Faculty, Adjunct professors, Research scientists,
Visiting scientists, Lecturers, PhD students, Post-doc
and Staff
at the Pescara Center
December 2015
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ICRANet Faculty Staff

Belinski, Vladimir  ICRANet
Bianco, Carlo Luciano  University of Rome “Sapienza” and ICRANet
Izzo, Luca  University of Rome “Sapienza”
Rueda, Jorge A.  University of Rome “Sapienza” and ICRANet
Ruffini, Remo  University of Rome “Sapienza” and ICRANet
Vereshchagin, Gregory  ICRANet
Xue, She-Sheng  ICRANet
Adjunct Professors of the Faculty

Aharonian, Felix Albert  
*Benjamin Jögbenschitz Markarjan Chair*  
Dublin Institute for Advanced Studies, Dublin, Ireland  
Max-Planck-Institut für Kernphysik, Heidelberg, Germany

Amati, Lorenzo  
Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy

Arnett, David  
*Subramanyan Chandrasekhar - ICRANet Chair*  
University of Arizona, Tucson, USA

Barres de Almeida, Ulisses  
Centro Brasileiro Pesquisas Físicas, Brazil

Buchert, Thomas  
University of Lyon, Saint-Genis-Laval, France

Chakrabarti, Sandip P.  
Centre for Space Physics, India

Chardonnet, Pascal  
Université de la Savoie, France

Chechetkin, Valeri  
*Mstislav Vsevolodich Keldysh - ICRANet Chair*  
Keldysh institute for Applied Mathematics Moscow, Russia

Damour, Thibault  
*Joseph-Louis Lagrange - ICRANet Chair*  
IHES, Bures sur Yvette, France

Della Valle, Massimo  
Osservatorio di Capodimonte, Italy

Einasto, Jaan  
Tartu Observatory

Everitt, Francis  
*William Fairbank - ICRANet Chair*  
Stanford University, USA

Fryer, Christopher Lee  
Los Alamos National Lab, USA

Frontera, Filippo  
University of Ferrara, Italy

Giavalisco, Mauro  
Department of Astronomy, University of Massachusetts, USA

Jantzen, Robert  
*Abraham Taub - ICRANet Chair*  
Villanova University USA

Jetzer, Philippe  
Institute of Theoretical Physics, University of Zurich, Switzerland

Khalatnikov, Markovich Isaak  
*Lev Davidovich Landau - ICRANet Chair*  
Landau Institute for Theoretical Physics, Russia
Kleinert, Hagen
Richard Feynmann - ICRANet Chair, Freie Universität Berlin

Kerr, Roy
Yegegeny Mikhailovich Lifshitz-ICRANet Chair
University of Canterbury, New Zealand

Lee, Hyung Won
Inje University, Korea

Madey, John
William Fairbank-ICRANet Chair
University of Hawaii

Mathews, Grant
University of Notre Dame, USA

Mirabel, Felix
CEA, France

Misner, Charles
John Archibald Wheeler-ICRANet Chair
University of Maryland

Mo, Houjun
Department of Astronomy, University of Massachusetts, USA

Nicolai, Hermann
Albert Einstein Institute – Potsdam, Germany

Pelster, Axel
Institute for Advanced Study, Germany

Pian, Elena
INAF and Osservatorio Astronomico di Trieste

Piran, Tsvi
Yuval Neeman-ICRAnet Chair
The Hebrew University - Jerusalem

Popov, Vladimir
ITEP, Russia

Punsly, Brian Matthew
Mathew California University, Los Angeles USA

Quevedo, Hernando
Institute of Nuclear Science, UNAM

Rosati, Piero
European Southern Observatory, Germany

’t Hooft, Gerard
(Nobel Laureate) Institut for Theoretical Physics
Utrecht Universiteit, Holland

Titarchuk, Lev
US Naval Laboratory, USA

Zen Vasconcellos, Cesar
UFRGS, Brazil
Lecturers

Aksenov, Alexey
Institute for Theoretical and Experimental Physics

Alekseev, Georgy
Steklov Mathematical Institute-Russian Academy of Sciences

Bini, Donato
CNR and ICRANet, Italy

Chen, Pisin
National Taiwan University

Chieffi, Alessandro
INAF, Rome, Italy

Coulet, Pierre
Université de Nice - Sophia Antipolis, France

Di Castro, Carlo
Università di Roma "Sapienza", Italy

Filippi, Simonetta
ICRANet and Campus Biomedico, Italy

Jing, Yi-Peng
Shangai Astronomy Observatory

Lanz, Thierry
Observatoire de la Côte d'Azur, Nice, France

Lee, Chul Hoon
Hanyang University, Korea

Lee, Yung Kyu
Department of Physics, Hanyang University, Korea

Lou, You Qing
Tsinghua University, Beijing

Malheiro, Manuel
ITA, Brazil

Mester, John
Stanford University, USA

Ohanian, Hans
Rensselaer Polytechnic Institute, New York, USA

Pacheco, José
Observatoire de la Côte dʻAzur, Nice, France

Perez Bergliaffa, Santiago
Univesidade do Estado de Rio de Janeiro, Brasil

Pucacco, Giuseppe
Università di Tor Vergata Roma

Sang, Pyo Kim
Kunsan National University, Korea

Sepulveda, Alonso
University of Antioquia, Colombia

Song, Doo Jong
National Institute of Astronomy, Korea

Starobinsky, Alexei
Landau Institute for Theoretical Physics, Russia

Sung-Won, Kim
Institute of Theoretical Physics for Asia-Pacific, Korea

Vissani, Francesco
Gran Sasso National Laboratories, Italy

Wiltshire, David
University of Canterbury, New Zealand
## Research Scientists

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Bernardini, Maria Grazia</td>
<td>ICRANet and Università di Roma “Sapienza”, Italy</td>
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<tr>
<td>Cherubini, Christian</td>
<td>Campus Biomedico, Rome, Italy</td>
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<tr>
<td>Geralico, Andrea</td>
<td>ICRANet and Università di Roma “Sapienza”, Italy</td>
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<tr>
<td>Lattanzi, Massimiliano</td>
<td>University of Oxford and ICRANet</td>
</tr>
<tr>
<td>Muccino, Marco</td>
<td>ICRANet and Università di Roma “Sapienza”, Italy</td>
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<tr>
<td>Rotondo, Michael</td>
<td>ICRANet and Università di Roma “Sapienza”, Italy</td>
</tr>
</tbody>
</table>
Visiting Scientists

Abishev, Medeu
Ahmedov, Bobomurat
Ansoldi, Stefano
Arkhangelskaia, Irene
Batebi, Saghar
Bavarsad, Ehsan
Bernal, Cristian Giovanni
Blinne, Alexander
Cadez, Andrej
Carneiro Da Cunha, Bruno
Cho, Yongmin
Corvino, Giovanni
Davis, Stanley
De Lorenci, Vittorio
Fimin, Nicolaj
Gadri, Mohamed
Gell-Mann, Murray
Goulart, Erico
Haghighat, Mansour
Hoang, Ngoc Long
Hutsi, Gert
Kenesbek, Zhadyra
Kim, Hongsu
Kim, Hyeong-Chan
Kim, Hyuong Yee
Kim, Jin-Young
Lee, Chang-Hwan
Lee, Wonwoo
Malheiro, Manuel
Manchester, Dick
Manreza Paret, Daryel
Mansouri, Reza
Mohammadi, Rohollah
Motie, Iman
Nagataki, Shigehiro
Negreiros, Rodrigo
Nessipbay, Aizhan
Park, Il Heung
Park, Myeong-Gu
Passiltay, Ainur
Paudel, Rishiram
Peresano, Michele
Perez Martinez, Aurora
Piechocki, Wlodzimierz
Qadir, Asghar
Raffaelli, Bernard
Romero, Gustavo E.
Sasaki, Misao
Tarasenko, Alexander
Tkachenko, Alessya
Torres, Sergio
Tizchang, Seddigheh
Van Putten, Maurice
Yang, Jongmann
Yeom, Dong-han
Zalaletdinov, Roustam

Zhumbayeva, Symbat
International Relativistic Astrophysics Ph. D.

<table>
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<tr>
<th>Cycle</th>
<th>Years</th>
<th>Students</th>
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<tr>
<td>First Cycle</td>
<td>2002-05</td>
<td>Peirani, Sebastien</td>
<td>France</td>
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<td>Second Cycle</td>
<td>2003-06</td>
<td>Bernardini, Maria Grazia</td>
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<td>Third Cycle</td>
<td>2004-07</td>
<td>Chiappinelli, Anna</td>
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<td>Fourth Cycle</td>
<td>2005-08</td>
<td>Battisti, Marco Valerio</td>
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<td>Dainotti, Maria.Giovanna</td>
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<td>Fifth Cycle</td>
<td>2006-09</td>
<td>Caito, Letizia</td>
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<td>De Barros, Gustavo</td>
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<td>Sixth Cycle</td>
<td>2007-2010</td>
<td>Armando</td>
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<td>Kanaan, Chadia</td>
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<td>Pugliese, Daniela</td>
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<td>Sigismondi, Costantino</td>
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<td>Seventh Cycle</td>
<td>2008-2011</td>
<td>Belvedere, Riccardo</td>
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<td>Ceccobello, Chiara</td>
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<td>Ferrara, Walter</td>
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<td>Han, Wen-Biao</td>
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<td>Taj, Safia</td>
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</table>
Eighth Cycle 2009-2012
Boshkayev, Kuantay Kazakhstan
Bravetti, Alessandro Italy
Ejlli, Damian Albania
Haney, Maria Germany
Lombardi, Caterina Antonietta Italy
Menegoni, Eloisa Italy
Sahakyan, Narek Armenia
Sahini, Sahil India

Ninth Cycle 2010-2013
Arguelles, Carlos Argentina
Benetti, Micol Italy
Muccino, Marco Italy

Tenth Cycle 2011-2014
Cáceres Uribe, Diego Leonardo Colombia
Wang, Yu China

Eleventh Cycle 2012-2015
Barbarino, Cristina Italy
Cipolletta, Federico Italy
Dichiara, Simone Italy

Twelfth Cycle 2013-2016
Becerra, Laura Colombia
Harutyunyan, Vahagn Armenia

Thirteenth Cycle 2014-2017
Moradi, Rahim Iran
Rodriguez Ruiz, Jose Fernando Colombia

IRAP Ph. D. Erasmus Mundus Students

First Cycle 2010-2013
Baranov, Andrey Russia
Benedetti, Alberto Italy
Dutta, Parikshit India
Fleig, Philipp German
Machado De Oliveira Fraga, Bernardo Brazil
Gruber, Christine Austria
Liccardo, Vincenzo Italy
Martins De Carvalho, Sheyse Brazil
Penacchioni, Ana Virginia Argentina
Valsan, Vineeth India
<table>
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<th>Second Cycle</th>
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<td>Begue, Damien</td>
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<td>Dereli, Husne</td>
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<td>Gregoris, Daniele</td>
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<td>Sversut Arsioli, Bruno</td>
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<td>Wu, Yuanbin</td>
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<td>Bardho, Onelda</td>
<td>Albania</td>
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<td>Enderli, Maxime</td>
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<td>Filina, Anastasia</td>
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<td>Strobel, Eckhard</td>
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<tr>
<td>Ahlén, Olof</td>
<td>Sweden</td>
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<td>Gómez Diaz, Gabriel</td>
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<td>Kovacevic, Milos</td>
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<td>Yang, Xiaofeng</td>
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<tr>
<td>Aimuratov, Yerlan</td>
<td>Kazakhstan</td>
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<td>Chang, Yu-Ling</td>
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<td>Efremov, Pavel</td>
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<td>Karlica, Mile</td>
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<td>Krut, Andreas</td>
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<td>Martinez Aviles, Gerardo</td>
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</table>
CAPES

First Cycle 2013-2018

PhD Students
Brandt, Carlos Henrique
Guimarães Carvalho, Gabriel
Lobo Pereira, Iarley

Senior Visitors to Brazil
Aharonian, Felix
Bisnovatyi Kogan, Gennady
Giommi, Paolo
Mathews, Grant
Rueda Hernández, Jorge Armando

Visitors to Europe/Asia
Rangel Lemos, Luis Juracy
Mosquera Cuesta, Herman J.
Picanço Negreiros, Rodrigo
Luchini Martins, Gabriel
Zen Vasconcellos, César Augusto

Postdoc in Europe and Asia
Bartosch Caminha, Gabriel
Goulart Coelho, Jaziel
Machado de Oliveira Fraga, Bernardo
Silva Bittencourt, Eduardo Henrique
Camargo Rodrigues de Lima, Rafael
Batista dos Santos, Grasiele

Postdoc in Brazil
Belvedere, Riccardo
Martins de Carvalho, Sheyse
Penacchioni, Ana Virginia
Siutsou, Ivan
Zaninoni, Elena
Administrative and Secretarial Staff

ICRANet - Pescara

Adamo, Cristina Administrative Office
Brandolini, Gabriele System Manager
Cimini, Marzio Maria Documentation Center (until April 2015)
Di Berardino, Federica Head of the Secretarial Office
di Niccolo, Cinzia Secretariat
Latorre, Silvia Administrative Office

ICRANet Br – Rio de Janeiro

Schaller, Flavia
ICRANet Faculty Staff
I Scientific Work

1. In 2014 ICRANet started the new program “Exact solutions in the super-symmetric General Relativity” in collaboration with the group of Prof. Hermann Nicolai at Albert Einstein Institute at Potsdam (Germany). This new direction is now is in the list of the thematic of the ICRANet sector “Exact Solutions of the Einstein and Einstein-Maxwell equations”. The foremost target is construction of the exact solutions for super-gravitational solitons. During 2014-2015 the work have been dedicated to the extension of the generating technique known as the Inverse Scattering Method (ISM) to the super-gravity. Here we have two main problems: first to formulate the super-symmetric version of ISM for the two-dimensional integrable models in super-gravity and then to find a way to construct exact super-solitonic solutions. During this year both of these problems was solved for the 2-dimensional extended N=2 super-gravity and corresponding paper have been published in Physical Review D, reference [1].

2. A paper on the influence of the shear viscosity (in the framework of Israel-Stewart non-equilibrium thermodynamics) on the character of the cosmological singularity has been published, see reference [2]. The results confirm the previous author’s statement on the existence of some types of viscous matter which are able to generate the stable Friedman-like initial cosmological singularity without any fine tuning.

3. The work on the book "Cosmological Singularity" (V.Belinski and M.Henneaux) has been continued. The project is in progress under the agreement with Cambridge University Press. This year was dedicated to the chapter "Oscillatory singularity in String models" and to few sections dedicated to the influence of different kinds of matter on the character of the singularity.

II Conferences and educational activities

Conferences:
1) 14th Marcel Grossmann Meeting, July 2015. I served as chairman of the "Quantum Fields" parallel session.
2) 14th Italian-Korean Meeting, July 2015, Rome. The talk: V. Belinski "Integrable Super-Gravity models".

2015 List of Publication

Bianco Carlo Luciano

Position: ICRANet Faculty staff
Member of ICRANet Scientific Committee
Member of IRAP-PhD Faculty


I Scientific Work

Research on: Gamma-Ray Bursts, Relativistic astrophysics, Cosmology.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Gave the following invited lectures:


- C.L. Bianco; Equations of motion and beaming in Gamma – Ray Bursts; 1st Cesare Lattes Meeting, Mangaratiba (RJ), Brazil, 1 March 2007.


- C.L. Bianco; The fireshell model and the canonical GRB scenario; Scuola Nazionale di Astrofisica (National School of Astrophysics) (II course, IX cycle); Venice (Italy), 18 September 2007.


- C.L. Bianco, M.G. Bernardini, L. Caito, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini; The canonical GRB scenario within the fireshell model: “long”, “genuine short” and “disguised short” GRBs; GRB 2010: Dall’eV al TeV tutti i colori dei GRB – Secondo congreso italiano sui GRB; Cefalù (Italy), 15 June 2010.

S.-S. Xue; New developments of the Fireshell scenario; *The Shocking Universe Meeting*, San Servolo, Venice (Italy), September 2009.

- C.L. Bianco, M.G. Bernardini, L. Caito, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini; The fireshell equations of motion and the P-GRB observational properties; 2\textsuperscript{nd} *Galileo – Xu GuangQi meeting*, Ventimiglia (Italy), July 2010.

- C.L. Bianco, M.G. Bernardini, L. Caito, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini; The fireshell model for GRBs: toward a canonical GRB scenario; 3\textsuperscript{rd} *Galileo – Xu GuangQi meeting*, Beijing (China), October 2011.

**II b Work With Students**

- Students of the IRAP-PhD program at University “La Sapienza”, Rome, Italy: Maria Grazia Bernardini, Letizia Caito, Maria Giovanna Dainotti, Gustavo De Barros, Maxime Enderli, Roberto Guida, Luca Izzo, Milos Kovacevic, Marco Muccino, Barbara Patricelli, Ana Virginia Penacchioni, Giovanni Battista Pisani, Luis Juracy Rangel Lemos, Yu Wang.

- Students of the First three years degree Thesis (“Tesi di Laurea triennale”) in Physics at University “La Sapienza”, Rome, Italy: Giulia De Rosi, Eliana La Francesca, Francesco Alessandro Massucci, Federica Volpi.


**II c Diploma thesis supervision**

- 2005. External supervisor of the First three years degree thesis (“Tesi di laurea triennale”) in Physics by Francesco Alessandro Massucci at University “La Sapienza”, Rome, Italy.

- 2006. External supervisor of the Degree thesis in Physics by Letizia Caito at University “La Sapienza”, Rome, Italy.


- 2008. External supervisor of the First three years degree thesis (“Tesi di laurea triennale”) in Physics by Eliana La Francesca at University “La Sapienza”, Rome, Italy.


- 2010. Thesis advisor of the IRAP-PhD Degree Thesis by Letizia Caito at University “La Sapienza”, Rome, Italy.
2010. External supervisor of the First three years degree thesis (“Tesi di laurea triennale”) in Physics by Giulia De Rosi at University “La Sapienza”, Rome, Italy.

**II d. Other Teaching Duties**

- Assistant teacher in the course of “Laboratory of Electromagnetism and Circuits” by Prof. Giulio D’Agostini at Physics Department of the University “La Sapienza”, Rome, Italy, academical year 2005/2006.
- Assistant teacher in the course of “Laboratory of Systems and Signals” by Prof. Andrea Nigro at Physics Department of the University “La Sapienza”, Rome, Italy, academical years 2013/2014, 2014/2015, 2015/2016.

**II e. Work With Postdocs**

**III. Service activities**

**III a. Within ICRANet**

- Administrator of the two servers used for numerical computations at ICRANet – Rome.
- Secretariat of the IRAP PhD.
- Member of the ICRANet Scientific Committee.
- Member of the IRAP PhD Faculty

**III b. Outside ICRANet**

- “Cultore della Materia” (“Expert of the subject”) for the “FIS/01 – Experimental Physics”, “FIS/02 – Theoretical Physics, Models and Mathematical Methods”, “FIS/05 – Astronomy and Astrophysics” scientific sectors in the Mathematical, Physical and Natural Sciences Faculty of the University of Rome “La Sapienza”.

**IV. Other**
2015 List of Publication

A) REFEREED SCIENTIFIC JOURNALS

<http://adsabs.harvard.edu/abs/2015ApJ...798...10R>
<http://dx.doi.org/10.1088/0004-637X/798/1/10>

<http://adsabs.harvard.edu/abs/2015ARep...59..581M>
<http://dx.doi.org/10.1134/S1063772915070070>

<http://adsabs.harvard.edu/abs/2015ARep...59..626R>
<http://dx.doi.org/10.1134/S1063772915070094>

<http://adsabs.harvard.edu/abs/2015ARep...59..667W>
<http://dx.doi.org/10.1134/S1063772915070148>

<http://dx.doi.org/10.1088/0004-637X/808/2/190>

<http://dx.doi.org/10.1142/S0217751X15450232>

B) CONFERENCE PROCEEDINGS


Izzo Luca

Position: Junior Staff  
Period covered: 2013 - 2016

I Scientific Work

- Data reduction and Analysis of Gamma-Ray bursts observed by Swift and Fermi
- Support for the Swift-XRT team (one week per month on-duty for the monitor of GRBs observed by Swift)
- Analysis of nova phenomena in outbursts
- Cosmology with GRBs

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- Swift – 10 years of discovery - Rome, 2-5 December 2014  
- 2nd Cesar-Lattes meeting – Rio de Janeiro, 11-19 April 2015  
- The Golden Age of Cataclysmic Variables and Related Objects III – Palermo, 7-12 September 2015  
- IX Congresso Nazionale Oggetti Compatti – Rome, 22-25 September 2015

II b Work With Students

1) Induced gravitational collapse in the BATSE era: The case of GRB 970828, Astronomy Reports (2015) – students: Cristina Barbarino, Maxime Enderli, Yu Wang


II c Diploma thesis supervision

II d Other Teaching Duties

Main lecturer and organizer of the "1st ICRANet Lecture Series for PhD students", University of Rome Sapienza, Italy.

II e. Work With Postdocs


2) Induced gravitational collapse in the BATSE era: The case of GRB 970828, Astronomy Reports (2015) – postdocs: Marco Muccino, Giovanni Battista Pisani, Carlo Luciano Bianco, Jorge Rueda

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc...)]

III a. Within ICRANet

Main lecturer and organizer of the ‘‘1st ICRANet Lecture Series for PhD students”, University of Rome Sapienza, Italy.

III b. Outside ICRANet

Support for the Swift-XRT team (one week per month on-duty for the monitor of GRBs observed by Swift)

IV. Other

Seminar held at

- Pontificia Università Catolica de Chile, Santiago – January 2015
- Istituto Superior Tecnico, Lisboa – November 2015
- Osservatorio Astronomico di Capodimonte – November 2015

2015 List of Publication

Refereed

- L. Izzo; M. Della Valle; E. Mason; F. Matteucci; D. Romano; L. Pasquini; L. Vanzì; A. Jordan; J. M. Fernandez; P. Bluhm; R. Brahm; N. Espinoza; R. Williams; “Early Optical Spectra of Nova V1369 Cen Show the Presence of Lithium”, Astroph. Journal Letters, 808, 14, (2015), arXiv:1506.08048
Rueda Hernández Jorge Armando

Position:
Faculty Professor at ICRANet
Member of ICRANet Faculty
IRAP PhD Faculty
Period covered: 2011-Present

Coordinator of the CAPES-ICRANet Program at ICRANet
CAPES-ICRANet Program Visiting Professor in Brazil
Period covered: 2013-2016

I Scientific Work

1) Nuclear and Atomic Astrophysics.

Within this subject of research I study the properties and processes occurring in compact stars in which nuclear and atomic physics have to be necessarily applied. I focus on the properties of nuclear matter under extreme conditions of density and pressure found in these objects. The equation of state of matter in compact stars is studied in detail taking into account all the interactions between the constituents within a full relativistic framework.

2) White Dwarfs Physics and Astrophysics.

I analyze the structure of white dwarfs within a self-consistent description of the equation of state of the interior together with the solution of the hydrostatic equilibrium equations in general relativity. Both not-magnetized and magnetized white dwarfs are studied. I am also interested in the astrophysics of white dwarfs both isolated and in binaries systems. Magnetized white dwarfs, soft gamma repeaters, anomalous X-ray pulsars, white dwarf pulsars, cataclysmic variables, binary white dwarf mergers, and type Ia supernovae are studied. The role of a realistic white dwarf interior structure is particularly emphasized.

3) Neutron Stars Physics and Astrophysics.

I am interested in computing the properties of the interior structure of neutron stars using realistic models of the nuclear matter equation of state within the general relativistic equations of equilibrium. Strong, weak, electromagnetic and gravitational interactions have to be jointly taken into due account within a self-consistent fully relativistic framework. Both unmagnetized and magnetized neutron stars are considered. From the astrophysical viewpoint, I study systems harboring neutron stars such as isolated and binary pulsars, low and intermediate X-ray binaries, inspiraling and merging double neutron stars. Most extreme cataclysmic events involving neutron stars and their role in the explanation of extraordinarily energetic astrophysical events such as gamma-ray bursts are analyzed in detail.

4) Radiation Mechanisms of White Dwarfs and Neutron Stars.

I study the possible emission mechanisms of white dwarfs and neutron stars. I consider both electromagnetic and gravitational radiation at work in astrophysical systems such as compact star
magnetospheres, in-spiraling and merging relativistic double neutron stars, neutron star-white dwarfs, and neutron star-black hole binaries.

5) Exact Solutions of the Einstein and Einstein-Maxwell Equations in Astrophysics.

I am also interested in studying the ability of analytic exact solutions of the Einstein and Einstein-Maxwell equations to describe the exterior spacetime of compact stars such as white dwarfs and neutron stars. The problem of matching between interior and exterior spacetimes is addressed in detail. The effect of the quadrupole moment on the properties of the spacetime is also investigated. Particular attention is given to the application of exact solutions in astrophysics, e.g. the dynamics of particles around compact stars and its relevance in astrophysical systems such as X-ray binaries.


I study the conditions under which ultrastrong electromagnetic fields can develop in astrophysical systems such as neutron stars and in the process of gravitational collapse to a black hole. The effects of non-linear electrodynamics minimally coupled to gravity are investigated. New analytic and numeric solutions to the Einstein-Maxwell equations representing black holes or the exterior field of a compact star are obtained and analyzed. The consequences on extreme astrophysical systems, for instance gamma-ray bursts, are studied.

7) Distribution of Dark Matter in Galaxies and Cosmological Implications

I study the possible distribution of equilibrium of dark matter particles in galaxies. Particular attention is given to the distribution of fermion candidates. I analyze the possible mass as well as self-interactions that such fermions could have in order to be in agreement with the current astrophysical and cosmological observational constraints. The dark matter distribution in dwarf spheroidal, elliptic, spiral, and big spiral galaxies is considered. I am at the same time interested in the consequences that the inferred dark matter properties and distribution have in cosmology.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Organizer of the “First Sandoval Vallarta Caribbean Meeting”, Mexico City, Mexico, November 30-December 3, 2015. <www.icranet.org/1sv/>


II b Work With Students

Below in the section II c, I list the PhD theses which I have supervised and the ones currently under supervision. They are all distributed in the seven topics listed above in the section I. I also include the scientific production which has been the result of these PhD researches.
In the following list of PhD theses developed under my supervision, I have also included the topics, from the list of section I, in which the PhD students have performed or are performing their research.


Scientific Production:


- PhD thesis of Laura Becerra Bayona 2013-2016, Sapienza University of Rome, Italy. Topics: 1-4. Fellowship: IRAP-PhD

Scientific Production:


- PhD thesis of Luis Gabriel Gómez 2013-2016, Sapienza University of Rome, Italy and University of Nice Sophia-Antipolis, Nice, France. Topics: 7. Fellowship: Erasmus Mundus IRAP-PhD

Scientific Production:


- PhD thesis of Fernanda Gomes Oliveira 2012-2015, Sapienza University of Rome, Italy and University of Nice Sophia-Antipolis, Nice, France. Topics: 2-4. Fellowship: Erasmus Mundus IRAP-PhD

Scientific Production:


- PhD thesis of Diego Leonardo Cáceres Uribe 2011-2014, Sapienza University of Rome, Italy. Topics: 2 and 4. Fellowship: IRAP-PhD

Scientific Production:


- PhD thesis of Jonas Pedro Pereira’s PhD 2011-2014, Sapienza University of Rome, Italy and University of Nice Sophia-Antipolis, Nice, France. Topics: 3 and 6. Fellowship: Erasmus Mundus IRAP-PhD

Scientific Production:


- PhD thesis of Carlos Raul Arguelles 2011-2014, Sapienza University of Rome, Italy. Topics: 7. Fellowship: IRAP-PhD

Scientific Production:


- PhD thesis of Sheyse Martins de Carvalho 2010-2013, Sapienza University of Rome, Italy and University of Nice Sophia-Antipolis, Nice, France. Topics: 1-3. Fellowship: Erasmus Mundus IRAP-PhD

Scientific Production:


- PhD thesis of Riccardo Belvedere 2008-2013, Sapienza University of Rome, Italy. Topics: 1, 3-4. Fellowship: IRAP-PhD

Scientific Production:


- PhD thesis of Kuantay Boshkayev 2009-2012, Sapienza University of Rome, Italy. Topics: 2-5.

