

Alberto ALOISIO - Short CV

Education

(1988) degree in Physics, Laurea cum laude, University of Naples 'Federico II', Italy

Research Experiences, pre and post-lauream

(1985) Summer Student at CERN (Geneva, Switzerland)

(1989-1991) Two-year fellowship granted by Istituto Nazionale di Fisica Nucleare, Naples

Faculty Positions

(1991-1998) Assistant Professor (Physics) at University of Naples 'Federico II', Italy

(1999-2003) Associate Professor of Physics at University of Sannio, Italy

(2004-2011) Associate Professor of Physics at University of Naples 'Federico II', Italy

(2012-present) Full Professor of Physics at University of Naples 'Federico II', Italy

Teaching Experience

(1991-1995) Physics II, degree in Physics, Univ. of Naples;

(1995-1998) Laboratory of Physics I, degree in Physics, Univ. of Naples;

(1999-2003) Experimental Physics, degree in Geology, Univ. of Sannio;

(1999-2003) Laboratory of Computer Architecture, degree in Computer Science, Univ. of Naples;

(2004-2011) Laboratory of Digital Systems, degree in Physics (LM), Univ. of Naples;

(2012-present) Digital Electronics, degree in Physics (LM) Univ. of Naples;

(2004-present) Computer Architecture, degree in Computer Science, Univ. of Naples;

(2005-present) Member of the Council of the PhD School of Physics, Univ. of Naples

Peer-review Activity

(1999-2003) Reviewer of the Research Programs of National Interest (PRIN) of the Italian Ministry of University and Research

(2004-present) Member of the Reviewer Board for the evaluation of Programs of National Interest (PRIN)

(2004) Member of the Expert Board of the Committee for Evaluation of Research (CIVR)

(2004) Member of the Reviewer Board of the Industrial Research, Innovation and Technology Transfer Regional Program - Emilia-Romagna, Italy

(2001-present) Regular Reviewer of the journal IEEE Transactions on Nuclear Science

(2014-present) Regular Reviewer of the journal IEEE Transactions on Circuits and Systems

(2010) Reviewer of the 'Rita Levi Moltacini' Program for Young Researcher funded by the Italian Ministry of University and Research

(2011) Reviewer of the 'Future in Research - FIRB' Program funded by the Italian Ministry of University and Research

(2011-2012) Member of the Scientific Standing Committee of the Km3Net neutrino telescope EU project

(2012-present) Reviewer of CRC Press Scientific Publishing House (www.crcpress.com)

(2012-2013) Reviewer of the VQR 2004-2010 (Evaluation of the Quality of the Research) for the Italian Research and University Evaluation Agency (ANVUR)

(2014) Reviewer of the 'FutureinResearch' program, funded by Regione Puglia, Italy

Organizations of International Conferences

Member of Scientific Committee:

(2005) IEEE Real-Time Conference (Stockholm, Sweden)

Member of the Program Committee and Reviewer of IEEE Nuclear Science Symposium:

(2003) Portland, USA (*)

(2005) Puerto Rico, USA

(2006) San Diego, USA

(2007) Honolulu, USA (*)

(2008) Dresden, Germany (*)

(2009) Orlando, USA

(2010) Knoxville, USA

(2011) Valencia, Spain (*)

(*) also Session Chairman

Coordination of Scientific Projects

(1999-2007) Principal Investigator of the experiments:

POLAR (development of parallel optical links)

COLOR and DREAM (design of DWDM optical networks for real-time applications),

TWO2TEN (design of high speed serial links for real-time applications)

All approved and funded by the Italian Institute for Nuclear Physics (INFN)

(2006-2011) Member of the INFN 5th National Scientific Committee for Accelerators and Applied Physics

(2007-2008) Local Scientific Coordinator of the PRIN 2006 project 'Design of a data acquisition system for a tracking calorimeter with imaging read out', Unit of the University of

Naples

(2012-2015) Principal Investigator of the EOS project (EOS: Organic Electronics for innovative

research instrumentation), approved and funded by the Italian Ministry for Research and University in the framework of Call 'Progetti Premiali 2012' (2014-2015) Project Coordinator of the LEOSIR project (Laboratory of Organic Electronics for Innovative Research Equipments), funded by Regione Campania within POR FESR 2007/2013

Brief overview of research activities

My research activity aims at the development and characterization of radiation detectors to be used in High Energy Physics experiments and at the design of the related read-out electronics, data acquisition and trigger systems. I am co-author of more than 300 publications on international journals with h-index (SPIRES) of 68. The details of my research activities are presented hereafter, presented in the context of the most important experiments where the work has been carried out.

The L3 experiment

The L3 experiment was designed to study the e+e- collisions up to a cm energy of 200 GeV on the Large Electron Positron Collider (LEP) at CERN. The most important achievements were the measures of mass and total width measures of the Z and W, their coupling with leptons and quarks, the study of quarks and leptons in the Z decays. In 1990, I had the responsibility of the trigger system of the forward/backward muon detectors, based on RPC detectors. This architecture represents one of the first examples of FPGA-based logic in a DAQ and trigger system for a High-Energy Physics experiment, supporting real-time data analysis and compression.

The KLOE experiment

In 1993, I joined the KLOE experiment at the INFN National Laboratory, Frascati (Italy). The experimental apparatus has been optimized to study the CP violation in the decays of the phi. The DAFNE accumulator ring has an interaction frequency of 330 MHz, asking for a novel approach to the detector read-out and trigger scheme. I proposed and realized the DAQ backbone for the entire apparatus. Those Processors read out the detectors and perform the first steps of event building in real-time, keeping the pace with the nearly continuous DAFNE beam interaction rate.

The ARGO-YBJ experiment

ARGO-YBJ is an apparatus for the detection of cosmic radiation based upon RPC installed at the High Altitude Cosmic Ray Laboratory nearby YangBajing (Tibet, PRC) at 4300m a.s.l.. The research program covered the cosmic ray study, the gamma astronomy at an energy threshold as low as few hundreds of GeV and the detection of gamma ray bursts from galactic and extragalactic sources. From 2001, I participate to the definitions of the trigger algorithms and I have implemented the trigger logic which have been successfully deployed and tested since the first pilot runs started in 2003.

