

Appointments

1994-2005 Researcher of INFN at the National Laboratories in Frascati

2005-2017 Associate Professor of Astronomy and Astrophysics at the University of Rome Tor Vergata

2017-... Full Professor of Physics at the University of Rome Tor Vergata

2007-... INFN Research Associate

2015-2017 Member of the Virgo Editorial Board

2017-... Co-chairperson of the Virgo Editorial Board and of the joint LIGO-Virgo editorial board

2018-... National Coordinator for INFN of VIRGO

Main Scientific Responsibilities

1997-2006 Coordinator of the Gravitational Wave (GW) Nautilus experiment at the INFN Frascati National Laboratories

2004-2006 Local coordinator of the ROG (Ricerca Onde Gravitazionali – Gravitational Wave research) group at INFN Frascati National Laboratories

2006-... Team leader of the Virgo Tor Vergata group and member of the Virgo Steering Committee

2008-2010 Coordinator of the University of Tor Vergata research unit for the project “*Studio di problematiche sperimentali degli interferometri per onde gravitazionali criogenici e sotterranei*” funded by the Italian Ministry for Education, University and Research (MIUR) (PRIN Research Program 2007)

2008-2016 Manager of the Advanced Virgo Thermal Compensation System

2008-2011 National contact person of INFN for the *ET (Einstein Telescope) Design Study*, European Commission FP7 (Grant Agreement 211743) and member of the ET Governing Council. Member of the writing team of the ET Design Study.

2016-... Manager of the Aberration Control group for the Advanced Virgo commissioning

Academic Service

2008-2012 Member of the Teaching Board of the PhD course in Astronomy at the University of Rome Tor Vergata

2013-... Member of the Teaching Board of the joint PhD course in Astronomy, Astrophysics and Space Science of the Universities of Rome Tor Vergata and Sapienza

2011-... Local coordinator, Academic Advisor and member of the Selection Committee of the Erasmus Mundus Master Program “*AstroMundus, International Master’s Degree in Astronomy and Astrophysics*” funded by the European Union

2013-... Representative of the Faculty of Science in the Tor Vergata University Board for Learning, Orientation and Tutoring

2015-2017 Invited member of the Tor Vergata University Board for the International Relations and Cooperation

2015-... Member of the Tor Vergata Physics Department Executive Board

Awards

1993: Winner of the Italian Physical Society Prize for young researchers

2002: Winner of the Italian Society of General Relativity and Gravitational Physics prize “for the contribution given to the field of Relativity and Gravitation on the experiments with resonant detectors and to the studies, both experimental and theoretical, on new generation gravitational waves detectors”. Selection Committee: C. Bachas (Ecole Normale Supérieure, Paris), M. Cerdonio

(Università di Padova), G. Ellis (Cape Town, South Africa), B. Schutz (Albert Einstein Institute, Potsdam), G. Veneziano (CERN)

2016: Special Breakthrough Prize in Fundamental Physics, "For the observation of gravitational waves, opening new horizons in astronomy and physics" with the LIGO Scientific Collaboration and the Virgo Collaboration

2016: Gruber Cosmology Prize, "... for not only validating a key prediction of Einstein's general theory of relativity but inaugurating a new method for studying cosmology, in particular the workings of astronomical objects exhibiting the greatest gravitational effects in the universe" with the LIGO Scientific Collaboration and the Virgo Collaboration

2017: Albert Einstein Medal with the LIGO Scientific Collaboration and the Virgo Collaboration

Other appointments

2012-2015 Referee of the ETRUSCO-GMES experiment in the National Committee for Technological Research Experiments of INFN

2009 Member of the Selection Committee for the Gravitational Wave International Committee Thesis Prize

2010 Chair of the Selection Committee for the Gravitational Wave International Committee Thesis Prize

Referee of international journals (Classical and Quantum Gravity, Nuclear Inst. and Methods in Physics Research)

Teaching activity

- At the Physics Department of the University of Rome "Tor Vergata":

- Academic Year 2006/2007 - Academic Year 2016/2017: General Physics – Electromagnetism and Optics (Laurea Triennale)
- Academic Year 2007/2008 - ... : Gravitational Waves (Laurea Magistrale)
- Academic Year 2016/2017 - ... : General Physics – Mechanics and Thermodynamics (Laurea Triennale)
- Lectures on General Relativity and Gravitational Waves for PhD programs in Physics and in Astronomy and Astrophysics.

- At the Gran Sasso Science Institute:

- Lectures on Gravitational Waves sources and experiments since 2013

- Tutor for many bachelor, master and PhD theses.

- Active in outreach and educational activities addressed to students and teachers of secondary schools.

Conferences

Member of the Local Organizing Committee of EWASS 2012 (European Week of Astronomy and Space Science), July 1-6 2012, Rome

Convener of the session "Q&A: Everything you wanted to know about GWs but were afraid to ask" at the 20th International Conference on general Relativity and Gravitation and 10th Amaldi Conference on Gravitational Waves, July 7-13, 2013 Warsaw

Member of the Scientific Advisory Committee of "GDADW 2015 – Gravitational Wave Advanced Detectors Workshop", May 17-22, 2015, Girdwood (Alaska)

Convener of the session on "Gravitational Waves" of TAUP 2015 (Topics in Astroparticle and Underground Physics), September 7-11, 2015

Convener of the session on Gravitational Waves at RICAP-16 (6th Roma International Conference on AstroParticle Physics) June 21-24, 2016

Member of the Scientific Organizing Committee of the LXII Italian Astronomical Society Conference, May 2-5, 2018

Participation with invited talks in many international conferences

Publications

- Author of more than 250 peer-reviewed publications on international journals. h-index: 54 (Web of Science)

- Books:

“Thermal Adaptive Optics” in *Advanced Interferometric Gravitational Wave Detectors*, D. Reitze, P.R. Saulson editors (World Scientific), in press

“Gravitational Physics: from Quantum to Waves” in *Multiple Messengers and Challenges in Astroparticle Physics*, R. Aloisio, E. Coccia, F. Vissani editors (Springer International Publishing Switzerland, 2018).