Fellowship: IRAP-PhD


II d Other Teaching Duties

In addition to the supervision of PhD theses, I teach in the IRAP PhD Program and in the Doctoral Schools organized within it. The topics of teaching are the ones in section I.

II e International Scientific Collaborations

In Brazil: with Prof. Sergio B. Duarte from CBPF at Rio de Janeiro, Prof. R. Negreiros from UFF at Niterói, Prof. Débora P. Menezes from UFSC at Florianópolis Profs. S. O. Kepler and C. A. Z. Vasconcellos from UFRGS at Porto Alegre, Profs. R. Marinho Jr and M. Malheiro from ITA at São José dos Campos, Prof. Luis J. Rangel-Lemos from UFU at Palma.
In Colombia: with Profs. Luis Nuñez and Guillermo González from UIS at Bucaramanga, Prof. Leonardo A. Pachón from UdeA at Medellín, Prof. César A. Valenzuela from Univalle at Cali.

In Kazakhstan: with Prof. Kuantay Boshkayev from Al-Farabi Kazakh National University at Almaty.

In Mexico: with Prof. Hernando Quevedo from UNAM at México D. F.

In Spain: with Prof. Enrique García-Berro from UPC at Barcelona.

In USA: with Prof. Chris L. Fryer from LANL at New Mexico, Prof. G. Mathews from UND at South Bend.

II e. Work With Postdocs

-Riccardo Belvedere (CAPES-ICRANet Program Fellow at ICRANet - Rio de Janeiro and Universidade Federal Fluminense). Scientific collaboration in the topics 1 and 3.

Scientific Production:


-Rafael Camargo Rodrigues de Lima (CAPES-ICRANet Program Fellow at ICRANet - Pescara). Scientific collaboration in the topics 1 and 3.

Scientific Production:


Scientific Production:


-Jaziel Goulart Coelho (CAPES-ICRANet Program Fellow at ICRANet and Sapienza University of Rome). Scientific collaboration in the topics 1-3.

Scientific Production:


Curriculum Vitae:

- Doctorate in Physics, University of Rome, 1966.
- Assistant Professor, Princeton University, 1971-74.
- Member Institute for Advanced Study, Princeton, N.J. 1974-76.
- Visiting professor Kyoto University (Japan), 1975.
- Visiting professor University of Western Australia, Nedlands (Australia), 1975.
- Professor University of Catania, Italy, 1976-78.
- Professor, Chair of Theoretical Physics, University of Rome “la Sapienza”, 1978-2012
- Member Council of Center. International Physics, Bogotà, Colombia, 1984-
- President International Center Relativistic Astrophysics (ICRA), 1985-
- Director of ICRANet, 2005-present
- Member of Task Force Scientific Use of Space Station NASA, Washington, 1986-88.
- Chairman International Organizing Committee of Marcel Grossmann Meetings, 1984-
- Member of Consiglio Ricerche Astronomiche, Rome, 1987-91.
- Co-Chairman Italian-Korean Meetings on Relativistic Astrophysics, Rome and Seoul, 1987-
- Chairman William Fairbanks Meetings, 1990-
- Member of the Board of ENEA, 2004-
- Co-Director Advanced Series in Astrophysics and Cosmology-World Scientific, Singapore, 1986
• Editor of the series “The Marcel Grossmann meetings on relativistic Field Theories”, 1985-
• Co-Editor of the Series “Italo-Korean meetings on Relativistic Astrophysics”.
• Member Sigma Xi.
• Member Italian Physical Society.
• Founding Member of European Physical Society.
• Member of Euroscience
• Fellow recipient:
  o Fellow of the American Physical Society 1974-
  o Alfred P. Sloan Foundation fellow, 1974-76.
  o Space Scientist of the Year Award, 1992.
  o Honorary Professor of University of Kirghizia 1998-

Main Scientific Publications:
Coauthor, among others, of the following books:
3. (with H.Gursky) “Neutron Stars, Black Holes and Binaries Sources”, D. Reidel, Dordrecht, 1975,
5. (with Humitaka Sato) “Black Holes”, in japanese, Chuo Koron-Sha, Tokyo 1976,
2015 List of Publication


12. Ruffini, Remo; Black holes, supernovae and gamma ray bursts; Astronomy Reports, 59, 625, 2015.


15. Aksenov, A. G., Ruffini, R., & Vereshchagin, G. V.; Radiative transfer in relativistic plasma outflows and comptonization of photons near the photosphere; Astronomy Reports, 59, 424


17. Mathews, Grant & Ruffini, Remo; Constraints on the Source for Gamma-ray bursts from Observed X-Ray Afterglows; APS April Meeting Abstracts

18. de Carvalho, Sheyse M., Rueda, Jorge A., & Ruffini, Remo; On the Relativistic Feynman-Metropolis Equation of State at Finite Temperatures; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 2483


27. Aksenov, A. G., Ruffini, R., & Vereshchagin, G. V.; Radiative Transfer Near the Photosphere of Mildly and Ultrarelativistic Outflows; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 1756

28. Ruffini, R., Siutsou, I. A., & Vereshchagin, G. V.; Photon Thick and Photon Thin Relativistic Outflows and GRBS; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 1750

29. Argüelles, Carlos & Ruffini, Remo; a Regular and Relativistic Einstein Cluster Within the s2 Orbit Centered in SgrA*; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 1740

30. Fraga, Bernardo M. O., Argüelles, Carlos, Ruffini, Remo, & Siutsou, Ivan; Semidegenerate Self-Gravitating System of Fermion as Dark Matter on Galaxies i: Universality Laws; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 1733


32. Ruffini, Remo; From Tian Shan to the Tian Kong: Personal Reflections on Fang Lizhi; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 455

33. Ruffini, Remo; Black Holes, Supernovae and Gamma Ray Bursts; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 314

34. Rueda, Jorge A. & Ruffini, Remo; Strong, Weak, Electromagnetic, and Gravitational Interactions in Neutron Stars; Thirteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics and Relativistic Field Theories, 209


I Scientific Work

The work focused on the following aspects:

- Bose enhancement and Pauli blocking in the pair plasma (with I.A. Siutsou, A.G. Aksenov and R. Ruffini)

Interactions in homogeneous electron-positron-photon plasma are studied numerically using the relativistic kinetic Boltzmann equation, with collision integrals including Bose enhancement and Pauli blocking corrections. The new method of computing collision integrals is developed.

- Thermal emission in the early afterglow of GRBs from their interaction with supernova ejecta (with R. Ruffini and Yu Wang)

The interaction between the GRB ejecta and a baryonic shell is considered in the context of the binary driven hypernova model of Gamma-Ray Bursts. The kinematic and observational properties of the shell after the interaction are derived. In particular, the temperature and the duration of the thermal emission are obtained. The model is then applied to GRB 090618 and the observed characteristics of the thermal component are reproduced.

- Cosmic absorption of ultra high energy particles (with R. Ruffini and S.-S. Xue)

This work summarizes the limits on propagation of ultra high energy particles in the Universe, set up by their interactions with cosmic background of photons and neutrinos. By taking into account cosmic evolution of these backgrounds and considering appropriate interactions we derive the mean free path for ultra high energy photons, protons and neutrinos. For photons the relevant processes are the Breit-Wheeler process as well as the double pair production process. For protons the relevant reactions are the photopion production and the Bethe-Heitler process. We discuss the interplay between the energy...
loss length and mean free path for the Bethe-Heitler process. Neutrino opacity is determined by its scattering off the cosmic background neutrino. We compute for the first time the high energy neutrino horizon as a function of its energy.

- Interaction of high energy photons with the background radiation in the Universe (with S. Tizchang, S. Batebi, R. Mohammadi, S.-S. Xue and R. Ruffini)

We study high energy cosmic ray in interaction with cosmic microwave background (CMB). We calculate optical depth due to Euler-Heisenberg photon-photon scattering at cosmological redshift. According to our result for CMB background and comparing with constrain obtained from Breit-Wheeler pair production, Euler-Heisenberg at energy less than TeV impose almost the same constrain as Breit-Wheeler on transparency of high energy cosmic photons. We also discuss implications of our results for two astrophysical data, Gamma Ray Burst and Blazar. We confirm theoretical bound in observation of high energy photons.

II Conferences and educational activities
II a Conferences and Other External Scientific Work

II b Work With Students

- S. Tizchang, S. Batebi: on interaction of high energy photons with the background radiation in the Universe

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

- Ivan Siutsou: on Bose enhancement and Pauli blocking in the pair plasma

- Wang Yu: on thermal emission in early afterglow from the GRB-SNR interaction

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

- Member of the IRAP PhD Faculty

- coordinating cooperation with the Belarusian State University

- coordinating cooperation with the National Academy of Sciences of Belarus
• co-chair (with J. Michaell Burgess) of the parallel session GB4 “Photospheric Emission in GRBs” at the Fourteenth Marcel Grossmann Meeting (MG14).
• organizational work for MG14, as a member of the LOC
• organizational work for the 14th Italian-Korean Symposium on Relativistic Astrophysics, as a member of the organizing committee
• organizational work for the First Sandoval Vallarta Meeting on Relativistic Astrophysics
• editorial work as co-editor of the proceedings of the Zeldovich-100 Meeting
• editorial work as co-editor of the proceedings of the Second ICRANet César Lattes Meeting

III b. Outside ICRANet

IV. Other

2015 List of Publication


Xue She-Sheng

Position: ICRANet Faculty

I Scientific Work

Strong and pulsating electromagnetic field in gravitational collapse and heavy atoms, as well as its relevance to Gamma-Ray Bursts (GRBs) and heavy atom physics.

Strong electromagnetic field in compact stars and heavy atoms and its relevance to their structure and properties.

Pair production rates and radiation in strong and time-varying electromagnetic fields, and its applications in physics and astrophysics.

Pair production and interactions of fields and matter in the cosmological evolution within the framework of Einstein-Maxwell theory.

Four-fermion interactions of Einstein-Cartan theory and its resulted particle spectra for matter and dark matter.

The opacity of high energy cosmic particles in terms of their energy and travelling distance.

See the following list of publications.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Participating organization of ICRANet meetings in Korea and China: the 14th Italian-Korean meeting (July, 2015, Pescara, Korea) and 4th Galileo –Xu Guangqi meeting (GX4, May 1st, 2015) and their proceedings.
Participating organization of MG14 Rome, July 2015, and acting as a chair of the parallel section.

The first Scientific ICRANet Meeting in Armenia, 30 June - 4 July 2014 – Yerevan (Armenia)

II b Work With Students

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Wang Yu, Li Liang, XiaoFeng Yang, and Iranian students, Rahim Moradi, Seddigheh Tizchang and Saghar Batebi

**II e Diploma thesis supervision**


**II d Other Teaching Duties**

Teaching courses in Nice and Les Houches schools for IRAP Ph.D. Erasmus Mundus students.

**II e. Work With Postdocs**

Ivan, Siutsou, Carlos Argulles, Christine Gruber, Rohoollah Mohammadi, and Ehsan Bavarsad.

**III. Service activities**  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc..) and outside ICRANet (teaching activities in your university etc…)]

**III a. Within ICRANet**

Participating organization of ICRANet Seminars.
Participating preparation of ICRANet Newsletter and ICRANet news for Hyperspce news.

**III b. Outside ICRANet**

**IV. Other**

**2015 List of Publication**

J. Rueda, R. Ruffini, Y.-B. Wu and S.-S. Xue, ``Surface tension for heavy atoms'', submitted to Phys. Rev. C.

Adjunct Professors of the Faculty
Aharonian Felix

Position:

Adjunct Professor of the ICRANet Faculty

Member of the ICRANet Scientific Committee

Professor, Dublin Institute for Advanced Studies, Dublin, Ireland (2006-presently)

Head of the High Energy Astrophysics Theory Group, Max-Planck-Institute for Nuclear Physics, Heidelberg, Germany (1992-presently)

I Scientific Work

Fields of Research: High Energy Astrophysics, Cosmic Rays, X-ray Astronomy, Gamma Ray Astronomy, Neutrino Astronomy, Theoretical Astrophysics

Areas of Interest: Radiation Processes, Particle Acceleration Processes, Interstellar Medium, Relativistic Outflows (Pulsar Winds and AGN Jets), Cosmology

Involvement in major Projects:

Member (representative of ESA) of the Science Working Group of the JAXA-NASA-ESA X-ray mission ASTRO-H

Member of the H.E.S.S. Collaboration Board

Member of the KM3NeT Consortium Board

Publications: more than 500 papers published in peer-reviewed journals, > 25,000 citations, h-index 87

II Conferences and educational activities

II a Conferences and Other External Scientific Work

in 2015 was a SOC (Scientific Organizing Committee) member of six International Conferences and Workshop
II b Work With Students

Supervision of 7 PhD students - 4 in MPIK/Heidelberg, 1 DIAS/Dublin, 1 GSSI/L’Aquila, 1 ICRANet/Yerevan

II c Diploma thesis supervision

II d Other Teaching Duties

A regular course on High Energy Astrophysics (20 hours) for students of the Gran Sasso Science Institute (GSSI), L’Aquila, Italy

II e. Work With Postdocs

Currently I supervise 9 PostDocs in MPIK/Heidelberg and DIAS/Dublin

III. Service activities

III a. Within ICRANet

Member of the Scientific Committee of ICRANet
Supervision of two PhD students in the Armenian Seat of ICRANet
Lecture on Synchrotron Radiation for the students belongs to ICRANet
Consultations to students and ICRANet staff members on different scientific topics

III b. Outside ICRANet

Member of the Scientific Advisory Committee of Astroparticle Physics European Consortium (APPEC)
Chair of the Intern. Advisory Council of the Institute of Sciences of Cosmos, University of Barcelona

IV. Other

Editor of the International Journal of Modern Physics D

2014 List of Publication

In addition to 27 papers of the HESS, KM3Net and ASTRO-H collaboration, I am a co-author of the following papers published since 2014 in peer reviewed journals:


Amati Lorenzo

Position: Adjunct Professor of the ICRANet Faculty and staff researcher at INAF (IASF Bologna).

Period covered: full 2015

Short CV

Lorenzo Amati was born in Modena, Italy, in 1966. He graduated in Astronomy at the University of Bologna in 1991 and received the PhD degree in astronomy from University "La Sapienza" of Rome in 1999. Since 1998, Lorenzo Amati is a research staff member at the Institute of Space Astrophysics and Cosmic Physics (IASF) in Bologna, which is part of the Italian National Institute for Astrophysics (INAF). He is also Adjunct Professor of the Faculty of the International Center for Relativistic Astrophysics Network (ICRANet) and member of the Faculty of the PhD course in Physics at the University of Ferrara. In 2011 Lorenzo Amati was elected member of the Board for Relativistic and Particle Astrophysics of the Italian National Institute for Astrophysics (INAF). Lorenzo Amati has also been Member of the Space Astrophysics Working Group of the Italian Space Agency (ASI) in 2007-2008, has been member of the BeppoSAX team from 1996 to 2002, is member of the Swift team since 2005, is member of the ATHENA collaboration since 2014, is member of the LOFT consortium and coordinator of the THESEUS consortium, is member of the International Astronomical Union (IAU), of SIGRAV and of ISGRG (International Society on General Relativity and Gravitation).

I Scientific Work

My field of research is high energy astrophysics, with particular emphasis on Gamma-Ray Bursts (GRB) studies. Under this respect, his research highlights include the discovery (in 2000) of a transient X-ray absorption edge in the first 13 s of GRB 990705, leading to the first estimate for a GRB redshift based on X-ray data, and the discovery of a strong correlation between the photon energy at which GRB spectra peaks and their radiated energy (known as "Amati relation"), which has relevant implication for the physics and possible cosmological use of these phenomena. Lorenzo Amati is also involved in the
study (science case and instrument concept) of future missions for GRB studies (e.g., THESEUS) and dedicates a minor part of his research work to the study of X-ray binaries.

My scientific collaboration with ICRANet is focused on Gamma-Ray Burst (GRB) astrophysics, with particular emphasis on the testing of the fireshell model against X-ray and gamma-ray data of the prompt emission. In particular, in 2015 we concentrated on the use of correlations between observables of the prompt and afterglow emission of GRBs for standardizing GRBs (e.g., the “combo relation”, Izzo et al. 2015, A&A 582, A115), on the further investigations of the links between long and short GRBs and SNe, following our work Kovacevic et al., 2014, 569, A108) and on the observational evidences supporting either the isotropic or collimated emission scenarios (e.g., Izzo, Della Valle & Amati, 2015, IAU Symposium, Volume 313, pp. 392-393). Finally, ICRANet was involved in the preparation of the proposal for ESA/M5 of THESEUS, a mission concept aiming at exploiting GRBs for the investigation of the Early Universe.

Besides my collaboration with ICRANet, my main scientific activity includes: spectral, timing and correlation properties of GRBs, investigation of the cosmological use of GRBs, X-ray spectral and timing properties of X-ray binaries, study of the scientific case and concept design of GRB detectors for future missions. Under this last respect, in particular, in 2015 I coordinated, as Lead Proposer, the preparation of the proposal THESEUS (Transient High-Energy Sky and Early Universe Explorer), submitted to ESA in response to the Call for next M5 mission. I also continued coordinating the GRB Science Working Group of the LOFT mission collaboration.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

December 2015: 28th Texas Symposium on Relativistic Astrophysics, Geneve, Switzerland (oral presentation)

December 2015: Cosmology and First Light, Parigi, France (oral presentation)

September 2015: IX Italian National Workshop on Compact Objects (CNOC IX)
Monte Porzio Catone - Rome, Italy (oral presentation)

September 2015: Astrophysical Probes of Fundamental Physics
Ferrara, Italy (lecturer)

July 2015: Fourteenth Marcel Grossmann Meeting - MG14
Roma, Italy (invited oral presentation)

April 2015: ISSI-BJ Workshop on Gamma-Ray Bursts: a tool to explore the young Universe
Beijing, China (invited oral presentation)

II b Work With Students

In 2015 I mostly worked with Disha Sawant, student of the IRAP Erasmus Mundus PhD at University of Ferrara, concerning the investigation of the $E_p, i$ – intensity correlations in GRBs. I also worked with
Onelda Bardho, student of the IRAP Phd Erasmus Mundus PhD at University of Nice on the statistical analysis and classification of GRB X-ray afterglow light curves and on the multi-wavelength analysis and interpretation of GRB141221A.

II c Diploma thesis supervision

I am the supervisor of Disha Sawant, student of the IRAP Erasmus Mundus PhD at University of Ferrara, who will defend her Thesis on next February 29th.

II d Other Teaching Duties

II e Work With Postdocs

In 2015 I mostly worked with Dr. Luca Izzo, Dr. Marco Muccino and N. Pisani on the use of the correlations between prompt and afterglow GRB observables for cosmology and on the association of GRBs (long and short) with SNe.

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

In 2015 I was part of the Local Organizing Committee of the Fourteenth Marcel Grossmann Meeting - MG14 held in Roma, Italy. I am the supervisor of the PhD of Disha Sawant, student of the IRAP Erasmus Mundus PhD.

III b. Outside ICRANet

I am member of the Faculty of the PhD in Physics and Geophysical Sciences at Unievsity of Ferrara. In September 2015 I have been Lecturer at the PhD school “Astrophysical Probes of Fundamental Physics” at University of Ferrara, Italy. Until Dec. 2015 I have been member of the Board for Relativistic and Particle Astrophysics of INAF (Macroarea 4). I acted as referee for some of the main Refereed Journals in the field of astrophysics (ApJ, MNRAS, A&A). I acted as a reviewer for the Italian ministry of Education and University (MIUR, SIR projects).

2015 List of Publication


population of high redshift Gamma Ray Bursts", Monthly Notices of the Royal Astronomical Society, 448, 2514


L. Amati, R. Campana, Y. Evangelista, et al., 2015, Proceedings of the MG13 Meeting on General Relativity, 889-901


Arnett William David

Present position: Adjunct Professor of the ICRANet Faculty
Regents Professor, Steward Observatory, University of Arizona, Tucson AZ, 85721

Education:
University of Kentucky, B.S., 1961;
Yale University, M.S. 1963, Ph.D. 1965, Physics

Previous position:
B. and E. Sunny Distinguished Service Professor, Astrophysics, Physics, and Enrico
Fermi Institute, University of Chicago, 1976-88

Professional Societies:
American Astronomical Society;
American Physical Society (Fellow)
International Astronomical Union
American Association for the Advancement of Science (Fellow).

Fellowships and Awards:
Alfred P. Sloan Research Fellowship, 1970
Yale Distinguished Graduate in Physical Sciences (with J. W. Truran), 1980
A. von Humboldt Prize (Senior Scientist), 1981
Member, National Academy of Sciences (1985-)
Member, American Academy of Arts and Sciences (1985-)
Member, Aspen Center for Physics (1997-2007)
Honorary Professor, Jilin University, Changchun, PRC (2005)
S. Chandrasekhar Lecture, Bose Center for Physics, Kolkata, (2007)
S. Chandrasekhar Professor, ICRANet, Rome, Pescara, Nice (2007-)
Bethe Prize, American Physical Society, 2009
Faculty Fellow, Texas A&M University  Institute for Advanced Study, 2015-2016

Recent Professional Activities:
- National Research Council Committee, "Future Directions for NSF Advanced Computing Infrastructure to Support U. S. Science in 2017-2020"
- National Ignition Campaign Review Committee, Lawrence Livermore National Laboratory, 2009-2013
- Board, International Center for Relativistic Astrophysics Network, 2009-

Publications:
- Articles: over 400 (over 200 in refereed journals), h-index = 64, over 13,000 citations, as of 2015
Buchert Thomas

Position: Professor of Cosmology
Staff Member of CRAL, Head of GALPAC:
Université Lyon 1 and École Normale Supérieure Lyon
Adjunct Professor of the Faculty: ICRANet
Period covered: January 2015 - December 2015

I Scientific Work

Investigation of (Lagrangian) perturbative models in relativistic cosmology including gravitoelectric perturbation and solution schemes at any order, and gravitational waves at first order. Observational strategies to detect an inhomogeneous metric in the Baryonic Accoustic Oscillation peak. Rebuttal paper on the Green-Wald formalism, co-authored by 10 relativists, demonstrating the inapplicability of the Green-Wald theorems to backreaction of inhomogeneities on average properties of the Universe.

II Conferences and educational activities

II a Conferences and Other External Scientific Work
- LOC and ICC of MG14 - 07/2015:
  organizer of parallel session DE2 on "Inhomogeneous Cosmology"
  (co-chaired with Alan Coley and David Wiltshire)
organizer of parallel session DE3 on "Large-scale structure and Statistics"
  (co-chaired with Hagen Kleinert)
- SOC - 08/2015: 1st "Roman Juszkiewicz Symposium", Warsaw, Poland

II b Work With Students

3 PhD students: Fosca Al Roumi (thesis defence in September 2015), and two students (ongoing) in collaboration with the University of Torun, Poland (Jan J. Ostrowski, T. Kazimierczak).

II c Diploma thesis supervision: 1 Master student (Pierre Mourier, 2015), who works now with me for one year on an extended internship that started in September 2015, before he begins his thesis in Lyon.

II d Other Teaching Duties see below.


III. Service activities

[activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc..) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet: none

III b. Outside ICRANet: Two Master Courses on "Cosmology and Gravitational Systems" and "Introduction to Theories of Gravitation" (École Normale Supérieure, Lyon); Exercises in "Continuum Mechanics" and "Mathematical Methods". Doctoral Course at the University of Santiago, Chile (April 2015).
IV. Other  Memberships in two groups of the Euclid consortium ("Theory" and "Clustering"), and in 4MOST.

2015 List of Publications

peer-reviewed:


invited papers:


Chakrabarti Sandip Kumar

Position: Adjunct Professor, ICRANET
Senior Professor and Head, Astrophysics and Cosmology
S.N. Bose National Centre for Basic Sciences
and
In Charge, Indian Centre for Space Physics

Period covered: 2015

I Scientific Work

We have completed several numerical simulations of black hole accretion to show that Two Component Advective Flow (TCAF) solution of black hole accretion is valid and implemented the solution into NASA/XSPEC software. We fitted data of several black hole candidates to obtain physical parameters such as accretion rates, shock locations, etc. which are not done by any other model. We have studied the attenuation of ionospheric signals to show that antarctic ice mass extent could be measured from the attenuation of very low frequency radio signal. I led the balloon borne astronomy and earth science team to have a total of 20 balloon missions (D69 to D89) in which several good quality data was obtained and various payloads (including a Phoswich detector of 5" diameter) have been tested. In astrobiology/astrochemistry work we have studied abundances of DNA constituents such as adenine, cytosine etc. and their precursors in the star forming regions so that we may observe where such biomolecules could be observed. We studied the formation of deuterated isotopomars.

II Conferences and educational activities

IIa Conferences and Other External Scientific Work:

January, 2015: Attended NAAC assessors interaction Meeting and participated in mock evaluation of Institutes at NAAC HQ, Bangalore
May, 2015: "Whither TCAF?" Invited talk at "Recent Trends of Study of Compact Objects - Theory and Observations", in "Recent Trends in Compact Objects -II" conference at ARIES
June 2015: "Unique high energy astrophysics experiment with weather balloons", at 22nd PAC Symposium at Tromso, Norway
July 2015: Chairman of "Accretion Processes on Black Holes" at the 14th Marcel Grossman meeting in Rome and invited talk at AC1 session
Sept. 2015: "Two Component Advective Flows: Theory and Observations" at the "100th Birth Centenary conference at St. Pet ersburgh

IIb Work With Students: In 2015 two students have submitted PhD Thesis. So far 30 PhD students have completed PhD work under my supervision and another 15 at at various stages of completion (including three students is at the stage of writing thesis.)
II c Diploma thesis supervision

II d Other Teaching Duties: Took two courses on High Energy Astrophysics and introductory course on Astrophysics.

II e. Work With Postdocs; I work with 2 Post-Docs and several project scientists. I also work with two engineers, two technical assistants and two helpers in the balloon team.

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet: Chaired/Organized a Session at 14th MG meeting in Rome and presented an invited talk.

III b. Outside ICRANet: I am the Senior most faculty at S.N. Bose National Centre for Basic Sciences, and Head, Department of astrophysics and Cosmology. I am also In Charge of Indian Centre for Space Physics and handle over thirty faculties, engineers and research students

IV. Other

I am being awarded with Doctor of Science (D.Sc.) Award (Honaris Causa) by Gour Banga University during the convocation on the 10th December, 2015.

