Staff, Visiting Scientists and Graduate Students at the Pescara Center

November 2010

Contents

ICRANet Faculty Staff

Belinski Vladimir	ICRANet
Bianco Carlo Luciano	ICRANet
Novello Mario	*Cesare Lattes-ICRANet Chair* CBPF, Rio de Janeiro, Brasil
Rueda Jorge A.	ICRANet
Ruffini Remo	Università di Roma "Sapienza"and ICRANet
Vereshchagin Gregory	ICRANet
Xue She-Sheng	ICRANet

Adjunct Professors Of The Faculty

Aharonian Felix Albert	*Benjamin Jegischewitsch Markarjan Chair* Dublin Institute for Advanced Studies, Dublin, Ireland Max-Planck-Institut für Kernphysis, Heidelberg, Germany
Amati Lorenzo	Istituto di Astrofisica Spaziale e Fisica Cosmica, Italy
Arnett David	*Subramanyan Chandrasektar- ICRANet Chair* University of Arizona, Tucson, USA
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
Christodoulou Dimitrios	ETH, Zurich, Switzerland
Coppi Bruno	Massachusetts Institute of Technology
Damour Thibault	*Joseph-Louis Lagrange- ICRANet Chair* IHES, Bures sur Yvette, France
Della Valle Massimo	Osservatorio di CapodiMonte, Italy
Einasto Jaan	Tartu Observatory, Estonia
Everitt Francis	*William Fairbank-ICRANet Chair* Stanford University, USA
Fang Li-Zhi	*Xu-Guangqi-ICRANet Chair* University of Arizona, USA
Frontera Filippo	University of Ferrara, Italy
Jantzen Robert	*AbrahamTaub-ICRANet Chair* Villanova University USA
Kleinert Hagen	*Richard Feynmann-ICRANet Chair* Freie Universität Berlin
Kerr Roy	*Yevgeny Mikhajlovic Lifshitz-ICRANet Chair* University of Canterbury, New Zealand
Madey John	*William Fairbank-ICRANet Chair* University of Hawaii
Misner Charles	*John Archibald Wheeler* University of Maryland

Nicolai Hermann	Albert Einstein Institute – Potsdam, Germany
Pian Elena	INAF and Osservatorio Astronomico di Trieste
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
Rosquist Kjell	*Karl Gustav Jacobi-ICRANet Chair* Stockholm University, Sweden
t Hooft Gerard	*(Nobel Laureate)* Institut for Theoretical Physics Utrecht Universiteit, Holland
Titarchuk Lev	US Naval Laboratory, USA

Lecturers

Aksenov Alexey	Institute for Theoretical and Experimental Physics
Alekseev Georgy	Steklov Mathematical Institute-Russian Academy of Sciences
Bini Donato	CNR and ICRANet, Italy
Boccaletti Dino	ICRANet and Università di Roma "Sapienza"
Chen Pisin	National Taiwan University
Chieffi Alessandro	INAF, Rome, Italy
Coullet 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
Lee Chul Hoon	Hanyang University, Korea
Lee Hyun Kyu	Department of Physics, Hanyang University,
Lee Hyung Won	School of Computer Aided Science, Inje, Korea
Limongi Marco	INAF, Rome, Italy
Lou You Qing	Tsinghua University, Beijing
Malheiro Manuel	ITA, Brazil
Mester John	Stanford University, USA
Mignard François	Observatoire de la Côte d'Azur, Nice, France
Montani Giovanni	ENEA and ICRANet
Nagar Alessandro	Politecnico di Torino and IHES, Bures sur Yvette, Franc
Ohanian Hans	Rensselaer Polytechnic Institute, New York, USA
Pacheco José	Observatoire de la Côte d 'Azur, 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

Benini Riccardo	ICRANet and Università di Roma “Sapienza”, Italy
Bernardini Maria Grazia	ICRANet and Università di Roma “Sapienza”, Italy
Caito Letizia	ICRANet and Università di Roma “Sapienza”, Italy
Cherubini Christian	Campus Biomedico, Rome, Italy
Cianfrani Francesco	ICRANet and Università di Roma “Sapienza”, Italy
Geralico Andrea	ICRANet and Università di Roma “Sapienza”, Italy
Lattanzi Massimiliano	University of Oxford and ICRANet
Patricelli Barbara	ICRANet and Università di Roma “Sapienza”, Italy
Rotondo Michael	ICRANet and Università di Roma “Sapienza”, Italy

Short-Term Visiting Scientists

Ahmedov Bobomurat	Uzbekistan Academy of Sciences
Ansoldi Stefano	University of Udine, Italy
Cadez Andrej	University of Ljubljana, Slovenia
Gao Yu	Purple Mountain Observatory, China
Malheiro Manuel	ITA, Brasil
Manchester Richard	Australia Telescope National Facility, CSIRO
Nagataki Shigehiro	YITP, Kyoto University, Japan
Qadir Asgar	National University Of Sciences And Technology,Pakistan
Rishi Ram Paudel	Tribhuvan University, Nepal
Sasaki Misao	Kyoto University, Japan
Stanley Davis	Universite Bordeaux, France

Long-Term Visiting Scientists

Arkhangekskaja Irene	Moscow Engineering Physics Institute, Russia
Fimin Nicolaj	Keldysh institute for Applied Mathematics, Russia
Gadri Mohamed	University of Tripoli Libya
Gert Hutsi	Tartu Observatory, Estonia
Goulart Erico	CBPF, Brasil
Hoang Ngoc- Long	IPE, Hanoi, Vietnam
Mosquera Cuesta Herman	CBPF, Brasil
Motie Iman	Isfahan University of Technology, Pakistan
Rohollah Mohammadi	Isfahan University of Technology, Pakistan
Torres Sergio	Centro Internacional de Fisica, Bogotà Colombia
Zalaletdinov Roustam	Dept. of Theoretical Physisc, Institute of Nuclear Physics

International Relativistic Astrophysics Ph. D.

Third Cycle	*2004-07*
Chiappinelli Anna	France
Cianfrani Francesco	Italy
Guida Roberto	Italy
Rotondo Michael	Italy
Yegoryan Gegham	Armenia

Fourth Cycle	*2005-08*
Battisti Marco Valerio	Italy
Dainotti Maria.Giovanna	Italy
Khachatryan Harutyun	Armenia
Lecian Orchidea Maria	Italy
Pizzi Marco	Italy
Pompi Francesca	Italy

Fifth Cycle	*2006-09*
Caito Letizia	Italy
De Barros Gustavo	Brasil
Minazzoli Olivier	Switzerland
Patricelli Barbara	Italy
Rangel Lemos Luis Juracy	Brazil
Rueda Hernandez Jorge Armando	Colombia

Sixth Cycle	*2007-2010*
Ferroni Valerio	Italy
Izzo Luca	Italy
Kanaan Chadia	Lebanon
Pugliese Daniela	Italy
Sigismondi Costantino	Italy

Seventh Cycle	*2008-2011*
Belvedere Riccardo	Italy
Ceccobello Chiara	Italy
Ferrara Walter	Italy
Han Wen-Biao	China
Luongo Orlando	Italy
Pandolfi Stefania	Italy
Taj Safia	Pakistan

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

IRAP Ph. D. Erasmus Mundus Students

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

Administrative and Secretarial Staff

Adamo Cristina	Administrative Office
Del Beato Annapia	Documentation Office
Di Berardino Federica	Head of the Secretarial Office
Latorre Silvia	Administrative Office
Regi Massimo	System Manager

Belinski Vladimir

Position: ICRANet, Faculty Member
Period covered: December 2009-December 2010

I. Scientific Work

Cosmology:

It was finished the first part of the book "Cosmological Singularity" by V.Belinski and T.Damour. The book we are planning to publish with Cambridge University Press. The short and adapted version of this part will appear in AIP Conference Proceedings of XIV Brazilian School of Cosmology and Gravitation (the School was held in Rio de Janeiro in September 2010).

Astrophysics:

We (V.Belinski and G.Alekseev) continued the investigation of exact solutions for the motions of self-gravitating shells which can have some applications to the stellar clusters. The corresponding paper have been published in the Journal of Korean Physical Society in October 2010.

Exact solutions of Einstein and Einstein-Maxwell equations:

1) The new derivation of static equilibrium state for two charged masses in General Relativity was found (V.Belinski and G.Alekseev) in the framework of the Inverse Scattering Method in contradistinction to the previous derivation by the Integral Equation Method. This shows that such solution are of solitonic character and represents the particular case of the most general 12-parametric stationary solitonic solution for two rotating charged objects obtained by Alekseev in 1986. It was shown also that an analytical continuation of this 12-parametric solution in the space of arbitrary parameters is possible which means that applicability of the Inverse Scattering Method in presence of electromagnetic field not restricted only to the naked singularities cases but includes the cases with horizons as well.

2) The stability (with respect to the appearance of rotation) of the true equilibrium static solution recently obtained by Alekseev and Belinski was under investigation. Preliminary results shows that stability exists for small enough rotation but the case of rapid rotation and the structure of the border (in the space of parameters) between stable and unstable solutions remain to be seen. The study is still in pogress.

3) It was shown that (unlike to some statements in the literature) the real poles in the dressing matrix of the Alekseev's Inverse Scattering Method for electro-vacuum does not lead to any principal difficulties but the restriction is that real poles correspond to the extreme objects. The formal technique for Inverse Scattering Method for such special case have been constructed. This technique has some new mathematical peculiarities in comparison to the case of complex poles.

4) The work on extension of the of the book "Gravitational Solitons" by V.Belinski and E.Verdaguer have been started (keeping in mind the second edition). The new chapter presenting the Integral Equation Method for construction of solutions of Einstein-Maxwell equations and additional sections demonstrated the new practical applications of the old Inverse Scattering Method have been prepared for inclusion into the second edition.

5) The new derivation for the Kerr solution was found as solitonic perturbation of the Schwarzschild background. The new interpretation for the mass of a Kerr black hole was obtained.

II. Publications

1. G.Alekseev and V.Belinski "On the equilibrium configuration of two Reissner-Nordstrom objects and repulsive gravity", Journ. Korean Phys. Soc., **57**, 571 (2010).
2. V.Belinski "On the Singularity Phenomenon in Cosmology", AIP Conference Proceedings, submitted (2010).

III. Conferences and educational activity

Conferences:

2-nd Galileo-XuGuangqi Meeting, 12-17 July 2010, Ventimiglia (Italy).
The talk: V.Belinski "Stationary Einstein-Maxwell Solitons".

Educational activity:

1) V.Belinski "On the Singularity Phenomenon in Cosmology", the course of 7 lectures at XIV Brazilian School of Cosmology and Gravitation, CBPF and Brazilian ICRANET Department, Rio de Janeiro, 30 August-11 September, 2010.

2) V.Belinski "Cosmological Singularity", the course of 5 lectures for Erazmus Mundus Joint Doctorate Program, Nice University "Sophia Antipolis", Nice (France), 20-25 September, 2010.

III. Work with students:

A.Bravetti (PhD degree under IRAP, in progress)

Bianco Carlo Luciano

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

Period covered: 2005 – present

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

II Conferences and educational activities

IIa. Conferences and Other External Scientific Work
Gave the following invited lectures:

- C.L. Bianco, M.G. Bernardini, P. Chardonnet, F. Fraschetti, R. Ruffini, S.-S. Xue; Our model for Gamma-Ray Bursts; *1st Bego scientific rencontre*, Université de Nice Sophia-Antipolis, Nice, France, 14 February 2006.
- 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, M.G. Bernardini, L. Caito, M.G. Dainotti, R. Guida, R. Ruffini; Theoretical interpretation of GRB060614; *2007 April Meeting of the American Physical Society*; Jacksonville, Florida (USA), 14 April 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, M.G. Dainotti, R. Guida, R. Ruffini, G. Vereshchagin, S.-S. Xue; Equations of motion of the fireshell; *3rd Stueckelberg Workshop*; Pescara (Italy), 10 July 2008.
- C.L. Bianco, M.G. Bernardini, L. Caito, G. De Barros, L. Izzo, F.A. Massucci, B. Patricelli, R. Ruffini, G. Vereshchagin, S.-S. Xue; The fireshell equations of motion and equitemporal surfaces; *6th Italian-Sino Workshop*; Pescara (Italy), 29 June 2009.
- 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 congresso italiano sui GRB*; Cefalù (Italy), 15 June 2010.
- A.G. Aksenov, M.G. Bernardini, C.L. Bianco, L. Caito, C. Cherubini, G. De Barros, A. Geralico, L. Izzo, F.A. Massucci, B. Patricelli, M. Rotondo, J.A. Rueda Hernandez, R. Ruffini, G. Vereshchagin, 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; *2nd Galileo – Xu GuangQi meeting*, Ventimiglia (Italy), July 2010.

IIb. 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, Roberto Guida, Luca Izzo, Barbara Patricelli.
- Students of the First three years degree Thesis ("Tesi di Laurea triennale") in Physics at University "La Sapienza", Rome, Italy: Eliana La Francesca, Francesco Alessando Massucci.
- Students of the Final Degree Thesis ("Tesi di Laurea Vecchio Ordinamento") in Physics at University "La Sapienza", Rome, Italy: Letizia Caito, Walter Ferrara, Laura Rosano.

IIc. 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.
- 2007. Thesis advisor of the IRAP-PhD Degree Thesis by Maria Grazia Bernardini 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.
- 2008. Thesis advisor of the IRAP-PhD Degree Thesis by Roberto Guida at University "La Sapienza", Rome, Italy.
- 2009. External supervisor of the Degree thesis in Physics by Laura Rosano 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. Mario Mattioli at Physics Department of the University "La Sapienza", Rome, Italy, academical years 2007/2008, 2008/2009, 2009/2010.

III. Service activities

III a. Within ICRANet

- Administrator of the server 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".

2010 List of Publications

M.G. BERNARDINI, C.L. BIANCO, L. CAITO, M.G. DAINOTTI, R. GUIDA, R. RUFFINI; GRB970228 in the "canonical GRB" scenario; *Journal of the Korean Physical Society*, **56**, 1575 (2010). <http://dx.doi.org/10.3938/jkps.56.1575>

L. CAITO, M.G. BERNARDINI, C.L. BIANCO, M.G. DAINOTTI, R. GUIDA, R. RUFFINI; GRB060614: a preliminary result; *Journal of the Korean Physical Society*, **56**, 1579 (2010). <http://dx.doi.org/10.3938/jkps.56.1579>

M.G. DAINOTTI, M.G. BERNARDINI, C.L. BIANCO, L. CAITO, R. GUIDA, R. RUFFINI; The astrophysical trypthic: GRB, SN and URCA can be extended to GRB060218?; *Journal of the Korean Physical Society*, **56**, 1588 (2010). <http://dx.doi.org/10.3938/jkps.56.1588>

L. CAITO, L. AMATI, M.G. BERNARDINI, C.L. BIANCO, G. DE BARROS, L. IZZO, B. PATRICELLI, R. RUFFINI; GRB 071227: an additional case of a disguised short burst; *Astronomy & Astrophysics*, (2010) *in press*. <http://adsabs.harvard.edu/abs/2010arXiv1006.4842C>
<http://dx.doi.org/10.1051/0004-6361/201014640>

L. IZZO, M.G. BERNARDINI, C.L. BIANCO, L. CAITO, B. PATRICELLI, R. RUFFINI; GRB 090423 at Redshift 8.1: a Theoretical Interpretation; *Journal of the Korean Physical Society*, **57**, 551 (2010). <http://dx.doi.org/10.3938/jkps.57.551>

A.G. AKSENOV, M.G. BERNARDINI, C.L. BIANCO, L. CAITO, C. CHERUBINI, G. DE BARROS, A. GERALICO, L. IZZO, F.A. MASSUCCI, B. PATRICELLI, M. ROTONDO, J.A. RUEDA HERNANDEZ, R. RUFFINI, G. VERESHCHAGIN, S.-S. XUE; The fireshell model for Gamma-Ray Bursts; in *The Shocking Universe*, Proceedings of the conference held in Venice (Italy), September 2009, G, Chincarini, P. D'Avanzo, R. Margutti, R. Salvaterra, Editors; *SIF Conference Proceedings*, **102**, 451 (2010).

M.G. BERNARDINI, C.L. BIANCO, L. CAITO, L. IZZO, B. PATRICELLI, R. RUFFINI; The end of the prompt emission within the fireshell model; in *The Shocking Universe*, Proceedings of the conference held in Venice (Italy), September 2009, G, Chincarini, P. D'Avanzo, R. Margutti, R. Salvaterra, Editors; *SIF Conference Proceedings*, **102**, 489 (2010).

L. IZZO, M.G. BERNARDINI, C.L. BIANCO, L. CAITO, B. PATRICELLI, R. RUFFINI; GRB 090423 in the fireshell scenario; in *The Shocking Universe*, Proceedings of the conference held in Venice (Italy), September 2009, G, Chincarini, P. D'Avanzo, R. Margutti, R. Salvaterra, Editors; *SIF Conference Proceedings*, **102**, 537 (2010).

B. PATRICELLI, M.G. BERNARDINI, C.L. BIANCO, L. CAITO, L. IZZO, R. RUFFINI, G. VERESHCHAGIN; A new spectral energy distribution of photons in the fireshell model of GRBs; in *The Shocking Universe*, Proceedings of the conference held in Venice (Italy), September 2009, G, Chincarini, P. D'Avanzo, R. Margutti, R. Salvaterra, Editors; *SIF Conference Proceedings*, **102**, 559 (2010).

Rueda Hernández Jorge Armando

Position: *Researcher at ICRANet and Sapienza University of Rome*
Period covered: 2010

I Scientific Work

- *Neutron star physics:* the electrodynamical properties of neutron stars are studied by formulating self-consistently the equations of equilibrium governing neutron star interiors including the nuclear interaction, the gravitational interaction and the electro-weak interaction between particles, all duly expressed in general relativity. The general relativistic equations of equilibrium are integrated numerically to obtain the properties of neutron star cores and neutron star crusts.
- *Nuclear physics:* we study the properties of nuclear matter under extreme conditions of compression through the solution of the relativistic Thomas-Fermi equations of equilibrium. We apply our approach to the construction of neutron star crust and white-dwarf matter equation of state.
- *Critical fields in neutron stars and black holes:* we study the conditions under which critical electromagnetic fields can develop in neutron stars. The subsequent evolution of the electromagnetic fields in the collapse of neutron stars to black holes is also investigated and applied to the physics of extreme astrophysical phenomena like Gamma-Ray-Bursts.

II Conferences and educational activities

II a. Conferences and Other External Scientific Work

- 2nd Galileo-Xu Guantqi Meeting, Ventimiglia (Italy), July 12-18, 2010.
- 11th Italian-Korean Symposium on Relativistic Astrophysics, Seoul (Korea), November 2-4, 2009
- 1st Galileo-Xu Guangqi Meeting, Shanghai (China), October 26-30, 2009
- 12th Marcel Grossmann Meeting On General Relativity, Paris (France), July 12-18, 2009
- 6th Italian-Sino Workshop on Relativistic Astrophysics, Pescara (Italy), June 29-July 1, 2009
- 1st Sobral Meeting, Fortaleza (Brazil), May 26-29, 2009
- 3rd Stueckelberg Workshop on Relativistic Field Theories, Pescara (Italy), July 8 - 18, 2008
- April Meeting of the American Physical Society, St. Louis (Missouri - USA), April 12-15, 2008
- 4th Italian-Sino Workshop on Relativistic Astrophysics, Pescara (Italy), July 20 - 30, 2007
- 10th Italian-Korean Symposium on Relativistic Astrophysics, Pescara (Italy), June 25 - 30, 2007
- 1st Cesare Lattes Meeting on Gamma Ray Bursts, Black Holes and Supernovae, Mangaratiba (Brazil), February 25 - March 3, 2007

II b. Work With Students

- *With Daniela Pugliese (IRAP Ph. D student 3rd-year):* we have formulated the general relativistic equations of equilibrium for a fluid of degenerate neutrons, protons and electrons in beta equilibrium including the nuclear interaction, the gravitational interaction and the electro-weak interaction between particles. Our work generalizes previous results about the general relativistic conditions of equilibrium for multi-component fluids (Klein 1949, Kodama and Yamada 1972, Olson and Bailyn 1975-1976-1978) by including the Coulomb interaction between charged particles and the nuclear interaction between nucleons through the extension to general relativity of the extended Walecka model usually employed for the description of nuclei. We use such a formulation to study the properties of the core-crust phase-separation in neutron stars.
- *With Riccardo Belvedere (IRAP Ph. D student 2nd-year):* We construct neutron star equilibrium configurations by integrating numerically the set of self-consistent ground-state equilibrium equations for neutron stars we have obtained with Daniela Pugliese taking into account quantum statistics,

electro-weak, and strong interactions, within the framework of general relativity. We calculate the mass and the thickness of the outer crust of neutron stars for different core-models obtained for selected parametrizations of the extended Walecka model. Furthermore, we study the influence of the core-model on the nuclear element abundances in the outer crust. The analysis is performed for different equations of state of the outer crust.

- *With Maria Haney (IRAP Ph. D student 2nd -year):* We study the collapse to a black hole of the neutron star configurations. Such neutron star equilibrium configurations are characterized by possessing an electromagnetic structure. Therefore, we investigate the dynamic evolution of the electromagnetic fields in the collapsing phase.
- *With Kuantay Boshkayev (IRAP Ph. D student 2nd -year):* In collaboration with Michael Rotondo (Researcher at ICRANet and Sapienza University of Rome) we study the effects of rotation on the properties of the new neutron star equilibrium configurations. In particular, we study the magnetic field created by the rotation of the internal electric field of the configurations. We study the construction of the internal Hartle-Thorne metric for the neutron star configurations we obtain in the static case.
- *With Sheyse Martins de Carvalho (Erasmus Mundus Ph. D student 1st-year):* We are studying the influence of the temperature on the properties of neutron stars by extending the formulation we did with Daniela Pugliese to the non-degenerate fermion case. On the other hand, we will study the crust matter equation of state through the formulation of a full Thomas-Fermi theory. Such a formulation joins the extended Walecka model for nuclear interaction with the relativistic Thomas-Fermi model proposed by our group to model the Coulomb interaction between the charged nucleus and relativistic surrounding electrons.

II c. Diploma thesis supervision

Sheyse Martins de Carvalho (Erasmus Mundus Ph. D student 1st-year): Ph. D Thesis: "On the electrodynamics of Neutron Stars". We extend the previous results of Daniela Pugliese and Riccardo Belvedere (both IRAP Ph. D-students, 3rd and 2nd year respectively) by including on neutron star configurations the effects of temperature. Furthermore, we construct new neutron star equilibrium configurations including a new equation of state for the crust of the neutron star, which treats self-consistently both the nuclear interaction inside the nucleus and the Coulomb interaction between the nucleus and the surrounding electrons in relativistic regimes.

II e. Work With Postdocs

- *With Michael Rotondo (Researcher at ICRANet and Sapienza University of Rome):* In collaboration with Kuantay Boshkayev (IRAP Ph. D student 2nd -year) we study the effects of rotation on the properties of the new neutron star equilibrium configurations. In particular, we study the magnetic field created by the rotation of the internal electric field of the configurations. In addition, we study the construction of the corresponding internal Hartle-Thorne metric for the neutron star configurations we obtain in the static case.

2010 List of Publications

Refereed Journals

- **The solution of the Thomas-Fermi equation for neutron star matter in presence of strong magnetic fields**, R. Mohammadi, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. C.
- **On the outer crust of neutron stars**, R. Belvedere, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.
- **A self-consistent general relativistic Thomas-Fermi treatment of neutron stars cores**, Jorge A. Rueda, D. Pugliese, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.
- **The effect of critical fields on the properties of electromagnetic black holes within the Euler-Heisenberg approach**, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.

- **The general relativistic Thomas-Fermi model of white-dwarfs**, Jorge A. Rueda, Michael Rotondo, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.
- **A self-consistent general relativistic solution for a self-gravitating system of degenerate neutrons, protons and electrons in beta equilibrium**, Jorge A. Rueda, M. Rotondo, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev Lett.
- **On the self-consistent equilibrium equations of neutron stars**, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev Lett.
- **On the relativistic Thomas-Fermi treatment of compressed atoms and compressed nuclear matter cores of stellar dimensions**, Michael Rotondo, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev C.
- **A self-consistent approach to neutron stars**, Jorge A. Rueda, Michael Rotondo, Remo Ruffini, and She-Sheng Xue. J. Korean Phys. Soc. 57, 560 (2010).

Contributions to the Proceedings of Meetings and Workshops

- **A general relativistic Thomas-Fermi treatment of neutron stars cores I. The case of non-interacting particles**, Jorge A. Rueda, D. Pugliese, Michael Rotondo, Remo Ruffini, and She-Sheng Xue. To be published in Int. J. Mod. Phys. D as a contribution for the Proceedings of the 2nd Galileo-Xu Guantqi Meeting, Ventimiglia-Italy (2010).
- A general relativistic Thomas-Fermi treatment of neutron stars cores II. Generalized Fermi energies and beta equilibrium in the strongly interacting case**, Jorge A. Rueda, D. Pugliese, Michael Rotondo, Remo Ruffini, and She-Sheng Xue. To be published in Int. J. Mod. Phys. D as a contribution for the Proceedings of the 2nd Galileo-Xu Guantqi Meeting, Ventimiglia-Italy (2010).**
- On the electrostatic structure of neutron stars**, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. AIP Conf. Proc. 1205, 143 (2010).**

Ruffini Remo

Position: Professor at Università "Sapienza" Roma
Director ICRANet
President IRAPh. D.

Curriculum Vitae:

- Doctorate in Physics, University of Rome, 1966.
- Postdoctoral fellow Mainz Academy of Sciences. Hamburg, Fed. Republic, Germany, 1967.
- Postdoctoral fellow Palmer Physics Lab. Princeton University, N.J., 1967-68.
- Member Institute for Advanced Study, Princeton, N.J., 1968-70.
- Instructor, Princeton Univ., 1970-71.
- 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-
- Member Council of Center. International Physics, Bogotà, Colombia, 1984-
- President International Center Relativistic Astrophysics (ICRA), 1985-
- Director of ICRANet, 2005-
- Member of Task Force Scientific Use of Space Station NASA, Washington, 1986-88.
- Chairman International Organizing Committee of Marcel Grossmann Meetings, 1984-
- Member International Forum on the Scientific Use of Space Station, Washington, 1986-90.
- 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-
- President of the Scientific Committee of the Italian Space Agency, Rome, 1989-93.
- Member of the Board of ENEA, 2004-
- Co-Director Advanced Series in Astrophysics and Cosmology-World Scientific, Singapore, 1986
- Editor Internat. Jour. Modern Phys. D World Scientific Singapore, 1992-
- 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:
    - Cressy Morrison award of the New York Academy of Sciences , 1972.
    - Fellow of the American Physical Society 1974-
    - Alfred P. Sloan Foundation fellow, 1974-76.
    - Space Scientist of the Year Award, 1992.
    - Honorary Professor of University of Kirghizia 1998-

Main Scientific Publications:

Coauthor, among others, of the following books:

1. (with J. Bardeen, B. Carter, H. Gursky, S. Hawking, I. Novikov and K. Thorne) “Black holes”, Ed. B. and C. de Witt, Gordon and Breach, New York, 1973,
2. (with M. Rees and J.A. Wheeler) “Black Holes, Gravitational Waves and Cosmology”, Gordon and Breach N.Y. 1974, also translated in Russian as “Cernie Diri Gratazionnie Volni I Kosmologia”, Mir, Moscow 1974,
3. (with H.Gursky) “Neutron Stars, Black Holes and Binaries Sources”, D. Reidel, Dordrecht, 1975,
4. (with R. Giacconi et al.) “Physics and Astrophysics of Neutron Stars Black Holes”, North Holland Pub. Co. Amsterdam 1978
5. (with Humitaka Sato) “Black Holes”, in japanese, Chuo Koron-Sha, Tokyo 1976,
6. (with Fang Li Zhi) “Basic Concepts in Relativistic Astrophysics”, in chinese, Science Press, Beijing 1981, also translated into english,, World Scientific, Singapore 1983,
7. (with Francesco Melchiorri) “Gamow Cosmology”, North Holland Pub. Co., Amsterdam,1986,
8. (with H. Ohanian) “Gravitation and Spacetime” W.W. Norton and Co., New York 1976,
9. (with H. Ohanian) “Gravitazione e Spazio-Tempo” Zanichelli, Bologna 1997
10. (with H. Ohanian) “Gravitation and Spacetime” W.W. Norton and Shin Won Agency Co., Seoul 2001

Vereshchagin Gregory

Position: researcher
Period covered: 2010

I. Scientific Work

The research was focused on kinetic and hydrodynamic approach to electron-positron plasma, generalization of the computation scheme and consequently:

- determination of thermalization timescales for wide range of plasma parameters;
- accounting for degeneracy of the pair plasma;
- determination of spatial profiles of expanding optically thick pair plasma with baryonic loading for various initial and boundary conditions;
- approach to transparency of expanding optically thick pair plasma.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

- Korean Physical Society 2010 Fall Meeting, Pyeong-chang, Korea, 20-22 October, 2010.
- GRB 2010 / Dall'eV al TeV tutti i colori dei GRB, Secondo Congresso Italiano sui Gamma-ray Burst, Cefalù 15-18 Giugno 2010.

II b. Diploma thesis supervision

- Gustavo de Barros,
- Ivan Siutsou,
- Alberto Benedetti

II c. Other Teaching Duties

"Relativistic kinetic theory and its applications in astrophysics and cosmology": Lecture course for International Relativistic Astrophysics PhD, Erasmus Mundus Joint Doctorate Program from the European Commission. September 6-24, 2010, University of Nice Sophia Antipolis, Nice, France.

III. Service activities

III a. Within ICRANet

Official visit to the Republic of Armenia 26.06.10-03.07.10 with Director of ICRANet

III b. Outside ICRANet

Supervision of the course work of undergraduate student of the Belorusian State University Ivan Rybak, title of the work "The problem of the cosmological constant"

2010 List of Publications

A.G. Aksenov, R. Ruffini and G.V. Vereshchagin, "Pair plasma relaxation time scales", Physical Review E, Vol. 81 (2010) 046401.

R. Ruffini, G.V. Vereshchagin and S.-S. Xue, "Electron-positron pairs in physics and astrophysics: from heavy nuclei to black holes" Physics Reports, Vol. 487 (2010) No 1-4, pp. 1-140.

Xue She-Sheng

Position: Staff
Period covered: 2009 – 2010

I Scientific Work

A self-consistent general relativistic Thomas-Fermi treatment of neutron stars cores, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.

The effect of critical fields on the properties of electromagnetic black holes within the Euler-Heisenberg approach, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. To be submitted to Phys. Rev. D.

A self-consistent general relativistic solution for a self-gravitating system of degenerate neutrons, protons and electrons in beta equilibrium, Jorge A. Rueda, M. Rotondo, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev Lett.

On the self-consistent equilibrium equations of neutron stars, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev Lett.

``Electron-positron pairs in physics and astrophysics, from heavy nuclei to black holes'', Phys. Rep. Vol 487 (2010) 1.

On the relativistic Thomas-Fermi treatment of compressed atoms and compressed nuclear matter cores of stellar dimensions, Michael Rotondo, Jorge A. Rueda, Remo Ruffini, and She-Sheng Xue. Submitted to Phys. Rev C.

``Electron-positron production in non-uniform electric fields'' , Phys. Rev. D 78 (2009) 02501

`` Electron-positron pair oscillation in spatially inhomogeneous electric field and radiation'', Phys. Lett. B691 (2010) 99.

``Gravitational, electroweak and strong interactions of massive nuclear density cores'', Proceedings Marcel Grossmann meeting (MG12), Paris , World scientific (2009).

``Quantum Regge calculus of Einstein-Cartan theory'' , Phys. Lett. B682 (2009) 300

``Gravitational instanton and cosmological term'' , Int. Jour. Of Mod. Phys. A24, (2009) 3865.

II Conferences and educational activities

Conferences and Other External Scientific Work
Presenting talks and posters in international ICRANet meetings:
MG12 Marcel Grossmann meeting (Paris)
1st Xu Guangqi meeting (Shanghai, China)
2nd Xu Guangqi meeting (Ventimiglia, Italy)
11th Italian-korean and 6th Italian-Chinese meetings (Korea and Pescara)
And international Conferences:
"Swift and GRBs: *The Shocking Universe*", in Venice (Italy), Sept 5-9, 2008

Work With the research group of Gamma Ray Bursts :

Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, G. Vereshchagin, B. Patricelli, G. De Barros, Juracy Luis, L.J. Rangel Lemos

Diploma thesis supervision
IRAP PhD. Faculty, thesis supervision and reading and examination
Han wenbiao and Juracy Luis, L.J. Rangel Lemos,

Other Teaching Duties
Discussion and Work With Postdocs
Jorge Rueda and M. Rotondo
Discussion and Work With the Director R. Ruffini and External Professors
V.S. Popov, H. Kleinert, Pascal Chardonnet,

III Service activities

Within ICRANet
Participating organization of ICRANet meetings: the 11th Italian-Korean meeting and 6th Italian-Chinese meeting on Cosmology and Relativistic Astrophysics
Editor of two conference proceedings 5th Italian-Chinese meeting on Cosmology and Relativistic Astrophysics'', published by American Institute of Physics, and 1st galileo –Xu Guangqi meeting, published by the World scientific.

Participating organization of 1st Galileo - Xu Guangqi Meeting, October 26-30, 2009 Shanghai - China and 2nd Galileo - Xu Guangqi Meeting, July 12-18, 2010 Ventimiglia-Nice, Italy-France.

Participating organization of ICRANet Seminars

Give a public lecture in ICRANet Pescara center.

Outside ICRANet
external Professor of Chinese Academy and University

Adjunct Professors of the Faculty

Aharonian Felix A.

Positions: Professor of the Cosmic School of the Dublin
Institute for Advanced Studies (DIAS) and
Director of the Center for Astroparticle Physics
and Astrophysics at DIAS, Dublin, Ireland
and
Head of High Energy Astrophysics Theory Group,
MPI for Nuclear Physics, Heidelberg, Germany

Fields of Research: High Energy Astrophysics, Astroparticle Physics, Cosmology

Scientific Work

Involvement in major Projects:
Member (representative of ESA) of the Science Working Group of the JAXA-NASA X-ray mission ASTRO-H (X-ray Astronomy)
Member of the H.E.S.S. Collaboration Board (gamma-ray astronomy)
Member of the KM3NeT Consortium Board (neutrino astronomy)
Co-PI of the ROTSE network of optical telescopes (GRB afterglows)

Panels, Committees, Schools
Co-director of LEA - European Associated Laboratory on High Energy Astrophysics
jointly supported by CNRS (France) and MPG (Germany)
Scientific Advisor of the High Energy Astrophysics Laboratory, Yerevan, Armenia
Adjunct Professor, School of Physics, University College Dublin (USD)
Adjunct Professor and member of the International Center for Relativistic Astrophysics, Rome/Pescara, Italy
Member ("Supervisor") of the Heidelberg Graduate School of Fundamental Physics,
Member of the International Review Board of the Helmholtz Association on Astroparticle Physics
Member of the European ASTRONET Infrastructure Roadmap Panel A:
"High energy astrophysics, astro-particle physics and gravitational waves"
Editor of the International Journal of Modern Physics D

PostDocs and Students:
DIAS/Dublin: three postdoctoral fellows and four PhD students
MPIK/Heidelberg: six postdoctoral fellows and four PhD students
ICRANET/Pescara: one PhD student

Lectures in 2010

Frontiers in High Energy Astrophysics,
27th Jerusalem Winter School in Theoretical Physics,
Jerusalem, Israel, December 2009 – January 2010

40th Saas-Fee Lecture Series: Astrophysics at Very High Energies,
Les Diablerets, Switzerland, March 15-20, 2010

Organization of International Workshops, Symposia, Conferences (2010)

The GeV to TeV Connection: Science at 10 GeV to 100 GeV, Ringberg Castle,

Germany, Jan 11-16 (together with W. Hofmann, S.Wagner, F. Rieger, M. Rau)

Exploring Supernova Remnants and Pulsar Wind Nebulae in X-rays: before and after ASTRO-H, ISAS, Tokyo, Japan, February 18-19 (together with A. Bmba)

Variable Galactic Gamma-Ray Sources, Heldelberg, Germany, Nov 29-Dec 3, 2010
(together with V. Bosch-Ramon and D. Khangulyan)

25th Texas Symposium on Relativistic Astrophysics, Heidelberg, Germany, Dec 6-11
(together with W. Hofmann)

Service activities

Within ICRANet
Supervision on a PhD student - Narek Sahakian
Close collaboration with an ICRANET associate - Prof. Francesco Vissani
Participation and talk at the "The second Galileo - Xu Guangqi" meeting, July 12-18, 2010.

2010 List of Publications (in peer-reviewed journals)
(more than 300 papers in peer review journals –
see http://www.mpi-hd.mpg.de/astrophysik/HEA/1024.html)

V.N. Zirakashvili, F.A. Aharonian: Nonthermal Radiation of Young Supernova Remnants: The Case of RX J1713.7-3946, Astrophys.J. , 2010, vol. 708, pp. 965-980

S.Casanova, D. Jones, F.A. Aharonian, Y. Fukui, S. Gabici, A. Kawamura, T. Onishi, G. Rowell, H. Sano, K. Torii, H. Yamamoto: Modeling the gamma-ray emission produced by runaway cosmic rays in the environment of RX J1713.7-3946. Publ. Astron. Soc. Jap., 2010, vol. 62, 1127-1134

F.Yuan, P. Schady, … F.A. Aharonian, … J. Wren: GRB 081008: From Burst to Afterglow and the Transition Phase in Between, Astrophys. J., 2010, vol. 711, pp. 870-880

F.A. Aharonian, A. Taylor: Limitations on the Photo-disintegration Process as a Source of VHE Photons, Astroparticle Physics, 2010, in press (arXiv:1005.3230)

M. Barkov, F.A. Aharonian, V. Bosch-Ramon: Gamma-ray flares from red giant/jet interactions in AGN, Astrophys.J., 2010, in press (arXiv:1005.5252)

A. Giuliani, M. Tavani, ….F.Aharonian, …. L. Salotti: AGILE detection of GeV γ-ray emission from the SNR W28, Astron. Astrophys., 2010, vol. 516, L11-L14

F. Yuan, R.M. Quimby, J.C. Wheeler, J. Vinko, E. Chatzopoulos, C.W. Akerlof, S. Kulkarni, J.M. Miller, T. McKay, F. Aharonian: The Exceptionally Luminous Type Ia Supernova 2007if, Astrophys. J., 2010, vol. 715, pp. 1338-1343

S. Casanova, F.A. Aharonian, Y. Fukui, S. Gabici, D. Jones, A. Kawamura, T. Onishi, Toshikazu, G. Rowell, H. Sano, K. Torii, H. Yamamoto: Molecular Clouds as Cosmic-Ray Barometers, Publications of the Astronomical Society of Japan, 2010, vol.62, pp.769-777

R.M. Crocker, F.A. Aharonian: The Fermi Bubbles: Giant, Multi-Billion-Year-Old Reservoirs of Galactic Center Cosmic, Phys Rev. Letters, 2010, submitted (arXiv:1008.2658)

F.A. Aharonian, S.R. Kelner, A.Yu. Prosekin: Angular, spectral, and time distributions of highest energy protons and associated secondary gamma rays and neutrinos propagating through extragalactic magnetic and radiation fields, Physical Review D, vol. 82, Issue 4, id. 043002

M. Chernyakova, D. Malyshev, F.A. Aharonian, R.M. Crocker, D.I. Jones: Galactic center at very high-energies, Astrophys.J., 2010, in press (eprint arXiv:1009.2630)

O. Zacharopoulou, D. Khangulyan, F.A. Aharonian, L. Costamante: Modeling hard gamma-ray spectra blazers, Astrophs.J., 2010 (submitted)

D. Malyshev, S. Gabici, L. Drury, F.A. Aharonian: A simple model for electron plasma heating in supernova remnants, Astron. Astrophys., 2010, vol. 521, id.A14

R.M. Crocker, D.I. Jones, F.A. Aharonian, C. Law, F. Melia, J. Ott: Gamma-Rays and the Far-Infrared-Radio Continuum Correlation Reveal a Powerful Galactic Centr Wind, 2010, MNRAS, submitted (arXiv:1009.4340)

F.Vissani, F.A. Aharonian, N.V. Sahakian: "On the prospects of High Energy Galactic Neutrino Astronomy", Astroparticle Physics, 2010, submitted

plus 11 "HESS collaboration" papers

Books:

F. A. Aharonian and S.R. Kelner "Radiation Processes in High Energy Astrophysics", Oxford University Press, in preparation

F. A. Aharonian "Very high energy cosmic gamma radiation : a crucial window on the extreme Universe", World Scientific Publishing, second edition, in preparation

Amati Lorenzo

Position: ICRANet external collaborator
(researcher at INAF – IASF Bologna)

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). His 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 triansient X-ray absorption edge in the first 13 s of GRB 990705, leading to the first estimate fo a GRB redshift based on X-ray data, and the discovery of a strong correlation between the photon energy at whch GRB spectra peaks and their radiated energy (known as "Amati relation"), whch has relevant implicaiton 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 and dedicates a minor part of his research work to the study of X-ray binaries.

