astron. & Astrophys. Dep., University of California, USA dalpino@astro.iag.usp.br
 Elisabete de **Gouveia Dal Pino**, University of Sao Paulo - IAG-USP, Brazil maria@iar-conicet.gov.ar
 Maria V. del **Valle**, IAR - CONICET, Argentina charles.dermer@nrl.navy.mil
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 Richard **Dubois**, SLAC National Accelerator Laboratory, USA eikenberry@astro.ufl.edu
 Stephen **Eikenberry**, University of Florida Research Foundation D.Emmanoulopoulos@soton.ac.uk
 Dimitrios **Emmanoulopoulos**, University of Southampton, UK fabrika@sao.ru
 Sergei **Fabrika**, Special Astrophysical Observatory, Russia diego.goncalves@cruzeirodosul.edu.br
 Diego **Falceta-Goncalves**, Universidade Cruzeiro do Sul, Brazil h.falcke@astro.ru.nl
 Heino **Falcke**, Radboud University Nijmegen/ASTRON, The Netherlands jhfan-cn@yahoo.com.cn
 Junhui **Fan**, Center for Astrophysics, Guangzhou University, China fendt@mpia.de
 Christian **Fendt**, Max Planck Institute for Astronomy, Germany Jonathan.Ferreira@obs.ujf-grenoble.fr
 Jonathan **Ferreira**, Laboratoire d'Astrophysique de Grenoble, France luigi.foschini@brera.inaf.it
 Luigi **Foschini**, INAF - Osservatorio Astronomico di Brera, Italy gfossati@rice.edu
 Giovanni **Fossati**, Rice University, USA cfromm@mpifr.de
 Christian **Fromm**, Max Planck Institute for Radio Astronomy, Bonn, Germany egallo@mit.edu
 Elena **Gallo**, University of Michigan, USA fgarcia@carina.fcaglp.unlp.edu.ar
 Federico **García**, FCAGLP-UNLP, Argentina Walter.Gear@astro.cf.ac.uk
 Walter **Gear**, CF, UK giancarlo.ghirlanda@brera.inaf.it
 Giancarlo **Ghirlanda**, INAF-Osservatorio Astronomico di Brera, Italy gabriele.ghisellini@brera.inaf.it
 Gabriele **Ghisellini**, INAF-Osservatorio Astronomico di Brera, Italy ggiovann@ira.inaf.it
 Gabriele **Giovannini**, Instituto di Radioastronomia, Italy ngizani@eap.gr
 Nectaria **Gizani**, Hellenic Open University, Greece y.gomez@crya.unam.mx
 Yolanda **Gomez**, CRYA-UNAM, Mexico guillard@ipac.caltech.edu
 Pierre **Guillard**, Spitzer Science Center, Caltech, USA phardee@bama.ua.edu
 Philip **Hardee**, University of Alabama, USA jhSh@virginia.edu
 John **Hawley**, University of Virginia, USA mahaya@slac.stanford.edu
 Masaaki **Hayashida**, KIPAC/SLAC, USA martinhe@pas.rochester.edu
 Martin **Huarte Espinosa**, University of Rochester & Cambridge Cavendish Astrophysics Group, USA
 Naoki **Iso**, Kyoto University, Japan n-iso@kusastro.kyoto-u.ac.jp
 Agnieszka **Janiuk**, Copernicus Astronomical Center, agnes@camk.edu.pl
 Polish Academy of Sciences, Poland
 Sarka **Jiraskova**, Radboud University Nijmegen, the Netherlands sarka@astro.ru.nl
 Emrah **Kalemci**, Sabanci University, Tuzla, Turkey ekalemci@sabanciuniv.edu
 John **Kirk**, Max-Planck-Institut für Kernphysik, Heidelberg, Germany John.Kirk@mpi-hd.mpg.de
 Shinji **Koide**, Kumamoto University, Japan koidesin@sci.kumamoto-u.ac.jp
 Karri **Koljonen**, Alto University Metsähovi Radio Observatory, Finland karri.koljonen@gmail.com
 Ruben **Krasnopolsky**, Academia Sinica, Taiwan (R.O.C.) ruben@asiaa.sinica.edu.tw