Research

Research interests are in the field of gravitation, with the main focus on gravitational wave physics, sources and detectors and CMB.

Major involvement in the cryogenic GW detectors Explorer (CERN) and Nautilus (INFN Frascati Labs) and in the interferometric detector Virgo (European Gravitational Observatory in Cascina - Pisa).

Participation in the Large Scale Polarization Explorer project for detection of B-modes in CMB since 2015.

Participation in the AdCoat project on new coatings and materials for interferometric detectors in 2014-2015.

Collaborations with research groups in many international institutions, such as University of Leiden (The Netherlands), California Institute of Technology and Massachusetts Institute of Technology (USA), University of Adelaide (Australia).

Curriculum vitae di Pia Astone

Io sottoscritta Pia Astone, nata a Napoli il 10/03/1960 e residente in Roma, Via di Grottarossa 55, 00189, Codice Fiscale: STNPIA60C50F839D, presento di seguito il mio Curriculum Vitae (CV), descrivendo in modo sintetico e critico la mia attività scientifica, al fine di evidenziare i miei contributi.

Consapevole che, ai sensi dell'art. 76 del decreto del Presidente della Repubblica n. 445/2000, le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali vigenti in materia, dichiaro sotto propria responsabilità che quanto qui affermato corrisponde al vero. Il CV è redatto in forma sostitutiva di atto notorio, ai sensi degli articoli 46,47 del DPR 445/2000. La sottoscritta acconsente al trattamento dei propri dati personali, anche con strumenti informatici, ai sensi del d.lgs. 196/2003.

PRESENT POSITION

March, 2001–today: “Primo ricercatore” of the Italian Institute for Nuclear Physics (INFN) at the Rome INFN section.

Nov. 2005-today: “Professore a contratto” before, and “Professore in convenzione ente” then, to teach Physics in basic courses at the University “La Sapienza” (“Facolta’ di Medicina e Farmacia”)

2003-today: Member of the Virgo collaboration since the year 2003. And of the LIGO/Virgo collaboration from the year 2007, when the first agreement was signed

Personal web pages: <http://www.roma1.infn.it/rog/astone/>

RESEARCH FIELDS

Gravitational-Wave (GW) Physics; GW Data Analysis, with particular expertise in Transient and Stochastic Background searches (at the beginning) and in the search for Continuous Waves (CWs), in more recent years; Observational Relativity and Cosmology.

PREVIOUS POSITIONS IN INFN

1988-1990: INFN researcher, with a 2-year position. Work on data analysis, within the GW resonant detectors group (ROG), to search for transient GW signals.

1990-2000: From December 1990, INFN researcher with a permanent position. Work in GW data analysis, with emphasis on noise mitigation, search for transient signals, stochastic background and CW signals.

HIGHER EDUCATION AND PREVIOUS WORKING EXPERIENCE

1979: High school diploma “Maturità classica”, with the maximum grade (60/60^h)

1984: Master degree cum laude in Physics, at the Rome University “La Sapienza” Supervisors: Prof. G.V. Pallottino, Prof. M. Caciotta. Experimental thesis: “Analisi

mediante rumore spontaneo e stimolato delle caratteristiche di condensatori.” 1984, June 28^h

1984-1986: Work as volunteer “assistant researcher” at the Engineering Faculty of Electronics, with Prof. G. Sacerdoti, Prof. M. Caciotta.

1984-1986: High school teacher at the Technical Institute “Maxwell” and teacher at the Military School of Aeronautics in Pratica di Mare.

1986-1988: Radar systems project engineer at the firm “Contraves”, working to project delay lines and low-noise amplifiers for the X-SAR mission.

MERITS AND RESPONSIBILITIES

1998-2003: Data analysis chair and co-chair for the scientific activities of the ROG group and of the “International Gravitational Event Collaboration” (IGEC), for the search of transient signals in a network of resonant GW detectors, spread around the world (Italy, CERN, Louisiana, Western Australia). Responsible of the two agreements with ROG and the Polish Academy of Sciences, before, and the AEI Institute in Potsdam, after, for the analysis of the data of the detector Nautilus, aimed at using different methods to look for Continuous Gravitational Wave (CW) signals.

2010-2012: Virgo Chair of the “CW working group”, and co-Chair of the LIGO-Virgo CW group.

2012-2014: Virgo data analysis Chair, and co-Chair of the LIGO-Virgo Collaboration. We were preparing the LIGO and Virgo science in the Advanced Detector Era, together with the future collaboration with electromagnetic (EM) partners. In particular, the “Search Plans” proposal (by myself and the LIGO co-Chair) and related work, <https://dcc.ligo.org/LIGO-T1400054/public>, has proved to be very successful in the upcoming years, when detections had become a reality. In the same period I was member of the “Virgo Steering Committee” (VSC), the highest decisional organ in Virgo.

2012-2014: Virgo computing coordinator, with the particular mandate of developing the “Advanced Virgo Computing Model”, public link at <https://tds.virgo-gw.eu/ql/?c=9474>

2012-2015: Chair of the INFN Rome ROG group.

2013: Member of the LIGO/Virgo restricted group for the renewal of the collaborations agreement. This agreement has been very important for the successful joint activities in the advanced detectors era, started with the first detection of a binary black hole merger in September 2015.