I Scientific Work

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 2010 we concentrated on the physical explanation of the Ep,i – Eiso ("Amati") correlation, the identification and interpretation of "disguised" short GRBs, based also on their location and evolution in the Ep,i – Eiso plane, the synthesis of prompt emission spectra, with particular emphasis on the explanation of the soft X-ray spectral data.
Besides my collaboration with ICRANet, my main scientific activity includes: spectral, timing and correlation properties of GRBs, investigation of the cosmological use of GRBs, study of the scientific case and concept design of GRB detectors for future missions, X-ray spectral and timing properties of X-ray binaries.

II Conferences and educational activities

Conferences and Other External Scientific Work
November 2010: "Gamma-Ray Burst 2010 Conference", Annapolis, USA (oral presentation)
September 2010: "8th Workshop on Science with the New Generation of High Energy Gamma-ray Experiments", Trieste, Italy (oral presentation)
July 2010: "The second Galileo - Xu Guangqi meeting", Ventimiglia, Italy (oral presentation)
May 2010: "Vulcano Workshop 2010 - Frontier Objects in Astrophysics and Particle Physics", Vulcano, Italy (invited oral presentation)
May 2010: "54th Meeting of the Italian Astronomical Society (SAIT)", Napoli, Italy (oral presentation)
April 2010: "8th AGILE Mini-Workshop - The Third Birthday" Bologna, Italy (oral presentation)

Work With Students

Discussions and joint data analysis of GRBs with some of the ICRANet IRAP Ph.D. students (e.g., collaborations with L. Caito on GRB 071227 , L. Izzo on the cosmological use of the Ep,i – Eiso correlation).
Lecures at the IRAP Ph.d. LECTURES, March 22-26, 2010, University of Ferrara (Italy)
Lectures at the IRAP Ph.d. Erasmus Mundus School (6-24 Sept. 2010, Nice)

III Service activities

Within ICRANet

- Member of the International Scientific Advisory Committee of the 2nd Galileo - Guangqui
- Member of Commissions for the Discussion of the Thesis of IRAP PhD: Students at Rome University "La Sapienza".

Outside ICRANet

- Reviewer of several articles for the main astrophysical journals (ApJ, A&A, MNRAS, JCAP, …)
- Member of the Editorial Board of "Galaxies" (MDPI) and "ISRN Astronomy & Astrophysics" (HINDAWI)

2010 list of Publications

Refereed

C. Guidorzi, M. La Capra, F. Frontera, E. Montanari, L. Amati, F. Calura, L. Nicastro,, M. Orlandini, 2010, " Spectral catalogue of bright gamma-ray bursts detected with the BeppoSAX/GRBM " , Astronomy & Astrophysics, in press

A. de Ugarte Postigo, I. Horváth, P. Veres, Z. Bagoly, D. A. Kann, C. C. Thöne, L. G. Balazs, P. D'Avanzo, M. A. Aloy, S. Foley, S. Campana, J. Mao, P. Jakobsson, S. Covino, J. P. U. Fynbo, J. Gorosabel, A. J. Castro-Tirado, L. Amati, M. Nardini, 2010, " Characteristics of Swift's intermediate-population bursts " , Astronomy & Astrophysics, in press

L. Caito, L. Amati, M.G. Bernardini, C.L. Bianco, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini, 2010, " GRB 071227: an additional case of disguised short burst " , Astronomy & Astrophysics, 521, 80

S. Covino, S. Campana, M. L. Conciatore, V. D.Elia, E. Palazzi, C. C. Thoene, S. D. Vergani, K. Wiersema, M. Brusasca, A. Cucchiara, B.E. Cobb, A. Fernandez-Soto, D.A. Kann, D. Malesani, N.R. Tanvir, L.A. Antonelli, M. Bremer, A.J. Castro-Tirado, A. de Ugarte Postigo, E. Molinari, L. Nicastro, M. Stefanon, V. Testa, G. Tosti, F. Vitali, L. Amati, et al., 2010, " Challenging GRB models through the broadband dataset of GRB060908 " , Astronomy & Astrophysics, 521, 53

L. Amati, 2010, " The correlation between peak photon energy and radiated energy in Gamma--Ray Bursts " , Journal of the Korean Physical Society, 56, 1603

Conference proceedings

L. Amati, 2010, "The Ep,i - Eiso correlation and Fermi Gamma-Ray Bursts", 2010, Conference Proceedings of the Italian Physical Society, Vol. 102, pag. 71

Frontera, F.; Amati, L.; Guidorzi, C.; Landi, R.; La Parola, V., 2010, "Memorie della Società Astronomica Italiana, v.81, p.426

Campana, R.; Pacciani, L.; Feroci, M.; Costa, E.; Del Monte, E.; Donnarumma, I.; Evangelista, Y.; Lazzarotto, F.; Mastropietro, M.; Muleri, F.; Rubini, A.; Rapisarda, M.; Amati, L., et al., "A concept for a lightweight, low-power and sensitive Silicon-based All Sky Monitor for transient sources and Gamma Ray Bursts", AIP Conference Proceedings, Volume 1248, pp. 577-578

Campana, R.; Feroci, M.; Vacchi, A.; Labanti, C.; Zampa, G.; Del Monte, E.; Evangelista, Y.; Muleri, F.; Pacciani, L.; Rubini, A.; Soffitta, P.; Costa, E.; Donnarumma, I.; Lazzarotto, F.; Mastropietro, M.; Morelli, E.; Rapisarda, M.; Fuschino, F.; Marisaldi, M.; Bonvicini, V.; Rashevsky, A.; Zampa, N.; Perotti, F.; Amati, L.; et al., 2010, "Concept for an innovative wide-field camera for x-ray astronomy", Proceedings of the SPIE, Volume 7732, pp. 77324

Chakrabarti Sandip K.

Position: Dean (Academic Programme), Senior Professor and Head,
Department of Astrophysics and Cosmology,
S. N. Bose National Centre for Basic Sciences, Kolkata
and
In Charge, Academic Affairs, Indian Centre for Space Physics
Recent period in which ICRA was visited: July 19-29th, 2006; Oct. 28-30th, 2007; Aug. 29th-Sept. 1St, 2008, Oct. 2009 [1st Xu-Guangqui]; July 2009 [MG12]; February, 2010 [Nice]; July, 2010 [2nd Xu-Guangqi]; Sept. 2010 [EMJD]

I Scientific Work

His main research work consists of study of the Astrophysical Flows around black holes. He studies the spectral and temporal properties of black holes, from quasars to nano-quasars. However he is also spending some time on formation and evolution of bio-molecules in star-forming region. He has published about 175 papers in International Refereed journal and a similar number of papers in Proceedings. He has written a book and edited several volumes.

II Conferences and educational activities

Doctorate Students Supervision

He has produced 16 Ph. D. scholars and another 8 students are registered for PhD and would submit their thesis soon. Six more students have joined since last year. The students mainly worked on (a) Monte Carlo simulations of spectral and timing properties in presence of jets and outflows; (b) Outbursting black holes; (c) Quasi-periodic Oscillations of several black holes (d) Transonic accretion flows with heating and cooling; (e) Spectral properties of accretion disks having shock waves; (f) Formation of simple bio-molecules during star formation and Grain chemistry using Monte-Carlo simulations etc. (g) Ionospheric change in presence of terrestrial and extra-terrestrial high energy phenomena.

Most of his students have received permanent posts in various national and international institutes (see, bio-data).

Other Teaching Duties

Generally he takes courses on high energy astrophysics at S.N. Bose Centre and R.K.M. College (autonomous MSc in Astrophysics).

Work With Postdocs

he has several colleagues including post-docs.

III Service activities

Within ICRANet :

(a) Participated in the activities of Minsk Conference (April, 2009)
(b) Participated in the Marcel Grossman Conference (July, 2009)
(c) Participated in the 1st Galileo-Xu-Guanqi conference (October, 2009)
(d) Contributed in writing Erusmus Mundus joint PhD programme (May, 2009) which was successful. Subsequently, participated ICRAnet lecture series in Nice Observatory (Feb. 2010); 2nd Galileo-Xu-Guangqi conference in Ventimiglia (July, 2010); EMJD lectures in Univ. of Nice (Sept. 2010).

2010 List of Publications

Talks/papers

January, 2010, *Invited talk on "Importance of Galileo and Darwin today" at IYA programme (400yrs. of Galileo Telescope and 200 years of Darwin's birth)*

February, 2010, *Series of Five talks on "Accretion Process Around Black Holes" at University of Nice (Observatory of Cote Azur), France*

March, 2010, *Invited talk on "Chemical Evolution during Star formation and effects of X-rays and Gamma Rays" at IIT/Roorkee at the Conference on 'Origin of Life'*

March, 2010, *Invited talks on "VLF Research at SNBNCBS and ICSP" at the International Conference on Very Low Frequency Radio Waves: Theory and Observations (VELFRATO-10)*

April, 2010, *Reporting the Status of RT-2 in front of ADCOS Committee*

July, 2010, *'VLF Campaigns in summer, winter and during solar eclipse all over India' at the AOGS conference, Hyderabad, July, 2010*

July, 2010, *Accretion onto outbursting black holes: How do they do it? atthe 2nd Galileo-Xu Guanqi meeting at Ventimiglia.*

July, 2010, *Oral presentations of `RT-2 observations of Solar flares', 'Possible First Evidence of a double gamma ray burst' and poster presentations on 'RT-2 observations of Gamma-Ray Bursts','Variability Classes of GRS1915+105: Physical Picture' and 'Evidence of two component accretion flow around the black hole candidate XTE J1550-564 during the outbursts' at 10th COSPAR meeting (17th-25th July) Bremen.*

Sept. 2010, *A Series of 5 lectures to Erasmus Mundus Joint Astronomy Programme Students at the University of Nice.*

October, 2010 *"Accretion processes on Black Holes: the Spectral and temporal properties" at the "Accretion and Outflow in Black Hole Systems" (10-16th October, 2010), Kathmandu, Nepal.*

Papers in Journals:

1. S. K. CHAKRABARTI, S. PALIT, D. DEBNATH, A. NANDI, V. YADAV, R. SARKAR, 2009, Fresnel Zone Plate Telescopes for X-ray Imaging I: Experiments with a quasi-parallel beam, Exp. Astronomy, 24, 109

2. H. GHOSH, S.K. CHAKRABARTI & P. LAURENT, 2009, Monte-Carlo Simulations of Thermal Comptonization Process in a Two Component Accretion Flow Around a Black Hole, IJMPD, 18, 1693

3. S. Das, S.K. Chakrabarti & Mondal, S., 2010 Studies of dissipative standing shock waves around black holes, MNRAS, 401, 2053

4. B.G. Dutta & S.K. Chakrabarti, 2010, Evidence for two component flows around the black hole candidate XTE J1550-540 from spectral features during its 1998-1999 outburst, MNRAS, 404, 2136

5. S. Palit, S. K. Chakrabarti, D. Debnath, A. R. Rao, A. Nandi, Vipin K. Yadav, V. Girish, 2009, Fresnel Zone Plate Telescopes for X-ray Imaging II: Numerical simulations with parallel and diverging beams, Exp. Astronomy, 27, 77

6. H. Ghosh, S. Garain, S.K. Chakrabarti and P. Laurent, 2010, Monte-Carlo Simulations in a Two component Flow in presence of Outflow, IJMPD, 19, 607

7. Kinsuk Giri, S. K. Chakrabarti, Madan M. Samanta, Dongsu Ryu, 2009, Hydrodynamic Simulation of Oscillating Shock Waves in a Sub-Keplerian Accretion Flow Around Black Holes, MNRAS, 403, 516

8. S. MANDAL & S.K. CHAKRABARTI, 2010, On the Evolution of Accretion Rates in Compact Outburst Sources, Astrophysical Journal Letters, 710, 147

9. A.R. RAO, M. HINGER, A. MALKAR, S.K. CHAKRABARTI et al., 2010, RT-2 Detection of Quasi-Periodic Pulsations in the 2009 July 5 Solar Hard X-ray Flare, Astrophysical Journal, 714, 1142

10. R. SARKAR & S.K. CHAKRABARTI, 2010, Feasibility of Spectro-Photometry in X-rays (SPHINX) from the Moon, Exp. Astron. 28, 61

11. S.K. Chakrabarti, S. Sasmal, S. Chakrabarti, 2009, Ionospheric Anomaly due to Seismic Activities – II: Evidence from D-Layer preparation and disappearance times, Nat. Haz. Earth. Syst. Sc. 10, 1751.

12. D. Debnath and S.K. Chakrabarti, 2010, Properties of the Propagating Shock wave in the accretion flow around GX 339-4 in 2010 outburst, Astron. & Astrophys. 520, 98

Edited Volumes:
S.K. CHAKRABARTI, G.S. Bisnovatyi-Kogan, A.I. Zhuk, (Eds): Astrophysics and Cosmology After Gamow, AIP Publication No. 1206 (NY), (2009)

S.K. Chakrabarti: {\bf Propagation Effects of Very ow Frequency Waves}, AIP Publication (NY), No. 1286 (2010)

Papers in Proceedings:
1. S.K. Chakrabarti, 2009, Generalized Accretion Flow Configuration: Rationale and Observational Evidences, (Eds.) S.K. Chakrabarti, G.S. Bisnovatyi-Kogan \& A.I. Zhuk

2. S.K. CHAKRABARTI, S. PALIT, A. NANDI, V. K. YADAV, D. DEBNATH, 2009, Fresnel Zone Plate Telescopes as high resolution imaging devices, in Proceedings of International conference on Space Science and Technology, Thessaloniki, Greece, Eds. G. Lampropoulos and M. Petrou.

3. V.K. YADAV, S.K. CHAKRABARTI, A. NANDI, S. PALIT, 2009, X-ray experiments for Space applications in intermediate energy range in Proceedings of International conference on Space Science and Technology, Thessaloniki, Greece, Eds. G. Lampropoulos and M. Petrou.

4. A. NANDI, A.R. RAO, S.K. CHAKRABARTI, J.P. MALKAR, S. SREEKUMAR, D. DEBNATH, M.K.HINGAR, T. KOTOCH, Y. KOTOV, A. ARKHANGELSKIY, 2009,
Indian Payloads (RT-2 Experiment) On board CORONAS-PHOTON Mission,
in Proceedings of International conference on Space Science and Technology, Thessaloniki, Greece, Eds. G. Lampropoulos and M. Petrou.

5. S. K. Chakrabarti, 2010, Black Hole Astrophysics in 'The Sun, Stars, The Universe and General Relativity', proceedings in Memory of Y. Zeldovich, held in Minsk (April 2009), p. 41-50, Ed. R. Ruffini and G. Vereschagin

6. S. K. Chakrabarti and S. Chakrabarti, 2010, Evolution of Pre-biotic molecules during star formation in 'The Sun, Starrs, The Universe and General Relativity', proceedings in Memory of Y. Zeldovich, held in Minsk (April 2009), p. 51-58, Ed. R. Ruffini and G. Vereschagin

7. S. K. Chakrabarti Fundamental Concepts in Transonic Flow Paradigm of Black Hole Astrophysics, 2010, Proceedings of 1st Galileo-Xu-Guangqi conference in Shanghai, Oct. 2009

8. Chakrabarti Sandip K., Sasmal S., Pal S., Mondal S. K., Results of VLF campaigns in Summer, Winter and during Solar Eclipse in Indian Subcontinent and Beyond, AIP Conf. Proc. 1286, 61 (2010)

9. Pal Sujay, Chakrabarti S. K. Theoretical models for Computing VLF wave amplitude and phase and their applications AIP Conf. Proc. 1286, 42 (2010)

10. Bhowmick D., Chakrabarti S. K., Sasmal S., Mondal S. K. Studies of VLF Signals using Balloon Borne and Undersea Antennas, AIP Conf. Proc. 1286, 345 (2010)

11. Kotoch T. B., Chakrabarti Sandip K., Nandi A., Debnath D., Mondal S. K. Gamma-Ray Bursts from RT-2 payloads and VLF signals AIP Conf. Proc. 1286, 339 (2010)

12. Mondal S. K., Chakrabarti S. K. Earth's Ionosphere as a Gigantic Detector of Extra-terrestrial Energetic Phenomena: A Review, AIP Conf. Proc. 1286, 311 (2010)

13. Ray Suman, Chakrabarti S. K., Sasmal S., Choudhury A. K. Correlelations between the Anomalous Behaviour of the Ionosphere and the Seismic Events for VTX-MALDA VLF Propagation AIP Conf. Proc. 1286, 298 (2010)

14. Sasmal S., Chakrabarti S. K., Chakrabarti S. Studies of the Correlation Between Ionospheric Anomalies and Seismic Activities in the Indian Subcontinent AIP Conf. Proc. 1286, 270 (2010)

Maji Surya K., Chakrabarti Sandip K., Mondal Sushanta K. Partial Effects on VLF Data due to a Solar Flare During 2010 Annular Solar Eclipse AIP Conf. Proc. 1286, 214 (2010)

15. Nandi Anuj, Chakrabarti Sandip K., Debnath Dipak, Kotoch Tilak B., Rao A. R., Mondal S. K., Maji S., Sasmal S. Simultaneous observation of Solar Events by Indian Payload (RT-2) and ICSP-VLF receiver, AIP Conf. Proc. 1286, 200 (2010)

16. Basak Tamal, Chakrabarti S. K., Pal S. Global effects on Ionospheric Weather over the Indian subcontinent at Sunrise and Sunset AIP Conf. Proc. 1286, 137 (2010)

Chechetkin Valery

Position: Keldysh Institute of Applied Mathematics RAS Main Scientific Researcher, Professor RAS;
1998-2010. M I PH U , Moscow, Russia , Professor

Period covered: : Keldysh Institute of Applied Mathematics RAS 1994 –2010;
1998-2004. M I PH U , Moscow, Russia

I. Scientific Work

Belotserkovskii, O. M.; Fimin, N. N.; Chechetkin, V. M., Coherent structures in fluid dynamics and kinetic equations, 2010CMMPh..50. p1536

Belotserkovskii, O. M.; Fimin, N. N.; Chechetkin, V. M., Application of the Kac equation to turbulence simulation, 2010CMMPh..50 p549

Chechetkin, V. M. Mechanism Of Supernova , 2010AIPC.1205 p59

Chardonnet, Pascal; Chechetkin, Valery; Titarchuk , On the pair-instability supernovae and gamma-ray burst phenomenon , 2010Ap&SS.325, p153

Galanin, M. P.; Lukin, V. V.; Chechetkin, V. M. Mathematical modeling of magnetic jets, 2010AIPC.1206 p293

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

1.VULCANO WORKSHOP 2010, May 23-29, Vulcano, Italy
FRONTIER OBJECTS IN ASTROPHYSICS AND PARTICLE PHYSICS

2. 10-th Gamow Summer School “Astronomy and beyond: Astrophysics, Cosmology, Radioastronomy, High Energy Physics and Astrobiology”,20-28 August, 2010, Odessa, Ukraine

3. Galiskii school, 6-12 September, 2019 . M I PH U , Moscow, Russia

Coppi Bruno

Position: Massachussets, Institute of Technology
Period covered: 1968 to now

I. Scientific Work

Basic Plasma Physics, Plasma Astrophysics, Nuclear Fusion Research

II. Conferences and educational activities
II a. Conferences and Other External Scientific Works
numerous

II b. Work With Students
numerous

II c. Diploma thesis supervision
numerous

II d. Other Teaching Duties
Have being teaching regularly since 1966 with relatively brief interruptions

II e. Work With Postdocs
Had many postdoc collaborations over the years

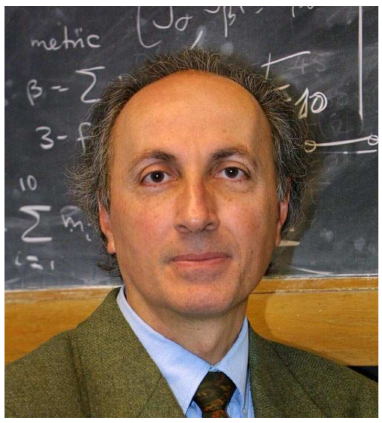
III. Service activities
III a. Within ICRANet
Presented invited paper at Ventimiglia Symposium

III b. Outside ICRANet
Participated in other international conferences concerning the fields mentioned in I

List of Publications

- B. Coppi, "Accretion theory of 'spontaneous' rotation in toroidal plasmas," Nucl Fusion 42, 1: 1-4 (2002).
- B. Coppi, G. Laval, and R. Pellat "Dynamics of the Geomagnetic Tail," Phys. Rev. Letters 16, 26: 1207-1210 (1966).
- B. Coppi, M.N. Rosenbluth, and R.V. Sudan "Non-linear Interactions of Positive and Negative Energy Modes", Ann. Physics 55, 2: 248-270 (1969).
- B. Coppi, F. Pegoraro, R. Pozzoli and G. Rewoldt "Slide Away Distributions and Relevant Collective Modes in Hihg-Temperature Plasmas", Nucl. Fusion 16, 2: 309-328 (1976).
- B. Coppi "Nonclassical Transport and the 'Principle of Profile Consistency'", Comments Plasma Phys. Cont. Fusion 5, 6: 261-270 (1980).
- B. Coppi, A. Airoldi, F. Bombarda, et al. "Optimal regimes for ignition and the Ignitor experiment," Nucl Fusion 41, 9: 1253-1257 (2001).

Damour Thibault



Position: Professeur Permanent
Institut des Hautes Etudes Scientifiques.

Period covered: 2010

Conferences and educational activities
February 2010: lectures given to IRAPhD and Erasmus Mundus students in Nice (France) about «Advanced General Relativity»

July 2010: Orchidea Lecian gave a presentation about her collaboration with Thibault Damour on the Statistical Properties of Cosmological Billiards during the 2nd Galileo-XuGuangqi meeting, Ventimiglia (Italy)

September 2010: lectures given to IRAPhD and Erasmus Mundus students in Nice (France) about «Gravitational Waves I»

ICRANET-related Collaborations with
Alessandro NAGAR
Orchidea LECIAN

2010 List of publications (T. Damour, A. Nagar and O.M. Lecian)
1. Gravitational Self Force in a Schwarzschild Background and the Effective One Body Formalism.
Thibault Damour (IHES, Bures-sur-Yvette).
Published in Phys.Rev. D81 (2010) 024017

2. Effective One Body description of tidal effects in inspiralling compact binaries.
Thibault Damour, Alessandro Nagar (IHES, Bures-sur-Yvette & ICRA, Pescara).
Published in Phys.Rev. D81 (2010) 084016

3. Precession effect of the gravitational self-force in a Schwarzschild spacetime and the effective one-body formalism.
Leor Barack (Southampton U.), Thibault Damour (IHES, Bures-sur-Yvette), Norichika Sago (Kyoto U., Yukawa Inst., Kyoto).
Published in Phys.Rev. D82 (2010) 084036
e-Print: arXiv:1008.0935 [gr-qc]

4. Analytic modelling of tidal effects in the relativistic inspiral of binary neutron stars.
Luca Baiotti, Thibault Damour, Bruno Giacomazzo, Alessandro Nagar, Luciano Rezzolla.
e-Print: arXiv:1009.0521 [gr-qc]

5. Binary black hole merger in the extreme-mass-ratio limit: a multipolar analysis.
Sebastiano Bernuzzi (Jena U.), Alessandro Nagar (IHES, Bures-sur-Yvette).
Published in Phys.Rev. D81 (2010) 084056
e-Print: arXiv:1003.0597 [gr-qc]

6. Statistical Properties of Cosmological Billiards, Thibault Damour and Orchidea Lecian, Nov. 2010, to be submitted

Della Valle Massimo

Position: Director
Osservatorio Astronomico di Capodimonte
Istituto Nazionale di Astrofisica-Napoli
Period covered: 1990-2010

I Scientific Work
The research activity spans several fields in the observational Astrophysics:

- Supernovae (local and at high redshifts) and measurement of the cosmological parameters; b) Gamma-ray bursts and their afterglows c) Supernova/GRB connection); d) Novae (galactic and extragalactic); e) Distance Scale.

Curriculum
1976. High School diploma, Brescia.
1983. Laurea in Astronomia, Università di Padova
(Summa cum Laude). Supervisor: Prof. L. Rosino.
1984. Fellow at the Asiago Astrophysical Observatory
1985. PhD student at the Byurakan Observatory (ex-URSS).
Supervisor: Prof. Ambartsumian.
1988. PhD in Astronomy Università di Padova. Supervisors:
Prof. L. Rosino, e M. Capaccioli
1989. Post-Doc at SISSA, Trieste
1990. Fellow at the European Southern Observatory, La Silla, Cile.
1994. Fellow at the European Southern Observatory, Munchen, Germany
1995. Assistant Professor at the Astronomy Dept., Universita' di Padova.
1999. Associate Astronomer at the Arcetri Astrophysical Observatory
2006. Adjunct Professor at the International Center for Relativistic Astrophysics Network, 65122, Pescara
2007. Director for Research at the Osservatorio Astronomico di Capodimonte, INAF-Napoli
2008. Associate Scientist at the ESO Telescope Division (on leave of INAF-Napoli)
2010. Director of the INAF-Capodimonte Astronomical Observatory

Sabbatical leaves (longer than 1 month)
1994, 1996, 1997, 1999, 2003, 2005. Visiting Scientist, European Southern Observatory, Garching.
1995, 1997, 2000, 2002, 2004. Visiting Scientist, Space Telescope, Science Institute, Baltimore.
1998, 2001, 2003. Visiting Scientist, European Southern Observatory, Santiago.
2006. Visiting Scientist, Department of Astronomy, Graduate School of Science, University of Tokyo, Japan
2006, 2007. Visiting Scientist, KAVLI Institute, Santa Barbara, California University
2007. Visiting Scientist, Dark Cosmology Center, Niels Bohr Institute, Copenhagen
2007. Visiting Scientist, Queen's University, Belfast, UK
2007. Visiting Scientist, Aspen Center for Physics, USA

Teaching
1989. Lecturer at the SISSA (Trieste): ``The Cosmological Distance Ladder'' .
1992. Visiting Professor, Centro de Astrofisica da Universidade do Porto, Portugal: ``The Late Stages of the Stellar Evolution'' (grad. level).
Assistant Professor for Esercitazioni di Astronomia I (Padova, Astronomy Dept. a.a.1993/94; 1994/95; 1995/96; 1996/97).
Assistant Professor for Laboratorio di Fisica II (Padova Astronomy Dept. a.a. 1995/96).

Assistant Professor for Astrofisica (Padova Astronomy Dept. a.a. 1996/97).
Professor in charge of Astronomia Generale (Padova Physics Dept. a.a. 1996/97; 1997/98)
Professor at the Physics Dept. Ferrara University for "Tecniche Osservative in Astronomia" (a.a. 2002/03; 2003/04; 2005/06; 2006/2007; 2007/2008).
Professor at the Physics Dept. Ferrara University for "Tecniche Osservative in Astronomia" and "Supernovae", PhD course (a.a. 2009/2010)
Lecturer in about fifteen national and international PhD Schools.

Publications
Author of about 400 scientific papers, 156 referred articles, 137 GCN and IAU telegrams and 110 contributes to International Conferences.

Outreach
Author of about 40 popular papers published on Astronomia, Coelum, Le Stelle and national newspapers.

2010 List of Publications

1. The Afterglows of Swift-era Gamma-ray Bursts. I. Comparing pre-Swift and Swift-era Long/Soft (Type II) GRB Optical Afterglows, Kann et al. 2010, ApJ, 720, 1513
2. Nearby Supernova Rates from the Lick Observatory Supernova Search. IV. A Recovery Method for the Delay Time Distribution, Maoz et al. 2010, astro-ph/1002.3056
3. Unveiling the origin of X-ray flares in gamma-ray bursts, Chincarini, G. et al. 2010, MNRAS, 406, 2113
4. Supernova 2010bh = GRB 100316D, Bufano et al. 2010, CBET 2227
5. The afterglow and host galaxy of GRB 090205: evidence of a Ly-α emitter at $z = 4.65$, D'Avanzo et al. 2010, A&A, 522, 20
6. X-ray variability with WFXT: AGNs, transients and more, Paolillo, M. et al. 2010, astro-ph/1010.5922
7. X-ray monitoring of classical novae in the central region of M 31. II. Autumn and winter 2007/2008 and 2008/2009, Henze et al. 2010, astro-ph/1010.1461
8. X-ray monitoring of classical novae in the central region of M 31. I. June 2006 - March 2007, Henze et al. 2010, astro-ph/1009.1644
9. FSS galaxies in southern hemisphere, Hakobyan et al. 2010, VizieR On-line Data Catalog
10. Path to the stars: the evolution of the species in the hunting to the GRBs, Vitali et al. 2010, SPIE 7733, 26
11. The Sooner: a Large Robotic Telescope, Chincarini et al. 2010, astro-ph/1005.1569
12. Weird and wild supernovae, Della Valle, M. 2010, MmSAI, 81, 367
13. Emerging supernova in the afterglow of GRB 100316D, Bufano et al. 2010, GCN 10543
14. Optical Telescopes, Della Valle, M & Gilmozzi, R. in Landolt-Bornstein Vol. 4, pg. 1

Einasto Jaan

Position: Adjunct Professor of the ICRANet Faculty
Period covered: 01 January – 31 December 2010

I. Scientific Work

Together with E. Tago, E. Saar and other members of the Tartu Observatory cosmology group I participated in the compilation of a catalogue of groups of galaxies for the Sloan Digital Sky Survey (SDSS) using all 7 data releases (Tago et al. 2010a, 2010b). The catalogue is prepared in two versions, using all galaxies up to observational limit (flux-limited catalogue), and a series of volume-limited catalogues.
In collaboration Tartu with and Potsdam astronomers I made several series of numerical simulations of structure evolution of the universe. These simulations have 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, the absence of galaxies in voids etc. Simulations were made for several cube sizes: 64, 100, 256, 500, 768, 1000 Mpc/h. For most models simulations were performed with full power spectrum, and with truncated spectrum, where long-wave perturbations are cut. Initial conditions (random numbers used to generate initial positions and velocities of particles) were identical in models of various cut, this allows to identify particles in systems (halos), and to follow the behavior of halos in varying conditions. The analysis of models shows that voids appear in regions of space where large-scale density perturbations have similar phases of low-density sections of perturbations, and superclusters form in regions where large-scale perturbations have similar phases in high-density sections. Two papers based of this series of models are almost completed and ready to send to the publisher (``Wavelet analysis of the formation of the cosmic web'' by J. Einasto G. Hütsi, E. Saar, I. Suhhonenko, L. J. Liivamägi, M. Einasto, V. Müller, A. A. Starobinsky, E. Tago, and E. Tempel and ``The cosmic web for various scale density perturbations'' by Suhhonenko, J. Einasto, L. J. Liivamägi, E. Saar, M. Einasto, S. Gottlöber, G. Hütsi, V. Müller, E. Tago, and E. Tempel).
I participated in the analyze of rich clusters of galaxies in the Sloan Great Wall (Einasto et al. 2010), and in the study of the environment of nearby quasars (Lietzen et al. 2010).

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

Series of 5 lectures in January 2010 in Nice Observatory on Large-scale Structure of the Universe. Invited talk ``Large Scale Structure of the Universe - a powerful probe for fundamental physics'' in the 2nd Galileo-Xu Guangqi Meeting in July 12 - 18 in Ventimiglia.
Lectures in the IRAP PhD Erasmus Mundus School, 6 - 10 September in Nice: 1. Large Scale Structure of the Universe I. Introduction; 2. Large Scale Structure of the Universe II. Quantitative Analysis; 3. Large Scale Structure of the Universe III. Dark Matter; 4. Large Scale Structure of the Universe IV. Cosmological Parameters and Dark Energy; 5. Large Scale Structure of the Universe V. Formation and Evolution.

II b. Other Teaching Duties

Lecturing in Tartu and Baltimore Universities and Estonian Schools
March 17 - lecture ``The Structure of the Universe'' in Paldiski High-School, Estonia.
March 19 - lecture ``The Structure and Evolution of the Universe'' in Ala High-School, Estonia.
April 19 - seminar talk in Baltimore University ``Large Scale Structure studies in Tartu''.
May 25 - Tartu University seminar talk ``Professor Taavet Rootsmae 125 Jubilee''.
May 27 - Tartu Observatory seminar talk ``Remarks on the History of Tartu Observatory''.
September 24 - Lecture in Tartu University ``The Structure and Evolution of the Universe''.
October 29 - Lecture ``Large Scale Structure of the Universe - current problems'' in Virtual Institute of Astroparticle Physics, Paris via internet.

III. Service activities
III a. Within ICRANet
participation of the preparation of Erasmus Mundus program

III b. Outside ICRANet
Member of the Scientific Organizing Committee of the Conference devoted to the 200 Anniversary of Tartu Observatory, to be held in April 2011.

IV. Visits:
January 17 - February 21: Pescara, ICRANet;
01 April 01 - May 01: Baltimore, Astronomy Department of Johns Hopkins University;
July 11 - September 12: Nice, Ventimiglia;
September 27 - November 27 - Astrophysics Institute Potsdam.

2010 List of Publications:
Einasto, J. 2009, *Dark Matter*, arXiv0901.0632E (revised)

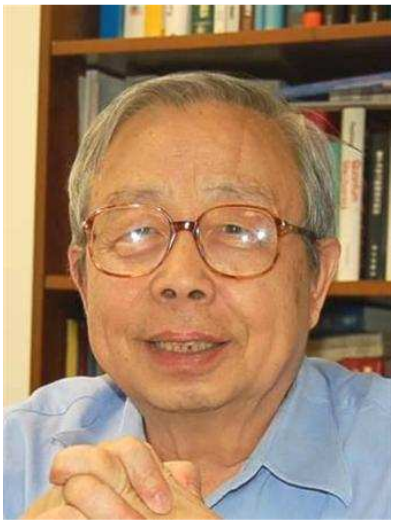
Einasto, J. 2010, *Two hundred years of galactic studies in Tartu Observatory*, ArXiv e-prints

Einasto, M., Tago, E., Saar, E., Nurmi, P., Enkvist, I., Einasto, P., Heinamaki, P., Liivamagi, L. J., Tempel, E., Einasto, J., Martinez, V. J., Vennik, J., & Pihajoki, P. 2010, *The Sloan Great Wall. Rich clusters*, ArXiv e-prints
Lietzen, H., Heinamaki, P., Nurmi, P., Liivamagi, L. J., Saar, E., Tago, E., Tempel, E., Einasto, M., Einasto, J., Gramann, M., & Takalo, L. O. 2010, *Large Scale Environments of Nearby Quasars*, in American Institute of Physics Conference Series, Vol. 1240, American Institute of Physics Conference Series, ed. V. P. Debattista & C. C. Popescu, 249

Tago, E., Saar, E., Tempel, E., Einasto, J., Einasto, M., Nurmi, P., & Heinamaki, P. 2010a, *Groups of galaxies in the SDSS Data Release 7 . Flux- and volume-limited samples*, A&A, 514, A102+

Tago, E., Saar, E., Tempel, E., Einasto, J., Einasto, M., Nurmi, P., & Heinamaki, P. 2010b, *Groups of galaxies in the SDSS Data Release 7. Flux- and volume-limited samples.*, VizieR Online Data Catalog, 351, 49102

Fang Li-Zhi



Position: Adjunct Professor
Period covered: 2010

I. Scientific Work

1. Vorticity of Intergalactic Medium Velocity Field on Large Scales, Weishan Zhu, Longlong Feng, Li-Zhi Fang, ApJ, 712, (2010), 1
(with ICRANet support)

2. Resonant Scattering and Lyα Radiation Emergent from Neutral Hydrogen Halos Ishani Roy, Chi-Wang Shu, Li-Zhi Fang, ApJ, 716, (2010), 604

3. Log-Poisson non-Gaussianity of Lyα transmitted flux fluctuations at high redshift. Yi Lu, Weisha n Zhu, Yaoquan Chu, Longlong Feng, Li-Zhi Fang, MNRAS, 408, (2010) , 452
(with ICRANet support)

4. Statistical and dynamical decoupling of the IGM from Dark Matter Li-Zhi Fang, Weishan Zhu, Advances in Astronomy, 2011, Article ID 492980
(with ICRANet support)

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works
The Second Galileo-Xu Guanqi Meeting

II b. Work With Students
Wenshan Zhu, Yi Lu, Ishani Roy

II c. Diploma thesis supervision
Ishani Roy's thesis: WENO Method in Computational Cosmology

II d. Other Teaching Duties
Teaching Courses PHYS195A, PHYS332, PHYS515B at the University of Arizona

II e. Work With Postdocs
Dr. Wen Xu was in University of Arizona on March 2010.

III. Service activities

III a. Within ICRANet
Chairperson of Steeling Committee of ICRAnet

III b. Outside ICRANet
Chair of Exam Committee of Department of Physics, University of Arizona

Frontera Filippo

Position: Full professor, University of Ferrara
Period covered: 2010

I. Scientific Work

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

a. Gamma-ray lens development;
b. Payload study of the MIRAX mission (collaboration with INPE, Brazil);
c. Observational studies of GRB prompt emission;
d. Observational studies of compact objects in binary systems

Filippo Frontera is full professor of Experimental Physics at the University of Ferrara, Engineering Faculty. Previously, for about 16 years, from 1969 until 1985, he was researcher of the National Research Council (CNR) with the Institute of Technology and Study of Extraterrestrial Radiations (TESRE) in Bologna, now Institute of Space Astrophysics and Cosmic Physics (IASF) of the National Institute of Astrophysics (INAF), where he continues to coordinate an X-ray astronomy group.

He is Chair of the Doctorate program in Physics of the Physics Department of University of Ferrara, where is responsible of the High Energy Astrophysics Group, that is engaged in theoretical, observational and experimental researches of X-ray astronomy.

Since his graduation degree 'Laurea' at the Bologna University, his main scientific activity has concerned experimental and observational hard X-ray astronomy. He has been Principal Investigator (PI) of several hard X-ray astronomy experiments successfully launched with stratospheric balloons from different balloon bases (Italy, France, USA and Australia). He has been PI of the high energy experiment PDS (Phoswich Detection System) and Gamma-Ray Burst Monitor aboard the BeppoSAX satellite, both of which had a key role in the advancement of the high energy astrophysics: PDS was the most sensitive instrument among the high energy (15-300 keV) telescopes launched thus far, and GRBM had a key role for the afterglow discovery of Gamma Ray Bursts (GRBs). More recently he has been Co-Investigator (Co-I) of the JEM-X experiment aboard the INTEGRAL satellite now in flight, developing the field collimator of the instrument and a peculiar hard X-ray facility for its ground calibration. This facility, now being expanded in a tunnel of 100 m length (LARIX), is proposed to EU as hard X-ray facility with trans-national access.

His current main research focus is for GRBs and for compact galactic and extragalactic sources (AGN). Among current experimental projects, he is responsible of the project "Laue", supported by the Italian Space Agency and devoted to the development of a hard X-/gamma-ray focusing telescope (70/100-600 keV) based on Laue lenses.

He is author of about three hundred publications in international refereed journals, among which Nature and Science, and invited speaker at many international conferences. His papers mainly concern experimental X-ray astronomy and results of X-ray observations of celestial sources and GRBs. Given the high number of citations (currently more than 13000) of his publications, he appears among the "highly cited researchers" in the ISI Web of Knowledge. He is referee for several international journals.

For the discovery of X-ray afterglows from celestial Gamma-Ray Bursts, he is among the winners of the 1997 Bruno Rossi Prize awarded by the American Astronomical Society and of the 2002 Descartes Prize for Science awarded by the European Union Committee. For the discovery of the Afterglow from Gamma Ray Bursts with BeppoSAX, he has received the "Enrico Fermi Prize 2010" awarded by the Italian Physical Society in September 2010.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

a. IRAP-PhD school, Nice, February 2010

b. IRAP-PhD school, Ferrara, March 2010
c. Erasmus Mundus IRAP-PhD school, Nice, September 2010

II b. Work With Students
yes, with 2 PhD students in Physics, University of Ferrara

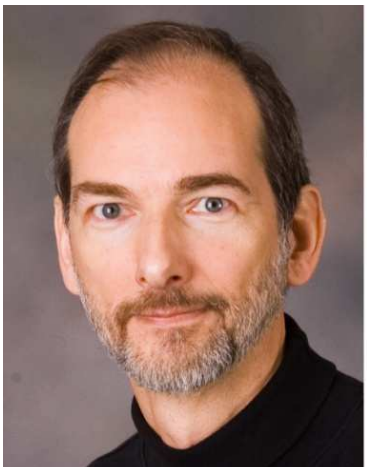
II c. Diploma thesis supervision
Yes, with a PhD student in Physics (Lara Sambo), University of Ferrara

II d. Other Teaching Duties
2 Semester Courses:
a. Astronomical Observations
b. Observation of Celestial X-rays

II e. Work With Postdocs
Yes, with 2 PostDocs (Ruben Farinelli, Gianluca Loffredo and Enrico Virgilli) a Physics Dept University of Ferrara

III. Service activities
III a. Outside ICRANet
Director of the PhD program in Physics, University of Ferrara

Jantzen Robert



Position: Professor
Period covered: Summer 2009 through Summer 2010

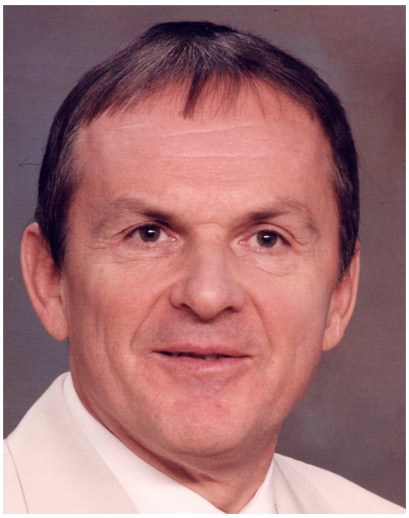
I. Scientific Work

Continuing collaboration with Donato Bini and Andrea Geralico on mathematical properties of stationary spacetimes and with Donato Bini, Andrea Geralico, Oldrich Semerak and Luigi Stella on the relativistic Poynting-Robertson effect in astrophysics.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works
Continuing MG12 editorial duties, July Villa Hanbury ICRANet Meeting

Kleinert Hagen



Position: Richard Feynman Professor
Period covered: 2009

2010 List of Publications

H. Kleinert, From Landau's Order Parameter to Modern Disorder Field Theory in L.D. Landau and his Impact on Contemporary Theoretical Physics, Horizons in World Physics 264 (2008), A. Sakaji and I. Licata (preprint).

