Faculty, Adjunct professors, Research scientists,

Visiting scientists, Lecturers, PhD students, Post-doc

and Staff

at the Pescara Center

December 2023

# Contents

## ICRANet Faculty Staff

| | |
|---|---|
| Belinski, Vladimir | ICRANet |
| Bianco, Carlo Luciano | ICRANet and Università di Roma "Sapienza" |
| Cherubini, Christian | ICRANet and University Campus Bio-medico, Italy |
| Damour, Thibault | IHES, France |
| Della Valle, Massimo | INAF-Napoli - Osservatorio Astronomico di Capodimonte, Italy |
| Filippi, Simonetta | ICRANet and University Campus Bio-medico, Italy |
| Giommi, Paolo | ASI Science Data Centre, Italy |
| Jantzen, Robert | AbrahamTaub-ICRANet Chair and Villanova University, USA |
| Kerr, Roy P. | Yevgeny Mikhajlovic Lifshitz - ICRANet<br>University of Canterbury, New Zeland |
| Li, Liang | ICRANet |
| Moradi, Rahim | ICRANet |
| Punsly, Brian Mathew | Mathew California University, Los Angeles USA |
| Rueda, Jorge A. | ICRANet and Università degli Studi di Ferrara |
| Ruffini, Remo | ICRANet and Università di Roma "Sapienza" |
| Sahakyan, Narek | ICRANet-Yerevan, Armenia |
| Vereshchagin, Gregory | ICRANet |
| Wang, Yu | ICRANet |
| Xue, She Sheng | ICRANet |

## Adjunct Professors of the Faculty

| | |
|---|---|
| Aimuratov, Yerlan | Fesenkov Astrophysical Institute, Kazakhstan |
| Ansoldi, Stefano | University of Udine, Italy |
| Argüelles, Carlos Raúl | CONICET, Argentina |
| Barres de Almeida, Ulisses | CBPF, Rio de Janeiro, Brazil |
| Becerra Bayona, Laura Marcela | Universidad Católica de Chile, Chile |
| Bini, Donato | CNR, Italy |
| Bisnovatyi-Kogan, Gennady | Space research institute RAS, Moscow |
| Buchert, Thomas | Centre de Recherche Astrophysique de Lyon, UCBL1, ENS-L, CNRS, France |
| Camargo Rodrigues de Lima, Rafael | Universidade do Estado de Santa Catarina, Brazil |
| Chakrabarti, Sandip Kumar | Indian Centre for Space Physics, Kolkata, India |
| Cherubini, Christian | ICRANet and Campus Biomedico, Italy |
| Della Valle, Massimo | Osservatorio di CapodiMonte, Italy |
| Filippi, Simonetta | ICRANet and Campus Biomedico, Italy |
| Fisher, Robert | University of Massachusetts Dartmouth |
| Frontera, Filippo | University of Ferrara, Italy |
| Fryer, Chris L. | University of Arizona, Tucson, Arizona, USA |
| Giommi, Paolo | ASI, Italian Space Agency |
| Karlica, Mile | University of Nova Gorica, Slovenia |
| Kleinert, Hagen | Richard Feynmann - ICRANet Chair, Freie Universitat Berlin |
| Kerr, Roy | Yevgeny Mikhajlovic Lifshitz - ICRANet Chair and University of Canterbury, New Zeland |
| Lee, Hyung Won | Inje University, South Korea |
| Mansouri, Reza | Sharif University of Technology |
| Mathews, Grant | University of Notre Dame |
| Merafina, Marco | University of Rome La Sapienza, Italy |

| | |
|---|---|
| Mirabel, Felix | CEA |
| Mirtorabi, Seyed Mohammad Taghi | Alzahra University, Iran |
| Muccino, Marco | INFN |
| Pak-Hin, Tam | Sun Yat-Sen University, Guangzhou, China |
| Petrosian, Vahe | Stanford University, California, USA |
| Piran, Tsvi | Yuval Neeman-ICRANet Chair and the Hebrew University, Israel |
| Prakapenia, Mikalai | ICRANet-Minsk, Belarus |
| Punsly, Brian Mathew | Mathew California University, Los Angeles USA |
| Quevedo, Hernando | Institute of Nuclear Science, UNAM |
| Rodriguez Ruiz, José Fernando | Universidad Industrial de Santander |
| Romano, Antonio Enea | Universidad de Antioquia Medellín, Antioquia, Colombia |
| Shakeri, Soroush | Isfahan University of Technology, Iran |
| Sigismondi, Costantino | ICRA, Italy |
| Sobouti, Yousef | Institute for Advanced Studies in Basic Sciences, IASBS, Iran |
| Sonnino, Giorgio | Université Libre de Bruxelles, ULB |
| Torres, Sergio | Centro Internacional de Fisica, Bogotà, Colombia |
| Zen Vasconcellos, Cesar Augusto | UFRGS, Porto Alegre, RS, Brazil |

## Lecturers

| | |
|---|---|
| Aksenov, Alexei | Institute for Theoretical and Experimental Physics |
| Alekseev, Georgy | Steklov Mathematical Inst- Russian Acad of Sciences |
| Bini, Donato | CNR and ICRANet, Italy |
| Chen, Pisin | National Taiwan University, Kavli Instit. Particle Astrophysics and Cosmology |
| Cherubini, Christian | Campus Biomedico, Rome, Italy |
| Jing, Yi-Peng | Shangai Astronomy Observatory |
| Lee, Chul Hoon | Hanyang University, Seoul, Korea |
| Lee, Hyun Kyu | Department of Physics, Hanyang University, Korea |
| Lou, You Qing | Tsinghua University, Beijing |
| Mester, John | Stanford University, USA |
| 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, Rome, Italy |
| Sang Pyo Kim | Kunsan National University, Korea |
| Sepulveda, Alonso | University of Antioquia, Columbia |
| Song Doo Jong | Korea Astronomy and Space Science Institute, South Korea |
| Starobinsky, Alexei | Landau Institute for Theoretical Physics, Russia |
| Sung-Won Kim | Institute of Theoretical Physics for Asia-Pacific, Korea |
| Wiltshire David | University of Canterbury, New Zealand |

## Research Scientists

| | |
|---|---|
| Benetti, Micol | ICRANet |
| Bernardini, Maria Grazia | 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 |

## Visiting Scientists

| | |
|---|---|
| Abishev, Medeu | Al-Farabi Kazakh National University, Kazakhstan |
| Ahmedov, Bobomurat | Uzbekistan Academy of Sciences |
| Alfonso Pardo, Wilmer Daniel | Universidad de Antioquia Medellín, Antioquia, Colombia |
| Ansoldi, Stefano | University of Udine, Italy |
| Arkhangelskaya, Irene | Moscow Engineering Physics Institute, Russia |
| Bakytzhan, Zhami | Al-Farabi Kazakh National University, Kazakhstan |
| Batebi, Saghar | Isfahan University of Technology, Iran |
| Bavarsad, Ehsan | Isfahan University of Technology, Iran |
| Belczynski, Chris | Nicolaus Copernicus Astronomical Center, Poland |
| Berezhiani, Zurab | University of L'Aquila |
| Bernal, Cristian Giovanny | Universidad Nacional Autónoma de México (UNAM), Mexico |
| Bisnovatyi-Kogan, Gennady | Space Research Institute of the Russian Academy of Sciences - SRI RAS |
| Blinne, Alexander | University Jenna, Germany |
| Boçi, Sonila | University of Tirana, Albania |
| Boshkayev, Kuantay | Al-Farabi Kazah National University, Kazakhstan |
| Cadez, Andrej | University of Ljubljana, Slovenia |
| Cho, Yongmin | UNIST |
| Corvino, Giovanni | University of Rome La Sapienza, Italy |
| Da Cunha, Bruno Carneiro | UFPE, Brazil |
| Davis, Stanley | Université Bordeaux, France |
| De Lorenci, Vitorio | Federal University Of Itajuba - Brazil |
| Eslampanah, Behzad | University of Mazandaran, Iran |
| Eslamzadeh Askestani, Sareh | University of Mazandaran, Iran |

| | |
|---|---|
| Ewald, Denise Grüne | Universidade Federal do Rio Grande do Sul, Brazil |
| Felix, Mirabel | Universidade Federal do Rio Grande do Sul, Brazil |
| Fimin, Nicolaj | Keldish Institute for Applied Mathematics, Russia |
| Gadri, Mohamed | University of Tripoli, Libya |
| Gallego Cadavid, Alexander | Universidad de Antioquia Medellín, Antioquia, Colombia |
| Goulart, Erico | Centro Brasileiro de Pesquisas Físicas, Brazil |
| Guzzo, Marcelo Moraes | Universidade Estadual de Campinas, Brazil |
| Gabriele, Grittani | ELI-Beamlines, Czech Republic |
| Haghighat, Mansour | Isfahan University of Technology, Iran |
| Hoang, Ngoc-Long | IPE, Hanoi, Vietnam |
| Hütsi, Gert | Tartu Observatory, Estonia |
| Kenesbek, Zhadyra | Al-Farabi Kazakh National University, Kazakhstan |
| Kilin, Sergei | National Academy of Sciences of Belarus |
| Kim, Hongsu | KASI |
| Kim, Hyeong-Chan | Chungju National University |
| Kim, Hyuong Yee | INJE, South Korea |
| Kim, Jin Young | Kunsan National University |
| Kim, Sang Pyo | Kunsan National University, Republic of Korea |
| Komarov, Stanislav | BSU and NASB - Belarus |
| Kurmangaliyeva, Venera | al-Farabi Kazakh National University, Kazakhstan |
| Lecian, Orchidea Maria | Sapienza University of Rome, Italy |
| Lee, Chang-Hwan | Pusan National University |
| Lee, Hyung Won | Inje University |
| Lee, Wonwoo | Cquest, Sogang University |
| Lin, Wenbin | Southwest Jiaotong University, Chengdu, China |
| Mahmoudikooshkeqazi, | Shiraz University, Iran |

| | |
|---|---|
| Somayyeh | |
| Malheiro, Manuel | ITA, Brazil |
| Mansouri, Reza | Sharif University of Technology, Iran |
| Mathews, Grant | University of Notre Dame, USA |
| Merafina, Marco | University of Rome La Sapienza |
| Mirtorabi, Seyed Mohammad Taghi | Alzahra University, Iran |
| Modaresvamegh, Saeidehalsadat | Shiraz University, Iran |
| Mohammadi, Rohollah | Isfahan University of Tecnology, Iran |
| Moliné, Maria de los Angeles | Instituto de Astrofísica e Ciências do Espaço, Lisboa |
| Mosquera Cuesta, Herman | Instituto Federal de Educação, Ciência e Tecnologia do Ceará, Brazil |
| Motie, Iman | Isfahan University of Technology, Iran |
| Muhsin Burhan Mohammed Rashid Al-Jaf | University of Science and Technology of China - Hefei |
| Nagataki, Shigehiro | Yukawa Institute for Theoretical Physics, Kyoto University |
| Nessipbay, Aizhan | Al-Farabi Kazakh National University, Kazakhstan |
| Pak-Hin, Tam | Sun Yar-Sen University, China |
| Pakhshan, Espoukeh | Azad University |
| Park, Ilhung | Ieu, Ewha Womans University |
| Park, Myeong-Gu | Kyungpook National University |
| Passiltay, Ainur | Al-Farabi Kazakh National University, Kazakhstan |
| Paudel, Rishiram | Tribhuvan University, Central Department of Physics |
| Peqini, Klaudio | University of Tirana, Albania |
| Peres Menezes, Débora | Universidade Federal de Santa Catarina, Brazil |
| Peresano, Michele | University of Udine, Italy |
| Perez Bergliaffa, Santiago | Universidade do Estado do Rio de Janeiro, Brazil |

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|---|---|
| Perez Martinez, Aurora | Instituto de Cibernetica Matematica Y Fisica, Cuba |
| Picanço Negreiros, Rodrigo | Universidade Federal Fluminense, Brazil |
| Piechocki, Wlodzimierz | Institute for Nuclear Studies - Poland |
| Pinto Neto, Nelson | Centro Brasileiro de Pesquisas Físicas, Brazil |
| Prakapenia, Mikalai | B.I. Stepanov Institute of Physics, NASB, ICRANet-Minsk |
| Qadir, Ashgar | National University of Sciences and Technology - Pakistan |
| Rafelski, Johann | University of Arizona |
| Raffaelli, Bernard | Université de Corse, France |
| Rastegar Nia, Fatemeh | Alzahra University, Iran |
| Riahi, Rashid | Isfahan University of Technology, Iran |
| Romano, Antonio Enea | Universidad de Antioquia Medellín, Antioquia, Colombia |
| Romero, Gustavo E. | Instituto Argentino de Radioastronomia IAR-CONICET, Argentina |
| Rybak, Ivan | Centro de Astrofísica da Universidade do Porto, Portugal |
| Sasaki, Misao | Kyoto University, Japan |
| Scopel, Stefano | Sogang University, South Korea |
| Sergey, Bulanov | ELI-Beamlines, Czech Republic |
| Shakeri, Soroush | Isfahan University of Technology, Iran |
| Soares Maia, Clovis Achy | Universidade de Brasília, DF, Brazil |
| S. O. Kepler | Universidade Federal do Rio Grande do Sul, Brazil |
| Takibayev, Muruert | Rutgers, the State University of New Jersey, USA |
| Tahvildarzadeh, Shadi Abdolreza | Rutgers, the State Univeristy of New Jersey, USA |
| Tarasenko, Aleksander | Belarusian State University |
| Teixeira Coelho, Hélio | Universidade Federal de Pernambuco, Brazil |
| Tkachenko, Alessya | Al-Farabi Kazakh National University, Kazakhstan |

| | |
|---|---|
| Torres, Sergio | Centro Internacional de Fisica, Bogotà, Colombia |
| Torrieri, Donato Giorgio | Universidade Estadual de Campinas, Brazil |
| Tizchang, Seddigheh | Isfahan University of Technology, Iran |
| Uka, Arban | Epoka University, Albania |
| Vallejo Peña, Sergio Andrés | Universidad de Antioquia Medellín, Antioquia, Colombia |
| Van Putten, Maurice | Korean Institute for Advanced Study, South Korea |
| Vyblyi, Yuri | B.I. Stepanov Institute of Physics, Republic of Belarus |
| Yang, Jongmann | Ieu, Ewha Womans University |
| Yernazarov, Tursynbek | Al-Farabi Kazakh National University |
| Yeom, Dong-Han | Cquest, Sogang University |
| Zhang, Shurui | University of Science and Technology of China - Hefei |
| Zheng, Yunlong | University of Science and Technology of China |
| Zhumabayeva, Symbat | Al-Farabi Kazakh National University, Kazakhstan |

## International Relativistic Astrophysics Ph. D

| | |
|---|---|
| *First Cycle* | *2002-2005* |
| Peirani, Sebastien | France |
| | |
| *Second Cycle* | *2003-2006* |
| Bernardini, Maria Grazia | Italy |
| Mattei, Alvise | Italy |
| Mercuri, Simone | Italy |
| | |
| *Third Cycle* | 2004-2007 |
| Chiappinelli, Anna | France |
| Cianfrani, Francesco | Italy |
| Guida, Roberto | Italy |
| Rotondo, Michael | Italy |
| Yegorian, Gegham | Armenia |
| Vereshchagin, Gregory | Belarus |
| | |
| *Fourth Cycle* | 2005-2008 |
| Battisti, Marco Valerio | Italy |
| Dainotti, Maria Giovanna | Italy |
| Khachatryan, Harutyun | Armenia |
| Lecian, Orchidea Maria | Italy |
| Pizzi, Marco | Italy |
| Pompi, Francesca | Italy |
| | |
| *Fifth Cycle* | *2006-2009* |
| Caito, Letizia | Italy |
| De Barros, Gustavo | Brazil |
| 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 | |
| Pugliese, Daniela | Italy |
| Sigismondi, Costantino | Italy |
| Siutsou, Ivan | Belarus |
| | |
| *Seventh Cycle* | *2008-2011* |
| Belvedere, Riccardo | Italy |
| Ceccobello, Chiara | |
| 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 |
| Haney, Maria | Germany |
| Lombardi, Caterina Antonietta | Italy |
| Menegoni, Eloisa | Italy |
| Sahakyan, Narek | Armenia |
| Sahini, Sahil | India |

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

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

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

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

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

| *Fourteenth Cycle* | *2015-2018* |
|---|---|
| Melon Fuksman, J. David | Argentina |
| Primorac, Daria | Croatia |
| Uribe S., Juan D. | Colombia |

| *Fifteenth Cycle* | *2016-2019* |
|---|---|
| Baghmanyan, Vardan | Armenia |
| Bedić, Suzana | Croatia |
| Campion, Stefano | Italy |
| Chen, Yen-Chen | Taiwan |
| Gasparyan, Sargis | Armenia |
| Marongiu, Marco | Italy |
| Martone, Renato | Italy |
| Vieira Lobato, Ronaldo | Brazil |
| Zargaryan, Davit | Armenia |

| *Sixteenth Cycle* | *2017-2020* |
|---|---|
| Becerra Vergara, Eduar Antonio | Colombia |
| Carinci, Massimo Luca Emiliano | Italy |
| Prakapenia, Mikalai | Belarus |
| Yunis, Rafael Ignacio | Argentina |

## IRAP Ph. D. Erasmus Mundus Students

| | |
|---|---|
| *First Cycle* | *2010-2013* |
| Baranov, Andrey | Russia |
| Benedetti. Alberto | Italy |
| Dutta, Parikishit | India |
| Fleig, Philipp | Germany |
| Gruber, Christine | Austria |
| Liccardo, Vincenzo | Italy |
| Machado De Oliveira Fraga, Bernardo | Brazil |
| Martins De Carvalho, Sheyes | Brazil |
| Penacchioni, Ana Virginia | Argentina |
| Valsan, Vineeth | India |
| | |
| *Second Cycle* | *2011-2014* |
| Begue, Damien | France |
| Dereli, Husne | Turkey |
| Gregoris, Daniele | Italy |
| Iyyani, Shabnam Syamsunder | India |
| Pereira, Jonas Pedro | Brazil |
| Pisani, Giovanni | Italy |
| Rakshit, Suvendu | India |
| Sversut Arsioli, Bruno | Brazil |
| Wu, Yuanbin | China |
| | |
| *Third Cycle* | *2012-2015* |
| Bardho, Onelda | Albania |
| Enderli, Maxime | France |
| Filina, Anastasia | Russia |
| Galstyan, Irina | Armenia |
| Gomes De Oliveira, Fernanda | Brazil |
| Khorrami, Zeinab | Iran |
| Ludwig, Hendrik | Germany |
| Sawant, Disha | India |
| Strobel, Eckhard | Germany |
| | |
| *Fourth Cycle* | *2013-2016* |
| Ahlén, Olof | Sweden |
| Gómez Diaz, Gabriel | Colombia |
| Kovacevic, Milos | Serbia |
| Li, Liang | China |
| Lisakov, Sergey | Russia |
| Maiolino, Tais | Brazil |
| Sridhar, Srivatsan | India |
| Stahl, Clément | France |
| Yang, Xiaofeng | China |
| | |
| *Fifth Cycle* | *2014-2017* |
| Aimuratov, Yerlan | Kazakhstan |
| Chang, Yu-Ling | Taiwan |

| | |
|---|---|
| Delgado, Camilo | Colombia |
| Efremov, Pavel | Russia |
| Karilca, Mile | Croatia |
| Krut, Andreas | Germany |
| Martinez Aviles, Gerardo | Mexico |

## CAPES Students

| *First Cycle* | *2013-2016* |
|---|---|
| Brandt Carlos Henrique | Brazil |
| Guimarães Carvalho Gabriel | Brazil |
| Pereira Lobo Iarley | Brazil |

## Administrative and Secretarial Staff

ICRANet - Pescara

| | |
|---|---|
| Adamo, Cristina | Administrative Office |
| D'amico, Emanuele | System Manager |
| De Santana Regis, Katherine | Secretariat |
| Di Niccolo, Cinzia | Secretariat |
| Gloria, Ilaria | Secretariat (trainee) |
| Latorre, Silvia | Administrative Office |
| Natale, Elisabetta | Secretariat |
| Scanzano, Luciano | System Manager |

# ICRANet Faculty Staff

# Bianco Carlo Luciano

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

Period covered: 2005 – 2023

**I Scientific Work**

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

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

Gave the following invited lectures:

- C.L. Bianco, 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.

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

*II b Work With Students*

- Students of the IRAP-PhD program at University "La Sapienza", Rome, Italy: Yerlan Aimuratov, Maria Grazia Bernardini, Letizia Caito, Maria Giovanna Dainotti, Gustavo De Barros, Maxime Enderli, Roberto Guida, Luca Izzo, Mile Karlika, Milos Kovacevic, J. David Melon Fuksman, Marco Muccino, Barbara Patricelli, Ana Virginia Penacchioni, Giovanni Battista Pisani, Daria Primorac, Luis Juracy Rangel Lemos, Yu Wang.

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

- 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.

*II c Diploma thesis supervision*

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

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

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

*II d Other Teaching Duties*

- Assistant teacher in the course of “Laboratory of Electromagnetism and Circuits” by Prof. Giulio D’Agostini at Physics Department of the University “La Sapienza”, Rome, Italy, academical year 2005/2006.
- Assistant teacher in the course of “Laboratory of Systems and Signals” by Prof. Mario Mattioli at Physics Department of the University “La Sapienza”, Rome, Italy, academical years 2007/2008, 2008/2009, 2009/2010, 2010/2011, 2011/2012, 2012/2013.
- Assistant teacher in the course of “Laboratory of Systems and Signals” by Prof. Andrea Nigro at Physics Department of the University “La Sapienza”, Rome, Italy, academical years 2013/2014, 2014/2015, 2015/2016, 2016/2017.
- Assistant teacher in the course of “Laboratory of Systems and Signals” by Prof. Mauro Raggi at Physics Department of the University “La Sapienza”, Rome, Italy, academical years 2013/2014, 2014/2015, 2015/2016, 2016/2017, 2017/2018, 2018/2019.

## III. Service activities

*III a. Within ICRANet*

- Administrator of theserver used for numerical computations.
- Secretariat of the IRAP PhD.
- Member of the ICRANet Scientific Committee.
- Member of the IRAP PhD Faculty

*III b. Outside ICRANet*

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

## IV. Other

### 2023 List of Publication

Y. Aimuratov, L. M. Becerra, C. L. Bianco, C. Cherubini, M. Della Valle, S. Filippi, L. Li, R. Moradi, F. Rastegarnia, J. A. Rueda, R. Ruffini, N. Sahakyan, Y. Wang, & S. R. Zhang; "GRB-SN Association within the Binary-driven Hypernova Model"; The Astrophysical Journal, 955 (2023) 93

R. Ruffini, Y. Aimuratov, L. Becerra, C. L. Bianco, C. Cherubini, S. Filippi, L. Li, R. Moradi, F. Rastegar Nia, J. A. Rueda, N. Sahakyan, Y. Wang, S. S. Xue, S. R. Zhang, & Icranet Team; "transient AT2023sva: A Binary Driven Hypernova with a possible associated supernova"; GRB Coordinates Network, 34779 (2023) 1

C. L. Bianco, M. T. Mirtorabi, R. Moradi, F. Rastegarnia, J. A. Rueda, R. Ruffini, Y. Wang, M. Della Valle, L. Li, & S. R. Zhang; "Probing electromagnetic-gravitational wave emission coincidence in type I binary-driven hypernova family of long GRBs at very-high redshift"; arXiv e-prints, (2023) arXiv:2306.05855

R. Ruffini, Y. Aimuratov, L. Becerra, C. L. Bianco, C. Cherubini, S. Filippi, M. Karlica, L. Li, R. Moradi, F. Rastegar Nia, J. A. Rueda, N. Sahakyan, Y. Wang, S. S. Xue, & Icranet Team; "GRB 230430A: A short GRB from a neutron star merger"; GRB Coordinates Network, 33723 (2023) 1

R. Ruffini, Y. Aimuratov, L. M. Becerra, C. L. Bianco, C. Cherubini, S. Filippi, L. Li, R. Moradi, F. Rastegarnia, B. Punsly, J. A. Rueda, N. Sahakyan, Y. Wang, & S. S. Xue; "The role of a standard family of Ic supernovae in BDHN I, BDHN II, and BDHN III GRBs"; Astronomische Nachrichten, 344 (2023) e20220099

## Cherubini Christian

Position: Full Professor in Mathematical Physics (MAT/07).
Department of Science and Technology for Sustainable Development and One Health and Unit of Nonlinear Physics and Mathematical Modeling
Campus Bio-Medico University of Rome
Via A. del Portillo 21, I-00128 Rome, Italy
and
Adjunct Professor in ICRANet Faculty.

Period covered: position at ICRANet started on September 11th, 2017

**I Scientific Work**

- Electrodynamics and magnetohydrodynamics around black holes;
- Selfgravitating systems;
- Mathematical Biology.

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

- Lecturer for the Course of "Biotechnology Modeling and Simulation Laboratory" (Department of Science and Technology for Sustainable Development and One Health, Campus Bio-Medico University of Rome), a.y. 2022-2023.
- Lecturer for the Course of "Physics (Department of Science and Technology for Sustainable Development and One Health, Campus Bio-Medico University of Rome), a.y. 2022-2023.
- Lecturer of "Mathematics" for the integrated Course of Mathematics and Computer Science (Department of Science and Technology for Sustainable Development and One Health, Campus Bio-Medico University of Rome), a.y. 2022-2023.
- Faculty of the PhD in Sustainable development: Environment, Health and Food, Campus Bio-Medico University of Rome.

**IV. Other**

Prof. Cherubini has a longstanding collaboration with other ICRANET scientists. In particular, in collaboration with Dr D. Bini, Prof. R. T Jantzen, Prof. R. Ruffini and Dr. J.A. Rueda, he has written several articles in various aspects of classical General Relativity. With Prof. S. Filippi he is involved in research activities in the fields of Stellar and Galactic self-gravitating Structures, Black Holes, Analogue models of Gravitation and Complex Systems in biophysics.

**2023 List of Publications**


- Aimuratov, Y.; Becerra, L. M.; Bianco, C. L.; Cherubini, C.; Della Valle, M.; Filippi, S.; Li, Liang; Moradi, R.; Rastegarnia, F.; Rueda, J. A.; Ruffini, R.; Sahakyan, N.; Wang, Y.; Zhang, S. R.; "GRB-SN Association within the Binary-Driven Hypernova Model", ApJ, 955 (2023) 93;

## Filippi Simonetta

Position: Full Professor in Theoretical Physics (FIS/02)
Department of Engineering,
Pro-rector for Integrated Academic Development
Head, Laboratory of Nonlinear Physics and Mathematical Modeling
Campus Bio-Medico University of Rome,
Via A. del Portillo 21, I-001285 Rome, Italy,
Tel. +39-06-225419611
and
Adjunct Professor in ICRANet Faculty.

Period covered: The position at ICRANet started on September 12th, 2017.

**I Scientific Work**

- Electrodynamics around black holes and self-gravitating systems.
- Theoretical biophysics.
-

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

Organizing committee Mini-symposium "Analysis and control of cardiac dynamics: experiments, modelling, and simulations". Dynamics Days 2023.

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

- Lecturer "Dynamics of Complex Systems" (Engineering Department, University Campus Bio-Medico of Rome).
- Lecturer "Rational Mechanics Laboratory" (Engineering Departmental Faculty, University Campus Bio-Medico of Rome).
- Faculty of the "Bioengineering, Applied Sciences and Intelligent Systems PhD" at University Campus Bio-Medico of Rome.
- Advisor of 8 PhD students in Science and Biomedical Engineering UCBM.

- **IV. Other**

Prof. Filippi has a longstanding collaboration with ICRANet scientists. In collaboration with Prof. Remo Ruffini, she has written several articles on various aspects of Gravitational Physics with a specific focus on classical figures of equilibrium. With Prof. Christian Cherubini, Dr Jorge Rueda, Dr Andrea Geralico and Dr Donato Bini, she has been involved in research activities in the fields of Stellar and Galactic Structures, Black Holes, and Analogue gravity models. With Prof. Christian Cherubini, the further research topic is "Complex Systems and Biological Systems".

**2023 List of Publications**


- Aimuratov, Y.; Becerra, L. M.; Bianco, C. L.; Cherubini, C.; Della Valle, M.; Filippi, S.; Li, Liang; Moradi, R.; Rastegarnia, F.; Rueda, J. A.; Ruffini, R.; Sahakyan, N.; Wang, Y.; Zhang, S. R.; "GRB-SN Association within the Binary-Driven Hypernova Model", ApJ, 955 (2023) 93;

- Luchetti N., Filippi. S, and Loppini A. Multilevel synchronization of human b-cells networks, Front. Netw. Physiol., Volume 3 - (2023);

- Luchetti N., Loppini A., Matarrese M.A.G., Chiodo L. and Filippi S. Structural controllability to unveil hidden regulation mechanisms in Unfolded Protein Response: The role of network models", Physica A: Statistical Mechanics and its Applications Volume 617, 128671 (2023).

## Punsly

Position: Research Scientist
Period covered: 12/2022 – 12/2023

**I Scientific Work**

Black Holes and Quasars

**1. Introduction**

This report describes the research performed by Brian Punsly and collaborators in cooperation with ICRANet in 2023. The research was directed at finding observational evidence needed to define the location and kinematics of the jet launching region of M 87.

2. **HST-1 as a Window to the Energetics of the Jet Spine of M87**

Abstract:

A new interpretation of the optical knot in the jet of M\,87, HST-1, is presented. High sensitivity 22 GHz Very Large Array images locate HST-1 to within 6 mas of the jet axis immediately upstream. 1.7 GHz Very Long Baseline Array images of a bright flare in 2005 indicates that the preponderance of emission in the early stages originates in an elongated region that is tilted $12.5^{\circ}$ from the jet axis. The superluminal motion, shape, location and the large jet-aligned optical/UV polarization suggest an identification with the putative relativistic spine of the jet. As such, energy flux estimates for HST-1, $\sim 870$ mas from the nucleus, published in 2006 indicate that the central engine injected $Q_{\rm{spine}}\approx 2.5 \times 10^{41}\rm{ergs/s}$ into the base of the spine $\sim 200$ years earler. Furthermore, previous studies reveal a tubular protonic jet on sub-mas scales that envelopes a low luminosity core, presumably the faint spine base. It was estimated that the central engine injected $Q_{\rm{tubular\,jet}}\approx 6.1\times 10^{41}\rm{ergs/s}$ $\sim 1.5$ years earlier. If one component of the jet is inherently more powerful, a firm constraint on total jet power in the recent past exists. If the emitted jet is inherently dominated by the spine (tubular jet) then the total bilaterally symmetric jet power emitted from the central engine was $<4Q_{\rm{spine}}\approx 1.0 \times 10^{42}\rm{ergs/s}$ ($< 4Q_{\rm{tubular\,jet}}\approx 2.4\times 10^{42}\rm{ergs/s}$) $\sim 200$ ($\sim 1.5$) years earlier. Assuming a nearly constant central engine injected jet power for $\sim 200$ years indicates a total jet power of $\lesssim  2\times 10^{42}$ ergs/s in epochs of modern observation or $\lesssim 3.5\%$ jet production efficiency for an accretion rate of 0.001$M_{\odot}$/yr. Seemingly, the focus of Event Horizon Telescope Collaboration numerical models should be biased towards jet powers $\lesssim 2 \times 10^{42}$ ergs/s as opposed to larger estimates from ejections many centuries or millennia earlier.