2015: Member of the LIGO Red Team for the review of LIGO computing (charged by D. Shoemaker, for my experience as former Virgo computing coordinator). The mandate was to deeply examine the LIGO computing scope and requests prior to the presentation to the NSF (National Science Foundation). This was extremely important, after the first NSF review report of May 2014.

Sept 2015-Feb 2016: For my previous work and role, I was, in September 2015, been charged to be one of the six editors of the first discovery paper: <https://www.ligo.org/magazine/LIGO-magazine-issue-8-extended.pdf#page=34>. This has been a strong responsibility, as we had to decide not only the structure of the paper, but also the details of content, the citations and had in the end the full responsibility and the last word on any proposal.

OTHER RESPONSIBILITIES

2008-2011: Within the INFN activities in the Rome section, I had the mandate by the Director Dr. Speranza Falciano, to coordinate the education and training courses for INFN colleagues (in some cases, for educational arguments, open to students of the University).

2013-2015: Virgo Chair of the “LVC diversity committee”, which I contributed to create in Virgo, with the mission to promote awareness and appreciation of diversity, to address equity issues, and to protect minority rights in a scientific context. I wrote the document with the role of the “Ombudsperson”.

November 2017-today: Chair of the INFN task force “outreach for gravitational waves”, with the mandate of producing outreach material mainly for schools. I am now coordinating two efforts, for which we have been funded by CC3m (“Terza missione INFN”). The first is the production of a comic on the gravitational wave discovery (the target are students 14-19 years old). The idea is to produce an appealing product, with some reference to other fields, like dark matter or neutrinos, in order to possibly continue the history. The second is the production of 3 posters (history of the GW search effort, discovery, GW sources) to be mainly distributed to schools or used during public events. With Ettore Majorana, I have also constructed a low-cost (~ 150 euro)

Michelson Interferometer and prepared detailed written instructions (with pictures) for the INFN Asimmetrie journal, number summer/fall 2018, in order to divulgate this expertise within students or even push schools to add this activity in their laboratories (in the end, the school will have a new instrument, which can be used for experiences). I have given several outreach talks and some are listed in the section "Public Outreach". During the last year, from October 2017, I also joined the "Lab2Go" project, working as tutor for the "Liceo Nomentano" in Rome. I will repeat the experience next year.

TEACHING EXPERIENCE

1990-today: activity as researcher in many University classes (physics for math and chemistry courses, experimental physics for chemistry courses, electronics and physics laboratories in physics courses). From 2005, as written above, I teach Physics to first year students of "La Sapienza" (Pharmacy master degree). Here I have recently supervised a master thesis "Gli acceleratori di particelle da strumento di ricerca a realtà terapeutica" (Luca Salis, July 2018).

1995-today: Supervisor (Relatore) of many Physics Degree Thesis.

1995-today: Examiner (Controrelatore) for many Physics Degree Thesis. And for 3 PhD Thesis (1 for the Barcelona University, 2 for the AEI in Golm, Germany)

2011-today: Mentor for summer students (IREU agreement). I have supervised the work of 8 summer students working on different aspects of DA with interferometric detectors.

2016: support to the dissertation of 2 high school students for their final exam ("Maturita' classica" and "Maturita' scientifica").

2017-today: tutor in a project (Alternanza Scuola-Lavoro) for the revaluation of the physics laboratory in high schools, called "Lab2Go" (where I am in charge for the liceo "Nomentano").

2017-today: Supervisor of a PhD in Physics student, Andrew Miller (joint with a Professor from the University of Florida, Prof. Bernard Whiting).

2017/2018: Tutor "Phys Lab II" (assigned by "Giunta CAD of the Physics Department", "La Sapienza", Rome).

INTERNATIONAL CONFERENCES AND SCHOOL ORGANIZATIONS

I have been in the Scientific Organizing Committee (SOC) and in the Local Organizing Committee (LOC) of International conferences. Very recently:

- In 2016, Scientific Organizing Committee member for the PhD student school "5th GraWIToN School - 2nd DAS School", October 2016, 24-28, Rome "La Sapienza" University.
- 2018: in the SOC of "GEMMA" conference on GW, Multimessenger Astronomy, Dark Matter.
- LOC of the "First European Physicist Society Conference on Gravitation", that will be held in Rome on February 2019.

A detailed list is attached at the end of this CV, in the section "List of relevant Invited Talks and Conference Organization"

REFeree ACTIVITY

2011-today: I am reviewer for the National Agency for the Evaluation of Universities and Research Institute (ANVUR): “revisore di prodotti di ricerca per la VQR per conto dell'ANVUR”.

VQR stands for “evaluation of the quality of research products” and I have revised 3 papers.

I am also reviewer for the Italian Ministry of Research (MIUR) of the “Programmi per Giovani Ricercatori Rita Levi Montalcini” and I have evaluated two proposals in the last 2 years.

In the years 2012-2013, I have been reviewer of two FIRB proposals (“Future in Research” program).

In the year 2017 I have evaluated, as MIUR expert (as indicated in the REPRIS data base), a project for the Department of Mathematics, Informatics and Physics of the University of Udine (charged by the “Area servizi ricerca Università di Udine”).

1995-today: Referee for many journals, including “Physical Review D”, “Physical Review Letters”, “Classical and Quantum Gravity” (O(10) papers in two years).

2007-today: Internal Referee for several papers and presentations authored by LIGO-Virgo colleagues. And, in the case of the August 2017 detection, internal reviewer of one paper authored by a group of our EM partners. Internal reviewer for search procedures (recently, Testing General Relativity, CW analysis with E@H, Testing the equivalence principle).

PUBLICATIONS

Author of more than 270 papers on international journals with referees.