P. Jizba, H. Kleinert, and P. Haener Perturbation Expansion for Option Pricing with Stochastic Volatility Physica A 388 (2009) 3503 (preprint)

P. Jizba, H. Kleinert, and F. Scardigli Uncertainty Relation on World Crystal and its Applications to Micro Black Holes (arXiv:0912.2253) Phys. Rev. D 81, 084030 (2010)

H. Kleinert New Gauge Symmetry in Gravity and the Evanescent Role of Torsion (arxiv/1005.1460) EJTP 24, 287 (2010)

H. Kleinert Converting Divergent Weak-Coupling into Exponentially Fast Convergent Strong-Coupling Expansions (arXiv:1006.2910) preprint (2010)

Petr Jizba and Hagen Kleinert Superstatistics approach to path integral for a relativistic particle (arxiv/1007.1007.3922) Phys. Rev. D 82, 085016 (2010) (2010) II Conferences and educational activities

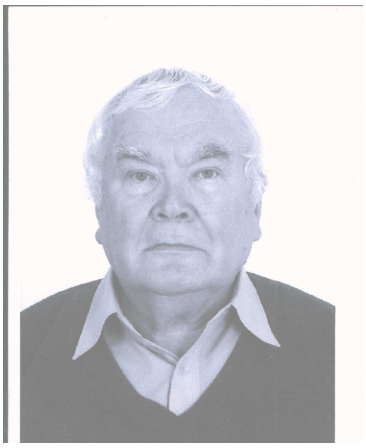
Work With Students

- Tim X.J. Chen (FU-Berlin, Germany)
- Konstantin Glaum (FU-Berlin, Germany)
- Sonja Overesch (FU-Berlin, Germany)
- Walja Korolevski (FU-Berlin, Germany)
- Mathias Ohlinger (FU-Berlin, Germany)
- Moritz Sch ¨ utte (FU-Berlin, Germany)
- Steffen R¨othel (FU-Berlin, Germany)
- Matthias Ohliger (FU-Berlin, Germany)
- Pascal Mattern (FU-Berlin, Germany)1469
- Ednilson Santos (FU-Berlin, Germany)
- Alexander Hoffmann (FU-Berlin, Germany)
- Parvis Soltan-Panahi: Thermodynamic Properties of F=1 Spinor Bose-Einstein Condensates; (2006)
- Markus Dttmann: Variational Methods in Disorder Problems – Testing Approximation Techniques with and without Replicas on a Zero-Dimensional Disorder Model; (2009)
- Oliver Gabel: Non-Equilibrium Quantum Statistics of Trapped Ideal Bose Gases; (2009)
- Tobias Grass: Real-Time Ginzburg-Landau Theory for Bosonic Gases in Optical Lattices; (2009)
- Pascal Mattern: Quench Dynamics of Bosons in Optical Lattices; (2009)
- Lance Labun (USA): Dipolar Bose Gases; DAAD-RISE-Program
- Henrik Enoksen (Norway): Green's Function of Bosons in Optical Lattices; DAAD-IAESTE-Program (2007)
- Kiel Howe (USA): Rotating Spinor-Fermi Gases; DAAD-RISE-Program (2008)
- Barry Bradlyn (USA): Effective Action of Bosons in Optical Lattices; DAADRISE-Program (2008)

• Isaac Abban-Mensah (Ghana): Hanbury Brown-Twiss-Effect of Bosons in Optical Lattices; DAAD-IAESTE-Program (2008)
• Melek K¨ uc ¨ uktalaslio (Turkey): Green's Function of Bose-Fermi Mixture in Optical Lattices; DAAD-IAESTE-Program (2008)
• Avinash Kumar (India): Fidelity of a Quantum Mechanical Particle in Random Potential; SFB/TR 12 (2008)
• Srinivas Kumar (India): Vortices in Bose-Einstein Condensates (2009)
• Bridget Bertoni (USA): Dipolar Spinor Fermi Gases; DAAD-RISE-Program (2009)
• Jerome Simons (USA): Frustation of Bosons in Triangular Optical Lattice; DAAD-RISE-Program (2009)
• Artem Gryshchuk (Ukraine): Bose-Gas in Random Potential; DAAD-IAESTE
• Eduardo Paulo Jorge da Costa Alves (Portugal): Two Weakly Coupled Bose-Gases; DAAD-IAESTE-Program (2009)

Other Teaching Duties
Courses on Quantum Field Theory and Many-Body Physics

Popov Vladimir Stepanovich



Position: leading scientist, ITEP, Moscow
Period covered: 2008-2010

I. Scientific Work

In 2006 and 2008 I have visited Prof. Ruffini and his colleagues two times. We discussed fruitfully some aspects of strong fields in massive nuclear density cores. Results of our collaborative work have been published later (see Publication List).
In 2009 I visited the Conference "The Sun, the Stars, the Universe and General Relativity", organized by the ICRANet, where I made a talk and had also useful discussions with Prof.Ruffini and other ICRANet people.

II. Conferences and educational activities
International Conf. "The Sun, the Stars, the Universe and General Relativity" (Zel'dovich Meeting, Minsk, April 2009).

2010 List of Publications
V.S.Popov, From superheavy nuclei to massive nuclear density cores. AIP Conf. Proc. 1205, 127 (2010).

S.S.Bulanov, V.D.Mur, N.B.Narozhny, J.Nees, V.S.Popov, Multiple colliding electromagnetic pulses; a way to lower threshold of $e^+\tilde{e}$ -pair production from vacuum. Phys.Rev.Lett. 104, 220404 (2010).
Other

Punsly Brian

Position: Research Scientist
Period covered: 2010

I. Scientific Work

Brian Punsly/ICRANet Research 2009 and 2010

ABSTRACT:
This report describes the research performed by Brian Punsly in cooperation with ICRANet in 2010.
1. Introduction
In 2010, the research was concentrated in three areas. First, I discovered a propensity for red (redward of the QSO systemic velocity) broad line emission excess in radio loud quasars that is accentuated for polar lines of sight. Second my discovery working with Shaohua Zhang of excess narrow line widths of broad emission lines in broad absorption line quasars and showing that this is best explained by polar lines of sight. I am also leading collaborations to perform high frequency (high resolution), time resolved VLBA observations of broad absorption line quasars.

2. The Redshifted Excess in Quasar C IV Broad Emission Lines
The article, The Redshifted Excess in Quasar C IV Broad Emission Lines" was written for ApJ 2010. 713, 232 with the intention of trying to determine a unique signature of the accretion environment of radio loud AGN that could help discriminate between the wide range of boundary conditions that are assumed in simulations of black hole magnetospheres.
ABSTRACT: In this article, the Evans and Koratkar Atlas of Hubble Space Telescope Faint Object Spectrograph Spectra of Active Galactic Nuclei and Quasars is used to study the redward asymmetry in CIV broad emission lines (BELs). It is concluded that there is a highly significant correlation between the spectral index from 10 GHz to 1350 Angstroms and the amount of excess luminosity in the red wing of the CIV BEL (> 99:9999% significance level for the full sample and the radio loud subsample independently, but no correlation is found for the radio quiet subsample). This is interpreted as a correlation between radio core dominance and the strength of the CIV redward asymmetry. The data implies that within the quasar environment there is BEL gas with moderately blueshifted emission associated with the purely radio quiet quasar phenomenon (the accretion disk) and the radio jet emission mechanism is associated with a redward BEL component that is most prominent for lines of sight along the jet axis. Thus, radio quiet quasars have CIV BELs that tend to show blueshifted excess and radio loud quasars show either a red or blue excess with the tendency for a dominant red excess increasing as the line of sight approaches the jet axis.
As a follow-on to this work, we obtained a third epoch of observation of one of the most redward asymmetric gamma ray superluminal gamma ray blazars, 0954+556, with the Lick 3 meter telescope with Matt Malkan of UCLA. In the optical the Mg II line is visible and a sample figure is shown below.

3. Hβ Line Widths as an Orientation Indicator for Broad Absorption Line Quasars
The article, "Hβ Line Widths as an Orientation Indicator for Broad Absorption Line Quasars" was written for ApJ with Shaohua Zhang from Key Laboratory for Research in Galaxies and Cosmology, University of Sciences and Technology of China, China Academy of Science, Hefei, Anhui, 230026, China. The article is in press for ApJ. This is part of a multi-tiered study trying to understanding why some quasars have radio jets and others the outflow is dominated by a broad absorption line wind.
ABSRACT: There is evidence from radio-loud quasars to suggest that the distribution of the Hβ broad emission line (BEL) gas is arranged in a predominantly planar orientation, and this result may well also apply to radio-quiet quasars. This would imply that the observed full width at half maximum (FWHM) of the Hβ BELs is dependent on the orientation of the line of sight to the gas. If this view is correct then we propose that the

FWHM can be used as a surrogate, in large samples, to determine the line of sight to the Hβ BELs in broad absorption line quasars (BALQSOs). The existence of broad UV absorption lines (BALs) means that the line of sight to BALQSOs must also pass through the BAL out-flowing gas. It is determined that there is a statistically significant excess of narrow line profiles in the SDSS DR7 archival spectra of low ionization broad absorption line quasars (LoBALQSOs), indicating that BAL gas flowing close to the equatorial plane does not commonly occur in these sources. We also find that the data is not well represented by random lines of sight to the BAL gas. Our best fit indicates two classes of LoBALQSOs, the majority (≈ 2/3) are polar outflows, that are responsible for the enhanced frequency of narrow line profiles, and the remainder are equatorial outflows. We further motivated the line of sight explanation of the narrow line excess in LoBALQSOs by considering the notion that the skewed distribution of line profiles is driven by an elevated Eddington ratio in BALQSOs. We constructed a variety of control samples comprised of nonLoBALQSOs matched to a de-reddened LoBALQSO sample in redshift, luminosity, black hole mass and Eddington ratio. It is demonstrated that the excess of narrow profiles persists within the LoBALQSO sample relative to each of the control samples with no reduction of the statistical significance. Thus, we eliminate the possibility that the excess narrow lines seen in the LoBALQSOs arise from an enhanced Eddington ratio.
In pursuit of more information one can also investigate the far more numerous high ionization BALQSOs. In order for a HiBALQSO to be detected from an earth based telescope requires that C IV be visible through the earth's atmosphere, i.e. z > 1.5. Thus, Hβ lies beyond the optical band in the IR. There are bands in the IR where Hβ is still visible at the appropriate redshift. I have submitted a proposal to use the ISAAC spectrograph at the ESO VLT to obtain a modest sample (40) of J and H band spectra of Hβ of HiBALQSOs with Paola Marziani, INAF, Osservatorio Astronomico di Padova, Vicolo dell' Osservatorio 5, IT 35122, Padova, Italy and Jack Sulentic, Instituto de Astrof´ısica de Andaluc´ıa (CSIC), C/ Camino Bajo de Hu´etor 50, 18008 Granada, Spain.

4. VLBA Observations of Sub-Parsec Structure in Mrk 231: Interaction between a Relativistic Jet and a BAL Wind

I am leading an effort to study Mrk 231 at the highest resolution. It is the nearest broad absorption line quasar and we have proven that it conforms with the idea of a polar broad absorption line outflow (instead of the popular notion of an equatorial outflow) that was developed in Punsly (1999a,b). This research and proposal is being done in collaboration with Cormac Reynolds (Curtin University of Technology, Department of Imaging and Applied Physics), Christopher P. O'Dea (Department of Physics, Rochester Institute of Technology) and Joan Wrobel (NRAO, Socorro).

4.1. Large VLBA Proposal Approved

We have already received re-approval for 2010/2011 for a very aggressive observation this object.

4.1.1. Abstract

We propose VLBA monitoring at 8.4, 15, 22 and 43 GHz of a high frequency flare in the nearby quasar MRK231. The "target of opportunity" observation (ToO) would be triggered by a flare detected by VLA monitoring at 22 and 43 GHz (see related proposal). The primary goals would be to detect a 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).

4.1.2. 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 x 1017 cm. We propose to 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.

5. VLBA Observations of Parsec Scale Structure of the "Radio Loud" BALQSO FIRST J1556+3517

I am also leading an effort to study FIRST J1556+3517at the high resolution. It is one of the nearest broad absorption line quasar and we have proven (Ghosh and Punsly 2007) that it conforms with the idea of a polar broad absorption line outflow (instead of the popular notion of an equatorial outflow) that was developed in Punsly (1999a,b). This accepted proposal was done in collaboration with Cormac Reynolds (Curtin University of Technology, Department of Imaging and Applied Physics), and Christopher P. O'Dea (Department of Physics, Rochester Institute of Technology).

ABSTRACT FROM ACCEPTED PROPOSAL: We propose VLBA observations at 1.8, 5, 8.4 and 15 GHz of the Broad Absorption Line Quasar FIRST J1556+3517 ("the first radio loud BALQSO"). The primary goal would be to resolve the flat spectrum radio core for the first time. Determination of the radio jet direction, in consort with the knowledge that the jet is relativistic and viewed in a pole-on orientation and the known PA of the optical continuum polarization tightly restrict the quasar geometry. This will allow us to directly constrain the relative orientations of the "dusty torus" (scattering surface), accretion disk and the broad absorption line outflow. We also propose multiple frequency observations to look for free-free absorption that might arise from the local environment of the accretion disk or the BAL wind gas itself. If the jet is resolved by the VLBA, this observation would be the first data point in a search for component motion. If the jet is not resolved, the incredibly compact nature of the relativistic outflow indicates a severe kinematical environment.

REFERENCES

Ghosh, K. and Punsly, B. 2007 ApJL 661 139
Punsly, B. 1999, ApJ 527 609
Punsly, B. 1999, ApJ 527 624

RELATED 2010 PUBLICATIONS:

Punsly, B. 2010, ApJ 713 232
Punsly, B. and Zhang, S. 2010, ApJ in press

Quevedo Hernando

Position: Full Profesor (Universidad Nacional Autónoma de México)
Adjunct Professor (ICRANet)
Period covered: December 2009 – October 2010

I. Scientific Work

Topics
- Exterior and interior solutions of Einstein's equations and applications in relativistic astrophysics.
- Investigation of the minimum size of astrophysical compact objects.
- The physics of naked singularities.
- Geometrothermodynamics of black holes.
- Topological quantization of classical mechanics and classical field theories.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

Cosmology on the Beach "Essential Cosmology for the Next Generation", Playa del Carmen, Mexico, January 2010.

19th International Conference on General Relativity and Gravitation, Mexico City, July 2010.
XIV Brazilian School of Cosmology and Gravitation, Rio de Janeiro, Brazil, September 2010.

II b. Work With Students

ICRANet students:
- Kuantay Boshkayev

Topic: Exact and approximate metrics in relativistic astrophysics

II c. Diploma thesis supervision
ICRANet students:
- Orlando Luongo (PhD)

Topics: Geodesic motion in a mass-quadrupole field
Cosmological models in Einstein's gravity
- Daniela Pugliese (PhD)

Topic: Motion of test particles around naked singularities
- Safia Taj (PhD)

Topic: Geometrothermodynamics of black holes
UNAM students:
- Jose Alvarez (PhD)

Topic: Statistical models for black holes
- Lorena Campuzano (MSc)

Topic: Thermodynamics of cosmological models
- Francisco Hernandez (PhD)

Topic: Holography in field theories
- Francisco Nettel (PhD)

Topic: Topological quantization in string theory
- Leticia Plascencia (MSc)

Topic: Statistical models in geometrothermodynamics
- Antonio Ramirez (BSc)
Topic: Geometrothermodynamics of the van der Waals gas
- Moices Rodriguez (PhD)
Topic: Topological quantum mechanics
- Alejandro Vazquez (PhD)
Topic: Variational principles in geometrothermodynamics
II d. Other Teaching Duties
II e. Work With Postdocs
- Dr. Alberto Sanchez (UNAM)
Topic: Geometrothermodynamics and statistics of black holes

2010 List of Publications

- "Thermodynamic Systems as Extremal Hypersurfaces" (A. Vazquez, H. Quevedo, A. Sanchez), International Journal of Geometry and Physics, 60 1942-1949 (2010).

- "Exterior and Interior Metrics with Quadrupole Moment" (Hernando Quevedo), General Relativity and Gravitation (2010) in press.

- "Phase Transitions in Geometrothermodynamics" (Hernando Quevedo, Alberto Sánchez, Safia Taj and A. Vázquez), General Relativity and Gravitation (2010) in press.

- "Curvature as a Measure of Thermodynamic Interaction" (Hernando Quevedo, Alberto Sánchez, Safia Taj and A. Vazquez) Korean Journal of Physics (2010) in press.

- "Mass Quadrupole as a Source of Naked Singularities" (Hernando Quevedo), International Journal of Modern Physics D (2010) submitted.

- "Circular Motion in Reissner-Nordström Spacertime" (Daniela Pugliese, Hernando Quevedo and Remo Ruffini) in Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity (Paris, France July 12 – 18, 2009).

- "Matching conditions in relativistic astrophysics (Hernando Quevedo) in Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity (Paris, France July 12 – 18, 2009).

- "Toward an Invariant Definition of Repulsive Gravity" (Orlando Luongo and Hernando Quevedo) in Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity (Paris, France July 12 – 18, 2009).

Rosati Piero

Position: Full Astronomer at ESO - European Southern Observatory (Garching bei München)
Period covered: ESO Staff since 1997

I. Scientific Work
Observational Cosmology
X–ray and Optical Studies of Distant Galaxy Clusters
Galaxy Formation and Evolution
Cosmic X–ray Background/AGN Evolution
Gravitational Lensing

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works
– April 2010 - "Structure Formation: IXO synergies with the E-ELT and Euclid"
Invited talk presented at the"IXO Science Meeting" , Paris

– May 2010 - "The Baryonic and Dark Matter content of Galaxy Clusters Across Cosmic Time"
Invited talk presented at at the "Societ`a Astronomica Italiana" meeting, Naples

– June 2010 - "The Dark Matter and Baryonic content of Distant Galaxy Clusters"
Contributed talk presented at "CL J2010+0628: from Massive Galaxy Formation to Dark Energy", at IPMU, Kashiwa, Japan

– July 2010 - "The Baryonic and Dark Matter Content of the Most Distant Galaxy Clusters"
Invited talk presented at Galaxy clusters: observations, physics and cosmology", Garching bei M¨unchen

– September 2010 - "Distant Clusters as Probe of Structure Formation and Cos-mology"
Colloquium presented at Milano-Brera Observatory, Italy

II b. Work With Students
Supervision of two students at ESO

III. Service activities

III a. Within ICRANet
- Lectures at University of Nice for the International Relativistic Astrophysics Ph. D. (IRAP)
"Structure Formation and Cosmology with Galaxy Clusters", Nice, France (Sep 28-30, 2010)

- Lectures at University of Nice for the IRAP-Erasmus European PhD program "Baryons and Dark Matter in Galaxy Clusters", Nice, France (Feb 15-17, 2010)

III b. Outside ICRANet
- Member of the E-ELT Science Working Group

- Topical Editor of Il Nuovo Cimento B – Area Astrophysics

- Junior PI in Cluster of Excellence "Origin and Structure of the Universe" (Garching)

IV. Other
PI of ESO Large Programme: Dark Matter Mass Distributions of Hubble Treasury Clusters and the Foundations of ΛCDM Structure Formation Models

2010 List of Publications
Publications in 2010: refereed and accepted

K.K. Nilsson, O. Moller-Nilsson, P. Rosati, M. Lombardi, M. Kuemmel, H. Kuntschner, J.R. Walsh, R.A.E. Fosbury 2010 Stellar properties of z ~1 Lyman-break galaxies from ACS slitless grism spectra, A&A, in press (arXiv:1009.1619)

R. Demarco, R. Gobat, P. Rosati, C. Lidman, A. Rettura et al. 2010 Star Formation Histories in a Cluster Environment at z~0.84, ApJ, in press (arXiv:1009.3986)

V. Strazzullo, P.Rosati, M. Pannella, R. Gobat, J.S. Santos, et al. 2010 Cluster galaxies in XMMU J2235-2557: galaxy population properties in most massive environments at z=1.4, A&A, in press (arXiv:1009.1423)

J.D. Silverman, V. Mainieri, M. Salvato, G. Hasinger, J. Bergeron, P. Capak, G. Szokoly, A. Finoguenov, R. Gilli, Rosati et al. 2010 The Extended Chandra Deep Field-South Survey: Optical spectroscopy of faint X-ray sources with the VLT and Keck, ApJS, in press (arXiv:1009.1923)

Fassbender R. et al. (19 coauthors including P. Rosati) 2010 A panchromatic view of the galaxy cluster XMMU J1230.3+1339 at z = 0.975 - Observing the assembly of a massive system, A&A, in press (arXiv:1009.0264)

Vanzella E. et al. (16 coauthors including P. Rosati) 2010 The Great Observatories Origins Deep Survey: Constraints on the Lyman Contin-uum Escape Fraction Distribution of Lyman-Break Galaxies at $3.4 < z < 4.5$, ApJ, in press (arXiv:1009.1140)

B. Sartoris, S. Borgani, C. Fedeli, S. Matarrese, L. Moscardini, P. Rosati, J. Weller 2010 The potential of X-ray cluster surveys to constrain primordial non-Gaussianity, MNRAS, 407, 2339

Wang, Y. et al. (16 coauthors including P. Rosati) 2010 Designing a space-based galaxy redshift survey to probe dark energy, MNRAS, in press (arXiv:1006.3517)

Schwope, A.D. et al. (25 coauthors including P. Rosati) 2010 XMMU J100750.5+125818: a strong lensing cluster at z = 1.082, A&A, 513, 20

Vanzella, E. et al. (11 coauthors including P. Rosati) 2010 The unusual N IV]-emitter galaxy GDS J033218.92 275302.7: star formation or AGN-driven winds from a massive galaxy at z = 5.6, A&A, 513, 20

I. Balestra, V. Mainieri, P. Popesso, M. Dickinson, M. Nonino, P. Rosati, M. Dick-inson, B. Vandame et al. 2010 The Great Observatories Origins Deep Survey - VLT/ISAAC Near-Infrared Imaging of the GOODS-South Field, A&A, 511, 50

J. Retzlaff, P. Rosati, M. Dickinson, B. Vandame et al. 2010 The Great Observatories Origins Deep Survey - VLT/ISAAC Near-Infrared Imaging of the GOODS-South Field, A&A, 511, 50

M. Chiaberge, A. Capetti, F.D. Macchetto, P. Rosati, P. Tozzi, G.R. Tremblay 2010 Three Candidate Clusters of Galaxies at Redshift 1.8: The "Missing Link" Between Protoclusters and Local Clusters, ApJ, 710, L107

M. Puech, P. Rosati, S. Toft, A. Cimatti, B. Neichel, & T. Fusco 2010 Simulating the physics and mass assembly of distant galaxies out to z=6 with the E-ELT, MNRAS, 402, 903

J.E. Geach, A. Cimatti, W. Percival, Y. Wang, L. Guzzo, G. Zamorani, P. Rosati et al. 2010 Empirical H⊙ emitter count predictions for dark energy surveys, MNRAS, 402, 1330

Castellano, M. et al. (24 coauthors including P. Rosati) 2010 Evidence of a fast evolution of the UV luminosity function beyond redshift 6 from a deep HAWK-I survey of the GOODS-S field, A&A, 511, 20

A.Rettura, P.Rosati, M.Nonino, R.A.E.Fosbury, R.Gobat, N.Menci, V.Strazzullo, R.Demarco, H.C.Ford, S.Mei 2010 Formation epochs, star formation histories and morphologies of massive early-type galaxies, in cluster and field environments at z=1.2: insights from the rest-frame UV, ApJ, 709, 512

Other Publications in 2010

P. Rosati, S. Borgani, R. Gilli, M. Paolillo, P. Tozzi et al. 2010 “Wide Field X-ray Telescope: Mission Overview”, in Memorie della S.A.It, proceedings of the International Conference \WFXT", (Bologna, Nov 2009)

S. Borgani, P. Rosati, B. Sartoris, P. Tozzi, R. Giacconi and the WFXT Team 2010 “Astrophysics and cosmology with galaxy clusters: the WFXT perspective”, in Memorie della S.A.It, proceedings of the International Conference “WFXT", (Bologna, Nov 2009)

R. Gilli, P. Tozzi, P. Rosati, M. Paolillo, S. Borgani et al. 2010 “Demography of obscured and unobscured AGN: prospects for a Wide Field X-ray Telescope”, in Memorie della S.A.It, proceedings of the International Conference “WFXT", (Bologna, Nov 2009)

J.S. Santos, P. Tozzi and P. Rosati 2010 “Are there cool-core clusters at high-redshift? Chandra results and prospects with WFXT”, in Memorie della S.A.It, proceedings of the International Conference “WFXT", (Bologna, Nov 2009)

P. Rosati and the ESO GOODS Team 2010 “ESO-GOODS: Closing the Book, Opening New Chapters", The ESO Messenger, 140, p.50

S. Murray, R. Giacconi, A. Ptak, P. Rosati, M. Weisskopf et al. 2010 “The Wide Field X-ray Telescope Mission: A Digital Sky Survey in X-rays”, AIP Conf. Proc., 1248, 549, proceedings of the International Conference “X-ray Astronomy 2009" (Bologna, 7-11 Sept 2009)

Rosquist, Kjell

Position: professor
Period covered: 2009-2010

I. Scientific Work

Ongoing projects

1. Spatial curvature in cosmology

Spatial curvature is a key factor in cosmological theory. We are investigating properties of spatial curvature, such as estimating its size directly from the mass distribution in the universe and we are also analyzing theoretically how the spatial curvature depends on the observer.
Collaborators: L. Samuelsson, Umeå University, Sweden and H. Quevedo, ICRANet

2. Inhomogeneous cosmology

The matter in the present universe occurs in discrete lumps such as stars and galaxies. However, current models of the universe treat the matter as a homogeneous fluid. The purpose of this project is to attempt to quantify how the discrete nature of the matter influences the evolution of the universe. We have some very interesting results, in particular about implications of the Einstein constraint equations concerning the validity of the fluid approximation in cosmology. This is a long-standing problem ("averaging problem") in general relativity. We have found indications that the dynamics of the discrete models is distinctly different from that of the fluid models. We are now investigating the dynamics of the discrete models in more detail in order to obtain a more accurate form of the cosmological evolution equations.
Collaborators: L. Samuelsson, Umeå University, Sweden, Marcel Reboucas and Bruno Mota, CBPF, Rio de Janeiro, Brazil, Reza Tavakol, Queen Mary, University of London

3. Microphysical gravitomagnetic effects

In Einstein gravity, the source of the gravitational field has an additional part, namely the spin (or angular momentum) which is responsible for the gravitomagnetic field in analogy with the magnetic field in electromagnetism. In this project we work with the Einstein-Maxwell field equations which are responsible for the interaction between the gravitational and electromagnetic fields. We use solutions of the field equations to examine how the gravitomagnetic field induces modifications of the Coulomb electromagnetic field at the Compton scale. The results are amenable to experimental verification.
Collaborators: L. Samuelsson, Umeå University, Sweden, M. von Strauss, Stockholm University, Sweden
Consultant: R. Ruffini, ICRANet

4. Black holes as accelerators

When particles collide near black holes, they can in principle attain extremely high center-of-mass energies. We are estimating the practical limits on the energy of particles escaping from such collisions near black holes.
Collaborator: M. von Strauss, University of Stockholm, Sweden

5. Gravitomagnetic jets

The acceleration of particles in the form of jets is a common phenomenon in observational astrophysics. The underlying mechanisms which drive the jets are still poorly understood. In this work, we investigate how gravitational fields are able to accelerate particles up to velocities close to the speed of light. We do this by examining a number of exact solutions which exhibit acceleration of test particles.
Collaborators: B. Mashhoon, C. Chicone

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

- Talk given at the 2nd Galileo - Xu Guangqi conference, Ventimiglia, Italy, July 2010-10
- Invited lectures given at the XIV BRAZILIAN SCHOOL OF COSMOLOGY AND GRAVITATION, Mangaratiba, Brazil

II b. Work With Students

1 student

II c. Diploma thesis supervision

3 students

II d. Other Teaching Duties

Two undergraduate courses

III. Service activities

III a. Within ICRANet

Member of IRAP faculty and work with Erasmus Mundus program
Preparation for MG13, 13th Marcel Grossmann conference, to be held in Stockholm 2012

2010 List of Publications

Some consequences of gravitationally induced electromagnetic effects in microphysics
J. Korean Phys. Soc., 56 (2010) 1612 (E-print arXiv:0802.2914).

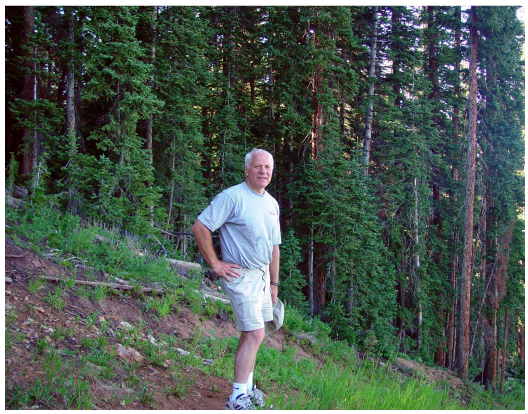
Generating spatial curvature in an inhomogeneous universe: A bottom-up approach to cosmology
in Proceedings of the 11th Italian-Korean Symposium on Relativistic Astrophysics,
J. Korean Phys. Soc., 57 (2010) 586 (with L. Samuelsson).

A direct estimate of the spatial curvature of the universe
in Proceedings of the 12th Marcel Grossmann Conference on General Relativity, World Scientific, in press (2010), (with L. Samuelsson).

How matter generates spatial curvature
in Proceedings of the 1st Galileo – Xu Guangqi Meeting, Int. J. Mod. Phys. D, in press (2010), (with L. Samuelsson).

Interacting Kerr-Newman fields
in Proceedings of the 12th Marcel Grossmann Conference on General Relativity, World Scientific, in press (2010), (with L. Samuelsson and M. von Strauss)

Titarchuk Lev



Position: Professor of University of Ferrara and
Senior scientist of Goddard Space Flight Center
Period covered: 1st Nov 2009 - 1st Nov 2010.

I Scientific Work and List of Publications

1. Seifina, L., Titarchuk, L. 2010, ApJ, 722, 586
2. Titarchuk, L., Seifina, 2009, ApJ, 706, 1463
2. Farinelli, R., Titarchuk, L. 2010, A&A, in press
3. Shrader, C., Titarchuk, L., Shaposhnikov, N. 2010, ApJ, 718, 488
4. Titarchuk, L., Shaposhnikov, N. 2010, ApJ, in press
5. Shardonnet, P., Chechetkin, V., Titarchuk 2010, Ap&SS, 325, 153
6 Cocchi, M., Farinelli, R., Paziis, A., Titarchuk, L. 2010, A&A, 509, A2
7. Shaposhnikov, N., Titarchuk, L 2009, ApJ, 699, 453

II Conferences and educational activities

Conferences and Other External Scientific Work

1. X-ray Astronomy meeting in Crete, October 2010
2. Seminar in the University of Rome, 2010
3. Washington meeting on high energy Astrophysics in November 2009
4. Ferrara meeting on AGN in May, 2010

Working with students of University of Ferrara Chiara Ceccobello on her thesis

Work With Postdocs

Drs. Ruben Farinelli, Enrico Montanari and Enrico Virgilli.

Aksenov Alexey

Position: Senior scientific staff member
Dep. of Comp. Methods and Turbulence
Institute for Computer-Aided Design, RAS
and Dep. of Comp. Mathematics Scientific
Research Institute of System Development RAS,
Moscow
Period covered: 2008-present

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
2010: Interaction of Intense Energy Fluxes, March, Elblus, Russia; The second Galileo - Xu Guangqi meeting, July, Nice and Ventimiglia

2009: Interaction of Intense Energy Fluxes, March, Elblus, Russia; Zeldovich Meeting, Minsk, Belorussia; Marsell Grossmann General Relativity, July, Paris, France; Russian-Japan seminar Turbulence and instabilities, October, Moscow, Russia; Russian-Indian seminar for high performance calculations, November, Moscow, Russia

III Service activities
Within ICRANet
2009-2010 Visitor at Icranet 1-2 months per year

Outside ICRANet
1989—1992 engineer, Laboratory for Astrophysics and Plasma Physics of the Institute for Theoretical and Experimental Physics (ITEP); 1992—1999 Junior sci. staff member, ITEP; 1999—2008 scientific staff member, ITEP; 2008—now Senior scientific staff member, department for mathematical modeling and turbulence, Institute for Computer-Aid design, Russian academy of Sciences.
1993, 1997 2—3 months Visitor at Max-Planck Institute for Astrophysics, Garching, FRG; 2000/11—2001/10 Postdoc Fellow, Cond. Matt. Dept., Weizmann Institute of Science, Rehovot, Israel; 2002—2008 Visitor at Weizmann Institute of Science, Rehovot, Israel 1—3 months per a year

2010 List of Publications

The physical model of the gravitational collapse of the iron-oxygen stellar core, the neutrino luminosity, and Supernova. Aksenov A.G., Chechetkin p. 17 in Collection Phys. of Extreme States of Matter ed. by Fortov V.E. et al, Institute of Problems of Chem. Phys. RAS, Chernogolovka.

MDMT hydrodinamical code and the laser ablation simulations. Aksenov A.G., Troshkin O.V. p. 141 in Collection Phys. of Extreme States of Matter ed. by Fortov V.E. et al, Institute of Prob-lems of Chem. Phys. RAS, Chernogolovka.

Pair plasma relaxation time scales. Aksenov A.G., Ruffini R., Vereshchagin, G. V. Phys. Rev. E, 81, 046401

Kinetics of the mildly relativistic plasma and GRBs. Aksenov A.G., Ruffini R., Vereshchagin G.V. AIP Conf. Proc., 1205, p 11

To the countercurrent theory in rotating viscous heatconducting gas. Belosterkovskiy O.M., Betelin V.B., Borishevich V.D., Oparin A.M., Konyukhov A.V., Troshkin O.V., Aksenov A.G., Denisenko V.V., Kozlov S.A., Eriklintsev I.V. accepted in Comp. Mathematics and Math. Physics.

Alekseev George A.

Position: Leading researcher
Steklov Mathematical Institute
Russian Academy of Sciences
Moscow, Russia
Period covered: 1975 – present time

2010 List of Publications

1. *George A. Alekseev, "New soliton generating transformations in the bosonic sector of heterotic string effective theory", Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity, edited by Thibault Damour, Robert T Jantzen and Remo Ruffini, World Scientific, Singapore (2010) (3 pages)*
Abstract In the author's paper (Phys.~Rev. {\bf D80}, 041901(R) (2009)), the integrable structure of the symmetry reduced bosonic dynamics in the low energy heterotic string effective theory was presented. In that paper, for a complete system of massless bosonic fields which includes metric, dilaton field, antisymmetric tensor and any number of Abelian vector gauge fields, considered in the space-time of D dimensions with $D-2$ commuting isometries, the spectral problem equivalent to the symmetry reduced dynamical equations was constructed. However, the soliton generating transformations were described in that paper only for the case in which all vector gauge fields vanish. In this paper, we recall the integrability structure of these equations and describe some new type of soliton generating transformations in which the gauge fields can enter the background (seed) solution as well as these can be generated even on vacuum background by an appropriate choice of soliton parameters.

2. *George A. Alekseev, "Thirty years of studies of integrable reductions of Einstein's field equations}, Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity", edited by Thibault Damour, Robert T Jantzen and Remo Ruffini, World Scientific, Singapore (2010) (22 pages).*
Abstract More than thirty years passed since the first discoveries of various aspects of integrability of the symmetry reduced vacuum Einstein equations and electrovacuum Einstein - Maxwell equations were made and gave rise to constructions of powerful solution generating methods for these equations. In the subsequent papers, the inverse scattering approach and soliton generating techniques, B\"acklund and symmetry transformations, formulations of auxiliary Riemann-Hilbert or homogeneous Hilbert problems and various linear integral equation methods have been developed in detail and found different interesting applications. Recently many efforts of different authors were aimed at finding of generalizations of these solution generating methods to various (symmetry reduced) gravity, string gravity and supergravity models in four and higher dimensions. However, in some cases it occurred that even after the integrability of a system was evidenced, some difficulties arise which do not allow the authors to develop some effective methods for constructing of solutions. The present survey includes some remarks concerning the history of discoveries of some of the well known solution generating methods, brief descriptions of various approaches and their scopes as well as some comments concerning the possible difficulties of generalizations of various approaches to more complicate (symmetry reduced) gravity models and possible ways for avoiding these difficulties.

3. *G.A. Alekseev, "Reply to F.J.Ernst, V.S.Manko and E.Ruiz "On interrelations between Sibgatullin's and Alekseev's approaches to the construction of exact solutions of the Einstein-Maxwell equations" (2010 J.~Phys.: Conf. Ser. {\bf 229} 012050)", submitted to J.Phys.A; Preprint: arXiv:1008.2787v1 [gr-qc] 16 Aug 2010 (16 pages)*
Abstract The necessity of this Comment was invoked by numerous mistakes, erroneous discussions and misleading citations curiously collected in the paper of F.J.Ernst, V.S.Manko and E.Ruiz and concerning the interrelations between two integral equation methods developed for solution of Einstein - Maxwell equations more than twenty five years ago. At first, we clarify the origin of the errors in the paper of F.J.Ernst, V.S.Manko and E.Ruiz which gave rise to so curious authors "conclusions" as that the monodromy transform integral equations "...are simple combinations of Sibgatullin's integral equations and normalizing conditions..." or even

that ”...in the electrovac case Alekseev’s integral equations are erroneous...”. In the Comment, the way of correct derivation of Sibgatullin’s reduction of the Hauser and Ernst integral equations in the context of the monodromy transform approach is briefly outlined. In response to various speculations and priority claims collected in the section 3 of the F.J.Ernst, V.S.Manko and E.Ruiz paper, the concrete references are given here to the papers which were ignored completely by these authors and which show that the so called ”extended electrovacuum N-soliton solutions” considered by E.Ruiz, V.S. Manko and J. Martin in 1995, are not new because all these solutions are the particular cases of a larger class of solutions constructed much earlier in explicit (determinant) form using the monodromy transform equations, and that the real story of construction of the solution for superposition of fields of two Reissner - Nordstr¨om sources and of corresponding equilibrium configurations found in our papers with V.Belinski differs crucially from that, which one can read in the paper of F.J.Ernst, V.S.Manko and E.Ruiz.

Visits: 1. Pescara: 22.06.2010-23.06.2010
2. IHES (Paris, France): 20.09.2010 – 30.09.2010

Conferences and seminars:
1. "Nonlinear Physics. Theory and Experiment VI", Gallipoli (Leece, Italy) from June 23 to July 3, 2010.
Talk: G.A.Alekseev, "Einstein-Maxwell solitons and aspects of black hole dynamics in external gravitational and electromagnetic felds" (30 min)

2. IHES, Séminaires sur les aspects théoriques et expérimentaux de la gravitation,
Talk: G.A.Alekseev, “Monodromy transform approach to solution of integrable reductions of Einstein's field equations in General Relativity and String gravity” (1h)

Bini Donato

Position: Reasercher at Istituto per le Applicazioni del Calcolo, "M. Picone"
CNR Viale Manzoni, 30 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 quadrupolar structure), gravitational perturbations, gravitational waves.
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 many students at the University of Rome "La Sapienza", since 1995:
G. Spoliti, A. Merloni, C. Germani, C. Cherubini, G. Miniutti, G. Cruciani, A. Geralico, A. Lunari, M. De Mattia.

Ph.D thesis supervision

Dr. V. Montaquila, Physics departments of the University of Naples "Federico II."

Other Teaching Duties

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, post-doc student at the University of Rome "La Sapienza."

III Service activities

Scientific collaboration with:
Prof. R. Ruffini (University of Rome, Italy and ICRANet);
Prof. R.T. Jantzen (Villanova Univesity, USA and ICRANet);
Prof. S. Filippi (University Campus Biomedico, Rome, Italy and ICRANet).
Dr. C. Cherubini (University Campus Biomedico, Rome, Italy and ICRANet).

Outside ICRANet

Scientific collaboration with:
Prof. F. de Felice (University of Padova, Italy);

Prof. L. Lusanna (INFN Florence, Italy);
Prof. P. Fortini (University of Ferrara);
Dr. A. Ortolan (INFN Legnaro, Padova);
Prof. O. Semerak (University of Prague);

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

2010 List of Publications
Published papers
Bini D., C. Cherubini, S. Filippi, A. Gizzi and P. E. Ricci
On the universality of spiral waves
Communications in Computational Physics (CiCP), vol. 8, pp. 610-622, 2010

Bini D., Geralico A., Kerr R.P.
The Kerr-Schild ansatz revised
International Journal of Geometric Methods in Modern Physics (IJGMMP)
vol.7, 693-703, 2010

Bini D., Geralico A.
Spinning bodies and the Poynting-Robertson effect in the Schwarzschild spacetime
Classical and Quantum Gravity, vol. 27, 185014, 2010.