3. **The cylindrical jet base of M87 within 100$\mu\rm{as}$ of the central engine**

ABSTRACT:

A recent article on high-resolution 86 GHz observations with the Global Millimeter VLBI Array, the phased Atacama Large Millimeter/submillimeter Array, and the Greenland Telescope describes the detection of a limb-brightened cylindrical jet, $25 \mu\rm{as}< z< 100 \mu\rm{as}$, where $z$ is the axial displacement from the supermassive black hole in the sky plane. It was shown to be much wider and much more collimated than 2D simulations of electromagnetic (Blandford-Znajek) jets from the event horizon predicted. This was an unanticipated discovery. The claimed detection of a jet connected to the accretion flow provides a direct observational constraint on the geometry and physics of the jet launching region for the first time in any black hole jetted system. This landmark detection warrants further analysis. This Letter focuses on the most rudimentary properties, the shape and size of the source of the detected jet emission, the determination of which is not trivial due to line-of-sight effects. Simple thick-walled cylindrical shell models for the source were analyzed to constrain the thickness of the jet wall. The analysis indicates a tubular jet source with a radius $R\approx 144 \mu\rm{as}\approx 38M$ and that the tubular jet walls have a width $W \approx 36\mu\rm{as} \approx 9.5 M$, where $M$ is the geometrized mass of the black hole (a volume comparable to that of the interior cavity). The observed cylindrical jet connects continuously to the highly limb-brightened jet (previously described as a thick-walled tubular jet) that extends to $z> 0.65$ mas, and the two are likely in fact the same outflow (i.e., from the same central engine).

**II Conferences and educational activities**

*N/A*

**III. Service activities***N/A*

**IV. Other**

2023 List of Publication

Punsly, Brian “HST-1: a Window to the Jet Spine of M\,87”, 2023 A&A, 677, A180

Punsly, Brian “M87 Jet Within 100$\mu\rm{as}$ of the Central Engine”,2023 A&A 679, L1

## Summary

J.A.R. is a researcher in relativistic astrophysics with about 150 publications in high-impact-factor journals (H-index 30, Scopus, August 2023). He has supervised about 20 doctoral theses in various topics of theoretical physics and astrophysics of compact stars (white dwarfs and neutron stars – isolated and in binaries), dark matter, gamma-ray bursts, accretion onto compact objects, compact-star binaries including electromagnetic and gravitational-wave transients from merging binaries and neutrino astrophysics. J.A.R. has contributed to the introduction of modern concepts in relativistic astrophysics such as the *dyadotorus* (the region around a charged rotating black hole where vacuum polarization takes place), the global charge neutrality of neutron stars, the white dwarf model of magnetars, the induced gravitational collapse of a neutron star by accretion, the binary-driven hypernova model of gamma-ray bursts, the *darkinos* (fermion particles that can be the dark matter in the Universe), and the *blackholic quantum* (the extractable energy of a rotating black hole immersed in a magnetic field).

## Contact Information


| | |
|---|---|
| First Name | Jorge Armando |
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| Address | International Center for Relativistic Astrophysics Network (ICRANet), Piazza della Repubblica 10, Pescara 65122, Italy |
| | ICRANet-Ferrara, Dipartimento di Fisica, Università di Ferrara, Via Giuseppe Saragat 1, Ferrara 44122, Italy |
| | Dipartimento di Fisica, Università di Ferrara, Via Giuseppe Saragat 1, Ferrara 44122, Italy |
| | International Center for Relativistic Astrophysics (ICRA), Dipartimento di Fisica, Sapienza University of Rome, P.le Aldo Moro 5, Rome 00185, Italy |
| E-mail | jorge.rueda@icra.it |
| ORCID | 0000-0003-4904-0014 |
| Scopus ID | 25823978800 |


## Personal Information

| | |
|---|---|
| Date of Birth | October 24, 1982 |
| Place of Birth | Barrancabermeja, Colombia |
| Citizenship | Colombian |

## Education

2009–2010 *Postdoctoral Researcher*, Sapienza University of Rome, Rome, Italy

Conducted research: *Unified treatment for the description of nuclei and neutron stars based on the Thomas-Fermi model*

2006–2009 *Ph.D in Relativistic Astrophysics*, Sapienza University of Rome, Italy

Thesis title: *Electrodynamics: from nuclei to neutron stars*

Thesis Advisor: Prof. Remo Ruffini

2005–2006 *Master in Physics*, Universidad de Los Andes, Mérida, Venezuela – Universidad Industrial de Santander, Bucaramanga, Colombia

Thesis title: *Radiant shock waves in the post-quasistatic approximation*

Thesis Advisor: Prof. Luis Nuñez

2000–2005 *Physicist*, Universidad Industrial de Santander, Bucaramanga, Colombia

Thesis title: *Equilibrium of binary systems involving one extreme object in the stationary vacuum case*

Thesis Advisor: Prof. Jose David Sanabria Gómez

## Additional Qualifications

### *Computer Skills*

Operative Systems: Linux, Windows

Programming Languages: Fortran, C, C++, Python

Scientific Software: Wolfram Mathematica, Maple, Gnuplot, LaTeX

### *Languages*

Spanish: Mother tongue

Italian: Spoken (excellent), listening comprehension (excellent), written (excellent)

English: Spoken (very good), listening comprehension (very good), written (excellent)

Portuguese: Spoken (good), listening comprehension (excellent), written (good)

## Employment History

### *Science Administration*

2011–current Coordinator of international cooperation agreements, ICRANet, Pescara, Italy

2013–2017 Coordinator of the CAPES-ICRANet Program, ICRANet, Pescara, Italy

### *Research and Teaching*

2023–current Project researcher, Probing Sources of High-Energy Phenomena through Multimessenger Observations, Universidade Federal do Paraná, Universidade Tecnológica Federal do Paraná, Brazil

20023–current Project researcher, Bayesian Analysis of state-of-the-art surveys in Cosmology and Astrophysics, International Ph.D. Program in Astrophysics, Cosmology, and Gravitation (PPGCosmo), Brazil

2023–current Faculty Professor, International Ph.D. Program in Astrophysics, Cosmology, and Gravitation (PPGCosmo), Brazil

2021–current Faculty Professor, Joint International Relativistic Astrophysics (JIRA) Ph.D. Program between the University of Ferrara and the University of Science and Technology of China, Ferrara, Italy

2021–current Faculty Professor, Doctoral Program in Physics, University of Ferrara, Ferrara, Italy

2012–current Faculty Professor, International Relativistic Astrophysics (IRAP) Ph.D. Program

2011–current Full Professor, ICRANet, Pescara, Italy

2019–current Professor, ICRANet-UNIFE joint appointment, Physics Department, University of Ferrara, Italy

2011–current Associate Researcher, International Center for Relativistic Astrophysics (ICRA), Rome, Italy

2012–2017 Professor, ICRANet-Sapienza joint appointment, Physics Department, Sapienza University of Rome, Italy

2006–2011 Scientific Assistant of ICRANet, Pescara, Italy

2006–2011 Substitute Professor. Sapienza University of Rome, Italy

2006 Lecturer, Differential Calculus. Universidad de Los Andes, Mérida, Venezuela

2005 Lecturer, Physics I. Universidad Industrial de Santander, Bucaramanga, Colombia

2005 Lecturer, Waves and Oscillations. Universidad Industrial de Santander, Bucaramanga, Colombia

2004 Assistant lecturer, Newtonian Mechanics. Universidad Industrial de Santander, Bucaramanga, Colombia

### *Supervisor of Postdoctoral Research*

2013–2015 Riccardo Belvedere, CAPES-ICRANet Program Fellow at ICRANet - Rio de Janeiro, Brazil

2013–2015 Rafael Camargo Rodrigues de Lima, CAPES-ICRANet Program Fellow at ICRANet - Pescara, Italy

2013–2015 Jaziel Goulart Coelho, CAPES-ICRANet Program Fellow at Sapienza University of Rome, Italy

### *Advisor of Ph.D. Thesis*

2023–current Student: Zhang Shurui, University of Ferrara, Ferrara, Italy and University of Science and Technology of China, Hefei, China

Thesis in progress: Theoretical aspects of black holes and neutron stars in gamma-ray bursts associated with supernovae

2023–current Student: Tulio Ottoni, Universidade Federal do Espírito Santo, Vitória, Brazil

Thesis in progress: Tests of gravitational theories in the strong-field regime

2016–2024 Student: Massimo Carinci, Sapienza University of Rome, Italy

Constraints on self-interacting fermionic dark matter from galactic observables

2018–2021 Student: Gulmira Nurbakyt, Al-Farabi Kazakh National University, Almaty, Kazakhstan

Gravitational field of compact objects in the general theory of relativity

2018–2021 Student: Gulnur Zhumakhanova, Al-Farabi Kazakh National University, Almaty, Kazakhstan

Dark matter profiles in galactic bulges and halos

2017–2020 Student: Eduar Becerra, Sapienza University of Rome, Italy

Universidad Industrial de Santander, Bucaramanga, Colombia

Geodesic motion in the spacetime of self-gravitating dark matter and its application to stellar orbits around Sgr A*

2017–2020 Student: Rafael Yunis, Sapienza University of Rome, Italy

Fermionic dark matter and its self-interactions: from astrophysics to cosmology

2016–2020 Student: Stefano Campion, Sapienza University of Rome, Italy

Neutrino emission via proton-proton interaction and magnetic field screening in GRBs

2016–2019 Student: Geanderson Araujo Carvalho, Instituto Tecnológico de Aeronáutica, Sao Jose dos Campos, Brazil

Thesis: White dwarfs in general relativity, modified theories of gravity and binary systems

2016–2019 Student: Ronaldo Vieira Lobato, Sapienza University of Rome, Italy

Instituto Tecnológico de Aeronáutica, Sao Jose dos Campos, Brazil

Thesis: SGRs/AXPs and binary star mergers: electromagnetic and gravitational emission

2015–2018 Student: Juan David Uribe, Sapienza University of Rome, Italy

Thesis: Neutrino flavor oscillations in the process of hypercritical accretion: the case of binary-driven hypernovae

2015–2018 Student: José Rodriguez, Sapienza University of Rome, Italy

Thesis: Analytic approaches to the gravitational radiation from astrophysical sources

2013–2016 Student: Laura Becerra, Sapienza University of Rome, Italy

Thesis title: Accretion in compact stars: hypercritical accretion in the induced gravitational collapse and the post-merger evolution of white dwarfs mergers

PhD thesis winner of the International Astronomical Union (IAU) PhD Prize 2018, Division D, High Energy Phenomena and Fundamental Physics

2013–2016 Student: Gabriel Gómez, Sapienza University of Rome, Italy

University of Nice Sophia-Antipolis, Nice, France

Thesis title: Astrophysical implications of the fermionic dark matter in galaxies

2012–2015 Student: Federico Cipolletta, Sapienza University of Rome, Italy

Thesis title: Structure of rotating self-gravitating figures of equilibrium in Newtonian gravity and general relativity with an emphasis on neutron stars

2012–2015 Student: Fernanda Gomes Oliveira, Sapienza University of Rome, Italy

University of Nice Sophia-Antipolis, Nice, France

Thesis title: X, gamma-ray and gravitational wave emission from short and long GRBs and their detection rates

2011–2015 Student: Diego Leonardo Cáceres Uribe, Sapienza University of Rome, Italy

Thesis title: Massive fast rotating highly magnetized white dwarfs: theory and astrophysical applications

2011–2014 Student: Jonas Pedro Pereira, Sapienza University of Rome, Italy

University of Nice Sophia-Antipolis, Nice, France

Thesis title: General relativistic electrodynamical processes in neutron stars and black holes

2011–2014 Student: Carlos Argüelles, Sapienza University of Rome, Italy

Thesis title: Fermionic dark matter on galaxy scales

2010–2013 Student: Sheyse Martins de Carvalho, Sapienza University of Rome, Italy

University of Nice Sophia-Antipolis, Nice, France

Thesis title: Finite temperature effects in the white dwarf structure and neutron star cooling in general relativity

2008–2013 Student: Riccardo Belvedere, Sapienza University of Rome, Italy

Thesis title: Static and rotating neutron stars in a general relativistic formulation of fundamental interactions and their astrophysical applications

2009–2012 Student: Kuantay Boshkayev, Sapienza University of Rome, Italy

Thesis title: Rotating white dwarfs and neutron stars in general relativity

### *Advisor of Undergraduate/Master Thesis*

2019–2021 Student: Farhad Zekavat, University of Ferrara, Italy

2015–2016 Student: Silvia Petroni, Sapienza University of Rome, Italy

2015–2016 Student: Davide Gizzi, Sapienza University of Rome, Italy

### *Lecturer in Workshops and Ph. D. Schools* (partial list)

2021 *Primera Escuela Latinoamericana de Relatividad y Astrofísica*, 1–3 December, Virtual Meeting, Colombia

2019 *The Open Universe International Doctoral School:"The discovery of Black Holes"*, 10–14 June, Nice, France

2018 *41th International School for Young Astronomers (ISYA)*, 23–27 July, El Socorro, Colombia

2017 *Fifth Bego Rencontres - IRAP Ph.D. Erasmus Mundus School*, 15–19 May, Nice, France

2016 *Fourth Bego Rencontres - IRAP Ph.D. Erasmus Mundus School*, 30 May-3 June, Nice, France

2014 *Third Bego Rencontres - IRAP Ph.D. Erasmus Mundus School*, 9–19 September, Nice, France

2014 *IRAP Ph.D. Erasmus Mundus School*, 11–16 May, Les Houches, France

2013 *Second Bego Rencontres - IRAP Ph.D. Erasmus Mundus School*, 16–31 May, Nice, France

2012 *IRAP Ph.D. Erasmus Mundus School*, 3–21 September, Nice, France

2011 *IRAP Ph.D. Erasmus Mundus School*, 5–16 September, Nice, France

2011 *IRAP Ph.D. Erasmus Mundus School*, May 25-June 10, Nice, France

2011 *IRAP Ph.D. Erasmus Mundus Workshop:From Nuclei to White Dwarfs and Neutron Stars*, 3–8 April, Les Houches, France

2010 *IRAP Ph.D. Erasmus Mundus School*, 1–30 September, Nice, France

### *Organization of Conferences*

2024 *17th Marcel Grossmann Meeting on Relativistic Astrophysics*, July

2024 *3rd Julio Garavito Armero Meeting on Relativistic Astrophysics*, 6–8 March, Bucaramanga, Colombia

2023 *18th Italian-Korean Symposium on Relativistic Astrophysics*, 19–23 June, ICRANet Headquarters, Pescara, Italy

2021 *16th Marcel Grossmann Meeting on Relativistic Astrophysics*, 3–9 July, Virtual Meeting

2021 *17th Italian-Korean Symposium on Relativistic Astrophysics*, 2–6 August, Virtual Meeting

2018 *15th Marcel Grossmann Meeting on Relativistic Astrophysics*, 1–7 July, Rome, Italy

2018 *2nd Julio Garavito Armero Meeting on Relativistic Astrophysics*, 1–2 August, Bucaramanga, Colombia

2018 *The Third Zeldovich meeting*, 23–27 April, Minsk, Belarus

2017 *15th Italian-Korean Symposium on Relativistic Astrophysics*, 3–7 July, Seoul, South Korea

2017 *The Fifth Galileo-Xu Guangqi Meeting*, 25–30 June, Chengdu, China

2016 *Supernovae, Hypernovae and Binary Driven Hypernovae - An Adriatic Workshop*, 20-30 June, Pescara, Italy

2015 *14th Italian-Korean Symposium on Relativistic Astrophysics*, 20–24 July, Pescara, Italy

2015 *First Sandoval Vallarta Caribbean Meeting*, 30 November-3 December, Mexico City, Mexico

2015 *First Julio Garavito Armero Meeting on Relativistic Astrophysics*, 23–27 November, Bucaramanga, Colombia

### *Speaker in Plenary Session (partial list)*

2023 *Constraining the neutron star critical mass with long gamma-ray bursts*, 18th Italian-Korean Symposium on Relativistic Astrophysics, 19–23 June, ICRANet Headquarters, Pescara, Italy

2023 *An electrodynamic process to extract the rotational energy of a Kerr black hole*, The Fifth Zeldovich Meeting, 12–16 June, ICRANet-Armenia, Yerevan, Armenia

2022 *White dwarf binary mergers: an overlooked class of low-energy gamma-ray bursts*, National Congress of GRBs, 12–15 September, Institute for Fundamental Physics of the Universe, Trieste, Italy

2021 *Gravitomagnetic interaction of a Kerr black hole with a magnetic field as the source of the high-energy radiation of gamma-ray bursts*, ICRANet-ISFAHAN Astronomy Meeting, 3–5 November, Isfahan University of Technology, Iran

2021 *RAGtime 23 workshop*, 6–10 September, Institute of Physics, Faculty of Philosophy and Science of the Silesian University in Opava, Czech Republic

2021 *Synchrotron emission in GRB afterglows from binary-driven hypernovae and compact star binary mergers*, 17th Italian-Korean Symposium on Relativistic Astrophysics, 2–6 August, Virtual Meeting, Kunsan National University, South Korea

2021 *GRB 170817A as a double white dwarf merger*, 16th Marcel Grossmann Meeting, Virtual Meeting, Italy

2020 *An update of the binary-driven hypernova scenario*, The Fourth Zeldovich meeting, 7–11 September, Virtual Meeting, Belarus

2019 *RAGtime 21 workshop*, 16–20 September, Institute of Physics, Faculty of Philosophy and Science of the Silesian University in Opava, Czech Republic

2018 *Nuevos límites a la naturaleza de la materia oscura a partir de observables de la Vía Láctea*, 2nd Julio Garavito Armero Meeting on Relativistic Astrophysics, Bucaramanga, Colombia

2018 *Binary-driven hypernovae and the understanding of gamma-ray bursts*, 15th Marcel Grossmann Meeting, Rome, Italy

2018 *Latest news on the induces gravitational collapse scenario of long gamma-ray bursts*, The Third Zeldovich meeting, Minsk, Belarus

2018 *Simulating the induced gravitational collapse scenario of gamma-ray bursts*, Conference on Particles and Cosmology, 5–9 March, Singapore

2017 *¿Hacia dónde van la astronomía y la astrofísica en Colombia?*, 20 October, Universidad Industrial de Santander, Bucaramanga, Colombia

2017 *Binary-driven hypernovae as multimesseger astrophysical systems*, THESEUS Workshop, 5–6 October, Naples, Italy

2017 *News on neutrino astrophysics from gamma-ray bursts*, 9th European Summer School on Experimental Nuclear Astrophysics, 17–24 September, Santa Tecla, Italy

2017 *On the detection rate of the gravitational-wave emission of short and long gamma-ray bursts*,The Fifth Galileo-Xu Guangqi Meeting, 25–30 June, Chengdu, China

2017 *On the rate and gravitational wave emission of short and long GRBs*, 15th Italian-Korean Symposium on Relativistic Astrophysics, 3–7 July, Seoul, South Korea

2015 *On the binary systems associated with short and long GRBs and their detectability*, 14th Marcel Grossmann Meeting, Rome, Italy

2012 *Extreme systems in relativistic astrophysics*, 3rd Colombian Meeting on Astronomy and Astrophysics, Bucaramanga, Colombia

2012 *Strong, weak, electromagnetic, and gravitational interactions in neutron stars*, 13th Marcel Grossmann Meeting, Stockholm, Sweden

2011 *On the Einstein-Maxwell-Thomas-Fermi equations for white dwarfs and neutron stars*, 3rd Galileo-Xu Guangqi Meeting, Beijing, China

2009 *A the self-consistent treatments of neutron star configurations*, 11th Italian-Korean Symposium on Relativistic Astrophysics, Seoul, Korea

2009 *The role of compressed electrons: from nuclei to neutron stars*, 1st Galileo-Xu Guangqi Meeting, Shanghai, China

### *Speaker in Ordinary Sessions (partial list)*

2018 *15th Marcel Grossmann Meeting on Relativistic Astrophysics*, 1-7 July, Rome, Italy

2018 *2nd Julio Garavito Armero Meeting on Relativistic Astrophysics*, 1–2 August, Bucaramanga, Colombia

2018 *The Third Zeldovich meeting*, 23–27 April, Minsk, Belarus

2017 *15th Italian-Korean Symposium on Relativistic Astrophysics*, 3–7 July, Seoul, South Korea

2017 *The Fifth Galileo-Xu Guangqi Meeting*, 25–30 June, Chengdu, China

2016 *Supernovae, Hypernovae and Binary Driven Hypernovae - An Adriatic Workshop*, Pescara, Italy

2015 *14th Italian-Korean Symposium on Relativistic Astrophysics*, Pescara, Italy

2013 *13th Italian-Korean Symposium on Relativistic Astrophysics*, Seoul, South Korea

2012 *26th Texas Symposium on Relativistic Astrophysics*, Sao Paulo, Brazil

2012 *III National Meeting on GRBs "Lampi su Napoli"*, Naples, Italy

2012 *39th COSPAR Assembly*, Mysore, India

2012 *13th Marcel Grossmann Meeting*, Stockholm, Sweden

2011 *12th Italian-Korean Symposium on Relativistic Astrophysics*, Pescara, Italy

2011 *Recent News from the Mev, GeV and TeV Gamma-Ray Domains*, Pescara, Italy

2010 *2nd Galileo-Xu Guangqi Meeting*, Ventimiglia, Italy

2009 *6th Italian-Sino Workshop on Relativistic Astrophysics*, Pescara, Italy

2009 *1st Sobral Meeting*, Fortaleza, Brazil

2008 *3rd Stueckelberg Workshop on Relativistic Field Theories*, Pescara, Italy

2009 *12th Marcel Grossmann Meeting On General Relativity*, Paris, France

2008 *APS April Meeting*, St. Louis, USA

2007 *4th Italian-Sino Workshop on Relativistic Astrophysics*, Pescara, Italy

2006 *Centro de Física Fundamental-Universidad de Los Andes*, Merida, Venezuela

2005 *Laboratorio de Astronomía y Física Teórica-Universidad del Zulia*, Maracaibo, Venezuela

2005 *Laboratorio de Astronomía y Física Teórica-Universidad del Zulia*, Maracaibo, Venezuela

2005 *Primera Reunión Colombo-Venezolana de Relatividad y Gravitación*, Cartagena, Colombia

2005 *Segundo Taller de Gravitación, Cosmología y Objetos Compactos*, Universidad de Los Andes, Merida, Venezuela

### *Outreach Activities*

2023–current Co-founder and organizer of the project *Universo a km 0*, Verona, Italy

2023 Talk: *Universo invisibile.* Universo a km 0, September 2023, San Pietro in Cariano, Italy

2023 Talk: *Sobre las explosiones más poderosas del Universo.* Semaine de l'Amérique Latine et des Caraïbes, 25 May - 10 June 2023, Clermont-Ferrand, France

2018 Talk: *Three-dimensional view of hypernovae and gamma-ray bursts.* Delivered at the inauguration of the exhibition "Einstein Fermi e Heisenberg e la nascita della Astrofisica Relativistica" e "ICRANet e Cina", 12 December 2017 - 12 January 2018, Fondazione Marco Besso, Roma, Italy

2017 Talk: *"Vida" después de la "muerte": estrellas de neutrones y las explosiones más potentes del Universo.* Delivered in the "Café Científico" at Casa del Libro Total, Bucaramanga, Colombia

2017 Talk: *"Vida" después de la "muerte": estrellas de neutrones y las explosiones más potentes del Universo.* Delivered at Instituto Antonio Nariño, Barrancabermeja, Colombia

2017 Talk: *Simulando le onde gravitazionali.* Delivered at "La Notte dei Ricercatori", Pescara, Italy

2016 Talk: *Dai nuclei atomici alle stelle di neutroni ai lampi di raggi gamma.* Delivered at "La Notte dei Ricercatori", Pescara, Italy

2016 Talk: *Dai nuclei atomici alle stelle di neutroni ai lampi di raggi gamma.* Delivered at "La Notte dei Ricercatori", Pescara, Italy

2015 Talk: *Stelle di neutroni nelle esplosioni più potenti dell'universo: supernove e lampi di raggi gamma.* Delivered at "La Notte dei Ricercatori", Pescara, Italy

2014 Talk: *Dai nuclei alle pulsar ai gamma-ray bursts.* Delivered at the ICRANet for high-school students, Pescara, Italy

### *Reviewer and/or Referee*

Scientific Journal Referee *The Astrophysical Journal*, *The Physical Review (C,D)*, *Monthly Notices of the Astronomical Royal Society*, *Astronomy and Astrophysics*, *Physics Letters B*, *Nuclear Physics A*, *European Physical Journal C*, *Astrophysics and Space Science*, *Researches in Astronomy and Astrophysics*, *Canadian Journal of Physics*, *Advances and Space Research*, *Universe*, *Symmetry*, *Mathematical Reviews of the American Mathematical Society*

| | |
|---|---|
| Projects Referee | Estonian Research Council (ETAg), Estonia |
| | Science of Frontier 2019, National Council of Science and Technology, CONACYT-Gobierno de México, Mexico |
| | Agencia Nacional de Promoción Científica y Tecnológica and Fondo para la Investigación Científica y Tecnológica del Ministerio de Ciencia, Tecnología e Innovación Productiva, Argentina |
| Scientific Advisor | National Center of Science and Technology Evaluation, Ministry of Education and Science, Kazakhstan |
| | Silesian University in Opava, Opava, Czech Republic |

## Memberships

INFN Associate, Istituto Nazionale di Fisica Nucleare, Sezione Ferrara, Italy

INAF Associate, Istituto di Astrofisica e Planetologia Spaziali, Rome, Italy

Member of the Italian Physical Society

Member of the American Physical Society

Member of the International Astronomical Union – Division D "High Energy Phenomena and Fundamental Physics"

Member of the Brazilian Physical Society

Member of the Colombian Academy of Physical and Natural Sciences – AstroCO-IAU Node

## Prizes and Awards

| | |
|---|---|
| Fellowship 2023 | Senior Visiting Professor, Print CAPES Program, Instituto Tecnológico de Aeronáutica (ITA), Brazil |
| Prize 2021 | Premio Lucio Colletti, Rome, Italy |
| Award 2021 | Third Award in the Gravity Research Foundation essay competition, Gravity Research Foundation, USA |
| Award 2019 | Third Award in the Gravity Research Foundation essay competition, Gravity Research Foundation, USA |
| Award 2016 | Distinguished Award, Universidad Industrial de Santander, Bucaramanga, Colombia |
| Fellowship 2013-2016 | Senior Visiting Professor Fellowship, CAPES-ICRANet Program, Brazil |
| Fellowship 2010 | Postdoctoral Fellowship, Sapienza University of Rome, Rome, Italy |
| Fellowship 2006-2009 | Ph.D. Fellowship, International Relativistic Astrophysics Ph. D. Program, Sapienza University of Rome, Italy |
| Award 2005 | *National Prize Otto de Greiff to the best undergraduate thesis*, August 2006. Best undergraduate thesis of Natural Sciences in Colombia 2005: *Equilibrium of binary systems involving one extreme object in the stationary vacuum case*, Bucaramanga, Colombia |

| | |
|---|---|
| Award 2005 | Awarded undergraduate thesis: *Equilibrium of binary systems involving one extreme object in the stationary vacuum case*, May 2005. Physics Department, Universidad Industrial de Santander, Bucaramanga, Colombia |
| Fellowship 2002 | Distinguished student, Physics Department, Universidad Industrial de Santander, Bucaramanga, Colombia |
| Award | High-School Award for the results in the National Test of Knowledge ( 371/400 ) in 1999. Instituto Antonio Nariño, Barrancabermeja, Colombia |
| Award 1999 | First place in the XV Natural Sciences Olympiads, 1999. Award: fellowship to pursue any university career at Universidad Autónoma de Bucaramanga (UNAB)-Instituto Caldas, Bucaramanga, Colombia |

**Surname Name** **Photo**

**Vereshchagin Gregory**

Position: professor
Period covered: 2023

## I Scientific Work

This year scientific work was focused on the following projects:

- Pauli blocking effects on pair creation in strong electric field (with M.A. Prakapenia)

The process of electron-positron pair creation and oscillation in a uniform electric field is studied, taking into account the Pauli exclusion principle. Generally, we find that pair creation is suppressed; hence, coherent oscillations occur on longer timescales. Considering pair creation in already existing electron-positron plasma, we find that the dynamics depends on pair distribution function. We considered Fermi-Dirac distribution of pairs and found that for small temperatures pair creation is suppressed, while for small chemical potentials it increases: heating leads to enhancement of pair creation.

- Pair production in hot electrospheres of compact astrophysical objects (with M.A. Prakapenia)

The mechanism of pair creation in electrosphere of compact astrophysical objects such as quark stars or neutron stars is revisited, paying attention to evaporation of electrons and acceleration of electrons and positrons, previously not addressed in the literature. We perform a series of numerical simulations using the Vlasov-Maxwell equations. The rate of pair creation strongly depends on electric field strength in the electrosphere. Despite Pauli blocking is explicitly taken into account, we find no exponential suppression of the pair creation rate at low temperatures. The luminosity in pairs increases with temperature and it may reach up to $L=10^{52}$ erg/s, much larger than previously assumed.