The ATLAS experiment

ATLAS is one of the experiments presently taking data at the LHC accelerator at CERN. The apparatus has been designed aiming at the detection of the Higgs boson (eventually discovered in 2012) in the widest mass range as well as of supersymmetric and heavy W and Z-like particles. The experimental program also covers the CP violation in the B decay and a detailed study of the top. I was responsible for the design and construction of the optical read-out for the Level-1 trigger of the RPC detectors in the muon spectrometer. I also designed the FPGA logic and embedded microprocessors to accelerate the execution of the event building algorithms.

Optical Networks and novel DAQ architectures.

From 2002 to 2007, I was the spokesperson of R&D programs (COLOR, POLAR, DREAM, TWO2TEN) funded by INFN on the application of the Dense Wavelength Division Multiplexing (DWDM) technology and high speed serial links to the DAQ systems of HEP experiments. In the DWDM network, each user modulates a laser source tuned on a specific wavelength (or color) belonging to a standard grid. Colors are then muxed on a single strand of optical fiber and then demuxed at the far end of the fiber. The research program has produced a novel DWDM network architecture, which has been selected by the NEMO-KM3NET experiment (an underwater neutrino telescope) for the DAQ system of the first prototype, deployed in 2007 at 2000m below the sea level, 20 km offshore the Catania's harbour.

Organic Electronics

From 2013, I am the Principal Investigator for the EOS project (EOS: Organic Electronics for innovative research instrumentation), approved and funded by the Italian Ministry of University and Research, in the framework of 2012 Progetti Premiali Call. Organic Electronics is opening unbeaten paths to the use of heterogeneous electronic components in the form of thin, lightweight, flexible and low cost systems. The ability to integrate onto organic supports a wide range of new features is undoubtedly an opportunity and a technological challenge. The theme of Organic Electronics is now universally considered of strategic interest for the countless technological spillovers that it is driving in the most different types of applications, from lighting to photovoltaic power generation, from the development of new sensors to the implantation of bio-compatible electronics. EOS project is aimed at developing advanced digital and analog organic circuits to provide a vast research community with an innovative concept of deep-embedded electronics for lab-grade instruments.

I am also Project Coordinator of LEOSIR (Laboratory of Organic Electronics for research instrumentation), a spin-off activity of EOS funded by Regione Campania in the framework of POR FESR 2007/2013.

Naples, Oct.27th 2016


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Research Interests

computational astrophysics; binary neutron stars; gamma-ray bursts; black hole binaries; gravitational waves; relativistic magnetohydrodynamics; neutron star collapse; numerical relativity

Positions

October 2016 - to date: Associate Professor
Institution: Department of Physics, University of Trento, Italy

October 2013 - September 2016: Assistant Professor (tenure-track RTDb contract)
Institution: Department of Physics, University of Trento, Italy

October 2011 - September 2013: Research Associate
Institution: JILA, University of Colorado, Boulder (CO), USA

October 2009 - September 2011: Research Associate
Institution: University of Maryland, College Park (MD), USA
joint with NASA Goddard Space Flight Center, USA

November 2006 - September 2009: PostDoc
Institution: Max Planck Institute for Gravitational Physics
(Albert Einstein Institute), Potsdam, Germany

Education

2002 - 2006: Ph.D. training at SISSA (International School for Advanced Studies), Trieste, Italy.
Degree: PhD in Astrophysics.
Date: October 26th, 2006.
Supervisor: Prof. Luciano Rezzolla.
Thesis: General Relativistic Magnetohydrodynamics: fundamental aspects and applications

1996 - 2002: Undergraduate studies in Physics at the University of Parma, Parma, Italy.
Degree: M.Sc. in Physics (Laurea 110/110).
Date: July 17th, 2002.
Advisor: Prof. Enrico Onofri.
Thesis: Development of algorithms to study matter at gravitational collapse

Grants (80000 USD, 313000 EUR, and 68 M cpu hours as a PI)

- PI, 33.4 million core hours PRACE computer time grant 2016153613 “Magneto - Effect of Magnetar Level Fields in Binary Neutron Star Mergers”, 2017-2018
- co-I (PI Troja), ATCA (Australia Telescope Compact Array) observational grant no. C3059, 2015-2016
- PI, 0.2 million core hours CINECA computer time grant IsC34_HMBNS, 2015-2016
- PI, ~ 16 million core hours PRACE computer time grant “GRSimStar - General Relativistic Simulations of binary neutron Star mergers”, 2015-2016
- PI, 1 million service units CINECA computer time grant IsC24_GRMHDNS, 2014-2015
- co-PI (PI Zachariah Etienne), 1 million service units NSF XSEDE computer time grant TG-AST140068, 2014-2015
- PI, MIUR FIR Grant No. RBFR13QJYF (3 years, **EUR 313000**, 2014-2017)
- collaborator (PI John Baker), NASA Grant No. 13-ATP13-0077 (3 years, **\$440000**, 2014-2017)
- PI, 4 million service units NSF XSEDE computer time grant TG-PHY110027, 2013-2014
- PI, NASA Grant No. NNX12AO67G (1 year, **\$80000**, 2012-2013)
- PI, 8 million service units NSF XSEDE computer time grant TG-PHY110027, 2012-2013
- PI, 6.4 million service units NSF Teragrid computer time grant TG-PHY110027, 2011-2012
- co-I (PI Sean McWilliams), 1.5 million service units NSF Teragrid computer time grant TG-AST100027, 2010-2011
- co-PI (PI Erik Schnetter), 21.2 million service units NSF Teragrid computer time grant TG-MCA02N014, 2010

Teaching Experience

- University of Trento (2013 - Present)
 - 2016 - Present: “Fisica Generale III (Physics III)” (84 hour course for Bachelor students)
 - 2014 - Present: “High Energy Astrophysics” (48 hour course for M.Sc. students)
 - 2013 - 2014: “Computational Physics (Advanced)” (12 hour course for M.Sc. students)
- International Schools
 - July 4 - 8 2016: 10 hour lectures on “Neutron Star Mergers and Gravitational Waves” given at the 2016 ECT* Doctoral Training Programme
 - May 6 2008: 2 hour invited lecture on “Gravitational Collapse” given at the 3rd VESF School on Gravitational Waves, Cascina (Pisa), Italy
 - March 18 2008: 45 minute lecture on “Numerical Relativity at AEI: Simulating Single and Binary Neutron Stars” given at the *Ferienkurs in Gravitationsphysik 2008* (Semester break courses on Gravitational Physics) at AEI, Potsdam, Germany