Bini D., C. Cherubini, S. Filippi, Geralico A.
Effective geometry of the n=1 uniformly rotating self-gravitating polytrope
Physical Review D, vol. 82, 044005 2010

Bini D., Geralico A., Jantzen R. T.
Spin-geodesic deviations in the Schwarzschild spacetime
General Relativity and Gravitation, to appear, 2010

De Felice F., Bini D.
Classical Measurements in Curved Space-Times
Series: Cambridge Monographs on Mathematical Physics, Cambridge, UK, 2010

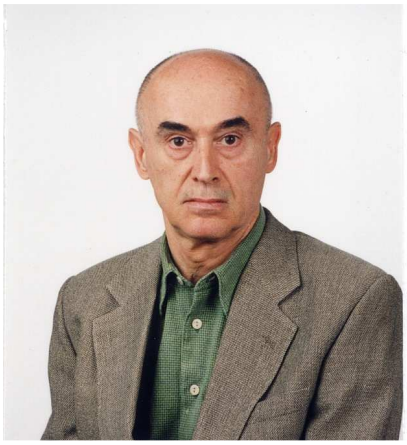
Bini D., Geralico A., Jantzen R.T.
Fermi coordinates in Schwarzschild spacetime: closed form expressions
General Relativity and Gravitation, submitted, 2010.

Gizzi A., Bernaschi M., Bini D., Cherubini C., Filippi S., Melchionna S., Succi S.
Three-band decomposition analysis of wall shear stress in pulsatile flows
Physical Review E, submitted, 2010.

Bini D., Geralico A., Jantzen R. T., Semerak O. and Stella L.

The general relativistic Poynting-Robertson effect II: A photon flux with nonzero angular momentum Classical and Quantum Gravity, submitted, 2010.

Boccaletti Dino



Position: Formerly Professor of Celestial Mechanics
University of Rome "La Sapienza"
Period covered: 1987- 2008

I Scientific Work
Researches in the field of Physics of Elementary particles (in the first period), Theoretical Astrophysics, Theory of the gravitational waves, Stellar Dynamics, Celestial Mechanics, Mathematical Physics. The relevant papers are published on Nature, Nuovo Cimento B, Physical Review D, Astronomy & Astrophysics, Celestial Mechanics & Dynamical Astronomy. An aside activity has regarded the history of Astronomy.

II Conferences and educational activities
In the last years communications at meetings on General Relativity and Celestial Mechanics

Work With Students
In the last twenty years many students have been aided at the beginning of their researches on topics of Celestial Mechanics and someone supervised until the doctorate

Diploma thesis supervision
Since 1987 about 70 thesis on topics of Celestial Mechanics

Other Teaching Duties
Member of the "Collegio Docenti" of the "Dottorato in Astronomia" at the University of Rome "La Sapienza" until October 31th 2007. Member of the Faculty of the IRAP PhD until October 31th 2008.

Work With Postdocs
Researches in collaboration.
The latest postdoc is still involved in researches in collaboration (application of the technique of the normal forms to the study of galactic potentials).

III Service activities
Within ICRANet
No direct service activities but collaboration in some occasion regarding topics of research of mutual interest

IV Other
Member of IAU (International Astronomical Union)
• Commission 7 (Celestial Mechanics & Dinamical Astronomy)
• Commission 41 (History of Astronomy)
Member of SAIT (Società Astronomica Italiana)

2010 List of Publications

- Motion in Minkowski Space-Time, Dino Boccaletti, Francesco Catoni, Roberto Cannata, Paolo Zampetti, Vincenzo Catoni (Springer- Verlag, book in press)

- Quando gli astronomi consultavano la Sphaera, Dino Boccaletti
  Sapere, N. 5 Ottobre 2010, pp. 76-85

Filippi Simonetta

Position: Associate Professor (Fis/02) in Theoretical Physics.
Integrated Center for Research and
Vice-Dean, Biomedical Engineering faculty,
University "Campus Bio-Medico",
Via A. del Portillo 21, I-001285 Rome, Italy,
Tel. +39-06-225419611
Email: s.filippi@unicampus.it
Affiliated of the American Physical Society and of the Italian Physical society

Curriculum Vitae

Education

Laurea Diploma in Physics, University of Rome "La Sapienza," (with highest honors), 1982.
Thesis title: "Formation of self-gravitating systems in Relativistic Cosmology and in Newtonian approximation."

Professional Experiences

[2010] Visiting Professor, Biosciences Department, Cornell University, USA
[2003-today] Associate Professor in Theoretical Physics, University Campus Bio-Medico of Rome.
[1999] Researcher in Physics University Campus Bio-Medico of Rome, Italy.
[1997] Reviewer "Kluwer academic publishers," (ed. Prof. J. E. Dyson.).
[1996-99] Expert on Theoretical Physics Department of Physics, University of Rome "La Sapienza,".
[1993-99] Assistant Professor of Physics University Campus Biomedico of Rome, Italy.
[1993-96] ASI grant.
[1993-96] Research Leader ICRA Project on "Structure and Morphology of galaxies," (CEE grant),.
[1990-93] Research Assistant Department of Physics, University "La Sapienza," Rome.
[1990] Visiting Researcher Harvard-Smithsonian Center for Astrophysics (Harvard University-Boston),University of Chicago
[1989-97] Researcher ICRA,
[1987-90] ICRA: International Center for Relativistic Astrophysics, Rome.
[1985-86] High-school professor, Liceo Classico, Naples.
[1984-86] Research Fellow Astronomical Observatory of Capodimonte (Naples),
[1983-84] Assistant Professor of Physics Department of Mathematics, Catholic University, Brescia, Italy,

I. Scientific activities

- Physics of self-gravitating systems
- Effective geometries in fluids
- Nonlinear dynamics and complex systems in Biology
- Relativistic Astrophysics and Cosmology

Teaching Duties

1) Engineering Faculty (University Campus Biomedico)
Reader: Dynamics of Complex Systems
Reader: Mechanics and Thermodynamics
2) Medicine Faculty (University Campus Biomedico):
Coordinator of the courses of Physics for Medicine,Nursing and Dietology.
3) Reader of IRAP PhD

4) Reader and examiner at University La Sapienza of Rome for the course of Theoretical Physics II.

Participation to Conferences

- 5th International Workshop on Cardiac Mechano-Electric Feedback and Arrhythmias, Oxford (GREAT BRITAIN)
- Joint SIAM/RSME-SCM-SEMA Meeting Emerging Topics in Dynamical Systems and Partial Differential Equations DSPDEs'10 May 31st, – June 4th, 2010, Barcelona, Spain 2010
- 4th International Symposium on Modelling of Physiological Flows, Chia Laguna (ITALY) 2010
- 12th Marcel Grossman Meeting, Paris 2009.
- Cardiac MEF and Arrhythmias Conference, Oxford, UK 2007.
- 10th Italian-Korean Symposium on Relativistic Astrophysics in Pescara, Italy, 2007.
- Cardiac Dynamics Kavli Institute for Theoretical Physics, University of Santa Barbara, California, 2006.
- Bego scientific Rencontres, Nice, France 2006.
- COMSOL Users Conference, Milan, Italy 2006.
-COMSOL Italian Multiphysics Meeting, Milan Italy, 2005.
- Russian-Italian Lifshitz-Zeldovich Meeting on Relativistic Astrophysics, Pescara, Italy, 2005.
- Vip guest at Stanford University for the Gravity Probe B launch mission.2004.
- YALE COSMOLOGY WORKSHOP on The shapes of galaxies and their halos, communication: "A General Theory of self-gravitating Systems: Shapes of Astronomical Objects", 2001.
- Member of Scientific Organizing Committee "Fermi and Astrophysics", 2001.
-"Ninth Marcel Grossmann Meeting" University of Rome "La Sapienza", communications: "Equilibrium Solutions for Self-Gravitating Polytropic Systems"
- "Functional Method to solving the Euler Equation for Self-Gravitating Systems", 2000.
- International Meeting on Normal galaxies at high and low red-shift. Structure, Dynamics and Evolutions, Accademia Nazionale dei Lincei (Rome, Italy) , communication: "Inhomogeneous self-gravitating, rotating toroidal sequences," 1997.
-"Eighth Marcel Grossmann Meeting" (Hebrew University, Jerusalem, Israel), communications: "Landau damping of fermions perturbations in an expanding universe," "Toroidal solutions to the problem of inhomogeneous rotating gravitational systems," 1997.
-"Italian - Korean meeting on relativistic astrophysics," (Italy), invited talk: "The n-th order Virial Theory," 1995.
-"Seventh Marcel Grossmann Meeting," Stanford University (USA), communication: "The Landau damping in semi-degenerate gravitating systems," 1994.
-International Meeting on Structures in Early-Type Galaxies, Accademia Nazionale dei Lincei (Rome, Italy) , communication: "Landau damping in galactic systems," 1992.
-International Meeting on Dynamics of Elliptical Galaxies, Accademia Nazionale dei Lincei (Rome, Italy) , communication: "Relations between observed quantities and parameters of galactic models," 1991.
-"Sixth Marcel Grossmann Meeting," (Kyoto, Japan) communication on "Dynamical Equilibrium and Stability of Rotating Masses," 1991.
-International Meeting on Dynamics of Galaxies, Accademia Nazionale dei Lincei (Rome, Italy) , communication: "Nonlinear Velocities in Ellipsoidal Figures of equilibrium," 1990.
-International Meeting on Dynamics of Galaxies, Accademia Nazionale dei Lincei (Rome, Italy) , communication: "Observable properties of generalized Riemann ellipsoids and their application to elliptical galaxies", 1989.
-"Italian - Soviet Symposium on Cosmology and Relativistic Astrophysics" (Estonia), invited talk: "Generalized Riemann ellipsoids," 1989.
-"Italian - Korean meeting on relativistic astrophysics", (Rome, Italy), invited talk: "Non-linear Dedekind-Riemann sequences," 1989.
-International Meeting on Internal Dynamics of Galaxies, Accademia Nazionale dei Lincei (Rome,Italy), invited talk: "New class of rotating, anisotropic and inhomogeneous models of elliptical galaxies based on the tensor virial theorem," 1988.
-"Fifth Marcel Grossmann Meeting," Perth (Australia), communication on "Equilibrium of triaxial self-gravitating ellipsoid with rotation and anisotropic pressure," 1988

-Equatorial School of Relativistic Astrophysics, CIF (Centro Internacional de Fisica), Bogotà (Colombia), communication on "Processes of clustering in Friedmann cosmology", 1984.
-Varenna Physics School on "Gamow Cosmology": communication on "The Capture of Particles in an Einstein-Straus Universe", 1982.

Work With Postdocs
The main collaboration of Prof. Filippi with ICRANET postdocs has been with Dr Andrea Geralico, in relation with perturbation theory in effective geometries occurring in uniformly rotating self gravitating classical fluids.

II. Service activities
Prof. Filippi has a longstanding collaboration with other ICRANET scientists. In particular in collaboration with Dr Donato Bini, Dr Christian Cherubini and Prof. Remo Ruffini she has written plenty articles in various areas of Astrophysics, hydrodynamics and complex systems in Nature.

2010 List of Publications

A. PUMIR S. SINHA, S. SRIDHAR, M. ARGENTINA, M. HORNING, S. FILIPPI, C. CHERUBINI, S. LUTHER and V. KRINSKY "Wave-train-induced termination of weakly anchored vortices in excitable media". Phys Rev E, 81; 010901 (2010).

A. GIZZI, C. CHERUBINI, S. MIGLIORI., R. ALLONI., R. PORTUESI and S. FILIPPI. "On the electrical intestine turbulence induced by temperature changes". Phys. Biol., 7; 16011-1(2010).

C. CHERUBINI and S. FILIPPI " Boundary Conditions for Scattering Problems from Acoustic Black Holes". Journal of Korean Physical Society, 56; 1668 (2010)

D. BINI, C. CHERUBINI, S. FILIPPI, A GIZZI and P.E. RICCI, "On spiral waves arising in natural systems". Comm. Comput. Phys., 8; 610 (2010).

D. BINI, C. CHERUBINI, S. FILIPPI, and A. GERALICO "Effective geometry of the n=1 uniformly rotating self-gravitating polytrope" , Phys. Rev. D, 82; 044005 (2010).

Chapters on Volumes:
Cherubini C., Filippi S, Nardinocchi P and Teresi L. ""Electromechanical Modelling of Cardiac Tissue". in: Kamkin A. and Kiseleva (Editors). Mechanosensitivity of the Heart. vol. 3, p. 421-449, BERLIN: Springer, (2010)

Hyun Kyu, Lee

Position: Professor
Period covered: July 4, 2010 – July 25, 2010

Conferences and educational activities

Conferences and Other External Scientific Works
"Structure of Compact Stars with Dense Hadronic Matter at the Core," 2nd Galileo-Xu Guangqi Conference, Ventimiglia, Italy, July 12 - 16, 2010.

Discussions on the Korea-ICRANET

2010 List of Publications
Effective Action of QED in Electric Field Backgrounds II. Spatially Localized Fields" (with S.P. Kim, Y. Yoon), Physical Review D 82, 025015(2010)

Nonperturbative QED Effective Action at Finite Temperature" (with S.P. Kim, Y. Yoon), Physical Review D 82, 025016(2010)

"Dilatons for dense hadronic matter" (with M. Rho), Nuclear Physics A 844(2010)

Pair Production of Majorana Neutrinos by Annihilaton of Charged Particles in High Energy Collision" (with Y. Goh, W-G. Paeng, Y. Yoon), J.Korean Phys. Soc. 56, 6(2010)

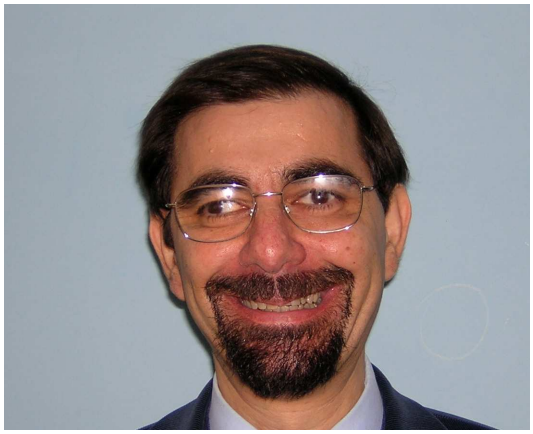
Lee Chul Hoon

Position: Visiting Scientist
Period covered: 4-18, July 2010

Conferences and educational activities
The 2nd Galileo-XuGuangqi Meeting (Ventimiglia, Italy; 11-16, July 2010)

2010 List of Publications
"Instanton solutions mediating tunneling between the degenerate vacuua in curved space"
Bum-Hoon Lee, Chul H. Lee, Wonwoo Lee and Changheon Oh
Phys. Rev. D82, 024019 (2010)

Montani Giovanni



Position: ENEA Researcher displaced at ICRANet
Period covered: 2005/10

I Scientific Work
Fundamental General Relativity, Quantum Gravity, Extra-dimensional physics, Early Cosmology, Plasma Physics

II Conferences and educational activities (2009)

Work With Students
Coordination of a research group within ICRANet on Cosmology, Gravity and Multidimension.
The group is constituted by post-docs, PhD and undergraduates students, and it produces around 10/15 publications per year.

Diploma thesis supervision
4 undergraduate students during 2010 only.

Other Teaching Duties
Lecturer for the "Primordial Cosmology" class.

2010 List of Publications

R. Benini and G. Montani, "2-D MHD configurations for Accretion Disks around Magnetized Stars", in *Proceedings of the XII Marcel Grossmann Meeting on General Relativity*, Paris (2009).

V. Lacquaniti, G. Montani and D. Pugliese, "Effective potential approach to the motion of massive test particles in Kaluza-Klein gravity", in *Proceedings of the XII Marcel Grossmann Meeting on General Relativity*, Paris (2009).

V. Lacquaniti, G. Montani and D. Pugliese, "Massive test particles motion in Kaluza-Klein gravity", *General Relativity and Gravitation*, 104 (2010).

R. Belvedere, M.V. Battisti, G. Montani, "Quantum suppression of weak Universe anisotropy", in *Proceedings of the XII Marcel Grossmann Meeting on General Relativity*, Paris (2009).

N. Carlevaro and G. Montani, "Gravitational Instability in Presence of Bulk Viscosity: the Jeans Mass and the Quasi-Isotropic Solution", in *Proceedings of the XII Marcel Grossmann Meeting on General Relativity*, Paris (2009).

F. Cianfrani and G. Montani, "On the Removal of Time-Gauge in Loop Quantum Gravity, with and without Matter", in *Proceedings of the XII Marcel Grossmann Meeting on General Relativity*, Paris (2009).

M.Lattanzi and G. Montani, "A Separable Solution for the Oscillatory Structure of Plasma in Accretion Disks", *Europhysics Letters* 89, 39001 (2010).

V.Lacquaniti, G.Montani, "Restated dynamics for particles and field in a 5D framework", in *Proceeding of XII Marcel Grossmann Meeting*, July 2009, Paris.

V.Lacquaniti, G.Montani, F. Vietri, " Geodesic deviation on a Kaluza-Klein background", in *Proceeding of XII Marcel Grossmann Meeting*, July 2009, Paris.

V.Lacquaniti, G.Montani, D. Pugliese, R. Ruffini, "Effective potential approach to the motion of massive test particles in Kaluza-Klein gravity", in *Proceeding of XII Marcel Grossmann Meeting*, July 2009, Paris.

G. Montani and R. Benini, "Crystalline Structure of Accretion Disk: Features of the Global Model" Submitted to *Physical Review E*

G. Montani and R. Benini, "Viscoresistive MHD configurations of plasma in accretion disks", *General Relativity and Gravitation*, 1 (2010).
R. Benini, M. Lattanzi and G. Montani "Signatures of the neutrino thermal history in the spectrum of primordial gravitational waves", *General Relativity and Gravitation*, 99 (2010).

M.Lattanzi, G. Montani and R. Benini, "A possible signature of cosmic neutrino decoupling in the nHz region of the spectrum of primordial gravitational waves", *Classical and Quantum Gravity* **27**:4008 (2010).

R. Benini and G. Montani, "The last ten years of the Mixmaster model" *XII Marcel Grossmann Meeting*, Parigi 12-19 Luglio 2009

M. Lattanzi, G. Montani and R. Benini, "On the Propagation of Gravitational Waves across the Universe: Interaction with the Neutrino Component", *XII Marcel Grossmann Meeting*, Parigi 12-19 Luglio 2009

G. Montani and R. Benini, "2-D MHD Configurations for Accretion Disks around Magnetized Stars", *XII Marcel Grossmann Meeting*, Parigi 12-19 Luglio 2009

F. Cianfrani, G. Montani, M. Muccino, ``Semi-Classical Isotropization of the Universe during a de Sitter phase '', *Phys. Rev. D*, in press, arXiv:1010.5090.

F. Cianfrani, G. Montani, ``Shortcomings of the Big Bounce derivation in Loop Quantum Cosmology'', *Phys. Rev. D*, **82**, 021501(2010), arXiv:1006.1814.

F. Cianfrani, G. Montani, ``Gravity in presence of fermions as a SU(2) gauge theory '', *Phys. Rev. D*, **81**, 044015(2010), arXiv:1001.2699.

F. Cianfrani, O.M. Lecian and G. Montani, "Fundamentals and recent developments in non-perturbative canonical Quantum Gravity", submitted to *Gen. Rel. Grav.*

O.M. Lecian, G. Montani and N. Carlevaro, "Spinor interactions and non-Riemannian geometry", submitted to *IJMPD*

Perez Bergliaffa Santiago Esteban

Position: Professor – Department of Theoretical Physics
Institute of Physics, University of the State of Rio de Janeiro (Brazil).

I Scientific Work

I work in Gravitation, Cosmology, and Classical Field Theory, in four main lines: f(R)-theories (Cosmology and Black Holes), Inhomogeneous Cosmologies, Bouncing Universes, and Effective Metric in Nonlinear Field Theories.
My CV is available at http://lattes.cnpq.br/2925938973363409

II Conferences and educational activities

Conferences and Other External Scientific Work

- "Black Holes", short course (in portuguese) at the Universidade Federal da Amazônia (UFAM), in November 2009. This course is part of the itinerant Program of Cosmology, Relativity, and Astrophysics, organized by Icra/Brasil.
- "Aplicaciones de GRTensor en Astrofísica y Cosmología", 1-week course delivered at the Observatório de La Plata, Universidad Nacional de La Plata (in spanish), in March 2010.
- Member of the Organizing Committee of the XIV Brazilian School of Cosmology and Gravitation, held at Mangaratiba (State of Rio de Janeiro, Brazil) from August 30 to September 11, 2010.
- "An overview of f(R) theories", seminar delivered at the XIV Brazilian School of Cosmology and Gravitation.
- "Static and Spherically Symmetric Black Holes in f(R) theories", talk given at the 9th International Conference on General Relativity and Gravitation (GR19) held in Mexico City in July 2010.
- 15- day visit to the Department of Physics of the Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV), to collaborate with Prof. Nora Bretón, in the area of Non-Linear Electromagnetism.
- "La métrica efectiva y sus aplicaciones"(in spanish), colloquium given at the Department of Physics of the CINVESTAV), Mexico City (July 2010).

Diploma thesis supervision

- Marcio Oliveira Pinheiro, Msc student (at DFT/UERJ), working in wave propagation in generalized gravitational theories (Advisor).
- Claudia Isabel Azucena P. Rivasplata, PhD student (at the Brazilian Center for Research in Physics), working in applications of the effective metric (Co-advisor).
- Florencia Anabella Teppa Pannia, PhD student of the Observatory of La Plata, (Argentina), working in inhomogeneous cosmological models (Advisor).

Other Teaching Duties

During this period I taught several courses at the graduate level in the University of the State of Rio de Janeiro, and I delivered the course "Gravitation", at the PhD level.

Other

- The Agreement between ICRANet and the University of the State of Rio de Janeiro, was signed by the President of the University, Prof. Ricardo Vieiralves, and Prof. Remo Ruffini in 2009. The details of the implementation of the Agreement will be specified in an Addendum, on which I am working along with the University personnel.

- Vice-Director of the Post-graduation Program of the Institute of Theoretical Physics of the University of the State of Rio de Janeiro (from March 2010 to September 2011).

2010 List of Publications

- Author of the chapter "Black Holes" in the book Programa Minimo de Cosmologia (in portuguese), published in Brazil by Editora Jauá (2010).
- Co-Editor of the book Programa Minimo de Cosmologia (in portuguese), published in Brazil by Editora Jauá (2010).

Sang Pyo Kim

Position: Professor of Physics, Kunsan National University, Kunsan 573-710, Korea
Period covered: July 4-July 28, 2010

I. Scientific Work

1. attended the 2nd Galileo-XuGungQi Meeting and chaired two sessions.
2. discussed with Drs S-S. Xue and also G Vereshchagin on QED problems in strong background electric fields and related problems and exchanged information for future research.
3. discussed QED effect on the polarization of CMB and planned to write paper(s) on this issue in the near future, which is still in progress.
4. have done part of the following paper and acknowledged Prof. Ruffini and ICRANeT

arXiv:1008.0577 [pdf, ps, other]
Title: Vacuum Structure of de Sitter Space
Authors: Sang Pyo Kim (Kunsan Nat'l Univ.)
Comments: LaTex 16 pages, no figure
Subjects: High Energy Physics - Theory (hep-th); General Relativity and Quantum Cosmology (gr-qc)

II. Conferences and educational activities

Conferences and Other External Scientific Works
Attended the 2nd Galile-XuGuang Qi Meeting and chaired two sessions.

2010 List of Publications

1. Sang Pyo Kim (2010), ``The Stokes Phenomenon and Quantum Tunneling for de Sitter Radiation in Nonstationary Coordinates,'' Journal of High Energy Physics, JHEP09(2010)054.

2. Sang Pyo Kim, Hyun Kyu Lee and Yongsung Yoon (2010), ``Nonperturbative QED effective action at finite temperature,'' Physical Review D82, 025016.

3. Sang Pyo Kim, Hyun Kyu Lee and Yongsung Yoon (2010), ``Effective action of QED in electric field backgrounds. II. Spatially localized fields,'' Physical Review D82, 025015.

4. Sang Pyo Kim (2010), ``Strong Scalar QED in Inhomogeneous Electromagnetic Fields,'' Journal of Korean Physical Society 56, 1624-1632 [Proceedings].

Kim Sung-Won

Position: Professor in Ewha Womans University, Seoul, Korea
Period covered: Since 1985

I. Scientific Work

2010 List of Publications

1. Sung-Won Kim, Zerilli-type Perturbation of Traversable Wormhole, Journal of the Korean Physical Society, Vol. 56, No. 5, May 2010, pp. 1644-1648.

2. Sung-Won Kim, Dark Energy Accretion onto a General Wormhole in the Friedmann- Robertson- Walker Universe, Journal of the Korean Physical Society, Vol. 57, No. 3, September 2010, pp. 660-663.

3. Soon-Tae Hong and Sung-Won Kim, Hydrodynamics and Global Embeddings of Taub-NUT Spacetime, Journal of the Korean Physical Society, Vol. 56, No. 5, May 2010, pp. 1633-1637.

4. Sung-Won Kim and Wan-Seon Kim, Study for the Leadership Qualities of International WYP 2005 Young Physics Talent, New Physics: Sae Mulli , Volume 60, Number 9, 2010 , pp. 952-959.

5. Miyoung Cho, Kongju Mun, and Sung-Won Kim, The Development and Application of evaluating Standards for Creative Problem Solving Items, The Journal of Curriculum and Evaluation, 2010, Vol. 13, No. 2, pp. 309 ~ 333.

6. Sung-Youn Choi, Sung-Won Kim, An Exploration of the Influencing Factors and Development of Effective Models of Science Teacher Efficiency, J Korea Assoc. Sci. Edu, Vol. 30, No. 6, pp. 693-718(2010. 10)

7. Miyoung Cho, Jiyoung Jang, Jungsook Yoo, Sung-Won Kim, and Hyunju Lee, Analysis of questioning used in science classes based on teaching and learning purposes and processes: Two case studies, J. of Learner-Centered Curriculum and Instruction, Vol. 10, No. 2, pp. 408-428 (2010).

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

1. Korean Physical Society Spring Meeting, April 20, 2010, Daejeon, Korea.
2. Korean Physical Society Fall Meeting, October 20-22, 2010, Pyeongchang, Korea.
3. Classical and Quantum Cosmology Workshop, May 7 – June 5, 2010, Kyoto, Japan.
4. 2nd Galilei-Xu Guanqi Meeting, July 14 -17, Ventimiglia, Italy.
5. 2010 NARST Meeting, April 21-24, Philadelphia, PA, USA.
6. 2010 Petrov Anniversary Meeting on GRG, Nov. 1- 6, Kazan, Russia.

II b. Work With Students

Research on Physics (Astrophysics) and Science Education

II c. Diploma thesis supervision

3 Master Degree Students 1 PhD Student

II d. Other Teaching Duties

Sabbatical Year

II e. Work With Postdocs

Work on Science Education with 2 Postdocs.

III. Service activities

Outside ICRANet

1. Chair of Korean Physics Olympiad Committee (KPS)
2. President of Korean Society for School Science (KOSSS)

Vissani Francesco

Position: Senior INFN researcher.
Head of Gran Sasso Theory group since 2006.
ICRANet lecturer since October 2009
Period covered: 2009-2010

Scientific Interests
Models of neutrino signal from gravitational collapse. Connection with gravity wave search.
Very high energy neutrinos from supernova remnants. Phenomenology of extensions of the standard model of elementary particles.

Conferences and educational activities

Conferences in 2010
May: Frontier Objects in Astrophysics and Particle Physics (Vulcano 2010 Workshop) Vulcano, Italy; talk on What is the Issue with SN1987A Neutrinos?

June: Organization of the meeting in honor of G. Senjanovic The Joy of Making Physics (Goranfest) at Split, Croatia.

July: The sun, the stars, the universe and general relativity (second Galileo-Xu Guangqi meeting), Ventimiglia, Italy; talk on Progresses in Neutrino Astronomy.

September: National meeting of the Italian Physics Society (SIF) Bologna, Italy: talk on High Energy Neutrino Astronomy: From the Hope for Surprises to Predictions.

October: Second PHYSUN Workhop, LNGS, Italy: Summary talk.

Work with students

Advisor of Giulia Pagliaroli. PhD thesis on supernova neutrinos, defended with success on April 2009 at L'Aquila University. Since December 2009, Giulia joined the theory group of Gran Sasso with a postdoc contract.

Advisor of Andrea Lami, Rome 3 U., for a diploma thesis on electroweak reactions.

Collaborates with Fernando Rossi Torres, PhD student at Campinas University, Brazil on supernova data analysis and neutrino mass studies.

Collaborates with Maria Laura Costantini, ICRANet, Pescara, on neutrinos from SN1987A.

Collaborates with Narek Sahakyan, ICRANet, Pescara and Rome U., on high energy neutrinos and gamma rays.

Other commitments

SIF referent person at LNGS since 2009.

Coordinator for LNGS of the Virgo-EGO Science Forum (VESF) since April 2009.
Member of the scientific committee for the ICRANet-INFN agreement.

INFN representative in the Science Advisory Committee of ApPEC/ASPERA.

List of Scientific Works

SIGNALS OF LEFT-RIGHT SYMETRY IN ACCELERATORS AND LOW ENERGY LEPTONIC PROCESSES.
V. Tello, M. Nemevsek, F. Nesti, G. Senjanovic, F. Vissani.
Submitted for publication.

THE DIFFUSE SUPERNOVA NEUTRINO BACKGROUND: EXPECTATIONS AND THEORETICAL UNCERTAINTIES FROM SN1987A.
F. Vissani, G. Pagliaroli.
Submitted for publication.

ON THE PROSPECTS FOR HIGH-ENERGY GALACTIC NEUTRINO ASTRONOMY.
F. Vissani, F. Aharonian, N. Sahakyan.
Submitted for publication.

WHAT IS THE ISSUE WITH SUPERNOVA NEUTRINOS?
F. Vissani, M.L. Costantini, A. Ianni, G. Pagliaroli.
Proc. of the Vulcano 2010 workshop.

USING SUPERNOVA NEUTRINOS TO MONITOR THE COLLAPSE, TO SEARCH FOR GRAVITY WAVES AND TO PROBE NEUTRINO MASSES.
F. Vissani, G. Pagliaroli, F. Rossi-Torres.
Proc.of the 1st Galileo – Xu Guangqi meeting.

NEUTRINO MASS BOUND IN THE STANDARD SCENARIO FOR SUPERNOVA ELECTRONIC ANTINEUTRINO EMISSION.
Giulia Pagliaroli, Fernando Rossi-Torres, Francesco Vissani.
Astropart. Phys. 33 (2010) 287.

SEARCHING FOR PROMPT SIGNATURES OF NEARBY CORE-COLLAPSE SUPERNOVAE BY A JOINT ANALYSIS OF NEUTRINO AND GRAVITATIONAL-WAVE DATA.
Isabel Leonor et al., including Francesco Vissani.
Class. Quant. Grav. 27 (2010) 084019.

ON THE GOALS OF NEUTRINO ASTRONOMY.
F. Vissani, G. Pagliaroli, F.L. Villante.
Nuovo Cim. C32 (2009) 353.

COSMIC RAYS AND NEUTRINOS FROM SUPERNOVA REMNANTS FROM VHE GAMMA RAY DATA.
F.L. Villante, F. Vissani.
Nucl.Phys.Proc.Suppl. 188 (2009) 261.

NEUTRINI DALLO SPAZIO (in Italian)
G. Pagliaroli, F.L. Villante, F. Vissani.
Nuovo Saggiatore 25, no.3-4 (2009), 5-19.

THE LIKELIHOOD FOR SUPERNOVA NEUTRINO ANALYSES.
A. Ianni, G. Pagliaroli, A. Strumia, F.R. Torres, F.L. Villante, F. Vissani.

Phys.Rev.D80 (2009) 043007

NEUTRINOS FROM SUPERNOVAE AS A TRIGGER FOR GRAVITATIONAL WAVE SEARCH.
G. Pagliaroli, F. Vissani, E. Coccia, W. Fulgione.
Phys.Rev.Lett.103 (2009) 031102

IMPROVED ANALYSIS OF SN1987A ANTINEUTRINO EVENTS.
G. Pagliaroli, F. Vissani, M.L. Costantini, A. Ianni.
Astropart.Phys.31 (2009) 163

FEATURES OF KAMIOKANDE-II, IMB AND BAKSAN OBSERVATIONS AND THEIR INTERPRETATION IN A 2-COMPONENT MODEL FOR THE SIGNAL.
Francesco Vissani and Giulia Pagliaroli.
Astronomy Letters 35 (2009) 1.

Wiltshire David L.

Position: Senior Lecturer, Department of Physics & Astronomy,
University of Canterbury, Christchurch, New Zealand
Period covered: 29 July 2008 – 30 October 2008

I Scientific Work

Prof. Wiltshire completed work for two research papers during his three month visit to ICRANet. Both papers relate to his current program of investigating the possibility that effects attributed to dark energy and cosmic acceleration have their origin in a misidentification of gravitational energy gradients within the inhomogeneous structure of the universe, once structures form. This "radically conservative" solution to the problem of dark energy has begun to attract a reasonable amount of interest, and has already featured prominently in the popular press, with a cover feature in New Scientist in March, 2008.

2010 List of Publications

D.L. Wiltshire,
"Average observational quantities in the timescape cosmology",
Phys. Rev. D80 (2009) 123512.

D.L. Wiltshire,
"Gravitational energy as dark energy: Average observational quantities",
in Proceedings of the Invisible Universe Conference, eds. J.-M. Alimi and
A. Fuozfa, AIP Conf. Proc. 1241 (2010) 1182-1191.

D.L. Wiltshire,
From time to timescape - Einstein's unfinished revolution,
Int. J. Mod. Phys. D18 (2009) 2121-2134.

Benini Riccardo

Position: Post Doc
Period covered: 01/10/2009 - 30/09/2010

Member of the Examination Panel for the course "Cosmologia Primordiale" - Physics Dept c/o "Sapienza" University of Rome
Assistant to the course "Modelli e Metodi Matematici della Fisica" 2010 - Physics Dept c/o "Sapienza" University of Rome

2010 List of Pubblications

- Crystalline Structure of Accretion Disk: Features of the Global Model
  G. Montani and R. Benini.
  Summitted to *Physical Review E*

- Viscoresistive MHD configurations of plasma in accretion disks
  G. Montani and R. Benini
  General Relativity and Gravitation, 1 (2010).

- Signatures of the neutrino thermal history in the spectrum of primordial gravitational waves
  R. Benini, M. Lattanzi and G. Montani
  General Relativity and Gravitation, 99 (2010).

- A possible signature of cosmic neutrino decoupling in the nHz region of the spectrum of primordial gravitational waves
  M. Lattanzi, G. Montani and R. Benini
  Classical and Quantum Gravity **27**:4008 (2010).

Conference Proceedings

- The last ten years of the Mixmaster model
  R. Benini and G. Montani
  XII Marcel Grossmann Meeting, Parigi 12-19 Luglio 2009

- On the Propagation of Gravitational Waves across the Universe: Interaction with the Neutrino Component.
  M. Lattanzi, G. Montani and R. Benini
  XII Marcel Grossmann Meeting, Parigi 12-19 Luglio 2009

- 2-D MHD Configurations for Accretion Disks around Magnetized Stars
  G. Montani and R. Benini
  XII Marcel Grossmann Meeting, Parigi 12-19 Luglio 2009

Bernardini Maria Grazia

Position: Postdoctoral Research Fellow
(Assegnista di Ricerca)
Period covered: 2005 - 2010

I Scientific Work

- Analysis of GRB970228 as an example for GRBs characterized by an initial spikelike emission followed by a soft bump like e.g. GRB050724, GRB060614, identifying in this way a possible new class of GRBs whose peculiarities depend on their astrophysical setting.
- Study of the association between Gamma-Ray Bursts and Type Ib/c Supernovae, with particular interest toward the induced gravitational collapse phenomenon as a possible explanation for this association.
- Study of the X-ray flares in the context of the Fireshell model, assuming that they are produced in the interaction with an inhomogeneous CircumBurst Medium. Development of a 2-dimensional numerical code to account for the CBM distribution.
- Analysis of the X-ray afterglow of Gamma-Ray Bursts and interpretation of the X-ray flares in the context of internal and external shock models.

II Conferences and educational activities

Talks presented to international conferences:

- "The canonical GRB scenario: light curves and spectra" at *"The second Galileo-Xu Guangqi Meeting"*, Ventimiglia (Italy) and Nice (France), July 12-18, 2010.
- "How to get a flare out of a prompt pulse: let the time go" at the conference *"Deciphering the Ancient Universe with GRBs"*, Kyoto (Japan), April 19-23, 2010.
- "A complete analysis of GRB060607A within the fireshell model: prompt emission, X-ray flares and late afterglow phase" and "Collisions in the slowing down phase of the prompt emission" at the *"XII Marcel Grossman Meeting on General Relativity"*, Paris (France), July 12-18, 2009.
- "Collisions in the slowing down phase of the prompt emission" at the *"2nd Italian-Pakistani Workshop on Relativistic Astrophysics"*, Pescara (Italy), July 8-10, 2009.
- "GRB060607A: prompt emission and X-ray flares" at the*"6th Italian-Sino Workshop in Relativistic Astrophysics"*, Pescara (Italy), June 29 – July 1, 2009.
- "Preliminary analysis of GRB060607A and GRB060418 within the fireshell model" at the *"Probing Stellar Populations out to the Distant Universe"*, Cefalù (Italy), September 14-19, 2008.
- "The GRB classification within the fireshell model: short, long and fake short GRBs " at the *"3rd Stueckelberg Workshop on Relativistic Field Theories"*, Pescara (Italy), July 8-18, 2008.
- "Preliminary analysis of GRB060607A within the fireshell model" at the *"2008 Nanjing GRB Conference"*, Nanjing (China), June 23-27, 2008.
- "Testing the "Canonical GRB" Scenario" at the "2nd Kolkata Conference on the Observational Evidence for Black Holes in the Universe", Kolkata (India), February 10-17, 2008.
- "GRB970228 and a class of GRBs with an initial spikelike emission" at the *"4th Italian-Sino Workshop on Relativistic Astrophysics"*, Pescara (Italy), July 20-30, 2007.
- "A new interpretation of GRB970228" at the *"10th Italian-Korean Symposium on Relativistic Astrophysics"*, Pescara (Italy), June 25-30, 2007.
- "GRB970228: a prototype for a new GRB class" at the *"APS April Meeting"*, Jacksonville (USA), April 14-17, 2007.
- "GRB970228 as a prototype for Short GRBs with afterglow" at the *"Cesare Lattes Meeting on GRBs Black Holes and Supernovae"*, Mangaratiba (Brazil), February 25-March 3, 2007.

- "GRB970228 as a prototype for Short GRBs with afterglow" at the *"XII Brazilian School of Gravitation and Cosmology"*, Mangaratiba (Brazil), September 10-23, 2006.
- "GRB970228 as a prototype for Short GRBs with afterglow" and "Theoretical interpretation of luminosity and spectral properties of GRB980425" at the *"XI Marcel Grossmann Meeting on General Relativity"*, Berlin (Germany), July 23-29, 2006.
- "Theoretical model on Gamma-Ray Burst" at the *"IX Italian-Korean Symposium on Relativistic Astrophysics"*, Seoul (South Korea) – Mt. Kumgang (North Korea), July 19-24, 2005.

External Scientific Work:

- Postdoctoral research fellowship at "Osservatorio Astronomico di Brera".
- Collaboration with the *Swift* Italian Team.

Work With Students:

- Students of the IRAP-PhD program at University "La Sapienza", Rome, Italy: Letizia Caito, Maria Giovanna Dainotti, Gustavo De Barros, Roberto Guida, Luca Izzo, Barbara Patricelli, Luis Juracy Rangel Lemos.

PhD thesis supervision:

- 2009: Thesis advisor of the IRAP-PhD Degree Thesis by Barbara Patricelli at University "La Sapienza", Rome, Italy.
- 2010: Thesis advisor of the PhD student Elena Zaninoni at University of Padova, Padova, Italy.

III Service activities

Within ICRANet

- Member of the Local Organizing Committee for the "4th Italian-Sino Workshop on Relativistic Astrophysics" held in Pescara (Italy) on July 20-30, 2007.