- Electromagnetic field of a charge asymptotically approaching a spherically symmetric black hole (with S. O. Komarov and A. K. Gorbatsievich)

We consider a test charged particle falling onto a Schwarzschild black hole and evaluate its electromagnetic field. The Regge-Wheeler equation is solved analytically by approximating the potential barrier with Dirac delta function and rectangular barrier. We show that for asymptotically large times measured by a distant observer the electromagnetic field approaches the spherically symmetric electrostatic field. This implies that in the region accessible to a distant observer the initial state of separated charge and the electromagnetic field outside the event horizon of Schwarzschild black hole becomes asymptotically indistinguishable from the Reisnner-Nordström solution. The implications of this result for some astrophysical models of black holes accreting charged particles are discussed.

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

- talk "On direct and inverse Schwinger process in pair plasma", The Fifth Zeldovich meeting, Yerevan, Armenia, June 12-16, 2023.
- talk "Creazione di elettroni-positroni e principio di esclusione di Pauli", European Researchers' Night, ICRANet, Pescara, 29 September 2023.

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

- Mikalai Prakapenia: kinetic processes and radiation transfer in relativistic plasma in external electric and magnetic fields
- Stanislav Komarov: electromagnetic field of a system of charges moving near spherically symmetric and magnetized black holes

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

*III a. Within ICRANet*

- member of ICRANet faculty
- coordination of cooperation with the Belarusian State University
- coordination of cooperation with the National Academy of Sciences of Belarus
- coordination of activities in ICRANet-Minsk center
- editing the proceedings of the 16th Marcel Grossman Meeting, with 390 papers, published by World Scientific in March 2023: https://doi.org/10.1142/13149

- editorial work on the paper of Remo Ruffini, submitted for the proceedings of 17th Italo-Korean symposium
- editing the Special Issue "Remo Ruffini Festschrift" of the Universe journal https://www.mdpi.com/journal/universe/special_issues/J0M337731D with 10 papers
- supervision of the ICRANet newsletter

*III b. Outside ICRANet*

- PI in the Joint BRFFR – ICRANet – 2023 project, with the title: "Kinetic processes and radiation transfer in relativistic plasma in external electric and magnetic fields"
- PI in the Joint BRFFR – ICRANet – 2023 project, with the title: "Electromagnetic field of a system of charges moving near spherically symmetric and magnetized black holes"
- PI in the Joint BRFFR – ICRANet – 2023 project, with the title: "New effects in interaction of electromagnetic radiation with astrophysical plasma resulting from lower permittivity and density of states as compared to vacuum"

## IV. Other

**2023 List of Publication**

1. Mikalai Prakapenia and Gregory Vereshchagin, "Pauli blocking effects on pair creation in strong electric field", Phys. Rev. D 108, 013002 (2023).
2. S. O. Komarov, A. K. Gorbatsievich and G. V. Vereshchagin, "Electromagnetic field of a charge asymptotically approaching a spherically symmetric black hole", Phys. Rev. D 108, 104056 (2023).
3. S. O. Komarov, A. K. Gorbatsievich, A. S. Garkun, and G. V. Vereshchagin, "Electromagnetic Radiation and Electromagnetic Self-Force of a Point Charge in the Vicinity of the Schwarzschild Black Hole", Nonlinear Phenomena in Complex Systems, 26 (2023), pp.77 - 82.
4. Mikalai Prakapenia and Gregory Vereshchagin, "Pair creation in hot electrosphere of compact astrophysical objects", submitted to ApJ (2023).
5. G. V. Vereshchagin, "On diffusive photospheres in Gamma-Ray Bursts", in proceedings of the Sixteenth Marcel Grossmann Meeting, World Scientific, 2023, pp. 2989-3001.
6. G. V. Vereshchagin and D. Bégué, "Summary of the parallel session GB3", in proceedings of the Sixteenth Marcel Grossmann Meeting, World Scientific, 2023, pp. 3002-3008.

# Adjunct Professors of the Faculty

## Aimuratov Yerlan

**Position current**:
Researcher at Fesenkov Astrophysical Institute, Almaty, Kazakhstan
Postdoc/Senior Lecturer at al-Farabi Kazakh National University
Adjunct Professor at ICRANet, Pescara, Italy

**Position former within ICRANet**:
EMJD IRAP V cycle PhD student
University of Rome "La Sapienza" (defended 25.02.2020)

**Period covered**: January-December 2023

**I Scientific Work**

GRB, GRB-SN, HMXB: observation and analysis

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

- "Abdildin Readings 2023", 12–15 April 2023, Almaty, Kazakhstan (in-person)

*II b Work With Students*

- none

*II c Diploma thesis supervision*

- TursynbekYernazarov (3rd year Doctoral student, al-FarabiKazNU)
- Adel Umirbayeva (2nd year Master student, al-FarabiKazNU)
- Ruslan Spassyuk (1st year Master student, al-FarabiKazNU, **BSc defended: June 2023**)
- IldanaIzmailova (al-FarabiKazNU, **MScdefended: June 2023**)
- Laura Aktay (al-FarabiKazNU, **BScdefended: June 2023**)

*II d Other Teaching Duties*

- Introduction to Nuclear Astrophysics (Master course, al-FarabiKazNU, Spring 2023)
- Academic Writing (Doctoral course, al-FarabiKazNU, Autumn 2023)

*II e. Work With Postdocs*

- GRB-SN with ICRANet postdocs Yu Wang, Rahim Moradi and Liang Li

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

*III a. Within ICRANet*

- none

*III b. Outside ICRANet*

- weeklyscientific seminars at Fesenkov Astrophysical Institute
- weekly scientific seminars at al-FarabiKazNU
- participation at IVOA May Interoperability Meeting, 08–12May 2023, Bologna, Italy (online)
- oral talk "Towards Kazakhstani Virtual Observatory", International Conference "Abdildin Readings 2023", 12–15 April 2023, al-FarabiKazNU, Almaty, Kazakhstan (in-person)

**IV. Other**

- member of the National Science Council, Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan, May–December 2023, Kazakhstan

**2023 List of Publication**(https://orcid.org/0000-0001-5717-6523)

- **Aimuratov Y.**, Becerra L. M., Bianco C. L., Cherubini C., Della Valle M., Filippi S., Li L., Moradi R., Rastegarnia F., Rueda J. A., Ruffini R., Sahakyan N., Wang Y., Zhang S. R. GRB-SN

Association within the Binary-Driven Hypernova Model. // *The Astrophysical Journal* – 2023. – Vol. 955. – Article ID 93. – DOI: https://doi.org/10.3847/1538-4357/ace721

- Kim V., Izmailova I., **Aimuratov Y.** Catalog of the Galactic population of X-ray pulsars in High-mass X-ray binary systems. // *The Astrophysical Journal Supplement Series* - 2023. – Vol. 268. – Article ID 21. – DOI: https://doi.org/10.3847/1538-4365/ace68f
- Kim V., Umirbayeva A., **Aimuratov Y.** Estimates of the Surface Magnetic Field Strength of Radio Pulsars. // *Universe*, Vol. 9, Issue 7, Article ID 334. July 2023. – DOI: https://doi.org/10.3390/universe9070334
- Yernazarov T., Abishev M., **Aimuratov Y.** Correspondence of gamma radiation coming from GRBs and magnetars based on the effects of nonlinear vacuum electrodynamics // *The Sixteenth Marcel Grossmann Meeting. Conference Proceedings*, Vol. 4, pp. 4401–4409, February 2023. https://doi.org/10.1142/9789811269776_0371
- Ruffini R., **Aimuratov Y.**, Becerra L. M., Bianco C. L., Cherubini C., Filippi S., Li L., Moradi R., Rastegarnia F., Punsly B., Rueda J. A., Sahakyan N., Wang Y., Xue S. S. The role of a standard family of Ic supernovae in BDHN I, BDHN II, and BDHN III GRBs. // *AstronomischeNachrichten* - 2023. - Vol. 344. – Article ID 20220099. - DOI: https://doi.org/10.1002/asna.20220099
- + GCN Circular Archive—2 telegrams

# ARGÜELLES CARLOS RAÚL

Position: ICRANet Adjunct professor of the Faculty; Researcher (permanent position) at IALP, UNLP & CONICET – Argentina
Period covered: 2023

## I Scientific Work

Theoretical and phenomenological aspects of particle Dark Matter, self-gravitating systems, Numerical methods, Galactic Dynamics, Cosmology, Neutrino Physics beyond standard model.

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

- Invited (virtual) speaker at the “Fundamental physics at the Galactic Centre” workshop at CENTRA, Porto, Portugal, December, 15$^{th}$ & 18$^{th}$ , 2023

- Invited speaker at dipartimento di fìsica e scienze della terra, UNIFE, Ferrara, Italy, 13th September 2023

- Invited speaker at the conference “Cosmology 2023 in Miramare” at SISSA, Trieste, Italy, August 28$^{th}$ to 2$^{nd}$ September, 2023

- Scientific visit at ICRANet, Ferrara-seat, Italy, September 5$^{th}$ – 15$^{th}$ , 2023

- Invited speaker at “Ciclos de seminarios del IAFE”, at IAFE, UBA, Buenos Aires, Argentina, 5$^{th}$ April, 2023

- Invited speaker at “Seminarios de FCAG”, at FCAGLP, UNLP, La Plata, Argentina, 7$^{th}$ June, 2023

*II b Work With Students*

*II c Diploma thesis supervision*

- Ph.D Thesis director of Mr. Santiago Collazo – Beca doctoral CONICET, Argentina. Period 2023

- Ph.D Thesis director of Ms. Valentina Crespi – Beca doctoral CONICET, Argentina. Period 2023

*II d Other Teaching Duties*

- Assistant Professor position in Theoretical Physics at La Plata National University (UNLP – Physics department)

*II e. Work With Postdocs*

- Collaboration in a research project in N-body Cosmological simulations with the Postdoc Clement Stahl (Strasbourg Observatory, France)

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

*III a. Within ICRANet*

Adjunct professor of the Faculty. Scientific collaborator with the Astroparticle Physics and Dark Matter group.

*III b. Outside ICRANet*

Researcher (permanent position) at CONICET – Argentina. Working place: IALP - UNLP, La Plata, Argentina. Paseo del Bosque, Casco Urbano, B1900FWA La Plata, Buenos Aires. Phone: +54 0221 4236593 Int. 1052. Teaching activities as Assistant Professor at UNLP. Master in Science Thesis advidor and Ph.D thesis advisor.

**IV. Other**

**2023 List of Publication**

**1**. Krut, A.; Argüelles, Chavanis P.-H.; Rueda, J. A.; Ruffini, R., “Galaxy rotation curves and universal scaling relations: comparison between phenomenological and fermionic dark matter profiles”, The Astrophysical Journal (2023), Volume 945, Issue 1, id.1, 16 pp.

**2**. Argüelles, C. R., Collazo S.“Galaxy Rotation Curve Fitting Using Machine Learning Tools”, Universe (2023), Volume 9, Issue 8, id.372.

**3**. Argüelles, C. R.; Becerra-Vergara E. A.; Rueda, J. A.; Ruffini, R., “Fermionic dark matter: physics, astrophysics, and cosmology”, Universe (2023), Volume 9, Issue 4, id.197.

**4.** Crespi, V.; Argüelles, C. R.; Mestre, M. F., “Testing the nature of SgrA* with the S-2 star orbit data”, Boletín de la Asociación Argentina de Astronomía. Edited by R.D. Rohrmann, C.H. Mandrini, C.E. Boeris and M.A. Sgró. (2023) Vol. 64, p. 274-276.

**5.** Argüelles, C. R.; Boshkayev, K.; Krut, A.; Nurbakhyt, G.; Rueda, J. A.; Ruffini, R.; Uribe-Suárez, J. D.; Yunis, R., “On the growth of supermassive black holes formed from the gravitational collapse of fermionic dark matter cores”, Monthly Notices of the Royal Astronomical Society (2023), Volume 523, Issue 2, pp.2209-2218.

**6.** Argüelles, C. R.; Rueda, J. A.; Ruffini, R., “Baryon-induced collapse of dark matter cores into supermassive black holes”, Accepted for publication in The Astrophysical Journal Letters (2023), eprint arXiv:2312.07461.

**7.** Yunis, R; Argüelles, C. R. et al., “The role of self interactions in the cosmological evolution of warm dark matter”, The Sixteenth Marcel Grossmann Meeting. World Scientific Publishing Co. Pte. Ltd., 2023. ISBN #9789811269776, pp. 2127-2138

**8.** Argüelles, C. R.; Becerra-Vergara E. A.; Krut, A.; Yunis, R.; Rueda, J. A.; Ruffini, R. **“**Reshaping our understanding on structure formation with the quantum nature of the dark matter” The Sixteenth Marcel Grossmann Meeting. World Scientific Publishing Co. Pte. Ltd., 2023. ISBN #9789811269776, pp. 164-179

## Bini Donato

Position: Current
Research Director (permanent position) at
Istituto per le Applicazioni del Calcolo "M. Picone," CNR
Via dei Taurini, 19 I-00185 Roma (IT).

### I Scientific Work

The main topic of my interest is General Relativity, with special attention to classical aspects.

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

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

### 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. From 2016 I'm attending the Capra Meetings of the gravitational self-force community and as well as all meeting involving Post-Newtonian approximation, Post-Minkowskian approximation, Effective Field Theory and Effective One-Body approach, e.g. meeting of the series "QCD meets Gravity".

*Diploma thesis supervision*
I've been supervisor of the Diploma thesis of several 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, D. Gregoris.

*Ph.D thesis supervision*
Dr. V. Montaquila, Physics departments of the University of Naples "Federico II.," year 2011.
Dr. M. Haney, IRAP Ph.D, University of Rome "Sapienza," year 2013.
Gabriel G. Carvalho (CAPES, Brazil and ICRANet), year 2016.

*Teaching experiences*
I'm Contract Professor of Physics since 2004 at the faculty of Medicine of the University Campus Biomedico, in Rome. From 2007-2009 I have also been Contract Professor of Physics at the Nursery School of the same university. I've been teaching monographic courses at various Ph.D. schools in Italy.

*Work with associate researchers*
A Geralico (Istituto per le Applicazioni del Calcolo "M. Picone," CNR, Rome, Italy)

**III Service activities**
Scientific collaboration with:
Prof. R.T. Jantzen (Villanova Univesity, USA and ICRANet);

*Outside ICRANet*
Scientific collaboration with:
Prof. T. Damour (IHES, Paris, France).

**Other**

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*

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 2017, 2018 and 2019 I've been awarded as **Outstanding Referee** from the journal Classical and Quantum Gravity (IOP).
In the year 2021 I've been awarded as **Outstanding Referee** from the American Physical Society.

## 2023 List of publications

1) Tello P. G., Bini D., Kauffman S., Succi S.,
*Predicting today's cosmological constant via the Zel'dovich-Holographic connection*
EPL, **141**, 19002 (2023)
doi: 10.1209/0295-5075/acae01
e-Print: [arXiv:2208.08129 [gr-qc]].

2) Bini D., Damour T., Geralico A.
*Radiated momentum in gravitational two-body scattering including time-asymmetric effects*
Phys. Rev. D **107**, no.2, 024012 (2023)
doi:10.1103/PhysRevD.107.024012
e-Print: [arXiv:2210.07165 [gr-qc]].

3) Bini D., Geralico A., Jantzen R. T.
*Petrov type I spacetime curvature: principal null vector spanning dimension*
IJGMMP, Vol. 20, No. 05, 2350087 (2023)
doi: 10.1142/S0219887823500871
e-Print: [arXiv:2111.01283 [gr-qc]]

4) Bini D., Geralico A., Jantzen R. T.
*Wedging spacetime principal null directions*
IJGMMP, Vol. 20, No. 9 (2023) 2350149 (24 pages)
doi: 10.1142/S0219887823501499
e-Print: [arXiv:2302.03367 [gr-qc]]

5) Tello P. G., Succi S., Bini D., Kauffman S.,
From quantum foam to graviton condensation: the Zel'dovich route
EPL, 143 (2023) 39002
doi: 10.1209/0295-5075/acec95
e-Print: [arXiv:2306.17168 [physics.gen-ph]]

6) Bini D., Geralico A., Rettegno P.
*Spin-orbit contribution to radiative losses for spinning binaries with aligned spins*

Phys. Rev. D **108**, no.6, 064049 (2023)
doi:10.1103/PhysRevD.108.064049
e-Print: [arXiv:2307.12670 [gr-qc]]

7) Bini D., Damour T., Geralico A.
*Comparing One-loop Gravitational Bremsstrahlung Amplitudes to the Multipolar-Post-Minkowskian Waveform*
Phys.Rev.D **108** (2023) 12, 124052
doi:10.1103/PhysRevD.108.124052
e-Print: [arXiv:2309.14925 [gr-qc]].

## Submitted papers

1) Astesiano D., Bini D., Geralico A., Ruggiero M.L.
*Particle motion in a rotating dust spacetime: the Bonnor solution*
Class. Quantum Grav., submitted (2023)
e-Print: [arXiv:2310.04157 [gr-qc]].

2) Bini D., Geralico A., Jantzen R. T., Ruffini R.
On Fermi's resolution of the "4/3 problem" in the classical theory of the electron
Foundation of Physics, submitted (2023)

**Surname Name** **Bisnovatyi-Kogan Gennady**

**Photo**

Position: Current permanent position: Main Sci. fellow, Institute of Space Research RAS, Profsoyuznaya, 84/32, 117997, Moscow, Russia. Professor of Astrophysics.

Period covered:

## I Scientific Work

Idea of the magnetorotational supernovae model (1969), numerical calculations of which made in IKI group, had shown high efficiency of transformation of the rotational energy into the energy of explosion, what is enough for explanation of the energetics of core-collapse supernovae.

Prediction of the existence of the binary radiopulsars (1974), going through the stage of the X-ray sources (recycled pulsars). Now about 200 of such objects are known. The first one, the Hulse-Taylor pulsar, was observed 1n 1975 (Nobel Prize for this observational discovery in the year 1993).

Formation of the accretion disc coronae; first indication of accretion disc convective instabilities (1976); formation of large magnetic fields in the vicinity of black holes (1976).

The neutrino background formed by core-collapse supernovae was first calculated, and possibility of its observation have been discussed (1982). Its discovery is expected in the near future in the experiment Superkamiokande (Japan).

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

**IV. Other**

**2021 List of Publication**

List of selected publications of G.S. Bisnovatyi-Kogan

1. Hydrodynamic modeling of accretion onto stellar magnetospheres.
Astron. Ap. 364, 901-910 (2001) (with I.A.Kryukov, N.V.Pogorelov,
U.Anzer, G.B_orner)

2. On the structure of advective accretion disks at hugh luminosity.
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Proc. Conf. "Magnetic fields in the universe: From Laboratory and Stars
to Primordial Structures_. AIP Conference Proceedings,
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Astron. Ap. Transactions 24, 377-381 (2005) (with O.Yu.Tsupko).

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(with O.Yu. Tsupko).

37. Gravitational lensing by gravitational waves. Gravitation and Cosmology 14, 226-229 (2008) (with O.Yu. Tsupko).

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(with Yu. M. Krivosheyev, A. M. Cherepashchuk and K. A. Postnov)

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(with O.Yu. Tsupko).

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(with Merafina, M., Vaccarelli, M. R.).

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ApJ 701, 885_890 (2009)
(with Lovelace, R. V. E., Rothstein, D. M.).

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(with Merafina, M., Vaccarelli, M. R.).

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(with Greiner, J.; Iyudin, A.; Kanbach, G.; Zoglauer, A.; Diehl, R.; Ryde, F.; Hartmann, D.; Kienlin, A. V.; McBreen, S.; Ajello, M.; Bagoly, Z.; Balasz, L. G.; Barbiellini, G.; Bellazini, R.; Bezrukov, L.; Bisikalo, D. V.; Bisnovaty-Kogan, G.; Boggs, S.; Bykov, A.; Cherepashuk, A. M.; Chernenko, A.; Collmar, W.; DiCocco, G.; Dro"ge, W.; Gierlik, M.; Hanlon, L.; Horvath, I.; Hudec, R.; Kiener, J.; Labanti, C.; Langer, N.; Larsson, S.; Lichti, G.; Lipunov, V. M.; Lubsandorgiev, B. K.; Majczyna, A.; Mannheim, K.; Marcinkowski, R.; Marisaldi, M.; McBreen, B.; Meszaros, A.; Orlando, E.; Panasyuk, M. I.; Pearce, M.; Pian, E.; Poleschuk, R. V.; Pollo, A.; Pozanenko, A.; Savaglio, S.; Shustov, B.; Strong, A.; Svertilov, S.; Tatische_, V.; Uvarov, J.; Varshalovich, D. A.; Wunderer, C. B.; Wrochna, G.; Zabrodskij, A. G.; Zeleny, L. M.)

48. Stellar Physics Vol.2: Stellar Evolution and Stability. Second edition. (2011). Astronomy and Astrophysics Library, ISBN 978-3-642-14733-3.
Springer-Verlag Berlin Heidelberg, 2011. 491 pages.

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(with Neishtadt, A. I.; Seidov, Z. F.; Tsupko, O. Yu.; Krivosheyev, Yu. M.)

50. A study of jet heating mechanisms with application to the microquasar SS 433 Astronomy Reports, Volume 56, Issue 3, pp.167-178 (2012) (with Krivosheev, Yu. M.)

51. A brief analysis of self-gravitating polytropic models with a non-zero cosmological constant. Astronomy & Astrophysics, Volume 541, 84-88,(2012)
(with Merafina, M.; Tarasov, S. O.)

52. Vertical Structure of Stationary Accretion Disks with a Large-scale Magnetic Field Astrophysical Journal, Volume 750, 109-112 (2012). (with Lovelace, R. V. E.)

53. Analytic solution for kinetic equilibrium with respect to $\beta$-processes in nucleon plasmas with relativistic pairs. Astrophysics, Volume 55, Issue 3, pp.387-396 (2012)

## Thomas Buchert

Position: Professor of Cosmology
Staff Member of CRAL, Head of Cosmology Group :
Université Lyon 1 and École Normale Supérieure Lyon
Adjunct Professor of the Faculty : ICRANet
Member of Euclid and 4MOST
PI: ERC advanced Grant ARThUs

Period covered: January 2023 - December 2023

### I Scientific Work

(i) Non-perturbative collapse models for self-gravitating flows in Newtonian gravitation.
(ii) A direct correspondence between Newtonian gravitation and GR.
(iii) CMB analyses with homology and persistence statistics to detect the topology of the Universe.

### II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

- Workshop ERC ARTHUS Roundtable X, Lyon, France (SOC, LOC)

*II b Work With Students*
*II c Diploma thesis supervision:*
2 Master students Master 2: Tom Boismard, UCBL; Licence 3: Félix de la Salle, ENS
*II d Other Teaching Duties see below.*
*II e. Work With Postdocs :*
Collaboration with Asta Heinesen, Hamed Barzegar, ERC postdocs, financed by the ERC advanced Grant "ARTHUS, PI: T. Buchert". Collaboration with Pratyush Pranav (Luxembourg), Nezihe Uzun (Warsaw), Jan. J. Ostrowski (Warsaw), Ismael Delgado Gaspar (Warsaw).

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

*III a. Within ICRANet :*

*III b. Outside ICRANet :*

Management of ERC advanced grant "ARTHUS, PI: T. Buchert", until August 2023.
Submission of ERC-Proof of Concept grant "GRAMMAR, PI: T. Buchert".

Lecture : "Introduction to General Relativity", École Normale Supérieure, Lyon.
Exercises in "Fluidmechanics", Université Lyon 1.
Tutorials for future teachers at École Normale Supérieure, Lyon.

IV. **Other** Memberships in the *Euclid consortium* ("Theory" and "Clustering"), and in *4MOST*.

**2023 List of Publications**

**peer-reviewed – published and accepted**

**( Formerly listed accepted papers in 2022 published in January )**

ad (i) – 'Non-perturbative collapse models for collisionless self-gravitating flows'
N. Fardeau, T. Buchert, F. Al Roumi and F. Felegary,
*Phys. Rev. D 108*, 083502. (25 pages)

ad (ii) – 'A direct correspondence between Newtonian gravitation and general relativity'
T. Buchert,
*Phys. Rev. D 108*, L101502. (6 pages)

ad (iii) – 'Homology reveals significant anisotropy in the cosmic microwave background'
P. Pranav and T. Buchert,
*Astron. Astrophys.*, to be published. (15 pages)

Overall 10 publications within the ERC adG Team in 2023.

## Fisher Robert

Position: **Full Professor** in Physics
Graduate Program Director
University of Massachusetts Dartmouth
285 Old Westport Road
North Dartmouth, Ma. 02740
Tel. +1-508-999-8353
Email: robert.fisher@umassd.edu

Memberships: International Astronomical Union, American Physical Society, American Astronomical Society, National Society of Black Physicists

Period covered: 2021

### I Scientific Work

- **Type Ia Supernovae**
- **Star Formation**
- **Physics of the Interstellar Medium**
- **Turbulence and Combustion**
- **Computational Fluid Dynamics**

### II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

- Research advisor to 6 graduate students and 5 undergraduate students
- Graduate program director
- Instructor for classical physics, statistical mechanics, modern physics, and astrophysics courses

**IV. Other**

**2022 List of Publications**

D. Kosakowski, M. Ugalino, R. Fisher, O. Graur, A. Bobrick, H. Perets, "Using 44Ti Emission to Differentiate Between Thermonuclear Supernova Progenitors," accepted to the Monthly Notices of the Royal Astronomical Society: Letters. arXiv Journal

V. Tiwari, O. Graur, R. Fisher, I. Seitenzahl, S.C. Leung, K. Nomoto, H. Perets, K. Shen, "The Late-Time Light Curves of Type Ia Supernovae: Confronting Models with Observations," The Monthly Notices of the Royal Astronomical Society, 515, 3, 3703-3715, 2022. arXiv DOI

N. Roy, V. Tiwari, A. Bobrick, D. Kosakowski, R. Fisher, H. Perets, R. Kashyap, P. Lorén-Aguilar, E. García-Berro, "3D Hydrodynamical Simulations of Helium-Ignited Double-Degenerate White Dwarf Mergers," The Astrophysical Journal Letters, 932, L24, 2022. arXiv DOI

S. Neopane, K. Bhargava, R. Fisher, M. Ferrari, S. Yoshida, S. Toonen, E. Bravo, "Near-Chandrasekhar Mass Type Ia Supernovae from the Double-Degenerate Channel," Accepted for publication in The Astrophysical Journal, 925, 92, 2022. arXiv DOI

# Name Surname Filippo Frontera

Position: Adjunct Professor of ICRANET, Distinguished Scholarof the University of Ferrara, AssociatedSenior Scientist of INAF-OAS Bologna

Period covered: January - December 2023

## I Scientific Work

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

a. Prosecution of the development of a focusing Laue lens of gamma-rays for space astrophysics;

b. Contribution to the mission concept, THESEUS, now accepted for a new ESA M7 phase A study. THESEUS is devoted to high z GRBs, multi-messenger astronomy and monitoring of the X-ray sky for the search of new transient phenomena.

c. Prosecution of the development of a pathfinder of the space mission concept ASTENA (Advanced Surveyor of Transient Events and Nuclear Astrophysics) based on aNarrow Field Telescope with a50-700 keV pass band, unprecedented sensitivity and <1 arcmin angular resolution, to be proposed as small mission devoted to face from long time unsolved questions, like the origin of positron annihilation line form the Galactic Center region and the Physics of the Supernova Explosions.

d. Prosecution of the scientific exploitation of the Chinese satellite mission Insight-HXMT, in particular forthe search of the high energy counterparts of Fast Radio Bursts and unprecedented studies of GRB time variability.

## II Conferences and educational activities

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

1. *Lecture to students of "Liceo Classico Pitagora", Crotone, on "Search of new worlds since ancient times", 22 May 2023.*

2. *Attendance, with invited talks, to regular online meetings of the core team of the Insight-HXMT Chinese satellite in orbit (Febr.3, 2023; July 5, 2023; Dec.1, 2023)*
3. *PRISMA days 2023, workshop on Meteor discoveries with the PRISMA telescope network,Prato,November17-18, 2023.*

*II b. Work With Students*

*yes, with*

a) *1 PhDstudentin Physics of University of Ferrara: Lisa Ferro*

*II c. Other Teaching Duties*

*Course for the Master's Degree in Physics, University of Ferrara, on "Measures and Observations of Celestial X- and gamma-rays".*

*II d. Work With Postdocs*

*Yes, with 1PostDoc: Miguel Moita, at the Physics and Earth Sciences Department, University of Ferrara*

## III. Service activities

*III a. Member of the IRAP-PhD Faculty*

## IV. Other

*none*

## 2023 List of Publications

1. Virgilli, Enrico search by orcid ; Amati, Lorenzo ; Auricchio, Natalia ; Caroli, Ezio ; Fuschino, Fabio ; Orlandini, Mauro ; Buchan Stephen, John ; Ferro, Lisa ; **Frontera, Filippo** ; Moita, Miguel ; Rosati, Piero ; Caselle, Michele ; Ferrari, Claudio,

   *Opening the path to hard X-/soft gamma-ray focussing: the ASTENA-pathfinder mission,*

   Il Nuovo Cimento, Vol. 46C, 125 (2023); eprint arXiv:2302.09272 (February 2023).

2. Camisasca, A. E. search by orcid ; Guidorzi, C. search by orcid ; Amati, L. ; **Frontera, F.** search by orcid ; Song, X. Y. ; Xiao, S. ; Xiong, S. L. ; Zhang, S. N. ; Margutti, R. search by orcid ; Kobayashi, S. ; Mundell, C. G. search by orcid ; Ge, M. Y. ; Gomboc, A. ; Jia, S. M. ; Jordana-Mitjans, N. search by orcid ; Li, C. K. ; Li, X. B. ; Maccary, R. search by orcid ; Shrestha, M. search by orcid ; Xue, W. C. ; ...,

   *GRB minimum variability timescale with Insight-HXMT and Swift. Implications for progenitor models, dissipation physics, and GRB classifications,*

   Astronomy & Astrophysics, Volume 671, id.A112, 18 pp. (2023).