Students and Postdocs Mentored (14 undergraduates, 7 graduates, 2 postdocs)

- University of Trento (2013-present)
 - Postdocs: Riccardo Ciolfi, Wolfgang Kastaun
 - PhD students: Takumu Kawamura, Andrea Endrizzi
 - master students: Andrea Endrizzi
 - bachelor students: Elisa Ritondale, Francesco Gramendola, Luigi Bassini, Lumen Boco, Lorenzo Zandonella Dall’Aquila, Giulio Isacchini, Riccardo La Placa, Federico Zangrandi, Simone Veronese
- JILA, University of Colorado (2011-2013)
 - undergraduate students: John Mark Demopoulos
- University of Maryland and NASA GSFC (2009-2011):
 - graduate students: John Capone (2010 summer internship at NASA Goddard Space Flight Center)
 - undergraduate students: Philip Cowperthwaite (2011 summer internship at NASA Goddard Space Flight Center)
- Albert Einstein Institute (2006-2009):
 - graduate students: Kyriaki Dionysopoulou (advisor L. Rezzolla), Filippo Galeazzi (advisor L. Rezzolla), Aaryn Tonita (advisor L. Rezzolla), Thorsten Kellermann (2011, advisor L. Rezzolla)
 - undergraduate students: David Link (2009, advisor L. Rezzolla), Filippo Galeazzi (2008, advisor L. Rezzolla)

Refereeing Activities

Proposal Reviewer for: NSF (2013, 2015, 2017), NASA (2013), NSERC (2014), LinkSCEEM/Cy-Tera (2014)

Referee for: *Astrophysical Journal*, *Astrophysical Journal Letters*, *Astrophysics and Space Science*, *Classical and Quantum Gravity*, *Journal of Fluid Mechanics*, *Mathematical Reviews*, *Physical Review D*, *SIAM Journal on Scientific Computing*, *SIGMA: Symmetry, Integrability and Geometry: Methods and Applications*

Administrative Duties

October 2016 - Present: Coordinator of International Agreements for the Physics Department of the University of Trento

October 2014 - Present: Member of the committee of the SISSA-Trento Joint Master Degree

October 2014 - Present: Member of the committee of the Tuebingen-Trento Joint Master Degree

July 2014 - Present: Colloquium organizer for the Department of Physics of the University of Trento (Italy)

June 2014 - Present: Member of the Executive and Faculty committees of the PhD School in Physics at the University of Trento

October 2010 - September 2011: Organizer of Seminars on Computational Astrophysics at NASA Goddard Space Flight Center, Greenbelt, MD, USA

January 2007 - July 2009: Organizer of Seminars and Journal Clubs for the Numerical Relativity group at AEI, Potsdam, Germany

November 2004 - October 2006: PhD Students' Representative for the Astrophysics Sector at SISSA, Trieste, Italy

Conference Organization

November 2016 - Present: Member of the Local Organizing Committee of the Annual Meeting of the Italian Physical Society (Trento, September 11-15 2017)

May 2014 - Present: Topic Leader for the topic on "Numerical modelling in binary inspirals" in the EU COST Action *NewCompStar*

June 13 - 17 2016: Chair of the "Einstein Toolkit EU School and Workshop 2016" (Trento, Italy)

August 11 - 14 2015: Organizer of the "Einstein Toolkit Workshop 2015" (Stockholm, Sweden)

April 7 - 8 2008: Organizer (together with R. De Pietri and L. Rezzolla) of the Whisky Retreat 2008, Parma, Italy

Awards and Societies

April 2017 - Present	Member of the Virgo Collaboration
March 28 2017	Awarded the Italian National Scientific Qualification (Abilitazione Scientifica Nazionale) to become a full professor in astronomy and astrophysics (02/C1)
January 8 2014	Awarded the Italian National Scientific Qualification (Abilitazione Scientifica Nazionale) to become an associate professor in theoretical physics (02/A2)
October 1 2009 - Present:	Member of the American Physical Society
September 1 2015 - Present:	Member of the Italian Physical Society

Invited Seminars and Talks (31 in total)

January 25 2017:	invited seminar at Stony Brook University (Stony Brook, NY, USA) on “Magnetic Field Effects in Merging Binary Neutron Stars”
November 8 - 11 2016:	“IV National Congress on GRBs” (Bergamo, Italy) - invited review talk on “General Relativistic Simulations of Gamma-Ray Burst Engines”
September 9 2016:	international workshop “SHORT GAMMA-RAY BURSTS: From observation to numerical simulations” (Trento, Italy) - invited review talk on “General Relativistic Simulations of Neutron Star Binaries and Short Gamma-Ray Bursts”
June 4 2015:	invited seminar at CENTRA (Instituto Superior Tecnico, Lisbon, Portugal) on “General Relativistic Simulations of Binary Neutron Star Mergers”
November 25 2014:	invited seminar at University of Parma (Parma, Italy) on “General Relativistic Simulations of Binary Neutron Star Mergers: Gravitational Waves and Short Gamma-Ray Bursts”
November 14 2014:	invited seminar at Institut fur Theoretische Physik, Johann Wolfgang Goethe-Universitaet (Frankfurt, Germany) on “Investigating the Progenitors of Short Gamma-Ray Bursts via General Relativistic Simulations of Neutron Star Mergers”
November 11 2014:	invited seminar at Technische Universitaet Darmstadt (Darmstadt, Germany) on “General Relativistic Simulations of Binary Neutron Star Mergers: Gravitational Waves and Short Gamma-Ray Bursts”
September 15 - 19 2014:	Conference “XXI SIGRAV Conference on General Relativity and Gravitational Physics” (Alessandria, Italy) - invited talk on “General Relativistic Simulations of Binary Neutron Stars: Gravitational Waves and Gamma-Ray Bursts”
August 27 2014:	invited seminar at Stony Brook University (Stony Brook, NY, USA) on “General Relativistic Simulations of Binary Neutron Star Mergers: Gravitational Waves and Short Gamma-Ray Bursts”