H-index (Scopus, July 2018): 52

The complete list of publication (taken from Scopus, July 2018) is attached.

INVITED TALKS

Besides the many contributions at Scientific conferences and workshops, invited speaker at many Scientific International Conferences. Among the others, back in 2001 I was invited to Perth for the “4th E. Amaldi conference” to summarize results and status of resonant GW detectors and also interviewed for the Western Australia Newspaper. Coming to recent years, in 2015 I have been invited at the Marcel Grossman Meeting, to give a summary on the status of the LIGO/Virgo CW searches. I was invited two times, as plenary speaker, by the organizers of the Spanish General Relativity Meeting (ERE), the latest time was in September 2015 (immediately before the GW discovery). In December 2017 I was invited to present the recent LIGO/Virgo discoveries at the Italian Space Agency (ASI) workshop, <https://www.asi.it/it/eventi/workshop/workshop-onde-gravitazionali-asi-4-dicembre>. From January to March 2018 I have been invited to other 3 international conferences, on different subjects all related to my activity on GWs. In May 2018 I have been invited to give the opening lecture at the “Luce, Imaging, Microscopia, Spettri” (LIMS) workshop, <http://www.frascati.enea.it/LIMS2018/>, on the role of optical technology in the GW discovery.

PUBLIC OUTREACH

From Feb. 2016 to today:

- Invited (February 2016) at the Press release in Cascina (at the European Gravitational Observatory (EGO)) on February 12th to announce the first GW discovery. In particular chosen to comment the discovery, from the EGO site, for the wide public in Italy on Rai News 24, immediately after the announcement in Cascina and Washington. The official INFN announcement for the detection contains my interview. I was also in charge to edit the text of the announcement. Released interviews on the first direct gravitational-wave detection, gravitational waves, and interferometers at TV stations (Rai News 23, Rai 2 in “Rai 2 Storie, with an interview on November 2016, TV 2000 for a “Telegiornale”) radio stations (RadioPadania for the first detection, Rai 2 for the second detection), newspapers, like La Stampa, Il Giornale, Repubblica and many others). In addition to these, an interview to the monthly edited “La Freccia” (Trenitalia) in April 2016.
- Many seminars delivered at Italian middle and high schools. One seminars also in one Elementary school.
- Seminar on gravitational waves organized by the Physics Department of “La Sapienza” in January 2018 for high schools, open with reservation (~ 200 students).
- Outreach seminars (in particular, three for the “Astronomiamo” association), on GWs and on Testing GR.
- Testimonial of one event held during the “Settimana internazionale del cervello”, in March 2017, organized by Istituto Tumori Regina Elena.
- Lectio Magistralis at the 57 Congresso Nazionale SNO Scienze Neurologiche applicate. Napoli, May 2017.
- May 2018: invited lectures (together with Prof. S. Frasca) at the annual “Matlab Expo” events, in Rome and Milan. The reason for this invitation is related to the award we have received from Matworks, cited in the AWARDS section.
- Within the INFN outreach event “Particelle in biblioteca”, I gave a lecture at “Biblioteca Villino Corsini”, 2017, May 4th. See: <https://www.bibliotechediroma.it/opac/news/a-spesso-per-lo-spaziotempo-che-cosa-sono-le-onde-gravitazionali-e-come-le-abbiamo-scoperte/18295>
- June, 15th invited 18 minutes speech at TEDxMonopoli on “One, mari e correnti innovative”. See: <https://tedxmonopoli.com/> (talks are being loaded under the official TEDx pages).
- RAI scuola and RAI 3: Galileo Memex TV Program: interview on GW missing sources and presentation of a significant representative piece of the experiment. Will be transmitted on 2018 October 19th: <http://www.raiscuola.rai.it/programma-unita/memex-galileo/301/-1/default.aspx#Puntate>
- In July 2018: member of the technical panel for the Photowalk 2018 event, <http://edu.lnf.infn.it/photowalk-2018/>. We have presently selected the top 10 pictures, among a total of ~ 200 done in the INFN National Laboratories (Frascati, Legnaro, SUD, Gran Sasso).
- July 2018: with Ettore Majorana. Instructions (mainly for 16-20 years-old students and schools) on how to construct a low cost Michelson Interferometer, for Asimmetrie (next issue).

Within the INFN “Commissione Terza Missione” (CC3m) activities, I was in November 2017 nominated chair of the INFN task force for “Outreach for Gravitational Waves”, with the mandate of producing outreach material mainly for schools. We are now working on a comic on the GW discovery (a story on and around the detection) and on posters on GWs.

NATIONAL AND INTERNATIONAL ACKNOWLEDGMENTS

1. December 11, 2017. Physics World 2017 Breakthrough of the Year Award for the direct Gravitational-Wave (GW) detection.
2. May 2016. Special Breakthrough Prize for the direct GW detection.
3. July 12, 2016. Gruber Cosmology Prize for the first GW detection, <http://gruber.yale.edu/ligo-team-members>.
4. A major acknowledgement to my career - devoted to the search for GW since the year 1988- was the fact that the LIGO/Virgo collaboration charged me, together with other 5 colleagues, to coordinate the writing of the first detection paper, in Sept 2015.
5. Related to point 4, I was charged, on February 2016, to report the detection result to important national newspapers. The official INFN press release reports my comments, <http://home.infn.it/it/comunicazione/comunicati-stampa/1771-osservatele-onde-gravitazionali-a-100-anni-dalla-previsione-di-einstein>.