Outside ICRANet

- Member of the Scientific Organizing Committee and Local Organizing Committee for the ICRA Weekly Seminars organized by the Physics Department of the University of Rome "La Sapienza"

2010 List of Publications

Publications in refereed journals

- Maria Grazia Bernardini, Raffaella Margutti, Guido Chincarini, Cristiano Guidorzi, Jirong Mao, *"Gamma-Ray Burst long lasting X-ray flaring activity"*, A&A (2010) accepted for publication.
- Raffaella Margutti, Maria Grazia Bernardini, Rodolfo Barniol Duran, Cristiano Guidorzi, Ronfen Shen, Guido Chincarini, *"On the average gamma-ray burst X-ray flaring activity"*, MNRAS (2010) accepted for publication.
- Raffaella Margutti, Cristiano Guidorzi, Guido Chincarini, Maria Grazia Bernardini, Frank Genet, Jirong Mao, Francesco Pasotti, *"Lag-Luminosity relation in Gamma-Ray Burst X-ray flares: a direct link to prompt emission"*, MNRAS 406 (2010) 2149-2167.
- Guido Chincarini, Jirong Mao, Raffaella Margutti Maria Grazia Bernardini, Cristiano Guidorzi, Francesco Pasotti, Demetrios Giannios, Massimo Della Valle, Alberto Moretti, Patrizia Romano, Paolo D'Avanzo, Giancarlo Cusumano, Paolo Giommi, *"Unveiling the origin of X-ray flares in gamma-ray bursts"*, MNRAS 406 (2010) 2113-2148.
- Letizia Caito, Lorenzo Amati, Maria Grazia Bernardini, Carlo Luciano Bianco, Gustavo De Barros, Luca Izzo, Barbara Patricelli, Remo Ruffini, *"GRB071227: an additional case of disguised short GRB"*, A&A 521 (2010) 80-84.

Caito Letizia

Position: Post-doctoral fellowship
Period covered: January 2010 – December 2010

I. Scientific Work

Theoretical analysis of the properties of both the prompt and the late afterglow phase of Gamma Ray Bursts (GRBs) presenting an initial hard, spikelike emission followed by a soft bump. Some crucial examples of this kind of GRBs are GRB 06014 and GRB 071227. This analysis has lead to the identification, within the Fireshell scenario, of a possible new class of GRBs whose peculiarities depend on their astrophysical setting.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

July 2010: "The Second Galileo-Xu Guangqi Meeting", Ventimiglia (Italy), July 11-16, 2010.
http://www.icranet.org/index.php?option=com_content&task=view&id=508&Itemid=686
Contributed: talk

February 2009: Irap-PhD Lectures, February 14-20, 2010, Nice, France.
http://www.icranet.org/index.php?option=com_content&task=view&id=513
Contributed: lecture

October 2009: "The First Galileo-Xu Guangqi Meeting", Shanghai (China), October 26-30, 2009.
http://www.icranet.org/index.php?option=com_content&task=view&id=399&Itemid=686
Contributed: talk

2010 List of Publications

Publications In Refereed Journals

Letizia Caito, Lorenzo Amati, Maria Grazia Bernardini, Carlo Luciano Bianco, Gustavo De Barros, Luca Izzo, Barbara Patricelli, Remo Ruffini,*"GRB071227: an additional case of disguised short burst*", A&A 521, A80 (2010).

Conference Proceedings

- Barbara Patricelli, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Gustavo De Barros, Luca Izzo, Remo Ruffini, "*Black holes in Gamma Ray Bursts*", in the Proceedings of *"Deciphering the ancint Universe with Gamma-Ray Bursts"*, in Kyoto, Japan, April 19-23, 2010, ed. N. Kaway and S. Nagataky, AIP Conf. Proc., 1279 (2010) 406-408.

- Luca Izzo, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Barbara Patricelli, Louis Juracy Rangel Lemos, Remo Ruffini, "*On GRB 080916C and GRB 090902B observed by the Fermi satellite*", in the Proceedings of *"Deciphering the ancint Universe with Gamma-Ray Bursts"*, in Kyoto, Japan, April 19-23, 2010, ed. N. Kaway and S. Nagataky, AIP Conf. Proc., 1279 (2010) 343-345

- Carlo Luciano Bianco, Maria Grazia Bernardini, Letizia Caito, Gustavo De Barros, Luca Izzo, Barbara Patricelli, Remo Ruffini, "*Disguised Short Bursts and the Amati relation*", in the Proceedings of *"Deciphering the ancint Universe with Gamma-Ray Bursts"*, in Kyoto, Japan, April 19-23, 2010, ed. N. Kaway and S. Nagataky, AIP Conf. Proc., 1279 (2010) 299-301.

- Barbara Patricelli, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Luca Izzo, Remo Ruffini, "*A new spectral energy distribution of photons in the fireshell model of GRBs*", in the Proceedings of "*The Shocking Universe – Gamma Ray Bursts and High energy Shock Phenomena*", in

San Servolo (Venice, Italy), September 14-18, 2009, ed. G. Chincarini, P. D'Avanzo, R. Margutti and R. Salvaterra. Conf. Proc. Vol. 102, (2010) 559.

- Luca Izzo, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Barbara Patricelli, Remo Ruffini, "*GRB090423 in the fireshell scenario*", in the Proceedings of "*The Shocking Universe – Gamma Ray Bursts and High energy Shock Phenomena"*, in San Servolo (Venice, Italy), September 14-18, 2009, ed. G. Chincarini, P. D'Avanzo, R. Margutti and R. Salvaterra. Conf. Proc. Vol. 102, (2010) 537.

- Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Luca Izzo, Barbara Patricelli, Remo Ruffini, "*The end of the prompt emission within the fireshell model*", in the Proceedings of "*The Shocking Universe – Gamma Ray Bursts and High energy Shock Phenomena"*, in San Servolo (Venice, Italy), September 14-18, 2009, ed. G. Chincarini, P. D'Avanzo, R. Margutti and R. Salvaterra. Conf. Proc. Vol. 102, (2010) 489.

- Letizia Caito, Maria Grazia Bernardini, Carlo Luciano Bianco, Maria Giovanna Dainotti, Roberto Guida, Remo Ruffini, *``GRB 060614: a preliminary result''*, JKPS 56 (2010) 1579-1582.

- Luca Izzo, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Barbara Patricelli, Remo Ruffini, *``GRB 090423 at redshift 8.1: a theoretical interpretation''*, JKPS 57 (2010) 551-556.

- Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Maria Giovanna Dainotti, Roberto Guida, Remo Ruffini, "*GRB 970228 in the "canonical GRB" scenario''*, JKPS 56 (2010) 1575-1578.

- Maria Giovanna Dainotti, Maria Grazia Bernardini, Carlo Luciano Bianco, Letizia Caito, Maria Roberto Guida, Remo Ruffini, "*The astrophysical trypthic: GRB, SN and URCA can be extended to GRB 060218?''*, JKPS 56 (2010) 1588-1593.

Cherubini Christian

Position: University Researcher (Fis/02) in Theoretical Physics.
Integrated Center for Research
Biomedical Engineering faculty,
University "Campus Bio-medico",
Via A. del Portillo 21, I-001285 Rome, Italy.

Period covered: November 1st 2007-today

Curriculum vitae

Born: July 24, 1973 in Rome, Italy.
Nationality: Italian.
Phone: +39-06225419660
E-Mail: cherubini@icra.it
c.cherubini@unicampus.it
Languages: Italian, English.

EDUCATION
[2004-2007]
Postdoctoral Fellowship at the Biomedical Engineering Faculty of the University "Campus Bio-Medico" of Rome.

[2000-2003]
"International PhD in Gravitational Physics and Astrophysics" established by the Universities of Salerno (Italy), Portsmouth (UK), Zurich (Switzerland), Berlin and Potsdam, (Germany) and recognized by the Universities of Salerno (Italy) and Portsmouth (UK). Supervisors: Dr. Marco Bruni (UK), Prof. S. Capozziello (IT).Thesis Title: "Curvature Perturbation Theory and Teukolsky Master Equations in General Relativity." [British Library system number: 012905345]

[1992-2000]
University "La Sapienza" in Rome: Diploma di Laurea in Physics with full marks (110/110); supervisors: Prof. Remo Ruffini, Dr. Donato Bini. Thesis Title: Black hole physics reanalyzed and developed with symbolic manipulation methods: new perspectives in field theory around black holes.

I. Scientific Work

- Astrophysics of self-gravitating fluids.
- General relativistic perturbation theory for black holes and cosmology.
- Cosmology.
- Numerical Relativity.
- Analogue black holes and effective curved geometries in hydrodynamics
- Theoretical biophysics focused on pathological physiology of cardiac, neural and pancreatic tissues and on cancer growth modelling.

II. Conferences and educational activities

Conferences and Other External Scientific Work

2010 - 4th International Symposium on Modelling of Physiological Flows, Chia Laguna, Sardinia (ITALY)
- 2nd Galileo - Xu Guangqi Meeting, Ventimiglia (ITALY) and Nice(FRANCE)

- 5th International Workshop on Cardiac Mechano-Electric Feedback and Arrhythmias, Oxford (GREAT BRITAIN)

Teaching Duties
2009/10 Lecturer "Physics" (Alimentation and Human Nutrition Sciences, Medicine Faculty, University Campus Bio-Medico) and "Modern Physics" (Engineering Faculty, University, Campus Bio-Medico) ;

Work With Postdocs
The main collaboration of Dr Cherubini with ICRANET postdocs has been with Dr Andrea Geralico, in relation with perturbation theory in effective geometries occurring in uniformly rotating self gravitating classical fluids.

III. Service activities
Within ICRANet
Organization of conference activities in the ICRA center of Pescara (3rd ICRA Network workshop and Sixth Italo-Korean Meeting 1999) as well as in the organization of the 9th Marcel Grossmann in Rome (2000).

Other
Dr Cherubini has a longstanding collaboration with other ICRANETscientists. In particular in collaboration with Dr Donato Bini, Prof. Robert T Jantzen and Prof. Remo Ruffini he has written plenty articles in various areas of General Relativity. In collaboration with Dr Giovanni Montani he has studied problems of cosmology while with Prof. Simonetta Filippi he is involved in research activities in the fields of Numerical Relativity, effective Geometries in classical fluids, Stellar and Galactic Structures and Complex Systems in Nature.

2010 List of Publications

Articles Published on Refereed Journals:
Pumir A., Sinha S., Sridhar S., Argentina M., Horning M., Filippi S., Cherubini C., Luther S. and Krinsky V. "Wave-train-induced termination of weakly anchored vortices in excitable media". Phys Rev E, 81; 010901 (2010).

Gizzi A, Cherubini C., Migliori S., Alloni R., Portuesi R. and FILIPPI S. "On the electrical intestine turbulence induced by temperature changes". Phys. Biol., 7; 16011-1(2010).

Cherubini C. and Filippi S. " Boundary Conditions for Scattering Problems from Acoustic Black Holes". Journal of Korean Physical Society, 56; 1668 (2010)

Bini D, Cherubini C., Filippi S, Gizzi A and Ricci P E, "On spiral waves arising in natural systems". Comm. Comput. Phys., 8; 610 (2010).

D. Bini, C. Cherubini, S. Filippi, and A. Geralico "Effective geometry of the n=1 uniformly rotating self-gravitating polytrope" , Phys. Rev. D, 82; 044005 (2010).

Chapters on Volumes:
Cherubini C., Filippi S, Nardinocchi P and Teresi L. ""Electromechanical Modelling of Cardiac Tissue". in: Kamkin A. and Kiseleva (Editors). Mechanosensitivity of the Heart. vol. 3, p. 421-449, BERLIN: Springer, (2010)

Cianfrani Francesco

Position: Postdoc
Period covered: 2010

I. Scientific Work

Publications:

- F. Cianfrani, G. Montani, M. Muccino, ``Semi-Classical Isotropization of the Universe during a de Sitter phase'', Physical Review D, in press, arXiv:1010.5090.
- F. Cianfrani, G. Montani, ``Shortcomings of the Big Bounce derivation in Loop Quantum Cosmology'', Physical Review D, 82, 021501(2010), arXiv:1006.1814.
- F. Cianfrani, G. Montani, ``Gravity in presence of fermions as a SU(2) gauge theory '', Physical Review D, 81, 044015(2010), arXiv:1001.2699.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

``19th International Conference on General Relativity and Gravitation (GR19)'', Mexico City, July 5-9.

II b. Diploma thesis supervision

Master thesis:

- ``Hamiltonian analysis of the Dirac formulation for gravity and ADM formalism'' by M. Lulli.
- ``Study of BRST symmetries in the extended phase space for the spherical-symmetric gravitational field'' by M. Renzelli.
- ``Investigation on the semi-classical behavior of an anisotropic Universe in Quantum Gravity'' by M. Muccino.

\Bachelor thesis:

``Polymer quantization and discrete space structure'' by M. Letizia.

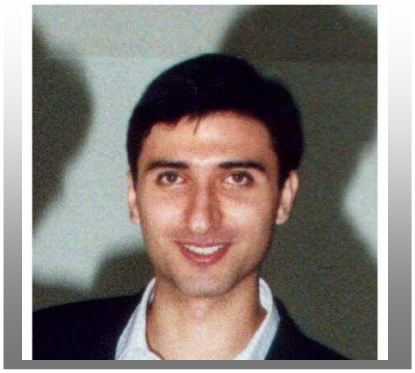
2010 List Of Publications

F. Cianfrani, G. Montani, M. Muccino, ``Semi-Classical Isotropization of the Universe during a de Sitter phase '', Physical Review D, in press, arXiv:1010.5090.

F. Cianfrani, G. Montani, ``Shortcomings of the Big Bounce derivation in Loop Quantum Cosmology'', Physical Review D, 82, 021501(2010), arXiv:1006.1814.

F. Cianfrani, G. Montani, ``Gravity in presence of fermions as a SU(2) gauge theory '', Physical Review D, 81, 044015(2010), arXiv:1001.2699.

Geralico Andrea



Position: Postdoc
Period covered: October 1st, 2006 – present

I Scientific Work

1 $3+1$ splitting of spacetime: measurement processes and the role of observers in general relativity;
2 test particle dynamics in black hole spacetimes; motion of small extended bodies (neutral or charged test particle endowed with an internal structure described by its spin and quadrupole moment);
3 general relativistic perturbation theory of Einstein-Maxwell systems;
4 exact solutions of Einstein's field equations;
5 gravitational lensing techniques in strong gravitational fields;

II Conferences and educational activities

Conferences and Other External Scientific Work

ICRANet Workshops 2001-2009
Xth Brazilian School of Cosmology and Gravitation (Rio de Janeiro, Brazil, 2002)
XIth Marcel Grossmann Meeting (Berlin, DE, 2006)
APS April Meeting (Jacksonville, US, 2007)
XIIth Marcel Grossmann Meeting (Paris, FR, 2009)
Vth Australasian Conference on General Relativity and Gravitation (Christchurch, NZ, 2009)

2010 List of publications

Bini D., Geralico A., Kerr R. P.,
The Kerr-Schild ansatz revised,
International Journal of Geometric Methods in Modern Physics, vol. 7, 693–703, 2010.

Bini D, Cherubini C., Filippi S. and Geralico A.,
Effective geometry of the n=1 uniformly rotating self-gravitating polytrope,
Physical Review D, vol. 82, 044005, 2010.

Bini D., Geralico A.,
Spinning bodies and the Poynting-Robertson effect in the Schwarzschild spacetime,
Classical and Quantum Gravity, vol. 27, 185014, 2010.

Lattanzi Massimiliano

Position: ICRA Postdoctoral fellow
Physics Department, "Sapienza" University of Rome
Period covered: January 2010 – Present.

I. Scientific Work

In the last year, I have been working mainly in the fields of Particle Cosmology and Astroparticle Physics. In particular, I have been studying the possibility of detecting the imprint of the annihilation of supersymmetric dark matter in the 21 cm signal, induced by the heating and ionization of the intergalactic medium. I have also been studying "axion-like" dark matter candidates arising in theories of gravity with torsion and in see-saw models for neutrino mass generation. Another line of research has been the study of the interaction of cosmological gravitational waves with relic neutrinos, and of the possibility of detecting the signature of neutrino decoupling in the spectrum of gravitational waves, through Pulsar Timing Arrays. Finally, I have also bee working on the estimation of cosmological parameters from the observational data, in the framework of models with varying fundamental constants, and on the viability of models with zero cosmological constant and a non-standard spectrum of primordial perturbations.
During 2010, the above mentioned work has lead to the publication of 12 scientific papers, of which 8 in peer-reviewed international journals, and 4 in conference proceedings.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works
I have attended the following conferences:
Jan 2010 - 14th Gravitational Waves Data Analysis Workshop, Rome, Italy
Jul 2010 – 16th International Symposium on Particles, Strings and Cosmology, Valencia, Spain

II b. Work With Students
I have been working with IRAP Ph.D. students Stefania Pandolfi and Eloisa Menegoni.

II c. Work With Postdocs
I have been collaborating with Dr. Riccardo Benini.

III. Service activities

III a. Within ICRANet
ICRA Post-doc at the Physics Department, University of Rome "Sapienza".

2010 List of Publications

1. Signatures of clumpy dark matter in the global 21 cm background signal
D. Cumberbatch, M. Lattanzi, J. Silk, Phys. Rev. D in press.
e-Print: arXiv:0808.0881 [astro-ph].

2. On the viability of a non-analytical f(R)-theory
N. Carlevaro, G. Montani, M. Lattanzi, in Proceedings of the workshop: Cosmology, the Quantum Vacuum and Zeta Functions.
e-Print: arXiv:1007.5397v1[gr-qc]

3. A possible signature of cosmic neutrino decoupling in the nHz region of the spectrum of primordial gravitational waves

M. Lattanzi, R. Benini, G. Montani, Class. Quant. Grav. 27, 194008, (2010).

4. Signatures of the neutrino thermal history in the spectrum of primordial gravitational Waves
R. Benini, M. Lattanzi, G. Montani, Gen. Rel. Grav. online first, doi:10.1007/s10714-010-0994-4.
e-Print: arXiv:1009.61190 [astro-ph.CO]

5. A solution of the strong CP problem via the Peccei-Quinn mechanism through the NiehYan modified gravity and cosmological implications
M. Lattanzi, S. Mercuri, Phys. Rev. D 81, 125015 (2010).
e-Print: arXiv:0911.2698 [gr-qc]

6. Ination with primordial broken power law spectrum as an alternative to the concordance cosmological model
S. Pandolfi, E. Giusarma, M. Lattanzi, A. Melchiorri, Phys. Rev. D 81, 103007 (2010).

7. The majoron: a new dark matter candidate
M. Lattanzi, J. Kor. Phys. Soc. 56, 1677, 2010.

8. Constraints on the dark energy equation of state in presence of a varying fine structure constant
E. Menegoni, S. Pandol_, S. Galli, M. Lattanzi, A. Melchiorri, Int. J. Mod. Phys. D 19, 507 (2010).

9. A separable solution for the oscillatory structure of plasma in accretion disks
M. Lattanzi, G. Montani, Europhys. Lett. 89, 39001 (2010).
e-Print: arXiv:1001.2430 [astro-ph.SE]

10. On the propagation of gravitational waves across the Universe: interaction with the neutrino component.
R. Benini, M. Lattanzi, G. Montani, to appear in Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity, eds. T. Damour, R. T. Jantzen and R. Ru_ni, World Scienti_c, Singapore, 2010.

11. Enhancement of the dark matter annihilation cross section in cold substructures
M. Lattanzi, to appear in Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity, eds. T. Damour, R. T. Jantzen and R. Ru_ni, World Scienti_c, Singapore, 2010.

12. Enhancement of the dark matter annihilation cross section in the low-velocity regime
M. Lattanzi, in Proceedings of the Third Stueckelberg Workshop on Relativistic Field Theories, Eds. N. Carlevaro, G. Vereshchagin, Cambridge University Press, 2010

Patricelli Barbara

Position: Post doc researcher
Period covered: January 2010 – December 2010

I. Scientific Work

- Study of the electrodynamics of Neutron Star (NS) Core.
- Study of the outer crust of NS. Study of a possible correlation between the mass of the outer crust and the B parameter of the fireshell model of Gamma Ray Bursts (GRB).
- Study of the prompt emission of high energetic GRBs (burst with an isotropic energy Eiso ≥ 1054 erg) within the fireshell model. Introduction of a new spectral energy distribution of the photons in the comoving frame of the fireshell to explain the observational properties of the prompt emission of these sources.
- Study of the X-ray flares in the context of the fireshell model, assuming that they are produced in the interaction with an inhomogeneous CircumBurst Medium (CBM). Application of a 2-dimensional numerical code for the CBM distribution to reproduce the X-ray flares observed in the light curve of GRB 050904.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

i. First Cesare Lattes meeting of Gamma Ray Bursts, Black Holes and Supernovae, February 25 – March 3, 2007, Mangaratiba, Brazil
ii. Fourth Italian – Sino Workshop on Relativistic Astrophysics, June 25 - 30, 2007, Pescara, Italy
iii. National school of Astrophysics, September 13 – 22, 2007, San Servolo (Venezia), Italy
iv. April meeting of the American Physical Society, April 12 – 15, 2008, Saint Louis, Missouri – USA
v. Fifth Italian – Sino Workshop on Relativistic Astrophysics, May 28 – June 1, 2008, Taipei – Hualien, Taiwan
vi. Third Stueckelberg Workshop on Relativistic Field Theories, July 8 – 18, 2008, Pescara, Italy
vii. XIII Brazilian School of Cosmology and Gravitation, July 20 – August 2, 2008, Rio de Janeiro, Brazil
viii. Probing stellar populations out to the distant universe, September 7 – 19, 2008, Cefalù (Palermo), Italy
ix. The Stars, the Sun, the Universe and General Relativity, May 26 – 29, 2009, Fortaleza, Brazil
x. Sixth Italian – Sino Workshop on Relativistic Astrophysics, June 29 – July 1, 2009, Pescara, Italy
xi. XII Marcel Grossman Meeting, July 12 – 18, 2009, Paris, France
xii. The Shocking Universe: Gamma Ray Bursts and High Energy shock phenomena, September 14 - 19, 2009, San Servolo (Venezia), Italy
xiii. First Galileo- Xu Guangqi meeting, October 26 – 30, 2009, Shangai, China
xiv. Deciphering the Ancient Universe with Gamma-Ray Bursts, April 19 – 23, 2010, Kyoto, Japan
xv. Second Galileo- Xu Guangqi meeting, July 12 – 18, 2010, Ventimiglia, Italy

2010 List of Publications

L. Caito, L. Amati, M.G. Bernardini, C.L. Bianco, L. Izzo, G. de Barros, B. Patricelli, R. Ruffini, "GRB 071227: an additional case of a disguised short burst", accepted for publication on A&A in date 24/06/2010, DOI: 10.1051/0004-6361/201014640 (arXiv:1006.4842v2)

L. Izzo, M. G. Bernardini, C. L. Bianco, L. Caito, G. de Barros, B. Patricelli, R. Ruffini, "GRB 090423 at redshift 8.1: a theoretical interpretation", in the Proceedings of the "11th Italian-Korean Symposium on Relativistic Astrophysics" in Seoul, Korea, November 2 - 4, 2009, Journal of the Korean Physical Society, Vol. 57, pp. 551-556 (2010)

B. Patricelli, J. A. Rueda H., R. Ruffini, "On the Crust of Neutron Stars", in the Proceedings of the "Third Stueckelberg Workshop on Relativistic Field Theories" in Pescara (Italy), July 8 - 18, 2008, eds. N. Carlevaro and G.S. Vereshchagin, Cambridge Scientific Publisher (2010)

J. A. Rueda H., B. Patricelli, M. Rotondo, R. Ruffini, S- S. Xue, "The Extended Nuclear Matter Model with Smooth Transition Surface", in the Proceedings of the "Third Stueckelberg Workshop on Relativistic Field Theories" in Pescara (Italy), July 8 - 18, 2008, eds. N.Carlevaro and G.S. Vereshchagin, Cambridge Scientific Publisher (2010) (arXiv:0903.4282v1)

B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini and G.S. Vereshchagin, "A new spectral energy distribution of photons in the fireshell model of GRBs", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 559-560 (2010)

L. Izzo, M. G. Bernardini, C. L. Bianco, L. Caito, G. de Barros, B. Patricelli, R. Ruffini, "GRB 090423 in the fireshell scenario", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 437-439 (2010)

A.G. Aksenov, M.G. Bernardini, C.L. Bianco, L. Caito, C. Cherubini, G. de Barros, A. Geralico, L. Izzo, F.A. Masucci, B. Patricelli, M. Rotondo, J.A. Rueda Hernandez, R. Ruffini, G. Vereshchagin and S.-S. Xue, "The fireshell model for gamma-ray bursts", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 451-460 (2010)

M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, B. Patricelli, R. Ruffini, "The end of the prompt emission within the fireshell model", in the Proceedings of "The Shocking Universe: Gamma Ray Bursts and High Energy Shock phenomena in the Universe" in Venice, Italy, September 14 - 18, 2009, SIF Conference Proceedings, Vol. 102, pp. 489-490 (2010)

B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, "Black Holes in Gamma Ray Bursts", in the Proceedings of the "Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 406-408 (2010)

L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "On GRB 080916C and GRB 090902B observed by the Fermi satellite", in the Proceedings of the `Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 406-408 (2010)

C. L. Bianco, M. G. Bernardini, L. Caito, G. De Barros, L. Izzo, B. Patricelli, R. Ruffini, "Disguised Short Bursts and the Amati Relation", in the Proceedings of the "Deciphering the Ancient Universe with Gamma-Ray Bursts" in Kyoto, Japan, April 19 - 23, 2010, AIP Conference Proceedings, Vol. 1279, pp. 299-301 (2010)

Rotondo Michael

Position: postdoctoral researcher
Period covered: 2008-2010

I Scientific Work
Supercritical electric fields in nuclei and neutron stars
Electrodynamical properties of white dwarfs and neutron stars

II Conferences and educational activities
Conferences and Other External Scientific Work

APS April Meeting, St.Louis, Missouri (USA), 11-15 April, 2008: *'Ultra-relativistic solutions of Thomas-Fermi equation'*

3rd E.C.G. Stueckelberg Workshop, Pescara (Italy), 7-19 July, 2008: *'On the gravitational and electrodynamical stability of nuclear matter cores'.*

6th Italian-Sino Workshop, Pescara (Italy), 29 June-1 July, 2009: *'Massive neutron density cores'.*

12th Marcel Grossmann Meeting on General Relativity, 13-18 July, 2009: *'On the gravitational and electrodynamical stability of nuclear massive density cores'.*

2nd Galileo-Xu Guangqi Meeting, 11-16 July 2010, Ventimiglia (Italy)-Nice (France): *'On the relativistic Thomas-Fermi treatment of compressed atoms and compressed nuclear matter cores of stellar dimensions'.*

Work With Students
Students of the IRAP-PhD program at University "Sapienza", Rome, Italy: Barbara Patricelli, Jorge A. H. Rueda, Kuantay Boskhayev.

Other Teaching Duties
Lessons on the *Thomas-Fermi model and its applicability to the study of the structure of compact stars* within the courses *'Relativistic Linear Theories of the Gravitation and Electrodynamics'* and *'Black Holes, Vacuum Polarization, Big Bang and Cosmology'* by Prof. Remo Ruffini at Physics Department of the University "Sapienza", Rome, Italy, academical years 2008/2009 and 2009/2010.

2010 List of Publications
Rueda J. A. H., Rotondo M., Ruffini R. and Xue S.-S., *A Self-Consistent Approach to Neutron Stars,* Journal of the Korean Physical Society, Vol.57, No. 3, 560-562, 2010.

Aksenov A. G., Bernardini M. G., Bianco C. L., Bini D., Caito L., Chardonnet P., Cherubini C., De Barros G., Geralico A., Izzo L., H. Kleinert, Patricelli B., Rangel Lemos L.J., Rotondo M., Rueda Hernandez J.A., Vareshchagin G., Xue S-S, *Dipartimento di Fisica dell'Università di Roma Sapienza, January 2007-December 2009 Scientific Report*, p. 34, 2010 (http//www.phys.uniroma.it/.)

Rotondo M., Ruffini R., Xue S.-S., *Analytic Solutions of the Ultra-Relativistic Thomas-Fermi Equation,* in Proceedings of the Third Stueckelberg Workshop, N. Carlevaro and G. W. Vereshchagin (eds.), (Cambridge, 2010, in press).

Rueda J. A. H., Rotondo M., Ruffini R. and Xue S.-S., *The Extended Nuclear Matter Model with Smooth Transition Surface,* in Proceedings of the Third Stueckelberg Workshop, N. Carlevaro and G. W. Vereshchagin (eds.), (Cambridge, 2010, in press).

Popov V., Rotondo M., Ruffini R., Xue S.-S., *On Gravitationally and Electrodynamically Bound Massive Nuclear Density Cores,* 2010 (submitted to Physical Review C).

Rotondo M., Rueda J. A. H., Ruffini R., Xue S.-S., *On the relativistic Thomas-Fermi treatment of compressed atoms and compressed nuclear matter cores of stellar dimensions*, 2010 (submitted to Physical Review C).

Rueda J. A. H., Rotondo M., Ruffini R., Xue S.-S., *A Rigorous General Relativistic Solution for a Self-Gravitating System of Degenerate Neutrons, Protons and Electrons in Beta Equilibrium* 2010 (submitted to Physical Review D).

Rotondo M., Rueda Jorge J. A. H., Ruffini R., Xue S.-S., *From Compressed Atoms to Compressed Massive Nuclear Density Cores*, in Proceedings of the twelfth Marcel Grossmann meeting, T. Damour, R. Jantzen and R. Ruffini (eds.), 2010 (submitted to World Scientific) .

Rueda J. A. H., Rotondo M., Ruffini R., Xue S.-S., *On Compressed Nuclear Matter: From Nuclei to Neutron Stars,* in Proceedings of the first Galileo-Xu Guangqi meeting, 2010 (submitted to International Journal of Modern Physics D).

Ahmedov Bobomurat

Position: Project Leader/Professor
Period covered:

I Scientific Work

My present employment and duties:

My main duty is to carry out the theoretical research in the field of electrodynamics of continuous media in general relativity and relativistic astrophysics 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 (affiliated to the AS-ICTP as PRJ-29) in the Institute of Nuclear Physics, position of Leading Researcher and Projects Leader (part time) at the Ulugh Beg Astronomical Institute in Tashkent and position of Full Professor (part time) at the Uzbekistan National University in Tashkent and Tashkent Pedagogical University. I was co-organizer of Int. Symposium on Experimental Gravitation held in Samarkand, Uzbekistan, 1999. I am delivering lectures to graduate students at Samarkand State University starting year 1993 and at Uzbekistan National University, Tashkent from year 2000. I plan to give lectures at the Tashkent Pedagogical University starting this year. I am a key person being responsible for Uzbekistan in AS-ICTP Network on Relativity, Astrophysics and Cosmology between Bangladesh, India, Pakistan, Turkey and Uzbekistan (BIPTUN). I am Vice-Chairman of Scientific Council D.067.02.13 awarding PhD/DrSc degrees in Astrophysics and Radioastronomy & Theoretical Physics at the Uzbekistan National University and have full responsibility for PhD/DrSc dissertation defenses in Astrophysics and Radioastronomy in Uzbekistan. I am member of Scientific Councils at the Ulugh Beg Astronomical Institute and at the Institute of Nuclear Physics, Tashkent.

My research is mainly devoted to the general-relativistic electrodynamics of continuous media such as superconductor, conductor, plasma etc and its application for theoretical explanation and analysis of EM (electromagnetic) and astrophysical processes in the external gravitational fields. 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. Recently I have started a research on VLF (very low frequency) EM wave propagation in Earth ionosphere and study of the ionospheric disturbances caused by various atmospheric, terrestrial and extraterrestrial phenomena.

Resume Of Current Research

The basic equations of the GR EM fields in plasma magnetosphere of an oscillating magnetized neutron star have been formulated. The GR boundary conditions for discontinuities of EM fields at the surface of oscillating star are obtained. The Maxwell equations are investigated under the assumption of quasistationarity and low current approximation in plasma magnetosphere around oscillating relativistic star. Expressions for interior EM fields of a relativistic oscillating spherical star inside the perfectly conducting crust of oscillating magnetized star in the interior Schwarzschild metric in case of infinite conductivity are obtained. General relativistic expressions for the EM fields interior of oscillating conducting crust of magnetized NS with polytrophic equation of state have been found.

Numerical solutions for space charge density and electric field in plasma magnetosphere for various modes of toroidal and spheroidal oscillations of Schwarzschild star have been obtained. The results justify that near the surface of oscillating magnetized neutron star the space charge density and electric field will be modified by the strong gravitational field. GR effects lead to shrinking of the size of the polar cap and an increase in the energy density of the outflowing plasma. These effects act in opposite directions but the net result is that the energy loss from the NS is significantly smaller than suggested by the Newtonian treatment.

The impact that stellar oscillations have on electric and magnetic fields external to a relativistic magnetized star in vacuum has been investigated. Modelling the star as a relativistic polytrope with infinite conductivity, the solution of the general relativistic Maxwell equations both in the vicinity of the stellar surface and far from it has been found. The general relativistic energy loss through EM radiation for different type (radial, toroidal and spheroidal) oscillations of relativistic magnetized stars has been calculated. GR corrections to EM fields lead to a damping timescale due to EM losses which is at least one order of magnitude smaller than its Newtonian counterpart; the emission of GW represents the most efficient mechanism for the damping of p- and f-mode oscillations; EM losses represents the most efficient mechanism for the damping of g-mode oscillations.

The dipolar magnetic field configuration in dependence on brane tension and present solutions of Maxwell equations in the internal and external background spacetime of a magnetized spherical star in a Randall-Sundrum II type braneworld. The star is modelled as sphere consisting of perfect highly magnetized fluid with infinite conductivity and frozen-in dipolar magnetic field. With respect to solutions for magnetic fields found in the Schwarzschild spacetime brane tension introduces enhancing corrections both to the interior and the exterior magnetic field. These corrections could be relevant for the magnetic fields of magnetized compact objects as pulsars and magnetars and may provide the observational evidence for the brane tension through the modification of formula for magneto-dipolar emission which gives amplification of EM energy loss up to few orders depending on the value of the brane tension.

Analytical solutions of Maxwell equations in background spacetime of BH (black hole) in braneworld immersed in external uniform magnetic field have been found. Influence of both magnetic and brane parameters on effective potential of the radial motion of charged test particle around slowly rotating in braneworld immersed in uniform magnetic field has been investigated by using Hamilton-Jacobi method. Exact analytical solution for dependence of the radius of the innermost stable circular orbits (ISCO) from brane parameter for motion of test particle around nonrotating isolated black hole in braneworld has been derived. It has been shown that radius ISCO is monotonically growing with the increase of module of brane tidal charge. Comparison of the predictions on ISCO radius of the brane world model and of the observational results of ISCO from relativistic accretion disks around black holes provided upper limit for brane tidal charge.

Analytic general relativistic solutions for the EM fields external to a slowly-rotating magnetized NUT star with nonvanishing gravitomagnetic charge are found. It is shown that the general relativistic corrections due to gravitomagnetic charge are not present in the form of the stationary magnetic fields but emerge only in the form of the electric fields. The gravitomagnetic charge provides an additional induced EF being analogous to the one introduced by the rotation of the star in the flat spacetime limit.

The general relativistic Ohm's law for the conduction current where the gravitomagnetic terms are incorporated has been derived. Then it is applied to predict a new galvano-gravitomagnetic effect, which takes place when a current carrying conductor is placed in a gravitomagnetic field. In connection with this galvano¬gravitomagnetic effect, the possibility of using current carrying conductors for detecting the Lense-Thirring field of the Earth was explored.

The general relativistic formula for charge distribution inside conductors has been derived from the Maxwell equations with the help of constitutive relations. The measurements of the general relativistic effect of charge redistribution inside conductors which can be performed within a conductor in the presence of gravitational field of a slow rotating metric source and an applied magnetic field both are proposed. It is shown that superconducting quantum interferometers could not detect the gravitomagnetism in the space of charged capacitor since they measure the quantity including the sum of electric and magnetic fields, and the general-relativistic magnetic part will be totally cancelled by the electric one which is in agreement with the experiments.

The appearance of general-relativistic contribution to the magnetic flux through a superconducting thermoelectric bimetallic circuit is shown. A response of the Josephson junctions to a heat flow is investigated in the general¬relativistic framework. Some gravitothermoelectric effects which can be observed in the superconducting state in the earth's gravitational field are considered.

Analytic solutions of Maxwell equations in the internal and external background spacetime of a slowly rotating misaligned magnetized neutron star have been obtained. With respect to a flat spacetime solution, general relativity introduces corrections related both to the monopolar and the dipolar parts of the gravitational field.

In particular, in the case of infinite electrical conductivity general relativistic corrections due to the dragging of reference frames are present, but only in the expression for the electric field. In the case of finite electrical conductivity, however, corrections due both to the spacetime curvature and to the dragging of reference frames are shown to be present in the induction equation, which could be relevant for the evolution of the magnetic fields of pulsars and magnetars.
Electrostatic plasma modes along the open field lines of a rotating neutron star and Goldreich-Julian charge density in general relativity are analyzed for the neutron star with zero inclination. It is found that the charge density is maximum at the polar cap and it remains almost same in certain extended region of the pole. For a steady state Goldreich-Julian charge density the usual plasma oscillation along the field lines are found; plasma frequency resembles to the gravitational redshift close to the Schwarzchild radius. The nonlinear plasma mode along the field lines is studied. From the system of equations under general relativity, a second order differential equation is derived. The equation contains a term which describes the growing plasma modes near Schwarzchild radius in a black hole environment. The term vanishes with the distance far away from the gravitating object. For initially zero potential and field on the surface of a neutron star, Goldreich-Julian charge density is found to create the plasma mode, which is enhanced and propagates almost without damping along the open field lines.
The equations that describe the EM processes in a plasma surrounding a neutron star are obtained by using the general relativistic form of Maxwell equations in a geometry of slow rotating gravitational object. A new mechanism of the generation of azimuthal current under the gravitomagnetic effect on radial current in a plasma around neutron star is predicted. The azimuthal current being proportional to the Lense-Thirring angular velocity can give valuable contribution on the evolution of the stellar magnetic field in some cases and therefore in general relativity a rotating neutron star, embedded in plasma, can in principle generate axial-symmetric magnetic fields even in axisymmetry.
The influence of the general-relativistic effects on charge distribution inside neutron star is investigated. The qualitative distinction of space charge distribution inside conducting crust from that inside superconducting core allows us to propose a possible mechanism of radio-wave radiation produced inside pulsar. A possibility of modelling this radiation in laboratory experiments in rotating frame of reference is analyzed.
It has been proposed that ionospheric disturbances before earthquakes, may have influence on the propagation of radio waves and, therefore, be precursors of EM signals detectable from ground- and space-based measurements. Analytical solution for the electric current arising in the lower ionosphere due to ejection of charged aerosols from the ground before earthquake is found and energy losses of the EM wave propagating through this layer of ionosphere are explored. Corrections to the "group delay" of the EM wave, Faraday rotation of the polarization plane and Doppler frequency shift, caused by electron density inhomogeneities induced in the higher layers of the ionosphere before earthquakes are studied.
On 22-Aug-2008 an earthquake with magnitude M=6.5 occurred in Tashkent, Uzbekistan where from May 2008 a VLF radio receiver provided by the STAR Laboratory of Stanford University is into operation. The raw analysis of VLF radio paths revealed a clear increase in the amplitude of the radio signals exactly at the time of the earthquake occurrence. Data from two GPS stations operated by Ulugh Beg Astronomical Institute and located in Tashkent and Kitab has been analyzed for possible earthquake ionospheric precursors. TEC (total electron content in ionosphere) time series over both sites are produced and applied to detect anomalous TEC signals accompanying the earthquakes. Anomalous TEC signals and significant correlation in time between these TEC anomalies and the occurrence of earthquake in Tashkent on 22-Aug-2008 have been detected. The deflection amplitude of maximum value of TEC over Tashkent reached about 20-30 with compare to the nondisturbed initial monthly mean background value one day before and after the earthquake. Exactly at the time of the earthquake occurrence TEC drastically dropped and came back near to the typical value after about 5 hours. This result does prove the possibility of precursory phenomena and show that the TEC precursor signature is enough to be detected by the GPS data analysis techniques. The localness of seismo-ionospheric TEC variation is demonstrated by the fact that no essential deflection was observer over Kitab GPS station which is at the distance of about 300 km from the epicenter.

II Conferences and educational activities

II a. Conferences and Other External Scientific Works

SEMINARS, SUMMER SCHOOLS AND CONFERENCES attended
13th Regional Conference on Mathematical Physics
Antalya, Turkey, 27 – 31 October 2010
United Nations Workshop on the Applications of Global Navigation
Satellite Systems, Chisinau, Moldova, 17 – 21 May 2010

II b. Work With PhD Students
Ahmadjon Abdujabbarov, PhD Defence, Uzbekistan National University, Tashkent, June 18, 2009, Particle Motion and Electromagnetic Fields of Axial Symmetric Compact Objects in General Relativity
Viktoriya Giryanskaya, PhD Defence, Uzbekistan National University, Tashkent, June 10, 2010, Effects of General Relativity for Axial Symmetric Gravitational Models and Their Application to Astrophysics of Compact Objects
Ahror Mamadjanov, PhD Defence, Uzbekistan National University, Tashkent, March, 2011 (expected), General Relativity Effects in Spacetime of Stationary Axial Symmetric Gravitating Objects

II c. Diploma thesis supervision
Viktoriya Giryanskaya, MSc Defence, Uzbekistan National University, Tashkent, 2009,
Plasma modes along open field lines of magnetized neutron stars

Abdikamalov Ernazar, MSc Defence, Uzbekistan National University, Tashkent, 2005, General Relativistic Plasma Magnetosphere of Magnetized Oscillating Stars

Kagramanova Valeria, MSc Defence, Uzbekistan National University, Tashkent, 2006, Observable Effects of General Relativity in Stationary Gravitational Fields

Fattoyev Farrukh, MSc Defence, Uzbekistan National University, Tashkent, 2004, Quasistationary Electromagnetic Effects in Gravitational Field

Rakhimov Ozodbek, MSc Defence, Uzbekistan National University, Tashkent, 2008, Particle Motion in Stationary Axial Symmetric Gravitational Field

Abdujabbarov Ahmadjon, MSc Defence, Uzbekistan National University, Tashkent, 2007, Thermoelectric Instability in Magnetized Neutron Stars

Slava Giryanskiy, MSc Defence, Uzbekistan National University, Tashkent, 2009,
Electromagnetic fields of oscillating magnetized relativistic stars

Sardor Tojiev, MSc Defence, Uzbekistan National University, Tashkent, 2010, Electromagnetic Ionospheric Phenomena and Monitoring of F and D Layers of Ionosphere of Earth

Sanjar Shaymatov, MSc Defence, Uzbekistan National University, Tashkent, June, 2010, VLF (Very Low Frequency) Electromagnetic Waves Data Analysis in MatLab Programming

II d. Other Teaching Duties
Teaching Experience
Winter-spring term 2010: Course in Statistical Physics and Thermodynamics, II part (66 lecture hours) for the 4th year undergraduate students (Bachelor Course), Chair of Theoretical Physics, Faculty of Physics, Uzbekistan National University, Tashkent, Uzbekistan.