- July 14 - 18 2014: International Workshop “Astro-GR/VESF-School” (Rome, Italy)
 - **invited review talk** on “General Relativistic Simulations of Neutron Star Binaries”
- June 23 2014: **invited seminar** at the Institute of Astrophysics (Paris, France) on “General Relativistic Magnetohydrodynamic Simulations of Binary Neutron Star Mergers”
- April 22 - 25 2014: International Conference “Sant Cugat Forum on Astrophysics: Gravitational Waves Astrophysics” (Sant Cugat, Spain)
 - **invited review talk** on “Simulations of NS-NS mergers: gravitational waves and electromagnetic signals”
- September 23 - 27 2013: International Conference “MICRA 2013” (ECT*, Trento, Italy)
 - **invited review talk** on “General Relativistic Simulations of NS-NS and NS-BH mergers”
- May 13 - 17 2013: International Conference “FOE Fifty-One Erg” (NCSU, Raleigh, NC, USA)
 - **invited talk** on “General Relativistic Simulations of Compact Binary Mergers”
- April 13 - 16 2013: April Meeting of the American Physical Society (Denver, CO, USA)
 - **invited talk** on “General Relativistic Magnetohydrodynamic Simulations of Compact Binary Mergers”
- June 4 - 8 2012: International Conference “CompStar: the physics and astrophysics of compact stars” (Tahiti, French Polynesia)
 - **invited talk** on “Magnetized binary neutron star mergers”
- May 11 2012: JSI Mini-Symposium on “Electromagnetic Counterparts to Gravitational Wave Sources”, NASA Goddard Space Flight Center (Greenbelt, MD, USA)
 - **invited talk** on “GRMHD Simulations Of Binary Neutron Stars and Binary Black Holes”
- March 12 2012: **invited seminar** at CITA (Toronto, Canada) on “General Relativistic Magnetohydrodynamic Simulations of Neutron Stars and Black Holes”
- September 7 - 9 2011: “Parma Workshop on Numerical Relativity and Gravitational Waves 2011”, University of Parma, Italy
 - **invited talk** on “Magnetized Binary Neutron Star Mergers”
- June 13 - 17 2011: International Conference “Astronum 2011”, Valencia, Spain
 - **invited talk** on “Magnetized Binary Neutron Star Mergers”
- October 15 2010: **invited seminar** at JILA, University of Colorado (Boulder, Colorado, USA) on “General Relativistic Simulations of Binary Neutron Star Mergers”
- February 26 2010: **invited seminar** at Canadian Institute for Theoretical Astrophysics (Toronto, Canada) on “General Relativistic Simulations of Binary Neutron Star Mergers”

- February 25 2010: **invited seminar** at Perimeter Institute (Waterloo, Canada) on “General Relativistic Simulations of Single and Binary Neutron Stars”
- January 26 - 29 2010: International Conference “14th Gravitational Wave Data Analysis Workshop”, University of Rome “La Sapienza”, Rome, Italy
 - **invited review talk** on “General Relativistic Simulations of Compact Binaries”
- December 9 - 11 2009: Gravitational Wave Bursts Meeting, Chichen-Itza, Yucatan, Mexico
 - **invited talk** on “Binary NSs and NS-BH mergers: a theoretical overview”
- November 2 2009: CIGR Collaboration Meeting, GeorgiaTech, Atlanta, Georgia, USA
 - **invited talk** on “The Whisky(MHD) code”
- October 19 2009: **invited seminar** at the Physics Department of the University of Maryland (College Park, Maryland, USA) on “General Relativistic Simulations of Binary Neutron Stars: Gravitational Waves and Matter Dynamics”
- June 18-20 2009: Workshop on “Probing Neutron Stars with Gravitational Waves”, State College, Pennsylvania, USA
 - **invited talk** on “GR Simulations of Binary NSs: GWs and matter dynamics”
- February 17 2009: ILIAS 6th Annual Meeting, Dresden, Germany
 - **invited talk** on “Fully General Relativistic Simulations of Binary Systems”
- November 13 2008: **invited seminar** at the Department of Mathematics of the Katholieke Universiteit Leuven (Leuven, Belgium) on “Fully General Relativistic Simulations of Binary Neutron Stars Mergers”
- August 8 2008: **Colloquium** at NSSTC (Huntsville, Alabama, USA) on “Fully General Relativistic Simulations of Binary Neutron Stars Mergers”

Contributed Seminars and Talks (48 in total, only most recent ones listed)

- January 28 - 31 2017: “April Meeting” of the American Physical Society (Washington DC, USA), talk on “General Relativistic Simulations of Low-Mass Magnetized Binary Neutron Star Mergers”
- December 14 - 16 2016: Conference “CoCoNut Meeting 2016” (Valencia, Spain), talk on “General Relativistic Simulations of Binary Neutron Star Mergers with WhiskyMHD”
- December 13 2016: “Workshop on Numerical Relativity in matter spacetimes for Gravitational Wave astronomy (NRmGW)” (Valencia, Spain), talk on “Magnetic Field Effects in Neutron Star Binaries”
- September 26 - 30 2016: Conference “Meeting of the Italian Physical Society (SIF)” (Padova, Italy), talk on “High-Mass Magnetized Binary Neutron Star Mergers And Short Gamma-Ray Bursts”
- September 13 - 14 2016 Workshop “NewCompStar meeting on oscillations and instabilities in neutron stars” (Southampton, UK), talk on “Structure of Stable Binary Neutron Star Merger Remnants: A Case Study”
- April 16 - 19 2016: April Meeting of the American Physical Society (Salt Lake City, UT, USA), talk on “High-Mass Magnetized Binary Neutron Star Mergers and Short Gamma-Ray Bursts”
- December 13 - 18 2015: Conference “28th Texas Symposium on Relativistic Astrophysics” (Geneva, Switzerland), talk on “Magnetar formation from the merger of binary neutron stars”
- September 21 - 25 2015: Conference “Meeting of the Italian Physical Society (SIF)” (Rome, Italy), talk on “Magnetar formation from the merger of binary neutron stars”
- July 13 - 18 2015: Conference “Fourteenth Marcel Grossmann Meeting” (Rome, Italy), talk on “GRMHD simulations of binary neutron star mergers and the central engine of short gamma-ray bursts”

Public Seminars

- September 16 2006: “The Bizarre Universe: Black Holes, Quasar, Gamma-Ray Bursts”, SISSA OpenDay, Trieste, Italy
- October 25 2005: “The Bizarre Universe: Black Holes, Quasar, Gamma-Ray Bursts”, seminar given to high-school students of UWCAd (United World College of the Adriatic) visiting SISSA, Trieste, Italy
- September 18 2004: “The Bizarre Universe: Black Holes, Quasar, Gamma-Ray Bursts”, SISSA OpenDay, Trieste, Italy