FUNDING SUPPORT BASED ON SELECTIVE COMPETITIONS

2016: Under the direction of Prof. Sergio Frasca, the Virgo Rome data analysis group has been awarded of a MathWorks grant, including 20keuro, ~ 60 free licences and support (as detailed in an agreement under the responsibility of by Prof. S. Frasca). The two lectures (one in Rome and one in Milan) I have given, together with Prof. S. Frasca, at Matlab EXPO (May 2018) are related to the project funded by this grant.

January 2018-today: Member of the Steering Committee, for the project “Department of Excellence”, assigned to the Physics Department of the Rome Sapienza University by the ANVUR: www.anvur.org/attachments/article/1205/All6DElenco180Ammessi.pdf. The Steering Committee will play a fundamental role for the success of the project and I am in charge to coordinate the investments related to the computing needs of the data analysis activities.

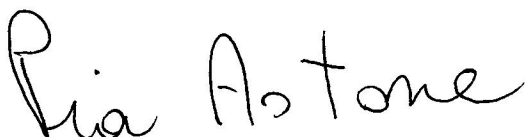
List of relevant Invited Talks and Conference Organization

- Organizing Committee of the First Edoardo Amaldi Conference on Gravitational Waves. Villa Tuscolana Frascati 14-17 Giugno 1994;
- Advisory Committee of the 4th Gravitational Waves Data Analysis Workshop, Rome, 2-4 Dec 1999
- International Advisory Committee of the 4th Amaldi Conference, 8-13 July 2001
- Invited Speaker at the 27th Spanish Relativity Meeting, Alicante Spain 2003
- Advisory Committee of the 10th Annual Gravitational Waves Data Analysis Workshop, Brownsville Texas (US),
- LOC of the 10th Gravitational waves data analysis workshop GWDAW14. Rome, 2010
- Presenter at the 10th Gravitational waves data analysis workshop GWDAW14. Rome, 2010. Title: "A method for detection of known sources of continuous gravitational wave signals in non-stationary data".
<https://agenda.infn.it/abstractDisplay.py?abstractId=93&confId=1157>
- Invited talk at the 9th Amaldi Conference, Cardiff (2011). "Recent results for the search of Continuous waves with the LIGO and Virgo detectors" (contribution published on CQG 27 (19) 2012)
- Session organizer, with Prof. Alan Weinstein, at the combined Amaldi 10 and General Relativity and Gravitation (GR20) conference. Session title : "Gravitational Waves: Search Results, Data analysis and Parameter Estimation". Co-author (first name) of the session summary published on General Relativity and Gravitation, available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4579869/>
- Invited talk at "New perspectives in time domain astronomy: electromagnetic follow-up of gravitational wave candidates" INAF (Istituto Nazionale di Astrofisica) Monte Mario, Roma, 5 Dicembre 2013. "GW searches with the LIGO and Virgo detectors: recent results and perspectives for the Advanced Detectors Era". This conference was needed within the organization of the joint Gravitational Waves and EM follow up work in the upcoming era
- Invited talk at the 14th Marcel Grossman Meeting, July 2015 Rome. "Searched for Continuous Wave Sources: recent results and plans for the Advanced Detector Era"

- Invited Speaker at the Spanish Relativity Meeting, ERE2015, Palmas de Mallorca . 7-11 Settembre 2015. <http://grg.uib.es/ERE2015/> . “GW searches with the LIGO and Virgo detectors: recent results and perspectives for the upcoming Advanced Detectors Era”.
- Scientific Organizing Committee member for the PhD student school “5th GraWIToN School - 2nd DAS School”, October 2016, 24-28, Rome “La Sapienza” University. And speaker in two (theory + exercises) sections on Continuous Wave searches.
- Lectio Magistralis at the 57 Congresso Nazionale SNO Scienze Neurologiche applicate. Napoli, 24 maggio 2017. Title: "La scoperta delle onde gravitazionali" https://www.avenuemedia.eu/wp-content/uploads/2017/05/SNO_prog_finale.pdf
- Invited talk at the Italian Space Agency (ASI) workshop, <https://www.asi.it/it/eventi/workshop/workshop-onde-gravitazionali-asi-4-dicembre>. “Observation of gravitational waves from a binary neutron star inspiral with the LIGO and Virgo detectors”. 4 dicembre 2017.
- 2018: member of the SOC of “GEMMA” conference on GW, Multimessenger Astronomy, Dark Matter (Lecce. Giugno 2018).
- Invited talk at: "Clues on GRB origin from chemical evolution models", Sexten 28 Gennaio-2 Febbraio 2018. "Observation of gravitational waves from a binary neutron star merger with LIGO and Virgo detectors"
- Member of the LOC of the “First European Physicist Society Conference on Gravitation”, that will be help in Rome on February 2019.
- GRASS: Gravitational Waves Science and Technology Symposium, Padova, Marzo 2018. Invited talk. “ Recent results and future challenges for Continuous waves and Stochastic background searches with a network of gravitational wave detectors” Web site: <https://agenda.infn.it/conferenceDisplay.py?confId=14869> .
- Problemi attuali in Fisica Teorica, "Gravitational Waves". Invited talk : “Present results and future challenges with the network of gravitational wave detectors”. 26-03-2018
- Invited talk (opening lecture) at the LIMS (Luce, Imaging, Microscopia, Spettri di Applicazione) organized by the research center ENEA in Frascati for the International Day of light. See: <http://www.lightday.org/> And: <http://www.frascati.enea.it/LIMS2018/>. 17/05/2018. Talk title: "The discovery of gravitational waves and the contribution of optical technologies".

Roma, 10 settembre 2018

In fede,



Pia Astone

CV Sintetico Prof. Matteo Barsuglia.

Matteo Barsuglia è direttore di ricerca al CNRS, a Parigi.

Si è laureato a Pisa, con il gruppo guidato da Adalberto Giazotto, e ha conseguito un dottorato all'università di Paris Sud, con il gruppo guidato da Alain Brillet.