Winter-spring term 2010: Course in General Relativity and Gravitation (50 lecture hours) for the 1st year graduate students (Master Course), Chair of Theoretical Physics, Faculty of Physics, Uzbekistan National University, Tashkent, Uzbekistan.

Winter-spring term 2010: Course in Basics of Cosmic Electrodynamics, II part (84 lecture hours) for the 1th year graduate students (Master Course), Chair of Astronomy, Faculty of Physics and Mathematics, Tashkent Pedagogical University, Uzbekistan.

Fall term 2010: Course in Statistical Physics and Thermodynamics, I part (60 lecture hours) for the 4th year undergraduate students (Bachelor Course), Chair of Theoretical Physics, Faculty of Physics, Uzbekistan National University, Tashkent, Uzbekistan.

II e. Work With Postdocs

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

With Viktoriya Giryanskaya, PhD, starting 2010 on project "Problems of Relativistic Astrophysics of Magnetized Compact Objects"

2010 List of Publications

1. A.A. Abdujabbarov, B.J. Ahmedov, Charged Particle Motion Around Rotating Black Hole in Braneworld Immersed in Magnetic Field, Phys. Rev. D., 2010, V.81, Issue 4, 9pp, 044022.

2. Morozova V.S., Ahmedov B.J., and Olindo Zanotti, General Relativistic Magnetosphere of Slowly Rotating Oscillating Magnetized Neutron Star, Mon. Not. R. Astron. Soc. – 2010. – 408, 490–502.

3. Morozova V.S., Ahmedov B.J., Abdujabbarov A.A., and Mamadjanov A.I. Plasma Magnetosphere of Rotating Magnetized Neutron Star in the Braneworld, Astrophys. Space Science, 2010, 330, 257–266.

4. A. Hakimov, B. Turimov, A. Abdujabbarov, B. Ahmedov. Quantum Interference Effects in Horava-Lifshitz Gravity // Mod. Phys. Lett., Vol. 25, No. 37, 1–13.

5. A.A. Abdujabbarov, A. Hakimov, B.J. Ahmedov, Particle motion around black hole in Horava-Lifshitz gravity, Phys. Rev. D, 2010, submitted.

6. A.A. Abdujabbarov, B.J. Ahmedov, B.B. Ahmedov, Energy Extraction from Rotating Black Hole in Horava Gravity, Mod. Phys.Lett. A, 2010, submitted.

7. B.B. Ahmedov, B.J. Ahmedov, A.A. Abdujabbarov, Spin Down of Rotating Compact Magnetized Strange Stars in General Relativity, Astrophys. Space Sci., 2010, submitted.

Ansoldi Stefano

Position: researcher, University of Udine, Udine, Italy
Period covered: Academic year 2009/2010

I. Scientific Work

1. ANSOLDI S. (in print). Quantum gravitational signatures in MAGIC observations of a very high energy source?. In: Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity. Paris, France, July 13th-18th, 2009, SINGAPORE: World Scientific;
2. ANSOLDI S., GUENDELMAN E. I, ISHIHARA H (in print). Multivalued Lagrangians and non singular cosmologies. In: Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity. Paris, France, July 13th-18th, 2009, SINGAPORE: World Scientific;
3. ANSOLDI S., GUENDELMAN E. I, SHILON I (in print). Regularization of ultraviolet divergences and production of child universes. In: Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity. Paris, France, July 13th-18th, 2009, SINGAPORE: World Scientific;
4. ANSOLDI S. (2010). Invited review about the article "On conformal, SL(4,R) and Sp(8,R) and symmetries of massless fields". MATHEMATICAL REVIEWS, vol. 2010a:81153; p. MR2380394, ISSN: 0025-5629;
5. ANSOLDI S. (2010). Invited review about the article "The Euclidean gravitational action as black hole entropy, singularities, and spacetime voids". MATHEMATICAL REVIEWS, vol. 2010h:83087; p. MR2412283, ISSN: 0025-5629;
6. ANSOLDI S. (2009). Invited review about the article "Fractional brane state in the early Universe". MATHEMATICAL REVIEWS, vol. 2009b:83158; p. MR2319441, ISSN: 0025-5629;
7. ANSOLDI S. (2009). Invited review about the article "Walls of marginal stability and dyon spectrum in N=4 supersymmetric string theories". MATHEMATICAL REVIEWS, vol. 2009c:81086; p. MR2318090, ISSN: 0025-5629;
8. ANSOLDI S. (2009). Invited review about the article "Gravity duals of half-BPS Wilson loops". MATHEMATICAL REVIEWS, vol. 2009e:81176; p. MR2326588, ISSN: 0025-5629;
9. ANSOLDI S. (2009). Invited review about the article "Integrability of type II superstrings on Ramond-Ramond backgrounds in various dimensions". MATHEMATICAL REVIEWS, vol. 2009a:81125; p. MR2326566, ISSN: 0025-5629;
10. ANSOLDI S. (2009). Invited review about the article "Geometric Lagrangians for massive higher-spin fields". MATHEMATICAL REVIEWS, vol. 2009h:81182; p. MR2398201, ISSN: 0025-5629;
11. ANSOLDI S. (2009). Invited review about the article "Geometry and dynamics of higher-spin frame fields". MATHEMATICAL REVIEWS, vol. 2009j:81100; p. MR2425202, ISSN: 0025-5629;
12. ANSOLDI S. (2009). Invited review about the article "Higher-spin Chern-Simons theories in odd dimensions". MATHEMATICAL REVIEWS, vol. 2009g:81109; p. MR2358798, ISSN: 0025-5629;

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works:

1. participation to the GC2010 long term Workshop *Gravity and Cosmology 2010*, Kyoto, Japan (May-August, 2010);
2. participation to the workshop *Inflation and cosmological perturbations*, Kyoto, Japan (June 1st-2nd, 2010);
3. participation to the *YKIS2010 Symposium*, Kyoto, Japan (June 28th – July 2nd, 2010).

II b. Work With Students

1. *PhD,* Idan Shilon, Eduardo I. Guendelman (full professor) [Ben Gurion University, Beer-Sheva, Israel]: "*Child Universe Formation"* (in progress);
2. *Master*, Tiziano Puppi [University of Udine, Italy]: "*Monte Carlo approaches for option pricing"* (in progress).

II c. Diploma thesis supervision

1. *Undergraduate*, Mathematics: Guglielmo Feltrin, "*I fondamenti matematici della teoria dell'interazione elettromagnetica*", graduated September 20th, 2010 (110/110 with honor), University of Udine, Italy;
2. *Master*, Computational Physics: Tiziano Puppi, "*Monte Carlo methods for option pricing in Jump models*", in progress, University of Udine, Italy.
3. *Master,* Computational Physics: Domenico Ferigo, a project in *numerical relativity*, just started, University of Udine, Italy.

II d. Other Teaching Duties:

1. Undergraduate course [Mathematics] Meccanica Razionale 2 (*Analytical Mechanics 2*) and master course [Computational Physics] Complementi di Meccanica (*Advanced Mechanics*), University of Udine, Italy;
2. Master course [Computational Physics] Meccanica Statistica (*Statistical Physics*) and master course [Biotechnology] Fisica 3 (*Physics 3*), University of Udine, Italy;
3. Master course [Computational Physics] Relativita` Generale (*General Relativity*), University of Udine, Italy.
4. Master thesis *examiner*: Sara De Faveri, "*Tensioni come misure singolari in sistemi continui non resistenti a trazione*", University of Udine, Italy;
5. PhD thesis *examiner*: Michela De Maria, "*Searching for Intrinsic Anisotropies of the Universe Through the Study of Kaon Lifetimes*", University of Udine, Italy;

II e. Work With Postdocs

1. Antonino Flachi [University of Kyoto, Japan]: "*Quasinormal modes of specific black hole solutions*" (recently started);
2. Viktor Czinner [University of Cape Town, South Africa]: "*A model for the dynamics of thick shells in General Relativity*" (in progress);
3. Nijil Mankuzhiyil [University of Udine, Italy] and Massimo Persic [astronomo associato, Trieste Observatory, Italy]: "*The spectral energy distribution of active galactic nuclei jets during quiescent, active and extremely bursting states*"(in progress);
4. Nijil Mankuzhiyil [University of Udine, Italy]: "*Implementation of a database for MAGIC data quality check*" (in progress).

III. Service activities

Member of the PhD board in Mathematics and Physics at the University of Udine, Italy.

IV. Other

Visiting researcher: Department of Physics, University of Victoria, Canada, December 14th 2009-January 5th 2010 (*host professor Werner Israel*).

Gao Yu

Position: senior researcher
Period covered: during 2010 for this summary

I. Scientific Work

1. Natale, G.; Tuffs, R. J.; Xu, C. K.; Popescu, C.; Fischera, J.; Lisenfeld, U.; Lu, N.; Appleton, P.; Dopita, M.; Duc, P. -A.; **Gao, Y.**; Reach, W.; Sulentic, J.; Yun, M.
Dust emission and star formation in Stephan's Quintet
eprint arXiv:1010.1227, accepted for publication in the Astrophysical Journal

2. Leech, J.; Isaak, K. G.; Papadopoulos, P. P.; **Gao, Y.**; Davis, G. R.
A CO(3-2) survey of a merging sequence of luminous infrared galaxies
2010MNRAS.406.1364L

3. González-Alfonso, E.; Fischer, J.; Isaak, K.; Rykala, A.; Savini, G.; Spaans, M.; van der Werf, P.; Meijerink, R.; Israel, F. P.; Loenen, A. F.; Vlahakis, C.; Smith, H. A.; Charmandaris, V.; Aalto, S.; Henkel, C.; Weiß, A.; Walter, F.; Greve, T. R.; Martín-Pintado, J.; Naylor, D. A.; Spinoglio, L.; Veilleux, S.; Harris, A. I.; Armus, L.; Lord, S.; Mazzarella, J.; Xilouris, E. M.; Sanders, D. B.; Dasyra, K. M.; Wiedner, M. C.; Kramer, C.; Papadopoulos, P. P.; Stacey, G. J.; Evans, A. S.; **Gao, Y.**
Herschel observations of water vapour in Markarian 231 Authors:
2010A&A...518L..43G

4. van der Werf, P. P.; Isaak, K. G.; Meijerink, R.; Spaans, M.; Rykala, A.; Fulton, T.; Loenen, A. F.; Walter, F.; Weiß, A.; Armus, L.; Fischer, J.; Israel, F. P.; Harris, A. I.; Veilleux, S.; Henkel, C.; Savini, G.; Lord, S.; Smith, H. A.; González-Alfonso, E.; Naylor, D.; Aalto, S.; Charmandaris, V.; Dasyra, K. M.; Evans, A.; **Gao, Y.**; Greve, T. R.; Güsten, R.; Kramer, C.; Martín-Pintado, J.; Mazzarella, J.; Papadopoulos, P. P.; Sanders, D. B.; Spinoglio, L.; Stacey, G.; Vlahakis, C.; Wiedner, M. C.; Xilouris, E. M.
Black hole accretion and star formation as drivers of gas excitation and chemistry in Markarian 231
2010A&A...518L..42V

5. Natale, G.; Tuffs, R. J.; Fischera, J.; Lu, N.; Popescu, C. C.; Xu, C. K.; Appleton, P.; Boulanger, F.; Dopita, M.; Duc, P.; **Gao, Y.**; Ogle, P.; Pineau Des Forets, G.; Reach, W.; Sulentic, J.; Yun, M.
Dust Emission from Stephan's Quintet Authors:
2010AIPC.1240...85N

6. Xu, C. Kevin; Domingue, D.; Cheng, Y.; Lu, N.; Huang, J.; **Gao, Y.**; Mazzarella, J. M.; Cutri, R.; Sun, W.; Surace, J.
Star Formation Enhancement in z=0 Close Major Mergers --- Spitzer Observations of a K-Band Selected Sample
2010AAS...21630703X

7. Xu, C. Kevin; Domingue, Donovan; Cheng, Yi-Wen; Lu, Nanyao; Huang, Jiasheng; **Gao, Yu**; Mazzarella, Joseph M.; Cutri, Roc; Sun, Wei-Hsin; Surace, Jason
Local Benchmarks for the Evolution of Major-merger Galaxies—Spitzer Observations of a K-band Selected Sample
2010ApJ...713..330X (arXiv:1002.3648)

8. Zhao, Yinghe; **Gao, Yu**; Gu, Qiusheng

Luminosity-Metallicity Relations for Blue Compact Dwarf Galaxies in the Optical and Near-infrared
2010ApJ...710..663Z

9. Zhang, Hong-Xin; **Gao, Yu**; Kong, Xu
Star formation histories within the Antennae galaxies (Arp244)
2010MNRAS.401.1839Z

10. Sun, Yan; Gao, Yu
Comparative study of the relationships between CO isotopic luminosities and infrared luminosity for the Galactic dense cores
2010ScChG..53.1169S

11. Zhang, Hong-Xin; **Gao, Yu**; Kong, Xu
SFHs Across the Merging Disks of Arp 244 - from FUV to MIR
2010IAUS..262..454Z

12. Liu, Fan; **Gao, Yu**
The Radio Continuum, Far-Infrared Emission, and Dense Molecular Gas in Galaxies
2010ApJ...713..524L

13. Wang, Jing-Bo; **Gao, Yu**
Chandra archival study of (U)LIRGs with a double nucleus: binary AGNs?
2010RAA....10..309W

14. Zhang, Zhiyu; **Gao, Yu**; Wang, Junzhi
CO observation of SNR IC 443
2010ScChG..53.1357Z

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

Conferences :

1. The second Galileo - Xu Guangqi meeting, July 12-18, 2010,Ventimiglia and Nice
2. Infrared Emission, Interstellar Medium and Star Formation, Feb.22-24, 2010 German Max-Planck-Institute of Astronomy
3. From Stars to Galaxies: Connecting our understanding of star and galaxy formation, April, 4-14, 2010, Gainesville, Florida, USA
4. Second Chinese-German Workshop on Star and Planet Formation, July 25-31, 2010
German, Kiel, Germany
5. Challenges in Infrared Extragalactic Astrophysics II, 2010.9.26-2010.10.1, Crete, Greece

Other External Scientific Works

1.Visit ESTEC, Netherlands during July 17th-22,2010 invited by Dr. Kate Isaak
2.Visit Seoul National University, Korea during Aug. 6-15 invited by Dr. Myungshin Im
3.Visit IPAC, Caltech, USA during 28, Jan- 19,Feb., April, June, August, invited by Dr. C. Kevin Xu

II b. Work With Students

1.Zhang, Hong-Xin; **Gao, Yu**; Kong, Xu
Star formation histories within the Antennae galaxies (Arp244)
2010MNRAS.401.1839Z

2. Sun, Yan; Gao, Yu
Comparative study of the relationships between CO isotopic luminosities and infrared luminosity for the Galactic dense cores

2010ScChG..53.1169S

3. Zhang, Hong-Xin; **Gao, Yu**; Kong, Xu
SFHs Across the Merging Disks of Arp 244 - from FUV to MIR
2010IAUS..262..454Z

4. Liu, Fan; **Gao, Yu**
The Radio Continuum, Far-Infrared Emission, and Dense Molecular Gas in Galaxies
2010ApJ...713..524L

II c. Diploma thesis supervision
1. Wang, Jing-Bo; **Gao, Yu**
Chandra archival study of (U)LIRGs with a double nucleus: binary AGNs?
2010RAA....10..309W

2. Zhang, Zhiyu; **Gao, Yu**; Wang, Junzhi
CO observation of SNR IC 443
2010ScChG..53.1357Z

II d. Other Teaching Duties
1. Give the short lecture course in Nanjing U. in Oct.

II e. Work With Postdocs
1.Zhao, Yinghe; **Gao, Yu**; Gu, Qiusheng
Luminosity-Metallicity Relations for Blue Compact Dwarf Galaxies in the Optical and Near-infrared
2010ApJ...710..663Z

III. Service activities
1. Assoc. Editor/Ap&SS (2007-now), Reviewer/referee for, AJ, MNRAS, RAA

2.Talks/colloquia at Dark Center, Denmark; Seoul National Univ.; U. Sci. & Tech. of China, Nanjing U., as well as many invited talks at meetings/conferences.

3. Organized meeting as SOC or Co-chair of SOC

1). "Key Issues in high-redshift galaxy/black hole evolution in the ALMA/JWST Era", Hangzhou, May 29-June 4, 2010
Website: http://sfig.pmo.ac.cn/hangzhou/

2). "Galaxy evolution: Infrared to millimeter wavelength perspective", Guilin Oct. 25-29, 2010
Website: http://202.121.53.133/guilin/

Lee Da-Shin

PERSONAL DATA:

Nationality: Republic of China
Date of Birth: February 27, 1964
Place of Birth: Hualien, Taiwan

CURRENT POSITION:

Professor
Department of Physics, National Dong Hwa University, Hualien 974, Taiwan, R.O.C.
Tel: 886-3-863-3695
Fax: 886-3-863-0068
email: *dslee@mail.ndhu.edu.tw*

EDUCATION:

1982-1986, B.S. in Physics, Tung Hai University, Taiwan
1986-1988, M.S. in Physics, National Tsing Hua University, Taiwan
1990-1995, Ph.D. in Physics, University of Pittsburgh, U.S.A.

HONORS AND AWARDS:

1982-1986, Honor Student Prize, Tung Hai University (Taiwan)
1986-present, Member of Phi Tau Phi Honor Society (Taiwan)
1992-1994, Predoctoral Mellon Fellowship, University of Pittsburgh (U.S.A.)
1997-1998, NSC Outstanding Research Award (Taiwan)
2005, Listed in Asia/Pacific Who's Who (India)
2005, Listed in Afro/Asian Who's Who (India)
2006, Listed in Distinguished & Admirable Achievers (India)
2009, Listed in Who's Who in the World (Marquis Who's Who,USA)

ACADEMIC POSITIONS:

1988-1990, Research Assistant, Institue of Physics, Academia Sinica, Taipei, Taiwan
1990-1995, Research and Teaching Assistant, Department of Physics, University of Pittsburgh, U.S.A.
1995-1996, Postdoctoral Fellow, Department of Physics and Astronomy, University of North Carolina at Chapel Hill,U.S.A.
1996-1997, Postdoctoral Fellow, Institute of Physics, Academia Sinica,Taipei,Taiwan
1996-1997, Associate Professor (part time), Department of Physics, Soochou University, Taipei, Taiwan
1997-1998, Assistant Professor, Department of Physics, National Dong Hwa University, Hualien, Taiwan
1998-2001, Associate Professor, Department of Physics, National Dong Hwa University, Hualien, Taiwan
2001-present, Professor, Department of Physics, National Dong Hwa University, Hualien, Taiwan

VISITING POSITIONS:

- July 1998; July 2000, Visiting Professor, Department of Physics, University of Pittsburgh, Pittsburgh, U.S.A..
- August 1998, Visiting Professor, Department of Physics and Astronomy, University of North Carolina at Chapel Hill, U.S.A..
- January 2001; July-September 2001; January 2002; July-August 2002, Visiting Professor, Institute of Physics, Academia Sinica, Taipei, Taiwan.
- August-September 2002; December 2004, Visiting Professor, LPTHE, Université Pierre et Marie Curie (Paris VI) et Denis Diderot (Paris VII), Paris, France.
- October 2004, Visiting Professor, International Center for Relativistic Astrophysics (ICRA), Rome, Italy.
- October 2004-April 2005, Visiting Professor, The Theory Group, Blackett Laboratory, Imperial College,

London, U.K..

REFEREED PAPER:

- T-H. Wu, J-T Hsiang and D.-S. Lee: Quantum Noise on a Point Charge from Electromagnetic Squeezed Vacuum Fluctuations, J. Korean Phys. Soc. **57**, 643 (2010).

Liu Wenbiao

Work Experience:
July, 2008 —— now Professor of Beijing Normal University
July, 2000 —— July, 2008 Associate Professor of Beijing Normal University
January, 2001 —— January, 2002 Visiting Scholar of Washington University in St. Louis
July, 1995 —— July, 2000 Lecturer of Beijing Normal University

Research Field:
Gravitation and Relativistic Astrophysics, Black Hole Physics, Cosmology

2010 List of Publications

Zhenfeng Niu, Wenbiao Liu. Hawking radiation and thermodynamics of a Vaidya-Bonner black hole. Research in Astronomy and Astrophysics 10 (2010) No.1, 33.

Bo Liu, Wenbiao Liu. Negative temperature of the inner horizon and Planck absolute entropy of a Kerr-Newman black hole. Communications in Theoretical Physics 53 (2010) No.1, 83.

Shiwei Zhou, Bo Liu, Jili Huang, Wenbiao Liu. The relation between a black hole and a general black body system. Chinese Physics B 19 (2010) No.1, 010403.

Gang Wang, Bo Liu, Wenbiao Liu. Coordinates problem of Hawking radiation derivation in a Kerr-Newman black hole using Hamilton-Jacobi equation. General Relativity and Gravitation 42 (2010) No.3， 633.
Xianming Liu, Wenbiao Liu. Where does Hawking radiation of a dynamical black hole come from? International Journal of Theoretical Physics 49 (2010) No.5, 1088.

Nagataki Shigehiro

Research interest:

● Central engine of gamma-ray bursts and formation of relativistic jet.
● Theory of gamma-ray burst emission and afterglows.
● High energy gamma-rays and neutrinos from compact objects.
● Origin of ultra-high energy cosmic rays and their propagation.
● Explosive nucleosynthesis in core-collapse supernovae and gamma-ray bursts.
● Particle acceleration mechanism in relativistic shocks.
● Broad research directions in other fields of astrophysics (cosmology, brane-world, etc.).

Research Activities & achievements:

Publications: 109, including: 62 in refereed journals, 4 submitted to refereed journals; 43in Conference papers.

Invited Talks (International Only):

● "Gamma-Ray Burst Physics", XIV Mexican School on Particles and Fields, Morelia, Mexico, November 4-12 (2010).
● "Ultra-High Energy Cosmic Rays and Neutrinos", XIV Mexican School on Particles and Fields, Morelia, Mexico, November 4-12 (2010).
● "Nonlinear Relativistic Jet Formation and Gamma-Ray bursts", Frontiers of Nonlinear Physics physics IV, Nizhny Novgorod, Russia, July 13-20 (2010).
● "Numerical High-Energy Astrophysics", Workshop on Circumstellar Interactions in Massive Binaries, Hokkaido, Japan March 17-18 (2010).
● "Ultra-High Energy Cosmic Rays and Neutrinos", XIV Mexican School on Particles and Fields, Morelia, Mexico, November 4-12 (2010).
● "Nonlinear Relativistic Jet Formation and Gamma-Ray bursts", Frontiers of Nonlinear Physics physics IV, Nizhny Novgorod, Russia, July 13-20 (2010).
● "Numerical High-Energy Astrophysics", Workshop on Circumstellar Interactions in Massive Binaries, Hokkaido, Japan March 17-18 (2010).
● "Nonlinear Relativistic Jet Formation and Gamma-Ray bursts", Frontiers of Nonlinear Physics physics IV, Nizhny Novgorod, Russia, July 13-20 (2010).
● "Numerical High-Energy Astrophysics", Workshop on Circumstellar Interactions in Massive Binaries, Hokkaido, Japan March 17-18 (2010).

2010 List of Publications

1. D. A. Prokhorov, Y. Dubois, **S. Nagataki**
"An analysis of the temperature structure of galaxy clusters by means of the thermal Sunyaev-Zel'dovich effect" Astronomy and Astrophysics, accepted (arXiv:1009.3305)
2. A. Calvez, A. Kusenko, **S. Nagataki**
'The role of Galactic sources and magnetic fields in forming the observed energy-dependent composition of ultrahigh-energy cosmic rays' Physical Review Letters 105 (2010) 091101
3. J. Aoi, K. Murase, K. Takahashi, K. Ioka, **S. Nagataki**
'Can we probe the Lorentz factor of gamma-ray bursts from GeV-TeV spectra integrated over internal shocks?' The Astrophysical Journal, 722 440-451 (2010).
4. Y. Masada, **S. Nagataki**, K. Shibata, T. Terasawa
'Solar-type Theoretical Model for Magnetar Giant Flare'

Publication of Astronomical Society of Japan, 62 1093-1102 (2010)
5. K. Murase, K. Toma, R. Yamazaki, **S. Nagataki**, K. Ioka
'High-Energy Emission as a Test of the Prior Emission Model for Gamma-Ray Burst Afterglows' Monthly Nortice of the Royal Astronomical Society 402 L54-L58 (2010).

Papers submitted to refereed journals:
1. **S. Nagataki**
"Rotating BHs as Central Engines of Long GRBs: Faster is Better"
Publications of the Astronomical Society of Japan, submitted.
2. A. Mizuta, **S. Nagataki**, J. Aoi
'Thermal Radiation from GRB Jets' The Astrophysical Journal Letters, submitted (arXiv:1006.2440).
3. X. Cui, J. Aoi, **S. Nagataki**
'Origins of Short Gamma-Ray Bursts Deduced from Offsets to Their Host Galaxies Revisited',
Publication of Astronomical Society of Japan, submitted (arXiv:1004.2302).

Qadir Asghar

Position: Professor and Director
Centre for Advanced Mathematics and Physics
Period covered: 2009/10

I. Scientific Work

A.	Research Papers:	Math./Phys.	(foreign journals)	140;
		"	(local journals) 03;	
		Economics	(foreign journals)	01;
		"	(local journals) 15;	
		Math./Phys.	(Int. Conf. Proc.)	20;
		Economics	(Loc. Conf. Proc.)	03.
B.	Books authored/edited:			16.
C.	Research level articles published:			24.
D.	Teaching journal papers:			07.
E.	Popular articles:			32.
F.	Research preprints:		45.	

II. Conferences and educational activities

Conferences and Other External Scientific Works:

- **(i)** Sixth Sino-Italian Conference, June 29-July 1, 2009 – Pescara;
- **(ii)** Second Joint Italian-Pakistani Workshop on Relativistic Astrophysics, July 8 – 10, 2009, Pescara;
- **(iii)** MG 12,Paris, July 12 – 18, 2009;
- **(iv)** 2nd Galileo - Xu Guangqi Meeting, July 12-18, 2010 Ventimiglia and Nice;
- **(v)** International Scientific Spring, March 01 - 06, 2010**,** National Centre for Physics, Islamabad, Pakistan;
- **(vi)** Various other National Conferences and numerous seminars at various laces in various countries.

Work With Students:

- **(i)** Directing the Centre for Advanced Mathematics & Physics of the National University of Sciences & Technology, H-12, Islamabad, Pakistan;
- **(ii)** Collaborated with six students of that Centre on Relativity, Astrophysics, Cosmology, Differential Equations, Special Functions;
- **(iii)** Worked with two students of the Department of Mathematics & Statistics of the King Fahd University of Petroleum & Minerals, Dhahran 31261, Saudi Arabia.

Diploma thesis supervision

Supervised 3 PhDs, supervising 4 PhDs and 2 MPhils.

Other Teaching Duties

Taught courses on Geometry, Electromagnetism, Mechanics.

III. Service activities

Within ICRANet:

Organized the Second Joint Italian-Pakistani Workshop on Relativistic Astrophysics, July 8 – 10, 2009 at Pescara.

III b. Outside ICRANe

Was involved in organizing several Workshops/Conferences in Pakistan, including the International Scientific Spring, March 01 - 06, 2010**,** National Centre for Physics, Islamabad, Pakistan and the 13th Regional Conference in Mathematical Physics at Antalya, Turkey, 26 – 31 October, 2010.

2010 List of Publications

"Approximate partial Noether operators of the Schwarzschild spacetime", I. Hussain, F.M. Mahomed and A. Qadir, J. Nonlin. Math. Phys. 17 (2010) 13–25.

"On Gauss-type quadrature rules", M.A. Bokhari, A. Qadir and H. Al-Attas, Numerical Functional Analysis and Optimization 10 (2010) 1120 - 1134.

Stanley P. Davis

Research Areas:

- Laboratory Astrophysics: High Energy Astrophysics / Density Physics
- Laser-Driven Inertial Fusion Energy
- Multi-wavelength Astrophysics: High Energy Astrophysical Transients, e.g., gamma-ray bursts (GRBs)
- Plasma Physics; Relativistic Beaming, Plasma Instabilities
- Laser Physics / Optics
- Nano-physics
- Medical Applications of Laser Plasma Interactions

Refereed Publications:

1. "Ion Beam Weibel Instability Simulations of Energy Transfer in Gamma-ray Bursts via Laser Irradiation on Foil", Davis, S P., Tikhonchuk V., d'Humières, E., Bochkarev, S
2. "Weibel Instability Simulations for Gamma-ray Bursts as an Application of Laboratory Astrophysics" Davis, S P., Tikhonchuk V., d'Humières, E., Weber S, Inertial Fusion Sciences with Applications 2009 (IFSA 2009), San Francisco, USA, 2009
3. "Gamma-ray Burst Simulations via Collisionless-Shock Driven Proton Weibel Instability", Davis S P, Tikhonchuk V, d'Humières E, Weber S, in preparation
4. "Extracted Dispersion from Spectrally Dispersed Young's Double Slit for the National Ignition Facility Coherent Addition of Pulses for Energy", Stanley Davis, Michael Rushford, Antonio Lucianetti, Igor Jovanovic, Lawrence Livermore National Laboratory / National Ignition Facility, written, to be published
5. "Coherent Addition of Pulse for Energy (CAPE) Instrument and Data Fitting Model Study", UCRL-ABS-225307, Michael C. Rushford, Stanley Davis, Antonio Lucianetti, et. al., Lawrence Livermore National Laboratory
6. "Model for the Redshift and Luminosity Distributions of Gamma-Ray Blazars", C. Dermer and S. P. Davis, 5th Compton Symposium Proceedings, 1999, AIP
7. "Pulse-Width, Pulse-Interval Distributions and Total Counts as Indicators of Time Dilation in Gamma-Ray Bursts", Davis, S. P. RIKEN Review, 1997
8. "Measurements of Time Dilation in Gamma-Ray Bursts by Analysis of Temporal Structure", Davis, S. P., 1995 9. "Measurement of Time Dilation in Pulse Widths and Intervals Between Pulses", Davis, S. P. 1994, BAAS, 26,
9. "Consistency of Time Dilation in Temporal Profiles and Spectra of Gamma-ray Bursts", Norris, J.P., Nemiroff, R.J., Bonnell, J.T., Scargle, J.D., Davis, S.P., et al. 1995, Adv. Space Res., Vol 15, No. 5, pp. (5)135-(5)138, COSPAR
10. "Exploration of Bi-Modality in Gamma-Ray Burst Duration and Hardness Distributions", Norris, J.P., Nemiroff, R.J., Davis, S.P., et al.: AIP Conference Proceedings 307, Huntsville Gamma-Ray Burst Workshop, 1994
11. "Pulse Width Distributions and Total Counts as Indicators of Cosmological Time Dilation in Gamma-Ray Bursts", Davis, S.P., et al.: AIP Conference Proceedings 307, Huntsville Gamma-Ray Burst Workshop, 1994
12. "Measurement of Signature Consistent with Cosmological Time Dilation in Gamma-Ray Bursts", Norris, J.P., Davis, S.P., et al.: 23rd International Cosmic Ray Conference, 1993, Vol. 1, p.89; (http://adsabs.harvard.edu/abs/1993ICRC....1...89N)
13. "Calibration of an Algorithm for Overlapping Pulses in Gamma-Ray Bursts", Davis, S.P., Norris, J.P., et al.: AIP Conference Proceedings 280, eds: M. Friedlander, N. Gehrels, Daryl J. Macomb, 1992, p.964
14. "Deconvolution of Pulses in Bright Gamma-Ray Bursts", Norris, J.P., Davis, S.P., et al.: AIP Conference Proceeding 280, eds: M. Friedlander, N. Gehrels, Daryl J. Macomb, 1992, p.959
15. "Deconvolution of Pulse Structures in Gamma-Ray Bursts Observed by BATSE", Davis, S. P., Norris, J.P., et al.: Bull. AAS. 23, 1323 (1992)

INTERNET PUBLICATION: On line Astrophysics: A Century of Great Discoveries:
http://heseweb.nrl.navy.mil/gamma/dap-aps/astro/index.htm;

Presentations At Professional Meetings And Colloquia:

1. S. P. Davis, Simulations of Energy Transfer in Gamma-ray Bursts via Laser Irradiation on CH–H^+ Foil, Invited Speaker, International Center for Relativistic Astrophysics Network, Pescara, Italy, June 28, 2010
2. S. P. Davis Proton Beam Instability Simulations of Energy Transfer in Gamma-ray Bursts via Laser Irradiation on CH–H^+ Foil, GDRE Gamma-ray Burst School, Carghese, Corsica, France, May 17-22, 2010

Goulart Érico

Position: Post-Doc ICRA-br, CBPF, Brasil
Period covered: 25/10/2010 – 19/11/2010

I. Scientific Work

At this moment I am specially interested in the connection between effective metrics and Newtonian mechanics. As was shown by W. R. Hamilton - when he was trying to formalize optics in the same way that Lagrange formalized mechanics - it is possible to map a given mechanical system in an optical one by means of the optical-mechanical analogy. According to this analogy, there exist a formula that relates a given potential in the mechanics of point particles to an index of refraction in geometrical optics. In this way the trajectory of light rays inside a material can be univocally mapped in the trajectory of particles in Newton's mechanics. I am studying how a geometrization procedure of these trajectories can be made in terms of effective geometries and effective null geodesics. The correlation between this study and the study of analogue models of gravitation is being made in this period in ICRAnet Pescara.

Furthermore, I have interests in the study of propagation properties in the context of nonlinear classical field theory. As in the last year, the problem is being investigated from the differential, and algebraic points of view. The mechanism of the effective metric correlates all these properties in a very powerfull and elegant framework that I am formalizing and studying in details. This is because in a nonlinear context the causal structure of the field does not coincide with the Minkowskian one anymore i.e. the rays of radiation cannot be identified with the geodesics of Minkowski space-time. Neverthless, it is possible to show, from the study of the characteristics of the equations, that exists an effective Riemannian manifold in wich the null geodesics coincide with the trajectories of the nonlinear excitations.

Special emphasis is being given to the causal structure of nonlinear electrodynamics theories. This is because it is exactly the linear nature of Maxwell´s electrodynamics that determines the causal structure of the relativistic spacetime we think we know well. In nonlinear electrodynamics the situation is not so simple. These theories, although clearly formulated in a Lorentz covariant fashion do not admit, in general, a special velocity associated to the excitations that has an invariant meaning. In general the velocity of the high energy perturbations depends on the direction, magnitude and nature of the external electromagnetic field in which it propagates. Our studies show, for instance, that the propagation of the waves in a null electromagnetic background is entirely different from the propagation in backgrounds where the electromagnetic invariants do not vanish. Furthermore, because the orientation of the characteristics in spacetime is field dependent, we do not have the same light cone for all points, i.e. the propagation is not isotropic in general. To understand such features i developed a classification of propagation properties of nonlinear electrodynamics based on local properties of the effective metric (class. Quantum Grav. 26 (2009) 135015). I am studying some of its consequences and its relation with the polarization.

My next objectives are to apply the method of classification to investigate in details the electromagnetic propagation properties of high energy excitations in astrophysical situations and in cosmolgy. Beside of this, because nonlinear electrodynamics presents many interesting formal properties that may be geometrized, it can be used as tool to understand better processes associated to gravitation, such as gravitational waves, Lorentz invariance and the geometrization of the interaction itself.

II. Service activities

Within ICRANet

I am writing a review with prof. Novello and S. Bergliaffa on the fundamentals of nonlinear field theory and wave propagation in this context. We are focusing on the propagation of shocks and discontinuities in nonlinear electrodynamics and how these features can be understood in terms of effective metrics. Many interesting special solutions are treated and the adequate analogies with the gravitational field are being made. These last aspects ranges from the causal structure of the field, differential aspects of the equations of motion, classification of the energy momentum tensor and effective metric, nonlinear properties of materials, exotic solutions for photon trajectories, analogue black-holes, nonlinear electrodynamics coupled to general relativity to cosmological solutions and magnetic fields in the large. Most of the review is been discussed and written in the very pleasant building of ICRA-net in Pescara.

2010 List of Publications

M. Novello and E. Goulart – Eletrodinâmica Não-Linear: Causalidade e Efeitos Cosmológicos, editora livraria da fisica, 2010 (book in portuguese);

Érico Goulart and Felipe Tovar Falciano –Geometrical properties of electromagnetic tidal forces– accepted for publication in Int. J. Mod. Phys. A;

Hoang Ngoc Long

Position: Head of Particle Physics section, Graduate School,
Institute of Physics
Vietnamese Academy of Science and Technology
Period covered: From 2000 --- now

I. Scientific Work

1. Right-handed sneutrinos as self-interacting dark matter in supersymmetric economical 3-3-1 model, H. N. Long, Adv. Studies Theor. Phys. 4 (2010) 173 - 196.

2. Inflationary scenario in the supersymmetric economical 3-3-1 model, Do T. Huong and Hoang N. Long, Phys. Atom. Nucl. 73, 5, (2010), pp. 791--804.
3. The 3-3-1 model with A_4 flavor symmetry, P. V. Dong, L. T. Hue, H. N. Long, D. V. Soa, Phys. Rev. D 81, (2010) 053004 (9 pages), [arXiv:1001.4625(hep-ph)].

4. Symmetry Factors of Feynman Diagrams for Scalar Fields, P. V. Dong, L. T. Hue, H. T. Hung, H. N. Long, and N. H. Thao, Theor. Math. Phys. 165 (2), 1500-1511 (2010).

5. Non-thermal leptogenesis in supersymmetric 3-3-1 model with inflationary scenario, D. T. Huong and H. N. Long, [arXiv:1004.1246(hep-ph)], subm.to JPG

6. The 3-3-1 model with S_4 flavor symmetry, P. V. Dong, H. N. Long, D. V. Soa, and V. V. Vien, [arXiv:1009.2328(hep-ph)], subm.to EPJC.

7. A simple model of gauged lepton and baryon charges, P. V. Dong and H. N. Long, [arXiv:1010.3818(hep-ph)]. Subm. to Phys. Rev. D.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works
I am member of Scientific committee of the National Conference in Theoretical Physics, 2nd -5th August 2010, HCM city, Vietnam

II b. Work With Students
I give lectures on Quantum Field Theory for Undergraduate students, Hanoi University of Education.

II c. Diploma thesis supervision
I am supervisor for 3 Ph. D. studens and 4 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: P. V. Dong

III. Service activities

III a. Within ICRANet - I hope to visit ICRANET next year 2011.

IV. Other

I am referee for some International Journal such as: Phys. Rev. D, Europhysics Letters,…

Hütsi Gert

Position: Researcher
Period covered: 11.07.2010 – 12.09.2010

I. Scientific Work

Working on topics related to the formation and evolution of the large-scale structure of the Universe. Also continuing work on astroparticle physics, especially focusing on astrophysical possibilities of indirect detection of dark matter. Preparing lecture material for the introductory cosmology course.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

Galileo - Xu Guangqi meeting, July 12-18, Ventimiglia, Italy; Large-scale structure of the Universe – a powerful probe of fundamental physics

Galaxy clusers: observations, physics and cosmology, July 26-30, Garching bei München, Germany; Power spectrum of the maxBCG sample: detection of acoustic oscillations using galaxy clusters (poster presentation)

II b. Work With Students

Introduction to Cosmology, 5 lectures at Erasmus Mundus IRAP PhD school, September 6-10, Nice, France

2010 List of Publications

Refereed Publications

• Implications of the Fermi-LAT diffuse gamma-ray measurements on annihilating or decaying Dark Matter
Hutsi, G., Hektor, A., Raidal, M., JCAP 07, 008 (2010), [arXiv:1004.2036]

• Constraint on the cosmological f(R) model from the multipole power spectrum of the SDSS LRG sample and prospects for a future redshift survey
Yamamoto, K., Nakamura, G., H¨utsi, G., Narikawa, T., Sato, T., Phys Rev. D 81, 103517 (2010) [arXiv:1004.3231]

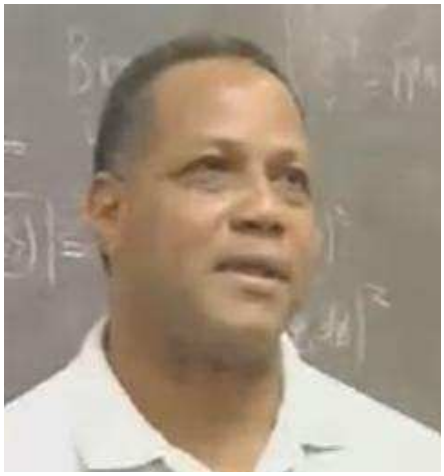
• Power spectrum of the maxBCG sample: detection of acoustic oscillations using galaxy clusters
H¨utsi, G., MNRAS 401, 2477 (2010), [arXiv:0910.0492]

Submitted

• Deconvolution of window effect in galaxy power spectrum analysis
Sato, T., H¨utsi, G., Yamamoto, K., submitted (2010), [arXiv:1010.0289]

• Window effect in the power spectrum analysis of a galaxy redshift survey
Sato, T., H¨utsi, G., Yamamoto, K., JCAP submitted (2010)

Mosquera Cuesta, Herman J.