3. An, Zheng-Hua ; Antier, S. ; Bi, Xing-Zi ; Bu, Qing-Cui search by orcid ; Cai, Ce ; Cao, Xue-Lei ; Camisasca, Anna-Elisa ; Chang, Zhi ; Chen, Gang ; Chen, Li ; Chen, Tian-Xiang ; Chen, Wen ; Chen, Yi-Bao ; Chen, Yong ; Chen, Yu-Peng ; Coughlin, Michael W. ; Cui, Wei-Wei ; Dai, Zi-Gao ; Hussenot-Desenonges, T. ; Du, Yan-Qi ; Du, Yuan-Yuan; Du,Yun-Fei; Fan, Cheng-Cheng; **Frontera, Filippo**;Gao, He; Gao, Min; Ge, Ming-Yu; Gong, Ke; Gu, Yu-Dong; Guan, Ju; Guo, DongYa; Guo, Zhi-Wei; Guidorzi, CristianoL; Han, Da-Wei; He, Jian-Jian; He, Jun-Wang; Hou, Dong-Jie; Huang, Yue; Huo, Jia; Ji, Zhen, Jia, Shu-Mei; Jang, Wei-Chun; Kann, David Alexander; Klotz, A.; Kong, Ling-Da; Lan, Lin; Li, An; Li, Bing; Li, Chao-Yang; Li, ChengKui; Li, Gang; LI, Mao-Shun; Li, Ti-Pei Li; Li, Wei; Li, Xiao-Bo; Li, Xin-Qiao; Li, Xu-Fang; Li, Yan-Guo; Li, Zheng-Wei; Jing Liang; Luang, Xiao-Hua; Liao, Jin-Yuan; Lin, Lin; Liu, CongZhan; Liu, He-Xin; Liu, Hong-Wei; Liu, Jia-Cong; Liu, Xiao-Jing; Liu, Ya-Qing; Liu, YuRong; Lu, Fang-Jun; Lu, Hong; Lu, Xue-Feng; Luo, Qi; Luo, Tao; Ma, Bin-Yuan; Ma, Fu-Li; Ma, Rui-Can; Ma, Xiang; Maccary, Romain; Mao, Ji-Rong; Meng, Bin; Mie, Jian-Yin, Orlandini, Mauro Orlandini; Ou, Ge; Peng, Jing-Qiang; Peng, Wen-XiL; Qiao, Rui; Qu, Jin-Lu; Ren, Xiao-Qin; Shi, Jing-Yan; Shi, Qi; Song, Li-Ming; Song, Xin-Ying; Su, Ju Su; Sun, Gong-Xing; Sun, Liang; Sun, Xi-Lei; Tan, Wen-Jun; Tan, YingL; Tao, Lian; Tuo, You-Li; Turpin, Damien; Wang, Jin-Zhou; Wang, Chen; Wang, Chen-Wei; Wang, Hong-Jun; Wang, Hui; Wang, Jin; Wang, Ling-Jun; Wang, Peng-Ju; Wang, Ping; Wang, Wen-Shuai; Wang, Xiang-Yu; Wang, Xi-Lu; Wang, Yu-Sa; Wang, Yue; Wen, Xiang-Yang; Wu, Bo-Bing; Wu, Bai-Yang; Wu, Hong; Xiao, Sheng-Hui; Xiao, Shuo; Xiao, Yun-Xiang; Xie, Sheng-Lun; Xiong, Shao-Lin; Xiong, Sen-Lin; Xu, Dong; Xu, He; Xu, Yan-Jun; Xu,Yan-Bing; Xu, Ying-Chen; Xu, Yu-Peng; Xue, Wang-Chen; Yang, Sheng; Yang, Yan-Ji; Yang, Zi-Xu; Ye, Wen-Tao; Yi, Qi-Bin; Yi, Shu-Xu; Yin; Qian-Qing; You, Yuan; Yu, Yun-WeiL; Yu, Wei; Yu, Wen-Hui; Zeng, Ming; Zhang, Bing; Zhang, Bin-Bin; Zhang, Da-Li; Zhang, Fan; Zhang, Hong-Mei; Zhang, Juan; Zhang, Liang; Zhang, Peng; Zhang, Peng; Zhang, Shu; Zhang, Shuang-Nan; Zhang, Wan-Chang; Zhang, Xiao-Feng; Zhang, Xiao-Lu; Zhang, Yan-Qiu; Zhang, YanTing; Zhang, Yi-Fei; Zhang, Yuan-Hang; Zhang, Zhen; Zhao, Guo-Ying; Zhao, HaiSheng; Zhao, Hong-Yu; Zhao, Qing-Xia; Zhao, Shu-Jie; Zhao, Xiao-Yun; Zhao, Xiao-Fan; Zhao, Yi; Zheng, Chao; Zheng, Shi-Jie; Zhou, Deng-Ke; Zhou, Xing; Zhu, Xiao-Cheng,

   *Insight-HXMT and GECAM-C observations of the brightest-of-all-time GRB 221009A,*

   To be published in National Science Review (2023); eprint arXiv:2303.01203 (March 2023).

4. Trudu, M. ; Pilia, M. ; Nicastro, L. search by orcid ; Guidorzi, C. ; Orlandini, M. search by orcid ; Zampieri, L. ; Marthi, V. R. ; Ambrosino, F. ; Possenti, A. ; Burgay, M. search by orcid ; Casentini, C. ; Mereminskiy, I. ; Savchenko, V. ; Palazzi, E. ; Panessa, F. ; Ridolfi, A. search by orcid ; Verrecchia, F. ; Anedda, M. ; Bernardi, G. ; Bachetti, M. ; ... **Frontera, F.,** .....,

   *Simultaneous and panchromatic observations of the fast radio burst FRB 20180916B,* \\

   Astronomy & Astrophysics, Volume 676, id.A17, 22 pp. (2023).

5. Campana, Riccardo search by orcid ; Evola, Chiara ; Labanti, Claudio ; Ferro, Lisa search by orcid ; Moita, Miguel ; Virgilli, Enrico ; Marchesini, Ezequiel J. ; **Frontera, Filippo** ; Rosati, Piero search by orcid,

   *Measurement of the non-linearity in the γ-ray response of the GAGG:Ce inorganic scintillator*,

   Nuclear Inst. and Methods in Physics Research, A, Volume 1056, article id. 168587 (2023).

6. Ferro, L ; Moita, M. ; Rosati, P. ; Lolli, R. ; Guidorzi, C. ; **Frontera, F.** ; Virgilli, E. ; Caroli, E. ; Auricchio, N. ; Stephen, J. B. ; Labanti, C. ; Fuschino, F. ; Campana, R. ; Ferrari, C. ; Squerzanti, S. ; Pucci, M. ; del Sordo, S. ; Gargano, C.,

   *Laue lenses: Focusing optics for hard X/soft Gamma-ray Astronomy*,

   The Sixteenth Marcel Grossmann Meeting. On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories. Held online 5-10 July, 2021. Edited by Remo Ruffini and Gregory Vereshchagin. Published by World Scientific Publishing Co. Pte. Ltd., 2023. ISBN #9789811269776, pp. 3355-3367 (July 2023); eprint arXiv:2211.16880, (Nov 2022).

7. Virgilli, E. ; **Frontera, F.** ; Rosati, P. ; Guidorzi, C. ; Ferro, L. ; Moita, M. ; Orlandini, M. ; Fuschino, F. ; Campana, R. ; Labanti, C. ; Marchesini, E. ; Caroli, E. ; Auricchio, N. ; Stephen, J. B. ; Ferrari, C. ; Squerzanti, S. ; Del Sordo, S. ; Gargano, C. ; Pucci, M.,

   *ASTENA: a mission concept for a deep study of the transient gamma-ray sky and for nuclear astrophysics*, \\

   Proceedings of Sixteenth Marcel Grossmann Meeting on General Relativity (editors R. Ruffini, G. Vereshchagin), Published online by World Scientific Publishing Co. Pte. Ltd., p. 3368 (2022), eprint arXiv:2211.16916, Nov.2022; Published by World Scientific Publishing Co. Pte. Ltd., 2023. ISBN #9789811269776, pp. 3368-3384 (July 2023).

8. M. Moita, L. Ferro, **F. Frontera**, E. Caroli, E. Virgilli, J. B. Stephen, M. Curado da Silva, M. Maia, del Sordo,

   *Polarimetric prospects of a new hard X-soft gamma-ray space mission for next decades*,

   Proceedings of Sixteenth Marcel Grossmann Meeting on General Relativity Online, (editors R. Ruffini, G. Vereshchagin), Published online by World Scientific Publishing Co. Pte. Ltd.p. 3385 (2022);Published by World Scientific Publishing Co. Pte. Ltd., 2023. ISBN #9789811269776, pp. 3385-3399 (July 2023).

**Surname Name** **Photo** 

Position: Professor
Period covered: Jan. 1st ~ Dec. 31st, 2023

## I Scientific Work

**Parameter Estimation Pipeline development for LIGO/KAGRA collaborations**

**Machine Leaning Application for cosmology**

**More accurate gravitational waveform development**

**Developing an efficient parameter estimation software**

**Application of Deep Learning Techniques**

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

*Two master students for Machine Learning: Da-eun Song and Tae-Sung Ha*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

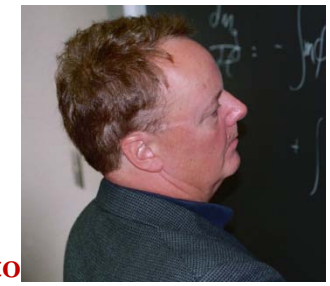
Lectures for Inje University

Various lectures for gravitational wave data analysis

## IV. Other

### 2023List of Publication

1. K.Y. Kim and H.W. Lee, "Investigating the suitability of data-driven methods for extracting physicalparameters in cosmological models", Astronomy and Computing **45,** 100762(2023).
2. 9 LIGO/Virgo/KAGRA Collaboration papers

**Mathews** **Photo** 

Position: James Ricker Wilson Adjunct ICRANet Professor
Period covered:

Jan 1 2023 – Dec. 31 2023

## I Scientific Work

**Binary neutron star mergers, Nuclear Equation of State, Supernova simulations, Galaxy formation and evolution simulations, Inflationary cosmology studies**

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

January 12, 2023 Invited talk, The 44th International Symposium on Nuclear Physics, Cocoyoc, Mexico, Core-Collapse Supernovae, Binary Neutron Stars, and the Nuclear Equation of State at High Density

Sept. 21, 2023 Invited talk, The 17th International Symposium on Nuclei in the Cosmos, Inst. Basic Sci, Daejeon Korea Binary Neutron Stars, Core-Collapse Su- pernovae, and the Equation of State

Nov. 2, 2023 Invited talk, International Workshop on Origin of Elements and Cosmic Evolution: From Big-Bang to Supernovae and Mergers, (OECE2023), Beihang Univ., Beijing China (virtual), Neutrino heated turbulent convection and the explodability of core collapse supernovae

Nov. 26, 2023 Invited Talk, APS-DNP meeting,, Workshop on Heavy Element Nucleosynthesis, Wakaloa Village, Hawaii Heavy Element Chemical Evolution

*II b Work With Students*

*II c Diploma thesis supervision*

*Currently advising 5 PhD students in theoretical astrophysics/cosmology. 1 PhD Graduated in May 2023*

*II d Other Teaching Duties*

*Particle Physics and Cosmology PHYS50602 Spring 2023*

*Wlwmwntary Cosmology PHYS10240 Fall 2023*

*II e. Work With Postdocs*

N/A

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

*III a. Within ICRANet*

*N/A*

*III b. Outside ICRANet*

UND Awards Committee

UND Colloquium Committee

UND College Council

**IV. Other**

**2023List of Publication**

Luca Boccioli, L. Roberti, M. Limongi, G. J. Mathews, A. Chieffi, 'Explosion Mechanism of Core-collapse Supernovae: Role of the Si/Si-O Interface,'Astrophys. J. 949 17 (2023), 10.3847/1538-4357/acc06a

G. J. Mathews, A. Kedia, H. I. Kim, I.-S. Suh, "Binary Neutron Star Mergers with a Crossover Transition Quark Matter,"Universe 2023, 9(9), 410, doi.org/10.3390/universe9090410

G. J. Mathews, Y. Yamazaki, H. Sasaki, and T. Kajino, J. of Phys. Conf. Ser. 2586, 012107 2023, doi:10.1088/1742-6596/2586/1/012107

X. Zhao, G. J. Mathews, A. L. Phillips, G. Tang, "A study of the properties and dynamics of the Disk of Satellites in a Milky-Way-like galaxy system"*Galaxies*, 11, 114 (2023), doi.org/10.3390/ galaxies11060114.

## Mohammad Taghi Mirtorabi

- Birth: 27 March 1966
- Address:


Department of Physics,
Azzahra University,
Vanak,
Tehran, Iran.


**Educations:**

- Bachelor of Science: Physics, Shiraz University, Shiraz, Iran, 1990.
- Master of Science: Physics and Astronomy, Shiraz University, Shiraz, Iran, 1994.
- Ph.D: Physics and Astronomy, Institute for Advance Studies in Basic Sciences, Zanjan, Iran, 2002.

**Research Interests:**

Solar physics, Late stage of stellar evolution, AGB stars, Pulsating red giant and supergiant stars, Mass loss in evolved stars, Stellar dynamics.

**Professional Activities:**

- Associated Professor of Physics and Astronomy, Azzahra University, 2013-present.
- Assistant Professor of Physics and Astronomy, Azzahra University, 2002-2013.
- Member of editorial board of Nojum Magazine (a monthly magazine about popular astronomy), 1997-2015.

- Chairman of the jury of the Iranian Student Physics Prize, "Rozbeh", awarded annually by Physics Society of Iran, 2002 and 2003.
- Head of the Iranian team participating in the International Astronomy Olympiad (IAO), 2003 - 2007.
- Head of the Iranian team participating in the International Olympiad of Astronomy and Astrophysics, 2003 - 2010,
- Chairman of SOC of the Second Workshop for Amateur Astronomers in "Observation and Analysis of Variable Stars", 2004, Tehran, Iran.
- Chairman of SOC of the Conference of Physics Students, 2004, Tehran, Iran.
- Head of the Iranian team participating in the International Olympiad of Astronomy and Astrophysics, 2019 - Ongoing.

**Computational skills**

- **Languages:** Fortran, C++, Python.
- **Platforms:** Windows, Linux.

**Publications:**


1. Zeinali F., Edalati M. T., Mirtorabi M. T. *Photoelectric Observations of the Eclipsing Variable ER Vulpeculae* 1995, IBVS, 4190.
2. Mirtorabi M. T., Guinan E. F., Wasatonic R. P., Ribas I., Engle S. G. *Starspots and Plages on the Active G8 IV-III Star λ Andromedae,* 2001, AAS, 198.9403.
3. Wasatonic R. P., Mirtorabi M. T., Guinan E. F., Messina S. *Seeing Spots: Wing Near-IR TiO and V-Band Photometry of Chromospherically Active Stars,* 2002, AAS, 199.3305.
4. Mirtorabi M. T., Guinan E. F., Wasatonic R. P., *Wing Near-IR, TiO and V-Band Photometry of Choromospherically Active Star λ Andromedae* , 2003. AJ, 125, 3265.

5. Mirtorabi M. T., Riazi N., *Photometric Observations and Light Curve Studies of the Semi-detached Eclipsing Binary R CMa*, 2006, Ap&SS, 306, 159.

6. Mirtorabi M. T., Javadi Khasraghi A., Abdolrahimi S., *Effects of core magnetic fields in evolution of binary neutron stars,* 2006, IAUJD, 2, 1.

7. Mirtorabi M. T., Javadi Khasraghi A., Abdolrahimi S., *Coupled Spin, Mass, Magnetic field, and Orbital Evolution of Accreting Neutron stars*, 2006, IAUJD, 2, 42.

8. Javadi A., van Loon J. T., Mirtorabi M. T., *JHK variable stars in M33* , 2010, SIMBAD, VizieR On-line Data Catalog: J/MNRAS/411/263.

9. Javadi A., van Loon J. T., Mirtorabi M. T., *The UK Infrared Telescope M33 monitoring project - I. Variable red giant stars in the central square kiloparsec* , 2011, MNRAS, 411, 263, Astro-ph 1009.1822

10. Javadi A., van Loon J. T., Mirtorabi M. T., *The UK Infrared Telescope M33 monitoring project - II. The star formation history in the central square kiloparsec* , 2011, MNRAS, 414, 3394, Astro-ph 1103.0755.

11. Javadi A., van Loon J. T., Mirtorabi M. T., *Infrared Survey of Pulsating Giant Stars in the Spiral Galaxy M33: Dust Production, Star Formation History, and Galactic Structure,*, 2011, ASP Conf. Series, Eds. Franz Kerschbaum, Thomas Lebzelter and Bob Wing Astroph-1101.5271.

12. Nikzat F., Javadi A., Mirtorabi M. T., van Loon J. Th., Khosroshahi H., *Photometry and Stellar Structure Analysis of the Central Regions of the M33 galaxy*, 2013, IAUS, 292, 160.

13. Javadi A., van Loon J. Th., Khosroshahi H., Mirtorabi M. T. *The UK Infrared Telescope M33 monitoring project - III. Feedback from dusty stellar winds in the central square kiloparsec* 2013, MNRAS, 432, 2824, Astro-ph 1304.3782.

14. Mirtorabi T., *A simple procedure to extend the Gauss method of determining orbital parameters from three to N points,* 2014, Ap&SS, 349, 137, astro-ph 1310.3790

15. Habibi, A., Mirtorabi, M. T., Roshan, M., *Local stability criterion for self-gravitating disks in modified gravity* , 2014, Iranian Journal of Astronomy and Astrophysics. Vol 1, No. 2, 95, Astro-ph 1405.6388.

16. Javadi, A., Saberi, M., van Loon J. Th., Khosroshahi H., Golabatooni N., Mirtorabi M. T., *The UK Infrared Telescope M33 monitoring project. IV. Variable red giant stars across the galactic disc* 2015, MNRAS, 447, 3973, Astro-ph 1412.3840.

17. Morabbi, S., Mirtorabi, M. T., *Double Stars as Tracers of Tiny Structures in the Interstellar Medium,* Publications of The Korean Astronomical Society, 2015, 30, 89

18. Azizi, F. Mirtorabi, M. T., *An updated wing TiO sensitive index for classification of M-type stars*, 2015, Ap&SS, 357, 96, Astro-ph 1505.04332

19. Bidaran, B., Mirtorabi, M. T., Azizi, F., *A new titanium oxide index in the visual band*, 2016, MNRAS, 457, 2043.

20. Gheidi Shahran, A., Mirtorabi, M. T., *Proper integration time of polarization signals of inter network regions using Sunrise/IMaX data*, 2016, Iranian Journal of Astronomy and Astrophysics. Vol 2, No. 2, 109.

21. Azizi, F., Mirtorabi, M. T., *A survey of TiO567 nm absorption in solar-type stars*, 2018, MNRAS, Vol 475, 2253.

22. Kianfar, S., Jafarzadeh, S., Mirtorabi, M. T., *Linear Polarization Features in the Quiet-Sun Photosphere: Structure and Dynamics*, 2018, Solar Phys, Vol 293, 123. T.L. Riethmlle

23. Papar, M., Kollath, Z., Shobbrook, R. R., Matthews, J. M., Antoci, V., Benko, J. M., Park, N. K., Mirtorabi, M. T., Luedeke, K., Kusakin, A., Bognar, Zs, Sodor, A., Gracia-Hernandez, A., Pena, J. H., Kuschnig, R., Moffat, A. F. J., Rowe, J., Rucinski, S. M., Sasselov, D., Weiss, W. W., *The Delta Scuti star 38 Eri from the ground and from space* , 2018, Vol 477, Issue 4, 43624379.

24. Najafi, Sh., Mirtorabi,M. T., Ansari, Z., Mota, D.F., *Red giant evolution in modified gravity,* 2019, JCAP02(2019)011.

25. Gholami, M., Mirtorabi, M. T., *The Isaac Newton Telescope Monitoring Project: Stellar Population in the IC 10 Dwarf Irregular Galaxy*, 2019, Iranian Journal of Astronomy and Astrophysics, Vol. 6, No. 1, 53.

26. Rastegarnia, F., Mirtorabi, M. T., Moradi, R., Vafaei Sadr A., Wang, Y., *Deep Learning in Searching the Spectroscopic Redshift of Quasars*, 2022, MNRAS, Vol. 511, 4490.

27. Monfared, S., Abdolvand, N., Mirtorabi, M. T., Rajaee Harandi, S., *Machine Learning Method for Predicting the Merger and Morphology of Galaxies through Near-Infrared Spectroscopy*, 2022, Iranian Journal of Astronomy and Astrophysics, Vol. 9, No. 1, 19, Spring 2022.

28. Parto, T., Dehghani, Sh., Javadi, A., Saremi, E., Van Loon, J., Khosroshahi, H., McDonald, I., Mirtorabi, M. T., Navabi, M., Saberi, M., *The Isaac Newton Telescope Monitoring Survey of Local Group Dwarf Galaxies. V. The Star Formation History of Sagittarius Dwarf Irregular Galaxy Derived from Long-period Variable Stars*, 2023, ApJ, Vol, 942, 13.

Prof. Carlo Maria Pace

Nato a Pescara il 7 dicembre 1966

Laurea di Dottore in Fisica presso l'Università degli studi "La Sapienza" di Roma; Votazione: 110/110

Relatrice: Prof.ssa Alessandra Pugliese

Titolo tesi: Decadimenti esclusivi dei mesoni B: analisi di modelli per il decadimento in due mesoni pseudo scalari e loro rilevanza per la determinazione dell'angolo alpha del triangolo di unitarietà

**Surname Name** **Photo** 

**Quevedo Hernando**

Position: Full Professor - National Autonomous University of Mexico -
Period covered: 2023

## I Scientific Work

**Topics:**

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

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

- Sasha Zaldivar (PhD - Physics)
  Topic: Geometric description of ideal quantum gases and Bose-Einstein condensation
- Elly Bayona (PhD - Astrophysics)
  Topic: Axially symmetric gravitational collapse
- Luis Cedeno (PhD – Mathematics)
  Topic: Quantum geometrothermodynamics
- Carlos Romero (PhD – Physics)
  Topic: Black hole extended geometrothermodynamics
- Jose Ladino (PhD – Astrophysics)
  Topic: Black hole shadows in alternative theories of gravity

*II d Other Teaching Duties*

*II e. Work With Postdocs*

- Francisco L. Escamilla, UNAM
- SakenToktarbay, Kazakh National University

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

Course: Relativistic Cosmology - UNAM (Mexico)
Course: Differential Geometry – University of Texas – Texas (USA)
Course: Mathematical Physics – Kazakh National University (Kazakhstan)

## IV. Other

### 2023 List of Publications

"Geometrothermodynamic approach in Econophysics" (Hernando Quevedo and María N. Quevedo) *International Journal of Geometric Methods in Modern Physics,* 2350057 (2023).

"Unified representation of homogeneous and quasi-homogenous systems in geometro-thermodynamics" (Hernando Quevedo and María N. Quevedo) *Physics Letters B*, **838** 137678 (2023).

"Geometrothermodynamic description of real gases using the law of corresponding states" (Hernando Quevedo, María N. Quevedo and Alberto Sánchez) *Journal of Geometry and Physics* **185**, 104727 (2023).

"Thermodynamics of the FLRW apparent horizon" (Luis M. Sanchez, Hernando Quevedo) *Physics Letters B*,**839** 137778 (2023).

"Study of ideal gases in curved spacetimes" (Luis Aragón-Muñoz, Hernando Quevedo) *International Journal of Geometric Methods in Modern Physics***2023**, 2350150 (2023).

"Ideal quantum gases: A geometrothermodynamic approach" (Sasha A. Zaldivar and Hernando Quevedo) *Journal of Geometry and Physics***189,** 104837 (2023).

"Inflation Driven by Non-Linear Electrodynamics" (H.B. Benaoum, Genly Leon, A. Ovgun, H. Quevedo) *The European Physical Journal C***83**,367 (2023).

"Gravitational Refraction of Compact Objects with Quadrupoles" (N.Beissen, D.Utepova, M.Abishev, H. Quevedo, M.KhassanovandS.Toktarbay) *Symmetry* , **15**(3), 614 (2023).

"Comparing metrics for mixed quantum states: Sjöqvist and Bures (Paul M. Alsing, Carlo Cafaro, Orlando Luongo, Cosmo Lupo, Stefano Mancini, and Hernando Quevedo) *Physical Review A*, **107**, 052411 (2023).

"Inflation Driven by Non-Linear Electrodynamics" (H.B. Benaoum, Genly Leon, A. Ovgün, H. Quevedo)*The European Physical Journal C***83**, 367 (2023).

"High redshift constraints on extended logotropic models" (H.B. Benaoum, P.H. Chavanis, O. Luongo, M. Mucino, and H. Quevedo) *Astroparticle Physics* **151***,* 102852 (2023).

"On black hole surface gravity" (D. Pugliese and H. Quevedo) *The European Physical Journal C* **83**, 370 (2023).

"Geometrothermodynamic cosmology" (O. Luongo and H. Quevedo) *Entropy* **25,** 1037 (2023).

## Rodriguez Ruiz Jose Fernando

Position: Postdoctoral Fellow Universidad Industrial de Santander
Period covered: Jan 2023 – Dec 2023

**I Scientific Work**

Gravitational Waves

Modified Gravity Models,

Compact objects, i.e. solitons black holes, neutron stars in the generalized Proca SU2 theory

**II Conferences and educational activities**

**Teaching courses**

*Physics I – Universidad Industrial de Santander*

*Introductory programming – Universidad Industrial de Santander*

*Astrophysics: Gravitational Waves, Black holes and Neutron Stars*

**Undergrad student supervision**

Student Juan Diego Figueroa - *Universidad Industrial de Santander*

**Master degree student supervision**

Student **Research Seedbed**
Angie Sanchez - *Universidad Industrial de Santander*

**PhD thesis co-supervision**

Student: Jhan Nicolas Martinez - *Universidad Industrial de Santander*

**Conferences**

- CoCo meeting (Cosmología en Colombia CoCO2o23) held from the 21st to the 22nd of September 2023 at Ciudad Universitaria Meléndez - Universidad del Valle, Cali –Colombia and presented the work entitled Some astrophysical properties of compact object solutions in the Generalized SU(2) Proca

**theory**

- Third Workshop on Current Challenges in Cosmology, held in Bucaramanga, Colombia from October 23rd to 27th, 2023. He contributed with the short talk entitled "Some astrophysical properties of compact object solutions in the Generalized SU(2) Proca theory".

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

*Organization of the weekly seminar of the research group GIRG*

**IV. Other**

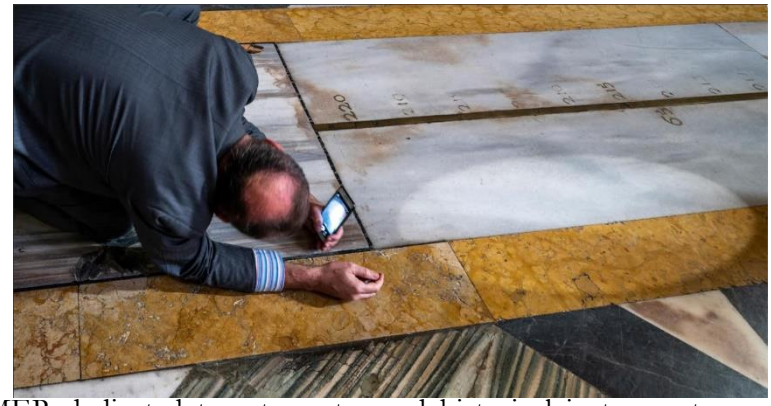
Science communication via https://twitter.com/Grupogirguis

**2023 List of Publication**

- Rodríguez, J. F., Rueda, J. A., Ruffini, R., Zuluaga, J. I., Blanco-Iglesias, J. M., & Lorén-Aguilar, P. (2023). Chirping compact stars: gravitational radiation and detection degeneracy with binaries. *Journal of Cosmology and Astroparticle Physics*, *2023*(10), 017. https://doi.org/10.1088/1475-7516/2023/10/017
- Gómez, G., & Rodríguez, J. F. (2023). New non-Abelian Reissner-Nordström black hole solutions in the generalized SU(2) Proca theory and some astrophysical implications. *Physical Review D*, *108*(2), 024069. https://doi.org/10.1103/PhysRevD.108.024069
- Martínez, J. N., Rodríguez, J. F., Rodríguez, Y., & Gómez, G. (2023). Particle-like solutions in the generalized SU(2) Proca theory. *Journal of Cosmology and Astroparticle Physics*, *2023*(04), 032. https://doi.org/10.1088/1475-7516/2023/04/032
- Becerra, L. M., Fryer, C., Rodriguez, J. F., Rueda, J. A., & Ruffini, R. (2023). Neutron Star Binaries Produced by Binary-Driven Hypernovae, Their Mergers, and the Link between Long and Short GRBs. *Universe*, *9*(7), 332. https://doi.org/10.3390/universe9070332

## Sigismondi Costantino

**Measuring theWinter solstice@Clementine gnomon**



Position: Professor
Period covered: 13 Jan 2023-12 Jan 2024

**I Scientific Work**

Observational campaign at the meridian line of S. Maria degli Angeli to detect at arcsec accuracy the atmospheric forcing (T and P). Foundation of the Academic Journal BALMER dedicated to astrometry and historical instruments. Catalogue of video observations compiled on youtube. Studies on the Vatican obelisk meridian line 1817 and the one in the Palazzo della Ragione (Padua, 1761). Solar astrometry with meridian transits, with the replica of Capitol's observatory experiments (1877-1937) at Galileo Ferraris Institute in Rome. Observative Campaign: Betelgeuse occultated and unveiled 12.12.2023 in Sibari, with the Italian team. 192 Observations of Betelgeuse, Antares, novae & SN transmitted to AAVSO, 101 meteors to IMO.

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*
*UPRA Pontifical University Regina Apostolorum: 28 February 2023 and 21 November 2023*
*Accademia Nazionale dei Lincei: Toponymy 2023 (chairman of the geographical ad polar session; speaker at the astronomical session). ISPRA 2 february 2023 Sinkholes' conference at the end of Geology and Mythology series '22-'23 Gerberto of Aurillac Pope and Scientist 12 april 2023 Angelicum – Science and Religion Series*
*Roman Diocesis, Basilica of S. Maria degli Angeli e dei Martiri – 2023 Winter Solstice Conference 21 and 22 dec 2023; Fall 22 sept and Spring 21 march Equinoxes conferences; Summer solstice 21 June conference.*

*II b Work With Students: Astrophysics Laboratory 2023/24 Sapienza University of Rome*

*II d Other Teaching Duties*
*Physics Course School Year 2022/23 ITIS 1DT and Lyceum 3CL G. Ferraris and IIS F. Caffè 1AE, Rome. ASYAGO Summer School –PCTO at Asiago/University of Padua Astrophysical Observatory July 13-21 and August 24-31. PON ESTATE 2023 @IIS F. Caffè, Roma on Cumulonimbus physics 25 may-15 June 2023.*

**III. Service activities**

*III a. Within ICRANet: PCTO with Galileo Galilei Lyceum, Pescara year 2022/23; Copernicus 550° 24 feb '23 meeting; Giornate Gerbertiane 2023 (Annular-total eclipse and solar diameter april-may 2023).*

*III b. Outside ICRANet: History of Astronomy course at UPRA Pontifical University Regina Apostolorum 2023/24*

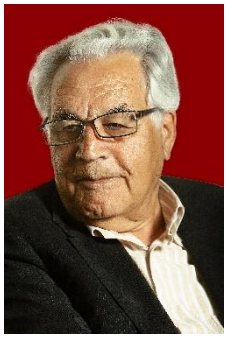
*State Examen 2023 at Convitto Nazionale Vittorio Emanuele II, and Gauss Institute June 19-July 11 2023*

**IV. Other 2023 List of Publication (45 items)**

On **NASA** ADS 37 publications: on Gerbertus vol. **19** (2023) + ATel #15991 #16001 and #16374+ **Astronomical Journal**, Anugu et al. (2023). 4 publications on **ISPRA** Giornate di Geologia e Storia 4a clima 3a ghost cities 2a geomitologia 1a grandi aree urbane. QG **1** 2023 on *Cumulonimbus physics*.