Da più di vent'anni s'interessa allo sviluppo di rivelatori interferometrici di onde gravitazionali.

Dal 2005 al 2007 ha guidato il gruppo che ha effettuato la messa a punto della prima versione del rivelatore Virgo.

In seguito ha contribuito al disegno e alla costruzione del rivelatore Advanced Virgo, come responsabile scientifico del disegno ottico dello strumento nel suo insieme e in particolare dei telescopi di mode-matching.

Dal 2008 è il responsabile del gruppo Virgo al laboratorio Astroparticule et Cosmologie di Parigi. E' stato professore invitato al National Astronomical Observatory di Mitaka-Tokyo e insegna alla scuola di dottorato STEP'UP di Parigi.

È stato uno dei coordinatori della recente pubblicazione LIGO-Virgo sulle onde gravitazionali emesse dalla fusione di due stelle di neutroni.

Ai fini della Pubblicazione su sito trasparenza Sapienza

Giovanni Losurdo - Curriculum Vitae

Email: losurdo@fi.infn.it – losurdo@ego-gw.it

Tel: +390554572260 - +39050752317

Homepage: <http://hep.fi.infn.it/Gruppo2/losurdo>

POSITIONS HELD

- 2004-present** Researcher, permanent position, Istituto Nazionale di Fisica Nucleare, Firenze
- May 2000-2003** Research fellow (“assegno di ricerca”), Istituto Nazionale di Fisica Nucleare, Firenze
- 1998-April 2000** Post-doctoral Fellow, Istituto Nazionale di Fisica Nucleare, Pisa, Italy.
-

EDUCATION

- 1999** PhD in Physics. Title of the thesis “*Ultra-Low Frequency Inverted Pendulum for the VIRGO Test Mass Suspension*”, Scuola Normale Superiore di Pisa, approved *summa cum laude* on March, 27th 1999. Advisor: Prof. Francesco Fidecaro (Universita’ di Pisa), referees: Prof. Peter Saulson (Syracuse University), Prof. Jim Hough (University of Glasgow). <http://www.infn.it/thesis/PS/499-Losurdo-dottorato.ps>
- 1993** “Laurea in fisica” (M.A. in physics). Title of the thesis “*Studio e realizzazione di un sistema di raffreddamento dinamico inerziale per il superattenuatore dell’antenna interferometrica VIRGO*” (An inertial damping system for the VIRGO superattenuator). Approved *summa cum laude* on July, 14th 1993. Advisor: Prof. Adalberto Giazotto.
-

MAIN RESPONSIBILITIES

Scientific responsibilities:

- **Advanced Virgo Coordinator**
- Director of the “International VESF school on gravitational waves”
- Chair of the Working Group 1 of the FP6 European Project ILIAS-GWA
- Member of the Virgo Steering Committee
- Member of the Virgo Speakers Bureau

INFN Commitments

- Member of the National Scientific Commission II (Astroparticle Physics)
- Coordinator of the Astroparticle Group at the INFN Firenze Lab

RESEARCH

Involved since 1992 in the VIRGO project for interferometric detection of **gravitational waves**.

Advanced Virgo (2005-present)

Since 2005 he is involved in the Advanced Virgo project, since 2006 he is the project coordinator:

- he coordinated the R&D within the Virgo Collaboration
- he has coordinated the preparation of the *Advanced Virgo Conceptual Design* and of the *Project Execution Plan and Cost Plan*
- he coordinates the activity of the Advanced Virgo subsystem manager
- he coordinates the preparation of the *Advanced Virgo Technical Design*

The commissioning of the Virgo detector (2001-present)

Since 2001 he has been deeply committed with the commissioning of the Virgo detector, mostly dealing with:

1. the **control strategy** of the superattenuator. He has been responsible for the Virgo Mirror Suspension Control (MSC) until September 2006;
2. **locking** and **alignment** issues;
3. **noise analysis**: he has been coordinator of the “seismic noise analysis” group.

Since 2003 he dealt with the commissioning of the full Virgo detector. He has been coordinator of the MSC (Mirror Suspension Control) Group. In particular he dealt with:

1. the inertial damping of the Superattenuator;
2. the local active control of the mirrors;
3. the reduction of the laser frequency noise;
4. the hierarchical control of the mirrors.

The superattenuator (1992-2000)

In the period 1992-2000 he gave a major contribution to the design, realization and test of the Superattenuator, the unique vibration isolation system for the Virgo mirrors. His main contributions concern:

1. the displacement and inertial sensors, to be used for the active control of the superattenuator;
2. the active control strategy;
3. the superattenuator mechanics;
4. the idea, design, construction and test of a ultra-low frequency mechanical pre-isolator (inverted pendulum) to be integrated in the superattenuator;
5. the idea and realization of the inertial damping;
6. the test and characterization of the first superattenuator prototype;
7. the complete Virgo mirrors control strategy

R&D: thermal noise reduction

Since 2003 he is responsible of a new lab at INFN-Florence dedicated to R&D activities on thermal noise reduction for 2nd and 3rd generation interferometers. He is coordinating the research on the use of silicon for the test mass suspensions in cryogenic interferometers and on the refinement of the measurements on coating thermal noise in second generation detectors.

R&D: Low Frequency Facility

He has participated to the Low Frequency Facility, an experiment to study the low frequency thermal noise in a Virgo-like Superattenuator.