 Wolfgang **Kundt**, Argelander Institute of Bonn University, Germany wkundt@astro.uni-bonn.de
 Magdalena **Kunert-Bajraszaska**, Torun Centre for Astronomy, Poland magda@astro.uni.torun.pl
 Nick **Kylafis**, University of Crete and FORTH, Greece kylafis@physics.uoc.gr
 Alvaro **Labiano**, European Space Agency, Spain alabiano@sciops.esa.int
 Tatiana **Larchenkova**, Astro Space Center P.N.Lebeshev Physical Institute, Russia tanya@lukash.asc.rssi.ru
 Laurits **Leedjärv**, Tartu Observatory, Estonia leed@aai.ee
 Amir **Levinson**, Dep. of Phys. Faculty of Exact Sc., Tel Aviv University, Israel Levinson@wise.tau.ac.il
 Diego **Lopez-Camara Ramirez**, Instituto de Ciencias Nucleares, UNAM, Mexico diego.lopez@nucleares.unam.mx
 Alexander **Lutovinov**, Space Research Institute, Russia aal@iki.rssi.ru
 Yuri **Lyubarsky**, Physics Department, Ben-Gurion University, Israel lynub@bgu.ac.il
 Dipankar **Maitra**, University of Michigan, USA dmaitra@umich.edu
 Julien **Malzac**, CESR (CNRS/Univestit Toulouse), France malzac@cesr.fr
 Sera **Markoff**, Astronomical Institute "Anton Pannekoek" University of Amsterdam s.b.markoff@uva.nl
 Francesco **Massaro**, Harvard - Smithsonian Astrophysical Observatory, USA fmassaro@cfa.harvard.edu
 David **Meier**, Jet Propulsion Laboratory, California Institute of Technology, USA dlm@jpl.nasa.gov
 Attila **Meszáros**, Charles University, Prague, Czech Republic meszaros@cesnet.cz
 Claire **Michaut**, LUTH - Observatoire de Paris, France Claire.Michaut@obspm.fr
 Simone **Migliari**, European Space Agency, Spain smigliari@sciops.esa.int
 James **Miller-Jones**, University of Valencia, Spain jmiller@nrao.edu
 Petar **Mimica**, University of Valencia, Spain Petar.Mimica@uv.es
 Felix **Mirabel**, CONICET & CEA, Argentina & France mirabel@iafe.uba.ar
 Danilo **Morales Teixeira**, IAG-USP, Brazil danilo@astro.iag.usp.br
 Ludmila **Nazarova** EuroAsian Astron. Socc, Univ. pr.13, Moscow, Russia lsnazarova@rambler.ru
 Joseph **Nielsen**, Harvard, USA jnielsen@head.cfa.harvard.edu

- Ken-Ichi **Nishikawa**, UAH/CSPAR, USA
 ken-ichi.nishikawa-1@nasa.gov
- Mariana **Orellana**, UV, Chile / FCAG-UNLP, Argentina, Chile
 morellana@fcaglp.unlp.edu.ar
- Zsolt **Paragi**, JIVE, Netherlands
 zparagi@jive.nl
- Joseph M. **Paredes**, Universitat de Barcelona, Spain
 jmparedes@ub.edu
- Asaf **Pe'er**, Space Telescope Science Institute, USA
 apeer@stsci.edu
- Leonardo J. **Pellizza**, Institute for Astronomy and Space Physics,
 CONICET/UBA, Argentina
 pellizza@iafe.uba.ar
- Carolina **Pepe**, IAFE-UBA-CONICET, Argentina
 carolina.pepe@gmail.com
- Pérez, Daniela, FCAGLP, University of La Plata, Argentina
 danielaperez@iar.unlp.edu.ar
- Cintia **Peri**, FCAGLP - Universidad Nacional de La Plata, Argentina
 cintia@carina.fcaglp.unlp.edu.ar
- Manel **Perucho-Pla**, Universitat de València, Spain
 manel.perucho@uv.es
- Pierre-Olivier **Petrucci**, LAOG, France
 pierre-olivier.petrucci@obs.ujf-grenoble.fr
- Tsvi **Piran**, The Hebrew University of Jerusalem, Israel
 tsvi@phys.huji.ac.il