2024 3 Publications: JOA on Betelgeuse occultation + BALMER second issue.

## Yousef Sobouti



Position: **Founder, Institute for Advanced Studies in Basic Sciences (IASBS)**
Period covered: **1992**

Position: **Founding President, IASBS**
Period covered: **1992 – 2010**

Position: **Professor of Physics, Shiraz University**
Period covered: **1964 -1997**

Position: **Professor of Physics, IASBS**
Period covered: **1993 – 2020**

Position: **Founder, Biruni Observatory of Shiraz University**
Period covered: **1971**

Position: **Founding Director, Biruni Observatory of Shiraz University**
Period covered: **1971 – 1981**

Position: **Founder and Founding Director, Center for Research in Climate Change and Global Warming, IASBS**
Period covered: **2012 - present**

Position: **Fellow, The World Academy of Sciences (TWAS)**
Period covered: **1987 – present**

Position: **Fellow, Iran Academy of Sciences**
Period covered: **1988 – present**

Position: **Iran Academy of Sciences, Head, Basic Sciences Branch**
Period covered: **2012-2019 and 2022 – present**

### I Scientific Work

- **Education:**

  B.Sc., Physics, Tehran University, 1953

  M.A., Physics, University of Toronto, 1960

  Ph.D., Astronomy and Astrophysics, University of Chicago, 1963

- **Positions held**:

Lecturer, Dept. of Math., University of Newcastle on Tyne, 1963-1964

Associate Professor, Physics, Shiraz University, 1964-1970

Visiting Associate Professor, Astronomy, University of Pennsylvania, 1968-1969

Professor of Physics, Shiraz University, 1971 to 1999

Chairman, Physics Department, Shiraz University, 1972-1974 and 1978-1980

Visiting Senior Researcher, Astronomical Institute, University of Amsterdam, 1975-1976

Visiting Scholar, Astronomy and Astrophysics Center, University of Chicago, 1984-1985

Visiting Professor, Physics Department, Northeastern University, Boston, 1991-1992

Professor of Physics, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran 1991- 2020

Academy of Sciences of Iran, Head of Basic Sciences Branch, 2012 –2019, 2022 –present

Adjunct Professor, International Center for Relativistic Astrophysics Network (ICRANET), Pescara, Italy, 2015

- **Publications (Papers)**

1. Sobouti, Y., "Three arguables: point particle singularity, asymmetry in EM and quantum waves, and the left out restricted Lorentz gauge from U(1), revised and abridged", *Astron. Rep.* (2023).

2. Sobouti, Y., "Three arguable concepts: point particle singularity, asymmetric action of EM on quantum wave functions, and the left out restricted Lorentz gauge from U (1)", Quantum Studies: Mathematics and Foundations, pp. 1-14, DOI: 10.1007/s40509-022-00290-0, (2023).

3. Sobouti, Y., "Astronomy in Iran (an update, 2021)", in Euro-Asian Astronomical Society, - (dir.), *Astronomical and Astrophysical Transactions, Vol. 33, No. 3.*, Cambridge Scientific Publishers, Coll. «Astronomical and Astrophysical Transactions», France, ISBN : 9781908106803, pp. 187-190, doi : https://doi.org/10.17184/eac.7521, (2022).

4. Ruffini, R. and Sobouti, Y., "A friendly exchange between Professor Remo Ruffini and Professor Yousef Sobouti during the editorial preparation of the Proceedings publication", in Euro-Asian Astronomical Society, - (dir.), *Astronomical and Astrophysical Transactions, Vol. 33, No. 3.*, Cambridge Scientific Publishers, Coll. «Astronomical and Astrophysical Transactions», France, ISBN: 9781908106803, pp. 185-186, doi : https://doi.org/10.17184/eac.7520, (2022).

5. Sobouti, Y., "Astronomy in Iran, an update, 2021", IUT International E-Newsletter, Volume 3, Special Issue, November 2021, pp. 9-10, (2021).

6. Sobouti, Y., "Massive Gravity as an Alternative Gravity", Gravitation and Cosmology, Vol. 26, Number 1, pp. 1–6, (2020).

7. Sobouti, Y., “An Oscillator representation of elementary particles”, J. Phys. Communication, Journal of Physics Communications, Volume 2, Number 8 (2018)2.

8. Sobouti, Y., "Iran’s commitments toward meeting the goals of Paris Agreement: harnessing the global temperature rise", Региональные проблемы, 21(3 (1)), 112-114, (2018).

9. Sobouti, Y., Jahani Poshteh, M. B., “A cosmological model with time varying cosmological constant”, (2017).

10. Sobouti, Y., “Harmonic Oscillators and Elementary Particles”, arXiv:1608.04598v1 [physics.gen-ph], (2016).

11. Sobouti, Y., “Lorentz Covariance `almost' implies electromagnetism and more”, Eur. J. Phys. 17 180–2. IOPscience, (2015), arXiv:1507.06393 [physics.class-h].

12. Sobouti, Y., Darvishzadeh, R., Naghavi Azad, A., “Climate of Iran-Projection of Temperature and Precipitation until 2030”, Science Cultivation 5 (2), pp. 18-25, (2015).

13. Sobouti, Y., “Notes on Iran's higher education, pre-1979”, 2nd International Conference on Advanced Science and Technology for Sustainable Development in Iran, Freie Universitat Berlin, Germany, 8 -10 August, (2015).

14. Sobouti, Y. And Naghavi Azad, A., “Projection of the Regional Climate of Iran”, Science Cultivation, Vol. 4 (2), pp. 124-129,( 2014).

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۱۸٤. ثبوتی، ی.، «به یاد چاندراسکار»، مجله فیزیک، مرکز نشر دانشگاهی، رفتگان، ۱۳۳- ۱۳۲، تابستان ۱۳۷۴

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- **Books (Publications)**

1. Thermodynamics and Statistical Mechanics, (2023), (Revisions and additions are in progress).

2. Basic Sciences of Zanjan: the story of the foundation of the Institute for Advanced Studies in Basic Sciences, narrated by Y. Sobouti, the founder [by Mandana Farhadian], (2022), Nashre Ney publication, Tehran, Iran.

3. Relativity: Special and General (a graduate-student textbook in Persian), Iran University Press, 2018.

4. Warmed Earth: What has the climate of the 21st Century to offer, Gita Shenasi Press, Tehran, (a book on climate change for Persian speaking communities), 2011.

5. Thermal physics (Book by Philip M. Morse), translation (1993), Nashre Daneshgahi Press, Iran.

6. Stellar Evolution (by Jack Meadows), translation (1984), Dena Press, Iran

- **Books (Editor)**

1. ICRANet-Isfahan Astronomy Meeting: From the Ancient Persian Astronomy to Recent Developments in Theoretical and Experimental Physics, Astrophysics and General Relativity, Editors: R. Ruffini, Y. Sobouti and S. Shakeri, Cambridge Scientific Publishers, ISBN 978-1-908106-88-9, (2022).

2. Commitments of the Islamic Republic of Iran to Climate Change. (2017). (2015 Paris Conference), on the order of the Researchers Support Fund, Letter of the Academy of Sciences, Guest Editor, Iran.

3. Science the Gateway to Understanding, Proceedings of the Workshop on, Tehran, October 2008, Editors: Glenn Schweitzer and Yousef Sobouti, The National Academies Press, Washington, D.C. (2008).

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

- **Conferences (recent)**

  - Sientifice Commitee Member of 5th International Conference on Physics, Mathematics, and Computer Science, Mustansiriyah University, Baghdad, Iraq, April 22-23, 2024
  - Sientifice Commitee Member of 17th National Conference on Astronomy and Astrophysics of Iran, Shahid Beheshti University, 2024
  - Sientifice Commitee Member of 8th Regional Conferences on Climate Change and Global Warming, Center for Research in Climate Change and Global Warming, IASBS**,** 2023
  - Sientifice Commitee Member of 7th Regional Conferences on Climate Change and Global Warming, Center for Research in Climate Change and Global Warming, IASBS**,** 2022
  - Sientifice Commitee Member of ICRANet-ISFAHAN Astronomy Meeting, November 2021
  - Sientifice Commitee Member of 6th Regional Conferences on Climate Change and Global Warming, Center for Research in Climate Change and Global Warming, IASBS**,** 2021
  - Sientifice Commitee Member of 23rd National Meetings on Research in Astronomy, IASBS, 2020

- **Major contributions to institutional developments**
    - Responsible for the initial conception and realization of Biruni Observatory, Shiraz University, Shiraz, Iran 1971-1975, and Director of the Observatory, 1975-1980
    - Responsible for the creation and development of graduate studies in physics (M.Sc., 1967 and Ph.D., 1986), Shiraz University, Shiraz, Iran
    - Responsible for the initial conception and creation of Institute for Advanced Studies in Basic Sciences, Gava Zang, Zanjan, Iran, 1991, Director, 1991-2010
    - Responsible for the initial conception and creation of Abdul - Rahman Sufi College (a private 1st degree college science and humanity), 2004, Head of the Board of Trustees, 2004 - present
    - Founding member of the Physical Society of Iran, 1983-present
    - Founding member of the Astronomical Society of Iran, 1987-present
    - Founding member of the Iranian Society of Ethics in Science and Technology, 2004-present

- **Memberships and fellowships in societies and scientific organizations**
    - Founding member and member of the Board of Directors of the Physical Society of Iran, 1983-1988, President, 1989-1991 and 1996-2000
    - Founding member of the Astron. Soc. of Iran, 1987, President 1987-1993 and 1996-1999
    - Member of the American Astronomical Society, 1968-2002
    - Member of the International Astronomical Union, Commissions 28, 35, 1969 present
    - Founder of Birouni Observatory, Shiraz, Iran, 1971
    - Iranian Journal of Science and Technology, Board of Advisors, 1971-1976, Board of Editors 1983 -1990
    - Iranian Journal of Physics, Board of Advisors, 1987 - present
    - Member of the Third world Academy of Science, 1987 - present
    - Member of the Academy of Sciences of Iran, 1989 - present
    - Member of the Scientific Council, International Center for Theoretical Physics, Trieste, Italy, appointed by UNESCO and IAEA, 1989-1992
    - Founder of Institute for Advanced Studies in Basic Sciences, Zanjan, Iran 1991
    - Member of Board of Trustees of The Regional Library of Science and Technology, appointed by the Ministry of Culture and Higher Education of Iran, 1991-1998
    - Member of the Board of Trustees of the University of Medical Sciences of Zanjan, 2004

- Member of Technical Advisory Committee of Commission on Science and Technology for Sustainable Development in the South (COMSATS), 2004
- Member of the International Advisory Committee, Marcel Grossmann Meetings, a la Sapiensa-based (Rome, Italy) annual conference in Honor of Marcel Grossman, the mathematician who helped Einstein to formulate his General Relativity, 2006 – present
- Founder of Sufi School of Business, a graduate school, stationed in Zanjan, in progress since 2015
- Journal of the Eurasian Astronomical Society, Astronomical and Astrophysical Transactions (AapTr), Vol. 33, No. 3., Cambridge Scientific Publishers, Coll. «Astronomical and Astrophysical Transactions», Guest Editor, 2022

## *II b Work with Students*

## *II c Diploma thesis supervision*

- Over 50 students, between 1964 to 1990
- After 1990 to 2018:

**Supervision:**

1. Mehdi Haghi, MSc, Thesis title: "Symmetries of the Liouville equation for the simple coordinate potential", Shiraz University, Graduation date: 1990
2. Amir Hosein Fariborz, MSc, Thesis title: "Outdoor synchronous oscillator", Shiraz University, Graduation date: 1990
3. Mansour Haghighat, MSc, Thesis title: "Eigenvalues of Liouville operator functions with simple coordinate potential", Shiraz University, Graduation date: 1990
4. Mohammad Ali Hoseinpour Feizi, MSc, Thesis title: "Chaos in simple quantum systems", Shiraz University, Graduation date: 1990
5. Ali Mohammad Jamilzadeh, MSc, Thesis title: "Chaos in classical dynamical systems", Shiraz University, Graduation date: 1990
6. Sadollah Nassiri Gheydari, PhD, Thesis title: "Cannon formulation of quantum statistical mechanics", Shiraz University, Graduation date: 1992
7. Mohammad Hosein Dehghani, PhD, Thesis title: "Liouville Equation Symmetry Group", Shiraz University, Graduation date: 1992
8. Javad Tahmasebi Birgani, PhD, Shiraz University, Graduation date: 1992
9. Hasan Ranjbar Asgari, MSc, Thesis title: "Spherical solutions of Brans-Dicke equations", Shiraz University, Graduation date: 1994

10. Hamid Reza Khalesifard, PhD, Thesis title: “Two wave mixing as a new method for measurement of nonlinear refractive index”, Shiraz University, Graduation date: 1996

11. Mansour Haghighat, PhD, Thesis title: “Heavy Hadron weak decay form factors”, Shiraz University, Graduation date: 1996

12. Hossein Hakimi Pajouh, MSc, Thesis title: “Phase Transition and Dynamic Exponets for Convective Motions in Nondissipative Fluids”, IASBS, Graduation date: 1995

13. Reza Alemi, MSc, Thesis title: “Quantum Behavior of Accelerated Electrons as Dissipative Quantum System”, IASBS, Graduation date: 1995

14. Malek Zareyan, MSc, Thesis title: “Dirac Equation in the Randers Metric and Hydrogen Atom in the Finslerian Formalism”, IASBS, Graduation date: 1995

15. Ali Nayeri, MSc, Thesis title: “Tethered Surfades and Space-Time: A Model for the Universe”, IASBS, Graduation date: 1995

16. Habib Gharar Khosroshahi, MSc, Thesis title: “The effect of gravitational waves on stars\”, IASBS, Graduation date: 1996

17. Mahmood Hoseini Farzad, PhD, Thesis title: “Four-wave vortex combination without approximation of slow amplitude changes and its quantum properties”, Shiraz University, Graduation date: 1996

18. Morteza Bayat, MSc, Thesis title: "Classification of Certain Plane Curves Satisfying R=f(d)" , IASBS, Graduation date: 1996

19. Hassan Firuzjahi, MSc, Thesis title: “Patterns Formation in Statistical Description of Hydrodynamical Instabilities”, IASBS, Graduation date: 1997

20. Peyman Ahmadi, MSc, Thesis title: “Long Period Magnetic Phenomena in the Sun as Hydromagnetic Mades of Oscillation”, IASBS, Graduation date: 1998

21. Mohammad Rahim Bordbar, MSc, Thesis title: “An Introduction to flame spectrophotometry”, Shiraz University, Graduation date: 1998

22. Maziyar Khosravi, MSc, Thesis title: “Boson stars in post-Newtonian approximation and poly-tropical structure”, Shiraz University, Graduation date: 1998

23. Arezoo Dianat, MSc, Thesis title: “Hydrogen Atom in Friedmann Universe”, IASBS, Graduation date: 1999

24. Vahid Rezania, PhD, Thesis title: “Normal Modes of Relativistic Systems in Postnewtonian Approxi- Mation and Thestability Curve ofr - Modes in Neutron Stars”, IASBS, Graduation date: 1999

25. Shahram Abbasi, MSc, Thesis title: “A Study of g-Modes of Oscillation of the Sun”, IASBS, Graduation date: 2000

26. Yousef Ali Aabedini, PhD, Thesis title: “Free earth oscillations”, IASBS, Graduation date: 2000

27. Ahmad Hosseini Zadeh, MSc, Thesis title: “Brightness Fluctuations in Globular Clusters”, IASBS, Graduation date: 2001

28. Kayoomars Karami, PhD, Thesis title: “Coronal Heating by Damping of MHD Waves and Third Order Effect of Rotation on Stellar Oscillations”, IASBS, Graduation date: 2003

29. Jalil Naji Damirani, MSc, Thesis title: “Mass Distribution Function for Self-Gravitating Spherical System”, IASBS, Graduation date: 2004

30. Hosein Safari, PhD, Thesis title: “Solar Coronal Plasma Heating I. Loops Oscillations and Resonant Absorption II. Nano-Flares Heating”, IASBS, Graduation date: 2006

31. Fatemeh Taati Asil, PhD, Thesis title: “Phase Space Quantum Mechanics-An Extended Phase Formalism Approach”, IASBS, Graduation date: 2006

32. Hadi Rahmani Baygi, MSc, Thesis title: “Long Term Lumitiosity Variations and Orbital Period Changes in CG CYg”, IASBS, Graduation date: 2006

33. Seyed Hossein Razizadeh, MSc, Thesis title: “A Chromospheric Activity Study of the Binary Star ER Vul Peculae”, Zanjan University, Graduation date: 2006

34. Akram Hassani Zonoozi, PhD, Thesis title: “I. Initial Mass Function: a Distinguishing Factor for Gravity Models II. The Flattening of the Mass Function of the Globular Cluster Palomar 14”, IASBS, Graduation date: 2011

35. Zohreh Ghaffari, MSc, Thesis title: “Metallicity of Starburst Galaxies in Chandra Deep Field South (CDF-S)”, IASBS, Graduation date: 2011

36. Parvin Mostafavi, MSc, Thesis title: “Physical Characteristics of Early Type Galaxies at Redshift $0.3<2<1$”, IASBS, Graduation date: 2011

37. Ehsan Moravveji, PhD, Thesis title: “Analysis of the Observational Data of the Blue Supergiant Star Rigel: An Asteroseismological Approach”, IASBS, Graduation date: 2012

38. Amir Naghavi Azad, MSc, Thesis title: “Projecting the Climate of Iran and Its Geographical Neighbours Using Regional Climate Model (RegCM)”, IASBS, Graduation date: 2013

39. Mehdi Mahmoodi, MSc, Thesis title: “Planetary Atomospheres in Solar System”, IASBS, Graduation date: 2014

40. Mahdi Yousefzadeh Soraki, MSc, Thesis title: “Automatic Identification of Supergranular Cell Boundaries”, IASBS, Graduation date: 2014

41. Roohollah Lotfi, MSc, Thesis title: “Study of the atmosphere of the planets of the solar system”, Abdolrahman Sufi Razi Higher Educational Institute, Graduation date: 2014

42. Nasim Ildartanha, MSc, Thesis title: “Reconstructing the Solar Magnetic Field by a Lagrange Multiplier Technique Subject to the Helicity Conservation”, IASBS, Graduation date: 2015

43. Rasul Darvishizadeh, MSc, Thesis title: “Forecast of Iran's climate and its geographical neighbors from 2010 to 2030 using RegCM regional model”, IASBS, Graduation date: 2015

44. Behzad Tahmasebzadeh, MSc, Thesis title: “Inflationary Cosmological Models in Scalar-Tensor Gravity “, IASBS, Graduation date: 2015

45. Zahra Ghafourizadeh, MSc, Thesis title: “The Effect of Dark Energy on Dynamics of Galaxy Clusters”, IASBS, Graduation date: 2015

46. Saeed Rajani, MSc, Thesis title: “Perturbed Metric and its Application in Cosmology”, IASBS, Graduation date: 2016

47. Mohammad Bagher Jahani Poshteh, PhD, Thesis title: “Black Holes in Horava-Lifshitz and Einsteinian Cubic Gravities: Thermodynamics, Phenomenology”, IASBS, Graduation date: 2018

**Advisor:**

48. Habib Gharar Khosroshahi, PhD, Thesis title: “The Photometric Plane of Galaxies”, IASBS, Graduation date: 2000

49. Iraj Gholami Ghadikolaei, MSc, Thesis title: “A New Technique to Study the Variability of the Sun and Data Analysis”, IASBS, Graduation date: 2001

50. Mahyar Madadi, PhD, Thesis title: “Lattise Boltzmann Simulation of Fluid Flow and Dispersion in Fracture Networks With Self-Affine Surface”, IASBS, Graduation date: 2002

51. Mohammad Taghi Mirtorabi, PhD, Thesis title: “Near Infrared Tio Band and Visual Photometry of Pulsating Giant and Chromospherically Active Stars”, Zanjan University, Graduation date: 2002

52. Sharareh Tavaddod, MSc, Thesis title: “Correction of Tip-Tilt Aberration with Adaptive Optics”, IASBS, Graduation date: 2003

53. Ebrahim Karimi, MSc, Thesis title: “A Study on Laser Cooling and Trapping of Neutral Atoms”, IASBS, Graduation date: 2003

54. Rozita Mohebbi, MSc, Thesis title: “Velocity Curve Analysis of the Spectroscopic Bjnary Stars”, IASBS, Graduation date: 2006

55. Narges Fathalian, MSc, Thesis title: “Investigation of Galactic Disks Rotation Curve in Modified Gravity”, IASBS, Graduation date: 2006

56. Hossein Teimoorinia, PhD, Thesis title: “Physical Properties of Distant Galaxies from Spectro-Photometric Analysis of Multi-Wavelength, Multi-Observatory Deep Surveys”, IASBS, Graduation date: 2010

57. Fateme Amirkhanlou, MSc, Thesis title: “Segmentation of Solar Coronal Image; Application of Neural Networks”, IASBS, Graduation date: 2010

58. Mostafa Rajabi Ebgha, MSc, Thesis title: “Measurement of Tree Growth Using Moire Technique”, IASBS, Graduation date: 2012

## *II d Other Teaching Duties*

- Teacher, High school, Tabriz, Iran, 1953-1956
- Teacher, Cartographic Organization of Iran, Tehran, 1956-1958
- Teaching various physics courses, Shiraz University, 1964 - 1988
- Teaching Physics courses (such as Quantum Mechanics, Gravity, Electrodynamics, Classical Mechanics, General Relativity, Structure and Evolution of Galaxies, Climate Change and Global Warming, Special Relativity, Symmetry and Principles of Conservation and Continuity Equations, statistical mechanics, Thermodynamics), IASBS, Zanjan, 1991 to present

## *II e Work with Postdocs*

1. “Calculate the torque applied to spherical particles, Double break in optical tweezers”, Researcher: Ibrahim Madadi, Supervisor: Prof. Yousef Sabouti, Start Date: 2013/08/23, Date of Completion: 2013/11/21, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

2. “Modeling and Assessment Time Series Climate Data in National and Regional Level Using Neural Network and Comparing with IPCC Projections”, Researcher: Fereshteh Jadari, Supervisor: Prof. Yousef Sabouti, Start Date: 2014/08/23, Date of Completion: September 2015, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

3. “Development and application of new Chemometric methods for the Assessment of effects of global change on natural systems from environmental monitoring and climate change data”, Researcher: Mahsa Dadashi, Supervisor: Prof. Yousef Sabouti, Start Date: 2014/05/22, Date of Completion: May 2015, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

4. “Study of noncommutativity on the scalar field models and its role in accelerated expansion of the Universe”, Researcher: Heidar Sheikh Ahmadi, Supervisor: Prof. Yousef Sabouti, Start Date: 2015/09/23, Date of Completion: July 2017, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

5. “Investigation of the synchronic effect of synaptic delay and oscillation frequency heterogeneity on neuronal symmetry”, Researcher: Ehsan Bolhasani, Supervisor: Prof. Yousef Sabouti and Dr. Alireza Valizadeh, Start Date: 2015/09/23, Date of Completion: October 2016, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

6. “Criticality hypothesis and its relation to memory in the brain”, Researcher: Amin Mousavi, Supervisor: Prof. Yousef Sabouti and Dr. Alireza Valizadeh, Start Date: 2015/09/23, Date of Completion:

May 2017, Admission of postdoctoral researcher Allameh Tabatabai Award of the National Elite Foundation.

7. "Investigation of Doppler effect and linear profiles with one-dimensional hydrodynamic model of rings (P-H) in Transition area (Moss area)", Researcher: Edris Tajfiroozeh, Supervisor: Prof. Yousef Sabouti, Start Date: February 2017, Date of Completion: February 2019, Admission of postdoctoral researcher of Iran National Science Foundation.

8. "Investigation of Doppler effect and linear profiles with one-dimensional hydrodynamic model of rings (P-H) in Transition area (Moss area)", Researcher: Hamed Ghasemi, Supervisor: Prof. Yousef Sabouti, Start Date: June 2017, (In progress), Admission of postdoctoral researcher of the National Elite Foundation.

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

## *III a. Within ICRANet*

1. Sientifice Commitee Member of ICRANet-ISFAHAN Astronomy Meeting, November 2021

2. The Second ICRA Network Workshop, The Chaotic Universe, Pescara, Rome, Italy, February 1999

3. Adjunct Professor, International Center for Relativistic Astrophysics Network (ICRANet), Pescara, Italy, 2015

## *III b. Outside ICRANet*

1. IAU 13$^{th}$ General assembly, Prague, 1967

2. IAU Sym. on planetary nebulae, Czechoslovakia, August 1967

3. IAU 14$^{th}$ General Assembly, Brighton, 1972

4. Black hole astrophysics, Les Houches, August 1972

5. Summer Session on Theory Astrophysics, Trieste, August 1973

6. AAS 141$^{st}$ Meeting, Tuscan, December 1973

7. AAS 143$^{rd}$ Meeting, Rochester, August 1974

8. International School of Physics (E. Fermi), Isolated gravitating systems in General Relativity, Varenna, July 1976

9. IAU Colloquium 38, Stellar Convection, Nice, France, August 1976

10. AAS 150th Meeting, Atlanta, June 1977

11. IAU Symposium 76, Planetary Nebulae, Cornell, June 1977

12. Conference on current problems in stellar pulsation instabilities, Baltimore, June 1978

13. IAU 17th General Assembly, Montreal, August 1979

14. Third Marcel Grossmann Meeting, Shanghai, 1981 (and member of International Advisory Committee)

15. AAS 164th Meeting, Tucson, January 1985

16. IAU Symposium 123, Helio- and astro-seismology, Aarhus, Denmark, July 1986

17. IAU Symposium 126, Globular systems in galaxies, Harvard, Cambrige, August 1986

18. Guest scientist, International Center for Theoretical Physics, Trieste, Summer 1986

19. Aspen Center for Physics, Workshop on Galaxies, June 1987

20. Second Regional Conference on Mathematical Physics, Adana, Turkey, 1987

21. Visiting Fellow, International Center for Theoretical Physics, Trieste, Summer 1988

22. IAU 20th General Assembly, Johns Hopkins University, August 1988

23. Visiting fellow, International Center for Theoretical Physics, Trieste, Summer 1989

24. Fourth Regional Conference on Mathematical Physics, Tehran, Iran 1990

25. Colloquium 132, International Astronomical Union, Problems of stability and instability in stellar system, Delhi October 1990

26. Wigner symposium, Gosslar, Germany, July 1991

27. Third World Academy of Science, General Assembly, Kuwait, October 1992

28. 6th Asian Pacific Regional Meeting of the IAU, Pune, India, August 1993

29. Frontiers in Theoretical Physics, Edirne, Turkey, December 1993

30. IAU 22nd General Assembly, The Hague, August 1994

31. VII International Conference on Symmetry Methods in Physics, Dubna, Russia, 1995

32. Third World Academy of Science, 5th General Assembly, Abuja, Nigeria, Septamber 1995

33. The 7th Asian-Pacific Regional of IAU Meeting, Pusan, Korea, August 1996

34. Inter University Centre for Astronomy & Astrophysics (IUCAA), Pune, India, August 1997

35. 23rd General Assembly Meeting, IAU, Kyoto, Japan, August 1997

36. 6th General Assembly of The Third World Academy of Sciences (TWAS) and the Third Network of Scientific Organizations (TWNSO), Rio does Janerio, Brazil, September 1997

37. The Third World Academy of Sciences (TWAS), Trieste, Italy, November 1997

38. 10th General Meeting, The Third World Academy of Sciences (TWAS), Trieste, Italy, December 1998

39. 7th General Assembly, The Third World Academy of Sciences (TWAS), Dakar, Senegal, November 1999

40. International Colloquium on Group Theoretical Methods in Physics, Dubna, Russia, August 2000

41. Stellar Dynamics from Classic to Modern, San Petersburg, Russia, August 2000

42. 12th General Meeting, Third World Academy of Sciences, Tehran, October 2000

43. Canadian Astronomical Society, Annual Meeting, McMaster University, Hamilton, May 2001

44. 8th General Assembly The Third World Academy of Sciences (TWAS), New Delhi, India, October 2001

45. Potsdam University, Invited lecturer, Potsdam, Germany, March 2002

46. IAU 8th Asian-Pacific Regional Meeting, Tokyo, Japan, July 2002

47. 25th General Assembly Meeting, IAU, Sydney, Australia, July 2003

48. 9th General Assembly The Third World Academy of Sciences (TWAS), Beijing, China, October 2003

49. 15th General Meeting, Third World Academy of Sciences, Trieste, Italy, October 2004

50. National Academy of Science of Armenia and Byurakan Astrophysical Observatory, Invited Lecturer, Yerevan, Armenia, March 2004

51. IAU 9th Asian-Pacific Regional Meeting, Bali, Indonesia, July 2005

52. 16th General Meeting, Third World Academy of Sciences, Alexandria, Egypt, December 2005

53. Inter-Academy Workshop on Science & Technology and the Future Development of Societies, Invited lecturer and head of the Iranian Delegation, Nice, France, June 2006

54. 11th Marcel Grossmann Meeting, Berlin, Germany, July 2006

## IV. Other

### HONORS

- Recipient of Medallion for Excellence in Research, Government of Iran, 1978
- Fellow of The Third World Academy of Sciences, elected 1987
- Fellow of The Academy of Sciences of Iran, elected 1990
- Award of the Book of the Year of the Islamic Republic of Iran, 1995
- TWAS 2000 Medal Lecturer in Physical Sciences, Tehran, October 2000
- Khwarazmi Award, 2001
- The Lasting Face in Science, Tehran, October 2001
- SOBOUTI-NAMEH, A Tribute to Professor Sobouti on his Seventieth Birthday, Physical Society of Iran, ISBN 964-6648-10-X, 2002
- Iranian Physics Association celebration, Called the annual physics conference in 2002 as Sobouti's conference, 2002
- Afzalipour Award, for Outstanding Research in Physics, 2005
- Islamic Development Bank, Prize in Science and Technology for Institute for Advanced Studies in Basic Sciences – Zanjan under the directorship of Prof Yousef Sobouti, 2006
- Chair of Research in Physics, Fund for Research Support in Iran, 2007
- Exemplary Professor, "Ministry of Science, Research and Technology", 2008
- TWAS Regional Office Prize for Scientific Institution Building in Central and south Asian Region, Bangalore, 2012
- Allamah Tabtabaee Prize, as Distinguished Scientist, Tehran, 2013
- Selected scientist of the Academy of Sciences, and proposed to the President to receive the 1st degree scientific award, 2013
- Letter of the Academy of Sciences, Iran. Journal of the Academy of Sciences of the Islamic Republic of Iran. No. 3, (Summer 2018). Academy of Sciences Publications.
- Zamini-e-Asemani, Anthology of Articles in Honor of the Prestigious Scholar PROFESSOR YOUSEF SOBOUTI, The Academy of Sciences, Islamic Republic of Iran, 2019.