VISITORSHIPS

- 2007** April-May, *Visiting scientist* at MIT, LIGO laboratory.
 - 2003** October, *visitor* at University of Glasgow, Institute for General Relativity.
 - 2002** September-October, *visitor* at University of Glasgow, Institute for General Relativity.
 - 2001** July-August, *visitor* at University of Tokyo, Department of Physics.
 - 2000** July-August, *visitor* at California Institute of Technology, Pasadena.
 - 1999** July-August, *visitor* at California Institute of Technology, Pasadena.
 - 1997** February-April, *visiting student* at University of Western Australia, Perth, under the supervision of Prof. D.G.Blair.
-

RESPONSIBILITIES

Virgo

- 2006-present** **Advanced Virgo Coordinator**
- 2006-present** Member of the Virgo Speakers Bureau
- 2003-present** Responsible for the INFN Florence lab dedicated to R&D activities for advanced interferometers.
- 2005-2006** Co-Coordinator of the work package “monolithic suspension” for the upgrade of the Virgo detector.
- 2004-2006** Responsible for the MSC (Mirror Suspension Control) activities in Virgo.
- 2004-2005** Member of the group responsible for writing the “white paper” for the Advanced Virgo detector.
- 2003-2004** Convenor of the Virgo Collaboration Meetings.
- 2002-2003** Coordinator of the analysis of the effect of seismic noise on Virgo.

INFN

- 2007** Observer of the INFN National Scientific Commission II in the National Scientific Committee V (Technological research)
- 2006-present** Member of the INFN National Scientific Commission II (Astroparticle physics)
- 2006-present** Coordinator of the area “Astroparticle and general physics” at INFN Firenze

Other international responsibilities

- 2005-2007** Director of the VESF school on gravitational waves
- 2003-present** Coordinator of the working group 1 of the ILIAS-GWA FP6 project
- 2003-present** Member of the ILIAS-GWA Executive Board
-

REVIEW ACTIVITIES

Journals

He has served as referee for *SCIENCE*, *Review of Scientific Instruments* and *Classical and Quantum Gravity*

Panels and boards

- Member of the *National Science Foundation Review Panel for Advanced LIGO*. CALTECH, Pasadena (CA), June 2003.
- Member of the *review committee* for the *Preliminary design review of the Advanced LIGO test mass suspension*, July 2006

Proposals e applications

- *Referee* (appointed by LIGO) of proposals for NSF grants, 2007
- *Referee* for the STFC (Science&Technology Facilities Council, UK) of *applications* for post-doc positions, 2007

PhD Thesis

Referee of the PhD thesis: “Advanced test mass suspensions and electrostatic control for AIGO”, by B.Lee, University of Western Australia, 2007

ORGANIZATION OF SCHOOLS AND CONFERENCES

- Member of the of the scientific board of the “Virgo-SIGRAV school on gravitational waves”, eventually named VESF school (2002-present).
- Director of the VESF school on gravitational waves (2005-2007)

- Member of the “Local Organizing Committee” of the “Fifth E.Amaldi Conference on Gravitational Waves”, Tirrenia (PI), July 2002.
- Member of the *Advisory Committee* of the workshop “Toward a 3rd generation European Gravitational Wave Observatory”, Perugia, September 2005.
- Member of the *Organization Board* of the “3rd ILIAS-GWA Annual General Meeting”, London, Oct 06.
- Member of the *Organization Board* of the “4th ILIAS-GWA Annual General Meeting”; Tübingen (D), Oct 07.

TALKS AT INTERNATIONAL CONFERENCES

- 2008** Jaca (Spain), “5th ILIAS General Annual Meeting”, *Status of the Gravitational Wave detectors*
- 2008** Austin (Texas), **American Astronomical Society** Winter meeting, *The next generation of ground based GW detectors*, invited talk, on behalf of Virgo Coll. And LIGO Scientific Community
- 2007** Manchester (UK), “European Physical Society **HEP07**”, *The next generations of GW interferometric detectors* (approved by Virgo Coll. and LIGO Scientific Coll.)
- 2007** Tübingen, “4th ILIAS-GWA Annual Meeting”, *Advanced Virgo Baseline Design*
- 2007** Chambery, “4th ILIAS General Annual Meeting”, *The commissioning of Virgo and GEO600*
- 2006** Moscow, **ICHEP2006**, *LIGO and Virgo: large interferometers searching for gravitational waves. (First LIGO-Virgo joint talk, reviewed by both Collaborations).*
- 2006** Isola d'Elba, “Gravitational Waves Advanced Detectors Workshop”, *The control of the Superattenuator: present and future*
- 2006** London, “3rd ILIAS-GWA Annual Meeting”, *Status of Working Group 1*
- 2006** London, “3rd ILIAS-GWA Annual Meeting”, *Towards Advanced Virgo*
- 2005** Perth (Australia), Italy-Australia workshop on GW detection”, invited talk: *The status of Virgo.*
- 2005** Warwick (UK), “IoP2005 – Physics: a century after Einstein”, invited talk: *Virgo: status and perspectives.*
- 2005** Munich, “1st European Astroparticle Town Meeting”, *Infrastructure for 3rd generation detectors*
- 2004** Roma, “2004 IEEE Nuclear Science Symposium”, *The Control of the Mirror Suspensions in GW Interferometric Detectors*
- 2004** Paris, “ILIAS 1st General Annual Meeting”, *ILIAS-GWA Work Package 1: status and perspectives*
- 2004** Vietri sul Mare, “XVI SIGRAV conference on general relativity and gravitational physics”, invited plenary talk: *Virgo and the worldwide search for gravitational waves.*