2014 List of Publications

(A) In refereed Journals


4 S.K. CHAKRABARTI, MAJUMDAR, L., DAS, A. and CHAKRABARTI, S., 2015, Search for Interstellar Adenine, Astrophysics and Space Science, 357, 90


6 V. NWANKWO, S.K. CHAKRABARTI and Robert S. Weigel, 2015, Effects of Plasma Drag on Low Earth Orbiting Satellites due to Solar Forcing Induced Perturbations and Heating, Advances of Space Research, 56, 47


10 P. S. PAL and S.K. CHAKRABARTI, 2015, Comptonizing Efficiencies of IGR 17091-3624 and GRS 1915+105, Advances of Space Science, 56, 1784


12 S. SASMAL, S. PALIT, S. CHAKRABARTI, 2015, Modeling of long path propagation characteristics of Very Low Frequency (VLF) radio waves as observed from Indian Antarctic station Maitri, JGR (in press)


(B) BOOKS

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I Scientific Work

The formation of the first stars hundreds of millions years after the Big-Bang marks the end of what it is called the « Dark Ages ». Currently, we have no direct observations on how the primordial stars formed. This new window is paramount of importance in astrophysics and cosmology. Certainly, the new generation of telescopes will test these theoretical ideas about the formation of the primordial stars. Today’s telescopes cannot look far enough into the cosmic past to observe the formation of the first stars. If we want to see that process, we need sophisticated numerical simulations. Pop III stars also have a potential to produce gamma-ray bursts (GRBs). GRBs may provide one of the most promising methods of directly probing the final stages of Pop III stars.

In this proposal we intend to develop a numerical code to study the explosion of such massive stars and to develop observational consequences (astrophysical and cosmological) of these results to the Pop III stars. Hydrodynamical simulations will be performed with our own numerical code based on the Piecewise Parabolic Method on a Local stencil. Extension of PPML-code to full 3D case to study the 3D hydrodynamic effects on the explosion of a star with realistic physics. This includes implementation of full equation of state of the stellar matter, self-gravity computations, radiation transfer implementation.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

II b Work With Students

II c Diploma thesis supervision

Andrey Baranov (2010-2013):

On Pair Instability Supernovae Explosion and Gamma-Ray Bursts

Now Andrey is researcher at Kurчатов Institute Moscow
Anastasia Filina (2012-2015)

Explosive Phenomena in Astrophysics: Gamma-Ray Bursts and Supernovae

Now Anastasia is researcher in Keldysh Institute of Applied Mathematics Moscow.

II d Other Teaching Duties

Teaching activity at University of Savoie-PRES Université Grenoble

II e. Work With Postdocs

Mikhail Popov: Post-doc in LAPTH Annecy, then in CRAL ENS Lyon

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc...)]

III a. Within ICRANet

Coordinator of EMJD IRAP PhD Program

Co-Advisor of Giovanni Pisanni

III b. Outside ICRANet

Russian Institute for Advanced Study, Moscow

Project on Art and Science

IV. Other

Project of Joint Euro Mediterranean Master on Big Data and Space Sciences with Emirates and Lebanon

2015 List of Publication

1) A.A. Baranov, P. Chardonnet, V.M. Chechetkin, A.A. Filina, M.V. Popov, Aspherical Nucleosynthesis in the He-layer of a Core-collapse Supernova Using the Tracer Particles Method, 2013


2) A.A. Baranov, P. Chardonnet, V.M. Chechetkin, A.A. Filina, M.V. Popov, Multidimensional Simulations of Pair-Instability Supernovae, 2013

   Astronomy & Astrophysics Volume 558 page A10 (2013)
Meeting

P. Chardonnet, A.A. Baranov, V.M. Chechetkin, A.A. Filina, M.V. Popov,

**Gamma-Ray Bursts appear simpler than expected?**

*IOFFE Conference, September 21-27, 2014, Saint-Petersburg, Russia*

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P. Chardonnet, A.A. Baranov, V.M. Chechetkin, A.A. Filina, M.V. Popov,

**Cosmic Gamma-Ray Bursts from Primordial Stars: a new Renaissance in Astrophysics?**

*Fourth Galileo-Xu Guangqi Meeting, May 5-8, 2015, Beijing, China*

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P. Chardonnet, A.A. Baranov, V.M. Chechetkin, A.A. Filina, M.V. Popov,

**On Gamma-Ray Bursts Spectra: a possible understanding**

*2nd Cesar Lattes Meeting, April 13-18, 2015, Rio de Janeiro Brazil*

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P. Chardonnet

**Artium Mater in Relativistic Astrophysics: new perspective for a European-Latin American PhD Program**

*2nd Cesar Lattes Meeting, April 13-18, 2015, Rio de Janeiro Brazil*
Einasto Jann

Position: Adjunct Professor of the Faculty

Period covered: 2009 - 2015

**I Scientific Work**


In collaboration with Tartu and Potsdam astronomers I made several series of numerical simulations of structure evolution of the Universe. These simulations had several goals: to investigate the influence of density perturbations of different scale to structure formation and evolution, the role of phases to the formation of systems of galaxies of various scale, and explanation of absence of galaxies in voids. Our study of the evolution of density perturbations of various scales has led to the following conclusions: 1) The formation of the cosmic web with filaments and voids is due to the synchronisation of density waves of medium and large scales, and the amplification of both over- and under-dense regions, 2) *Voids* are regions in space where medium- and large-scale density waves combine in similar *under-density* phases, *clusters, filaments and superclusters* form in regions where density waves combine in similar *over-density* phases.

I participated in the analyze of the morphology of superclusters of galaxies in the Sloan Great Wall, in the study of the luminosity function of galaxies of the SDSS. Also we investigated the possibility to trace the cosmic web with quasar systems at redshifts range $1.0 < z < 1.8$. The diameters of quasar systems are comparable to the sizes of poor galaxy superclusters in the local Universe.

Together with collaborators we studied the distribution, masses, and dynamical properties of galaxy groups in the A2142 supercluster. The orientation of the axis of the cluster A2142 follows the orientations of its X-ray substructures and radio halo, and is aligned along the supercluster axis. We analysed the density contrasts for the turnaround, future collapse, and zero gravity in different CDM models. The analysis of the supercluster A2142 shows that its high-density core has already started to collapse. The zero-gravity line outlines the outer region of the main body of the supercluster. In the course of future evolution, the supercluster may split into several collapsing systems.

We searched for shell-like structures in the distribution of nearby rich clusters of galaxies drawn from the SDSS DR8. The radii of possible shells, 120 Mpc/h, are larger than expected for a BAO shell (about 109 Mpc/h), and they are determined by very rich galaxy clusters and superclusters with high density contrast, while BAO shells are barely seen in the galaxy distribution.
II Conferences and educational activities

II a Conferences and Other External Scientific Work

2009: Zeldovich Memorial Meeting, Minsk (April, 19 – 25); Marcel Grossmann 12th Meeting, Paris (July, 12 – 19).

2010: 2nd Galileo-Xu Guangqi Meeting, Ventimiglia (July, 12 – 18).

2011: Conference “Expanding the Universe”, dedicated to the 200 anniversary of Tartu University Observatory (April, 27 – 29); Workshop “Cosmic Web Morphology and Topology”, Warsaw (July, 11 – 18).

2012: 13th Marcel Grossmann Meeting, Stockholm (July, 01 – 08); 26th Texas Symposium on Relativistic Astrophysics, Sao Paulo (December, 14 – 21).


2015: Conference “Drifting through the Cosmic Web: the Evolution of Galaxies within the Large Scale Structure”, Aix en Provance (July, 05 – 11).

II d Other Teaching Duties


III. Service activities

[activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

I had lectures in the IRAP PhD Erasmus Mundus School in 2010 and 2011, also I participated in conferences organized by ICRANet (see above).

III b. Outside ICRANet

I participated in the work of the Centre of Excellence of Dark Matter in (Astro)particle Physics and Cosmology, and benefitted from Estonian Research Council grants IUT26-2, and IUT40-2.

IV. Other

Visits

**Popularization of science**

I had numerous popular lectures in Estonia, organized by Tartu University, Estonian Academy of Sciences, Estonian Radio and Television, Estonian schools, and by other organizations. Also I have published popular papers for the Calendar of Tartu Observatory.

**Participation in scientific organizations**


**Awards**


**2015 List of Publication**

Einasto, J. 2014, *Yakov Zeldovich and the Cosmic Web Paradigm*, ArXiv, 1410.6932


Frontera Filippo

Position: Professor University of Ferrara
Period covered: Jan-December 2015

I Scientific Work

Experimental and observational X-/gamma-ray astronomy, in particular:

a. Gamma-ray lens development with long focal length (LAUE project);
b. Studies of new gamma-ray burst missions
c. Observational studies of GRB prompt emission;
d. Observational review on hard X-ray astronomy.

II Conferences and educational activities

II a. Conferences and Other External Scientific Work

a. Outreaching conference, Soverato (Calabria), 19-21 March 2015
c. 14th Marcel Grossmann Meeting, Roma, 12-18 July 2015
d. Kick off meeting of the EU project AHEAD (Integrated Activities for the High Energy Astrophysics Domain), CNR Research AREA, Rome, 15-15 September 2015

II b. Work With Students

yes, with

a) 2 PhD students (Disha Sawant and Tais Maiolino), EMJD-IRAP-PhD program

b) 1 Master Student in Physics, Erica Cavallari, of the University of Ferrara
II e Other Teaching Duties

One course at UNIFE, on “Measures and Observations of Celestial X- and gamma-rays” to Master Students in Physics.

II d. Work With Postdocs

Yes, with 1 PostDoc: E. Virgilli at the Physics and Earth Sciences Department, University of Ferrara

III. Service activities

III a. member of the IRAP-PhD Faculty

IV. Other

none

2015 List of Publications


Amati, Lorenzo; Campana, Riccardo; Evangelista, Yuri; Feroci, Marco; Fuschino, Fabio; Labanti, Claudio; Salvaterra, Ruben; Stratta, Giulia; Tagliaferri, Gianpiero; Frontera, Filippo; and 12 coauthors, Game: GRB and All-Sky Monitor Experiment, Proceedings of the MG13 Meeting on General Relativity (in 3 Volumes). Edited by ROSQUIST KJELL ET AL. Published by World Scientific Publishing Co. Pte. Ltd., 2015. ISBN No. 9789814623995, pp. 889-901 (2015).
Fryer Chris L.

Position: Scientist 5
Adjunct Professor of the ICRANet
Faculty

I Scientific Work

Fryer studies a wide range of astrophysics focusing primarily on supernovae, compact objects, nucleosynthetic yields and gamma-ray bursts as well as high-energy density plasma physics.

II Conferences and educational activities

II a Conferences and Other External Scientific Work: Chris co-organized a session in the MG15 meeting, gave plenary talks at MG15, invited talks at MIAPP, Benz, LAUGA meetings, and colloquia at Harvard, MIT and Univ. Manitoba in 2015.

II b Work With Students: Chris Fryer co-mentored 4 students in 2015: Sydney Andrews, Janie De La Rosa, Cole Kendrick, Tim Waters

II c Diploma thesis supervision: Chris Fryer is co-supervising the thesis of Janie De La Rosa

II d Other Teaching Duties

II e. Work With Postdocs: Chris mentored 3 post-docs in 2015: Josh Dolence, Brendan Krueger, Chris Malone.

III. Service activities

III a. Within ICRANet: Chris co-organized a session at MG15.

III b. Outside ICRANet: Chris is co-PI of NuGrid, the PI of the rad-flow campaign at LANL and serves on the executive board of the Center for Non-Linear Studies, advisory boards of Institutional Computing and NPAC (Nuclear Particle Astrophysics and Cosmology).

IV. Other

APS Fellow (2008), LANL Fellow (2014), Lawrence Award (2014)
2015 List of Publication

I Scientific Work
Continuing collaboration with Donato Bini and Andrea Geralico on mathematical properties of stationary spacetimes and relativistic Poynting-Robertson effects.

II Conferences and educational activities
II a Conferences and Other External Scientific Work
MG14 co-organizer, Italo-Korea IK14 talk

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs
Dr. E. Bittencourt (CAPES, Brazil and ICRANet)
Dr. Andrea Geralico (CNR)

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet
Continuing MG14 editorial duties, MG14 organizational work

III b. Outside ICRANet

IV. Other

Summer 2014 through Fall 2015 List of Publications
Slicing black hole spacetimes,
D. Bini, E. Bittencourt, A. Geralico and R.T. Jantzen,
Jetzer Philippe

University of Zurich, Switzerland

Position: Professor
Period covered: 2015

I. Service activities

III b. Outside ICRANet

Lecture on: “Mathematical Methods in Physics” during the Spring semester 2015 at University of Zurich

2015 List of Publication


Mirabel Félix

Present Position:
Conseiller Scientifique au CEA-France &
Investigador Superior CONICET-Argentina

Adjunct Professor of the ICRANet Faculty

Past positions:
- Representative and Head of the Office of Science in Chile of the European Southern Observatories
- Directeur de Recherches. Commissariat à l'Énergie Atomique et aux Énergies Alternatives. France
- Researcher "Superior" of the National Research Council. Argentina
- Professor (Associate - Full). Univ. of Puerto Rico, USA
- Guggenheim Fellow. California Institute of Technology. USA
- Associate Researcher. University of Maryland. USA
- Post-doctoral Researcher. University of Manchester. UK
- Fellow of the National Research Council. Argentina

Distinctions:
- Doctor Honoris Causa. University of Barcelona (2004). Discurso de Investidura. (Reduced version in English published by the French Academy of Sciences)
- Prix Konex 2013. One of the five most productive argentine scientists in Physics and Astronomy during the last decade.
- Consecration Prize. National Academy of Exact Sciences, Physical and Natural Sciences of Argentina (2010).
- Member of the National Academy of Exact Sciences, Physical and Natural Sciences of Argentina (2011).
- Member of the World Academy of Sciences (TWAS) - for the Advancement of Science in developing countries (2015)

I Scientific Work

Lead the discoveries of Microquasars, the Apparent Superluminous Motions in the Galaxy, and initiated the multiwavelength ground base research that lead to the discovery of Luminous Infrared Galaxies and Tidal Dwarf Galaxies.

Current areas of research:
II Conferences and educational activities

II a Conferences and Other External Scientific Work

About 6 per year

II b Work With Students

Animate science discussions at IAFE-Argentina and CEA-France

II c Diploma thesis supervision

Co-direct the thesis of Vanesa Douna on the Role of High Energy Sources in Cosmic Evolution

II d Other Teaching Duties

Several

II e. Work With Postdocs

Several

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

None until 15 November 2015

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

Publications:

- 612 (325 in refereed journals) with more than 16,100 citations
- Index h = 56 (Based on SAO/NASA Astrophysics Data System)

In 2015:

- Metallicity dependence of high-mass X-ray binary populations
  V. M. Douna1;2, L. J. Pellizza3, I. F. Mirabel1;4, and S. E. Pedrosa

- Jet-induced star formation by a microquasar

Authors: I. F. Mirabel, S. Chaty, L.F. Rodriguez, M. Sauvage


- CTA Contributions to the 34th International Cosmic Ray Conference (ICRC2015)

2015arXiv150805894C
I Scientific Work

Black Holes and Quasars

1. Introduction

This report describes the research performed by Brian Punsly and collaborators in cooperation with ICRANet in 2014-2015. The research was directed at finding environmental factors that are related to the switch-on of the general relativistic engine responsible for a few percent of quasars driving powerful relativistic jets. This is important since this will relate directly to constraints on the initial state and boundary conditions on numerical models of black hole driven jets.

2. Coordinated NUSTAR, XMM and VLBA Multi-Epoch Observations of Mrk 231 During a Radio Flare

I am leading an international effort to study Mrk 231 during a radio flare with the highest resolution radio interferometry and in the X-ray band. This nearby quasar is in the process of transitioning from a radio quiet quasar to a radio loud quasar. A flare was detected during our Arc Minute MicroKelvin array monitoring at 17.6 GHz. This research is being done in collaboration with Cormac Reynolds and Natasha Hurley-Walker (Curtin University of Technology, Department of Imaging and Applied Physics), Christopher P. O'Dea (Department of Physics, Rochester Institute of Technology) and Giovanni Miniutti (Centro de Astrobiología (CSIC–INTA), Dep. de Astrofísica, European Space Astronomy Centre Madrid Spain).

Abstract

On 3/26/2015 we began a target of opportunity VLBA 4–epoch monitoring at 8.4, 15, 22 and 43 GHz of a high frequency flare in the nearby quasar MRK231. The observations were spread out through May. The primary goals are to detect superluminal motion, estimate the internal energy of the flare from the spectrum and component sizes, and monitor the temporal evolution in order to understand the energy injection mechanism (rise) and the cooling mechanism (decay). The first three epochs had observations by NuSTAR in addition to VLBA and the last three epochs were observed with XMM. The data is currently being processed.
Background

From previous VLBA studies of MRK231 in Reynolds et al (2009) and other RQ (radio quiet) quasar studies, we have seen that RQ AGN can have relativistic outflows with significant kinetic luminosities (but maybe for short periods of time). So this raises the question what is it that makes some sources RQ and others radio loud (RL)? At a redshift of 0.042, MRK231 is one of the nearest radio quiet quasars to earth. The radio core is perhaps the brightest of any radio quiet quasar at high frequency (22 and 43 GHz). The combination of significant 43 GHz flux density and its proximity to earth makes MRK231 the optimal radio quiet quasar for study with VLBA. No other radio quiet quasar central engine can be explored with such high resolution, so it is ideal for studying the high kinetic luminosity relativistic ejecta in radio quiet quasars. 43 GHz VLBA observations can fully resolve nuclear structure to within $3.5 \times 10^{17}$ cm. We use sensitive high resolution observations to study the temporal evolution of the size and spectrum of a strong flare in MRK231 in order to shed light on why such strong flares cool off and never link to large scale powerful radio lobes.

3. Determining the Location of Relativistic Jet Launching in Quasars

The nature of the causative agent that makes some quasars radio loud (RLQs) has challenged astrophysicists for more than 50 years. It became clear early on that the optical/ultraviolet (UV) spectra of RLQs and radio quiet quasars (RQs) are very similar. Attempts to look for subtle differences involved statistical studies of optical and UV emission line strengths and widths. These emission regions are far from the central engine, many thousand times larger than the central black hole radius, so it is not clear what they tell us as a second order indicator of conditions in the jet launching region. Are they related to the fueling mechanism for radio loudness, the ionization continuum or jet propagation? Consequently, this research path has provided very little understanding of the jet launching mechanism. Seemingly more relevant to the physics of jet launching, the extreme ultraviolet (EUV) continuum, wavelength less than 1100 Angstroms, is created orders of magnitude closer to the central engine and RLQs display significant EUV continuum deficit relative to RQs. We have explored this in a series of new ApJ and MRAS articles.

3A. Evidence of the Dynamics of Relativistic Jet Launching in Quasars

ABSTRACT:

Hubble Space Telescope (HST) spectra of the EUV, the optically thick emission from the innermost accretion flow onto the central supermassive black hole, indicate that radio loud quasars (RLQs) tend to be EUV weak compared to the radio quiet quasars; yet the remainder of the optically thick thermal continuum is indistinguishable. The deficit of EUV emission in RLQs has a straightforward interpretation as a missing or a suppressed innermost region of local energy dissipation in the accretion flow. This article is an examination of the evidence for a distribution of magnetic flux tubes in the innermost accretion flow that results in magnetically arrested accretion (MAA) and creates the EUV deficit. These same flux tubes and possibly the interior magnetic flux that they encircle are the source of the jet power as well. In the MAA scenario, islands of large scale magnetic vertical flux perforate the innermost accretion flow of RLQs. The first prediction of the theory that is supported by the HST data is that the strength of the (large scale poloidal magnetic fields) jets in the MAA region is regulated by the ram pressure of the accretion flow in the quasar environment. The second prediction that is supported by the HST data is that the rotating magnetic islands remove energy from the accretion flow.
as a Poynting flux dominated jet in proportion to the square of the fraction of the EUV emitting gas that is displaced by these islands.

**Figure 1.** The correlation of the long term time averaged jet power normalized by the bolometric luminosity of the accretion flow in radio loud quasars with the EUV spectral index. A larger spectral index means a steeper spectrum and a larger EUV deficit relative to radio quiet quasar with a spectral index of about 1.57.

### 3B. The Extreme Ultraviolet Deficit: Jet Connection in the Quasar 1442+101

This research was an attempt to see if the long term time averaged affect described above was evident in the time evolution of an individual radio loud quasar. The collaboration included the efforts from Cormac Reynolds (Curtin University of Technology, Department of Imaging and Applied Physics), Christopher P. O'Dea (Department of Physics and Astronomy, University of Manitoba, Winnipeg, MB R3T 2N2 Canada), Paola Marziani (INAF, Osservatorio Astronomico di Padova, Italia), Preeti Kharb (Indian Institute of Astrophysics, II Block, Koramangala, Bangalore) and Marianne Vestergaard (Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen).

**ABSTRACT:** In previous studies, it has been shown that the long-term time-averaged jet power, $Q$, is correlated with spectral index in the extreme ultraviolet (EUV), $\alpha_{\text{EUV}}$ (defined by $F_\nu \sim \nu^{-\alpha_{\text{EUV}}}$ computed between 700 and 1100 Å). Larger $Q$ tends to decrease the EUV emission. This is curious relationship...
because it connects a long-term average over ∼106 years with an instantaneous measurement of the EUV. The EUV appears to emit adjacent to the central supermassive black hole and the most straightforward explanation of this correlation is that the EUV-emitting region interacts in real time with the jet-launching mechanism. Alternatively stated, the $Q - \alpha_{\text{EUV}}$ correlation is a manifestation of a contemporaneous (real time) jet power, $Q(t)$, correlation with $\alpha_{\text{EUV}}$. In order to explore this possibility, this paper considers the time variability of the strong radio jet of quasar 1442+101, which is not aberrated by strong Doppler enhancement. This high-redshift ($z = 3.55$) quasar is uniquely suited for this endeavor as the EUV is redshifted into the optical observing window allowing for convenient monitoring. More importantly, it is bright enough to be seen through the Lyman forest and its radio flux is strong enough that it has been monitored frequently. Quasi-simultaneous monitoring (five epochs spanning ∼40 years) show that increases in $Q(t)$ correspond to decreases in the EUV as expected.

Figure 2. The quasar 1442+101 shows the correlation between jet power and the decrement of EUV emission in real time.

3C. The extreme ultraviolet spectrum of the kinetically dominated quasar 3C 270.

ABSTRACT: Only a handful of quasars have been identified as kinetically dominated, their long-term time-averaged jet power, $Q$, exceeds the bolometric thermal emission, $L_{\text{bol}}$, associated with the accretion flow. This Letter presents the first extreme ultraviolet (EUV) spectrum of a kinetically dominated quasar, 3C 270.1. The EUV continuum flux density of 3C 270.1 is very steep, $F_\nu \propto \nu^{-\alpha_{\text{EUV}}}$, $\alpha_{\text{EUV}} = 2.98 \pm 0.15$. This value is consistent with the correlation of $Q/L_{\text{bol}}$ and $\alpha_{\text{EUV}}$ found in previous studies of the
EUV continuum of quasars, the EUV deficit of radio loud quasars. Curiously, although ultraviolet broad absorption line (BAL) troughs in quasar spectra are anticorrelated with $Q$, 3C 270.1 has been considered a BAL quasar based on an SDSS spectrum. This claim is examined in terms of the EUV spectrum of OVI and the highest resolution C IV spectrum in the archival data and the SDSS spectrum. First, from [O III]4959,5007 (IR) observations and the UV spectral lines, it is concluded that the correct redshift for 3C 270.1 is 1.5266. It is then found that the standard measure of broad absorption, BALnicity = 0, for Mg II 2800, C IV 1549 and OVI 1032 in all epochs.

2015 List of Publication

Punsly, Brian; Marziani, Paola., The extreme ultraviolet spectrum of the kinetically dominated quasar 3C 270.1 2015 MNRAS 453L 16

Punsly, Brian; Marziani, Paola; Kharb, Preeti; O'Dea, Christopher P.; Vestergaard, Marianne, The Extreme Ultraviolet Deficit: Jet Connection in the Quasar 1442+101 2015 ApJ 812 79

Quevedo Hernando

Position: Full Professor - National Autonomous University of Mexico
Period covered: 2015

I Scientific Work

Topics:
- Exterior and interior solutions of Einstein’s equations and applications in relativistic astrophysics.
- The physics of naked singularities.
- Geometrothermodynamics of black holes.
- Applications of geometrothermodynamics in cosmology.
- Topological quantization of classical field theories.

II Conferences and educational activities

II a Conferences and Other External Scientific Work
- Visit: New Granada Military University, Bogotá, Colombia (June 14 – 16, 2015)
- Conference: Geometry and its Applications, course: Geometrothermodynamics and its applications Bogotá, Colombia (June 17 – 21, 2015)
- Conference: XIIth International Conference on Gravitation, Astrophysics and Cosmology (ICGAC-12), plenary talk: “Geometrothermodynamic emergent gravity” Moscow, Russia (June 27 – July 7, 2015)
- Conference: 14th Marcel GrossmannMeeting, talk: “Cosmological models based on geometrothermodynamics” Rome, Italy (July 12 – 18, 2015)
- Visit: Sapienza-Università di Roma (July 19 – August 3, 2015)
- Research stay at Al Farabi Kazakh National University (Almaty, Kazakhstan, September 1 – 30, 2015)
- XII Xalapa Meeting, invited talk: “Geometrothermodynamics in relativistic cosmology” Xalapa, Mexico (October 21- 24, 2015)
- Visit: New Granada Military University, Bogotá, Colombia (November 8 – 16, 2015)

II b Work With Students

II c Diploma thesis supervision
- Viridiana Pineda (PhD)
  Topic: Microscopic models for black holes
- Daniel Flores (PhD)
  Topic: Topological quantization of minisuperspaces
- Selene Cruz (PhD)
  Topic: Diffeomorphism invariance in topological quantization
- Pedro Sánchez (MSc)
  Topic: Geometrothermodynamics in relativistic astrophysics
- Juan José Vega (MSc)
  Topic: Topological quantization of mechanical systems

II d. Other Teaching Duties

II e. Work With Postdocs

- Alessandro Bravetti, Cesar Lopez, Christine Gruber (all postdocs at UNAM)

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

Course: General Relativity at UNAM

IV. Other

2015 List of Publication

RELATIVISTIC LIKE STRUCTURE OF CLASSICAL THERMODYNAMICS
H. Quevedo, A. Sanchez and A. Vazquez
GENERAL RELATIVITY AND GRAVITATION 4, 36 (2015)
DOI: 10.1007/s10714-015-1881-9

GENERATING STATIC PERFECT-FLUID SOLUTIONS OF EINSTEIN'S EQUATIONS
H. Quevedo and S. Toktarbay
JOURNAL OF MATHEMATICAL PHYSICS 56, 052502 (2015)
DOI: 10.1063/1.4921062

THE ERGOREGION IN THE KERR SPACETIME: PROPERTIES OF THE EQUATORIAL CIRCULAR MOTION
D. Pugliese and H. Quevedo
EUROPEAN PHYSICAL JOURNAL C 75, 234 (2015)
DOI: 10.1140/epjc/s10052-015-3455-0
THERMODYNAMICS AND GEOMETROTHERMODYNAMICS OF BORN-INFELD BLACK HOLES WITH COSMOLOGICAL CONSTANT
H. Quevedo, M. N. Quevedo and A. Sanchez
INTERNATIONAL JOURNAL OF MODERN PHYSICS D 24, 1550092 (2015)
DOI: 10.1142/S0218271815500923

MAXIMALLY SYMMETRIC SPACETIMES EMERGING FROM THERMODYNAMIC FLUCTUATIONS
A. Bravetti, C.S. Lopez-Monsalvo, and H. Quevedo
e-Print: arXiv:1503.08358 [gr-qc]

SELF-ACCELERATED UNIVERSE INDUCED BY REPULSIVE EFFECTS AS AN ALTERNATIVE TO DARK ENERGY AND MODIFIED GRAVITIES
O. Luongo and H. Quevedo
e-Print: arXiv:1507.06446 [gr-qc]

MOTION OF TEST PARTICLES IN THE FIELD OF A NAKED SINGULARITY
K. Boshkayev, E. Gasperin, A.C. Gutierrez-Pineroes, H. Quevedo and S. Toktarbay
e-Print: arXiv:1509.03827 [gr-qc]

GEODESICS IN THE FIELD OF A ROTATING DEFORMED GRAVITATIONAL SOURCE
K. Boshkayev, H. Quevedo, M. Abutalip, Z. Kalymova and S. Suleymanova
e-Print: arXiv:1510.02016 [gr-qc]

ON THE EQUIVALENCE OF APPROXIMATE STATIONARY AXially SYMMETRIC SOLUTIONS OF EINSTEIN FIELD EQUATIONS
K. Boshkayev, H. Quevedo, S. Toktarbay and B. Zhami.
e-Print: arXiv:1510.02035 [gr-qc]

ACCRETION DISKS AROUND A MASS WITH QUADRUPOLE
M. Abishev, K. Boshkayev, H. Quevedo and S Toktarbay.
e-Print: arXiv:1510.03696 [gr-qc]

A PERFECT-FLUID SPACETIME FOR A SLIGHTLY DEFORMED MASS
M. Abishev, K. Boshkayev, H. Quevedo and S. Toktarbay.
e-Print: arXiv:1510.03699 [gr-qc]

ORBITAL STABILITY OF THE RESTRICTED THREE BODY PROBLEM IN GENERAL RELATIVITY
M. Abishev, H. Quevedo, S. Toktarbay and B. Zhami
e-Print: arXiv:1510.03703 [gr-qc]
Lecturers
Aksenov Alexey

Position: Senior scientific staff member
Dep. of Comp. Methods, Information and Management
Institute for Computer-Aided Design, RAS,
Moscow

Scientific Work
Collapse of stars cores, neutrino transport, multidimensional multi-temperature hydrodynamic simulations, simulations of the countercurrent in a gas centrifuge, one dimensional radiative transfer codes, a numerical modeling of electron-positron pairs and photons transfer, etc.