Press Releases

- October 10, 2012: JILA research highlight, “Messages from the Abyss”, <https://jila.colorado.edu/news-highlights/messages-abyss>
- September 27, 2012: NASA Goddard press release, “Simulations Uncover ‘Flashy’ Secrets of Merging Black Holes”, <http://www.nasa.gov/topics/universe/features/black-hole-secrets.html>
- April 7, 2011: NASA press release No. 11-103, “Breakthrough Study Confirms Cause Of Short Gamma-Ray Bursts”, http://www.nasa.gov/home/hqnews/2011/apr/HQ_11-103_Gamma_Rays.html

Numerical Codes

- developer of the general relativistic magnetohydrodynamic code *Whisky*
- developer of the first complete exact Riemann solver for relativistic MHD

Computational Skills

Operating Systems:	DOS, Linux, Mac OS X, Windows
Programming Languages:	C, C++, Fortran 77, Fortran 90
Software:	Amira, Mathematica, Matlab, OpenDX, VisIt
Working experience:	Computer Management Assistant of the Astrophysics sector at SISSA (Nov 2004 - Oct 2006)
Scientific Visualization:	excellent experience in visualizing results from numerical simulations through the use of programs such as VisIt, Matlab, and OpenDX
High-performance computing:	excellent experience in using several HPC resources

Personal

- *Citizenship*: Italian citizen
- *Spoken Languages*: Italian (native), English (fluent)

Refereed Publications

(h-index=22, more than 1500 citations in NASA ADS)

1. Ciolfi R., Kastaun W., **Giacomazzo B.**, Endrizzi A., Siegel D., Perna R. 2017, *General relativistic magnetohydrodynamic simulations of binary neutron star mergers forming a long-lived neutron star*, Phys. Rev. D, **95**, 063016
2. Kastaun W., Ciolfi R., **Giacomazzo B.** 2016, *Structure of Stable Binary Neutron Star Merger Remnants: a Case Study*, Phys. Rev. D, **94**, 044060
3. Kawamura T., **Giacomazzo B.**, Kastaun W., Ciolfi R., Endrizzi A., Baiotti L., Perna R. 2016, *Binary Neutron Star Mergers and Short Gamma-Ray Bursts: Effects of Magnetic Field Orientation, Equation of State, and Mass Ratio*, Phys. Rev. D, **94**, 064012
4. Endrizzi A., Ciolfi R., **Giacomazzo B.**, Kastaun W., Kawamura T. 2016, *General Relativistic Magnetohydrodynamic Simulations of Binary Neutron Star Mergers with the APR4 Equation of State*, Classical and Quantum Gravity, **33**, 164001
5. Perna R., Lazzati D., **Giacomazzo B.** 2016, *Short Gamma-Ray Bursts from the Merger of Two Black Holes*, ApJ Letters, **821**, L18
6. **Giacomazzo B.**, Zrake J., Duffell P., MacFadyen A. I., Perna R. 2015, *Producing Magnetar Magnetic Fields in the Merger of Binary Neutron Stars*, ApJ, **809**, 39
7. Dall’Osso S., **Giacomazzo B.**, Perna R., and Stella L. 2015, *Gravitational waves from massive magnetars formed in binary neutron star mergers*, ApJ, **798**, 25
8. Read J. S., Baiotti L., Creighton J. D. E., Friedman J. L., **Giacomazzo B.**, Kyutoku K., Markakis C., Rezzolla L., Shibata M., Taniguchi K. 2013, *Matter effects on binary neutron star waveforms*, Phys. Rev. D, **88**, 044042
9. Dionysopoulou K., Alic D., Palenzuela C., Rezzolla L., and **Giacomazzo B.** 2013, *General-Relativistic Resistive Magnetohydrodynamics in three dimensions: formulation and tests*, Phys. Rev. D, **88**, 044020
10. **Giacomazzo B.** and Perna R. 2013, *Formation of Stable Magnetars from Binary Neutron Star Mergers*, ApJ Letters, **771**, L26
11. Andersson N., Baker J., Belczynski K., Bernuzzi S., Berti E., Cadonati L., Cerda-Duran P., Clark J., Favata M., Finn L. S., Fryer C., **Giacomazzo B.**, et al 2013, *The Transient Gravitational-Wave Sky*, Classical and Quantum Gravity, **30**, 193002 (note: I was one of the main authors and responsible in particular of section IIA “Compact Object Binaries and Short Gamma-ray Bursts” and of the Conclusions)
12. **Giacomazzo B.**, Perna R., Rezzolla L., Troja E., and Lazzati D. 2013, *Compact Binary Progenitors of Short Gamma-Ray Bursts*, ApJ Letters, **762**, L18
13. **Giacomazzo B.** and Perna R. 2012, *General Relativistic Simulations of Accretion Induced Collapse of Neutron Stars to Black Holes*, ApJ Letters, **758**, L8
14. **Giacomazzo B.**, Baker J. G., Miller M. C., Reynolds C. S., and van Meter J. R. 2012, *General Relativistic Simulations of Magnetized Plasmas around Merging Supermassive Black Holes*, ApJ Letters, **752**, L15