- The first-place winner of the Zanjan Province Book of the Year Award in the Pure Sciences, for the book “Special and General Relativity”, 2019.
- The laureate of the first National Aburihan Award in the field of Aerospace Engineering and Astronomy, 2019.
- First Rank Special Award, and honoured for “Lasting Role in the Development of Education and Research”, 34th Khwarizmi International Award, 2021
- Medal of excellence of the Iranian National Commission for UNESCO, (“In the Shade of the Sun” medal), 2021
- 1st Prof. Gharib’s Award on Basic Sciences, Iranian Association for Ethics in Science and Technology, 2022
- The 650th Bukhara Night: Yousef Sobouti Night, 05/01/2023; Unveiling the book of “Basic Sciences of Zanjan: Story of the Foundation of the Institute for Advanced Studies in Basic Sciences”, narrated by Y. Sobouti, Founder; Mandana Farhadian, Editor; Nashr e Ney, Publisher, 2023
- The 60th Anniversary of the Establishment of the Physics Department of Shiraz University and commemoration of Professor Yousef Sobouti, Shiraz University, Shiraz, 6 June 2023

**Non science publications**

- Trends in Basic Sciences in Contemporary Iran: Growth and Structure of Mainstream Basic Sciences", (with Sh. Etemad)In Science and Technology and the Future Development of Societies, Editor: Glenn Schweitzer, National Research Council of the National Academies, the National Academies Press, Washington, D. C., 24-30, 2008.
- The Morality of Exact Sciences, In Science and Technology and the Future Development of Societies, Editor: Glenn Schweitzer, National Research Council of the National Academies, the National Academies Press, Washington, D. C., 10-13, 2008.
- Understanding others the science way, Proceedings of the Workshop on " Science the Gateway to Understanding, Tehran, October 2008", Editors: Glenn Schwitzer and Yousef Sobouti, The National Academies Press, Washington, D.C., 2008.
- Review of Cosmic Anger: Abdus Salam — the First Muslim Nobel Scientist, the Mathematical Association of America, Online, 2008.

**Lectures** (2019-2023):

- ❖ «سخن ثبوتی در مرجعیت علمی»، نشست دوازدهم: مرجعیت علمی در حوزه علوم پایه و بنیادی، مرکز تحقیقات سیاست علمی کشور، هفدهم آبان ماه ۱۴۰۲
- ❖ A lecture on climate change education in Iran, the second international seminar on climate change education, Organized by the Office for Climate Education and the French Ministry of Education, Paris, France, 12-15 September 2023

- Three Arguable Concepts: point particle singularity, asymmetric action of EM on quantum wave functions, and the Left out restricted Lorentz gauge from U(1)

  - دانشکده فیزیک دانشگاه تبریز، ۱۹ شهریور ۱۴۰۲
  - کنفرانس فیزیک ایران ۱۴۰۲، ۶ تا ۹ شهریور ۱۴۰۲، دانشگاه اصفهان
  - دانشگاه زنجان
  - ECOSF and UISMS jointly hosted a Lecture on Popularising Mathematics and Science, Lecture Series on Popularising Mathematics and Science, July 25, 2023
  - 28th Special School on Topics in Physics, IASBS, July 8-13, 2023
  - بیست و هشتمین مدرسه آموزش ویژه فیزیک، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۲۲-۱۷ تیر ماه ۱۴۰۲
  - Institute for Research in Fundamental Sciences (IPM), SoA seminars, Tehran, July 5, 2023
  - 5th Zeldovich Seminar, Yerevan, June 12-17, 2023
  - 4th international conference on pure sciences (ICPS), Mustansiriyah university, Baghdad, April 17, 2023
  - Shahid Beheshti University, February 25, 2023
  - 16th National Conference on Astronomy and Astrophysics of Iran, Yazd University, February 15-16, 2023
  - 9th International Conference on Materials Science and Nanotechnology for Next Generation, Gazi University, Ankara, Turkey, September 22-24, 2022
  - Shiraz University, April 12, 2022
  - دانشگاه زنجان، ۱۳ تیر ۱۴۰۱
  - بیست و چهارمین گردهمایی پژوهشی نجوم ایران، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۲۵ خرداد ۱۴۰۱
  - سمینار عمومی فیزیک، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، آذر ۱۴۰۰
  - سمینار عمومی فیزیک، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، خرداد ۱۴۰۰

- Understanding Others the Science Way, Lecture Series on Popularising Mathematics and Science, ECOSF and UISMS, July 25, 2023

- زمین در زیر بار جمعیت و مصرف
  - هفتمین دوره مدرسه علوم زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱۱ اردیبهشت ۱۴۰۲
  - گردهمایی موزه‌های علوم و دانشگاهی و تغییرات اقلیمی، موزه ملی علوم و فناوری ایران، ۱۵ اسفند ماه سال ۱۴۰۱
- زمین در زیر بار جمعیت و مصرف، هشتمین همایش منطقه‌ای تغییر اقلیم و گرمایش زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۲۷ و ۲۸ اردیبهشت ۱۴۰۲
- تفاهم با دیگران
  - همایش سیاست‌ها و راهبردهای توسعه در نیروهای مسلح، دانشگاه افسری امام علی (ع)، ۵ شهریور ۱۴۰۲
  - شب موزه ملی علوم و فناوری ایران، موزه ملی علوم و فناوری با همکاری ایکوم ایران و فرهنگستان علوم پزشکی، ۵ شهریور ۱۴۰۲
  - سومین مدرسه آموزش شیمی، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱ شهریور ۱۴۰۲
  - نشست اخلاق و آموزش، سلسله نشست‌های اخلاق در علوم و فناوری، انجمن ایرانی اخلاق در علوم و فناوری، ۹ خرداد ۱۴۰۱
- تغییر اقلیم و تاثیر ان بر منابع آب، اداره کل آموزش و پرورش شهر تهران، گروه درسی جغرافیا، ۲۲ دی ۱۴۰۱

- سیر علم و علم پژوهی در دنیا، دانشگاه علوم پزشکی زنجان، ۱ مهر ۱۴۰۱
- گذر از طبیعیات ارسطوئی به فیزیک امروز، بیست و هفتمین مدرسه فیزیک، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۲۱ تیر ۱۴۰۱
- گنجینه صوتی فرهنگستان علوم (پادکست)، دکتر یوسف ثبوتی، بهار و تابستان ۱۴۰۱
- گرمایش زمین و محیط زیست، ششمین مدرسه علوم زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱۶ خرداد ۱۴۰۱
- نشست اخلاق و آموزش (با حضور پرفسور ثبوتی)، انجمن ایرانی اخلاق در علوم و فناوری، ۹ خرداد ۱۴۰۱
- سخن ثبوتی به مناسبت سال جهانی علوم پایه برای توسعه پایدار ۲۰۲۲
  - سومین سمینار علوم ریاضی و چالش‌ها، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱۱ آبان ۱۴۰۱
  - دانشگاه زنجان، ۲ شهریور ۱۴۰۱
  - دانشگاه شهید بهشتی، ۱۷ اسفند ۱۴۰۰

- نکاتی در باره آب و آمایش سرزمین - فرازهایی ازاندیشه‌های گذشتگان، هفتمین همایش منطقه‌ای تغییر اقلیم و گرمایش زمین، پژوهشکده تغییر
  اقلیم و گرمایش زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان ، ۱۲ اسفند ۱۴۰۰
- زمین چرا گرم می‌شود
  - روز دانشجو، دانشکده علوم زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱۶ آذر ۱۴۰۰
  - وبینار شاخه زمین‌شناسی فرهنگستان علوم جمهوری اسلامی ایران، ۹ آذر ۱۴۰۰
  - سمینار عمومی، دانشکده فیزیک، دانشگاه شهید بهشتی، ۲۹ آبان ۱۴۰۰

- سخن ثبوتی برای مرکز آموزش نجوم ادیب، ۲ یادمان پروفسور احمد کیاست‌پور ، ۵ آذر ۱۴۰۰
- سخن ثبوتی در مراسم نکوداشت یونسکو، دانشگاه هنر، تهران، ۱۶ آبان۱۴۰۰
- Astronomy in Iran, an update, 2021
  - شانزدهمین همایش ملی نجوم و اخترفیزیک ایران، دانشگاه یزد، ۲۶-۲۷ بهمن ۱۴۰۱
  - کنفرانس ایکرانت-اصفهان، ۱۲ آبان ۱۴۰۰

- ابوریحان بیرونی
  - مرکز دایره‌المعارف بزرگ اسلامی (مرکز پژوهش‌های ایرانی و اسلامی)، ۱ آذر ۱۴۰۰
  - روز گرامیداشت ابوریحان بیرونی، تجلیل از پژوهشگران برجسته علوم پایه، فرهنگستان علوم جمهوری اسلامی ایران، ۲۷ آبان ۱۴۰۰

- نانوشته‌های دانش‌های تجربی، بیست و ششمین مدرسه فیزیک، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۲۳ تیر ۱۴۰۰
- گفتگو با دکتر یوسف ثبوتی پیرامون مقام والای معلم، شبکه شاد (آموزش و پرورش استان زنجان)، ۲۱ اردیبهشت ۱۴۰۰
- بار فرهنگی دانش‌ها و فناوری‌های نوین، بزرگداشت روز ملی آزمایشگاه و زادروز حکیم اسماعیل جرجانی، دانشگاه شیراز، ۲۹ فروردین ۱۴۰۰
- تعهدات جمهوری اسلامی ایران در قبالِ کنوانسیون چارچوب سازمان ملل برای تغییر اقلیم ۱ – نشست پاریس ۲۰۱۵، همایش منطقه‌ای تغییر اقلیم و گرمایش زمین، دانشگاه تحصیلات تکمیلی علوم پایه زنجان، ۱۴ اسفند ۱۳۹۹
- مطالعات آموزش عالی در ایران: تجربه زیسته دانش‌پژوهان (پرفسور یوسف ثبوتی)، هفتمین نشست از مجموعه نشست‌های الکترونیکی، ۱۹ اسفند ماه ۱۳۹۹
- سخن ثبوتی در بزرگداشت دکتر مصطفی معین، به میزبانی کتابخانه ملی و با مشارکت مؤسسه رحمان، انجمن ایرانی اخلاقی در علم و فناوری، انجمن ایرانی مطالعات فرهنگی و ارتباطات و انجمن آسم و آلرژی، ۲۸ بهمن ۱۳۹۹
- رد پای انسان صنعتی در ماجرای گرم شدن زمین، فرهنگستان علوم جمهوری اسلامی ایران، ۱۰ آذر ۱۳۹۹
- بررسی آینده دانشگاه‌ها در برنامه هفتم توسعه، پنل بیست و نهم میز آینده‌پژوهی آموزش عالی، مرداد ۱۳۹۹
- تجربه دانشگاه تحصیلات تکمیلی علوم پایه زنجان در تعامل با جامعه، مرکز تحقیقات سیاست علمی کشور، ۲۴ خرداد ۱۳۹۹
- سخنی از گذشته های آموزش عالی ایران، راه‌بردهای توسعه با محوریت آموزش عالی، هفتمین همایش پیشرفت و توسعه علمی کشور، دانشگاه خاتم، ۸ بهمن ۱۳۹۸
- Lorentz Covariance almost implies electromagnetism and more, University of Salahaddin, College of science, Department of Physics, (2017).

## 2022-2023 List of Publication

1. Sobouti, Y., “Three arguables: point particle singularity, asymmetry in EM and quantum waves, and the left out restricted Lorentz gauge from U(1), revised and abridged”, *Astron. Rep.* (2023).

2. Sobouti, Y., “Three arguable concepts: point particle singularity, asymmetric action of EM on quantum wave functions, and the left out restricted Lorentz gauge from U (1)”, Quantum Studies: Mathematics and Foundations, pp. 1-14, DOI: 10.1007/s40509-022-00290-0, (2023).

3. Basic Sciences of Zanjan: the story of the foundation of the Institute for Advanced Studies in Basic Sciences, narrated by Y. Sobouti, the founder [by Mandana Farhadian], (2022), Nashre Ney publication, Tehran, Iran.

4. Sobouti, Y., “Astronomy in Iran (an update, 2021)”, in Euro-Asian Astronomical Society, - (dir.), *Astronomical and Astrophysical Transactions, Vol. 33, No. 3.*, Cambridge Scientific Publishers, Coll. «Astronomical and Astrophysical Transactions», France, ISBN : 9781908106803, pp. 187-190, doi : https://doi.org/10.17184/eac.7521, (2022).

5. Ruffini, R. and Sobouti, Y., “A friendly exchange between Professor Remo Ruffini and Professor Yousef Sobouti during the editorial preparation of the Proceedings publication”, in Euro-Asian Astronomical Society, - (dir.), *Astronomical and Astrophysical Transactions, Vol. 33, No. 3.*, Cambridge Scientific Publishers, Coll. «Astronomical and Astrophysical Transactions», France, ISBN: 9781908106803, pp. 185-186, doi: https://doi.org/10.17184/eac.7520, (2022).

**Surname Name:** **Giorgio SONNINO**

**Photo**

## Position:

- *Professor* at the *Center for Advanced Study for Defense* (CASD) – *Department of Complex Systems*;
- *Scientific Advisor* at the European Commission; Task: "*Sinergy between Scientific Research and Higher Education*" at the European Union;
- *Senior Scientist* at the Université Libre de Bruxelles (U.L.B.) - Belgium, Department of Physics;
- *SeniorScientist* at the International SOLVAY Institutes for Physics and Chemistry, Brussels (Belgium).
- *Associate Professor* at the ICRANet (International Center for Relativistic Astrophysics Network).

**Period covered:** 1993 -

**I Scientific Works**

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

- International Workshop on Instabilities and Nonequilibrium Structures (INES): Enrique TIRAPEGUI

*II e. Work With Postdocs*

- Dr. Fernando MORA (Universidad de Chile).
-

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

*III b. Outside ICRANet*

Since 2023 Teachingat the Center for Advanced Study, Department of Complex Systems (CASD – Rome/Brussels) – HybridLectures on *Mathematics of Nonlinear Systems and ComplexPhenomena.*

**IV. Other (Awards)**

24 Nov. 2023 *Winner AMO Prize* (International Research Awards on *Atomic, Molecular and Optical Physics*Prize) under the category of "*Outstanding Scientist Award*". Entry Id: 2906.

27 July 2022 *Selectedas the outstandingreviewer of the journal* by the EditorialMembers of the Scientific Research Publishing (with Certificate and financialgrant).

6 April 2023 *Winner* "*Fluids 2022 OutstandingReviewer Award*" by MDPI-SectionManaging Editor (with Certificate and financialgrant).

1 March 2022 *Winner* "*Mathematics 2021 OutstandingReviewer Award*" by MDPI-SectionManaging Editor (with Certificate and financialgrant).

2018-2023 *98 Certificates* of "*Excellence in Reviewing*" awarded by 30 Peer-Reviewed Asian Scientific Journals.

**2021-2023List of Publications**

### Works on Thermodynamics of IrreversibleProcesses

[1] G. Sonnino, *Uncertainty Relations in Thermodynamics of IrreversibleProcesses on a Mesoscopic Scale*, Submitted topublication in Phys. Rev. E (June 2023).

[2] G. Sonnino, "*ThermodynamicFlux-Force Closure Relations for Systems out of the OnsagerRegion*", (2022)Springer Nature, Book entitled: *Nonequilibrium Thermodynamics and Fluctuation Kinetics*.

[3] G. Sonnino, P. Peeters, P. Nardone, and E. Tirapegui, *Tokamak-plasmas in Turbulent Regime: A ThermodynamicApproach*, Chaos, Solitons&Fractals, **165**, Part 1, 112796 (2022).

### Works on Black Holes

[4] R. uffini and G. Sonnino, *The Kerr-Newman Black Hole as a Classical System* (September 2023).

[5] R. Ruffini and G. Sonnino, *Extractible Energy from a Kerr-Newman Black Hole* (September 2023).

[6] R. Ruffini and G. Sonnino, *Some Properties of the Irreducible Mass in the Second Law of the Schwarzschild Black Hole Thermodynamics* (September 2023).

R. Ruffini and G. Sonnino, *Some Properties of the Extremal Black Holes in the Kerr-Newman Geometry*(October 2023).

[7] G. Sonnino and P. Nardone, *The ThermodynamicLaws of the Kerr-Newman Black Holes*, to be submitted to Phys. Rev. Lett. (December 2023).

[8] G. Sonnino and P. Nardone, *On the ReconciliationbetweenPrigogine'sLaws of Thermodynamics and Hawking'sRadiationProcess*, to be submitted to Phys. Rev. D. (December 2023).

### Works on Modeling of Population

[9] G. Sonnino, F. Mora., and P. Nardone, *A StochasticKineticType Reactions Model for COVID-19,* Journal of Mathematical Biology, **9**, 1221, 2021.

DOI reference: https://doi.org/10.3390/math9111221.

[10] G. Sonnino, P. Peeters, and Nardone P., "*Modelling the spreading of the SARS-CoV-2 in presence of the lockdown and quarantine measures by a kinetic-type reactions approach*", Mathematical Medicine and Biology: A Journal of the IMA, *Oxford University Press* (2021), DO 10.1093/imammb/dqab017, OP dqab017, SN 1477-8602

https://academic.oup.com/imammb/advance-article/doi/10.1093/imammb/dqab017/6454152

[11] G. Sonnino, "*A Simple Mathematical Model for Criminal Immigration*", submitted to the journal *International Migration Review* (2021).

[12] F. Mora, P. A. Henrıquez, and G. Sonnino, "*Early Warning Signals Occurring in Twitter Data before First Catastrophic-like events*", submitted to publication to the review CHAOS (2023).

[13] G. Sonnino, P. Peeters, and P. Nardone, "*Modeling the Spread of SARS-CoV2 and itsvariants. Comparison with Real Data. Relations thathave to be Satisfied to Achieve the Total Regression of the SARS-CoV2 Infection*", European Society of Medicine (ESMED), Archives, **10**, Issue 7 (2022) - ResearchArticles. DOI: https://doi.org/10.18103/mra.v10i7.2969

### Works on Classical Cyber-Security

[14] G. Sonnino and A. Sonnino "*Efficient Multiparty Protocols Using Generalized Parseval's Identity and the Theta Algebra*, IEEE-MMCTSE, - Mathematics and Computers in Sciences and Industry by CPS of IEEE(2022).

## Brochures for the European Commission

[15] G. Sonnino, *"Some Suggestions on Indicators and Statistical Analysis for Evaluation and Monitoring of the Community Programs. (With particular reference to the ERASMUS + program)*". European Commission - **ARES(2022)6717193**.
Available online: https://europa.eu/european-union/contact/write-to-us_en(September 2022).
[16] G. Sonnino, *"An Introduction to Information Technology at the European Commission and European Parliament*". European Commission - **ARES(2022)725907**.
Available online: https://europa.eu/european-union/contact/write-to-us_en(October 2022).
[17] G. Sonnino, and S. Sumathi, *"Artificial Intelligence and Learning Analytics with Applications to Higher Education*". European Commission - **ARES(2023)3504090**.
Available online: https://europa.eu/european-union/contact/write-to-us_en(May 2023).
[18] G. Sonnino, *"Green Skills for Education*". European Commission - **ARES(2023)4362888**.
Available online: https://europa.eu/european-union/contact/write-to-us_en(June 2023).
[19] G. Sonnino, *"Higher Education as I See It*". European Commission – **ARES(2023)6999454**
Availableonline :https://europa.eu/european-union/contact/write-to-us_en (October 2023).
[20] G. Sonnino, *"Mathematical Modeling as a Tool for Policy Decision – Application to the Spread of the SARS-CoV2Infection*". European Commission – **ARES(2023)8875824**
Availableonline::https://europa.eu/european-union/contact/write-to-us_en(December 2023).

## Sergio Torres

Position: Adjunct Professor
Period covered: January – December, 2023

**I Scientific Work**

Analysis of Type IaSupernovae (SN) data (Pantheon+ compilation) aimed at detecting and characterizing potential space and red-shift anisotropies that can explain the Hubble tension problem (discrepancy between the Hubble constant values measured using SN redshift/luminosity data and derived from Cosmic Microwave Background surveys).

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

Sebastián Rueda-Blanco, Camilo Delgado-Correal, Mario-A. Higuera-G., **Sergio Torres-Arzayus**, "Exploring Late-Time PhysicstoExplainthe Hubble Tension", ***XVII Latin American Regional IAU Meeting***, Montevideo, Uruguay, Nov 27th - Dec 1st, 2023, and *Revista Mexicana de Astronomía y Astrofísica Conference Series*.

*II b Work With Students*

Research collaboration with the Astronomy/Astrophysics group at the Andes University (Bogotá, Colombia)

Research collaboration with the Astronomy/Astrophysics group at the National University (Bogotá, Colombia)

*II c Diploma thesis supervision*

Currently co-directing research work by a PhD candidate at the National University (Bogotá, Colombia):

Sebastián Rueda-Blanco, "Evaluation of a Dynamic Dark Energy model to study the Hubble rate problem"

Thesissupervision, Universidad de los Andes:

Rafael Felipe Torres-Gaviria, "Top of the Cosmic Ladder: on high redshift extragalactic distances and the evolution of the Hubble parameter"

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

Residence at ICRANet, Pescara, during the month of April 2023 to conduct research related to Type Ia Supernovae in the context of the Hubble Tension.

*III b. Outside ICRANet*

Astrophysicsseminar, Universidad Nacional (Colombia)

**IV. Other**

**2023List of Publications**

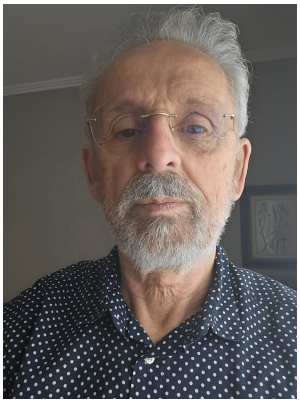

1) Sergio Torres-Arzayus, "Dark Energy Constraints from Pantheon+ Ia Supernovae Data", *Astrophysics and Space Science* (submitted), 2023, arXiv: 2311.04759

2) Sergio Torres-Arzayus1, Camilo Delgado-Correal, Mario-A. Higuera-G., Sebastián Rueda-Blanco, "Evaluating a Sigmoid Dark Energy Model to Explain the Hubble Tension", *Astrophysics and Space Science* (submitted), 2023, arXiv: 2311.05510

3) Sebastián Rueda-Blanco, Mario-A. Higuera-G., Camilo Delgado-Correal, Sergio Torres-Arzayus, "Evaluationof a Dynamic Dark Energy modeltostudythe Hubble rateproblem", *eSPECTRA*, **Vol. 1**, No. 1, 2023

4) Sebastián Rueda-Blanco, Camilo Delgado-Correal, Mario-A. Higuera-G., Sergio Torres-Arzayus, "Exploring Late-Time Physics to Explain the Hubble Tension", XVII Latin American Regional IAU Meeting, Montevideo, Uruguay, Nov 27th - Dec 1st, 2023, and *Revista Mexicana de Astronomía y Astrofísica Conference Series*, (in process)

# ZEN VASCONCELLOS, CÉSAR AUGUSTO



Position: Full Professor, UFRS, Brazil
Adjoint Professor, ICRANET
Period covered: JANUARY, 01 - DECEMBER, 31 2023

**I Scientific Work**

1. Research on the Branch-Cut Quantum Gravity
2. Research on Compact Stars, Neutron Stars
3. Quantum Field Theory and High Energy Physics

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

- *Organization of the MAGIC23, Workshop on Matter, Astrophysics, Gravitation, Ions and Cosmology, held on Marche -06-10, 2023, Praia do Rosa, Santa Catarina Brazil https://indico.cern.ch/event/1153372/*

*II b Work With Students*

1. *Conclusion of Geovane Naysinger's Master's degree supervision*
2. *Conclusion of Marcelo Netz-Marzola's Master's degree supervision*
3. *Conclusion of Benno Bodmann's Doctoral's degree supervision*

*II c Diploma thesis supervision*

1. ***Geovane Naysinger**'s Master's degree supervision, title of the work: **Estudo de Efeitos do Espaço - Tempo Não Comutativo na Teoria Quântica de Campos***
2. ***Marcelo Netz-Marzola**'s Master's degree supervision, title of the work: **Minimal Length Scale Models for Compact Stars***
3. ***Benno Bodmann**'s Doctoral's degree supervision, title of the work: **Implications of the Branch-Cut Gravitation***

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

*All activities outside ICRANet, except the organization of the MAGIC23 Workshop, because Prof. Remo Ruffini is one of the main organizers and member of the Editorial Board of the MAGIC23 Special Issues.*

**IV. Other**

**2023 List of Publication**

1) Wheeler-DeWitt Non-Commutative, Quantum Approach to the Branch-Cut Gravity, Benno Bodmann, Dimiter Hadjimichef, Peter Otto Hess, José de Freitas Pacheco, Fridolin Weber, César A. Zen Vasconcellos, Universe **9** (2023), 428.

2) Wheeler-DeWitt Quantum Approach to the Branch-Cut Gravitation with Ordering Parameters, Benno Bodmann, Dimiter Hadjimichef, Peter Otto Hess, José de Freitas Pacheco, Fridolin Weber, César A. Zen Vasconcellos, Universe **6** (2023), 278.

3) A Seesaw-Like Mechanism for the Neutrino in the Presence of a Minimal Length Space-Time, Thiago Oliveira Ferreira, César A. Zen Vasconcellos, Dimiter Hadjimichef, Astronomische Nachrichten **344** (2023), e220127.

4) The Branch-Cut Cosmology: evidences and open questions, César A. Zen Vasconcellos, Peter O. Hess, José de Freitas Pacheco, Dimiter Hadjimichef, Benno Bodmann, Astronomische Nachrichten **344** (2023), e220079.

5) The Branch-Cut Cosmology: a topological canonical quantum-mechanical approach, Peter O. Hess, César A. Zen Vasconcellos, José de Freitas Pacheco, Dimiter Hadjimichef, Benno Bodmann, Astronomische Nachrichten **344** (2023), e220101..

6) Causality and the Arrow of Time in the Branch-Cut Cosmology, Benno Bodmann, César A. Zen Vasconcellos, José de Freitas Pacheco, Peter O. Hess, Dimiter Hadjimichef, Astronomische Nachrichten **344** (1-2) (2023), e220086..

7) Branch-Cut Cosmology and the Bekenstein Criterion, José de Freitas Pacheco, César A. Zen Vasconcellos, Peter O. Hess, Dimiter Hadjimichef, Benno Bodmann, Astronomische Nachrichten **344** (2023), e220070.

8) Internal Heating Mechanism in Neutron Stars, Fábio Köpp, Jorge E. Horvath, Dimiter Hadjimichef, César A. Zen Vasconcellos, Internal Journal of Modern Physics D **32** (2023), 2350046.

**BOOKS:**

1) New Phenomena and New States of Matter in the Universe: From Quarks to Cosmos, César Augusto Zen Vasconcellos, Peter Otto Hess, Thomas Boller (Editors), World Scientific Co, ISBN: 978-981-12-2090-6, Singapore (2023).
2) Astrophysics in the XXI Century with Compact Stars, César Augusto Zen Vasconcellos, and Fridolin Weber (Editors), World Scientific Co, ISBN-10 : 981122093X, Singapore (2023).