Position: Visitor Professor ICRANet-Brasil
Period covered: 1st November 2009 to 31st October, 2010

I. Scientific Work
During this year I published the following set of scientific papers:
1) Title: Nonlinear Electrodynamics and CMB Polarization
Authors: Mosquera Cuesta, Herman J.; Lambiase, Gaetano
Publication: ICNAAM 2010: International Conference of Numerical Analysis and Applied Mathematics 2010. AIP Conference Proceedings, Volume 1281, pp. 864-869 (2010).

2) Title: L'energie sombre: Un mirage cosmique? Luminosity distance ≠ proper distance: A cosmological dissimilitude induced by nonlinear electrodynamics
Author: Mosquera Cuesta, Herman J.
Publication: INVISIBLE UNIVERSE: Proceedings of the Conference. AIP Conference Proceedings, Volume 1241, pp. 1083-1092 (2010).

3) Title: Precession in Extragalactic Parsec-Scale Accretion Disks
Authors: Caproni, Anderson; Livio, Mario; Abraham, Zulema; Mosquera Cuesta, Herman J.

4) Title: Removing Black Hole Singularities with Nonlinear Electrodynamics Authors: Corda, Christian; Mosquera Cuesta, Herman J.

5) Title: Bursts of Gravitational Waves Emitted During Ejection of Jet Superluminal Components in Active Galactic Nuclei Dynamically Dominated by Bardeen-Petterson Effect
Authors: Mosquera Cuesta, Herman J.; Caproni, Anderson; Abraham, Zulema

6) Title: Warping and Precession in Extragalactic Maser Accretion Discs
Authors: Caproni, A.; Abraham, Z.; Livio, M.; Mosquera Cuesta, H. J.
Publication: XII Latin American IAU Regional Meeting (Eds. G. Magris, G. Bruzual, & L. Carigi) . Revista Mexicana de Astronomía y Astrofísica (Serie de Conferencias) Vol. 35, pp. 58-59 (2009)

7) Title: A spherically symmetric and stationary universe from a weak modification of general relativity
Authors: Corda, C.; Mosquera Cuesta, H. J.
Publication: Europhysics Letters, Volume 86, Issue 2, pp. 20004 (2009).

8) Title: Luminosity distance vs. proper distance: Effects of nonlinear electrodynamics in cosmology
Authors: Mosquera Cuesta, H. J.; Salim, J. M.; Novello, M.
Publication: Proceedings of Science (PoS), ISFTG (2009) 009, Trieste, Italy

The following papers are also submitted for publication:
9) Title: Nonlinear electrodynamics and CMB polarization
Authors : Herman J. Mosquera Cuesta, Gaetano Lambiase
Submitted to: Journ. Cosm. Astropart. Phys. Preprint: JCAP_001P_0710

10) Title: Inflation from R^2 gravity: a new approach using nonlinear electrodynamics
Authors: Herman J. Mosquera Cuesta, C. Corda, R. Lorduy Gomez
Submitted to Astroparticle Physics (2010)

11) Title: The Correction to the Compton Shift from Nonlinear Electrodynamics
Authors: Jean Paul Mbelek, Herman J. Mosquera Cuesta
Submitted to Physics Letters B (2010)

12) Gravitational waves produced by ejection of jet superluminal components, precession and gravito-magnetic distortion of accretion disks in active galactic nuclei, micro-quasars, and T-Tauri starts dynamically driven by Bardeen-Petterson effect
Authors: Herman J. Mosquera Cuesta, Luis Alberto Sanchez, Daniel Alfonso Pardo, Anderson Caproni, and Zulema Abraham
Publication: The Open Astronomy and Astrophysics Journal, in press (2010)

I became referee of the scientific journals:
a) "Astronomy and Astrophysics", published by Editions de Frontieres Science (Berlin, print).
b) "Entropy", published by MDPI Publishing (Basel, Switzerland).
c) I was also invited to become member of the "Board of Editors" of the journal "Positioning", published by Scientific Research Publishing, USA. It is a journal dedicated to the latest advancement of positioning, with the goal of keeping a record of the state-of-the-art research and promoting the research work in these fast moving areas.

II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

By continuing my engagement in collaborating with Colombian Scientific Institutions and Universities, I have been participating in projecting astronomical infrastructures that will be evaluated by the Colombian "Comision Colombiana del Espacio (CCE)". This entity is an governmental organ created by the Government of Republica de Colombia, and has as main purposes to foster the development in Space and Basic Sciences in Colombia through a national plan named "Vision Colombia 2009-2019", through which is expected to achieve significant advances in development the growth of those fields of science in Colombia. Among the astronomical projects are: Creation of the Colombian Astrophysical Observatory, Participation in International Astronomical Enterprises (Big Science Projects), Creation of Undergraduate Programs in Astronomy and the Design of the Structural Academic Grids for those university programs.

Recently, I took benefit of my scientific amity with Prof. Dr. Sylvester James Gates, member of President Barack Obama Scientific Adviser Council, (an organ in charge of designing new policies for science and technology in USA for the decades to come), and suggested to Dr. Jaime Restrepo Cuartas, "Director of Colciencias" (Colombian Science Foundation), to invite Prof. Gates to visit the country in the next months having in perspective the Colombia-USA summit, next February 2011, which is seen as the first step to implement the international Agreement of Cooperation in Science and Technology Matters between both countries. Such agreement was signed last year by Mrs. Hillary Clinton (USA Secretary of State) and President Alvaro Uribe, during Mrs. Clinton visit to Bogota.

During this period, I was also engaged in the following projects:

a) Co-organizing with Dr. Christian Corda (Galileo Galilei Science Center, Prato, Italy) and Prof. Alexander Polnarev (Queen Mary College, University of London) the "Second Big Challenge Symposium: The Big Challenge of Cosmological Understanding: Gravitation, Dark Matter and Dark Energy. Towards New Scenarios". Such event was part of the "8th International Conference Of Numerical Analysis And Applied Mathematics: ICNAAM 2010", held in Rhodes, Greece, from 19-25 Sep 2010. General Editor Theodore Tsimos AIP in press

b) Participated in the international conference "VI Malian Symposium on Basic and Applied Sciences", which was held in Bamako, Mali, August 1-7, 2010, at the "Centre International de Conferences de Bamako". In this Symposium I delivered an invited lecture on " Nonlinear electrodynamics in cosmology", and was co-lecturer, with Dr. Jean Paul Mbelek (CEA/Saclay/Paris – Universite de Bamako), of the talk "The Correction to the Compton Shift from Nonlinear Electrodynamics".

As a very educational project, I was invited to become member of the International Associate Professors Project, a national initiative of the Ministry of Higher Education, Science and Technology of the Mali Government. Such program is intended to gain the support and effective participation of distinguished professors, from any country in the world, who are interested in sharing with young scholars at Malian universities their knowledge in these fields.

II b. Work With Students

Durind the months of July, August and September of this year, I continued, presentially in Pescara, my advising of the thesis work of Ph. D. student Luis Juracy Rangel Lemos, of the ICRANet IRAP-PhD Program. Such work was done in collaboration with Prof. Carlo Bianco of ICRANet from Rome. We redesigned the strategy to proceed with the work on computing the "Luminosity Function of Gamma-Ray Bursts (GRBs)", in the perspective of reproducing, in a complete fashion, the work done in a paper published in ApJ (2009) by Prof. M. Schmidt from Caltech. This astrophysical tool allows one to estimate the distance to a given GRB event without knowing its redshift. We obtained important new results, and this first task, which is one of the main subjects of Juracy's thesis project, is almost done. Nonetheless, there is still much work to be done in this respect. In particular, we need still to proceed to apply the obtained expertise in computing such luminosity function to a different sample of GRBs (such a sample was selected introducing new criteria related to observational features of GRBs), to obtain new results for that sample and to compare them with those of ones obtained by Prof. Schmidt in 2009. The discussion of such analysis must be presented in a paper to be submitted for publication in a specialized journal.

I also designed the M. Sc. Thesis Project of the student Daniel Alfonso Pardo of Universidad Nacional de Colombia, Sede Medellin, of whom I am tutoring his thesis project in collaboration with Prof. Luis Alberto Sanchez D., staff of Escuela de Fisica, Universidad Nacional/Sede Medellin. I also prepared, in collaboration with Prof. Luis Alberto Sanchez D., the research project: "Estudio de la Emision de Ondas Gravitacionales por Discos de Acrescion Dinamicamente Dominados por el Efecto Bardeeen-Petterson", which is being submitted to "Fundacion para la Promocion de la Investigacion y la Tecnologia Banco de la Republica", an institution dedicated to promote the research and technology development in Colombia. The project is designed for being executed during one year, and is related to the main part of student Alfonso Pardo thesis plan.

II c. Diploma thesis supervision

Over this year I have been tutoring, presentially when posible, and at a distance, the IRAP-PhD student Luis Juracy Rangel Lemos in his thesis work. An important progress has been achieved, but there is still more work to be done in the perspective of helping him to arrive to conclude in the due course his Ph. D. Dissertation.

Meanwhile, I have been advising the student Daniel Alfonso Pardo, Universidad Nacional de Colombia/Medellin, in the work related to his M. Sc. Thesis which will focus on the "Emission of gravitational waves from accretion discs in active galactic nuclei driven by Bardeen- Petterson Effect".

II d. Work With Post-docs

I started a research project with Dr. Fabrizio di Marco (ICRANet Pescara/Italy) on the subject: Cosmic Strings in Nonlinear Electrodynamics, which is a work in progress.

During this year, I continued my scientific collaboration with Dr. Jean Paul Mbelek (Universite de Bamako, and CEA/Saclay/Paris) on studies involving the application of nonlinear electrodynamics in open problems related to fundamental physics, astrophysics and cosmology.

In the late months, I started, in collaboration with Dr. Dinesh Singh (Regina University, Canada) and Prof. Donato Bini, (Istituto per l'Applicazione del Calcolo, Rome/Italy), a study on the "Emission of gravitational waves by gravito-magnetic distortion of accretion discs dominated by Bardeen-Petterson Effect".

III. Service activities

III a. Within ICRANet

In 2010, ICRA-Brasil published as a book, the innovative compilation "Programa Minimo de Cosmologia" (Minimum Program for Cosmology), JAUA' Editora/Brasil, with ISBN code 85-89410-03-8. To this special volume I contributed with a couple of chapters entitled: "Astrofisica de Ondas Gravitacionais"

(Astrophysics of Gravitational Waves), and "Astrofisica de Objetos Compactos" (Astrophysics of Compact Objects).

Starting this November, 2010, I will be engaged in the project intended to create in Fortaleza, Ceara' State, Brazil, the new filial of ICRANet: The "International Center for Relativistic Astrophysics – Fortaleza", an initiative of ICRA-Brasil and coordinated by Prof. Francisco J. Amaral Vieira of ICRANet South-America Secretariat, in Fortaleza. I will also give support to the project SOBRAL ASTRO, to be developed in the ville of Sobral, Ceara State, Brazil. This initiative is also coordinated by Prof. Francisco J. Amaral Vieira, in collaboration with professors of the Department of Physics, Universidade do Vale do Acarau, in Sobral.

III b. Outside ICRANet

I am also co-editor, together with Dr. Christian Corda, Dr. Oswaldo D. Miranda, and Prof. Theodore Tsimos, of the special volume on "Gravitational Waves: The Big Challenge", to be published in 2010 by "The Open Astronomy and Astrophysics Journal" (in press).

IV. Other

During the first week of November, 2010, I was invited to be Lecturer in the international conference "Forum du 3e Festival Mondial des Arts Nègres", which is being organized by Professeur Iba Der Thiam, UNESCO and Universite' de Dakar, and President of the Scientific Committee. The Forum will be held in Dakar, Senegal, from 10 to 22 December, 2010.

Mohammadi Rohoollah

Research Interests:

Field theory (main references: Introduction with field theory by Peskin).

- Introduction with supersymmetry (specially MSSM)
- Introduction with standard model and grand unified theory (GUT).
- Introduction with neutrino physics (main references: Massive neutrinos in Physics and Astrophysics by R. N. Mohapatra and Palash B. Pal).
- Fairly good introduction with numerical calculations (FORTRAN programming).

Participation in international conferences:

- Collaboration with ICRANet as visitor, March-August 2010, Pescara, Italy.
- Second Galileo-XuGuangqi meeting 11-16 July 2010, Ventimiglia- Italy
- A few international conferences held in Iran.

Papers:

- Majid Modarres and Roohalla Mohammadi, The self-consistent method in calculating the $\frac{F_2^n}{F_2^p}$ ratio by using the structure functions and EMC ratios for ^{3}He and ^{3}H, published in physics pajohesh journal in Iran
- M. Zarai, I. Motie, Z. Rezaei, M. Hagheghat, E. bavarsad and R. Mohammadi, Generation of circular polarization of the CMB, In this paper we show that CMB polarization obtain a small circular polarization component if one consider the noncommutative corrections, Lorentz violation corrections and back grand magnetic field in the Compton scattering of a electron with the CMB photons.(Phy. Rev. D, (2009))
- M. Hagheghat, E. bavarsad and R. Mohammadi, "Nucleon-Nucleon scattering in the presence of strong back ground magnetic field", In this we calculated Nucleon-Nucleon scattering in the presence of strong background magnetic field and we show that it is different from Nucleon-Nucleon scattering without considering background magnetic field.(Phy. Rev. D, (2010))
- M. Hagheghat, M. M. Etefaghi and R.Mohammadi, "Noncommutative QED+QCD and corresponding Beta-function" (Phy. Rev. D, (2010))
- R. Mohammadi, R. Ruffini and S. S. Xue, "The solution of Thomas-Fermi equation in the presence of the strong magnetic fields" (Presented in 2th Galileo-XuGuangqi meeting 11-16 July 2010, Ventimiglia-Italy)
- M. Hagheghat, E. bavarsad and R.Mohammadi, "Lorentz Violation and magnetic field" (in progressive).
- M. Hagheghat, E. bavarsad and R.Mohammadi, "Neutrino emissivity in background magnetic field" (in progressive).

Motie Iman

Position: Ph.D Student of physics
Period covered: 6 months

I. Scientific Work
I worked in Iran on:
1- Generation of circular polarization of CMB where published in PRD
2- Beta function in Lorentz violation theory (my calculation were finished and nowadays it will publish)
3- Electron electric dipole moment in standard model extension. (My calculation was finished and I am writing this paper)

II. Educational activities
II c. Diploma thesis supervision
Prof. M. Haghighat

III. Service activities
III a. Within ICRANet
Here I am working with prof. Xeu on:
1- generation of circular polarization of the CMB via Euler -Heisenberg Lagrange
2- neutrino physics
Moreover, I am working with prof. Vereshchagin on thermal equilibrium of the pair plasma.

2010 Publication
Generation of circular polarization of the CMB
Phys.Rev.D81:084035, 2010

Boshkayev Kuantay

Education

2009-2012	Ph.D, Department of Physics at Rome University La Sapienza (Italy)
2006-2009	Ph.D, Department of Physics at Al-Farabi Kazakh National University (KazNU, Kazakhstan)
2004-2006	Master of Physics, Department of Physics of KazNU
1999-2004	Bachelor, Department of Physics of KazNU

Qualification

2009 Ph.D degree in Theoretical Physics Department of Physics of KazNU.
Title of the thesis: "The metric of a rotating liquid sphere taking into account nonlinear in U and S_0 terms and convergence of expansion of the metric tensor components".
Supervisor: prof. T.A. Kozhamkulov and co -adviser: prof. R. Ruffini

2006 Master degree in Theoretical Physics Department of Physics of KazNU.
Title of the thesis: "To discrepancy problem of the relativistic equations of bodies' motions in General Relativity".
Supervisor: prof. M.M. Abdildin and co- adviser associated prof. M.E. Abishev

Research Interests:

General Relativity: Bodies Motion Problem in GR, exact and approximate solutions of the field equations

Practical experience

2006-2009 Teacher of practical lessons in mathematical physics, quantum mechanics and electrodynamics at the Department of Physics of KazNU, Almaty
2004-2006 Teacher of physics at Business and Fashion Academy "Symbat", Almaty

Languages

Kazakh (native), Russian (good), English (good), Italian (little).

Computer skills

Office programs, Mathematical package, Latex

Sport and Hobbies

Swimming, volleyball and tennis

Ceccobello Chiara

Position: PhD student of the University of Ferrara, Physic Department
Period covered: From January 2009 to December 2011

I. Scientific Work
The second year of my PhD has been devoted to the study of MonteCarlo techniques for the simulation of the emergent spectra coming from neutron stars with ultra strong magnetic field. I developed a Montecarlo code with the aim to overcome the problems encountered in the semi-analytical solution of the radiative transfer problem in strongly-magnetized atmospheres and also to have a comparison of the new results with the old ones. The use of this MonteCarlo code help us to have a more accurate description of the radiative transfer phenomenon in the atmospheres of the "magnetars".

II. Conferences and educational activities
II a. Conferences and Other External Scientific Works
MODE-SNR-PWN Workshop, Bordeaux, from 11/15/2010 to 11/17/2010
PULSAR 2010, Chia (Cagliari) from 10/10/2010 to 10/16/2010
AGN 9 Black Holes and Revelations, Ferrara, from 05/24/2010 to 05/27/2010
IRAPP PhD School, Observatoire de la Cote d'Azur, Nice, from 02/09/2010 to 02/19/2010
IRAPP PhD School, Physic Department, University of Ferrara, from 03/22/2010 to 03/26/2010

III. Service activities
III a. Outside ICRANet
"Progetto Lauree Scientifiche"

De Barros Gustavo

Position: Ph.D. student
Period covered: November 2006 – October 2010

I. Scientific Work
1- “On the nature of GRB050509b: a disguised short GRB” submitted to A&A.
2- “On the hydrodynamic of the optically thick phase at the onset of GRBs” submitted to A&A.

II. Conferences and educational activities
II a. Conferences and Other External Scientific Works
1-The Second Galileo-Xu Guangqi meeting. July 12-17, 2010 Nice France
2-Irap Ph.D. Erasmus Mundus school. September 6-24, 2010 Nice France

Ferroni Valerio

Position: ph. D student
Period covered: 2010

I. Scientific Work

Valerio Ferroni; Silbergleit A., "Patch Effect for Cylindrical Geometry 1: Potential and Energy between Slightly Non Coaxial Cylinders", submitted to Class. Quant. Grav., 2010;

Valerio Ferroni; Silbergleit A., "Patch Effect for Cylindrical Geometry 2: Forces ", submitted to Class. Quant. Grav., 2010;

Valerio Ferroni; Silbergleit A., "Patch Effect for Cylindrical Geometry 3: Torques ", submitted to Class. Quant. Grav., 2010;

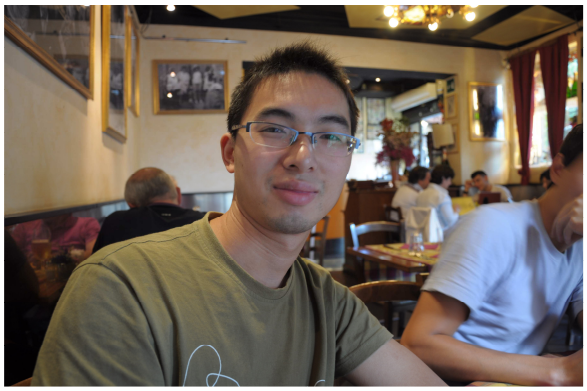
II. Conferences and educational activities

II a. Conferences and Other External Scientific Works

Valerio Ferroni; Mester J.; Everitt C.W. F.; Silbergleit A.; Wang S.; Worden P. "Technology Development and Disturbance Reduction for STEP", COSPAR, Bremen, Germany 2010;

Valerio Ferroni; Silbergleit A., "Patch Effect In Cylindrical Geometry: The STEP Accelerometer", Galileo-Xu Guangqi, Ventimiglia, Italy 2010;

Han Wenbiao



Position: Ph.D student
Period covered: 2009-2011

I Scientific Work
Electromagnetic radiation from electron-positron oscillation;
Spin effect on gravitational radiation

II Conferences and educational activities

Conferences and Other External Scientific Work
1. The Second Galileo-Xue Guangqi meeting, oral talk: *Radiation from electron-positron pair oscillation in spatially inhomogeneous electric fields*
2. Chinese Annual meeting on Relativistic Astrophysics, oral talk: Gravitational radiation from a spinning compact object orbiting a supermassive Kerr black hole.

2010 List of Publications

1. Gravitational Radiations from a Spinning Compact Object around a supermassive Kerr black hole in circular orbit, Wen-Biao Han, Phys. Rev. D82, 084013, 2010

2. Electron-positron pair oscillation in spatially inhomogeneous electric fields and radiation, Wen-Biao Han, Remo Ruffini, She-Sheng Xue, Physics Letters B 691, 99-104 (2010)

Izzo Luca

Position: IRAP PhD student
Period covered: 2007-2010

I Scientific Work

-S. Capozziello, L. Izzo, "Cosmography by Gamma Ray Bursts", Astron & Astroph., 490, 31, (2008),arXiv:0806.1120
-L. Izzo, S. Capozziello, G. Covone, M. Capaccioli, "Extending the Hubble diagram by gamma ray bursts", Astron & Astroph., 508, 63, (2009), arXiv:0910.1678
-S. Capozziello, L. Izzo, "A cosmographic calibration of the Ep;i-Eiso (Amati) relation for GRBs", Astron & Astroph., in press, arXiv:1003.5319
-L. Caito, L. Amati, M.G. Bernardini, C.L. Bianco, G. de Barros, L. Izzo, B. Patricelli, R. Ruffini, "GRB 071227: an additional case of disguised short burst", Astron & Astroph, in press, arXiv:1006.4842
-L. Izzo, et al., "GRB 090423 at redshift 8.1 : a theoretical interpretation", Journal of Korean Ph. Soc., in press.

Proceedings

-S. Capozziello, L. Izzo, "Cosmography by GRBs : Gamma Ray Bursts as possible distance indicators.", Nucl.Phys.Proc.Suppl., 194, 206, (2009), arXiv:0906.3025
-R. Ruffini, L. Izzo, et al., " The Blackholic energy and the canonical Gamma-Ray Burst IV: the 'long','genuine short' and 'fake - disguised short' GRBs.", AIP Conf. Proc., 1132, 199, (2009), arXiv:0907.5517
-L. Izzo, et al., "GRB 090423 in the fireshell scenario", SIF Conf. Proc., proceedings of the Shocking Universe meeting, in press
-L. Izzo, S. Capozziello, M.F: de Laurentis " Detecting the Cosmological Stochastic Background of Gravitational Waves with FastICA.", proceedings of the III Stueckelberg Workshop, Cambridge Scientific Press, in press.
-L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, R. Ruffini, "GRB 090423 in the Fireshell scenario: a canonical GRB at redshift 8.2", proceedings of the XII Marcel Grossmann meeting, World Scientific Press, in press.
-L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "GRB 080916C and the high-energy emission in the fireshell scenario", proceedings of the 1st Galileo-Xu Guangxi meeting, Int. J. of Mod. Phys. in press.
-L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "On GRB 080916C and GRB 090902B observed by the Fermi satellite", proceedings of the Kyoto meeting "Deciphering the Ancient Universe with GRBs", AIP Conf. Series, in press
-M.F. de Laurentis, S. Capozziello, L. Izzo, " Stochastic background of gravitational waves 'tuned' by f(R) gravity. ", proceedings of the III Stueckelberg Workshop, in preparation, Stochastic background of gravitational waves 'tuned' by f(R) gravity. .
-B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, G. Vereshchagin, "A new spectral energy distributions of photons in the fireshell model of GRBs", proceedings of the XII Marcel Grossmann meeting, World Scientific Press, in press.
-B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, "GRB 050904: the study of a high redshift GRB within the fireshell model", proceedings of the XII Marcel Grossmann meeting, World Scientific Press, in press.
-M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, B. Patricelli, R. Ruffini, "The X-ray flares of GRB 060607A within the fireshell model" proceedings of the XII Marcel Grossmann meeting, World Scientific Press, in press.
-B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, G. Vereshchagin, "A new spectral energy distributions of photons in the fireshell model of GRBs", SIF Conf. Proc., proceedings of theShocking Universe meeting, in press

-A.G. Aksenov, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, B. Patricelli, R. Ruffini, "The fireshellmodel for Gamma Ray Bursts", SIF Conf. Proc., proceedings of the Shocking Universe meeting, in press
-B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, G. Vereshchagin, "A new spectral energy distributions of photons in the fireshell model of GRBs", proceedings of the 1st Galileo-Xu Guangxi meeting, Int. J. of Mod. Phys. in press.
-B. Patricelli, M.G. Bernardini, C.L. Bianco, L. Caito, L. Izzo, R. Ruffini, "Black Holes in Gamma Ray Bursts", "Deciphering the Ancient Universe with GRBs", AIP Conf. Series, in press
Proceedings In Preparation:
-L. Izzo, O. Luongo, S. Capozziello, "Cosmography by Gamma Ray Bursts : GRBs as possible distance indicators ?", proceedings of the 54th Congresso della Societ´a Astronomica italiana, Mem. Sait, in preparation
-L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "The Ultrarelativistic GRBs", proceedings of the 2nd Galileo-Xu Guangxi meeting, in preparation.
-L. Izzo, M.G. Bernardini, C.L. Bianco, L. Caito, B. Patricelli, L.J. Rangel Lemos, R. Ruffini, "On GRB 080916C and GRB 090902B observed by the Fermi satellite", proceedings of the 38th COSPAR Assembly, in preparation.
Proposal
VLT proposal as PI : Detecting the host galaxy of the most distant gamma-ray burst, GRB 090423
in collaboration with G. Covone, A. Monna, M. Della Valle, M. Capaccioli, S. Capozziello
Swift proposal (submitted) as CoPI : SWIFT TOO OBSERVATIONS OF GALACTIC AND MAGELLANIC NOVAE
in collaboration with M. Della Valle (PI), G. Covone, M. Paolillo, A. Monna, M. Dall'ora
TNG proposal (submitted) as PI : TOO High Resolution Spectroscopy of Galactic Novae
in collaboration with M. Della Valle (PI), G. Covone, M. Paolillo, A. Monna, M. Dall'ora

II Conferences and educational activities
February 2008 - "Observational Evidence for Black Holes in the Universe", Kolkata, 10-17.
July 2008 - "3rd Stueckelberg workshop", Pescara, 8-18.
September 2008 - "Probing Stellar Populations out to the Distant Universe", Cefal´u, 14-19.
September 2008 - "18th SIGRAV Conference", Cosenza, 22-25.
May 2009 - "Sobral meeting", Fortaleza, 26-29.
June-July 2009 - "6th Italian-Sino Workshop", Pescara, 29-1.
July 2009 - "XII Marcel Grossmann meeting", Paris, 13-18.
September 2009 - "The Shocking Universe", Venice, 14-18.
October 2009 - "1st Galileo-Xu Guangxi meeting", Shanghai, 26-30.
November 2009 - "XI Italian-Korean meeting", Seoul, 2-4.
April 2010 - "Deciphering the Ancient Universe", Kyoto, 19-23
May 2010 - "54th Congresso SaIT", Naples, 2-4.
June 2010 - "2nd italian meeting on GRBs - Dall'eV al TeV, tutti i colori dei GRBs", Cefal´u, 15-18.
July 2010 - "2nd Galileo-Xu Guangxi", Ventimiglia, 12-16.
July 2010 - "COSPAR2010 - 38th Scientific Assembly", Bremen, 18-25.

Invited Talks
March 2009 - Lecture to Capodimonte Observatory, Naples, 20.
contributions: "I Gamma Ray Bursts come possibili indicatori di distanza",
June 2010 - "2nd Italian meeting on GRBs - dall'eV al TeV, tutti i colori dei GRBs", Cefal´u, 15-18.
contributions: "Cosmography by GRBs : Gamma Ray Bursts as a possible distance indicators",
July 2008 - "3rd Stueckelberg workshop", Pescara, 8-18.
contributions: "Detection of Cosmological Stochastic Background of Gravitational waves in f(R) gravity with FASTICA",
June-July 2009 - "6th Italian-Sino Workshop", Pescara, 29-1.
contributions: "GRB 090423 : the farthest GRB ever known",
May 2010 - "54th Congresso SaIT", Naples, 2-4.
contributions: "Cosmography by Gamma Ray Bursts : GRBs as possible distance indicators?"

Contributed Talks
September 2008 - "18th SIGRAV Conference", Cosenza, 22-25.
contribution: "Cosmography by GRBs".
May 2009 - "Sobral meeting", Fortaleza, 26-29.
contribution: "GRB 090423 : the farthest GRB ever known".
July 2009 - "XII Marcel Grossmann meeting", Paris, 13-18.
contribution: "GRB 090423 : a canonical GRB at redshift 8.2".
October 2009 - "1st Galileo-Xu Guangxi meeting", Shanghai, 26-30.
contribution: "GRB 080916C in the fireshell scenario".
November 2009 - "XI Italian-Korean meeting", Seoul, 2-4.
contribution: "GRB 090423 in the fireshell scenario".
July 2010 - "2nd Galileo-Xu Guangxi", Ventimiglia, 12-16.
contribution: "The Ultra-relativistic GRBs.".
July 2010 - "COSPAR2010 - 38th Scientific Assembly", Bremen, 18-25.
contribution: "A possible explanation for the high energy emission in GRB 080916C and GRB 090902B.".

Posters
September 2009 - "The Shocking Universe", Venice, 14-18.
poster: " GRB 090423 : a canonical GRB at redshift 8.2".
April 2010 - "Deciphering the Ancient Universe", Kyoto, 19-23
poster: "A possible explanation for the high energy emission in GRB 080916C and GRB 090902B.".

Conferences and Other External Scientific Work
- Observational Evidence for Black Holes in the Universe, February 10-15 (2008) and the satellite meeting Black Holes, Neutron Stars and Gamma Ray Bursts, February 16-17, S. N. Bose Centre for Basic Sciences, Kolkata, India.
- 3th Stueckelberg Workshop, July 8-18 (2008), Pescara, Italy.
- 13th Brazilian school of Cosmology and Gravitation, July 20-August 2 (2008), Mangaratiba, Brazil.
- Probing Stellar Populations out to the Distant Universe, September 14-19 (2008), Cefalù, Italy.
- 18th SIGRAV Conference, September 22-25 (2008), Cosenza, Italy.
- SIGRAV-INFN Cosmology School: "Coarse–Grained Cosmology", January 26-29 (2009), Firenze, Italy
- Sobral meeting, May 26-29 (2009), Fortaleza (Cearà), Brazil
- Meeting Unita-sez. Napoli, June 2009, Napoli, Italy
- XII Marcel Grossmann meeting, July 13-18 (2009), Paris, France
- The Shocking Universe, September 14-18 (2009), Venezia, Italy
- 1st Galileo-Xu Guangxi meeting, October 26-30 (2009), Shanghai, Cina
- XI Italian-Korean meeting, November 2-4 (2009), Seoul, South Korea
Lectures
- Osservatorio Astronomico di Capodimonte, March 20, 2009, Napoli, Italy.
Contributed and Invited Talks
- 3th Stueckelberg Workshop, July 8-18 (2008), Pescara, Italy. In this workshop he presented the following talks: "GRB061007: A progress report", and "Detection of Cosmological Stochastic Background of Gravitational waves in f(R) gravity with FASTICA", which will be published in the proceedings of the meeting itself.
- 18th SIGRAV Conference, September 22-25, Cosenza, Italy. In this workshop he presented the talk "Cosmography by Gamma Ray Bursts: GRB as distance indicators?", which will be published in the proceedings series of the meeting itself.
- SIGRAV-INFN Cosmology School: "Coarse–Grained Cosmology", January 26-29 (2009). In this workshop he presented the talk "Cosmography by Gamma Ray Bursts: GRB as distance indicators?", published by Nuc. Phys. B (Proc. Suppl.).
- Lecture hed at Osservatorio Astronomico di Capodimonte, March 20, 2009, Napoli, Italy. In this lecture he presented the talk "Cosmography by Gamma Ray Bursts: GRB as distance indicators?".

- Sobral meeting, May 26-29 (2009). In this workshop he presented the talk “GRB 090423 : the most distant GRB ever known”, which will be published in the proceedings series of the meeting itself.
- Meeting Unita-sez. Napoli, Napoli, Italy. In this workshop he presented the talk “Cosmography by Gamma Ray Bursts: GRB as distance indicators?”, which will be published in the proceedings series of the meeting itself.
- XII Marcel Grossmann meeting, July 13-18 (2009). In this workshop he presented the talk “GRB 090423 : a canonical GRB at redshift 8.1”, which will be published in the proceedings series of the meeting itself.
- 1st Galileo-Xu Guangxi meeting, October 26-30 (2009). In this workshop he presented the talk “GRB 080916C in the fireshell scenario”, which will be published in the proceedings series of the meeting itself.
- XI Italian-Korean meeting, November 2-4 (2009). In this workshop he presented the talk “GRB 090423 in the fireshell scenario”, which will be published in the proceedings series of the meeting itself.

Lecian, Orchidea Maria

Position: postdoc
Period covered: 1 February 2009, present.

I.Scientific Work
Research in General Relativity

II. Conferences and educational activities
II a. Conferences and Other External Scientific Works 2010
Seminars:- Sapienza, Rome, 30 September 2010, Seminario Teorico, "Sulle proprietà dei biliardi cosmologici";- APC, Paris, 22 April 2010: "Some further investigation on the BKL paradigm".
Meeting: 11-17 July 2010: "2nd Galileo-XuGuangqi Meeting", in Ventimiglia (Italy), with the contribution "About the statistical properties of cosmological billiards".

II b. Other Teaching Duties 2010
Spring 2010: Thesis Supervisor ('Relatore Esterno' for the 'Tesi di Laurea Triennale') for the student Stefano Iovieno. Title: "Aspetti geometrici e topologici dello spazio-tempo di Schwarzschild ", Physics Department, Sapienza- (Relatore Interno Prof. G. Montani).

2010 List of Publications
- O.M. Lecian, G. Montani, Riemannian and non-Riemannian extensions of geometrodynamics versus Einsteinian gravity, JKPS (2010) 56:1653-1657.

Menegoni Eloisa

Position: Ph. D student (VIII-IRAP)
Period covered: from November 1 2009 to 31 October 2012

I. Scientific Work

2009 (www.citebase.org/abstract:arXiv.org:0909.3584," published on Phys. Rev. D80:087302,2009".) "`New Constraints on variations of the fine structure constant from CMB anisotropies"' E. Menegoni, S. Galli, J. Bartlett, C. Martins, A. Melchiorri

2009 "`Constraints on the dark energy equation of state in presence of a varying fine structure constant"' (IJMPD, International Journal of Modern Physics D, Volume 19, Issue 04, pp. 507-512 2010). E. Menegoni, S. Pandolfi, S. Galli, M. Lattanzi, A. Melchiorri

2010 (Physical Review D, vol. 82, Issue 2, id. 023532, (2010)) "`Varying couplings in the early universe: correlated variations of α and G"' C.J.A.P. Martins, E. Menegoni, S. Galli and A. Melchiorri
E. Menegoni, "New Constraints on Variations of Fine Structure Constant from Cosmic Microwave Background Anisotropies", GRAVITATIONAL PHYSICS: TESTING GRAVITY FROM SUBMILLIMETER TO COSMIC: Proceedings of the VIII Mexican School on Gravitation and Mathematical Physics. AIP Conference Proceedings, Volume 1256, pp. 288-292 (2010).

A. Melchiorri, F. De Bernardis, E. Menegoni, "Limits on the neutrino mass from cosmology". GRAVITATIONAL PHYSICS: TESTING GRAVITY FROM SUBMILLIMETER TO COSMIC: Proceedings of the VIII Mexican School on Gravitation and Mathematical Physics. AIP Conference Proceedings, Volume 1256, pp. 96-106 (2010).

II. Conferences and educational activities

Conferences and Other External Scientific Works:

1) 'VIII Mexican School of the Gravitation and Mathematical Physics Division of the Mexican Physical Society:<Speakable and Unspeakable in Gravitational Physics> '", held in Playa del Carmen, Mèxico, 6-12 December 2009.
2)"`Cosmology on the Beach: Essential Cosmology for the Next Generation"' organized by Berkeley Center for Cosmological Physics (USA) and Istituto Avanzado de Cosmologìa (México) -Playa del Carmen, Qroo., México, January 11-15,2010.
3)"`IRAP Ph.D Lectures"' \, Nice Observatoire de la Cote d'Azur, Nice, France, February 1-5, 2010.
4)"`X-/gamma-ray observational astrophysics and prospects"', IRAP School in Ferrara, Italy, March 23-24, 2010.
5) "'5 Iberian Cosmology Meeting"'\, in Porto, Portugal, from 29 to 31 of March,2010, and organized by the "`Centro de Astrofisica da Universidade do Porto"'.
6) "'HORIBA INTERNATIONAL CONFERENCE COSMO/CosPA2010"'\, at the University of Tokyo, Japan, from 27 of September to 1 of October,2010.

III. Service activities

Junior Specialist for the Department of Physics and Astronomy at the University of California, Irvine, from June 21 to September 20, 2010 in collabortion with Dr. Asantha Cooray, Professor in the Department of Physics and Astronomy.

Pandolfi Stefania

Position: 3rd year IRAP PhD Student (VII cycle)
Period covered: 1Nov 2008 – 30 Oct 2011

I. Scientific Work

1) Impact of general reionization scenarios on extraction of the inflationary parameters
Stefania Pandolfi , Elena Giusarma, Edward W. Kolb, Massimiliano Lattanzi, Alessandro Melchiorri, Olga Mena, Manuel Pena, Asantha Cooray, and Paolo Serra,
submitted to Physical Review D, arXiv:1009.5433v1 [astro-ph.CO].

2) CMB neutrino mass bounds and reionization
M. Archidiacono, A. Cooray, A. Melchiorri, S. Pandolfi, accepted by Physical Review D (D15).

3). The Herschel-SPIRE Legacy Survey (HSLS): the scientific goals of a shallow and wide sub-millimeter imaging survey with SPIRE A. Cooray et al., HSLS Science Team, arXiv:1007.3519 [astro-ph.CO]

4.) Harrison-Zel'dovich primordial spectrum is consistent with observations
S. Pandolfi, A. Cooray, E. Giusarma, E. W. Kolb, A. Melchiorri, O. Mena and P. Serra,
Phys. Rev. D 81, 123509 (2010) - Published June 9, 2010, arXiv:1003.4763 [astro-ph.CO].

5.) Inflation with primordial broken power law spectrum as an alternative to the concordance cosmological model
Stefania Pandolfi, Elena Giusarma, Massimiliano Lattanzi, Alessandro Melchiorri, Phys. Rev. D 81, 103007 (2010) - Published May 24, 2010

6.) Constraints on the dark energy equation of state in presence of a varying fine structure constant Eloisa Menegoni, Stefania Pandolfi, Silvia Galli, Massimiliano Lattanzi, and Alessandro Melchiorri,
International Journal of Modern Physics D, Vol. 19, No. 4 (2010) pp. 507-512

7). No evidence for dark energy dynamics from a global analysis of cosmological data
Paolo Serra, Asantha Cooray, Daniel E. Holz, Alessandro Melchiorri, Stefania Pandolfi, and Devdeep Sarkar,
Phys. Rev. D 80, 121302 (2009), Rapid Communication, Published December 29, 2009

II. Conferences and educational activities

Conferences and Other External Scientific Works
INVITED TALKS

- Impact of general reionization scenarios on inflation

Horiba International Conference, COSMO/CosPa 2010, 30th September 2010, at The University of Tokyo, Hongo, Tokyo, Japan.

- Impact of general reionization scenarios on inflation"

Cosmolé Meeting, 8th September 2010, at IFIC, Instituto de Fìsica Corpuscular, Valencia, Spain.

- Inflation in general reionization scenarios

Summer School in Cosmology, 19-31 July 2010, at ICTP_the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.