- 2003** Sorrento, “Thinking, observing and mining the universe”, invited talk: *The status of Virgo*
- 2003** CERN, Ginevra, “Workshop on Cosmology and Particle Physics (CAPP 2003)”, invited long talk: *Interferometer experiments*.
- 2002** Isola d’Elba, “Gravitational Waves Advanced Detectors Workshop”, invited talk: *The Status of Virgo*
- 2001** Perth, “Fourth Edoardo Amaldi Conference on Gravitational Waves”. Invited talk: “Inertial Control of the VIRGO Superattenuator”.
- 2000** Rome, “Ninth M.Grossmann Meeting on General Relativity”. Invited talk: “Mirror Suspension Inertial Damping”.
- 1999** Pasadena, “Third Edoardo Amaldi Conference on Gravitational Waves”. Talk and poster: “Inertial Control of the VIRGO Superattenuator”.
- 1999** S.Miniato (Pisa), “6th San Miniato Topical Seminar on Neutrino and Astroparticle Physics”. Talk: “Astrophysical Sources of Gravitational Waves”.
- 1997** Geneva, “Second Edoardo Amaldi Conference on Gravitational Waves”. Talk: “Active Control Hierarchy in VIRGO Superattenuator”.

SEMINARS

- 2007** Massachusetts Institute of Technology (Cambridge, MA)
- 2006** European Southern Observatory (Garching, Germany)
- 2005** National Astronomical Observatory of China (Beijing, China)
- 2005** University of Florence (Italy)
- 2004** “3rd Virgo-SIGRAV school on gravitational waves” (Cascina, Italy) – Invited lecture
- 2002** University of Glasgow (Glasgow, UK)
- 2002** INFN Florence (Italy)
- 2001** University of Birmingham (Birmingham, UK)
- 2001** University of Tokyo (Tokyo, Japan)
- 2000** European Southern Observatory (Garching, Germany)
- 1999** California Institute of Technology (Pasadena, CA).
- 1999** Stanford University (Palo Alto, CA).
- 1999** “International summer school on experimental physics of gravitational waves”, Urbino (Italy). Invited lecture
- 1997** University of Western Australia (Perth, WA).

TEACHING, THESIS, OUTREACH

Teaching

Since 1997 to 2001, *Teaching Assistant* in the course of General Physics at the Departments of Informatics and Mathematics, University of Pisa.

PhD thesis

Supervisor of the PhD thesis: “Suspension thermal noise issues for advanced GW interferometric detectors”, by M.Lorenzini, Department of Astronomy, Florence University (2005-2007)

Outreach

- Responsible of the section “Interferometers” in the online Bulletin of the SIGRAV (Italian Society of Gravitation) (<http://www.sigrav.org/Bollettino/index.php>)
- Involved in the Virgo School visits program
- Interviewed for the BBC documentary film “Cosmos: a beginner’s guide”, 2007

Giovanni Andrea Prodi (1961) si occupa di gravitazione sperimentale dalla sua tesi di Laurea in Fisica (1986). E' professore associato di fisica sperimentale presso il Dipartimento di Fisica dell'Università di Trento dal 2002. Da Giugno 2016 è Data Analysis Coordinator di Virgo, collaborazione internazionale per la ricerca delle onde gravitazionali. Il gruppo di ricerca di Prodi ha contribuito direttamente alla prima rivelazione delle onde gravitazionali, nell'ambito della collaborazione con LIGO Scientific Collaboration e Virgo. Sta partecipando ad esperimenti relativi al Principio di Indeterminazione, per la ricerca di eventuali effetti di gravità quantistica (esperimento HUMOR, INFN).

E' co-autore di più di 200 pubblicazioni in riviste internazionali (<http://www.researcherid.com/rid/B-4398-2010>).

Negli anni 1999-2005 è stato Responsabile del Gruppo Collegato INFN presso il Dipartimento di Fisica di Trento. Dal 2008 al 2012 è stato membro del Consiglio di Amministrazione dell'Università di Trento. Negli anni 2010-2012 è stato Coordinatore Didattico dell'Area Fisica per la Facoltà di Scienze di Trento. E' stato Coordinatore della Scuola di Dottorato in Fisica di Trento da aprile 2014 a luglio 2016.

Ha partecipato alla realizzazione del rivelatore criogenico per onde gravitazionali a barra risonante AURIGA presso i Laboratori Nazionali di Legnaro dell'INFN. E' stato responsabile locale dell'esperimento AURIGA presso Padova e Trento fino al 2007, coordinando le attività sperimentali e di analisi dati. fino al 2007. E' stato coordinatore scientifico di IGEC (International Gravitational Event Collaboration, 1998-2002), la prima iniziativa per la ricerca di onde gravitazionali impulsive mediante la rete mondiale dei cinque rivelatori a barra risonante allora operanti, comprendente tutti i gruppi di ricerca impegnati in quel settore. Negli anni 2004-2006 è stato co-chair del gruppo di lavoro congiunto AURIGA-LIGO che ha preparato la prima ricerca per onde gravitazionali impulsive tramite una rete mista di rivelatori interferometrici e risonanti. Dal 2004 al 2006 è stato co-chair del gruppo di lavoro europeo sulle osservazioni congiunte e sull'analisi dati delle ricerche per onde gravitazionali nell'ambito del progetto ILIAS-GWA (European Commission).

Nel 2007 entra in Virgo Collaboration e fino al Giugno 2016 è responsabile del gruppo Virgo di Padova-Trento e membro del Virgo Steering Committee. Negli anni 2010-2014 è co-chair del "Data Analysis Burst Group", il gruppo di lavoro congiunto di LIGO Scientific Collaboration e di Virgo per le ricerche per onde gravitazionali transienti di tipo generale. Da giugno 2016 è Data Analysis Coordinator della Virgo Collaboration.

E' stato responsabile di Unità di Ricerca in progetti nazionali PRIN 1999, 2007 e 2011, e nel progetto QUANTOM (QUANTum Opto-Mechanics, progetto premiale MIUR 2013).