II Conferences and educational activities

III Service activities
Within ICRANet
Co-chair (SN2) Numerical simulations, SN, and GRB, connecting with massive SN in MG14

Outside ICRANet

2015 List of Publications
Bini Donato

Position: Researcher (permanent position) at
Istituto per le Applicazioni del Calcolo,
“M. Picone,” CNR
Via dei Taurini, 19 I-00185 Roma
Period covered: 1995 - today.

I Scientific Work
The main topic of my interest is General Relativity with special attention to several classical aspects, like the analysis and the interpretation of exact solutions of Einstein's field equations. In particular, I'm interested in spacetime splitting techniques, measurement process and the role of the observer in General Relativity, particle dynamics in certain fixed gravitational backgrounds (either test particles with scalar structure: the mass, or particles with internal structure: spinning test particles and particles with multipolar structure, quadrupolar and beyond), gravitational perturbations, gravitational waves. Currently, the main topics of interest for my research activities involve the PN approximation of General Relativity, gravitational self-force, effective-one-body model, with applications to astrometry and binary systems.

I'm an expert user of MAPLE™ tensor calculus package.

II Conferences and educational activities
Conferences and Other External Scientific Work
Since 1988 I have participated in all the international meetings of the Marcel Grossmann series as well as all the conferences of the ICRA-ICRANet series.

Diploma thesis supervision
I've been supervisor of the Diploma thesis of several students at the University of Rome “La Sapienza”, since 1995:

Ph.D thesis supervision
Dr. V. Montaquila, Physics departments of the University of Naples “Federico II.,” year 2011.
Dr. M. Haney, IRAP Ph.D, University of Rome "Sapienza," year 2013.
Gabriel G. Carvalho (CAPES, Brazil and ICRANet)

Teaching experiences
I'm Contract Professor of Physics since 2004 at the faculty of Medicine of the University Campus Biomedico, in Rome. From 2007-2009 I have also been Contract Professor of Physics at the Nursery School of the same university.

Work With Postdocs
A Geralico (University of Rome “La Sapienza” and ICRANet)
E. Bittencourt (CAPES, Brazil and ICRANet)
III Service activities
Scientific collaboration with:
Prof. R. Ruffini (University of Rome, Italy and ICRANet);
Prof. R.T. Jantzen (Villanova University, USA and ICRANet);

Outside ICRANet
Scientific collaboration with:
Prof. T. Damour (IHES, Paris, France);
Prof. F. de Felice (University of Padova, Italy);
Dr. A. Ortolan (INFN Legnaro, Padova, Italy);

Other
I’m currently doing referee activity for a large number of international journals in the field of General Relativity and I’m a reviewer for Mathreview.
For the years 2002-2004 I have been the leader of a collaboration project between the Italian Research Council (CNR) and the analogous institution in Venezuela. Title of the project: Construction of 3d numerical models for the study of magnetohydrodynamics in gravitational physics and astrophysics.
For the years 2007-2008 I have been the leader of young researchers projects of INDAM (Istituto Nazionale di Alta Matematica). Title of the project: Light coordinates and spacetime topography.
For the years 2008-2009 I have been the leader of young researchers projects of INDAM (Istituto Nazionale di Alta Matematica). Title of the project: Sistemi di Posizionamento Globale relativistici

2015 List of publications

1) Bini D. and Geralico A.,
Effect of an arbitrary spin orientation on the quadrupolar structure of an extended body in a Schwarzschild spacetime,

2) Bini D. and Geralico A.,
Tidal invariants along the world line of an extended body in the Kerr spacetime,

3) Bini D. and Damour T.,
Detweiler’s gauge-invariant redshift variable: analytic determination of the nine and nine-and-a-half post-Newtonian self-force contributions,
[arXiv:1502.02450 [gr-qc]].

4) Bini D., Mashhoon B.,
Weitzenbock’s Torsion, Fermi Coordinates and Adapted Frames,
[arXiv:1502.04183 [gr-qc]].

5) Bini D., Bittencourt E., Geralico A. and Jantzen R.T.,
Slicing black hole spacetimes,
6) Bini D. and Damour T.,
Analytic determination of high-order post-Newtonian self-force contributions to gravitational spin precession,
[arXiv:1503.01272 [gr-qc]]

7) Bini D., Iorio L. and Giordano D.,
Orbital effects due to gravitational induction,

8) Bini D., Bittencourt E. and Geralico A.,
Massless Dirac particles in the vacuum C-metric,

9) Bini D., de Felice F.,
Chronology protection in the Kerr metric,

10) Bini D., Faye G. and Geralico A.,
Dynamics of extended bodies in a Kerr spacetime with spin-induced quadrupole tensor,

Submitted papers

11) Bini D. and Mashhoon B.,
Nonlocal Gravity: Conformally Flat Spacetimes,
Classical and Quantum Gravity, submitted

12) Bini D., Esposito G. and Geralico A.,
Late time evolution of cosmological models with non-ideal fluids,

13) Bini D., Damour T. and Geralico A.,
Spin-dependent two-body interactions from gravitational self-force computations,

14) Bini D., Geralico A, Gregoris D, Mocz P., Succi S.,
CMB constraints on cosmological models with fluids obeying a Shan-Chen-like equation of state,
General Relativity and Gravitation, submitted

15) Bini D., Damour T. and Geralico A.
Confirming and improving post-Newtonian and effective-one-body results from self-force computations along eccentric orbits around a Schwarzschild black hole,
Filippi Simonetta

Position: **Full Professor** in Mathematical Physics (MAT/07).

Head, Laboratory of Non Linear Physics and Mathematical Modeling
Pro-Rector for Education, University “Campus Bio-Medico”,
Via A. del Portillo 21, I-001285 Rome, Italy,
Tel. +39-06-225419611
Email: s.filippi@unicampus.it

Membership: American Physical Society

I Scientific Work

- Astrophysics of self-gravitating fluids.
- Cosmology.
- Numerical Relativity.
- Fluid Dynamics
- Theoretical Biophysics.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

II b Work With Students

- Prof. Filippi, together with Dr. Christian Cherubini, is working with the IRAP PhD student Federico Cipolletta on neutron stars theory and numerical methods for obtaining rotating and self-gravitating classical and relativistic equilibrium configurations.

II c Diploma thesis supervision

II d Other Teaching Duties
II e. Work With Postdocs

Prof. Filippi is working with Dr. Cherubini and Dr. Jorge Rueda on numerical relativity applied to rotating fluids.

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

Prof. Filippi serves as supervisor for IRAP PhD students.

III b. Outside ICRANet

2014/15 Lecturer “Mechanics and Thermodynamics” (Engineering Department, University Campus Bio-Medico of Rome).

2014/15 Lecturer “Dynamics of Complex Systems” (Engineering Department, University Campus Bio-Medico of Rome).

2014/15 Lecturer “Mathematical Physics Models for Engineering” (Engineering Faculty, University Campus Bio-Medico of Rome).

- Faculty of the BIOENGINEERING AND BIOSCIENCES PH.D." by University Campus Bio-Medico" of Rome.

IV. Other

Prof. Filippi has a longstanding collaboration with ICRANET scientists. In particular in collaboration with Prof. Remo Ruffini she has written plenty articles on various aspects of Gravitational Physics. With Dr Christian Cherubini, Dr Andrea Geralico and Dr Donato Bini she has been involved in research activities in the fields of Stellar and Galactic Structures, Effective Geometries and Complex Systems in Nature.

2015 List of Publications


4) Cherubini C., Filippi S., Gizzi A., Nestola M.G.C., "On the Wall Shear Stress Gradient in Fluid Dynamics" Communications in Computational Physics, Volume: 17, 2015 Issue: 3 Pages: 808-821

5) Gizzi A., Cherubini C., Filippi S., Pandolfi A., "Theoretical and Numerical Modeling of Nonlinear Electromechanics with applications to Biological Active Media", Communications in Computational Physics Volume 17 2015 Issue 1 Pages: 93-126


**Wiltshire David L.**

Position: Professor, Department of Physics & Astronomy, University of Canterbury, Christchurch, New Zealand


**I Scientific Work**

Inhomogeneous Cosmology, Backreaction, the Averaging Problem in General Relativity.

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*, presented talks at:
  - New Zealand Institute of Physics 2015 Conference, Hamilton, NZ, 6-8 July, 2015
  - ACGRG8: 8th Australasian Conference on General Relativity and Gravitation, Melbourne, Australia, 2-4 December, 2015

*II b Student supervision*: Supervised 4 PhD students – M Ahsan Nazer, Nezihe Uzun, Cathy Neill, Yongzhuang Li – and 2 MSc students: Lawrence Dam, James McKay.

*II d Other Teaching Duties – Gave three lecture courses at University of Canterbury: PHYS203 Quantum Physics; PHYS326 Classical Mechanics and Symmetry Principles; PHYS415 General Relativity.*

**III. Service activities**

*III b. Outside ICRANet*: ACGRG8 Organizing Committee; Editorial Board of *Classical and Quantum Gravity*; Academic Board at the University of Canterbury, Council of NZ Institute of Physics.

**IV. Other activities**

Presented seminars at Institut d’Astrophysique de Paris, France, 7/4/2015; Université de Lyon 1, France, 10/7/2014

Edited Special Focus Issue on “Planck and the fundamentals of cosmology” together with François Bouchet, *Classical and Quantum Gravity*, November 2015.

**2015 List of Publications**

Research Scientists
Cherubini Christian


Period covered: November 1st 2007-today

I Scientific Work

- Astrophysics of self-gravitating fluids.
- General relativistic perturbation theory.
- Cosmology.
- Numerical Relativity.
- Fluid dynamics
- Theoretical biophysics.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

GNFM Meeting, October, 22-24, 2015, Montecatini (IT)

II b Work With Students

At the moment Dr Cherubini, together with Prof. S. Filippi is working with the IRAP PhD student Federico Cipolletta on numerical methods for rotating and self-gravitating classical and general relativistic fluid equilibrium configurations.

II c Diploma thesis supervision

II d Other Teaching Duties

- Lecturer “Electromagnetism” (Engineering Faculty, University Campus Bio-Medico of Rome).
- Lecturer “Mathematical Physics Models for Engineering” (Engineering Faculty, University Campus Bio-Medico of Rome).

II e. Work With Postdocs
At the moment Dr Cherubini is working with Dr Jorge Rueda on numerical relativity applied to rotating fluids.

**III. Service activities** [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

**III a. Within ICRANet**

- Participation to the "Collegio di Dottorato" of the INTERNATIONAL RELATIVISTIC ASTROPHYSICS PH.D." by University of Rome "La Sapienza".

**III b. Outside ICRANet**

**IV. Other**

Dr Cherubini has a longstanding collaboration with other ICRANET scientists. In particular in collaboration with Dr Andrea Geralico, Dr Donato Bini, Prof. Robert T Jantzen and Prof. Remo Ruffini he has written plenty articles in various areas of General Relativity. With Prof. Simonetta Filippi he is involved in research activities in the fields of Stellar and Galactic Structures, Effective Geometries and Complex Systems in Nature.

**2015 List of Publications**


4) Cherubini C., Filippi S., Gizzi A., Nestola M.G.C., "On the Wall Shear Stress Gradient in Fluid Dynamics" Communications in Computational Physics, Volume: 17, 2015 Issue: 3 Pages: 808-821

5) Gizzi A., Cherubini C., Filippi S., Pandolfi A., "Theoretical and Numerical Modeling of Nonlinear Electromechanics with applications to Biological Active Media", Communications in Computational Physics Volume 17 2015 Issue 1 Pages: 93-126


Marco Muccino

Position: PhD  
Period covered: 2010/2014  
Position: Post-Doc  
Period covered: 2014/2015

I. Scientific Work

My research area includes:

- data reduction of GRBs, from Swift-BAT and XRT, Fermi-GBM and LAT and BATSE by using XSPEC, RMFIT, and the Swift-BAT and XRT pipelines to create spectra and light curves;
- analysis and classification of short GRBs and quest of related progenitor systems as neutron star–neutron star (NS–NS) or NS–white dwarf (WD) mergers in the contest of the Fireshell model;
- analysis and classification of long GRBs and application of the "Induced gravitational collapse" (IGC) model, proposed to explain the GRBs-supernovae (SNe) connection;
- analysis of the X-ray afterglow of long and short GRBs;
- analysis of the high energy spectral component of short and long GRBs;
- cosmology with GRBs.

II. Conferences and educational activities

II a. Conferences:

1) IRAP Ph.D. Erasmus Mundus Workshop “Recent News from the Mev, GeV and TeV Gamma-Ray Domains”, March 21st – 26th, 2011 Pescara (Italy)

2) IRAP Ph.D. Erasmus Mundus school, May 25th – June 10th, 2011 Nice (France)

3) HEPRO (High Energy Phenomena in Relativistic Outflows) III, June 27th – July 1st, 2011, Barcelona (Spain)

4) 12th Italian-Korean Symposium on Relativistic Astrophysics, July 4th –8th, 2011 Pescara (Italy)

5) IRAP Ph Erasmus Mundus School, September 5th –16th, 2011 Nice (France)

6) IRAP Ph.D. Erasmus Mundus Workshop, “Gamma Ray Bursts, their progenitors and the role of thermal emission”, October 2nd –7th, 2011 Les Houches (France)


8) 9th AGILE Science Workshop, Astrophysics with AGILE: Five Years of Surprises, April 16th –17th, 2012 ESA-ESRIN, Frascati (Italy)

Stockholm (Sweden)

10) IRAP Ph.D. Erasmus Mundus School, September 3rd – 21st, 2012 Nice (France)


13) IRAP Ph.D. Erasmus Mundus school, September 2nd – 20th, 2013 Nice (France).


16) IRAP Ph.D. Erasmus Mundus School, February 23rd – March 2nd, 2014 Nice (France).


20) IRAP Ph.D. Erasmus Mundus school, September 8th – 19th, 2014 Nice (France).

21) The 2nd ICRANet Cesar Lattes Meeting, April 13th–18th, 2015 Niteroi – Rio De Janeiro (Brazil).

22) Fourteenth Marcel Grossmann Meeting - MG14, July 12th – 18th, Rome (Italy).

23) 14th Italian-Korean Symposium on Relativistic Astrophysics", July 20th – 24th, Pescara (Italy)

II b. Work With Students:

Internal seminars and supervision of data analysis with PhD students.

III. Service activities

III a. Within ICRANet


2) Lecture: IRAP Ph.D. Erasmus Mundus School, September 3rd - 21st, 2012 Nice (France) “GRB090227B: the missing link between genuine short and long GRBs”

3) Lecture: IRAP Ph.D. Erasmus Mundus School, May 16th-31st, 2013 Nice (France) “GRB
090510: A Disguised Short Gamma-Ray Burst with the Highest Lorentz Factor and Circumburst Medium”

4) Lecture: IRAP Ph.D. Erasmus Mundus School, September 2nd –20th, 2013 Nice (France) “Data analysis of GRBs in the Fermi era”


6) Lectures: IRAP Ph.D. Erasmus Mundus School, September 8th–19th, 2014 Nice (France)
a) “Generalities of GRBs and short GRBs in the fireshell model”,
b) “The binary-driven hypernovae”

III b. Outside ICRANet

December 2014. Set of lectures in Almaty (Kazakhstan) on GRBs for graduated and under-graduated students


Bianco, M. Enderli, M. Kovacevic.


Visiting Scientists
Abishev Medeu

Position: head of al-Farabi Kazakh national university’s theoretical and nuclear physics department

I Scientific Work
Research on GR and astrophysics

II Conferences and educational activities
II a Conferences and Other External Scientific Work
ICGAC-11, XIth International Conference on Gravitation, Astrophysics and Cosmology Al Farabi Kazakh National University in Almaty, Kazakhstan, October 1-5, 2013.

II b Work With Student
Toktarbay Saken, Yerlan Aimuratov, Bakytzhan Zhamy, Manas Hasanov, Nurzat Kenzhebayev, Meruert Takibayeva

II c Diploma thesis supervision
Toktarbay Saken, Yerlan Aimuratov, Bakytzhan Zhamy, Manas Hasanov, Nurzat Kenzhebayev

II d Other Teaching Duties
Special courses for master students: GR mechanics, Mathematical methods of theoretical physics

II e Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet
Head of GRG laboratory in Institute of experimental and theoretical physics, Almaty

IV. Other
2015 List of Publication


Abishev, ME; Boshkayev, KA; Dzhunushaliev, VD; Ivashchuk, VD. Dilatonic dyon black hole solutions. CLASSICAL AND QUANTUM GRAVITY, Volume: 32, Issue: 16

Abishev, M; Aimuratov, Y; Aldabergenov, Y; Beissen, N; Bakytzhan, Takibayeva, M. Some astrophysical effects of nonlinear vacuum electrodynamics in the magnetosphere of a pulsar. ASTROPARTICLE PHYSICS, Volume: 73, Pages: 8-13
I Scientific Work

My present employment and duties:

My main duty is to carry out the theoretical research in the relativistic astrophysics of the compact objects, electrodynamics of continuous media in general relativity and observational research on GPS and VLF data analysis for ionospheric disturbances caused by various atmospheric, terrestrial and extraterrestrial phenomena. At present I am holding a position of Projects Leader and Head of Sector of Theoretical Astrophysics (partly supported by the AS-ICTP through PRJ-29 project) in the Institute of Nuclear Physics, position of Principal Researcher and Projects Leader (part time) at the Ulugh Beg Astronomical Institute in Tashkent. I am coordinator of the AS-ICTP Network on Relativity, Astrophysics and Cosmology between India, Thailand and Uzbekistan (ITUN). I am a member of Scientific Councils at the Ulugh Beg Astronomical Institute and at the Institute of Nuclear Physics, Tashkent; and of Expert Group on Physics and Mathematics of the Supreme Attestation Committee under the Cabinet of Ministers of the Republic of Uzbekistan.

My research is mainly devoted to the general-relativistic electrodynamics of continuous media and its application for theoretical explanation and analysis of EM (electromagnetic) and astrophysical processes in the external gravitational fields, Particles and Fields in the vicinity of Black Holes. Experimental tests of general relativity, general relativistic EM effects and fields for pulsars and magnetized rotating and oscillating neutron stars are also in my scientific interests. In addition I do a research on VLF (very low frequency) EM wave propagation in Earth ionosphere and study of the ionospheric disturbances in D and F layers of the ionosphere caused by various atmospheric, terrestrial and extraterrestrial phenomena.

II Conferences and educational activities

II a. Conferences and Other External Scientific Works

SEMINARS, SUMMER SCHOOLS AND CONFERENCES attended in year 2015

RAGtime 17, Silesian university in Opava, Czech Republic, 01 – 05 November, 2015
II b. Work With PhD Students

Sanjar Shaymatov, PhD student, General relativistic astrophysical processes in the vicinity of compact gravitational objects in the presence of an electromagnetic field

Abdullo Hakimov, PhD student, Relativistic Astrophysical Processes in Axial Symmetric Alternative Gravitational Models

Ozodbek Rahimov, PhD student, Particle Motion and Electromagnetic Fields around Axial Symmetric Gravitating Objects

II c. Diploma thesis supervision

II d. Other Teaching Duties

Fall term 2015: Course in Methods of Mathematical Physics, (80 lecture hours) for the 3rd year undergraduate students (Bachelor Course), Chair of Theoretical Physics, Faculty of Physics, National University of Uzbekistan, Tashkent, Uzbekistan.

II e. Work With Postdocs

With Dr. Ahmadjon Abdujabbarov, PhD, starting 2009 on project “General Relativistic Astrophysical Processes in Vicinity of Axial Symmetric Compact Objects in Presence of Magnetic Field”

Partial work with Dr. Viktoriya Giryanskaya (Morozova), PhD, starting 2010 on project “Problems of Relativistic Astrophysics of Magnetized Compact Objects”

III Service activities

Within ICRANet

Outside ICRANet

Details of projects leaded in year 2015

UNESCO-TWAS Regular Associate (Trieste, Italy) at the TIFR (Mumbai, India), 2012-2015

Leader of 5 Years Research Project "Gravitational and Electromagnetic Processes in Relativistic Astrophysics and Cosmology" from the Uzbekistan Academy of Sciences, Grant F2-FA-F113, Tashkent, Uzbekistan (1 January 2012 - 31 December 2016).

Co-Leader of 5 Years Research Project "Physics of Gravitational Lenses, Compact Astrophysical Objects and Nonstationary Disc Systems" from the Uzbekistan Academy of Sciences, Grant F2-FA-F029, Tashkent, Uzbekistan (1 January 2012 - 31 December 2016).

Member of Expert Group on Physics and Mathematics of the Supreme Attestation Committee under the Cabinet of Ministers of the Republic of Uzbekistan (starting January 2014 up to now).
2015 List of Publications


Batebi Saghar

University: Isfahan University of Technology, Iran.
Position: Visiting researcher

I Scientific Work:
The investigation of Higgs boson production and decay channel in NonCommutative space-time.
Study of CMB polarization in NonCommutative space-time.
Study of the GRB circular polarization.
Interaction of high energy photons with the background radiation in the universe.

III. Service activities
Islamic Azad University, teaching Fundamental Physics, Electricity and magnetic physics and related Labs.

2015 List of Posters
S. Batebi; S. Tizchang; R. Mohammadi; R. Ruffini; S. S. Xue ‘The generation of circular polarization of GRB, MG14.

2015 List of Publication
I. Scientific Work (6 papers)


4. Neutrino mixing with non-zero $\theta_{13}$ and CP violation in the 3-3-1 model based on $A_4$ flavor symmetry, Vo Van Vien and **Hoang Ngoc Long**, *Int. J. Mod. Phys. A* 30 (2015), No. 21, 1550117 (32 pages)


II. Conferences and educational activities

II a. Conferences and Other External Scientific Works:

- Editor of journal of Vietnam: *Communications in Physics*.

II b. Work With Students: I give lectures on Quantum Field Theory for Undergraduate students, Hanoi University of Education, Standard Model for Graduate students, Can Tho University

II c. Diploma thesis supervision: I am supervisor for 5 Ph. D. students and 6 Master Students.

II d. Other Teaching Duties: I am a referee for some Ph. D. Theses.

II e. Work With Postdocs: Now I work with Postdoc D. T. Huong and L. T. Hue

III. Service activities

III a. Within ICRANet: I hope to visit ICRANET next year 2016

III b. Outside ICRANet:

IV. Other I am referee for some International Journal such as: Phys. Rev. D, Int. J. Mod. Phys. A,…
Perez Martinez Aurora Maria

Position: Senior Researcher/Senior Professor
Period covered: 2015

I Scientific Work

- Study of the problem of structure equations for magnetized compact objects: strange stars and white dwarfs.
- Study of the cosmological evolution of primordial magnetic fields.
- Study of the dispersion relation of photons in a magnetized medium and their astrophysical implications.
- Study of Constraints braneworld from compact stars.

II Conferences and educational activities 2015


2015 14th Marcel Grossmann Meeting, 12-18 July Rome, Italy. work presented: Magnetized stars and anisotropic stellar structure equations.


II b Work With Students.

PhD students
Supervision of the PhD thesis of Daryel Manreza Paret from Havana University, the title of the thesis “Efectos del campo magnetico en las ecuaciones de estado y de estructura de objetos compactos” Faculty of Physics, Havana University, Discussion January 20th 2015

II c Diploma thesis supervision

-Diploma thesis of Diana Alvear Terrero, entitled “Enanas Blancas Magnetizadas”, Faculty of Physics, Havana University discussion December 2th 2015

II d Other Teaching Duties

Theaching postgraduate course of Topics of Astrophysics. Faculty of Physics Havana University – ICIMAF, 2015-2016.

II e. Work With Postdocs

Work in collaboration with D. Manreza Paret in topics related to:
- Anisotropic structure equations for magnetized compact objects.
- Constraints braneworld parameters from compact stars models

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

II a. Within ICRANet

1. Discussion of topics of common interest with Jorge Rueda for the beginning of a work in collaboration: A) Dispersion relation of the photon in a magnetized medium. Applications to Neutron stars.

2. Discussion with Kuantay Boshkayev about rotating White Dwarfs

3. III b. Outside ICRANet

Collaboration:

1) Collaboration with Gabriella Piccinelli from FES Aragon UNAM, R. Sussman from ICN-UNAM, and Ismael Delgado from IGA from Havana in the field: Magnetic field and cosmological evolution.


3) Collaboration with Jorge Horvath from IAG USP Sao Paulo Brazil. Anisotropic stellar structure equations for magnetized stars.

IV. Other

Member of IAC Marcel Grossman Meeting (MG14) Rome, July 2015.


Awards

Award of Theoretical Physics of Cuban Academy of Science (2014).

2015 List of Publication


3. Anisotropic stellar structure equations for magnetized strange stars Daryel Manreza Paret, Jorge Ernesto Horvath and Aurora Pérez Martínez RAA 2015 Vol. 15 No. 7, 975–985 doi: 10.1088/1674–4527/15/7/005


Submitted papers:

Raffaelli Bernard

Position: Visiting Assistant Professor at ESME Lyon (école d'ingénieurs), France.