- Harrison Zel'dovich spectrum is consistent with observation

2nd Galileo-XuGuangqi meeting, 12-17 July 2010, Giardini Botanici Hanbury, Ventimiglia, Italy

- Inflation in a general reionization scenario

Xth School of Cosmology, 5-10 July 2010 at IESC, Cargèse, Corse, France

- Inflation and Reionization

University of Michigan, 23rd June, Ann Arbor (MI), USA

- _Inflation with the CMB

Brookhaven National Laboratory, 8th June 2010

- Inflation in a General Reionization Scenario

IberiCos2010 (5th Iberian Cosmology Meeting), Porto, Portugal, 29-31 March 2010

- _Inflationary Constraints and reionization

IRAP Ph.D. Lectures in Nice, Observatoire de la Côte d'Azur, 12-16 February 2010

Diploma thesis supervision Elena Giusarma
Thesis Title: Spettro invariante di scala delle perturbazioni inflazionarie ed evidenza osservativa per la costante cosmologica (Scale invariant power spectrum of inflationary perturbation and observative evidence for the Cosmological Constant)

Work With ***Postdocs***
"Inflation with primordial broken power law spectrum as an alternative to the concordance cosmological model"
Stefania Pandolfi, Elena Giusarma, **Massimiliano Lattanzi**, Alessandro Melchiorri, Phys. Rev. D 81, 103007 (2010) - Published May 24, 2010

2010 List of Publications

Impact of general reionization scenarios on inflation
Stefania Pandolfi, Elena Giusarma, Edward W. Kolb, Massimiliano Lattanzi, Alessandro Melchiorri, Olga Mena, Manuel Pena, Asantha Cooray and Paolo Serra,
submitted to Physical Review D, arXiv:1009.5433v1 [astro-ph.CO].

CMB neutrino mass bounds and reionization
M. Archidiacono, A. Cooray, A. Melchiorri, S.Pandolfi,
accepted by Physical Review D (D15), in press.

Harrison-Zel'dovich primordial spectrum is consistent with observations
S.Pandolfi, A.Cooray, E.Giusarma, E.W.Kolb, A.Melchiorri, O.Mena and P.Serra,
Phys. Rev. D 81, 123509 (2010) - Published June 9, 2010, arXiv:1003.4763 [astro-ph.CO].

Inflation with primordial broken power law spectrum as an alternative to the concordance cosmological model

Stefania Pandolfi, Elena Giusarma, Massimiliano Lattanzi, Alessandro Melchiorri, Phys. Rev. D 81, 103007 (2010) - Published May 24, 2010

Constraints on the dark energy equation of state in presence of a varying fine structure constant
Eloisa Menegoni, Stefania Pandolfi, Silvia Galli, Massimiliano Lattanzi, and Alessandro Melchiorri,
International Journal of Modern Physics D, Vol. 19, No. 4 (2010) pp. 507-512

No evidence for dark energy dynamics from a global analysis of cosmological data
Paolo Serra, Asantha Cooray, Daniel E. Holz, Alessandro Melchiorri, Stefania Pandolfi, and Devdeep Sarkar,
Phys. Rev. D 80, 121302 (2009), Rapid Communication, Published December 29, 2009

Other Works
The Herschel-SPIRE Legacy Survey (HSLS): the scientific goals of a shallow and wide sub-millimeter imaging survey with SPIRE
A.Cooray et al., HSLS Science Team, arXiv:1007.3519 [astro-ph.CO]

Pugliese Daniela

Position: International Relativistic Astrophysics Ph.D. Program (IRAP PhD)
(VI Cycle IRAP- XXIII Cycle "Sapienza").
Period covered: 2007-2010

I. Scientific Work
Self-gravitating systems of elementary particles. Boson Stars. Neutron. Test particle motion in Reissner-Nordstrom spacetime. .Test particle motion in Kerr spacetime

II. Conferences and educational activities
COURSES
December 2007-July 2008 :

- Fisica gravitazionale II *by Prof. R. Ruffini*
- Fisica teorica II: relatività generale, cosmologia, collasso gravitazionale *by Prof. R. Ruffini*
- Fisica teorica III: buchi neri, polarizzazione del vuoto, Big Bang e cosmologia *by Prof. R. Ruffini*
- Fisica teorica: meccanica analitica *by Prof G. Gallavotti*
- Cosmologia primordiale *by Dr G. Montani*

February 2010 :

- IRAP Ph.D. Lectures Nice Observatoire de la Cote D'Azur

by J. Einasto , S. Chakrabarti, R. Manchester, A. Melchiorri, G. Vereshchagin, A. Morbidelli, T. Regimbau, Y. Rabbia, A. Aksenov

Meetings And Schools
July 2010
– *"2nd Galileo-XuGuangqi Meeting" 12-17 July 2010*
Hanbury Botanic Gardens – Ventimiglia (Italy)

GIVEN TALKS AND SEMINARS
July 2010
- ***" A general relativistic Thomas-Fermi treatment of neutron star core"****2nd Galileo-XuGuangqi Meeting 2-17 July 2010 Hanbury Botanic Gardens – Ventimiglia (Italy)- Nice (France)*

2010 List of Publications
Circular motion in Reissner-Nordströmm spacetime.
Daniela Pugliese, Hernando Quevedo, Remo Ruffini, . Mar 2010. 5pp. Temporary entry e-Print: arXiv:1003.2687 [gr-qc]

A general relativistic Thomas-Fermi treatment of neutron stars cores I
Jorge A. Rueda, D. Pugliese, R. Ruffini and S.S. Xue.
Int. J. Mod. Phys. D. *to be submitted to International Journal of Modern PhysicsD*

A general relativistic Thomas Fermi treatment of neutron star cores II.
D. Pugliese, Jorge A. Rueda, R. Ruffini, S. S. Xue *submitted to International Journal of Modern Physics D*

Circular motion of neutral test particles in Reissner-Nordström spacetime,
D. Pugliese, H. Quevedo, R. Ruffini *in preparation.*

Rangel Lemos Luis Juracy

Position: PhD student of IRAP
Period covered: 01-10/2010

I. Scientific Work

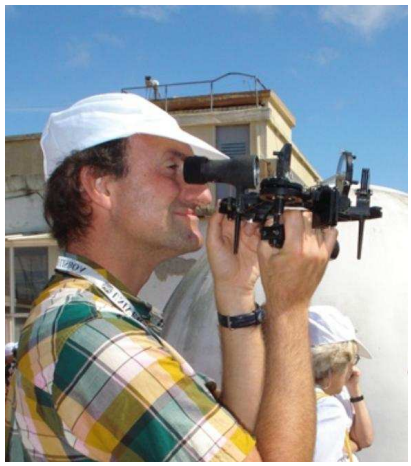
I applyed the same statistical approach of Maarten Schmidt [ApJ 700 (2009) 633] in a particular BATSE GRB sample, where we used a "sanitized" of the Schmidt 2009 sample, excluding GRBs whose prompt emission is dominated by the P-GRB emission, and we expanded the sample of GRBs with known redshift used in the calibration, to see if we can draw analogous conclusions.

II. Conferences and educational activities

Conferences and Other External Scientific Work

The 2nd Galileo - Xu Guangqi meeting, July 12-18, 2010. Hanbury Botanic Gardens (Ventimiglia - Italy) and Villa Ratti (Nice – France). In this conference I presented the talk "*pp* collision on the GRB scenario", which will be published by proceedings series.

Sigismondi Costantino



Position in ICRANet: IRAP/PhD Student
(UNice and Sapienza)
Period covered: 1/2010-10/2010

I. Scientific Work

Solar Variability: Ground Based Measurements of the Solar Diameter at high resolution.
The solar diameter is a proxy of the total solar irradiance, the possibility to know its value in the past can permit to reconstruct the past behavior of TSI and its influence on Earth's climate.
The recent history of solar diameter is being recovered through central eclipses data. Method and data analysis procedure have been implemented for 2006 and 2010 total eclipses with detailed studies on the Limb Darkening Function. The application of this method to historical eye observations is into dievelopment.
Drift-scan method of solar diameter measurements are being also conducted at IRSOL (CH) and IAP (F) in order to match the forthcoming data from space missions PICARD and SDO in view of continuing to monitor daily the Sun from the Earth when they will end.
Publications:

1. C. Sigismondi, A. B. Morcos, Long term variations of solar radius, General Relativity and Gravitation, Online 10.1007/s10714-010-0958-8, 2010-10-06
2. C. Sigismondi , Guidelines for measuring solar radius with Baily beads analysis, , Sci China 52 G, 1173 (2009).
3. C. Sigismondi, Relativistic Corrections to Lunar Occultations, C. Sigismondi, Journal of Korean Physical Society, 56, 1694-99 (2010).
4. C. Sigismondi, misura del ritardo accumulato dalla rotazione terrestre, DUT1, alla meridiana clementina dellaBasilica di Santa Maria degli angeli in Roma, in M. Incerti, E. Pavini, Mensura Caeli, 177, University of Ferrara Press (2010).
5. C. Sigismondi, Measuring Seeing in Daytime, proc. of IAGA2 meeting, A. Hady and L. Damé eds., p. 209-212, Cairo University Press (2010).
6. C. Sigismondi, Ground-based Measurements of Solar Diameter, proc. of IAGA2 meeting, A. Hady and L. Damé eds., p. 165-174, Cairo University Press (2010).
7. C. Sigismondi, Astronomia UAI: Clavius, submitted (2009).
8. C. Sigismondi, Astronomia UAI: Lunar impacts, submitted (2009).
9. C. Sigismondi, Astronomia UAI: Sunset measurement of solar diameter, submitted (2009)
10. C. Sigismondi, OVERCOMING BLACK DROP EFFECT IN HIGH RESOLUTION ASTROMETRY: THE CASE OF SEA SUNSETS, Int. J. of Mod. Phys. D subm. (2010)
11. C. Sigismondi, Lo Gnomone Clementino, astronomia meridiana in Basilica dal '700 a oggi, submitted to Astronomia UAI (2010)

II Conferences and educational activities

Conferences and Other External Scientific Work

1) 2010, Paris, France, *Precision and Harmony in Gerbert's Astronomy,* Universite' Paris VII- Diderot, invited talk 6.5.2010
2) 2010, Paris, France, *The solar limb during eclipses: Flash Spectrum Region and Baily beads*, Institute de Astrophysique, invited talk 30.9.2010
3) 2010, Buenos Aires, Argentina, *Generalities on Solar Diameter Measurements: problems and tasks*, IAFE 7.6.2010
4) 2010, Napoil, Italia, *The Asteroidal Occultation of Prudentia total over Rome on 5.9.2010,* IAU National Congress, OAC 25.9.2010

5) Visit to History of Science Museum, Istanbul from March 2 to 4, 2010
6) Visit to Bukowiec Astronomical Observatory (Poland) from May 19 to 22, 2010
7) Visit to IRSOL, Istituto Ricerche Solari Locarno (CH) from July 29 to August 14 2010 for research on solar diameter measurements with hourly circle transits.

Work With Students
Laboratory of Astrophysics, team of Prof. Paolo de Bernardis (Sapienza University)
Luigi Squillante, Riccardo Moriconi e Maria Concetta Tringali
Diploma thesis supervision at Sapienza University
Andrea Raponi (ongoing).
Other Teaching Duties
Course at Ateneo Pontificio Regina Apostolorum History of Astronomy

Updated CV
html: http://www.icra.it/People/sigismondi/Sigismondi.htm
PDF: http://www.icra.it/solar/sigismondi/cv_2010.pdf

Benedetti Alberto

EDUCATION
Dates October 2007 - April 2010

Qualification Master of Science in Theoretical Physics
Final mark 110/110 cum laude

Thesis Title: Accretion onto Primordial Black Holes. This thesis deals with the study of the electron gas degeneracy during the accretion onto very low mass black holes. Also the capture of such Primordial Black Holes by a main sequence star has been investigated.

Attended courses Quantum Electrodynamics - Quantum Optics - Theoretical Physics, Complements - Economical physics - Quantum Mechanics, Foundations - Information Theory - Statistical Mechanics II - Quantum Fields Theory - General Relativity – Astrophysics - Fundamental Interactions Theory - Groups and Physical Symmetries – Hadronic Physics - Elementary Particles Phenomenology.

Institution Faculty of Mathematical, Physical and Natural Sciences at the University of Pavia, Pavia, Italy

Dates September 2004 - October 2007

Qualification Bachelor of Science in Physics
Final mark 108/110

Thesis Title: Superheavy nuclei. In this thesis the stability of the superheavy nuclei is investigated using di_erent nuclear models.

Attended courses Linear Algebra - Mathematical Analysis, Concepts - English Language – Mechanics and Thermodynamics - Physics Experimentations I - Mathematical Analysis, Tools - Informatics for Physics - Di_erential Equations and Dynamical Systems – Analytical Mechanics - Mathematical Analysis, Complements - Chemistry - Physics Mathematical Methods I - Physics Experimentations II - Introduction to Modern Physics - Electromagnetism, Waves and Optics - Physics Mathematical Methods II – Introduction to Nuclear Physics Physics Laboratory III - Quantum Mechanics – Electrodynamics and Special Relativity - Structure of the nuclei - Statistical Mechanics I – Introduction to Subnuclear Physics - Structure of Matter.

Institution Faculty of Mathematical, Physical and Natural Sciences at the University of Pavia, Pavia, Italy

Dates September 1999 - June 2004

Qualification Chemistry High School Diploma
Final mark 100/100

Institution Istituto Tecnico Industriale Statale (ITIS) J. Torriani in Cremona (CR), Italy

COMPUTER SKILLS -
Platforms Mac OS X, Windows, Linux/Unix
Programming C, C++

Fleig Philip

Position: PhD student at the Max-Planck-Institute for Gravitational Physics in Potsdam, Germany
Period: 2010-present
PhD student at the Albert-Einstein-Institute for Gravitational Physics under the supervision of Professor H. Nicolai.
The PhD is financed by a scholarship from the IRAP Ph.D. Erasmus Mundus program.

Education:

2009-2010 Imperial College London, MSc in Quantum Fields and Fundamental Forces.
Advanced courses on topics in Theoretical Physics, including Quantum Field Theory, General Relativity, Supersymmetry and String Theory.

2006-2009 Imperial College London, BSc Physics with Theoretical Physics.

1997-2006 Hans und Sophie-Scholl Gymnasium Ulm, Allgemeinbildendes Abitur (High School).

Fraga Bernardo Machado de Oliveira

1. **Education**

Erasmus Mundus Ph.D. Student at Università di Roma "La Sapienza"
Degree in Astrononomy – Federal University of Rio de Janeiro (2009)
Master's Degree in Physics – Brazilian Center for Physics Research (CBPF) – 2010

2. Conferences and Educational Activities

VI CBPF School (2006) – From Galaxies to Dark Energy
IV School of Cosmology and Gravitation (2007) – CBPF
XII Reunión Regional Latinoamericana de la IAU (Latin America Regional meeting of IAU) (2007) – Venezuela
Graduate School in Astronomy, XII Special Courses (2007) – National Observatory of Rio de Janeiro
Quantum Theory of Cosmological Perturbations (2008) – CBPF. Short term course given by Prof. Viatcheslav Mukhanov.
V School of Cosmology and Gravitation (2009) - CBPF

2010 List of Publications

- *Articles Published*

Cosmic Acceleration from Interaction of Ordinary Fluids – Nelson Pinto-Neto e Bernardo M. O. Fraga – General Relativity and Gravitation, vol. 40, 1653-1662
Transient Cosmic Acceleration from Interacting Fluids – Julio C. Fabris, Bernardo Fraga, Nelson Pinto-Neto and Winfried Zimdahl – JCAP04 (2010) 008

- *Conference Proceedings*

A Model for Interacting Dark Energy – Nelson Pinto-Neto e Bernardo M. O. Fraga – XII Reunión Regional Latinoamericana de La IAU, Venezuela, 2007
A Model of Interacting Cosmological Fluids – Nelson Pinto-Neto e Bernardo M.O. Fraga – 61st Annual meeting of the Brazilian Society for Scientific Development (SBPC)

Gruber Christine

Education and training

Dates	September 2010 - present
Occupation	PhD, International Relativistic Astrophysics Program (Erasmus Mundus)
Supervisors	Prof. Hagen Kleinert, Prof. Vladimir Belinski
University	Freie Universität Berlin, Germany Université de Nice Sophia Antipolis, France

Dates	October 2004 – July 2010
Title of qualification awarded	Diplomingenieur der Technischen Physik (Diploma Engineer in Technical Physics)
Occupation	Study of Technical Physics
University	Johannes Kepler University, Linz, Austria
Thesis title	"Cosmic Microwave Background Anomaly and its Indication of a Pre-Inflation Black Hole Universe"
Supervisors	Prof. Pisin Chen, Dr. Fabio Scardigli
Grade	A (with distinction)

Dates	October 2007 – July 2008, October 2009 – June 2010
Occupation	Student Exchange (2007/2008), Research for Diploma thesis (2009/2010)
Supervisors	Prof. Pisin Chen, Dr. Fabio Scardigli
University	National Taiwan University, Taipei, Taiwan

Dates	March 2009 – August 2009
Occupation	Theoretikum (research project, in extent equivalent to a Bachelor thesis)
Institution	Institute of Theoretical Physics, Johannes Kepler University
Thesis title	"Neural Networks and the Bayes theorem – Application of the Bayes theorem to the nuclear stability problem and comparison of performance with neural networks"
Supervisors	Prof. Klaus A. Gernoth
Grade	A (with distinction)

Dates	September 1996 to May 2004
Title of qualification awarded	Matura (High School Diploma), with distinction
School	Bundesrealgymnasium Traun (secondary education)

Research

Publication	02.09.2010, arXiv:1009.0882v1 [gr-qc] F. Scardigli, C. Gruber, P. Chen
Title	"Black hole remnants in the Early Universe"

Language competences

Native	German
Other languages	English (fluent) Chinese – Mandarin (fluent on a basic level) French, Spanish (little)

Computer skills and competences

- Programming languages: Fortran and C (very good), C++ (basics).
- Mathematical programs: Mathematica (very good).
- Plotting engines: Gnuplot (basics).
- Typography: Latex (very good).

Martins de Carvalho Sheyse

1. Education

Erasmus Mundus Ph.D. Student at Università di Roma "La Sapienza".
Master's Degree in Physics – Instituto Tecnologico de Aeronautica – 2010.
Degree in Physics – Universidade Federal Fluminense – 2008.

2. Conferences and Educational Activities
Light Cone: Hadronic and particle physics – 2009.
4th International Workshop on Astronomy and Relativistic Astrophysics – IWARA – 2009.
International Astronomical Union: XXVII General Assembly – 2009.
Ciclo de Cursos Especiais - Observatório Nacional – 2007.
IV Escola de Cosmologia e Gravitação – CBPF – 2007.
Ciclo de Cursos Especiais - Observatório Nacional – 2006.

2010 List of Publications
Conference Proceedings:

- de CARVALHO, S. M. ; Malheiro M. ; Frederico T. ; Carlson B. ; Fiolhais M. ; Scoccola N. ; Grunfeld A.G. . The confinement effect and color superconductivity in CDM model. In: 4th Workshop on Astronomy and Relativistic Astrophysics - IWARA, 2009, Maresias. International Journal of Modern physics D, 2009.

- de CARVALHO, S. M. ; Malheiro M. ; Frederico T. ; Carlson B. ; Fiolhais M. ; Scoccola N. ; Grunfeld A.G. . Color Superconductivity and Confinament in the Chromodieletric model. In: Light Cone 09, 2009. Nuclear Physics B, 2009.

Presentations in Events:

- Color Superconductivity and confinement in the CDM model. International Astronomical Union: XXVII General Assembly, 2009, Rio de Janeiro. (Poster)

- Color Supercondutivity and Confinement in the CDM model. 4th International workshop on Astronomy and Relativistic Astrophysics - IWARA2009, 2009, Maresias. (Poster)

- The Confinement effects in the CFL phase of quark matter in the Chromodielectric model. Strangeness in Quark matter - SQM, 2009, Buzios. (Poster)

- Color Superconductivity and Compact Stars. Light-Cone 2009: Relativistic Hadronic and Particle Physics, 2009, São José dos Campos. (Poster)

Penacchioni Ana Virginia

- **High-School**
  Bachiller (2003)
  Colegio Secundario Virgen de Luján, Centenario
  Prov. de Neuquén, Argentina

- **Academic Degrees**

-First Certificate in English (FCE)
-Certificate in Adcanced English (CAE)
-Certificate in Proficiency English (CPE)
-Master (Licenciatura) in Physics
Title: Neutrino emission in collapsars
Director: Gustavo E. Romero
Local Assessor: Osvaldo Civitarese
Facultad de Ciencias Exactas de la Universidad Nacional de La Plata

Subject	Year	Mark of Final Exam	Date of Final Exam
General Physics I	2004	08	03/08/2004
Experimental Physics I	2004	10	19/10/2004
Calculus I	2004	10	02/05/2006
Algebra	2004	06	11/03/2005
General Physics II	2004	09	20/12/2005
Experimental Physics II	2004	10	16/03/2005
General Physics III	2005	10	26/12/2006
Experimental Physics III	2005	10	15/02/2007
Calculus II	2005	07	17/11/2006
General Physics IV	2005	09	17/07/2007
Experimental Physics IV	2005	09	10/10/2007
Special Maths I	2005	10	01/06/2007
Macroscopic Physics	2005	10	02/05/2007
Analitical Mechanics	2006	09	06/12/2008
Special Maths II	2006	08	28/06/2007
Electromagnetic Experiments I	2006	10	18/12/2007
Linear algebra: physical applications	2006	08	07/11/2007
Electromagnetism I	2007	10	29/02/2008
Quantum Mechanics I	2007	10	31/03/2009
Quantum Experiments I	2007	10	27/03/2008
Fluid Mechanics I	2007	10	13/08/2009
Termodynamics	2007	07	28/04/2008
Quantum Mechanics II	2008	10	30/04/2009
Quantum Experiments II	2008	08	30/04/2009
Statistical Mechanics	2008	09	13/08/2009
Particle Physics	2008	10	19/10/2009
Electromagnetism II	2008	09	02/07/2009
Gravitation	2008	06	22/12/2009
Methods of Mathematical Physics	2007	--	--
Introduction to Relativistic Astrophysics	2008	08	22/09/2009
Final Work	2010	10	01/07/2010

Average Mark: 8.77 (with aplazos)
9.00 (without aplazos)
-Doctorate in Astrophisics: Erasmus Mundus Student (IRAP PhD Joint Doctorate Program) Coursing the first year.

- **Academic Activities**

- Poster Exposure in the 91st National Meeting in Physics (AFA), San Luis, Argentina, September 25th-29th, 2006
Title: Determinación del exponente asociado a la interacción magnética
Authors: Ignacio Bruvera, Facundo Jerónimo, Ana V. Penacchioni, Pablo Girardin, Cecilia Jarne, Mariela Nieto, Betiana Pianciola, Jorge Runco, Marcelo Ceolín
Departamento de Física- Facultad de Ciencias Exactas
- Poster Expousure in the 93rd National Meeting in Physics (AFA), Buenos Aires, Argentina, 2008
Title: Polvos nanocristalinos de Fe ZnO obtenidos por molienda mecánica
Authors: Lorena Baum, Laura Damonte, Lisandro Giovanetti, Ana Penacchioni, Betiana Pianciola.
Departamento de Física- Facultad de Ciencias Exactas- UNLP
- Member of the Group of Relativistic Astrophysics and Radioastronomy (GARRA)
January 2009- present.
Web page http://www.iar.unlp.edu.ar/garra/.
- Adherent member of the AAA since 2009
- Attendance to the 94th National Meeting in Physics (AFA). Rosario, Argentina, September 14th-18th, 2009
- Atendance to the 52nd National Meeting in Astronomy (AAA). La Plata, Argentina, September 21st-25th,2009
- Attendace to the international meeting "High Energy Phenomena in Relativistic Outflows II" (HEPRO II). Buenos Aires, Argentina, October 26th-30th, 2009
- Member of the Local Organising Comitee (LOC)

Valsan Vineeth

SCHOLASTICS
(Current Status) From September 2010: Erasmus Mundus IRAP-PhD
-University of Ferrara & University of Nice
Research Topic: Configuration studies for broad band X-/Gamma-ray astronomy missions.
Under the guidance of Prof. Filippo Fronterra.
August 2010 : Master of Technology (M.Tech)

- In Astronomical Instrumentation, Indian Institute of Astrophysics in collaboration with University of Calcutta.
June 2007 : Bachelor of Technology (B.Tech)

- In Electronics &Communication Engineering, LBS College Of Engineering (Kannur University), Kerala, India

March 2003: Twelfth: [Kendriya Vidyalaya No: 1, Kozhikode, Kerala, India]
March 2001: Tenth: [Kendriya Vidyalaya No: 1, Kozhikode, Kerala, India]

PROJECT

- M.Tech: Development of faster algorithm for Shack-Hartmann wavefront sensor.

Stream: Adaptive Optics/MatLab
The project deals with the reconstruction of distorted wavefront coming from the celestial objects. Because of atmospheric turbulence the plane wavefront gets distorted. The incoming wavefront is optically sampled using Shack-Hartmann lenslet arrays and is captured using CCD. An algorithm is written in MatLab to get the centroid of each spot of the image and then from there the wavefront is reconstructed using Modal approach, using Zernike Polynomials.

- B.Tech: Micro controller (PIC) Based Platform For ROBOTS

Stream: Embedded system/PICμC
The project deals with the control of Robots with 2 degrees of freedom. The Robot can be controlled manually or automatically. Manually it can be controlled using voice recognition and also with a joy stick. And in the automatic mode the Robot finds its own way detecting any obstacles in its path.

Adamo Cristina

E mail address	cristina.adamo@icranet.org
Telephone	+39 085 23054205
Fax	+39 085 4219252
Nationality	Italian
Date and place of birth	Vibo Valentia, 12 December 1972

Work experiences

Date	09 November 2009 → present
Name of employer	ICRANet - International Center for Relativistic Astrophysics Network
	Administrative employee
Main activities and responsibilities	Administrative office: accountancy, preparing reimbursement and rewards for scientific visitors, on – line payments, analysis of bank statements.

Date	04 March 2007 → 09 October 2009
Occupation or position held	Head Administrative Office
Main activities and responsibilities	Account and budget General Account. Active and passive billing cycles. Bank settlement. Treasury management and bank relations management. RI.BA. emission. Down-payment and invoice discount management. Payment and takings management. Independent management of the main civil-fiscal fulfilments with a particular attention to the periodical settling and vat statement. General account management. Assets management. Arrangement INTRA model. Arrangement of the financial year ending. Reclassification of the budget. Management of the accounting plan. Implementation of new instruments aiming at improving the efficiency of the administrative services. Administrative management of the staff: recruitment and selection interviews, drawing up of mandatory documents (matriculation and presences books), elaboration of timesheets. Management of clients and suppliers' order. Purchase and choice of suppliers to be qualified. Prices definition, deposit and shipment management.
Name and address of employer	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
Principal subjects / occupational skills covered	Ordinary and simplified account. Fiscal fulfilments. European balance. Income tax return.
	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
Name and type of organisation providing education and training	University L.U.I.S.S. - Guido Carli – Roma – Final marks: 105/110 – Thesis: "Tax incentive for the occupational development"
Dates	1986 - 1991
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
Main Sujects	Ordinary and simplified account. Fiscal fulfilments. European balance. Income tax return.
Name and type of organisation providing education and training	Consultant office Dott. Vincenzo Micozzi - Pescara

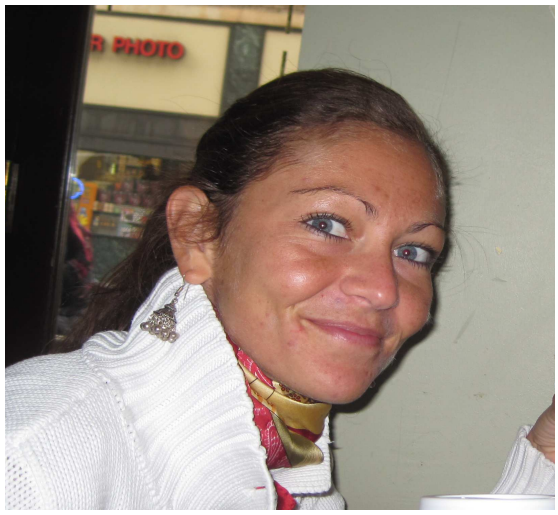
Date	1998 - 1998
Title of qualification awarded	Brief Master on Tax Law
Name and type of organisation providing education and training	University D'Annunzio - Pescara
Date	1998 - 1998
Title of qualification awarded	Postgraduate Course on " European Union: institutional, juridical and economic aspects"
Name and type of organisation providing education and training	European Commission and University of Lyon: corse 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
Social skills and competences	Communication Ability acquired during the working experiences Aptitude to learn, adaptable to new situations, different from the known ones. Ability to work under pressure. Good aptitude to work in multicultural environment thanks to the experiences spent abroad for education or personal reasons. Team spirit
Organisational skills and competences	Innate sense of organisation both in the working place and in the management of personal and familiar life. I am considered as a reference point by the production operators.

Technical skills and competences	Mastery in quality control processes in small enterprises (I was responsible for the qualily evaluation)
Computer skills and competences	Good Knowledge of Microsoft Office (Word, Excel e PowerPoint) Very good knowledge of Team System – Gamma, Mult program Basic knowledge of graphic application Good knowledge of Internet and web search engines.

Del Beato Annapia



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+39 085 4219252
annapia.delbeato@icranet.org

Work experiences

Dates	02/2008 - present
Occupation or position held	Responsible for the Documentation Center of ICRANet
Main activities and responsibilities	meeting planning (before and during the event) proceedings publication maintaining websites contents public relations (press contacts, announcements submission, contacts with researchers and students, etc…) collection and cataloguing of scientific publications management of the library
Name and address of employer	ICRANet
Address	P.zza della Repubblica 10 I-65122 Pescara (Italy)

Dates	13/06/2007 - 31/12/2007
Occupation or position held	Employee at the Information Point of the Azienda Speciale "D. Ferrigno"
Main activities and responsibilities	Responsible for the external relations of the Azienda Speciale Deborah Ferrigno of the Municipality of Montesilvano in the information point called “Sportello Sociale”.
Name and address of employer	Azienda Speciale "D. Ferrigno" - Municipality of Montesilvano
Address	Palazzo Baldoni -P.zza I. Montanelli I-65016 Montesilvano (Italy)

Dates	04/06/2007 - 31/01/2008
Occupation or position held	English teacher
Main activities and responsibilities	English Teaching in a Training Course at the Engineering Office “Studio Proima s.r.l.”
Name and address of employer	Studio Proima srl
Address	C.so Umberto I I-65016 Montesilvano (Italy)

Dates	15/02/2007 - 31/05/2007

Occupation or position held	English Teacher
Main activities and responsibilities	English teaching in courses organized by Centro Studi Stoa in the following public schools: I° Circolo “Ravizza” Chieti, Istituto comprensivo S. Giovanni Teatino (via Di Nisio, via Mazzini, via V.Emanuele)
Name and address of employer	Centro Studi Stoa
Address	V. San Paolo 2 I-65016 Montesilvano (Italy)

Dates	09/04/2006 - 31/12/2006
Occupation or position held	Employee at EURODESK
Main activities and responsibilities	Employed at Azienda Speciale “D. Ferrigno” of the Municipality of Montesilvano for the opening of a EURODESK. A particular attention was given to the social integration and assistance, as well as to the activities aiming at making easier the access and the fruition of the municipal facilities to disadvantage and needy subjects
Name and address of employer	Azienda Speciale "D. Ferrigno" - Municipality of Montesilvano
Address	P.zza I. Montanelli I-65016 Montesilvano (Italy)

Dates	09/2005 - 03/2006
Occupation or position held	English teacher
Main activities and responsibilities	English Teaching in the Project “Comunicare in Europa POR – Asse C – Misura 2 Az. 3” funded by CEE, realised by Liceo Scientifico C. D’Ascanio in Montesilvano in collaboration with Regione Abruzzo
Name and address of employer	Liceo Scientifico "C. D'Ascanio"
Address	V. Verrotti I-65016 Montesilvano (Italy)

Dates	01/2005
Occupation or position held	Hostess at a Communication Agency
Main activities and responsibilities	reception and registration assistance during the conferences
Name and address of employer	Virgola Comunicazione
Address	V. R. Sanzio I-65122 Pescara (Italy)

Education and training

Dates	02/2006 - 12/2006
Title of qualification awarded	I° level Master “How to teach English”
Principal subjects / occupational skills covered	English and German linguistics psycholinguistic sociolinguistic

	didactics computer skills 240 training hours as English teacher at Liceo Scientifico C. D'Ascanio Montesilvano.
Name and type of organisation providing education and training	Università degli Studi "G. D'Annunzio"
Address	V. dei Vestini, 66100 Chieti (Italy)
Dates	09/2003 - 03/2004
Title of qualification awarded	Erasmus EU-funded Scholarship
Principal subjects / occupational skills covered	Courses on: English Literature, American Literature, History and Marketing.
Name and type of organisation providing education and training	University of Warwick (UK) (university)
Address	Coventry (United Kingdom)
Dates	07/2005
Title of qualification awarded	Degree in Foreign Languages and Literature (courses on Touristic Management) with final mark: 110 cum laude.
Principal subjects / occupational skills covered	Courses on: English and French language English and French literature American Literature Italian Literature Touristic Management Economics Marketing Didactics Linguistics Final Thesis on American Literature, title: "Charles W. Chesnutt: The Marrow of Tradition"
Name and type of organisation providing education and training	Università degli Studi "G. D'annunzio"
Address	V.le Pindaro, 65124 Pescara (Italy)
Dates	Summer 1998 and 2000
Title of qualification awarded	Summer School Camps in UK
Principal subjects / occupational skills covered	Courses on English language
Name and type of organisation providing education and training	Westminster College - Oxford (United Kingdom) and Roehampton College - Putney, London (United Kingdom)
Dates	06/2000
Title of qualification awarded	High School Degree at Liceo Socio-Psico-Pedagogico with final mark: 100/100.

Principal subjects / occupational skills covered	Psychology Sociology Pedagogy Linguistics
Name and type of organisation providing education and training	Istituto "B. Spaventa"
Address	Città S. Angelo (Italy)

Personal skills and competences

Mother tongue	Italian
Other language(s)	English, French
Social skills and competences	reliable, well-organized, punctual and accurate, able to work in stressful situations, adaptable to work in new situations, able to work in team, helpful
Computer skills and competences	ECDL (European Computer Driving Licence) Microsoft Office (Word, Excel, Powerpoint, Access, Publisher, Outlook)
Driving licence(s)	B

Di Berardino Federica

AME	FEDERICA DI BERARDINO
PHONE	0039-085-23054200
FAX	0039-085-4219252
E-MAIL	federica.diberardino@icranet.org
NATIONALITY	Italian
DATE AND PLACE OF BIRTH	31-03-1980 PESCARA

WORK EXPERIENCE

November 2005-November 2007	▪ Head of Secretariat at ICRANet Pescara: coordination of secretariat work, logistic organization for meetings and workshops, translations.
May-October 2005	▪ Travel Agent at "Beg Viaggi" Pescara;
September-June 2005	▪ Italian language training courses for foreign students;
April 2005	▪ Congress Hostess for IN FIERA S.r.l., at "ECOTUR 2005"- Montesilvano;
December 2004	
October-December 2004	▪ Congress Hostess (Marcinelle 2005) for Manoppello Municipality (PE);
January-December 2004	▪ Customer service assistant for Terravision S.r.l. at Aeroporto d'Abruzzo, Pescara;
May 2004	▪ English courses for elementary and high school italian students;
March 2004	▪ Translations from/to English; ▪ Work for Ajilon Agency, Pescara, for distribution of books in the local schools;
2001-2004	▪ Interviews for Customer Satisfaction, for "NETWORK Istituto di ricerca S.r.l." at Iper - Città Sant'Angelo; ▪ Researcher for "Informazione e servizi senza barriere"(Agency: NETWORK S.r.l.). ▪ Exhibition Hostess for IN FIERA S.r.l., at "ECOTUR –Turismo in fiera" 2001, 2002, 2003, 2004 (at Palacongressi, Montesilvano – PE);
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., Torino).

EDUCATION

June 2004	▪ Foreign Language and Literature College degree, 110/110 *cum laudem*, at University G. D'annunzio (Pescara). Final thesis on Spanish and Economic -Tourism Geography: "Problemi, tendenze e prospettive dello sviluppo socio-economico in Spagna. Casi di studio" (supervisor Prof. G. Massimi);

January 2004	
September-December 2002	▪ Researches in Spain for graduation thesis and improvement of Spanish knowledge.
1998	▪ 4 months courses at "Nazareth College" di Rochester, N.Y. (U.S.A.)and final examson English, Marketing and Spanish.
Ottobre 1996	▪ High School degree at Liceo Linguistico "G. Marconi", Pescara.
1992, 1994, 1995	▪ 1 month English classes at "Irondequoit High-School" in Rochester (N.Y.)
	▪ Repeted visits to England to attend english colleges for training courses;
	▪ Visits to the USA (N.Y. e Massachussetts) to improve oral American-English knowledge.
SOCIAL-CULTURAL EXPERIENCES	January-March 2005: Trip to Vanuatu (Melanesian archipelago, old "New Hebrides ") for humanitarian aid experience. Voluntary work in a few islands of the archipelago and elementary learning of local language, the Bislamar.
PERSONAL SKILLS	Main studies and job experiences focused on foreign cultures and languages. University degree on Spanish and English. Daily practice with both languages through conversation and readings. The work experience in touristic exhibition and in the "in store promotion" field, in addition to the experience as entertainment organizer, helped to develop interpersonal abilities.
MOTHER-TONGUE	ITALIAN
OTHER LANGUAGES	ENGLISH, SPANISH, FRENCH
RELATIONAL ABILITIES	Team work experience, mainly 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 attitute 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, wich is the ability to listen to and to be listened. Development of a positive attitude towards any kind of problematic situation; problem-solving skills and working method based on the achievement of goals.
ORGANIZING COMPETENCES	Organizing ability mainly acquired trough team work in summer camps for kids and teen-agers, where showing a coordinating attitude in the group. In the same work field has been developed the spirit of adaptability, in addition to the creativity (namely invention of new games and artistic creation for entertainment). Open and charismatic personality, flexible, active, dynamic, loving challenges. Professionality based on accuracy, punctuality and strong attitude to work towards goals.

TECHNICAL SKILLS	Computer competences: Windows; Softwares: Word, Excel, Power Point. Daily use of personal computer at work: 80% of the work is based on the use of PC. 2004: Certificate for Informatics Course on “Basic Office” (Word, Excel, Internet e E-mailing) organized by: “E-Work”, Pescara in cooperation with “Ok Work”, Milano.
ARTISTIC SKILLS	Great passion for music (jazz, acoustic, ethnic, rock and classic), dance, theatre, readings and paintings. Free time: travels, museums. Piano and guitar classes. Artistic Gym and Jazz Dance; I am still studying in a Jazz Dance School.
DRIVING LICENCE	Driving licence cat. B

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.

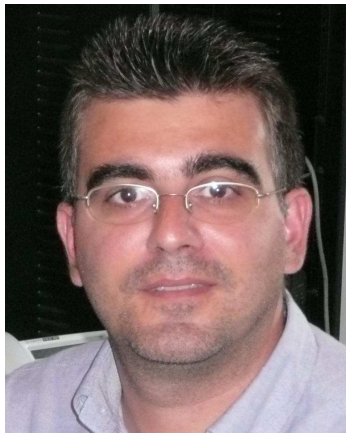
EDUCATION

• 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 operative 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
• Achieved Qualification	Business Economics Degree. Final thesis in business strategy and politics: "*Gli strumenti di analisi strategica: l'analisi SWOT"* (supervisor Prof. Michele A. Rea)
• 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	
MOTHER-TONGUE	ITALIAN
OTHER LANGUAGES	ENGLISH (GOOD) – FRENCH (ELEMENTARY)
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 COMPETENCES	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.
TECHNICAL SKILLS	Computers competences: Windows. Softwares: Word, Excel, Power Point. 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 reading, writing, travelling, going to the cinema, listening music, playing the piano. I have a determined, dynamic and flexible personality. I like staying and working with people.

Regi Massimo



Personal Data

Name and surname	Massimo Regi
Place, date of birth	Pineto (Te) – October 23, 1974
Military service	community service at Piccola Opera Caritas of Giulianova (TE) done in 2001/2002

Education

2004-2005	"Network Software Specialist" professional qualifications obtained at the S.M.I.L.E. institution on the 26-th of July 2005 in Pescara
1993-2003	University Degree in Information Tecnology and Automation Engineering Thesis: "An Application for an UMTS Service"
2003	University Degree apprenticeship effected at the Sisteda S.p.a. of Aspio di Osimo (AN) in the period of January-April in 2003 and concerning the database design for the web based applications
1988-1993	Scientific School leaving certificate at the Liceo Scientifico Statale of Giulianova (Te) with final marks 56/60

Software principal realizations

Fater s.p.a. Dust Control: application program for the management of the dust measurement in the production factory with graphs of the trend analysis

Morning Area Meeting: application program for daily report of the production Statistics

AMDB: application program for the management of the activities of the production lines maintenance

GLED System web: application program for the automatic forwarding of the production data towards the P&G server in Germany

CMP (Change Management Process): application program for the lines modifying management with an approval workflow

Defects Management in spare parts warehouse Visual Basic application for the CU-Report

Application for the import of the master lines from Excel file (Midrange Module) Sixty s.p.a
Company Intranet: importation and update of the domain users from ldap server to sql server, on the fly pdf generation, routine for the newsletters sending

Municipality of Pescara collaboration for the management of the computerized auction of the wholesale fish market (Linux/Java/MySQL platform)

Informatic knowledge

Operating Systems Windows 98/98SE/ME/2000/XP/2003 and Linux (various distributions)

Networks	local area network LAN, TCP/IP protocol, VPN, Active Directory
Programming languages	PHP, Javascript, Visual Basic 6.0, Java, C, Assembler x86, ASP
Databases	MS SQL Server, MySQL, PostgreSQL

Working experience

April 2008 -	IcraNet (International center for relativistic Astrophysics Network) as System Manager
June2005-March 2008	Infoteam Solution s.r.l. as System Engeneer / Web developer