- Richard **Plotkin**, University of Amsterdam, Netherlands
 r.m.plotkin@uva.nl
- Peter **Polko**, Astronomical Institute "Anton Pannekoek", the Netherlands
 P.Polko@uva.nl
- Almudena **Prieto**, IAC (Instituto Astrofísica Canarias), Spain
 aprieto@iac.es
- Daniel **Proga**, Department of Physics & Astronomy,
 University of Nevada, Las Vegas
 dproga@physics.unlv.edu
- Andreas **Quirrenbach**, Landessternwarte Heidelberg, Germany
 A.Quirrenbach@lsw.uni-heidelberg.de
- Farid **Rahoui**, Harvard-Smithsonian Center for Astrophysics, France
 frahoui@cfa.harvard.edu
- Luis **Reyes**, KICP - University of Chicago, United States
 luis.c.reyes@gmail.com
- Matías M. **Reynoso**, University of Mar del Plata &
 IFIMAR- CONICET, Argentina
 matias.reynoso@yahoo.com
- Rogemar **Riffel**, Departamento de Física - UFSM, Brasil
 rogemar@smail.ufsm.br
- Luis **Rodríguez**, CRYA, UNAM, Mexico
 lrodriguez@crya.unam.mx
- Gustavo E. **Romero**, Instituto Argentino de Radioastronomía
 (IAR - CONICET), Argentina
 romero@iar-conicet.gov.ar
- David **Russell**, University of Amsterdam, Netherlands
 d.m.russell@uva.nl
- Rita **Sambruna**, NASA/GSFC, USA
 Rita.M.Sambruna@nasa.gov
- Celia **Sanchez-Fernandez**, INTEGRAL Science Operations Center, ESA, Spain
 celia.sanchez@sciops.esa.int
- Frank **Schinzel**, Max-Planck-Institut fuer Radioastronomie, Germany
 schinzel@mpifr-bonn.mpg.de
- Hiromi **Seta**, Saitama University, Japan
 seta@heal.phy.saitama-u.ac.jp
- Tariq **Shahbaz**, Instituto de Astrofísica de Canarias, Spain
 shahbaz@iac.es
- Marek **Sikora**, Copernicus Astronomical Center, Poland
 sikora@camk.edu.pl
- Paolo **Soleri**, Kapteyn Astronomical Institute, University of Groningen,
 The Netherlands
 soleri@astro.rug.nl
- Marina Soledad **Sosa**, FCAGLP-UNLP, Argentina
 marina@carina.fcaglp.unlp.edu.ar
- Alejandra E. **Suárez**, FCAGLP, UNLP, Argentina
 suarezal@carina.fcaglp.unlp.edu.ar
- Ovidiu **Tesileanu**, University of Bucharest, Romania
 ovidiu.tesileanu@gmail.com
- Francesco **Tombesi**, NASA/GSFC, USA
 tombesi@iasfbo.inaf.it
- Gagik **Tovmassian**, Instituto de Astronomía, UNAM, Mexico
 gag@astroen.unam.mx
- Valeriu **Tudose**, ASTRON, Netherlands
 tudose@astron.nl
- Yoshihiro **Ueda**, Kyoto University, Japan
 ueda@kusastro.kyoto-u.ac.jp
- Mauri **Valtonen**, University of Turku, Finland
 mvaltonen2001@yahoo.com
- Pieter **van Oers**, University of Southampton, United Kingdom
 pvo1g09@soton.ac.uk
- Silvia **Vicente**, ESA/ESTEC/RSSD, Holland
 svicente@rssd.esa.int
- Florencia **Vieyro**, IAR - CONICET, Argentina
 florenciavieyro@gmail.com
- Gabriela S. **Vila**, IAR - CONICET, Argentina
 gvila@iar-conicet.gov.ar
- Emma **Whelan**, Laboratoire d'Astrophysique de l'Observatoire de Grenoble, France
 whelane@obs.ujf-grenoble.fr
- Feng **Yuan**, Shanghai Astronomical Observatory, China
 fyuan@shao.ac.cn
- Lorena **Zibecchi**, FCAGLP, Argentina
 lorenazibecchi@hotmail.com
- Janusz **Ziolkowski**, Copernicus Astronomical Center, Poland
 jz@camk.edu.pl
- Juan Antonio **Zurita Heras**, AIM Paris Saclay, France
 juan-antonio.zurita-heras@cea.fr