Period covered: from September 2015

Before: Postdoctoral researcher at Yukawa Institute for Theoretical Physics, Kyoto, Japan

Scientific Work

Research interests:
Gravitation, Black Holes Physics, Quantum Field Theory, Quantum Gravity, Cosmology and Foundations of Physics.

My recent works are focused on:
- AdS/CFT correspondance: CFT2 interpretation of the BTZ black hole Regge Modes
- Semi-classical strong gravitational lensing
- Quantum Field Theory on curved spacetime and the role of the quantum vacuum in the accelerated expansion of the Universe, in the framework of Hadamard renormalization.
- Quantum understanding of inertia, matter, spacetime and gravitation, through 2-spinors formalism and the SL(2,C) formulation of General Relativity.

Service activities

Outside ICR-ANet
- Teaching activities at ESME Lyon: Mechanics, Electricity, Electromagnetism, Thermodynamics to 1\textsuperscript{st} and 2\textsuperscript{nd} years students
- Administrative activities: curriculum development, assessment.

2015 List of Publication

**Tizchang Seddigheh**

**Position:** PhD Student  
**Present institute:** Dep. Of Physics, Isfahan University Of Technology, Isfahan, Iran  
**Period covered:** 2012 -present

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**I Scientific Work:**

I am working on: phenomenology of SM bosons in NonCommutative space-time.

In ICRANet I worked on: Circular polarization and opacity of high energy photon such as GRB in presence of background cosmic ray.

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**II Conferences and educational activities**

**II a Conferences and Other External Scientific Work outside ICRANet**

A few national conferences held in Iran.

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**III. Service activities**

**IIIa. Inside ICRANet**

Collaboration with ICRANet as visitor, November 2014- May 2015, Pescara, Italy.

**III b. Outside ICRANet**

Instructing a few Physics Courses in one of the universities in Iran.

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**IV. Other**

We presented our work in MG14 as two posters.

I. Interaction of High Energy photons with the background radiation in the universe.  
II. The generation of circular polarization of Gamma Ray Bursts.

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**(2015) List of Publication**


- Interaction of High Energy photons with the background radiation in the universe (in progress).

- The generation of circular polarization of Gamma Ray Bursts (in progress).
International Relativistic Astrophysics Ph. D.
I Scientific Work

General Relativity, Cosmology

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Quantum Gravity Meeting Rome 2015
Sapienza University, Rome, Italy, 20-23 July 2015
Contribution: Deformations of the Hamiltonian Constraint in General Relativity

III. Service activities

III a. Within ICRANet

Fourteenth Marcel Grossmann Meeting- MG14
Sapienza University, Rome, Italy, July 12-18, 2015
Contribution: The Hamiltonian constraint and its possible deformations (co-authors: Giovanni Amelino Camelia, Lorenzo Cesarini)
Contribution: An analysis of the symmetries of cosmological billiards

IV. Other

Focus Program on 100 Years of General Relativity
Singularities in General Relativity June 15-18, 2015
The Fields Institute for Research in Mathematical Sciences, Toronto, Canada

2015 List of Publication

O.M. Lecian: Cosmological-Billiards Groups and self-adjoint BKL Transfer Operators, author revision for publication on JHEP (Journal of High-Energy Physics)
Sigismondi Costantino

Position: Professor
Period covered: November 2014/ November 2015

I Scientific Work

In three fields: education, light curves of novae (photometry in Visual band), solar metrology.

Selection of Relativistic themes presented to high school students in the context of IYL2015 simplification of the language and of the mathematical load.

Measure in V band with 20 cm Telescope Schmidt-Cassegrain of Novae of SGR 2015 no. 2, 3, 4; participation to AAVSO observational champaigns and HST Science Institute preparational champaigns, with preliminary results on http://www.astronomerstelegram.org/?read=8275

Photometry of PHEMU 2015 with Io and Europa satellites of Jupiter.

Instrumental study to understand the anomaly of the measures of the solar diameter with the heliometer of Rio de Janeiro National Observatory focusing on the glass filter used.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

International Year of Light 2015 two public conferences June 21 and September 23. Public observations of the eclipse and of the spring equinox on March 20.

Link


International congress on Gerbert of Aurillac, scientist and Pope of year 1000, focused on Music theory for 2015 edition in Sapienza University.
www.icra.it/gerbertus

Conferences in Cosmology and Fundamental Physics at University Regina Apostolorum:
link

101\textsuperscript{st} Congress of Italian Physical Society, Rome Sapienza University September 2015
Marcel Grossmann Meeting XIV, Rome Sapienza University July 2015

II b Work With Students

Alessio Mimmo and Massimo Carinci Physics graduated students at the Sapienza University on experimental solar metrology, with Astrophysics' chair Paolo De Bernardis

II c Diploma thesis supervision


II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities

III a. Within ICRANet

Notte Europea dei Ricercatori on the observations of Novae in 2015 and on the measurements of the solar diameter. 25 September 2015

III b. Outside ICRANet

Full professorship at IIS Federico Caffè High School in Rome on Physics and Laboratory with 160 students

IV. Other

2015 List of Publication

1) Astrometry and numerical methods for the solar heliometer at Observatorio Nacional in Brasil
Andrei, A.; Boscardin, S.; Penna, J.; Sigismondi, C.; Reis Neto, E.; d'Avila, V. Proceedings of the Journées 2014 "Systèmes de référence spatio-temporels":Recent developments prospects in ground-
Bibliographic Code: 2015jsrs.conf..248A

2) Measures of the Earth obliquity during the 1701 winter solstice at the Clementine meridian line in Rome,
Bibliographic Code: 2015jsrs.conf..116A

3) 6 Years After the Inauguration of the Heliometer at Observatório Nacional
Humberto Andrei, Alexandre; Amorim D’Avila, Victor; Reis Neto, Eugenio; Lousada Penna, Jucira; Calderari Boscardin, Sergio; Sigismondi, Costantino, IAU General Assembly, Meeting #29, #2243377
Bibliographic Code: 2015IAUGA..2243377H

Humberto Andrei, Alexandre; Garcia, Marcos A.; Papa, Andres R. R.; Calderari Boscardin, Sergio; Lousada Penna, Jucira; Sigismondi, Costantino, IAU General Assembly, Meeting #29, #2235993
Bibliographic Code: 2015IAUGA..2235993H

5) The Eddington’s Eclipse and a Possible Replica of the Experiment of Light Bending
Sigismondi, Costantino eprint arXiv:1507.03879
Bibliographic Code: 2015arXiv150703879S

6) Optical Deformations in Solar Glass Filters for High Precision Astrometry
Sigismondi, Costantino; Humberto Andrei, Alexandre; Calderari Boscardin, Sergio; Lousada Penna, Jucira; Reis-Neto, Eugênio eprint arXiv:1507.03636
Bibliographic Code: 2015arXiv150703636S

7) Transits of Venus and Solar diameter measures from ground: method and results from Athens (2004) and Huairou (2012), Sigismondi, Costantino; Ayiomamitis, Anthony; Wang, Xiaofan; Xie, Wenbin; Carinci, Massimo; Mimmo, Alessio eprint arXiv:1507.03622
Bibliographic Code: 2015arXiv150703622S

8) Observational Accuracy of Variable Stars, Novae and Supernovae from Naked Eye to General Relativistic Standard: a Balance over Thousand SGQ Observations Sent to AAVSO, Sigismondi, Costantino eprint arXiv:1506.03770
Bibliographic Code: 2015arXiv150603770S

9) Declinazione magnetica: storia delle prime misure e misura con l'azimut del Sole
Sigismondi, Costantino
Bibliographic Code: 2015Gerb....9....1S

10) Stelle e pianeti artificiali per esperimenti di ottica ondulatoria al telescopio
Sigismondi, Costantino
Bibliographic Code: 2015Gerb....8...91S

11) Gerbertian paths for the Jubilee
Sigismondi, Costantino
Bibliographic Code: 2015Gerb....8...83S

12) Problemi e di Fisica e Astronomia ed il metodo di Gerberto docente, Sigismondi, Costantino
Gerbertus, Vol. 8, p. 39-64, 2015
Bibliographic Code: 2015Gerb....8...39S
13) Venus Transits: History and Opportunities for Planetary, Solar and Gravitational Physics
Bibliographic Code: 2015mgm..conf.2369S
14) Transits of Venus and the Astronomical Unit: Four Centuries of Increasing Precision, Sigismondi, C.
pp. 2064-2066
DOI: 10.1142/9789814623995_0358
Bibliographic Code: 2015mgm..conf.2064S
15) Tower bells and time zones, a history of ynychronization, Sigismondi, Costantino, eprint arXiv:1412.8661
Bibliographic Code: 2014arXiv1412.8661S
16) Measures of the Earth Obliquity during the 1701 Winter Solstice at the Clementine Meridian Line in Rome, Humberto Andrei, Alexandre; Sigismondi, Costantino; Regoli, Veronica, eprint arXiv:1412.6096
Bibliographic Code: 2014arXiv1412.6096H
17) PHEMU congress 2015
Visual observations of mutual eclipses of Galileian satellites with small telescopes under city lights
Costantino Sigismondi, proc. Of the congress, Paris 14-18 October 2015
18) The 2016 transit of Mercury and the solar diameter measurement, Solar metrology congress Royal Observatory of Belgium, 21 September 2015
ftp://ftp.latmos.ipsl.fr/outgoing/MEFTAH/
Boshkayev Kuantay

Position: Research associate
Period covered: 1 July-27 August 2015

I Scientific Work
- Rotating white dwarfs and neutron stars in general relativity
- Geodesics in the field of rotating and deformed objects
- Quasi-periodic oscillations from X-ray sources
- White dwarf model of magnetars
- Approximate and exact solutions of Einstein equations.

II Conferences and educational activities

II a Conferences and Other External Scientific Work
2. 9th APCTP-BLTP JINR Joint Workshop on Modern Problems of Nuclear and Elementary Particle Physics, Almaty, Kazakhstan, June 27-July 4, 2015.
3. 14th Marcel Grossmann Meeting on Recent Developments in Theoretical and Experimental General Relativity, Gravitation, and Relativistic Field Theory, University of Rome Sapienza July 12 - 18, 2015, Rome, Italy.

II b Work With Students
- Collaboration with Yerlan Aimuratov

II e. Work With Postdocs
- Collaboration with Marco Muccino, Camargo Rodrigues de Lima Rafael, Ivan Siutsou and Riccardo Belvedere

III. Service activities
   [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc..) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet
- Scientific collaboration with prof. Remo Ruffini and Dr. Jorge Rueda

III b. Outside ICRANet
- Teaching activity at the faculty of physics and technology of al-Farabi Kazakh National University (KazNU), Almaty, Kazakhstan.

2015 List of Publication


Benetti Micol

Position: Post-doctoral in the National Observatory of Rio de Janeiro
Period covered: 15/8/2014 - now

I Scientific Work

In the past year I started to work in the National Observatory of Rio de Janeiro. I was principally interested in implement the galaxy data (e.g the SDSS - data release 11) in the Cosmomc code, in order to use them in cosmology analyses. I also continue my PhD topic on constraining inflationary models, starting collaborations with the Prof. Rudnei Ramos (UERJ - Universidade do Estado do Rio de Janeiro) and the Prof. Susana Landau (IFIBA-Instituto de Física de Buenos Aires). I was also involved in two collaboration. First, with G. C. Carvalho, on the Baryon Acoustic Oscillations analysis; we submitted the work in PRD journal. Then, with C. Novaes, on primordial Non-Gaussianities signal; we submitted the work in JCAP journal. Finally, I participated at several conference, presenting our results.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Presented talk in XIVth Marcel Grossmann Meeting - International meeting, July 12-18 2015, Rome, Italy
Presented talk in Meeting on Fundamental Cosmology - International meeting, June 17-19 2015, Santander, Spain
Presented talk in V1th Workshop Challenges Of New Physics In Space - International meeting, May 24-29 2015, Campos do Jordao, SP, Brazil
Presented talk in 2nd Cesar Lattes Meeting - International ICRAnet meeting, Apr 13-18 2015, Rio de Janeiro, RJ, Brazil
Presented talk in 10th J-PAS Collaboration Meeting - International J-PAS meeting, Feb 9-13 2015, Paraty, RJ, Brazil
Participating in School of Theory of cosmological perturbations - Ph.D School, Nov 12-14 2014, Rio de Janeiro, RJ, Brazil
Participating in XIXth Cycle of Special Courses (CCE) - Ph.D School, Nov 3-7 2014, Rio de Janeiro, RJ, Brazil
Participating in 1st School of Statistical Methods in Physics - Ph.D School, Oct 6-10 2014, Goiania, GO, Brazil

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

Mini course for PhD and Post-PhD. Location: Observatorio Nacional. Topic: The CAMB code.

II e. Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

Presented talk in XIVth Marcel Grossmann Meeting - International meeting, July 12-18 2015, Rome, Italy

Presented talk in 2nd Cesar Lattes Meeting - International ICRAnet meeting, Apr 13-18 2015, Rio de Janeiro, RJ, Brazil

III b. Outside ICRAnet


Mini course for PhD and Post-PhD. Location: Observatorio Nacional. Topic: The CAMB code.

IV. Other

Affiliations:


SDSS IV collaboration, Sloan Digital Sky Survey.

2014 List of Publication


I Scientific Work

Soft gamma ray repeaters (SGRs) and anomalous X-ray pulsars (AXPs) are compact objects that can be explained as massive fast rotating white dwarfs. The stability properties of white dwarfs can account for the observed periods (2-12 secs) of these objects and their rotational energy loss can explain the high luminosities in x and gamma ray bands. I am focused on the magnetospheric emission of these objects, in order to explain the emission in X and gamma rays, taking into account the backflow of positrons coming from the magnetosphere and from the interaction between gamma-ray curvature photons and the intense magnetic fields (B~10^8 - 10^9 G).

I also worked on the stability of magnetized white dwarfs, in particular, the microscopic instabilities coming from the Inverse-beta decay, the Pycnonuclear reactions and General Relativity.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Assistance to meetings organized by Icra such as:


Participation with oral presentation in the following events:


- “Magnetospheric emission of soft gamma-ray repeaters (SGRs) and anomalous X-ray pulsars (AXPs) within the white dwarf model”. The 27th Texas symposium on relativistic astrophysics. 8 – 13 December, 2013, Texas, United States of America.


2015 List of Publications


Barbarino Cristina
Position: PhD Students
Period covered: 2012-2015

I Scientific Work

Research activities in Supernovae: observations, photometric and spectroscopic data reduction and data analysis, in both optical and near-infrared bands, of a wide range of SNe types from hydrogen-rich to he-poor.

The aim of this work is the study of different types of core-collapse supernovae. The study of photometric and spectroscopic evolutions of single objects is important to highlight the main characteristics of the target. A comparison with the literature is also necessary to identify common or peculiar behaviours.

II Conferences and educational activities

II a Conferences and Other External Scientific Work


- “PESSTO meeting” organized by Prof M. Dennefeld and Prof. S.J. Smartt, 15 June 2015 → 17 June 2015, Paris (France)

- “Opticon observing school and Awareness conference” organized by Prof M. Dennefeld, 17 September 2014 → 1th October 2014, Rozhen & Sofia (Bulgaria)


- “PESSTO meeting” organized by Prof. S.J. Smartt, 19 June 2014 → 21 June 2014, Belfast (UK)

- IRAP PhD and ERASMUS MUNDUS Workshop on “Supernovae, Gamma-ray bursts and the induced gravitational collapse” organized by Prof. R. Ruffini and Prof. P. Chardonnay, 11 May 2014 → 16 May 2014, Les Houches (France)
- IRAP PhD and ERASMUS MUNDUS School “Nice winter school” organized by Prof. R. Ruffini and Prof. P. Chardonnay, 23 February 2014 – 2 March 2014, Nice (France)

- “PESSTO meeting” organized by Prof. M. Della Valle and Prof. S.J. Smartt, 6 October 2013 → 8 October 2013, Napoli (Italy)

- 10 nights of observations at the ESO NTT Telescope in La Silla as third astronomer, 21 July 2013 → 22 August 2013, La Silla (Cile)

- “The first URCA meeting on Relativistic Astrophysics” organized by Prof. R. Ruffini, 24 June 2013 → 29 June 2013, Rio de Janeiro (Brasil)

- “The 2013 yearly ICRANet Scientific Meeting on Relativistic Astrophysics” held by Prof. R. Ruffini, 3 June 2013 → 21 June 2013, Pescara (Italy)

- Seminars on “Second Bego Scientific Rencontre Meeting” organized by Prof. R. Ruffini, 16 May 2013 → 31 May 2013, Nice (France)

- “PESSTO meeting” organized by Prof. M. Turatto and Prof. S.J. Smartt, 28 April 2013 → 30 April 2013, Padova (Italy)

II c Diploma thesis supervision

Supervisor: Massimo Della Valle


III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

- Talk on “The first URCA meeting on Relativistic Astrophysics” organized by Prof. R. Ruffini, 24 June 2013 → 29 June 2013, Rio de Janeiro (Brasil): “On the supernovae shock-breakout”

- Talk on “Second Bego Scientific Rencontre Meeting” organized by Prof. R. Ruffini, 16 May 2013 → 31 May 2013, Nice (France): “The photometric and spectroscopic evolution of type IIP SN 2012ec”

III b. Outside ICRANet

- Talk on “PESSTO meeting” organized by Prof M. Dennefeld and Prof. S.J. Smartt, 15 June 2015 → 17 June 2015, Paris (France): “Preliminary results on SN LSQ14efd”

- Talk on “PESSTO meeting” organized by Prof. S.J. Smartt, 19 June 2014 → 21 June 2014, Belfast (UK): “The photometric and spectroscopic evolution of type IIP SN 2012ec”

- Talk on “PESSTO meeting” organized by Prof. M. Della Valle and Prof. S.J. Smartt, 6 October 2013 → 8 October 2013, Napoli (Italy): “Preliminary results of type IIP SN 2012ec”
2013-2015 List of Publication

1) “SN 2012ec: mass of the progenitor from PESSTO follow-up of the photospheric phase”

2) “Supersolar Ni/Fe production in the Type IIP SN 2012ec”

3) “PESSTO: survey description and products from the first data release by the Public ESO Spectroscopic Survey of Transient Objects”

4) “A search for Fermi bursts associated with supernovae and their frequency of occurrence”

5) “Induced gravitational collapse at extreme cosmological distances: the case of GRB 090423”

6) “Supernova 2012ec: identification of the progenitor and early monitoring with PESSTO”
Cipolletta Federico

Position: IRAP PhD, XI Cycle
Period covered: 2013-2016

I Scientific Work


- In 2013 I won a PhD grant with ICRANet (IRAP PhD). During the following period my focus has been to study numerical models to obtain equilibrium sequences of rotating, self gravitating stars, in both classical and relativistic frame. In the classical (Newtonian) framework I implemented the method by Eriguchi and Muller (Y. Eriguchi, E. Muller. “A general computational method for obtaining equilibria of self-gravitating and rotating gases”, Astron. Astrophys. 146, 260-268(1985)) writing my own C code. This code allows to build equilibrium configurations of polytropic stars with for some fixed rotation laws. After testing the code with already studied rotation law (both uniform and differential), currently I am trying to insert a new two-parameter differential rotation law, to study the possible bifurcations from the main sequence and the cataclismic event in the parameter space. In the relativistic framework I learned how to use RNS public code (written by N. Stergioulas) to build equilibrium models of rapidly rotating Neutron Stars (NSs), taking into account several “realistic” equations of state (EOS). I studied physical properties of models (stability, maximum mass, radius, angular velocity, angular momentum and binding energy and angular momentum of particles orbiting in the innermost stable circular orbit of the NS), obtaining relations useful for astrophysical applications, some of with result to be EOS-dependent and other universal.

II Conferences and educational activities

-Nice BEGO school, May 2013

-2013 ICRANet meeting on Relativistic Astrophysics on the Occasion of the 50th anniversary of the Kerr solution of the Einstein's equations in Pescara

-Nice BEGO school, September 2013

-Nice Winter school February 23 – March 2 2014

-“Supernovae, Gamma-ray bursts and the Induced gravitational collapse”, May 11-16, 2014 – Les Houches (France)

-“Third BEGO Rencontres – IRAP PhD Erasmus Mundus School”, September 8-19, 2014
III. Service activities

Talks:
- Structure And Stability For Realistic Rapidly Rotating NS: Full GR Treatment, during “Fourteenth Marcel Grossmann Meeting - MG14”, Rome (Italy), July 12-18 2015;
- Structure And Stability For Realistic Rapidly Rotating NS: Full GR Treatment, during “14th Italian-Korean Symposium on Relativistic Astrophysics”, Pescara (Italy), July 20-24 2015;

2015 List of Publication

Published:


In Preparation:
- On the mostly bound circular orbit around rapidly rotating neutron stars, Authors: F. Cipolletta, J. A. Rueda, R. Ruffini.

Dichiara Simone

Position: PhD - Postdoc
Period covered: 2012-2015

I Scientific Work

During my undergraduate work I have studied the impact of instrumental selection effects and biases on the measure of intrinsic physical parameters (energy released, spectral features, etc). I analysed large GRBs data sets detected by CGRO/BATSE, Fermi/GBM, Swift/BAT and Konus/WIND, including also the events without a redshift estimation. Moreover, I implemented some Monte Carlo simulations to explore the different effects introduced by instrumental thresholds in terms of $E_{p,i}$-$E_{iso}$ relation (Amati et al. 2002). A reliability check of the “Amati relation” is essential given its importance in the study of the radiative mechanism involved in these phenomena (synchrotron shock model, double comptonization model, etc.) and as a potential cosmological tool.

During my PhD I was mainly focused on the timing analysis of GRB's light curves. I characterised the time variability using the classical Fourier technique. At first, I studied the average Power Density Spectra (PDS) of a sub-sample of bright GRBs detected by Fermi/GBM and by BeppoSAX/GRBM. Then, I studied the behaviours of the individual PDS of GRBs using a new Bayesian technique that involve the use of Markov chain Monte Carlo in order to compute the values of the PDS parameters.

This kind of analysis is basic to put constrains on the possible emission mechanism (magnetic reconnection, neutrino annihilation flow, etc) and also on the nature of the progenitor.

Combining timing and spectral features I provided important clues to probe the physical models proposed to explain the nature of the GRBs prompt emission (internal shock model, magnetised jet, etc).

During my activity I performed time-integrated and time-resolved spectral analysis of GRBs and I enhanced my knowledge about the statistical issues behind the data analysis. I studied different techniques to investigate the timing properties of this kind of sources. One promising technique is the Singular Spectrum Analysis (SSA), which allows to decompose the series into a set of eigenvectors (main components) derived in a completely data-driven way.
Furthermore, thanks to the close collaboration between my advisor Cristiano Guidorzi (University of Ferrara) and the Astrophysics Research Institute (Liverpool John Moore University), I had the opportunity to collaborate with the local GRB group on the common optical follow-up project. I used the Las Cumbres Observatory Global Telescope Network (LCOGT) to study the GRB afterglow candidates and I developed my own procedure to remove the noise component from the images collected by RINGO3 (the polarimeter mounted to Liverpool Telescope). I implemented the 2-D extension of the SSA technique to remove the noise contaminations from the images collected by different telescopes.

Lastly, I produced a catalogue of Solar X-ray Flares detected by BeppoSAX/GRBM developing a devoted detection algorithm. This work is very important considering that BeppoSAX operated during one of the latest intense maxima of the 11–year solar cycle.

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

- May 2012, Munich (Germany), “Fermi/Swift GRB conference 2012” (poster, title: “An investigation of the impact of selection and instrumental effects on the observed $E_{p,i}$-$E_{iso}$ correlation”)

- September 2012, Naples, “III Congresso nazionale GRB 2012 - Lampi su Napoli” (talk, title: “Average power density spectra of long GRBs detected with BeppoSAX/GRBM and with Fermi/GBM”)

- April 2014, Ferrara, “PRIN Meeting on Gamma Ray Bursts” (talk, title: “A search for pulsations in short GRB to constrain their progenitors”)

- September 2013, Ferrara, “VIII CNOC” (national conference on astrophysics of compact objects)

- June 2013, Pescara, “The 2013 yearly ICRANet Scientific Meeting on Relativistic Astrophysics”

- October 2013, Bologna, - GDRE meeting Oct 1-2, 2013: "Down of the gamma ray bursts"

*II b Work With Students*

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*II c Diploma thesis supervision*

- 

*II d Other Teaching Duties*
II e. Work With Postdocs

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc….)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2014 List of Publication


GCN list:


• C. Guidorzi; S. Dichiara; C.G. Mundell, 2014, GCN 16612, “GRB 140719A: FTS observations”

• S. Dichiara; C. Guidorzi; C.G. Mundell; A. Gomboc, 2014, GCN 16647, “GRB 140730A: LCO-Sutherland observations”

• S. Dichiara; C. Guidorzi; D. Kopac, 2014, GCN 16723, “Fermi 430148973/MASTER candidate: LCO-Sutherland observations”

• S. Dichiara; C. Guidorzi; J. Japelj, 2014, GCN 16781, “GRB 140903A: FTN observations”

• S. Dichiara; C. Guidorzi; J. Japelj, 2014, GCN 16821, “GRB 140916A: FTS observations”

• C. Guidorzi; D. Kopac; C. Mundell; S. Dichiara, 2014, GCN 16853, “GRB 140928A: LCO-Cerro Tololo further observations”

• S. Dichiara; C. Guidorzi, 2014, GCN 17082, “GRB 141121A: LCO-FTN observations”

• S. Dichiara; C. Guidorzi, 2014, GCN 17092, “GRB 141121A: LCO-FTN rebrightening confirmation”
• C. Guidorzi; S. Dichiara; D. Kopac; A. Gomboc, GCN 17209, “GRB 141221A: LCOGT-McDonald optical afterglow observations”

• Guidorzi, C.; Dichiara, S.; Mundell, C. G.; Gomboc, A., GCN 17316, “GRB 150120B: FTN optical afterglow confirmation.”

• Guidorzi, C.; Dichiara, S.; Mundell, C. G.; Gomboc, A., GCN 17340, “GRB 150120B: FTN early optical light curve.”