# Lecturers

# Research Scientists

# Visiting Scientists

**Surname Name:** **Sang Pyo Kim** **Photo** 

Position: Professor, Kunsan National University& APCTP (Associate Member)
Period covered: 2023.01.01–2023.12.31

## I Scientific Work

(i) Studied Hawking radiation as well as Schwinger effect in charged black holes and electromagnetic fields

(ii) Explored the QED vacuum polarization effect in supercritical magnetic fields and applied to astrophysics, such as magnetars

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*
*Organized
(a) CosPA 2023 hosted by Chinese University of Hong Kong on November 9 – November14, 2023 (AP CosPA President)

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

(i) 2023.6.12–2023.6.17: participation and talk at the fifth Zeldovich Meeting

(ii) 2020.6.17–2024.6.25: participation and talk at the eighteenth Italian-Korean Symposium

*III b. Outside ICRANet*

**IV. Other**

(iii) 2023.5.14–2023.5.21: lecture at the Asia Pacific School/Workshop on Gravitation and Cosmology

(iv) 2023.6.26–2023.6.17: visiting professor at Helmholtz Zentrum Dresden (HZDR)

(v) 2023.7.17–2023.8.21: visiting professor at ELI @Czech

**2021List of Publication**

(i) Zu-Cheng Chen, LangLiu and S. P. Kim, "Gravitational and electromagnetic radiation from binary black holes with electric and magnetic charges: hyperbolic orbits on a cone," [e-Print: 2210.15564 [gr-qc]] Commun. Theor. Phys. 75 (2023) 6, 065401

(ii) C. M. Kim and S. P. Kim, "Vacuum Birefringence in a Supercritical Magnetic Field and a Subcritical Electric Field" [e-Print: 2202.05477 [astro-ph-HE]] Eur. J. Phys. C 83 (2023) 2, 104

(iii) Chiang-Mei Chen, Sang Pyo Kim,"Dyon production from near-extremal Kerr-Newman-(anti)de Sitter black holes," [e-print:2111.14124 [hep-th]] Eur. Phys. J. C. 83 (2023) 3, 219

(iv) Chiang-Mei Chen, ToshimasaIshige, Sang Pyo Kim, Akitoshi Takayasu, Chun-Yu Wei, "Monodromy approach to pair production of charged black holes and electric fields,"[e-Print: 2210.14792 [hep-th]] Chin. J. Phys. 86 (2023) 255-268

(v) N. Ahmadiniaz, A. M. Fedotov, E. G. Gelfer, S. P. Kim and C. Schubert, "Generalized Gelfand-Dikii equation and solitonic electric fields for fermionic Schwinger pair production," [e-Print: 2205.15946 [hep-th]] Phys. Rev. D 108 (2023) 3, 036019

(vi) Chul-Min Kim, Sang Pyo Kim, "Schwinger Pair Production and Vacuum Birefringence around High Magnetized Neutron Stars," [e-Print: 2308.15830 [astro-ph.HE]] Astronomy Reports (in press)

(vii) Arpan Kar, Hyomin Kim, Sang Pyo Kim, Stefano Scopel, "WIMP constraints from black hole low-mass X-ray binaries," [e-Print: 2311.16539 [hep-ph]]

## Lecian Orchidea Maria Photo

Position: Visiting Professor.
Division of Algebra, Geometry and Didactics of Mathematics,
Kursk State University,
Kursk, The Russian Federation.
Period: January-February 2023

Position: Associate Professor.
Department of Civil and Industrial Engineering,

Department of Information Engineering,

Sapienza University of Rome, Rome Italy.

Period covered: March-December 2023

**I Scientific Work**

**Research in Theoretical Physics, Mathematics, Applied Mathematics.**

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

*Seminar:*

OML, Some features of the k-Minkowski space-times: coalgebra structures, University of Milan, Milan, Italy, 23 February 2023.

*Talks at Conferences:*

December 7, 2023, International Cosmology, Astronomy and Astrophysics Conference (ICAA-2023), OML, Geometrical qualities of the generalised Schwarzschild spacetimes, Virtual Meeting.

December 7, 2023, International Cosmology, Astronomy and Astrophysics Conference (ICAA-2023), OML, Some Grad-Shafranov solutions in General Relativity, Virtual Meeting.

November 16-17, 2023,4th International Conference on Biomaterials & Biodevices,
OML, Some properties of the Markov chains of the Markov Models of molecular processes, Rome, Italy.

July 22-23, 2023, Webinar on Applied Science, Engineering, and Technology WEBASET-2023, OML, A new lemma of the Optical Equivalence Principle: applications in opto-mechanical systems and new challenges, online event.

July 10-20, 2023, Workshop What Comes Beyond the Standard Models?, (Authors: M. Yu Khloopv, OML; Speaker: OML )Properties
of Fractons, Bled, Slovenia.

June 19-20, 2023, Global Summit and Expo on Materials Science and Engineering-GSEMSE2023, Force-free amgnetic field defined in a subset of the boundary (Authors: OML, B.B. Tirozzi, Speaker: B.B. Tirozzi), Paris, France.

June 19-20, 2023, Global Summit and Expo on Materials Science and Engineering-GSEMSE2023, OML, A New Lemma of the Optical Equivalence Theorem and Some New Applications, Paris, France.

June 19-20, 2023, 2nd Global Summit on Gravitation, Astrophysics and Cosmology-GSGAC2023, OML, Analytical studies of the generalized Reissner-Nordstrom spacetimes, Paris, France
.
June 15, 2023, 4th Edition of Chemistry World Conference, OML, A new lemma of the optical equivalence theorem: Applications in theoretical chemistry and new challenges, Paris, France.

June 5 - 9, 2023, Days on Diffraction 2023, Stellar dynamics (Authors: OML, B.B. Tirozzi, Speaker B. B. Tirozzi), St. Petersburg Branch of the Steklov Mathematical Institute, St. Petersburg, The Russian Federation

May 1- 15 2023, 1st International Online Conference on Mathematics and Applications (IOCMA 2023), OML, The desymmetrized PSL(2, Z) group and its 'square-box' one-cusp congruence subgroups, online event.

February 11-12, 2023, Global Webinar on Optics, Photonics, and Lasers (GWOPL-2023),OML, A novel lemma of the the optical equivalence theorem , online event (India)

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*Professorship:*

*Fundamentals of Physics I*

Department of Civil and Industrial Engineering,

Department of Information Engineering,

*Sapienza University of Rome, Rome Italy.*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

Conference Organisation

Organizing Committee Member
International Cosmology, Astronomy and Astrophysics Conference (ICAA-2023)
December 7, 2023, Virtual Meeting.

Organizing Committee
3-rd Global Summit and Expo on Aerospace and Mechanical Engineering (GSEAME2023)
November 16-18, 2023, Rome, Italy.

Organizing Committee Member
4th International Conference on Biomaterials & Biodevices
November 16-17, 2023, Rome, Italy.

Organizing Committee Member
4th International Conference on Advanced Functional Materials
November 16-17, 2023, Rome, Italy.

Steering Committee
2023 Asia Conference on Mathematics, Data Science and Information System (MDSIS 2023)
October 27-29, 2023, Sanya, China.

Organizing Committee Member
8th International Conference on Materials Science and Engineering
September 21-22, 2023, Paris (France).

Organizing Committee
2nd Global Summit on Gravitation, Astrophysics and Cosmology GSGAC2023
June 19-21, 2023, Paris (France).

Technical Committee Programme
2023 International Conference on Mathematics, Computation and Modeling (CMCM 2023)
24-26 March 2023, Hangzhou, China.

Committee
International Summit on Gravitation, Astrophysics and Cosmology (ISGAC2023)
March 6-7, 2023, Rome (Italy).

Scientific Committee
Global Meet on Biotechnology and Bioscience GMBB2023
February 16-18, 2023, Miami, Florida (USA).

Organizing Committee
Global Webinar on Optics, Photonics, and Lasers (GWOPL-2023)
February 11-12, 2023, online event (India).

IV. **Other**

**Associate Editor**

Open Access Journal of Engineering Sciences.

**Editorial Board Committee**

JPAA- Journal of Physics and Advanced Applications.

Journal of Aerospace Engineering and Mechanics.

**Editorial Board Member**

Mathematics for Life Science (2023, ongoing).

SCIREA Journal of Mechanical Engineering (2018-ongoing).

The Open Conference Proceedings Journal (2017-ongoing).

**Guest Editor:**

Galaxies MDPI, Special Issue Galactic Structure and Dynamics

**Reviewer:**

Frontiers in Physics

Applied Sciences MDPI

## 2023 List of Publication

### Research papers

OML, Analytical results frm the two-states Markov-States Model and applications to validation of molecular dynamics, International Journal of Mathematics and Computer Research- IJMCR, Vol 11, 3746-3754 (2023).

OML, Generalisations of the Bofill update, International Journal of Mathematics and Computer Research- IJMCR, Vol 11, 3734-3739 (2023).

OML, The Generalised Reissner-Nordstrom Spacetimes, the Cosmological Constant and the Linear Term, Computation 11(8), 157 (2023).

OML, Reduced 2-dimensional Birkhoff surfaces of section of the desymmetrized PSL(2, Z) group: the Anosov characterization, International Journal of Mathematics And Computer Research- IJMCR 11, 3255 (2023).

OML, The Desymmetrized PSL(2,Z) Group, The 'Square Box' Congruence Subgroup, The Congruence Subgroups and Leaky Tori, International Journal of Mathematics And Computer Research- IJMCR, 11, 3195 (2023).

OML, Summation of the Fourier coefficients of the non-holomorphic Eisenstein cusp series of the PSL(2, Z) group, International Journal of Mathematics And Computer Research- IJMCR, 11, 3190 (2023) .

### Conference Proceedings

OML, B. B. Tirozzi, Stellar dynamics, Proceeding of Days on Diffraction 2023, St. Petersburg, The Russian Federation, IEEE (2023).

OML, The desymmetrized PSL(2, Z) group; its 'square-box' one-cusp congruence subgroups, Comput. Sci. Math. Forum2023,7(1), 49, Proceedings of the 1st International Online Conference on Mathematics and Applications, 1-15 May 2023, MDPI: Basel, Switzerland.

## Surname : Lee,  Name : Wonwoo

## Photo

Position: Center for Quantum Spacetime (Research Professor), Korea
Homepage : http://cquest.sogang.ac.kr/
Period covered:

### I Scientific Work

1. Conducting research as a research professor at the Center for Quantum Spacetime (CQUeST), Korea

2. Teaching as a lecturer at Sogang University, Korea

3. One of the Korean committee for 'The 18th Italian-Korean Symposium on Relativistic Astrophysics, (2023)'

One of LOC for 'XV International Conference on Gravitation, Astrophysics and Cosmology (ICGAC15), (2023)'

One of LOC and Editors of proceedings for 'The 13th International Conference on Gravitation, Astrophysics, and Cosmology (ICGAC13), and 15th Italian-Korean Symposium on Relativistic Astrophysics: A Joint Meeting, (2017)'

One of the Organizers for 'String theory, gravity and cosmology (SGC2023)', 'SGC2022', 'SGC2021', 'SGC2020', 'STCOS2017', and 'STCOS2016'.

Co-chair for  'String theory, gravitation and cosmology (SGC2019)' and 'SGC2018'.

Chair for Domestic Workshop, 'Gravitation and Numerical Relativity (2014)' and 'GNR 2013'.

### II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

One of the Korean committee for 'The 18th Italian-Korean Symposium on Relativistic Astrophysics, (2023)'

One of LOC for 'XV International Conference on Gravitation, Astrophysics and Cosmology (ICGAC15), (2023)'

One of LOC and Editors of proceedings for 'The 13th International Conference on Gravitation, Astrophysics, and Cosmology (ICGAC13), and 15th Italian-Korean Symposium on Relativistic Astrophysics: A Joint Meeting, (2017)'

One of the Organizers for 'String theory, gravity and cosmology (SGC2023)', 'SGC2022', 'SGC2021', 'SGC2020', 'STCOS2017', and 'STCOS2016'.

Co-chair for 'String theory, gravitation and cosmology (SGC2019)' and 'SGC2018'.

Chair for Domestic Workshop, 'Gravitation and Numerical Relativity (2014)' and 'GNR 2013'.

*II b Work With Students*

Collaboration with graduate students working at Sogang University, Korea

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

Teaching as a lecturer at Sogang University, Korea

*II e. Work With Postdocs*

Collaboration with Postdocs working at CQUeST, Korea

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

*III a. Within ICRANet*

One of the Korean committee for 'The 18th Italian-Korean Symposium on Relativistic Astrophysics, (2023)'

One of LOC and Editors of proceedings for 'The 13th International Conference on Gravitation, Astrophysics, and Cosmology (ICGAC13), and 15th Italian-Korean Symposium on Relativistic Astrophysics: A Joint Meeting, (2017)'

*III b. Outside ICRANet*

One of LOC for 'XV International Conference on Gravitation, Astrophysics and Cosmology (ICGAC15), (2023)'

One of the Organizers for 'String theory, gravity and cosmology (SGC2023)', 'SGC2022', 'SGC2021', 'SGC2020', 'STCOS2017', and 'STCOS2016'.

Co-chair for 'String theory, gravitation and cosmology (SGC2019)' and 'SGC2018'.

Chair for Domestic Workshop, 'Gravitation and Numerical Relativity (2014)' and 'GNR 2013'.

## IV. Other

### 2023 List of Publication

(1) WIMPs in dilatonic Einstein Gauss-Bonnet cosmology

Anirban Biswas, Arpan Kar, Bum-Hoon Lee, Hocheol Lee, Wonwoo Lee, Stefano Scopel, Liliana Velasco-Sevilla, Lu Yin

Published in: JCAP 08 (2023) 024

DOI: 10.1088/1475-7516/2023/08/024

(2) Homoclinic orbit and the violation of the chaos bound around a black hole with anisotropic matter fields

Soyeon Jeong, Bum-Hoon Lee, Hocheol Lee, Wonwoo Lee

Published in: Phys.Rev.D 107 (2023) 10, 104037

DOI: 10.1103/PhysRevD.107.104037

**2022 List of Publication**

(1) Is local Ho at odds with dark energy EFT?

Bum-Hoon Lee, Wonwoo Lee, Eoin Ó. Colgáin, M.M. Sheikh-Jabbari, Somyadip Thakur

Published in: JCAP 04 (2022) 04, 004

DOI: 10.1088/1475-7516/2022/04/004

(2) Gravitational waves from the vacuum decay with LISA*

Bum-Hoon Lee, Wonwoo Lee, Dong-han Yeom, Lu Yin

Published in: Chin.Phys.C 46 (2022) 7, 075101

DOI: 10.1088/1674-1137/ac5d2a

**2021 List of Publication**

(1) Shadow cast by a rotating black hole with anisotropic matter

Bum-Hoon Lee, Wonwoo Lee, Yun Soo Myung

Published in: Phys.Rev.D 103 (2021) 6, 064026

DOI: 10.1103/PhysRevD.103.064026

## Surname Name Photo

LIN Wenbin
Position: Dean, School of Mathematics and Physics, University of South China
Period covered: 2021.10-2026.09

### I Scientific Work

Do research in GravitationandRelativistic Astrophysics.

### IV. Other

**2023List of Publication**

1. J. Li, B. Yang, Y. Wang, **W. Lin***, “The quasi-Keplerian motion in regular Bardeen spacetime”, *Gen. Relativ. Gravit.*, 55, 114(2023).
2. Z. Li, X. Tu, Y. Chen, **W. Lin***, “HetDDI: a pre-trained heterogeneous graph neural network model for drug-drug interaction prediction”, *Briefings In Bioinformatics*24:bbad385 (2023).
3. Y. Jiang, **W. Lin***, W. Zhao, C. Wang*, “AcsiNet: Deep learning based channel prediction for FDD downlink communication”, *IEEE Wireless Communications Letters*,12, 471 (2023).
4. J. Li, B. Yang, Y. Wang, **W. Lin***, “Anisotropic quark stars in de Rham-Gabadadze-Tolley like massive gravity”, *Phys. Dark Univ.*,42, 101308 (2023).
5. Y. Guo, H. Nakajima, **W. Lin***, “Gravitational-wave equation in EOB background for spinless binary”, *SCI. CHINA Phys. Mech. & Astron.*, 66, 270412 (2023).
6. **W. Lin***, J. Li, B. Yang, C. Jiang, “Coordinates in general relativity: Orbit, velocity, and the time from perihelion to aphelion”, *Gravit. Cosmo.*, 29, 95 (2023).

## Somayyeh Mahmoudi

Position: *Post-Doctoral Research Fellow, Shiraz University, Shiraz, Iran.*
Period covered:

**I Scientific Work:**

My research interests concerns the area of theoretical physics including particle physics, cosmology, and gravitational physics. In particular, I am interested in topics such as dark matter, CMB physics and gravitational waves. During my masters at Shiraz University, I worked on charged spherically symmetric solutions in five-dimensional kaluza-klein space time. The main focus of my PhD research at the University of Shiraz has been on the dark matter problem. Indeed, I tried to examine the dark matter signatures by considering its possible electromagnetic interaction with some cosmic photons such as the GRBs, radio frequency radiation and the CMB photons. Currently, I am a postdoctoral fellow at Shiraz University. In this period of research, in addition to following previous research work regarding dark matter problems, I have also focused on the physics of black holes and gravitational waves.

**II Conferences and educational activities**

**III. Service:**

Collaboration with ICRANet as visitor, November 3 - December 7, 2018, Pescara, Italy

**IV. Other**

**2021 List of Publication:**

**1-** S. Modares Vamegh, M. Haghighat, S. Mahmoudi and R. Mohammadi, "Impact of the vector dark matter on polarization of the CMB photon," Phys. Rev. D *100*, no.10, 103024 (2019) doi:10.1103/PhysRevD.100.103024 [arXiv:1911.02264 [hep-ph]].

**2-** M. Haghighat, S. Mahmoudi, R. Mohammadi, S. Tizchang and S. Xue, "Circular polarization of cosmic photons due to their interactions with Sterile neutrino dark matter," Phys. Rev. D *101*, no.12, 123016 (2020) doi:10.1103/PhysRevD.101.123016 [arXiv:1909.03883 [hep-ph]].

**3-** S. Mahmoudi, M. Haghighat, S. Modares Vamegh and R. Mohammadi, "Dipolar dark

matter and CMB B-mode polarization," Eur. Phys. J. C *80*, no.5, 402 (2020)

doi:10.1140/epjc/s10052-020-7982-y [arXiv:1805.11172 [hep-ph]].

**4-** S. Mahmoudi, Kh. Jafarzade, S. H. Hendi, "Gauss-Bonnet black holes in a special anisotropic scaling spacetime,"JHEP *12*, 009 (2022) doi:10.1007/JHEP12(2022)009 [arXiv:2210.06558 [gr-qc]].

**5-** Hendi, S. H., Hajkhalili, S., Mahmoudi, S., Thermodynamic Stability of a New Three Dimensional Regular Black Hole. Fortschr. Phys. 2023, 2200101. https://doi.org/10.1002/prop.202200101 [arXiv:2204.11558 [gr-qc]].

**6-** Jafar Khodagholizadeh, S. Mahmoudi, Rohoollah Mohammadi, Mahdi Sadegh, “Cosmic Birefringence as a probe of dark matter nature: Sterile neutrino and dipolar dark matter,” Phys. Rev. D *108*, no.2, 023023 (2023) doi:10.1103/PhysRevD.108.023023 [arXiv:2307.16286 [hep-ph]].

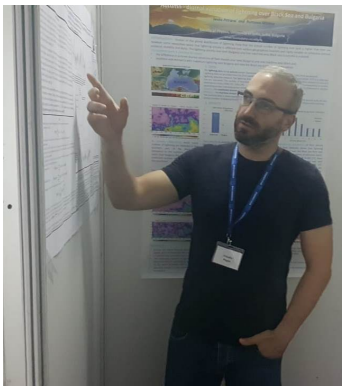
**7-** S. Mahmoudi, S. Hajkhalili and S. H. Hendi, ”Noether gauge symmetry approach applying

for the non-minimally coupled gravity to the Maxwell field,” Fortschr. Phys. 2023, 2300121. doi: 10.1002/prop.202300121

**8-** S. Mahmoudi, Kh. Jafarzade, and S. H. Hendi, ”A Comprehensive Review of Geometrical Thermodynamics: From Fluctuations to Black Holes ,”Turk J Phys *47*, 214 (2023) [arXiv:2307.00010 [gr-qc]].

## Surname Name

## Photo



Position: Visiting Scientist
Period covered: 16-30 September 2018

**I Scientific Work**

**Scientific interests:**

- Modeling of the geomagnetic field and its spatial-temporal variations
- Magnetohydrodynamics
- Fluid dynamics
- System dynamics and complex systems
- Earth sciences and Astrophysics
- Mathematical modeling and numerical solutions

**Participation in scientific projects:**

- 2022-2023 Participant in the project: "3D Modeling of hydrocarbon sources - Analysis of Reserves working regime's indicators - Methods for improving oil extraction". The project was in partnership with the Department of Energy Sources of the Polytechnic University of Tirana and was supported by the National Agency of Scientific Research and Innovation (NASRI).
- 2015-2017 Participant in the project: "Using ground and satellite data to study the variations of the geomagnetic field over Austria and Albania". This Project is in collaboration between University of Tirana and ZAMG (Zentrale Anstalt für Geophysik und Geodynamik) Vienna, Austria. Amount: 4000 Eur.
- 2014-2015 Participant in the project: "Optimization and Scalability testing of a new OpenFoam application". Field of research is: Engineering and Energy Sources.
- 2013-2014 Participant in the project: "Numerical simulations of natural convection in cylindrical cavities and the determination of the indicators of critical phenomena in the time series of the geomagnetic field variation", funded by the Faculty of Natural Sciences, University of Tirana.
- 2013-2015 Participant in the project: "Numerical experiments on the natural convection of the fluids between coaxial cylinders and concentric spheres (NUM-EXP-NAT-CONV)", a winning project of "hp-see-pilot-call-awarded- applications" (High Performance Computing in South East Europe).
- 2012-2014 Participant in the project: "Study of the stability of fluid dynamic systems in cylindrical and spherical geometry", project included in the Executive Program of Scientific and Technological Cooperation between Albania and Italy, for the years 2012 – 2014.

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

D. Prenga, **K. Peqini**, R. Osmanaj: "The study of the dynamics for the electorate system by using q-distributions-a case study". Oral presentation in the International Conference of Mathematical Modelling in Physical Sciences (IC–MSQUARE 2021), held virtually but planned in Budapest, Hungary, 06-09 September 2021.

**K. Peqini**, D. Prenga, R. Osmanaj: "Scaling laws and phase space analysis of a geomagnetic domino model". Oral presentation in the International Conference of Mathematical Modelling in Physical Sciences (IC–MSQUARE 2021), held virtually but planned in Budapest, Hungary, 06-09 September 2021.

J. Hoxha, **K. Peqini**, A. Uka: "Forecasting dipolar geomagnetic field from palaeo-models and synthetic models using neural networks". Oral presentation in the Joint Scientific Assembly IAGA – IASPEI 2021, held virtually but planned in Hyderabad, India, 21-27 August 2021.

A. Uka, **K. Peqini**, J. Hoxha: "FORECASTING VELOCITY FIELD AT THE CORE-MANTLE BOUNDARY USING NEURAL NETWORKS". Oral presentation in the Joint Scientific Assembly IAGA – IASPEI 2021, held virtually but planned in Hyderabad, India, 21-27 August 2021.

R. Osmanaj, **K. Peqini**, D. Hyka: "QCDLAB2, A Learning Tool for Students in Lattice QCD". Oral presentation in the Annual International Conferences on Sciences & Engineering, held virtually but planned in Athens, Greece, 19-22 July 2021.

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

## IV. Other

## 2021 List of Publication

1. **Peqini K.**, Prenga D., Osmanaj R., 2021. Scaling laws and phase space analysis of a geomagnetic domino model. J. Phys.: Conf. Ser. 2090 012030. Impact factor: 0.547.

2. Prenga D., **Peqini K.**, Osmanaj R., 2021. The analysis of the dynamics of the electorate system by using q-distribution-a case study. J. Phys.: Conf. Ser. 2090 012073. Impact factor: 0.547.

3. **Peqini K**., Osmanaj R., 2021. A Computational Model of Maxwell's Distribution for Undergraduates. International Journal of Physics and Chemistry Education, 13(2), 33-45.

4. Osmanaj R., **Peqini K.**, Hyka D., 2021. The Use of PhET Simulations in Teaching Modality in High Schools in Albania before and during COVID 19-Pandemic. European Journal of Education and Pedagogy, 2(6), 91-94.

# Fatemeh Rastegarnia

Last update: October 31, 2023

## Contact Information


First Name: Fatemeh

Last Name: Rastegarnia

Address:

- International Center for Relativistic Astrophysics Network (ICRANet), Piazza della Repubblica 10, Pescara 65122, Italy
- Room 1220, Building 5, Zhongguancun Rencaiyuan, Intersection of Beisihuan West Road and Zhongguancun East Road, Haidian District, Beijing. Zipcode:100080

E-mail:

f.rastegarnia308@gmail.com

f.rastegarnia@alzahra.ac.ir

Phone:

+39 085 23054200

+86 199 10553070


## Personal Information

Date of Birth: May 10, 1985

Place of Birth: Mahshahr, Khouzestan, Iran

Citizenship: Iranian

Resident in China-Beijing

Marital status: Married.

## Scientific Interests

High Energy Astrophysics

Data Analysis

Artificial Intelligence

## Computer skills

- Scientific Software: Wolfram Mathematica
- Programming Languages: Python (For Machine/Deep learning, scientific plots, and statistical fitting)
- Data reduction of GRBs: XSPEC, RMFIT, GTBURST and 3ML (Swift-BAT, Swift- XRT, Fermi-GBM and Fermi-LAT).

## Language skills

Persian: Native

English: Excellent

Italian: Good

## Academic Experience

- Associate Researcher: International Center for Relativistic Astrophysics (ICRANet), Pescara, Italy (2020–present)
- Assistant Professor: Alzahra University, Tehran, Iran (2023-persent)

## Education

PhD in Astronomy and Astrophysics, Alzahra University, Tehran, Iran
Thesis title: *Application of Deep Learning in Astrophysical Objects*, (2018-2022)
Classification: Excellent
Supervisors: Prof. Mohammad Taghi Mirtorabi
Prof. Rahim Moradi

Master of science in Physics (Particle physics and Quantum field theory), Islamic Azad University of Central Tehran Branch (IAUCTB) and Institute and Institute for Theoretical Physics and Mathematics in Iran (IPM), Tehran, Iran
Thesis title: *Application of Supersymmetric algebra in N=1,D=4*, (2010-2013)
Classification: Excellent
Thesis Advisor: Prof. Mohammad Ali-Akbari

Bachelor of science in Physics, Islamic Azad University of Tehran North Branch, Tehran, Iran (2005-2010)

High school **m**athematics/physics at Aeen Roshan Nour highschool, Tehran-Iran (2001-2005)

## Conferences and educational activities

- **The Fifth Zeldovich Meeting, 12–16 June 2023, Yerevan-Armenia**
- Talk title: *Deep learning in quasar physics*
  **Sixteenth Marcel Grossmann Meeting 5–10 July 2021**
- Planning a Workshop on Deep learning in Astronomy
  **ICRANet-ISFAHAN Astronomy Meeting, November 4, 2021, Pescara, Italy**
- Member of Local Organizing Committee
  **6th Bego Rencontre Summer School, 4-9 July 2022, Nice, France (hybrid)**
- Talk title: *Nature of the ultra-relativistic prompt emission (UPE) phase in GRB 180720B*
  **Bad Honnef Black Hole Physics School, 4–9 September 2022, Bad Honnef, Germany**

- **31st Texas Symposium on Relativistic Astrophysics. 12–16 September 2022, Prague, Czech Republic**
- **National Conference on Gravity and Cosmology, 24–25 January 2018, Isfahan University of Technology (IUT), Isfahan, Iran**
- **National Conference on Gravity and Cosmology,23–24 January 2019, IPM, Tehran, Iran**
- **Advanced Data Science Summer School (ADS3),18-23 Augus 2018,IPM, Tehran, Iran**
- **Data Science workshop, spring-2019, IPM, Tehran,Iran**
- **Data Science Application in Cosmology and Astrophysics workshop, USB,IPM, spring-2019, Tehran, Iran**

## References

- Prof. Remo Ruffini. Email: ruffini@icra.it
- Prof. Mohammad Taghi Mirtorabi. Email: torabi@alzahra.ac.ir
- Prof. Rahim Moradi. Email: Rahim.moradi@icranet.org
- Prof. Yu Wang Email: yu.wang@icranet.org
- Prof. Mohammad Ali-Akbari. Email: m_aliakbari@sbu.ac.ir

## Interests

Nature Exploration, Running, Reading, Philosophy, Traveling

## List of publications

To view the full list on Google Scholar, click here

Citations 29; h-index 3

1. "The structure of the ultrarelativistic prompt emission phase and the properties of the black hole in GRB 180720B", **F. Rastegarnia**, R. Moradi, J. A. Rueda, R. Ruffini, Liang Li, S. Eslamzadeh, Y. Wang, S. S. Xue
https://link.springer.com/article/10.1140/epjc/s10052-022-10750-x;
2. "Deep Learning in Searching the Spectroscopic Redshift of Quasars", **F. Rastegarnia**, M. T. Mirtorabi, R. Moradi, A. Vafaei. Sadr, Y. Wang
MNRAS: https://doi.org/10.1093/mnras/stac076;
3. "GRB-SN Association within the Binary-driven Hypernova Model",Remo Ruffini, Yerlan Aimuratov, Laura Marcela Becerra, Carlo Luciano Bianco, Christian Cherubini, Simonetta Filippi, Liang Li, Rahim Moradi, **Fatemeh Rastegarnia**, Brian Punsly, Jorge Armando Rueda, Narek Sahakyan, Yu Wang, She Sheng Xue
The Astrophysical Journal 955 (2), 93;
4. "Probing electromagnetic-gravitational wave emission coincidence in type I binary-driven hypernova family of long GRBs at very-high redshift", CL Bianco, MT Mirtorabi, R Moradi, **F Rastegarnia**, JA Rueda, R Ruffini, Y Wang, M Della Valle, Liang Li, SR Zhang
**Submitted**, 2023
https://arXiv preprint arXiv:2306.05855;

5. “GRB 190829A–A Showcase of Binary Late Evolution”, Yu Wang, JA Rueda, R Ruffini, R Moradi, Liang Li, Y Aimuratov, **F Rastegarnia**, S Eslamzadeh, N Sahakyan, Yunlong Zheng, **T**he Astrophysical Journal, 2022 https://doi.org/10.3847/1538-4357/ac7da3;
6. ”Deep learning in quasar physics” **F Rastegarnia**, MT Mirtorabi, R Moradi, Y Wang, A Vafaei Sadr, The Sixteenth Marcel Grossmann Meeting on Recent, 2023 https://www.worldscientific.com/doi/pdf/10.1142/9789811269776$_0$028;
7. "Introduction of Machine Learning for Astronomy" (Hands-on Workshop) Y Wang, R Moradi, MHZ Haghighi, **F. Rastegarnia** https://arxiv.org/pdf/2302.06475.pdf;
8. Y. Aimuratov, L. Becerra, C.L. Bianco, Y-C. Chen, C. Cherubini, S. Eslamzadeh, S. Filippi, M. Karlica, Liang Li, G.J. Mathews, R. Moradi, M. Muccino, G.B, Pisani, **F. Rastegarnia**, J.A. Rueda, R. Ruffini, N. Sahakyan, Y. Wang, S.S. Xue, on behalf of the ICRANet and ICRA-USTC team,'GCN CIRCULAR': https://gcn.gsfc.nasa.gov/gcn3/31056.gcn3;
9. Y. Aimuratov, C.L. Bianco, L. Li, R. Moradi, **F. Rastegarnia**, J.A. Rueda, R. Ruffini, N. Sahakyan, Y. Wang, S.S. Xue on behalf of the ICRANet team,'GCN CIRCULAR'. https://gcn.gsfc.nasa.gov/gcn/gcn3/29816.gcn3;
10. Y. Aimuratov, C.L. Bianco, L. Li, R. Moradi,**F. Rastegarnia**, J.A. Rueda, R. Ruffini, N. Sahakyan, Y. Wang, S.S. Xue on behalf of the ICRANet team,'GCN CIRCULAR'. https://gcn.gsfc.nasa.gov/gcn/gcn3/29823.gcn3;
11. GRB 220101A: The first example of a Petanova
R Ruffini, Y Aimuratov, L Becerra, CL Bianco, Y-C Chen, C Cherubini, YF Cai, S Eslamzadeh, S Filippi, M Karlica, Liang Li, GJ Mathews, R Moradi, M Muccino, **F. Rastegarnia**, JA Rueda, N Sahakyan, Y Wang, SS Xue, YF Yuan, YL Zheng, Ustc Team
https://ui.adsabs.harvard.edu/abs/2022GCN.31648....1R/abstract;
12. GRB 220101A: The most powerful GRB and BDHN I in 26 years
R Ruffini, Y Aimuratov, L Becerra, CL Bianco, Y-C Chen, C Cherubini, YF Cai, S Eslamzadeh, S Filippi, M Karlica, Liang Li, GJ Mathews, R Moradi, M Muccino, **F. Rastegarnia**, JA Rueda, N Sahakyan, Y Wang, SS Xue, YF Yuan, YL Zheng, Ustc Team
https://ui.adsabs.harvard.edu/abs/2022GCN.31465....1R/abstract;
13. GRB 221009A X-ray light-curve and the indication of TeV light-curve
Y Aimuratov, L Becerra, CL Bianco, C Cherubini, S Filippi, M Karlica, Liang Li, R Moradi, **F. Rastegarnia**, JA Rueda, R Ruffini, N Sahakyan, Y Wang, SS Xue, Icranet Team
https://ui.adsabs.harvard.edu/abs/2022GCN.32802....1A/abstract;
14. GRB 221009A: A type I BdHN of exceptional energetics
Y Aimuratov, L Becerra, CL Bianco, C Cherubini, S Filippi, M Karlica, Liang Li, R Moradi, **F. Rastegarnia**, JA Rueda, R Ruffini, N Sahakyan, Y Wang, SS Xue, Icranet Team
https://https://ui.adsabs.harvard.edu/abs/2022GCN.32780....1A/abstract;

# International Relativistic Astrophysics Ph. D.

## Daniele Gregoris

Position: Teaching and Research Personnel (Associate Professor) at Jiangsu University of Science and Technology
Period covered: 1st January 2023 – 31st December 2023

**I Scientific Work**

- I investigated the lack/occurrence of the Chandrasekhar mass limit for white dwarfs in some theories based on modified uncertainty principles (Annals of Physics 452 (2023) 169287);
- I investigated the possibility of obtaining a cosmological LCDM dynamics at a background level characterized by jerk parameter j=1 without invoking a cosmological constant but adopting specific dark energy models interacting with dark matter (Phys. Lett. B 842 (2023) 137962);
- I studied the evolution of a black hole absorbing cosmic material according to the Boyle-Hoyle-Lyttleton mechanism (Gen. Rel. Grav. 55 (2023) 97);
- I discovered some new wormhole solutions in the free Dirac-Born-Infeld theory (EPJC 83 (2023) 1056).