15. **Giacomazzo B.**, Rezzolla L., and Stergioulas N. 2011, *Collapse of differentially-rotating neutron stars and cosmic censorship*, Phys. Rev. D, **84**, 024022
16. Baiotti L., Damour T., **Giacomazzo B.**, Nagar A., and Rezzolla L. 2011, *Accurate numerical simulations of inspiralling binary neutron stars and their comparison with effective-one-body analytical models*, Phys. Rev. D, **84**, 024017
17. Rezzolla L., **Giacomazzo B.**, Baiotti L., Granot J., Kouveliotou C., and Aloy M. A. 2011, *The missing link: Merging neutron stars naturally produce jet-like structures and can power short Gamma-Ray Bursts*, ApJ Letters, **732**, L6
18. **Giacomazzo B.**, Rezzolla L., and Baiotti L. 2011, *Accurate evolutions of inspiralling and magnetized neutron-stars: equal-mass binaries*, Phys. Rev. D, **83**, 044014
19. Baiotti L., Damour T., **Giacomazzo B.**, Nagar A., and Rezzolla L. 2010, *Analytic modeling of tidal effects in the relativistic inspiral of binary neutron stars*, Phys. Rev. Letters, **105**, 261101
20. Rezzolla L., Baiotti L., **Giacomazzo B.**, Link D., and Font J. A. 2010, *Accurate evolutions of unequal-mass neutron-star binaries: properties of the torus and short GRB engines*, Classical and Quantum Gravity, **27**, 114105
21. Corvino G., Rezzolla L., Bernuzzi S., De Pietri R., and **Giacomazzo B.** 2010, *On the shear instability in relativistic neutron stars*, Classical and Quantum Gravity, **27**, 114104
22. **Giacomazzo B.**, Rezzolla L., and Baiotti L. 2009, *Can magnetic fields be detected during the inspiral of binary neutron stars?*, MNRAS Letters, **399**, L164-L168
23. Baiotti L., **Giacomazzo B.**, and Rezzolla L. 2009, *Accurate evolutions of inspiralling neutron-star binaries: assessment of the truncation error*, Classical and Quantum Gravity, **26**, 114005
24. Mizuno Y., Zhang B., **Giacomazzo B.**, Nishikawa K.-I., Hardee P. E., Nagataki S., and Hartmann D. H. 2009, *Magnetohydrodynamic Effects in Propagating Relativistic Jets: Reverse Shock and Magnetic Acceleration*, ApJ Letters, **690**, L47-L51
25. Kellerman T., Baiotti L., **Giacomazzo B.**, and Rezzolla L. 2008, *An improved formulation of the relativistic hydrodynamics equations in 2D Cartesian coordinates*, Classical and Quantum Gravity, **25**, 225007
26. Meliani Z., Keppens R., and **Giacomazzo B.** 2008, *Faranoff-Riley type I jet deceleration at density discontinuities: Relativistic hydrodynamics with realistic equation of state*, Astronomy & Astrophysics, **491**, 321-337
27. Baiotti L., **Giacomazzo B.**, and Rezzolla L. 2008, *Accurate evolutions of inspiralling neutron-star binaries: prompt and delayed collapse to black hole*, Phys. Rev. D, **78**, 084033
28. **Giacomazzo B.** and Rezzolla L. 2007, *WhiskyMHD: a new numerical code for general relativistic magnetohydrodynamics*, Classical and Quantum Gravity, **24**, 235-258
29. **Giacomazzo B.** and Rezzolla L. 2006, *The Exact Solution of the Riemann Problem in Relativistic Magnetohydrodynamics*, J. Fluid Mech., **562**, 223-259

Publications in Conference Proceedings

1. Aloy M. A., Rezzolla L., **Giacomazzo B.**, and Obergaulinger M. 2012, *Powering Short GRBs by Mergers of Moderately Magnetized Neutron Stars*, proceedings of the international conference “Numerical modeling of space plasma flows (astronom 2011)”, *ASP Conference Series*, **459**, 49
2. Font J. A., Rezzolla L., **Giacomazzo B.**, Baiotti L., and Link D. 2011, *Towards modelling the central engine of short GRBs*, proceedings of the “Spanish Relativity Meeting (ERE 2010)”, *Journal of Physics: Conference Series*, **314**, 012013
3. **Giacomazzo B.**, Rezzolla L., Baiotti L., Link D., and Font J. A. 2011, *General Relativistic Simulations of Binary Neutron Star Mergers*, proceedings of the “Gamma Ray Bursts 2010 Conference”, *AIP Conference Series*, **1358**, 187-190
4. Mizuno Y., Zhang B., **Giacomazzo B.**, Nishikawa K.-I., Hardee P. E., Nagataki S., and Hartmann D. H. 2010, *Magnetohydrodynamic Effects in Relativistic Ejecta*, proceedings of the international conference “High-Energy Phenomena in Relativistic Outflows II”, *International Journal of Modern Physics D*, **19**, 991-996
5. Mizuno Y., Zhang B., **Giacomazzo B.**, Nishikawa K.-I., Hardee P. E., Nagataki S., and Hartmann D. H. 2009, *Magnetohydrodynamic Effects in Propagating Relativistic Ejecta: Reverse Shock and Magnetic Acceleration*, proceedings of the “GAMMA-RAY BURST: Sixth Huntsville Symposium”, *AIP Conference Series*, **1133**, 229-231

General Public Articles

- L. Baiotti and **B. Giacomazzo**, “*Chi fa l’onda*”, article in italian about sources of gravitational waves published by INFN (Italy) on the public magazine *Asimmetrie*, **5/9.07**, September 2007

Curriculum vitae di Sandra Parlati

INFORMAZIONI PERSONALI

Parlati Sandra
Nazionalità: italiana
Data e luogo di nascita: 24/01/1966 Torino

ISTRUZIONE

Laurea in fisica presso l'università degli studi di Torino conseguita il 14 marzo 1991 con votazione 110/110.
La tesi, dal titolo "*L'orologio UTC ai Laboratori del Gran Sasso*", ha riguardato i sistemi di sincronizzazione a distanza di scale di tempo e, in particolare, la sincronizzazione dell'orologio atomico dei LNGS alla scala UTC tramite segnali radiofonici e televisivi. La tesi ha riguardato inoltre la sincronizzazione dei sistemi di timing degli esperimenti MACRO e EAS-TOP ai Laboratori del Gran Sasso.

POSIZIONE CORRENTE

Da dicembre 2001: tecnologo presso i Laboratori Nazionali del Gran Sasso dell'INFN con contratto di lavoro a tempo indeterminato.
Da giugno 2005: responsabile del Servizio Calcolo e Reti dei Laboratori Nazionali del Gan Sasso.

PRECEDENTI POSIZIONI

Da settembre 1992 a dicembre 1994: contratto con California Institute of Technology per la gestione dei dati dell'esperimento MACRO e dei computer impiegati per l'acquisizione e l'analisi dei dati sperimentali.

Da febbraio 1995 a maggio 1995: contratto a tempo determinato presso la sezione INFN di Pisa come collaboratore tecnico per la misura delle caratteristiche dei fotomoltiplicatori impiegati nell'esperimento CHOOZ.

Da maggio a luglio 1995: incarico di prestazione professionale presso l'Università degli studi di Pisa, Dipartimento di Fisica, per la misura delle caratteristiche dei fotomoltiplicatori impiegati nell'esperimento CHOOZ.