• S. Dichiara, C. Guidorzi, C.G. Mundell, A. Gomboc, GCN 17868, "GRB 150523A: LCOGT Cerro-Tololo optical afterglow candidate"

• S. Dichiara, C. Guidorzi, S.Kobayashi, C.G. Mundell, A. Gomboc, GCN 17869, "GRB 150523A: LCOGT FTS afterglow confirmation"

• S. Dichiara, C. Guidorzi, D. Kopac, GCN 18049, "GRB 150722A: LCOGT-Sutherland observations"

• S. Dichiara, C. Guidorzi, C.G. Mundell, S. Kobayashi, A. Gomboc, GCN 18083, “GRB 150727A: LCOGT-Cerro Tololo observations”

• S. Dichiara, C. Guidorzi, C.G. Mundell, S. Kobayashi, A. Gomboc, GCN 18090, "GRB 150728A: FTN observations"

• S. Dichiara, C. Guidorzi, C.G. Mundell, S. Kobayashi, A. Gomboc, GCN 18158, "GRB 150817A: LCOGT observations"

• S. Dichiara, C. Guidorzi, S. Kobayashi, A. Gomboc, C. Mundell, GCN 18510, "GRB 151027A: LCOGT-McDonald afterglow observations"
• **S. Dichiara**, D. Kopac, C. Guidorzi, S. Kobayashi, A. Gomboc, GCN 18520, "GRB 151027B: LCOGT FTN afterglow observations"

• **S. Dichiara**, C. Guidorzi, S. Kobayashi, A. Gomboc, GCN 18530, "GRB 151029A: LCOGT-FTS afterglow observations"

• **S. Dichiara**, C. Guidorzi, S. Kobayashi, A. Gomboc, GCN 18581, "GRB 151111A: LCOGT-FTS afterglow observations"
Becerra Bayona Laura Marcela

Position: IRAP PhD, XII Cycle
Period covered: 2013-2016

I Scientific Work

Bachelor of physics, Universidad Industrial de Santander, Bucaramanga. Graduation thesis: “Slow Gravitational Collapse of dissipative anisotropic spherical matter configuration”

Current Research: Binary systems, accretion discs, hypercritical accretion, neutrino emission

II Conferences and educational activities

II a Conferences and Other External Scientific Work


II b Work With Students

II c Diploma thesis supervision
II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2014 List of Publication


Harutyunyan Vahagn

Position: PhD
Period covered: 2013-2016

I Scientific Work

My current research is dedicated to measuring SN rate as a function of environment and radio luminosity of the galaxies. I exploit data from SUDARE (Supernova Diversity And Rate Evolution) survey, which is conducted with the ESO VST telescope with the aim to measure rates of different SN type in $0<z<0.8$ redshift range. For this task the study being performed on two best-studied extragalactic fields, CDFS and COSMOS.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

II b Work With Students

II c Diploma thesis supervision

Supervisor: Massimo Della Valle

Thesis: Supernova Diversity from Galaxy Cluster Diversity: Rates and Hints on Supernova Progenitors

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities

III a. Within ICRANet

Research: We aim to analyze if at higher redshifts both type Ia and CC SN rates follow the same trend that of the local Universe. For this purpose we cross-matched the galaxy sample monitored by SUDARE with VLA catalog. The Supernova Diversity And Rate Evolution (SUDARE) is a SN survey that aims to measure the SN rates as a function of redshift, sSFR, stellar mass and radio and infrared luminosity of galaxies. The SN search is performed in two of the best-studied extragalactic fields, the CDFS and COSMOS. The cadence of observation, during the first two years of our program, is every 3 days in r band and 1 week in g, i bands to obtain multicolor light curves for photometric typing of transients. We collected 117 SNe, from which 57% are type Ia SNe. To analyze if the SN rates also increase with infrared luminosity we cross-matched the SUDARE galaxy sample with MIR SWIRE catalog. In the LIRG subsample 8 SNe have been discovered. The SN Ia and CC rate measurement in radio and infrared galaxy samples is in preparation.
III b. Outside ICRANet

IV. Other

2014 List of Publication


2. V. Harutyunyan, M. T. Bottecella, E. Cappellaro, M. Della Valle, G. Pignata, L. Greggio, SN rates in Galaxy Groups luminosity from SUDARE survey (in preparation)
Moradi Rahim

Position: IRAP PhD Thirteenth Cycle

I Scientific Work
GRBs, Blackholes, Cosmological Black Holes and their connections with GRBs.

II Conferences and educational activities

Fourteenth Marcel Grossmann Meeting - MG14, July 12-18, 2015, La Sapienza University, Rome, Italy

Talk Title: Thermal component in induced gravitational collapse scenario

14th Italian-Korean Symposium on Relativistic Astrophysics, July 20-24, 2015 ICRANet, Pescara (ITALY)

Talk Title: The spherical perfect fluid collapse with pressure in a FRW background

2015 List of Publications

Cosmological black holes: the spherical perfect fluid collapse with pressure in a FRW background
R.Moradi et al
Journal-ref: Class. Quantum Grav. 32 (2015) 215001

Induced gravitational collapse in FeCO Core–Neutron star binaries and Neutron star–Neutron star binary mergers
R. Ruffini et al., 2015. 28 pp.
Published in Int.J.Mod.Phys. A30 (2015) 28n29, 1545023
Rodriguez Ruiz, Jose Fernando

Position: PhD Student

I Scientific Work

Publications

Proceedings


Articles


II Conferences and educational activities

II a Contributed Talks


2015 List of Publication
IRAP Ph. D. Erasmus Mundus Students
Martins de Carvalho Sheyse

Position: PosDoc at Universidade Federal Fluminense (Brazil)
Period covered: 2013-2015

I Scientific Work

a – White Dwarfs: The Feynman-Metropolis-Teller (FMT) treatment considering a classic non-relativistic Thomas-Fermi model confined in a Wigner-Seitz cell has been recently generalized to relativistic regimes and applied to the description of non-rotating white-dwarfs in general relativity. We extended the FMT treatment to the case of finite temperatures for white dwarfs with different nuclear compositions. Our aim is to understand the effects of finite temperatures on the structure of white dwarfs, constructing and analyzing their equation of state and mass-radius relation.

b – Thermal Evolution of Neutron Stars: It is known that their cooling evolution could reveal crucial information on the properties of matter at high density and pressure. So, the modeling of the thermal structure evolution together with its observation allow us, to probe the microscopic and macroscopic properties of neutron stars. The observed properties of neutron stars are extremely sensitive to the star’s composition. Taking account the analysis of these properties, it is possible to constrain the equation of state of dense matter and its composition. We explore a new model for the inner structure of neutron stars formulated by Belvedere et al. (2012), where it is considered the condition of global charge neutrality instead of local charge neutrality, which changes the star’s structure and composition.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- The second ICRANet César Lattes Meeting

II b Work With Students

- Globally – neutral neutron star and strange star cooling comparison

student: Ibsen Gomes, Universidade Federal Fluminense

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities
III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

-Title: Thermal Evolution of Hybrid stars within the framework of a non-local NJL model.
Authors: S. M. de Carvalho, R. Negreiros, M. Orsaria, G. A. Contrera, F. Weber and W. Spinella.
Published at Physical Rev. C – DOI: 10.1103/PhysRevC.92.035810

-Title: Thermal X-Ray emission from massive, fast rotating, highly magnetized white dwarf.
To be submitted.

List of publications:

Authors: S. M. de Carvalho, Jorge A. Rueda and Remo Ruffini.

Authors: S. M. de Carvalho, M. Rotondo, Jorge A. Rueda and Remo Ruffini.

Authors: S. M. de Carvalho, R. Negreiros, Jorge A. Rueda and Remo Ruffini.
Bégué Damien

Position: Postdoc at the Royal Institute of Technology
Stockholm, Sweden
Period covered: 2015

I Scientific Work

Photospheric emission of Gamma-Ray bursts, magnetic reconnection, non-thermal emission
in the framework of the external shock model.

II Conferences and educational activities

Cesare Lattes Meetings, Rio, April 2015

III. Service activities

IV. Other

2015 List of Publication

134B, 2015
Gregoris Daniele

Position: Postdoctoral fellow at Dalhousie University (Halifax, Canada) within the AARMS program since 1st June 2015
Period covered: 1st January – 11th November 2015

I Scientific Work

My scientific interests are:

- Application on the nonideal equation of state of Shan-Chen in cosmology
- Application of black hole lattices in cosmology
- Equivalence problem in General Relativity
- Geroch transform in General Relativity
- Averaging problem in General Relativity

II Conferences and educational activities

II a Conferences and Other External Scientific Work

II b Work With Students

I have been working with the students of the research group of Prof. Alan Coley to which I belong at Dalhousie University

II c Diploma thesis supervision

II d Other Teaching Duties

I gave two lectures of the course Math 1010 in the Fall term at Dalhousie University

II e Work With Postdocs

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

Talks at international conferences:

“Application of black hole lattices in relativistic cosmology”,

150
Second Cèsar Lattes meeting, Rio de Janeiro, 13th - 18th April 2015

“Applications of the nonideal Shan-Chen equation of state in cosmology”,
International Conference on Gravitation and Cosmology, the fourth Galileo-Xu Guangqi meeting, Kavli Institute for Theoretical Physics China at the Chinese Academy of Sciences (KITPC) Beijing - China May 4-8, 2015

III b. Outside ICRANet

Visitor, Queen Mary University London (22nd - 28th March 2015)

Talk:

“Application of black hole lattices in relativistic cosmology ”,
St. Francis Xavier University, Antigonish (Canada), October 15, 2015

IV. Other

2015 List of Publication

Proceedings:

T. Clifton, D. Gregoris, K. Rosquist, “Application of black hole lattices in relativistic cosmology”, submitted as proceeding for the 2CL meeting

On referred journals:

**Pisani Giovanni Battista**

**Position:** Assegnista di Ricerca (Post-Doc), Sapienza University of Rome, Rome, Italy and ICRANet, Pescara, Italy  
**Period covered:** 1st April 2015 – 31st March 2016

**Former position:** Ph.D. Student, Erasmus Mundus IRAP Ph.D. Program  
**Period covered:** 1st September 2011 – 26th November 2014

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**I Scientific Work**

Gamma Ray Bursts (GRBs) are among the most puzzling astronomical objects since their first detection by the Vela satellites in the late 1960s. GRBs are flashes in gamma-rays observed in distant galaxies. They can last from milliseconds to several minutes with an isotropic energy released up to the order of one solar mass. This peculiarity makes them the most powerful events ever observed in the Universe. A variety of models have been developed to theoretically explain the observational properties of GRBs.

My PhD research project includes the reduction and analysis of GRBs data from different satellites, such as Batse, Swift or Fermi. I investigate GRBs observations within the fireshell model scenario, which predicts that GRBs originate from an optically thick e+e- plasma at thermal equilibrium created by vacuum polarization during the formation of a Black Hole.

My attention is focused on GRBs associated with Supernovae (SN). Since the first discovery of this association (GRB 980425 - SN1998wt), various mechanisms have been proposed to explain it. Recently Prof. Ruffini and his collaborators have proposed the Induced Gravitational Collapse (IGC) occurring in a particular class of binary systems as progenitors for the GRB-SN sources having a released isotropic energy above $10^{52}$ ergs. We refer to such phenomena as Binary-driven HyperNovae (BdHNes). Together with them we are further developing the BdHN paradigm and enlarging the sample of BdHN candidates. One of the most exciting outcomes of this work is the possibility to consider this class of BdHN events as a standard candle. If confirmed, this result could provide new independent challenges on the current cosmological model back to 600 millions years only after the Big Bang.

During my current Post-Doc research project, basing on my Ph.D. thesis results, I am focusing on building a complete sample of BdHNes looking at redshifts larger than $z$~1, in order to drastically enlarge our current sample and to confirm that the standard candle hypothesis holds at larger cosmological distances. My recent analysis points to a non-spherical emission of the late X-ray of BdHNes which is supposedly generated by the young SN remnant. This result is in agreement with the observations of non-spherical SN remnants.
II Conferences and educational activities

II a Conferences and Other External Scientific Work

1) “Erasmus Mundus School”, Nice, France, 5th - 17th September, 2011;
2) “IRAP Erasmus Mundus Workshop”, Les Houches, France, 2nd - 6th October, 2011;
3) “Third Galileo-Xu Guangqi” meeting, Beijing, China, 11th - 15th October, 2011;
4) “Fermi/Swift GRB 2012 Conference”, Munich, Germany, 7th – 11th May, 2012;

Poster 1: The proto-black hole concept in GRB 101023 and its possible extension to GRB 110709B; A.V. Penacchioni, R. Ruffini, C.L. Bianco, L. Izzo, M. Muccino, G.B. Pisani;


5) “Erasmus Mundus School”, Nice, France, 4th – 8th June, 2012;


7) “Erasmus Mundus School”, Nice, France, 3rd – 19th September, 2012;

Lecture: The class of “disguised” short GRBs within the fireshell model and the particular case of GRB 060614; G. B. Pisani, R. Ruffini, C.L. Bianco, L. Izzo, M. Muccino, A. V. Penacchioni.

8) III National Congress “Lampi su Napoli”, Naples, Italy, 20th - 22nd September, 2012;


10) “7th Huntsville GRB Symposium”, Nashville TN, USA, 14th – 18th April, 2013;


12) “2013 yearly ICRANet Scientific Meeting on Relativistic Astrophysics”, Pescara, Italy, 3rd – 21st June, 2013;


16) “27th Texas Meeting on Relativistic Astrophysics”, Dallas TX, USA, 8th - 13th, December 2013;


18) “Erasmus Mundus School”, Les Houches, France, 11th - 16th May, 2014;


20) “3rd Bego Rencontres”, Nice, France, 8th – 19th September, 2014;


21) “Swift: 10 Years of Discovery”, Rome, Italy, 2nd – 5th December, 2015;


22) “2nd Cesar Lattes Meeting”, Rio de Janeiro, Brazil, 10th – 20th April, 2015;


II b Work With Students

None

II c Diploma thesis supervision

None

II d Other Teaching Duties

None

II e. Work With Postdocs

None

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

Teaching activities for international Ph.D. Schools organized by ICRANet. List of schools and lectures:
1) “Erasmus Mundus School”, Nice, France, 4th – 8th June, 2012;

2) “Erasmus Mundus School”, Nice, France, 3rd – 19th September, 2012;

Lecture: The class of “disguised” short GRBs within the fireshell model and the particular case of GRB 060614; G. B. Pisani, R. Ruffini, C.L. Bianco, L. Izzo, M. Muccino, A. V. Penacchioni;


6) “Erasmus Mundus School”, Les Houches, France, 11th - 16th May, 2014;


7) “3rd Bego Rencontres”, Nice, France, 8th – 19th September, 2014;


III b. Outside ICRANet

Teaching activity as assistant of Professor Valerio Parisi in his Physics classes for Medical Science students, Sapienza University of Rome.

IV. Other

None

List of Publications
Scientific papers published on refereed Journals (9)


Scientific papers submitted to refereed Journals or in preparation (3)


Proceedings of science (8)


**GRB Coordinates Network, Circular Service (11)**


- Ruffini, R.; Bianco, C. L.; Enderli, M.; Kovacevic, M.; Muccino, M.; Penacchioni, A. V.; Pisani, G. B.; Rueda, J. A.; Wang, Y., “GRB 060614: theoretical derivation of the redshift and need for deeper search of the host galaxy”, 2013, GCN 15560, 1;


- Ruffini, R.; Bianco, C. L.; Enderli, M.; Muccino, M.; Penacchioni, A. V.; Pisani, G. B.; Rueda, J. A.; Sahakyan, N.; Wang, Y., “GRB 130603B: analogy with GRB 090510A and possible connection with a supernova”, 2013, GCN 14913, 1;


Wu Yuanbin

Position: PhD student
Period covered: 2011-2014

I Scientific Work

Work in collaboration with ICRANet:

- Surface properties of the core-crust interface of neutron stars with global charge neutrality. The strong, weak, electromagnetic, and gravitational interactions are included in this neutron star model.
- Surface properties of giant-nucleus compressed atoms.
- The Einstein-Euler-Heisenberg (EEH) theory and charged black holes in the EEH theory. In the EEH theory, the one-loop nonperturbative QED effects of strong fields described by the Euler-Heisenberg effective Lagrangian is involved.
- Generalized Breit-Wheeler process of electron-positron pair production in the collision of a probe photon with two plane waves.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Conferences and schools attended during my PhD study:
(1) Erasmus Mundus IRAP PhD school, Nice, France, September 2011
(2) IRAP PhD Erasmus Mundus Workshop "Gamma Ray Bursts, their progenitors and the role of thermal emission", Les Houches, France, October 2011
(3) Third Galileo - Xu Guangqi meeting, Beijing, China, October 2011
(5) Erasmus Mundus IRAP PhD school, Nice, France, June 2012
(6) 13th Marcel Grossmann Meeting, Stockholm, Sweden, July 2012
(7) Erasmus Mundus IRAP PhD school, Nice, France, September 2012
  Talk: Surface tension of neutron star matter
(8) 2nd Bego Rencontres, Nice, France, May 2013
  Talk: On the surface tension of neutron star matter
(9) The 2013 yearly ICRANet Scientific Meeting on Relativistic Astrophysics, ICRANet, Pescara, Italy, June 2013
Talk: On the surface tension and Coulomb energy of neutron star matter
(11) Erasmus Mundus IRAP PhD school, Nice, France, September 2013.
Talk: Einstein-Euler-Heisenberg theory and charged black holes
(12) Erasmus Mundus IRAP PhD school, Nice, France, February 2014.
Talk: Strong electromagnetic fields in neutron stars, black holes, and laboratory experiments
(13) Workshop "Supernovae, Gamma-ray bursts and the induced gravitational collapse", Les Houches, France, May 2014
Talk: Nonrotating Charged Black Holes in Einstein-Euler-Heisenberg Theory
Talk: Nonlinear Breit-Wheeler process in the collision of a photon with two plane waves
(15) Erasmus Mundus IRAP PhD school, Nice, France, September 2014.
Talk: On the surface tension of the core-crust interface of neutron stars with global charge neutrality

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

Publications


I Scientific Work

My research area is devoted to study the evolution of binary systems composed of an evolved star and a neutron star and the conditions under which they lead to the process of Induced Gravitational Collapse (IGC), within the context of the gamma-ray burst (GRB) supernova (SN) connection. It supposes the study the conditions that lead to an SN explosion of the evolved star before the system could merge by the shrinking of the orbit owing to gravitational wave emission. There are in addition other conditions besides the above for the occurrence of the IGC as short orbital periods of the order of minutes. It is also studied the emission of gravitational waves from neutron star binaries originating short GRBs, and their detectability by the new generation of gravitational wave detectors such as Advanced LIGO.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

I have attended the following conferences:

2nd César Lattes Meeting. “Final Stages of a Neutron Star Binary System“, Brazil, 2015”.

14th Marcel Grossmann Meeting MG14. “Neutron Star Critical Mass and Short GRBs, Rome, 2015”.


II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs
III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc...)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

Mobility (March 18 – Jun 18, 2015) at the Observatoire de la Côte d'Azur (OCA, Côte d'Azur Observatory), Nice.

2015 List of Publication


Ludwig Hendrik

Position: PhD student
Period covered: 01.01.2015 – 19.11.2015

I Scientific Work

Gravitational collapse of charged fluids in general relativity

Pulsation modes of compressed atoms in Thomas-Fermi model

Mobility Nice / Observatoire de la Côte d'Azur: non-minimally coupled f(R) theories

Writing of PhD thesis

II Conferences and educational activities

II a Conferences and Other External Scientific Work

2nd César Lattes Meeting, Rio de Janeiro, April 16th 2015
14th Marcel Grossmann Meeting, Rome, July 13th 2015
IK 14 Meeting, Pescara, July 24th 2015

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication


Strobel Eckhard

Position: PhD Student
Period covered: September 1, 2012-August 31, 2015

I Scientific Work

Critical and overcritical Electromagnetic Fields

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- April 2015 “Second CÉSAR LATTES Meeting”, Rio de Janeiro, Brazil
- July 2015 “Fourteenths Marcel Grossmann Meeting – MG14”, Rome, Italy
- July 2015 “Conference on Extremely High Intensity Laser Physics”

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2014 List of Publication


Kovacevic Milos

Position: Erasmus Mundus Joint Doctorate student
Period covered: September 2013 – August 2016

I. Scientific Work

Induced Gravitational Collapse paradigm

II. Conferences and educational activities

EMJD school in Nice; September 2013, February 2014, September 2014
EMJD workshop in Les Houches, May 2014
1st Scientific ICRANet Meeting in Armenia

III. Service activities

[activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc...)]

IV. Other

2015 List of Publication

Lisakov Sergey

Position: PhD student
Period covered: 1 Sept 2013 – 1 Sept 2016

I Scientific Work

Thesis: Core-collapse supernovae and their progenitors

All stars with an initial mass greater than 8 solar masses, but not massive enough to encounter the pair-production instability, eventually form a degenerate core and collapse to form a compact object, either a neutron star or a black hole. At the lower mass end, these massive stars die as red-supergiant stars and give rise to Type II supernovae (SNe). The diversity of observed properties of SNe II suggests a range of progenitor mass, radii, but also explosion energy.

We have performed a large grid simulations designed to cover this range of progenitor and explosion properties. Using MESA STAR, we compute a set of massive star models (12–30 solar masses) from the main sequence until core collapse. We then generate explosions with V1D to produce ejecta within a range of explosion energies and yields. Finally, all ejecta are evolved with CMFGEN to generate multi-band light curves and spectra.

In this work, we focus our attention on the properties of low-energy explosions that give rise to low-luminosity Type II Plateau (II-P) SNe. Such low-energy explosions, characterized by low ejecta expansion rates, are more suitable for reliable spectral line identifications. Based on our models, we discuss the distinct signatures of low-energy explosions in lower and higher mass models. One important goal is to identify whether there is a progenitor-mass bias leading to such events.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Erasmus Mundus Joint Doctorate Schools, 2–20 Sep 2013, Nice, France
Erasmus Mundus Joint Doctorate Schools, 12–16 Sep 2014, Les Houches, France
New windows on massive stars, 23–27 June 2014, Geneva, Switzerland
Supernovae in the local Universe: celebrating 10,000 days of supernova 1987A, 11–15 Aug 2014, Coffs Harbour, Australia
Erasmus Mundus Joint Doctorate Schools, 2–16 Sep 2014, Nice, France
Fourteenth Marcel Grossmann Meeting – MG14, 12–18 July 2015, Rome, Italy
IAU XXIX General Assembly, 3–14 Aug 2015, Hilo, USA
III. Service activities

III b. Outside ICRANet

MESA workshop, December 2013
*Workshop given by L. Dessart and S. Lisakov for using MESA stellar evolution code.*

List of Publication

Maiolino Tais

Position: Ph.D Student
Period covered: 2013-2016

I Scientific Work

Red-skewed Iron Lines in Accreting Compact Objects

Data Analysis of galactic compact objects

II Conferences and educational activities

II Conferences and Other External Scientific Work

- 2nd César Lattes Meeting, 13-22th April, Rio de Janeiro (Brazil)
- MG14 Rome, Fourteenth Marcel Grossmann Meeting, 12-18th July, 2015 - Roma (Italy)
- School of Astrostatistics 2015: Clustering and Classification, 11th June-16th July, 2015 - École de Physique des Houches (Les Houches - France)

2015 List of Publication

No publications
Sridhar Srivatsan

Position: PhD student
Period covered: November 2013 – November 2016

I Scientific Work

Statistical analysis of galaxy cluster distribution and cosmological constraints from the Euclid Wide Survey

II Conferences and educational activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Period</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erasmus Mundus school, Nice, France</td>
<td>Feb 23rd to March 2nd, 2014</td>
<td>1 week (Participant)</td>
</tr>
<tr>
<td>Euclid Consortium Meeting, Marseille, France</td>
<td>May 5th to May 9th, 2014</td>
<td>1 week (Participant)</td>
</tr>
<tr>
<td>Erasmus Mundus school, Les Houches, France</td>
<td>May 11th to May 15th, 2014</td>
<td>1 week (Participant)</td>
</tr>
<tr>
<td>Euclid OU-LE3 meeting, Paris, France</td>
<td>June 22nd to June 27th, 2014</td>
<td>1 week (Participant)</td>
</tr>
<tr>
<td>Cluster cosmology in the XXI century, Madrid, Spain</td>
<td>November 3rd to November 8th, 2014</td>
<td>1 week (Participant)</td>
</tr>
<tr>
<td>JDPN, Barcelonnette</td>
<td>March 23rd to March 27th, 2015</td>
<td>1 week (Presented work)</td>
</tr>
<tr>
<td>Euclid joint SWG-OULE3 Galaxy Clusters meeting, Bologna</td>
<td>May 5th to May 8th, 2015</td>
<td>1 week (Presented work)</td>
</tr>
</tbody>
</table>
II b Work With Students
None

II c Diploma thesis supervision
None

II d Other Teaching Duties
None

II e Work With Postdocs
None

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)

III a. Within ICRANet

III b. Outside ICRANet

Was a full time volunteer at the Euclid OU-LE3 meeting held in Paris on the month of June 2014.

IV. Other

2014 List of Publication
Stahl Clément

Position: Erasmus Mundus PhD student
Period covered: 2015–present

I Scientific Work

Accelerated period of expansion of the Universe

II Conferences and educational activities

II a Conferences and Other External Scientific Work

1) 10 February 2015: group seminar in Pescara: Magnetic fields in the sky
2) April 2015: 2nd Cesar Lattes meeting, Rio. Talk: Pair creation in the early universe
3) 06 May 2015: ICRANet Lectures 2015, Lecturer: Fine tuning for life
4) July 2015: Marcel Grossmann meeting. Talk: Pair creation in the early universe
5) July 2015: Italian Korean meeting: Talk: Fractal matter distribution and supernovae IA
7) October 2015: The information Universe, Groningen
8) 12 October 2015: Nordita High energy physics seminar, Stockholm, Talk: Fermionic pair creation and current in de Sitter spacetime

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

III. Service activities

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

V. 2015 list of Publication:


Stahl C., Strobel E., Xue S-S, Pair Creation in the early universe, submitted (2015)
I Scientific Work

A cosmological preferred direction was reported from the type Ia supernovae (SNe Ia) data in recent years. Most gamma-ray bursts have higher redshifts than SNe Ia. We use the long gamma-ray bursts data to give a simple classification of such studies for the first time. Because the maximum anisotropic direction is independent of isotropic cosmological models, we adopt two cosmological models for the hemisphere comparison analysis and LCDM model for dipole fit approach. In hemisphere comparison method, the matter density and the equation of state of dark energy are adopted as the diagnostic qualities in the LCDM model and wCDM model, respectively. In dipole fit approach, we fit the fluctuation of distance modulus. We find that there is a null signal for the hemisphere comparison method, while a preferred direction for the dipole fit method. This result indicates that the dipole fit is more sensitive than the hemisphere comparison method.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Testing the foundation of modern cosmology from astronomical data: SN Ia and GRB, Oct.5, 2015, ICRANet, Pescara, Italy

Testing the foundation of modern cosmology from astronomical data: using SN Ia and GRB to test the isotropy of cosmological principle (CP), 14th Italian-Korean Symposium on Relativistic Astrophysics, Jul.24, 2015, ICRANet, Pescara, Italy

Testing the cosmological principle of isotropy, Fourteenth Marcel Grossmann Meeting, Jul.13, 2015, U.Rome, Rome, Italy

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs
III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

Searching for a preferred direction with Union2.1 data


Testing the cosmological principle of isotropy: Gamma-ray bursts

Xiaofeng Yang, et al, will submit to MNRAS
Aimuratov Yerlan

Position: EMJD IRAP PhD student (V cycle)
Period covered: January 2015 – December 2017

I Scientific Work

Gamma-Ray Bursts: Data Analysis and Theory

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- “Analysis of the GRB 081024B”
  Talk and Proceeding to Marcel Grossmann Meeting XIV, 2015 July 12th-18th, Rome, Italy
  Parallel session GB5-A: http://www.icra.it/mg/mg14/parallel_sessions.htm

- “GRB 081024B Analysis and Redshift Estimation”
  Talk at 14th Italian-Korean Symposium on Relativistic Astrophysics, July 20th-24th, Pescara, Italy
  http://icranet.org/index.php?option=com_content&task=view&id=935&Itemid=904#

- “Gamma-Ray Bursts within the Fireshell Model”
  Seminar in Fessenkov Astrophysical Institute, 2015 August 5th, Almaty, Kazakhstan
  http://aphi.kz/seminar-by-yerlan-aimuratov.html

II b Work With Students

None

II c Diploma thesis supervision

None

II d Other Teaching Duties

None

II e. Work With Postdocs

- Fireshell Model and analysis procedure for GRBs with RMFIT
  with ICRANet Postdoc M. Muccino, February-December 2015

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

None
III b. Outside ICRANet
None

IV. Other

2014 List of Publication

- F. Rspayev, L. Kondratyeva, Y. Aimuratov. CH Cygni: new brightening in 2014 // IBVS, 6117, 1R, October 2014

2015 List of Publication

- L. Kondratyeva, F. Rspayev, Y. Aimuratov. New results on spectral and photometric variability of V806 Cassiopeiae // IBVS, 6141, 1R, April 2015
Chang Yu-Ling

Position: PhD student

I Scientific Work

Multi-frequency studies of blazars.
Properties of blazars and radio-loud AGNs.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

July 12 – July 18, 2015- Fourteenth Marcel Grossmann Meeting, Rome, Italy.
June 14 – June 19, 2015- IVOA Interoperability Workshop, Sesto, Italy.