**II Conferences and educational activities**

*II a Conferences and Other External Scientific Work*

*II b Work With Students*
*II c Diploma thesis supervision*
*II d Other Teaching Duties*

- I taught the courses of College Physics I (Mechanics and Thermodynamics) and College Physics II (Electromagnetism, Optics and Modern Physics), 40 + 36 hrs, in Spring and Fall terms respectively, for the International students of Jiangsu University of Science and Technology;
- I delivered four oral reports for master students at Jiangsu University of Science and Technology about current research trends in gravitational physics, black holes and cosmology.

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

- "Black hole entropy, Weyl curvature, and Christodoulou-Ruffini irreducible mass" at 5th Zel'dovich meeting, Yerevan (Armenia), 2023.

*III b. Outside ICRANet*

- "On the uniqueness of LCDM-like evolution for homogeneous and isotropic cosmology in General Relativity", Asia-Pacific School and Workshop on Gravitation and Cosmology, Hangzhou (China) 2023;
- "On the uniqueness of LCDM-like evolution for homogeneous and isotropic cosmology in General Relativity", XV International Conference on Gravitation, Astrophysics and Cosmology, South Korea (2023);
- "On black hole entropy, and Weyl curvature", Pusan National University (2023);

- "On the uniqueness of LCDM-like evolution for homogeneous and isotropic cosmology in General Relativity", CosPA 2023, Hong Kong.

**IV. Other**

- I have been serving as Reviewer for the American Mathematical Society (AMS) @ MathSciNet (Mathematical Reviews).

- I have been serving as referee for various journals as GRG, CQG, Physica Scripta and Symmetry;

- I am a member of the national working group in Mathematical Physics GNFM (Gruppo nazionale fisica matematica) of Italian INDAM.

**2023 List of Publications**

On journals with referees:

- Daniele Gregoris, Yen Chin Ong, "On the Chandrasekhar limit in generalized uncertainty principles", Annals of Physics 452 (2023) 169287;
- Saikat Chakraborty, Daniele Gregoris, B. Mishra, "On the uniqueness of LCDM-like evolution for homogeneous and isotropic cosmology in General Relativity", Phys. Lett. B 842 (2023) 137962;
- Daniele Gregoris, "Black hole evolution in the Bondi-Hoyle-Lyttleton accretion model", Gen. Rel. Grav. 55 (2023) 97;
- Daniele Gregoris, "On some new black hole, wormhole and naked singularity solutions in the free Dirac-Born-Infeld theory", EPJC 83 (2023) 1056.

Conference proceedings:

- Daniele Gregoris, "A spherically symmetric stiff fluid spacetime in light of cosmic structure formation", contribution to MG16;
- Daniele Gregoris, "Christodoulou-Ruffini irreducible mass, black hole entropy, and Weyl curvature conjecture", to appear in Astronomy Reports a contribution for the 5$^{th}$ Zel'dovich meeting.

**Surname Name** **Photo**

**HAN Wenbiao**

Position: Professor, Shanghai Astronomical Observatory, CAS
Period covered: 2011.12----

## I Scientific Work

Gravitational wave astronomy: astrophysics, waveform templates, data analysis, cosmology

## II Conferences and educational activities

*II a Conferences and Other External Scientific Work*

*II b Work With Students*

*II c Diploma thesis supervision*

*II d Other Teaching Duties*

*II e. Work With Postdocs*

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

*III a. Within ICRANet*

*III b. Outside ICRANet*

I teach General Relativity and Cosmology in University of Chinese Academy of Sciences .

## IV. Other

## 2023List of Publication

1. Song Liand Wen-Biao Han, "Full waveform model for axisymmetric black hole mergers ", PHYSICAL REVIEW D 108, 083032 (2023) ;

2.Qianyun Yun, Wen-Biao Han , Qian Hu and Haiguang Xu, "Precessing binary black holes as better dark sirens ", MNRAS 527, L60–L65 (2024)

3.Ping Shen, Wen-Biao Han , Chen Zhang, Shu-Cheng Yang, Xing-Yu Zhong, Ye Jiang and Qiuxin Cui, Influence of mass-ratio corrections in extreme-mass-ratio inspirals for testing general relativity, PHYSICAL REVIEW D 108, 064015 (2023)

4.Zhixiang Ren, Tianyu Zhao, Zhoujian Cao, Zong-Kuan Guo, Wen-Biao Han, Hong-Bo Jin, Yue-Liang Wu, "Taiji data challenge for exploring gravitational wave universe", Front. Phys. 18(6), 64301 (2023)

5.Xing-Yu Zhong, Wen-Biao Han, Ye Jiang, Ping Shen, Shu-Cheng Yang, Chen Zhang， Detecting properties of echoes from the inspiraling stage with ground-based detectors， Eur. Phys. J. Plus (2023) 138:761

6.Pau Amaro-Seoane et. Al.,Astrophysics with the Laser Interferometer Space Antenna， Living Reviews in Relativity (2023)26:2

7.Xingyu Zhong, Wen-Biao Han, Ziren Luo and Yueliang Wu， Exploring the nature of black hole and gravity with an imminent merging binary of supermassive black holes， Sci. China-Phys. Mech. Astron. March (2023) Vol. 66 No. 3

8.Carlos A. Benavides-Gallego and Wen-Biao Han， Gravitational Waves and Electromagnetic Radiation from Charged Black Hole Binaries， Symmetry 2023, 15, 537.

# IRAP Ph. D. Erasmus Mundus Students

# CAPES

# Administrative, Secretarial and Technical Staff

# 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<br>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.<br>Implementation of new instruments aiming at improving the efficiency of the administrative services.<br>Administrative management of the staff: recruitment and selection interviews, drawing up of mandatory documents (matriculation and presences books), elaboration of timesheets.<br>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.<br>Coordination and reduction of commercial plans. |

| | |
|---|---|
| | Survey of the competition sale prices<br>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.<br>Consultant office Dott. Vincenzo Micozzi - Pescara |

| | |
|---|---|
| Date | 1997 - 31/03/2001 |
| Principal subjects / occupational skills covered | Responsible for Quality Insurance (ISO UNI EN 9002)<br>Management Assistance<br>Purchase management<br>Administrative and fiscal fulfilments<br>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.<br>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<br>Aptitude to learn, adaptable to new situations, different from the known ones.<br>Ability to work under pressure.<br>Good aptitude to work in multicultural environment thanks to the experiences spent abroad for education or personal reasons.<br>Team spirit |
| Organisational skills and competences | Innate sense of organisation both in the working place and in the management of personal and familiar life.<br>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)<br>Very good knowledge of Team System – Gamma, Mult program<br>Basic knowledge of graphic application<br>Good knowledge of Internet and web search engines. |

## di Niccolo Cinzia


| | |
|---|---|
| E mail address | cinzia.diniccolo@icranet.org |
| Telephone | +39 085 23054 219 |
| Fax | +39 085 4219252 |
| Nationality | Italian |
| Date and place of birth | Terlizzi, 23 May 1985 |


Work experiences

| | |
|---|---|
| Date | 01 August 2013 → present |
| Name of employer | ICRANet - International Center for Relativistic Astrophysics Network |
| Main activities and responsibilities | Secretariat Office |

| | |
|---|---|
| Date | 12 June → 16 July 2013 |
| Occupation or position held | ISTAO – Project Work |
| Main activities and responsibilities | Report And Presentation Of The Results Loccioni Group – Our Presence In The World: Germany, USA, China; Country Analysis: Turkey.<br>Results, Report And Final Slide Presentation To Loccioni Managers |
| Name and address of employer | Loccioni Group, via Fiume 16, 60030 Angeli di Rosora, Ancona<br>Phone +39.0731.8161 \| Fax +39.0731.814.700 |

| | |
|---|---|
| Date | From October 2012 |
| Occupation or position held | Conference interpreting and translations. |
| Name and address of employer | OS-Card Srl – Bologna |

| | |
|---|---|
| Date | May 2012 → September 2012 |
| Occupation or position held | Junior Export Manager |
| Main activities and responsibilities | Brazil country analysis. Brazilian Portuguese website translation.<br>Company profile in Brazilian Portuguese language. |
| Name and address of employer | Marzoarreda – Novoli (LE) |

| | |
|---|---|
| Date | September 2011 → January 2013 |
| Occupation or position held | Stageur |
| Main activities and responsibilities | Legal Office – Notary services<br>Drafting of documents concerning: general/special power of attorney, will and testament of citizens living abroad, public acts, certificates of |

| | |
|---|---|
| | authentications, self-certifications and official certificates that can be replaced by self-certifications. |
| Name and address of employer | Italian General Consulate in Brazil – São Paulo<br>Aveinda Paulista, 1963; CEP 01311-300 São Paulo (SP) |
| Date | October 2011 → January 2012 |
| Occupation or position held | Italian teacher |
| Main activities and responsibilities | Italian teacher for native Brazilian students.<br>Private lessons and classes.<br>Conference interpreter for 30th São Paulo *Venice Architecture Biennial* 2012 |
| Name and address of employer | Italian Institute of Culture in Brazil – São Paulo<br>Avenida Higienópolis, 436; CEP 01238-000, São Paulo (SP) |
| Date | January → July 2011 |
| Occupation or position held | Internship |
| Main activities | Editing, proofreading. |
| Name and address of employer | Edizioni dell'Urogallo – Literature from Portuguese-speaking countries |

Education and training

| | |
|---|---|
| Date | February → July 2013 |
| Title of qualification awarded | Postgraduate master course in International Management |
| Name and type of organisation providing education and training | ISTAO – Istituto Adriano Olivetti di Studi per la gestione dell'economia e delle aziende<br>The Masters Course in International Management prepares highly specialized students in the field of international business and trade.<br>Organized in collaboration with ICE (Governamental Agency for the internationalization of Italian companies), Confindustria Marche (Italian Employers' federation) and the Government of the Marche Region, the Master represents one of the most important and valuable programs for new graduates approaching the business world focused on the themes of internationalization: macroeconomics and global markets, enterprise organization, emerging countries, strategies and decision-making skills, contracts, rules, techniques. |
| Date | May 2012 |
| Title of qualification awarded | CEDILS Certificate<br>Certified teacher for Italian as foreign language |
| Name and type of organisation providing education and training | Ca' Foscari – University of Venice |

| | |
|---|---|
| Date | November 2008 → 11 July 2011 |
| Title of qualification awarded | Master degree in *Languages for international communication – Portugues EU/BR and Spanish* |
| Name and type of organisation providing education and training | Univerità degli Studi di Perugia<br>Final marks: 110/110 cum laude<br>Thesis: "Way to Europe. Portugal and the European integration process" |

| | |
|---|---|
| Date | November – December 2010 |
| Title of qualification awarded | Brief Master on Europroject Management 2007-2013 |
| Name and type of organisation providing education and training | Introduction to European Union: institutional, juridical and economic aspects. Training courses: full lifecycle of an EC funded project: proposal preparation and submission, evaluation, negotiation, technical and financial project management, reporting, technical reviews and post-project audits. |

| | |
|---|---|
| Date | November 2004 → 9 November 2008 |
| Title of qualification awarded | Degree in *Linguistic and Cultural Mediation Sciences – Portugues EU/BR and Spanish* |
| Name and type of organisation providing education and training | Univerità degli Studi di Perugia<br>Final marks: 110/110 cum laude<br>Thesis: Modern poetry in Portugal. |

| | |
|---|---|
| Dates | 1999 - 2004 |
| Title of qualification awarded | Secondary School Degree |
| Name and type of organisation providing education and training | Liceo Linguistico Carlo Troya – Andria (BT) |

Personal skills and competences

| | |
|---|---|
| Mother tongue | Italian |
| *Portuguese* | Second language |
| *Spanish* | Very good |
| *English* | Good |
| *French* | Basic User |

| | |
|---|---|
| Social skills and competences | Good ability to adapt to multicultural environment, gained through my experience of studying and travelling abroad (Brazil and Europe);<br>Very good aptitude in teamwork (working within collective projects in the postgraduate course and in academia);<br>Ability to work under pressure. |

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|---|---|
| Organisational skills and competences | Very good sense of organisation and time planning abilities;<br>Self rigorousness and self discipline;<br>Good analytical and problem-solving abilities gained during all study years and especially during internship at Italian General Consulate in Brazil (the Vice-Consul signed my letter of recommendation) |
| Computer skills and competences | Very good command of Microsoft Office (Word, Excel e PowerPoint);<br>Very good knowledge of Internet and web search engines;<br>Knowledge of graphic application. |

# ILARIA GLORIA

## CONTATTI


- Via Decontra 67 - 65027 Scafa (PE), Italia
- (+39) 388 074 1413
- ilariaglo01@gmail.com


## LINGUE

- Italiano | Madrelingua
- Inglese | Livello avanzato
- Spagnolo | Livello avanzato
- Francese | Livello intermedio

## COMPETENZE DIGITALI

- Sistemi operativi: Windows, Mac, Linux, ecc.
- Pacchetto Office: Word, PowerPoint, Outlook, ecc.
- Buona padronanza di Excel
- Gestione della posta elettronica

## ESPERIENZE PROFESSIONALI

Nov 2023 - presente

**Segretaria**
**ICRANet - International Center for Relativistic Astrophysics Network**

Organizzazione di riunioni, viaggi di lavoro ed appuntamenti. Esecuzione delle procedure burocratiche necessarie al funzionamento delle attività e dei processi cui l'ufficio stesso è preposto e alla circolazione dell'informazione e della documentazione tra i vari uffici

## FORMAZIONE ACCADEMICA

Mag 2023 - presente
Università "Unitelma Sapienza", Roma
**Master in Organizzazione e Gestione delle Risorse Umane**

Set 2020 - Mar 2023
Università "G. D'Annunzio", Pescara
**Laurea Magistrale in Lingue straniere per l'impresa e la cooperazione internazionale**
Voto: 110 con lode /110

Set 2020 - Mar 2023
Università telematica "Leonardo Da Vinci", Pescara
**Percorso FIT - 24 CFU**
Abilitazione all'insegnamento

## PATENTE DI GUIDA

- Patente di guida B
- Automunita

## FORMAZIONE ACCADEMICA

Sett 2016 - Apr 2020
Università "G. D'Annunzio", Pescara
**Laurea Triennale in Mediazione linguistica e comunicazione interculturale**
Voto: 100 /110

Set 2011 - Lug 2016
Liceo Statale "G. Marconi", Pescara
**Diploma Liceo Linguistico**
Voto: 90 /100

Set 2011 - Lug 2016
académie de Nice, Nizza
**Diploma ESABAC**
Abilitazione all'insegnamento

TRATTAMENTO DEI DATI PERSONALI:
autorizzo il trattamento dei miei dati personali ai sensi del D.l.g.s. 30/06/2003, n.196 "Codice in materia di protezione dei dati personali"

Pescara, 22/12/2023

Ilaria Gloria

## 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 | |
| | ITALIAN |
| MOTHER-TONGUE | |
| 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.<br>Self-reliant.<br>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.<br>Very good use of Internet and e-mail accounts.<br>Good use of cost-accounting system HELPAZI and bank system BNL Businessway.<br>Elementary knowledge of HTML e CSS programs for websites.<br>Knowledge of "TOP VALUE" program for financial diagnosis and corporate planning. |
| ARTISTIC SKILLS | Piano classes attended for 8 years. sol-fa Diploma. |
| DRIVING LICENCE | Driving licence cat. B |
| FURTHER INFORMATION | I like travelling, cooking, cinema, listening music, playing the piano. I have a determined, dynamic and flexible personality. I like staying and working with people. |

INFORMAZIONI PERSONALI

# Elisabetta Natale

Via Cesare Battisti 12, 65029, Torre de' Passeri (PE)

Data di nascita 07/11/1991 | Nazionalità Italiana

## ESPERIENZA PROFESSIONALE

Da 01/2018 →

### ICRANet Secretariat

**International Center for Relativistic Astrophysics Network (ICRANet)**, Pescara

Da 09/2017 a 12/2017 →

### Europe and North America Desk Assistant

**UNESCO**, Parigi

Relazione con Stati membri e Partner istituzionali (MSP), settore Relazioni estere e Public information and communication (ERI)

Da 03/2017 a 09/2017

### HR & Project Assistant Intern

**INTERSOS**, Roma

Da 08/2016 a 02/2017

### Intern – Delegazione dell'Unione Europrea presso Agenzie delle Nazioni Unite (FAO, IFAD, WFP), Santa Sede, Ordine di Malta e Repubblica di San Marino

**EEAS (European External Action Service)**, Roma

- Sezione rapporti Unione Europea – ONU, in particolare responsabile delle relazioni UE - FAO
- Partecipazione ai principali meeting FAO in qualità di delegata UE
- Organizzazione e coordinamento dei meeting tra i 28 stati membri, analisi e preparazione di documenti e statement per i meeting
- Assistente sezione stampa e comunicazione, cura del sito web della Delegazione
- Stesura di comunicati stampa e report per gli uffici UE a Bruxelles, in particolare per la Commissione Europea e le DG pertinenti

Da 06/2016 a 08/2016

### Marketing assistant

**General Communication Srl Bologna**, Bologna

- Ricerca e fidelizzazione di nuovi clienti per conto di ONGs e INGOs (AMNESTY INTERNATIONAL, UNICEF, AISM Onlus)
- Project Assistant

06/2016

### Exit poll e proiezioni elettorali per elezioni amministrative Bologna 2016

**IPR marketing per conto di RAI radiotelevisione italiana spa**, Bologna

- Raccolta dati, monitoraggio, analisi e statistiche per proiezioni elettorali
- Trasmissione dei dati a RAI radiotelevisione italiana per immediata diffusione in tempo reale

04/2016

### Scrutatrice per il referendum popolare italiano del 17 aprile 2016

**Comune di Torre de' Passeri (PE)**

Da 09/2015 a 11/2015

### Administrative assistant Intern

**Centro linguistico d'ateneo (CLA) Ravenna** - Alma Mater Studiorum università di Bologna

- Attività di front/ back office, traduttrice per gli studenti stranieri in arrivo
- Preparazione e correzione dei test di livello linguistici (inglese, francese, tedesco e spagnolo)
- Assistente all'insegnamento per il progetto "ALMA ENGLISH" e per le certificazioni linguistiche
- Assistente all'insegnamento della lingua italiana per studenti stranieri
- Assistente sezione comunicazione

Da 11/2013 a 04/2014

### Administrative assistant Intern

**Ufficio orientamento e career service Forlì,** Alma Mater Studiorum università di Bologna,Campus di Forlì (FC)

- Creazione e aggiornamento dei database
- Attività di front/ back office
- Colloqui con gli studenti per l'orientamento in entrata ed in uscita
- Promozione dell'attività formativa dell' Alma Mater Studiorum
- Assistente sezione comunicazione

Da 20/03/2014

### Co-founder associazione IAPSS sezione di Forlì

**IAPSS ( International Association for Political Science Students)**, Forlì (FC)

- Cofondatrice dell'associazione
- Presentazione di IAPSS a istituzioni accademiche e amministrative (Alma Mater Studiorum - UniBo, comune di Forlí,…)
- Organizzazione di conferenze a livello locale / nazionale e internazionale
- Organizzazione di conferenze, eventi, round-tables, workshops, viaggi studio e di approfondimento
- Assistente sezione stampa e comunicazione

03/ 2010

### Traduttrice DE> IT del materiale informativo relativo al XXXVII Congresso nazionale su "KANT E L'AUFKLÄRUNG"

**Società filosofica italiana**, Sulmona (L'AQ)

Traduzione di discorsi, flyer, documenti e materiale informativo relativo al XXXVII Congresso nazionale della "KANT E L'AUFKLÄRUNG"

## ISTRUZIONE E FORMAZIONE

02/ 2017

### Workshop in International Journalism and Communication

**The Post Internazionale and Limes**, Roma (RM)

**Panelists**: Enrico Mentana, Curzio Maltese, Marco Damilano, Amedeo Ricucci, Emiliano Fittipardi, Stefano Mentana, Giulio Gambino, Alessio Romenzi, Francesca Mannocchi, Nancy Porsia, Eva Giovannini, Sabika Shaha Povia, Laura Silvia Battaglia.

Da 04/2016 a 08/2016

### Executive master in International Business Development (percorso Export management e internazionalizzazione d'impresa)

**Sida group Management Academy**, Bologna (BO)

**Principali tematiche trattate**: Strategie per l'internazionalizzazione d'impresa; marketing analitico e operativo; web marketing; social media marketing; project management; supply chain management e disciplina doganale; bilancio aziendale; controllo di gestione, pianificazione e strategia aziendale; business plan e finanziamenti; fiscalità e contrattualistica internazionale; tutela di marchi e brevetti; pagamenti internazionali e gestione del credito; analisi di mercato.

06/2016

### Diploma congiunto NATO Allied commander transformation-UNIBO

**NATO summer workshop and NATO Model event**, Forlì (FC)

*"NATO and Security Challenges: Institutions and Policies, Key Trends and Best Practices"*

**Ruolo ricoperto**: giornalista NATO

**Principali tematiche**: Changing balances and the role of NATO in international politics: current challenges and

future opportunities; NATO in the future; Cooperative Security: Nato Partnerships in Perspective; Collective Defence and Crisis Management – Art.5 and Beyond; NATO and Other Actors in the New Security Environment: NATO and the UN'; NATO and the EU; Cybersecurity: Myth and Reality; The changing global security environment: Exploring new challenges and opportunities.

Da 09/2014 a 06/2015

### Erasmus +

**Institut d'études politiques (SCIENCES PO)**, Lione, Francia

Specializzazione nel percorso Affari internazionali e commerciali

**Principali tematiche**: Politique commerciale européenne et comparée; Pratiques du commerce international; Médias, pouvoir et construction du consensus politique ; Communication politique et publique; Théorie et pratiques de la diplomatie; Violence internationale et gestion des conflits; Politiques publiques; Histoire internationale.

Da 09/2013 a 03/2016

### Laurea magistrale in scienze internazionali e diplomatiche
### Curriculum: politica e sicurezza internazionale

Votazione: 110 con lode /110

**Alma Mater Studiorum università di Bologna,** Campus di Forlì

Redazione della tesi sperimentale in lingua francese, dal titolo «*L'outrecuidance «à la française»: paradoxes stratégiques et ambigüités historiques de la politique européenne et de défense de la France* ».

Attività extracurriculari:

- Co-fondatrice dell'associazione IAPSS ( International Association For Political Science Students)
- 07/05/2014: SEMINAR "The Ukrainian Warfare: historical path and future implications to the International System" (organizzatrice)
- 11/04/2014: Incontro "Percorsi verso le carriere internazionali-da scienze politche al mondo globale", Campus di Forlì
- 06/03/2014: simulazione del Consiglio dell'UE nella formazione Occupazione e Affari Sociali (Forlì) – Ruolo: Germania

Da 09/2010 a 07/2013

### Laurea in scienze internazionali e diplomatiche

**Alma Mater Studiorum università di Bologna**, Campus di Forlì

Attività extracurriculari:

- 05/2013: NATO Model Event (Forlì) - Ruolo: Ambasciatrice della Lituania
- 10/05/2013: "Croatian Membership in the New Europe", conferenza con l'Ambasciatore croato in Italia, Damir Grubiša, Punto Europa (Forlì)
- 12/04/2013: incontro ISPI "GLOBE, orientamento alle carriere internazionali", Campus di Forlì
- 07/03/2013: "L'Emilia nel cuore dell'Europa. Emigrazione in Belgio. Storia e memorie di molte partenze e di qualche ritorno", presentazione del libro del professor Lorenzo Bertuccelli, Punto Europa (Forlì)
- 02/2013: Prague Model United Nations Conference (Praga) - Ruolo: delegata della Mongolia nel Consiglio economico sociale Onu (ECOSOC)
- 13/03/2012: Cerimonia di consegna del Sigillum Magnum a Jean-Claude Juncker, Romano Prodi e Helmut Kohl, Bologna

Da 09/2005 a 07/2010

### Maturità linguistica

**Liceo linguistico Gian Battista Vico**, Sulmona (L'AQ)

**Lingue di studio**: inglese, francese e tedesco

**Scambi culturali**:

- 10/2008: scambio culturale in Germania, liceo "Kurfurst Maximilian Gymnasium" Burghausen (Salzach)
- 03/2008: scambio culturale in Francia, liceo "Jean Zay", Jarny (Lorraine)

## COMPETENZE PERSONALI

Lingua madre: Italiano

Altre lingue

| | COMPRENSIONE | | PARLATO | | PRODUZIONE SCRITTA |
|---|---|---|---|---|---|
| | Ascolto | Lettura | Interazione | Produzione orale | |
| **Inglese** | C1/C2 | C1/C2 | C1/C2 | C1/C2 | C1/C2 |
| **Francese** | C1/C2 | C1/C2 | C1/C2 | C1/C2 | C1/C2 |
| **Tedesco** | B1/B2 | B1/B2 | B1/B2 | B1/B2 | B1/B2 |
| **Russo** | B1 | B1 | B1 | B1 | B1 |
| **Spagnolo** | A2 | A2 | A2 | A2 | A2 |

Competenza digitale

| AUTOVALUTAZIONE | | | | |
|---|---|---|---|---|
| Elaborazione delle informazioni | Comunicazione | Creazione di Contenuti | Sicurezza | Risoluzione di problemi |
| Utente intermedio | Utente intermedio | Utente intermedio | Utente intermedio | Utente intermedio |

Altre competenze

- Corsi CRI (Pioniere e Volontaria del soccorso della Croce Rossa Italiana, corso BLSD e abilitazione all'utilizzo del defibrillatore semi automatico esterno)
- Attività sportiva agonistica (Federazione italiana Pentathlon moderno_ società sportiva Valpescara srl)
- Educatrice in Azione Cattolica e accompagnatrice/organizzatrice di campi estivi parrocchiali
- Aiuto nel doposcuola parrocchiale e ripetizioni private (saltuariamente).
- Conoscenza del sistema di scrittura e di lettura Braille

Patente di guida

B

## ULTERIORI INFORMAZIONI

Progetti

**GENERAZIONE ITALIA** - Progetto di formazione istituzionale e innovazione legislativa organizzato dalla FONDAZIONE CULTURA DEMOCRATICA e dal GOVERNO ITALIANO
Roma, 04 -08/ 2017

Riconoscimenti e premi

- Luglio 2015: attestato di merito per studenti meritevoli, Alma Mater Studiorum Università di Bologna
- 11/12/2010: Borsa di studio per conseguimento del diploma con esito eccellente, elargita dal "Centro studi Mac 47, Carmine Mastrogiuseppe no profit", Sulmona (L'AQ)
- 08/2010: Segnalazione da parte del Dirigente Scolastico del liceo G.B.Vico (Sulmona-L'AQ) per rappresentare la scuola e partecipare al Premio "Alfieri del Lavoro" e alle prove di ammissione nel Collegio Universitario Lamaro Pozzani di Roma, realizzate dalla Federazione Nazionale dei Cavalieri del Lavoro
- 05/2001: Riconoscimento ed elezione alla carica di Consigliere nel Consiglio comunale dei bambini di Torre de' Passeri (PE)

Certificazioni

- Luglio 2016: CORSO DI FORMAZIONE GENERALE PER I LAVORATORI secondo il D.Lgs. 81/2008 e l'accordo Stato Regioni del 21/12/2011

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".

Pescara, 10/11/2021

Elisabetta Natale