Da agosto 1995 a marzo 1996: contratto presso l'Università degli studi di Bologna e di Lecce per la gestione dei dati dell'esperimento MACRO.

Da marzo 1997 a dicembre 2001: tecnologo nel Servizio di Calcolo e Reti presso i LNGS dell'INFN con contratto di lavoro a tempo determinato.

BORSE di STUDIO

Da settembre 1991 a settembre 1992: borsa di studio INFN finanziata da Digital Equipment Corporation presso i LNGS per lo studio delle reti LAN Ethernet e FDDI.

Da maggio 1996 a marzo 1997: borsa di studio del CNR, Istituto di Cosmogeofisica di Torino, per lo sviluppo del software di visualizzazione dei dati dell'esperimento ICARUS.

ATTIVITA' DI DOCENZA e TUTORAGGIO

Anno accademico 2002-2003: docenza nei corsi "Fondamenti di Informatica I" e "Fondamenti di Informatica II" presso la Facoltà di lettere e Filosofia dell'Università degli Studi dell'Aquila, nell'ambito del corso di Laurea "Culture per la comunicazione".

Attività di docenza e tutoraggio negli anni 2007-2014 nell'ambito dei progetti POR Abruzzo "Gran Sasso in Rete", "Società della conoscenza" e "Sapere e Crescita" per 5 borsisti che hanno svolto la propria attività nell'ambito del Servizio Calcolo e Reti dei LNGS.

Febbraio 2010: docenza nel corso "Affidabilità dei servizi informatici aziendali" erogato in modalità e-learning nell'ambito del progetto POR Abruzzo "Gran Sasso in rete".

Febbraio 2016-Febbraio 2017: Attività di tutoraggio per una borsa di studio ai LNGS dal titolo "Supporto alla gestione della rete, con particolare attenzione a servizi e sicurezza"

Da ottobre 2015: Attività di tutoraggio per un AdR tecnologico ai LNGS dal titolo "Sviluppo e utilizzo di nuove tecnologie per l'aggiornamento dell'infrastruttura di calcolo scientifico U-Lite ai Laboratori Nazionali del Gran Sasso."

SUPERVISIONE DI STUDENTI

A.A. 2002-2003: relatore della tesi di laurea "Il web semantico" di Roberta De Paolis presso la Facoltà di Lettere e Filosofia dell'Università degli Studi dell'Aquila nell'ambito del corso di laurea "Culture per la Comunicazione".

ORGANIZZAZIONE DI MEETINGS e SEMINARI

Nel 1997: organizzazione del corso di formazione "Linguaggio di programmazione C" presso i LNGS per l'utenza scientifica.

Nel 1999: organizzazione del corso di formazione "Linguaggio di programmazione C++ e programmazione Object Oriented" presso i LNGS.

Nel 2000: organizzazione del corso di formazione "Linux Red Hat" presso i LNGS.

Nel 2002: organizzazione di un mini-workshop su Geant4 rivolto ai ricercatori dei LNGS.

Nel 2008: organizzazione del workshop della Commissione Calcolo e Reti dell'INFN, tenutosi presso i LNGS a giugno 2008.

Nel febbraio 2014: partecipazione al comitato organizzatore del workshop invernale della CCR presso i LNGS.

Convener della sessione dedicata al calcolo scientifico degli esperimenti afferenti a CSNII e relatore di un intervento sul calcolo scientifico ai LNGS.

Nel 2014, 2015, 2016: partecipazione al comitato di programma dei workshop CCR e convener delle sessioni relative alle attività CCR.

Nel 2017: organizzatore locale e membro del comitato di programma del workshop della CCR ai Laboratori Nazionali del Gran Sasso.

Dal 1997 al 2011: relatore di seminari ai LNGS

"AFS distributed filesystem"

"Condor batch system"

"ROOT analysis framework"

"NQS e Mosix: Sistemi batch, calcolo distribuito e load balancing"

"U-LITE: a proposal for scientific computing at LNGS"

RESPONSABILITA' ISTITUZIONALI

Da giugno 2005: responsabile del Servizio Calcolo e Reti dei LNGS.

Responsabilità della progettazione e della gestione dell'intera infrastruttura di rete dei laboratori e delle risorse di calcolo per gli esperimenti e per gli utenti. Responsabilità della gestione dei fondi assegnati al Servizio dal Direttore e dalla Commissione Calcolo e Reti dell'INFN.

A novembre 2001: nomina a rappresentante dei LNGS e del gruppo collegato dell'Aquila dell'INFN in seno alla Commissione Nazionale Calcolo e Reti dell'INFN per una durata di 3 anni.

A giugno 2004, giugno 2010, aprile 2013 e ottobre 2016: rinnovo della nomina a rappresentante dei LNGS e gruppo collegato dell'Aquila nella CCR dell'INFN.

Ruolo di APA (Access Port Administrator) per i LNGS e il gruppo collegato INFN dell'Aquila presso il Consortium GARR.

Registration Authority dei LNGS per l'autorizzazione alla richiesta di certificati X.509 della CA INFN e responsabile delle richieste di certificati X.509 Terena per i LNGS.

RUP per i fondi del Servizio Calcolo e Reti dei LNGS e per i fondi attribuiti ai LNGS dalla Commissione Calcolo e Reti dell'INFN. Dal 2017 RUP per tutti gli acquisti di materiale informatico dei LNGS.

Nel 2013 RUP per l'acquisto degli apparati di rete (cablata e wireless), dei server e del router di confine del Gran Sasso Science Institute (GSSI).

INCARICHI DI FIDUCIA

Da settembre 2013: membro del gruppo di referaggio sulle richieste finanziarie dei gruppi di lavoro della CCR.

Da luglio 2013 a luglio 2015: membro della commissione biennale per l'attribuzione degli assegni di ricerca scientifici e tecnologici dei LNGS.

A giugno 2007: commissione di esame per l'assegnazione di 5 borse di studio per giovani diplomati ai LNGS, in qualità di Presidente della Commissione.

A marzo 2014 e novembre 2015: commissione per l'attribuzione di una borsa di studio dei LNGS, in qualità di Presidente della Commissione.

A marzo 2014: commissione per l'attribuzione di un contratto di lavoro a tempo determinato, con profilo di tecnologo, ai LNGS in qualità di Presidente della Commissione.