2015 List of Publication

Chang, Y.-L.; Arsioli, B.; Giommi, P.; and Padovani, P. (in preparation)
Arsioli, B; Giommi, P; and Chang, Y.-L. (in preparation)
Padovani, P.; Giommi, P.; Resconi, E.; Arsioli, B.; Chang, Y.-L. (in preparation)
Delgado-Correal Camilo

Position: Erasmus Mundus PhD Student

I Scientific Work

low luminosity high redshift galaxies found in lensed fields by galaxy clusters

II Conferences and educational activities

II a Conferences and Other External Scientific Work

Fourteenth Marcel Grossmann Meeting - MG14, Rome-Italy, July 12-18, 2015

Astrophysical Probes of Fundamental Physics - PhD School, Ferrara-Italy, 7-11 September 2015.

CLASH-VLT Meeting, Florence-Italy, 23-25 September 2015

The high-redshift Universe and the role of galaxies and AGN to cosmic reionization-PhD School, Bologna-Italy, 26-30 October 2015

The first Colombia-ICRANet Julio Garavito Armero Meeting, Bogota-Colombia, November 23-27 2015.

2015 List of Publication

Caminha GB; Grillo C; Rosati P; ...; D. Coe; C. Delgado-Correal; et al., "CLASH-VLT: A Highly Precise Strong Lensing Model of the Galaxy Cluster RX J2248.7–4431 (Abell 1063) and Prospects for Cosmography", A&A, 2015, Submitted [SCI]
Efremov Pavel

Position: PhD Student
Period covered: 2014—2017

I Scientific Work

Relativistic Accretion onto Compact Objects

II Conferences and educational activities

II a Conferences and Other External Scientific Work

1. RTG “Models of Gravity”, Colloquium, Bielefeld, Germany (January, 14)
2. RTG “Models of Gravity”, Networking Workshop, University of Bremen, Germany (March, 2—5)
3. DPG Spring Meeting, Berlin, Germany (March, 15—20, 2015)
4. RTG “Models of Gravity”, Colloquium, ZARM, Uni Bremen, Germany (May, 13)
5. RTG “Models of Gravity”, Colloquium, Jacobs University, Bremen, Germany (June, 10)
6. RTG “Models of Gravity”, Colloquium, Uni Oldenburg, Germany (July, 1)
7. XIV Marcel Grossman Meeting, Sapienza, Rome Italy (July, 12—18)
8. 21st “Saalburg” Summer School, Wolfersdorf, Germany (August, 31 – September, 11)
9. RTG “Models of Gravity”, Networking Workshop, University of Bremen, Germany,(November, 9—11)

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc..) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2014 List of Publication

DOI: 10.1103/PhysRevD.91.124030
Karlica Mile

Position: EMJD PhD student
Period covered: 2014 - now

I Scientific Work

Development of numerical codes for solving the kinetic equation and calculation of non-thermal spectra with the special interest to GRB afterglow. In this past year we constructed the paradigm of “sponge” model which includes the influence of ejecta fragmentation on the form of GRB afterglow lightcurve.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- 2nd Cesar Lattes Meeting, Rio de Janeiro, Brazil, April 13-22, 2015
- Fourteenth Marcel Grossmann Meeting, Rome, Italy, July 12-18, 2015

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

- Talk at 2nd Cesar Lattes Meeting, Rio de Janeiro, Brazil, April 13-22, 2015 with the title: Synchrotron Radiation and GRB Perspective – A Short Review
- Talk at Fourteenth Marcel Grossmann Meeting, Rome, Italy, July 12-18, 2015 with the title: “Sponge Model” As The Hydrodynamical Background For GRB Afterglow Phase

III b. Outside ICRANet

IV. Other

2015 List of Publication

I Scientific Work

Dark matter and galaxy structures

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- Third Bego Rencontres, IRAP Ph.D. Erasmus Mundus school (September 8-19, 2014)
- 2nd César Lattes Meeting (April 13-22, 2015)
- 14th Marcel Grossmann Meeting (July 12-18, 2015)
- 14th Italian-Korean Symposium on Relativistic Astrophysics (July 20-24, 2015)
- Astrophysical Probes of Fundamental Physics, A PhD School at University of Ferrara (September 7-11, 2015)

II b Work With Students - none

II c Diploma thesis supervision - none

II d Other Teaching Duties - none

II e Work With Postdocs - none

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

No, yet
I Scientific Work

I am currently working on radio observations of galaxy clusters, with the main aim of detecting synchrotron radiation from the largest scale structures of the Universe. In my first PhD year, I have been able to learn the basis of radio-interferometry and of data reduction, finalizing in a few months the analysis of 7 big data sets. I am now working on my first publication on this topic.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

October 2015 Exoplanetary atmospheres and habitability, Nice, France
September 2015 Sixth European Radio Interferometry School ERIS 2015, Garching, Germany
June-August 2015 Research visit in Victoria University, Wellington, New Zealand
January 2015 Research visit in Victoria University, Wellington, New Zealand
November 2014 3rd LOFAR Data processing school, Dwingeloo, Netherlands

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

Organization of scientific meetings with PhD students and Postdocs in Observatoire de la cote d’azur.

IV. Other

2015 List of Publication
CAPES
I Scientific Work

The Stripe82 data collection started to be analyzed. We have collected data from all different wavelengths to build up a deep database of medium sky area survey. Data from the major survey/missions, SDSS, CS82, Stripe82X, SpIES, GALEX can be seen at the vo service at vo.bsdc.icranet.org. Matching these data with SDSS spectrographic redshift provides a dataset being used for photometric redshift estimation. This work is being carried in collaboration with professor Martin Makler, from CBPF, Brazil, using the ANNZ code. This study is under active development, where, after cleaning and filtering the photometric data we are now understanding the subtleties of machine learning algorithms for classification and regression purposes.

II Conferences and educational activities

II a

6th AstroInformatics meeting, 5-9 October, Dubrovnik, Croatia
XIV Marcel Grossmann meeting, 12-18 July, Rome, Italy
IVOA Interoperability meeting, 15-19 June, Sesto, Italy

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc..) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

Efforts have been done to setup a website for the Brazilian Science Data Center, in Pescara, but short on human resources are a major obstacle for the project. By all means, I am being able to maintain an interface for data access using VO protocols and web services accessible at http://vo.bsdc.icranet.org.

III b. Outside ICRANet

Using publicly available services we can find a small set of software projects I have been maintaining mainly focusing on VO data providing/access and cloud computing. The underlying common aim of those projects is to provide a platform independent setup for complex/intensive astronomical software. The projects can be found at https://github.com/chbrandt.

IV. Other
2015 List of Publication

Guimarães Carvalho, Gabriel

Position: Ph.D Student
Period covered: February 2014 – January 2017

I Scientific Work

- Bachelor Degree in Mathematics, Federal University of Pernambuco (UFPE), 2008 to 2010.
- Master Degree in Mathematics, Federal University of Pernambuco (UFPE), 2011 to 2013.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

- IRAP Ph.D Erasmus Mundus Winter School of Nice (France), February of 2014;
- Zel'dovich – 100 Meeting, Minsk (Belarus), March of 2014;
- École de Physique des Honchés (France), May 2014;
- First Scientific ICRANet Meeting in Armenia, June-July of 2014;
- IRAP Ph.D IRAP Ph.D Erasmus Mundus School of Nice (France), September of 2014;
- Fourteenth Marcel Grossmann Meeting, July 2015;

II b Work With Students

- “On the disformal invariance of the Dirac equation”, joint work with Eduardo Bittencourt (Postdoc) and Iarley Pereira (Ph.D).

II c Diploma thesis supervision

II d Other Teaching Duties
- Former Temporary Professor at the Federal University of Pernambuco.

II e. Work With Postdocs

- “On the disformal invariance of the Dirac equation”, joint work with Eduardo Bittencourt (Postdoc) and Iarley Pereira (Ph.D).

III. Service activities

III a. Within ICRANet

III b. Outside ICRANet

IV. Other 2015 List of Publication

- “On the disformal invariance of the Dirac equation” (Classical & Quantum Gravity v. 32, p. 185016, 2015.)
Pereira Lobo Iarley

Position: CAPES-ICRANet Ph.D. Student
Period covered: 2015

I Scientific Work

I investigate geometrical properties of models used to describe the phenomenology of quantum-gravity. In particular, the role of Planck-scale-dependent deformed kinematics in Special Relativity (named DSR) and it's generalization towards possible deformations of General Relativity; I also study the possibility of curved momentum spaces in such paradigm.
Another topic of interest is the use of non-riemannian geometries for the description of alternatives theories of gravity.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

I presented a talk named “Peculiar properties of 3D gravity, the Magueijo-Smolin model and other DSR-relativistic pictures with anti-de Sitter momentum space”.

2) July: Fourteenth Marcel Grossman Meeting on General Relativity, Rome, Italy.
I presented a talk named “Geometric picture of DSR-relativistic theories with de Sitter and anti-de Sitter momentum spaces”.

3) July: Quantum Gravity Meeting, Rome, Italy.
I presented a talk named “Geometric picture of DSR-relativistic theories with de Sitter and anti-de Sitter momentum spaces”.

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs
III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

E. Bittencourt, I. P. Lobo and G. G. Carvalho, Class. Quantum Grav. 32 185016 (2015).


I Scientific Work


II Conferences and educational activities

II a Conferences and Other External Scientific Work

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc…) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet  Lecture course: “Accretion disks in close binary systems” for graduate students in the University Santa Catarina, Florianopolis, Brazil; June 1- July 10, 2015.

III b. Outside ICRANet

IV. Other

2015 List of Publication

1. Strong Shock in a Uniformly Expanding Universe
G. S. Bisnovatyi-Kogan*

Space Research Institute, RAS, Profsoyuznaya 84/32, Moscow 117997, Russia;
2. Outer Parts of Large Galactic Clusters in the Presence of Dark Energy
G. S. Bisnovatyi-Kogan

F. Giovannelli, G. S. Bisnovatyi-Kogan, I. Bruni, G. Corfini, F. Martinelli and C. Rossi

4. Period Clustering of Anomalous X-Ray Pulsars
G. S. Bisnovatyi-Kogan and N. R. Ikhsanov
Astronomy Reports, 2015, Vol. 59, No. 6, pp. 503–509

5. Innermost stable circular orbits of spinning test particles in Schwarzschild and Kerr spacetimes
Paul I. Jefremov, Oleg Yu. Tsupko, and Gennady S. Bisnovatyi-Kogan

6. Development of the Magneto-Differential-Rotational Instability in Magnetorotational Supernova
S. G. Moiseenko and G. S. Bisnovatyi-Kogan
Paolo Giommi

Position: Director of ASI Science Data Center

Period covered: 1 January – 10 November 2015

I Scientific Work

Research in multi-frequency multi-messenger astrophysics, mostly in the field of AGN and Blazars. Over the past year I have been particularly active in high-energy (100MeV-10TeV) astrophysics, correlations between blazars, neutrinos and Ultra High Energy Cosmic Rays (UHECRs)

Development of new techniques (e.g. ASDC SED tool) for the analysis of large amounts of archival data, including published results.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

“2nd Latter Meeting, Rio de Janeiro . Invited talk
14th Marcel Grossman meeting – Roma . Plenary Talk
TeV Particle Astrophysics 2015 – Tokyo. Invited Plenary Talk

II c Diploma thesis supervision of Yu-Ling Chen and Carlos Brandi, Supervision of research work of Bruno Arsioli and (partly) Bernardo Fraga (CAPES post-docs)

III. Service activities

Director of ASI Science Data Center

III a. Within ICRANet.

Definition and first implementation of the Brazilian Science Data Center.

2015 List of Publications

1. 2015MNRAS.446.4078K
New white dwarf stars in the Sloan Digital Sky Survey Data Release 10

2. 2015MNRAS446L...41
A simplified view of blazars: the very high energy gamma-ray vision
Padovani, P.; Giommi, P.

3. 2015Ap&SS.357...75M
The 5th edition of the Roma-BZCAT.
Massaro, E.; Maselli, A.; Leto, C.; Marchegiani, P.; Perri, M.; Giommi, P.; Piranomonte, S.
4. 2015Sci...348..670B

5. 2015ApJS..218...23A
Fermi Large Area Telescope Third Source Catalog
As part of the Fermi collaboration

6. 2015MNRAS.449.3517D
Are many radio-selected BL Lacs radio quasars in disguise?
D’Elia, V.; Padovani, P.; Giommi, P.; Turriziani, S.

7. 2015A&A...579A..34A
1WHSP: An IR-based sample of ~1000 VHE $\gamma$-ray blazar candidates
Arsioli, B.; Fraga, B.; Giommi, P.; Padovani, P.; Marrese, P. M.

8. 2015ApJ...807...79H
Rapid Variability of Blazar 3C 279 during Flaring States in 2013-2014 with Joint Fermi-LAT, NuSTAR, Swift, and Ground-Based Multiwavelength Observations

9. 2015MNRAS.450.2404G
A simplified view of blazars: contribution to the X-ray and $\gamma$-ray extragalactic backgrounds
Giommi, P.; Padovani, P.

10. 2015arXiv150805894C
CTA Contributions to the 34th International Cosmic Ray Conference (ICRC2015)

11. 2015ApJ...810...14A
The Third Catalog of Active Galactic Nuclei Detected by the Fermi Large Area Telescope
Fermi collaboration

12. 2015arXiv150902063T
Multiwavelength Evidence for Quasi-periodic Modulation in the Gamma-ray Blazar PG 1553+113
Fermi collaboration

13. 2015JHEAp...7..173G
Multi-frequency, multi-messenger astrophysics with Swift. The case of blazars
P. Giommi
14. 2015MNRAS.452.1877P
A simplified view of blazars: the neutrino background
Padovani, P.; Petropoulou, M.; Giommi, P.; Resconi, E.

15. 2015ApJ...812...65F
First NuSTAR Observations of Mrk 501 within a Radio to TeV Multi-Instrument Campaign
NuSTAR+MAGIC+VERITAS collaborations

16. 2015arXiv151004631M
NuSTAR Hard X-ray Survey of the Galactic Center Region I: Hard X-ray Morphology and Spectroscopy of the Diffuse Emission
Mori, Kaya; Hailey, Charles J.; Krichon, Roman; Hong, Jassub; Ponti, Gabrielle; Bauer, Franz; Perez, Kerstin; Nyukam, Melanie; Zhang, Shuo; Tomsick, John A.; Alexander, David M.; Baganoff, Frederick K.; Barret, Didier; Barriere, Nicolas; Boggs, Steven E.; Canipe, Alicia M.; Christensen, Finn E.; Craig, William W.; Forster, Karl; Giommi, Paolo; Grifinsestette, Brian W.; Grindlay, Jonathan E.; Harrison, Fiona A.; Hornstrup, Allan; Kitaguchi, Takao; Kohlin, Jason E.; Lu, Vy; Madsen, Kristen K.; Mao, Peter H.; Miyasaka, Hiromasa; Perri, Matteo; Pivovaroff, Michael J.; Puccetti, Simonetta; Rana, Vikram; Stern, Daniel; Westergaard, Niels J.; Zhang, William W.; Zoglauer, Andreas

17. 2015arXiv151008358K
X-Ray Polarimetry with the Polarization Spectroscopic Telescope Array (PolSTAR)
Krawczynski, Henric S.; Stern, Daniel; Harrison, Fiona A.; Kislat, Fabian F.; Zajczyk, Anna; Beilicke, Matthias; Hoormann, Ian; Gu, Qingzhen; Endsley, Ryan; Ingram, Adam R.; Miyasaka, Hiromasa; Madsen, Kristen K.; Aaron, Kim M.; Aminia, Rashied; Baring, Matthew G.; Beheshtipour, Banafsheh; Bodaghee, Arash; Booth, Jeffrey; Borden, Chester; Boettcher, Markus; Christensen, Finn E.; Cappi, Paolo S.; Cowisuk, Ramanath; Davis, Shang; Dexter, Jason; Done, Chris; Dominguez, Luis A.; Ellison, Don; English, Robin L.; Fabian, Andrew C.; Falcone, Abe; Favrette, Jeffrey A.; Fernandez, Rodrigo; Giommi, Paolo; Grefenstette, Brian W.; Kara, Eren; Lee, Chong H.; Lyutikov, Maxim; Maccarone, Thomas; Matsumoto, Hiroshi; McKinney, Jonathan; Mihara, Tatehiro; Miller, Jon M.; Narayan, Ramesh; Natalucci, Lorenzo; Oezel, Feryal; Pivovaroff, Michael J.; Pravdo, Steven; Psaltis, Dimitrios; Okajima, Takashi; Toma, Kenji; Zhang, William W.

18. Proceedings of 2nd Lattes meeting
Multi-frequency multi.messenger astrophysics with blazars at ASDC and BSDC
Paolo Giommi
I Scientific Work

II Conferences and educational activities

II a Conferences and Other External Scientific Work

L. J. Rangel Lemos, C. L. Bianco, R. Ruffini; "Applying the luminosity function statistics in the fireshell model"; proceeding of the "The 2nd ICRA Net César Lattes Meeting"; it will be published by American Institute of Physics (AIP), 2015.

II b Work With Students


II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRA Net (e.g. teaching activities, conferences etc...) and outside ICRA Net (teaching activities in your university etc...)]

III a. Within ICRA Net


III b. Outside ICRA Net

Participation of Conferences:
- XXXIII Encontro de Física do Norte e Nordeste (XXXIII EFNNE), 11-13 November 2015, Natal-RN-Brazil.

- Participation and member of the organizing committee of the II Encontro de Física do Entorno do Bico do Papagaio (II ENFEBP), 18-20 November 2015, Araguaína-TO-Brazil.

Teaching courses in the Federal University of Tocantins:

- Fundamentos de Física Mecânica (60 hours)

- Cálculo de Várias Variáveis (60 hours)

IV. Other

2015 List of Publication
Zen Vasconcellos Cesar Augusto

Position:
- Full Professor, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil
- Adjunct Professor, ICRANet, Italy

Period covered: 2015

I Scientific Work

Research on Nuclear Astrophysics, with application in the description of the structure of neutron stars and pulsars.

II Conferences and educational activities

II a Conferences and Other External Scientific Work:

Chair of the following conferences:

Co-Chair of the following conferences:
- Eleventh Marcel Grossmann Meeting - MG14, University of Rome "La Sapienza" - Rome, July 12-18, 2015

II b Work With Students

II c Diploma thesis supervision:
- Rosana de Oliveira Gomes, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil
- Alberto Sperotto dos Santos Rocha, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

II d Other Teaching Duties

II e Work With Postdocs

III Service activities

III a. Within ICRANet

III b. Outside ICRANet
IV. Other

2015 List of Publication:


- A REVIEW ON THE RELATIVISTIC EFFECTIVE FIELD THEORY WITH PARAMETERIZED COUPLINGS FOR NUCLEAR MATTER AND NEUTRON STARS, C. A. Zen Vasconcellos – AIP Journal, 2015 (to be published)
Bartosch Caminha Gabriel

Position: Post-Doc
Period covered: 01/01/2015 – 25/11/2015

I Scientific Work

My research activities are focused in probing the total mass distribution in Galaxy Clusters using Strong Lensing techniques in combination with the outstanding data of these surveys.

My main interests are to study the nature of the dark components of the Universe, i.e. dark matter and dark energy, and how its properties impact on the evolution and formation of galaxies and cluster galaxies.

I am also member and collaborator of the SOAR Gravitational Arc Survey (SOGRAS), the CFHT/MegaCam Stripe-82 Survey (CS82) and the Strong Lensing Working Group of the Dark Energy Survey (DES).

II Conferences and educational activities

II a Conferences and Other External Scientific Work
Fourteenth Marcel Grossmann Meeting
6th Young Researcher Meeting
CLASH-VLT Meeting in Arcetri

II b Work With Students
Camilo Delgado-Correal

II c Diploma thesis supervision

II d Other Teaching Duties

II e. Work With Postdocs

III. Service activities

III a. Within ICRANet

III b. Outside ICRANet
IV. Other

**2015 List of Publication**

Caminha, et al., CLASH-VLT: A highly precise strong lensing model of the galaxy cluster RXC~J2248.7-4431 (Abell S1063) and prospects for cosmography, submitted to A&A


Balestra et al., CLASH-VLT: Dissecting the Frontier Fields Galaxy Cluster MACS J0416.1-2403 with \(~800\) Spectra of Member Galaxies, submitted to ApJ


Treu et al. 'Refsdal' meets Popper: comparing predictions of the re-appearance of the multiply imaged supernova behind MACS1149.5+2223, submitted to ApJ


[http://adsabs.harvard.edu/abs/2015arXiv151005659A](http://adsabs.harvard.edu/abs/2015arXiv151005659A)


[http://adsabs.harvard.edu/abs/2015A%26A...579A...4G](http://adsabs.harvard.edu/abs/2015A%26A...579A...4G)
Goulart Coelho Jaziel

Position: Postdoc

I Scientific Work

Compact objects: SGRs/AXPs, white dwarfs and neutron stars

Work With Students (ICRANet):

Thermal X-ray emission from massive, fast rotating, highly magnetized white dwarfs

Diego L. Cáceres. Jaziel G. Coelho, S. M. de Carvalho, R. C. R. de Lima, Jorge A. Rueda, Remo Ruffini

Work With Postdocs:

On the rotation-power nature of SGRs and AXPs

Jaziel G. Coelho, R. C. R. de Lima, Diego L. Cáceres, M. Malheiro, Jorge A. Rueda, Remo Ruffini

2015 List of Publication


Lobato, R. V.; Coelho, Jaziel; Malheiro, M.


Otoniel, E.; Malheiro, M; Coelho, J. G.
Do SGRs/AXPs and radio AXPs have the same nature? In: Proceedings of the MG13 Meeting on General Relativity, 2015, Stockholm University. The Thirteenth Marcel Grossmann Meeting. p. 2465-2467.

Coelho, J. and Malheiro, M.


Malheiro, M. and Coelho, J.

Thermal X-ray emission from massive, fast rotating, highly magnetized white dwarfs – (ready for submission to ApJ)

Diego L. Cáceres, Jaziel G. Coelho, S. M. de Carvalho, R. C. R. de Lima, Jorge A. Rueda, Remo Ruffini

On the rotation-power nature of SGRs and AXPs – (submitted to ApJ)

Jaziel G. Coelho, R. C. R. de Lima, Diego L. Cáceres, M. Malheiro, Jorge A. Rueda, Remo Ruffini
Bittencourt Eduardo

Position: Postdoc
Period covered: January – November 2014

I Scientific Work

1. Mathematical aspects of gravitational theories;
2. Geometric Scalar Theory of Gravity and possible generalizations;
3. Disformal transformations of dynamical field equations;
4. Cosmological models with viscosity and perturbation theory;
5. Analogue models of gravity;

II Conferences and educational activities

II a Conferences and Other External Scientific Work

1. 6th Young Researcher Meeting (L'Aquila)
2. GR100 in Rio (Rio de Janeiro)
3. Marcel Grossmann (Rome)
4. Einstein's Legacy (London)

II b Work With Students

Gabriel G. Carvalho and Iarley P. Lobo (CAPES)

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

Grasiele B. Santos (CAPES), Jonas P. Pereira and Andrea Geralico (ICRANet)

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]
III a. Within ICRANet

III b. Outside ICRANet

IV. Other

2015 List of Publication

1. Donato Bini, Eduardo Bittencourt and Andrea Geralico, Massless Dirac particles in the vacuum C-metric, Class. Quantum Grav. 32 (2015) 215010.


Position: PostDoc
Period covered: 2015

I Scientific Work

Compact objects: SGRs/AXPs, white dwarfs and neutron stars. Analysis of Equations of State for compact stars. Analysis of pulsed fractions due to hot spots in compact stars.

II Conferences and educational activities

II a Conferences and Other External Scientific Work

“Effect of strong magnetic fields on the nuclear pasta phase structure”, The Structure and Signals of Neutron Stars, from Birth to Death, 24-28 March, 2014, Florence, Italy


“SGRs and AXPs as rotation-powered compact stars”, Lima, R. C. R. ; Coelho, J. G. ; Rueda, J. A. ; Malheiro, M. ; Ruffini, R., Fourteenth Marcel Grossmann Meeting, University of Rome "La Sapienza" – Rome, July 12-18, 2015

II d Other Teaching Duties

“Slowly rotating relativistic neutron stars” - Third Bego Rencontres - IRAP Ph.D. Erasmus Mundus school - September 8th-19th, 2014

II e. Work With Postdocs


Batista dos Santos Grasiele

Position: Post doctoral fellow

Period covered: 2015

I Scientific Work

1. Quantum gravity phenomenology in cosmology;
2. Classical cosmological perturbation theory;
3. Cosmological models with viscosity;

II Conferences and educational activities

II a Conferences and Other External Scientific Work

1. XIV Marcel Grossmann Meeting (Rome)
2. Quantum Gravity Meeting (Rome)
3. Hot topics in general relativity and gravitation (Vietnam)
4. Einstein’s Legacy (London)

II b Work With Students

Francesco Brighenti (PhD student, Università di Bologna)

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

Eduardo Bittencourt (CAPES) and Giulia Gubitosi (INFN and Imperial College)

III. Service activities

III a. Within ICRANet
III b. Outside ICRANet

IV. Other

2015 List of Publication


Belvedere Riccardo

Position: Post Doc
Period covered: April 2014 - Present

I Scientific Work

I am collaborating with Professor Remo Ruffini and Dr. Rueda to analyze the astrophysical consequences of our new model of neutron stars, in particular focusing on its effect on the Kerr quadrupole moment and the creation of a black hole. At the same time I am working with Professor Sergio Barbosa Duarte, from CBPF, to introduce more degrees of freedom in our neutron stars model, taking into account the Delta-Resonances in the Walecka and Zimanyi-Moszkowski models. With Professor Rodrigo Picanço Negreiros, from UFF (Universidade Federal Fluminense), I am applying the cooling to our model of neutron stars, being it, until now, developed in the T=0 limit.

II Conferences and educational activities

- The Second ICRANet César Lattes Meeting, Niteroi – Rio de janeiro, Brazil, April, 13-18, 2015

2015 List of Publication

- R. Belvedere, J. A. Rueda, and R. Ruffini,
  “On the Magnetic Field of Pulsars with Realistic Neutron Star Configurations”.

- R. Belvedere, J. A. Rueda, and R. Ruffini,
  “Suitability of Analytical Formulas for the Determination of the Neutron Star Keplerian Frequency and Moment of Inertia”.
  Submitted to Phys. Rev. C
**Penacchioni Ana Virginia**

Position: Post-doc  
Period covered: 01/01/2014 to 31/12/2015

**I Scientific Work**

My post-doc research concentrated on the development of the space experiment MIRAX (Monitor e Imageador de RAios X), and a balloon-borne coded-mask experiment, protoMIRAX, that will serve as a prototype for testing the detectors and instrumentation in general. The energy range covered by the detectors is 10-200 keV for MIRAX and 30-200 keV for protoMIRAX. The detectors are 169 in total, distributed in a plane, in a 13 x 13 array. The experiment uses a coded mask with a MURA pattern (Uniformly Redundant Array) which is a 2 x 2 extension of the 13 x 13 pattern, minus one line and one column (25 x 25).

My work was to characterize and calibrate the X-ray detectors. I developed a program in order to acquire and analyze the data. The main astrophysical sources that will be observed by MIRAX are the Crab Nebula and three sources in the Galactic Centre region. I also helped to simulate the diffuse background and to reconstruct the images of the sources as will be seen by MIRAX. To do this we made use of the GEANT4 package, developed by CERN. The aim was to simulate every interaction of the incoming particles with the detectors and other parts of the experiment, and to generate shadowgrams (plots of the number of counts that reached each of the detectors). From these shadowgrams and applying a deconvolution procedure we obtained the images and were able to calculate the signal-to-noise ratio (SNR).

**II Conferences and educational activities**

**II a Conferences and Other External Scientific Work**


2015  **2nd Cesar Lattes Meeting, Niteroi & Rio de Janeiro, Brazil, April, 13th - 18th,** Oral presentation: *Telescope performance and image simulations of the coded-mask balloon-borne protoMIRAX experiment*.

2015  **XIV Marcel Grossmann Meeting, Rome, Italy, July, 13th -18th**, Oral presentation: *Telescope performance and image simulations of the coded-mask balloon-borne experiment protoMIRAX.*
2015 High Energy Phenomena in Relativistic Outflows (HEPRO) V, La Plata, Argentina, October, 5th-8th, Oral presentation: Estimating GRB detection rate with MIRAX.

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

III. Service activities  [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

2015 XIV Marcel Grossmann Meeting, Rome, Italy, July, 13th -18th , Oral presentation: Telescope performance and image simulations of the coded-mask balloon-borne experiment protoMIRAX.

III b. Outside ICRANet

IV. Other

2015 List of Publication

Publications in international journals


2015 On binary driven hypernovae and their nested late X-ray emission, Muccino, Marco; Ruffini, Remo; Bianco, Carlo Luciano; Enderli, Maxime; Kovacevic, Milos; Izzo, Luca; Penacchioni, Ana Virginia; Pisani,


Proceedings


I Scientific Work

1. Work on numerical solution of Boltzmann equations for mildly relativistic electron-positron-photon plasma taking into account Bose enhancement and Pauli blocking

2. Work on GRB emission mechanisms

II Conferences and educational activities

II a Conferences and Other External Scientific Work

2. Fourteenth Marcel Grossmann Meeting - MG14, University of Rome "La Sapienza" - Rome, July 12-18, 2015

II b Work With Students

II c Diploma thesis supervision

II d Other Teaching Duties

II e Work With Postdocs

III. Service activities [activities carried out in collaboration with ICRANet (e.g. teaching activities, conferences etc...) and outside ICRANet (teaching activities in your university etc…)]

III a. Within ICRANet

III b. outside ICRANet
IV. Other

2015 List of Publication


I Scientific Work

My research focuses on gamma-ray bursts (GRBs), in particular on X-ray and optical data analysis and their interpretation.

During my PhD (2010-2013), I worked in the Professor Chincarini group at the Brera Observatory in Merate. Me and my collaborators created a catalogue of X-ray and optical light-curves of GRBs. From this catalogue, we found out a correlation between the X-ray energy, the gamma-ray isotropic energy and the peak energy ($E_{\text{X,iso}} - E_{\gamma,\text{iso}} - E_{\text{pk}}$), which is followed by long and short GRBs as a whole. This was an important result, since other well known correlations, as the Amati relation, are followed only by long GRBs, and it links together prompt and afterglow emission properties, posing new questions about the nature and classification of GRBs. Since this year is the tenth anniversary of the launch of Swift satellite, we updated this three parameter correlation with the data collected in the last four years, discussing the physics that is driving this correlation. This work was published in the “Monthly Notices of the Royal Society” Journal and it was presented in some international meetings: “Swift: 10 Years of Discovery” (Rome, Italy), “The Second ICRANet César Lattes Meeting” (Rio de Janeiro, Brazil), and “The Fourteenth Marcel Grossmann Meeting” (Rome, Italy).

Due to my experience on X-ray analysis, I collaborated with the ICRA group in Rome to complete a work about GRBs and cosmology. In particular, I collaborated in the sample selection, data collection, and fitting of the X-ray light-curves. The work was published in the “Astronomy and Astrophysics” Journal. In addition, I was involved in the articles about GRB 090510 and GRB 140609B and their interpretation with the fireshell model.

In the meanwhile I am collaborating with Dr. Ulisses Barres de Almeida (CBPF) on a statistical and temporal analysis of a sample of blazars observed both by Fermi and Catalina telescope. For the first part of the project, we are selecting the sample and collecting Catalina and Fermi data using the Asi Science Data Center (ASDC) tool.

II Conferences and educational activities

a. Conferences and Other External Scientific Work
Talk: 'The GRB Universal Scaling $E_{X,iso} - E_{\gamma,iso} - E_{pk}$ with Ten Years of Swift Data'.

Talk: 'Ten Years of Swift: a Universal Scaling for Short and Long Gamma-Ray Bursts ($E_{X,iso} - E_{\gamma,iso} - E_{pk}$)'.

Poster: 'Ten Years of Swift: a Universal Scaling for Short and Long Gamma-Ray Bursts ($E_{X,iso} - E_{\gamma,iso} - E_{pk}$)'.

Talk: 'Gamma-ray bursts and their X-ray and optical afterglow'.

Posters: 'Gamma-ray burst optical light-curve zoo: comparison with X-ray observations'.
'The induced gravitational collapse and the bynary driven hypernovae'

III. Service activities

a. Within ICRANet

Collaboration with the ICRA group in Rome, in particular, with Luca Izzo, Marco Muccino, Giovanni Pisani.

Collaboration with Lorenzo Amati (ICRANet external collaborator - INAF - IASF Bologna) and Paolo Giommi (ASDC - ASI).

b. Outside ICRANet

Collaboration with Ulisses Barres de Almeida (CBPF), Maria Grazia Bernardini (INAF-OAB Merate), Stefano Covino (INAF-OAB Merate), Raffaella Margutti (CfA - Harvard University).

2014 -2015 List of Publication

Administrative, Secretarial and Technical Staff
<table>
<thead>
<tr>
<th><strong>Adamo Cristina</strong></th>
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<tbody>
<tr>
<td><strong>E mail address</strong></td>
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<tr>
<td><strong>Telephone</strong></td>
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<tr>
<td><strong>Fax</strong></td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
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<tr>
<td><strong>Date and place of birth</strong></td>
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### Work experiences

<table>
<thead>
<tr>
<th><strong>Date</strong></th>
<th><strong>Name of employer</strong></th>
<th><strong>Occupation or position held</strong></th>
<th><strong>Main activities and responsibilities</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>09 November 2009 → present</td>
<td>ICRANet - International Center for Relativistic Astrophysics Network</td>
<td>Administrative employee</td>
<td>Administrative office: accountancy, preparing reimbursement and rewards for scientific visitors, on-line payments, analysis of bank statements.</td>
</tr>
<tr>
<td>04 March 2007 → 09 October 2009</td>
<td>Solaris Srl - Manoppello (PE) - Industrial Springs Production</td>
<td>Responsible for marketing planning</td>
<td>Evaluation of markets perspective. Coordination and reduction of commercial plans.</td>
</tr>
</tbody>
</table>

**Solaris Srl - Manoppello (PE) - Industrial Springs Production**

**Date** 01 April 2001 - 28 January 2004

**Occupation or position held** Responsible for marketing planning

**Main activities and responsibilities**

- Evaluation of markets perspective.
- Coordination and reduction of commercial plans.
Survey of the competition sale prices
Coordination of marketing plans and commercial budgets

Name and address of employer: Merker SpA - Trucks production
Date: 1997 - 2000
Title of qualification awarded: Trainee at a Business Consultant

Consultant office Dott. Vincenzo Micozzi - Pescara

Date: 1997 - 31/03/2001
Principal subjects / occupational skills covered: Responsible for Quality Insurance (ISO UNI EN 9002) Management Assistance Purchase management Administrative and fiscal fulfilments Definition of Marketing plans and monitoring of mix marketing elements

Name and address of employer: Solaris Srl - Industrial Springs production

Date: 1997 - 1997
Occupation or position held: Stageur
Main activities and responsibilities: Implementation of check systems management

Name and address of employer: Software House Polymatic - Chieti Scalo

Education and training

Date: November 1991 - 16 July 1996
Title of qualification awarded: Degree in Economics – Economics of financial middleman

Title of qualification awarded: Secondary School Degree
Name and type of organisation providing education and training: Liceo Scientifico Leonardo Da Vinci - Pescara

Dates: 1997 - 2000
Title of qualification awarded: Trainee at a Business Consultant
Income tax return.

Name and type of organisation providing education and training
Consultant office Dott. Vincenzo Micozzi - Pescara

Date 1998 - 1998
Title of qualification awarded Brief Master on Tax Law
Name and type of organisation providing education and training University D'Annunzio - Pescara

Date 1998 - 1998
Title of qualification awarded Postgraduate Course on “European Union: institutional, juridical and economic aspects”
Name and type of organisation providing education and training European Commission and University of Lyon: course in Paris and Lyon. Success on final exams.

Dates 1997 - 1997
Title of qualification awarded Expert in enterprise management
Main Subjects Purchase and logistics, financing, administration and control, marketing, production, budget, bringing out of new products
Name and type of organisation providing education and training Regione Abruzzo - CIFAP

Dates 1997 - 1997
Title of qualification awarded Evaluator of Quality systems
Main subjects Expert according to the ISO regulations. Qualification for leading controls according to the UNI EN 9002 regulations.

Personal skills and competences
Mother tongue Italian
English Indipendent User
French Basic User
<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Social skills and competences</td>
<td>Communication Ability acquired during the working experiences</td>
</tr>
<tr>
<td></td>
<td>Aptitude to learn, adaptable to new situations, different from the known ones.</td>
</tr>
<tr>
<td></td>
<td>Ability to work under pressure.</td>
</tr>
<tr>
<td></td>
<td>Good aptitude to work in multicultural environment thanks to the experiences spent abroad for education or personal reasons.</td>
</tr>
<tr>
<td></td>
<td>Team spirit</td>
</tr>
<tr>
<td>Organisational skills and competences</td>
<td>Innate sense of organisation both in the working place and in the management of personal and familiar life.</td>
</tr>
<tr>
<td></td>
<td>I am considered as a reference point by the production operators.</td>
</tr>
<tr>
<td>Technical skills and competences</td>
<td>Mastery in quality control processes in small enterprises (I was responsible for the quality evaluation)</td>
</tr>
<tr>
<td>Computer skills and competences</td>
<td>Good Knowledge of Microsoft Office (Word, Excel e PowerPoint)</td>
</tr>
<tr>
<td></td>
<td>Very good knowledge of Team System – Gamma, Mult program</td>
</tr>
<tr>
<td></td>
<td>Basic knowledge of graphic application</td>
</tr>
<tr>
<td></td>
<td>Good knowledge of Internet and web search engines.</td>
</tr>
</tbody>
</table>
Brandolini Gabriele

First name Gabriele Attilio  
Surname Brandolini

E-mail address gabriele.brandolini@icranet.org
Telephone +39 085 23054203  
Fax +39 085 4219252

Nationality Italian

Place and date of birth Ortona (CH), 22 April 1986

Work experiences

Date 01 July 2013 - present
Name of employer Soabit srl 
c/o ICRANet - International Center for Relativistic Astrophysics 
Kind of Employment System manager
Main activities and responsibilities Network administrator – Web development

Date 2011 - 2011
Name of employer Tipografia F.lli Brandolini snc
Kind of Employment Graphic designer
Main activities and responsibilities Network administrator Graphic design and layout texts

Date 2010-2010
Name of employer Soabit srl 
c/o Università degli Studi “G. d'Annunzio” - Chieti
Kind of Employment

Help desk

Main activities and responsibilities

Web development: analysis and development of applications for managing stock of average complexity using PHP and MySQL technologies.
Network administrator: support to the installation of network devices and updating of its firmware, to the segmentation of local area network (VLAN 802.1q) and support to troubleshooting activities.
Network management: implementation of procedures for the historicizing of traffic flows (NetFlow / PMAct) generated by the various firewalls on the various local networks.

Date

2009 - 2009

Name of employer

Tipografia F.lli Brandolini snc

Kind of Employment

Graphic designer

Main activities and responsibilities

Network administrator
Graphic design and layout texts

Education

Date

September 2005 – 18 December 2012

Title of qualification awarded

Degree in Computer Science

Name and type of organisation providing education and training

University of L'Aquila – Final marks: 88/110
Thesis: “Analisi di prestazioni dell'instradamento in reti di sensori wireless”

Dates

September 2009 – July 2005

Title of qualification awarded

Secondary School Degree

Name and type of organisation providing education and training

Istituto Tecnico Industriale Statale “Luigi di Savoia” - Chieti

Personal skills and competences

Mother tongue

Italian

English

Basic User

Social skills and competences

Ability to work in a team matured in many situations where it was necessary collaboration between the figures, both in academia and in the business and sports.
Good relational abilities thanks to the past work experience.

Organisational skills and competences

Sense of organization
Good experience in project and team management
Computer skills and competences

Excellent knowledge of Operating Systems: Windows, Mac OS X and Linux.
Excellent knowledge of Apple and Microsoft applications and Microsoft Office.
Excellent knowledge, also, of various graphics and layout software.
Excellent ability to use the Internet and manage applications that use them.
Management of Local Area Networks LAN and WLAN and implementation of web applications.
Excellent knowledge of HTML, PHP, CSS, Javascript, jQuery, MySQL.
Good knowledge of C, C++, Java, VPN, Firewalling.

Other skills and competences

Considerable passion for the sport, followed and practiced.

Driving licence

Driving licence cat. A – B.
Di Berardino Federica

NAME          FEDERICA DI BERARDINO
PHONE          0039-085-23054200
FAX            0039-085-4219252
E-MAIL         federica.diberardino@icranet.org
NATIONALITY    Italian-American

DATE AND PLACE OF BIRTH             31-03-1980 PESCARA

WORK EXPERIENCE

November 2005-present

- Head of Secretariat at ICRANet Pescara: supporting Director, responsible for day-to-day tasks and secretarial duties, overall responsibility for the smooth running of the secretarial office; supervising the work of office juniors and provide advice and training to them; organizing business travels, itineraries and accommodation; organizing and preparing agendas for board/scientific committee meetings, providing facilities, taking minutes; updating processing and filing of documents (both on paper and computer); organizing diaries and making appointments; handling incoming/out coming calls, faxes, e-mails inquiries and post; handling requests for information and data; coordinating and scheduling secretarial tasks; translations; arranging interviews for new administrative/secretarial staff recruitment.

May-October 2005

- Travel Agent at “Beg Viaggi” Pescara;

September-June 2005

- Italian language trainer for foreign students;

April 2005

- Congress Hostess for IN FIERA S.r.l., at “ECOTUR 2005”- Montesilvano;

December 2004

- Congress Hostess for Manoppello Municipality (PE) on the occasion of the commemoration “Marcinelle 2005”;

October-December 2004

- Customer service assistant for Terravision S.r.l. at Aeroporto d’Abruzzo, Pescara;

January-December 2004

- Trainer/Supporter to elementary and high school Italian students for English language homeworks;

May 2004

- Translations from/to English;

March 2004

- Distribution of books in the local schools for Ajilon Agency, Pescara;

2001-2004

- Customer satisfaction interviews for “NETWORK Research Institute S.r.l.” at Iper - Città Sant’Angelo;

- Researcher for “Informazione e servizi senza barriere” (Agency: NETWORK S.r.l.);

2001-2003
- Hostess and sales promoter for the agency “Image Service”, Città Sant’Angelo (PE);

1998-2000
- Birthday party organizer for kids;
- Educator and entertainment organizer in summer camps of E.N.I. in Cesenatico; additional training courses (Cooperativa Sociale D.O.C. S.c.r.l., Turin).

EDUCATION

June 2004
- Graduation in “Foreign Language and Literatures”, 110/110 cum laude, at University G. D’annunzio (Pescara). Final thesis on “Problemi, tendenze e prospettive dello sviluppo socio-economico in Spagna. Casi di studio” (Supervisor: Prof. G. Massimi);

January 2004
- Researches in Spain for graduation thesis and improvement of Spanish language skills;

September-December 2002
- Four month period mobility at “Nazareth College”, Rochester, N.Y. (U.S.A.) and final exams on English language and literature; Marketing; Spanish language, history and culture;

1998
- High School diploma at Foreign Languages High School “G. Marconi”, Pescara;

October 1996
- English language courses at “Irondequoit High-School” in Rochester (N.Y., USA);

- Multiple visits to England for training courses;

- Visits to USA (N.Y. e Massachusetts) to improve oral skills for American-English.

SOCIAL-CULTURAL EXPERIENCES

January-March 2005: Trip to Vanuatu (Melanesian archipelago, former “New Hebrides”) for humanitarian-aid experience. Voluntary work in a few islands of the archipelago and elementary-level learning of local idiom, the Bislama.

PERSONAL SKILLS

Main studies and job experiences focused on foreign cultures and languages. Graduation on Spanish and English. Daily practice with both languages through conversation and readings. Good interpersonal and communications skills (both written and oral). Well presented.

MOTHER-TONGUE

ITALIAN
OTHER LANGUAGES
ENGLISH, SPANISH, FRENCH

RELATIONAL ABILITIES
Good attitude to work in multi-cultural contexts.
The two main training experiences in the US high school and later in college supported the personal and professional growth, helped to acquire an open-minded attitude towards other cultures, which are essential for cooperation and mutual respect.
The work as customer service assistant, hostess and sales promoter have been relevant in acquiring professional skills in the relationship with customers: importance of communication, which is the ability to listen to and to be listened.

ORGANIZING, PERSONAL AND OTHER COMPETENCES
Organizing abilities in team-work, accuracy, punctuality, positive attitude, problem-solving skills and working method based on the achievement of goals. Open and charismatic personality, highly resourceful, motivated, flexible, enthusiastic, active, dynamic, loving challenges. Ability to multitask and managing conflicting demands. Able to work to tight deadlines. Quick learner. Working at ICRANet consented to be experienced in coordinating, planning and organizing a wide range of secretarial activities, and in being a well organized good team-player with a proven ability to work proactively even whilst under pressure and in a complex and busy office environment.

TECHNICAL SKILLS

ARTISTIC SKILLS
Photography: Diploma of Basic and advanced courses, Photo-reportage and work flow.
Dance: Jazz Dance, Flamenco, Swing/Lindy Hop, Afro-dance, Latin and Brazilian Dances, Traditional folk dances, Artistic Gym.
Piano and guitar basic skills.
Great passion for music (jazz, acoustic, ethnic, rock and classic), theatre and readings.
Free time: travels and photography.

DRIVING LICENCE
Driving license cat. B
di Niccolo Cinzia

E mail address  cinzia.diniccolo@icranet.org
Telephone  +39 085 23054 219
Fax  +39 085 4219252
Nationality  Italian
Date and place of birth  Terlizzi, 23 May 1985

Work experiences

<table>
<thead>
<tr>
<th>Date</th>
<th>Occupation or position held</th>
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<tbody>
<tr>
<td>01 August 2013 → present</td>
<td>Secretariat Office</td>
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Name of employer  ICRANet - International Center for Relativistic Astrophysics Network

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<th>Occupations or position held</th>
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<tbody>
<tr>
<td>12 June → 16 July 2013</td>
<td>ISTAO – Project Work</td>
</tr>
</tbody>
</table>
Name of employer  ISTAO
Main activities and responsibilities  Report And Presentation Of The Results Loccioni Group – Our Presence In The World: Germany, USA, China; Country Analysis: Turkey. Results, Report And Final Slide Presentation To Loccioni Managers
Name and address of employer  Loccioni Group, via Fiume 16, 60030 Angeli di Rosora, Ancona Phone +39.0731.8161 | Fax +39.0731.814.700

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>From October 2012</td>
<td>Conference interpreting and translations.</td>
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</table>
Name and address of employer  OS-Card Srl – Bologna

<table>
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<th>Date</th>
<th>Occupations or position held</th>
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<tbody>
<tr>
<td>May 2012 → September 2012</td>
<td>Junior Export Manager</td>
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</table>
Name of employer  Marzoarreda – Novoli (LE)
Main activities and responsibilities  Brazil country analysis. Brazilian Portuguese website translation. Company profile in Brazilian Portuguese language.

<table>
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<td>September 2011 → January 2013</td>
<td>Stageur</td>
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</table>
Name of employer  Marzoarreda – Novoli (LE)
Main activities and responsibilities  Legal Office – Notary services Drafting of documents concerning: general/special power of attorney, will and testament of citizens living abroad, public acts, certificates of
<table>
<thead>
<tr>
<th>Name and address of employer</th>
<th>Date</th>
<th>Occupation or position held</th>
<th>Main activities and responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITALIAN INSTITUTE OF CULTURE IN BRAZIL - SAO PAULO</td>
<td>January → July 2011</td>
<td>Internship</td>
<td>Editing, proofreading.</td>
</tr>
<tr>
<td>EDIZIONI DELL'UROGALLO - LITERATURE FROM PORTUGUESE-SPEAKING COUNTRIES</td>
<td>February → July 2013</td>
<td>Postgraduate master course in International Management</td>
<td>The Masters Course in International Management prepares highly specialized students in the field of international business and trade. Organized in collaboration with ICE (Governamental Agency for the internationalization of Italian companies), Confindustria Marche (Italian Employers’ federation) and the Government of the Marche Region, the Master represents one of the most important and valuable programs for new graduates approaching the business world focused on the themes of internationalization: macroeconomics and global markets, enterprise organization, emerging countries, strategies and decision-making skills, contracts, rules, techniques.</td>
</tr>
<tr>
<td>Ca’ Foscari – University of Venice</td>
<td>May 2012</td>
<td>CEDILS Certificate</td>
<td>Certified teacher for Italian as foreign language</td>
</tr>
</tbody>
</table>
Date: November 2008 → 11 July 2011
Title of qualification awarded: Master degree in Languages for international communication – Portuguese EU/BR and Spanish
Name and type of organisation providing education and training: Università degli Studi di Perugia
Final marks: 110/110 cum laude
Thesis: “Way to Europe. Portugal and the European integration process”

Date: November – December 2010
Title of qualification awarded: Brief Master on Europroject Management 2007-2013
Name and type of organisation providing education and training: Introduction to European Union: institutional, juridical and economic aspects. Training courses: full lifecycle of an EC funded project: proposal preparation and submission, evaluation, negotiation, technical and financial project management, reporting, technical reviews and post-project audits.

Date: November 2004 → 9 November 2008
Title of qualification awarded: Degree in Linguistic and Cultural Mediation Sciences – Portuguese EU/BR and Spanish
Name and type of organisation providing education and training: Università degli Studi di Perugia
Final marks: 110/110 cum laude
Thesis: Modern poetry in Portugal.

Dates: 1999 - 2004
Title of qualification awarded: Secondary School Degree
Name and type of organisation providing education and training: Liceo Linguistico Carlo Troya – Andria (BT)

Personal skills and competences:
- Mother tongue: Italian
- Second language: Portuguese
- Very good: Spanish
- Good: English
- Basic User: French

Social skills and competences:
- Good ability to adapt to multicultural environment, gained through my experience of studying and travelling abroad (Brazil and Europe);
- Very good aptitude in teamwork (working within collective projects in the postgraduate course and in academia);
- Ability to work under pressure.
Organisational skills and competences

- Very good sense of organisation and time planning abilities;
- Self rigorousness and self discipline;
- Good analytical and problem-solving abilities gained during all study years and especially during internship at Italian General Consulate in Brazil (the Vice-Consul signed my letter of recommendation)

Computer skills and competences

- Very good command of Microsoft Office (Word, Excel e PowerPoint);
- Very good knowledge of Internet and web search engines;
- Knowledge of graphic application.
Latorre Silvia

PERSONAL INFORMATION

Place and date of birth Chieti, 23/09/1982
Nationality Italian
E- mail silvia.latorre@icranet.org
Phone 085 – 23054223
Fax 085 - 4219252

WORK EXPERIENCES

• Date 12/02/2008 – present
  • Name of employer ICRANet
  • Firm or Sector International Center for Relativistic Astrophysics Network
  • Kind of Employment Administrative employee
  • Main Tasks Managing the relationship with suppliers, controlling invoices, calculating reimbursement and rewards for our scientific visitors, preparing orders for the bank, executing and verifying on-line payments, meeting our bank referents for particular payment operations, cash holding, using ICRANet cost-accounting system.

• Date 01/12/2006 – 20/01/2008
  • Name of employer DelVerde Industrie Alimentari S.p.A.
  • Firm or Sector Pasta Factory
  • Kind of Employment Trainee
  • Main Tasks Study and analysis of annual financial statements of ten competitor pasta factories for the financial years from 2002 to 2006, as well as reclassification of balance sheets and profit and loss accounts and calculation of the main income and financial indexes. Analysis of export strategies of DelVerde and other Italian pasta factories.

EDUCATION

• Date 11/2005 – 12/2007
  • Institution Università degli Studi “G. D’Annunzio” Pescara
  • Main Subjects Marketing, commercial law, innovation management and economics, business statistics, quality technique and theory
  • Achieved Qualification Degree in Economics and Administration of the enterprises. Final thesis in analysis of balance sheet: “La leva finanziaria e la leva operativa nel settore pastario” (supervisor Prof. Michele A. Rea)
  • Mark 110/110 cum laude

• Date 09/2001 – 11/2005
  • Institution Università degli Studi “G. D’Annunzio” Pescara
  • Main Subjects Financial Mathematics, bank technique, business economics, accountancy, microeconomics, macroeconomics, private and public law, work law, analysis of balance sheet, business strategy and politics
  • Mark 106/110
• Date 09/1996 – 07/2001
• Institution Secondary School focusing on sciences- Liceo Ginnasio Statale “Publio Virgilio Marone” Vico del Gargano (FG)
• Main Subjects Mathematics analysis, Italian language and literature, Latin language and literature, Chemistry, Physics
• Achieved Qualification Scientific school-leaving certificate
• Mark 100/100

FOREIGN LANGUAGES

ITALIAN

MOTHER-TONGUE

ENGLISH (GOOD) – FRENCH (ELEMENTARY)

OTHER LANGUAGES

RELATIONAL ABILITIES

Good relational abilities thanks to the past work experience at DelVerde and to the present experience at ICRANet.
Self-reliant.
Good listener.

ORGANIZING

Good organizing abilities acquired handling the big amount of data at DelVerde and working at ICRANet, where they are essential for managing the large number of guests, mainly during the meetings.

COMPE TENCES

TECHNICAL SKILLS

Very good use of Internet and e-mail accounts.
Good use of cost-accounting system HELPAZI and bank system BNL Businessway.
Elementary knowledge of HTML e CSS programs for websites.
Knowledge of “TOP VALUE” program for financial diagnosis and corporate planning.

ARTISTIC SKILLS

Piano classes attended for 8 years. sol-fa Diploma.

DRIVING LICENCE

Driving licence cat. B

FURTHER INFORMATION

I like travelling, cooking, cinema, listening music, playing the piano. I have a determined, dynamic and flexible personality. I like staying and working with people.