A marzo 2015: membro della commissione per l'attribuzione di un contratto di lavoro a tempo determinato, con profilo di tecnologo, al CNAF.

A maggio 2016: membro della commissione per l'attribuzione di un contratto di lavoro a tempo determinato, con profilo di Collaboratore Tecnico E.R. di VI livello, al CNAF.

ATTIVITA' SCIENTIFICA e TECNOLOGICA

Dal 1990 al 1995 – Attivita' nell'ambito dell'esperimento MACRO

La mia attivita' ha riguardato la gestione dei dati sperimentali e dei sistemi di acquisizione e analisi.

Ho realizzato procedure automatiche in ambiente VAX/VMS per la distribuzione, la riduzione e l'archiviazione su supporti magnetici di grandi moli di dati sperimentali.

Ho collaborato inoltre alle analisi sulla composizione dei raggi cosmici attraverso lo studio dei muoni multipli.

1995 – Collaborazione CHOOZ

Ho partecipato al programma di test di fotomoltiplicatori da usare nell'esperimento CHOOZ.

Mi sono occupata principalmente dell'acquisizione dei dati e della loro successiva elaborazione in ambiente VAX/VMS.

1996 – Partecipazione all'esperimento ICARUS

Ho partecipato allo sviluppo di software per la visualizzazione dei dati sperimentali approfondendo la conoscenza del linguaggio C e di librerie grafiche in ambiente SUN Solaris.

Dal 1997 - Attivita' nell'ambito del Servizio di Calcolo e Reti dei LNGS.

Inizialmente la mia attivita' ha riguardato il supporto all'utenza scientifica dei LNGS in materia di calcolo. Ho curato il test e l'installazione di tools per la simulazione e l'analisi dati in ambiente unix

(Librerie NAG, Mathematica, Geant, Data Explorer, MCNP, ROOT,...), l'installazione della cella locale AFS, del CONDOR pool ai LNGS e collaborando alla sperimentazione del WAN CONDOR pool nazionale.

Ho partecipato al gruppo di lavoro della CCR dell'INFN su AFS e dal 1998 al gruppo di lavoro su CONDOR.

Dal 2002 al 2005 - membro del gruppo di sviluppo del software GEANT4

Ho partecipato allo sviluppo e all'esecuzione delle procedure di confronto tra dati simulati e dati sperimentali ai fini della validazione continua del software. Ho partecipato allo sviluppo di geant4 nel contesto della fisica elettromagnetica di bassa energia favorendo l'adozione di geant4 come framework di simulazione da parte degli esperimenti dei LNGS.

Dal 2007 al 2009 – partecipazione all'esperimento AUGER

Mi sono occupata dell'integrazione del software di simulazione del trigger nel framework generale di simulazione dell'esperimento e della gestione della farm di calcolo italiana dell'esperimento ospitata presso i LNGS. Ho inoltre

partecipato al setup del sistema di rivelazione del profilo verticale dell'atmosfera necessario alla ricostruzione dei dati di esperimento.

Da giugno 2005 - responsabile del Servizio Calcolo e Reti dei LNGS

Gran parte della mia attivita' e' dedicata alla progettazione, l'implementazione e la gestione delle infrastrutture di rete e calcolo e dei servizi informatici dei LNGS. Curo i rapporti tra il Servizio di Calcolo e gli esperimenti per gli aspetti riguardanti il computing e rapporti con gli altri Servizi del laboratorio.

A partire dal 2010 ho seguito la progettazione e lo sviluppo di U-Lite, un sistema integrato di calcolo, storage e backup per gli esperimenti e i gruppi di lavoro dei LNGS.

Nel 2013 ho curato la progettazione dell'infrastruttura di rete e di calcolo del nascente Gran Sasso Science Institute e ho coordinato le attività di supporto al GSSI per quanto riguarda i servizi informatici (collegamento al GARR, richiesta dominio TCP/IP, hosting del sito web, hosting della posta elettronica...).

Dal 2014 partecipo allo sviluppo di un nuovo sistema di timing per gli esperimenti dei LNGS.

Dal 2016 faccio parte del progetto Harmony della CCR sulla sicurezza informatica nell'INFN.

PUBBLICAZIONI

Co-autore di circa 100 pubblicazioni complessive, su riviste con referaggio, conference proceedings e note interne INFN.

Segue un elenco delle pubblicazioni piu' significative:

- **Measurement of the decoherence function with the MACRO detector at Gran Sasso**
MACRO Collaboration (S.P. Ahlen *et al.*). May 1992. 30 pp.
Published in Phys.Rev. D46 (1992) 4836-4845
- **The Measurement of the decorrelation function in underground muon pairs as a probe of primary cosmic ray interactions** – Grillo Aurelio F. *et al.* Astropart.Phys. 2 (1994) 335-346
LNGS-94-93
- **The photomultiplier test facility for thr reactor neutrino oscillation experiment CHOOZ and the measurements of 250 8-in EMI 935KA B35 photomultipliers** – NIM A 372 (1996)
- **The MACRO detector at Gran Sasso**
MACRO Collaboration (M. Ambrosio *et al.*). 2002. 45 pp.
Published in Nucl.Instrum.Meth. A486 (2002) 663-707
- **Comparison of Geant4 electromagnetic physics models against the NIST reference data**
Published in IEEE Trans.Nucl.Sci. 52 (2005) 910-918
- **Geant4 and its validation**
GEANT4 Collaboration (K. Amako *et al.*). 2006. 6 pp.
Published in Nucl.Phys.Proc.Suppl. 150 (2006) 44-49
- **U-LITE, 6 years of scientific computing at LNGS** INFN-17-06/LNGS 28th March 2017
- **Resource management on a VM based computer cluster for scientific computing”**
arXiv:1212.4658
- **INFN towards Cloud Computing** IEEE Proceedings of the NCCA 3rd Symposium 2014
- **U-LITE Unified LNGS IT Environment: a proposal for scientific computing at LNGS**
LNGS/TC/01/11
- **The LNGS AFS cell** INFN/TC-98/07 INFN
- **Indagine sui servizi offerti dai Servizi di Calcolo dell'INFN** – LNGS/TC01/09
- **A new control system for the LNGS atomic clock** INFN/TC-01/20 INFN

INTERRUZIONI DI CARRIERA

Nel 2004 e nel 2009 ho usufruito di due periodi di congedo per maternità.