

Viviana Fafone

Physics Department, University of Rome Tor Vergata, V. della Ricerca Scientifica 1, 00133 Rome, Italy | Phone: +39 0672594563 | viviana.fafone@roma2.infn,.it

Positions

- 1994-2005 INFN researcher at the Frascati National Laboratories
- 1/11/2005-28/02/2017 Associate Professor of Astronomy and Astrophysics at the University of Rome Tor Vergata
- 1/3/2017-... Full Professor of Physics at the University of Rome Tor Vergata

Main Scientific and Coordination Responsibilities

- 1997-2006 Coordinator of the Gravitational Wave detector Nautilus 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
- 2016-2019 Manager of the Thermal Compensation System for the Advanced Virgo commissioning
- 2017-... Co-chair of the Virgo Collaboration Editorial Board
- 2018-... National Representative of the Virgo experiment
- 2019-... Scientific Coordinator (PI) of the project “ENIGMA: ENabling technologies for the upgrades of second generation and for third generation ground-based Interferometric Gravitational wave detectors in the medium- and high-frequency range: the keystone to foster Multimessenger Astronomy” (PRIN Research Program 2017)
- 2019-2022 Manager of the Advanced Virgo Plus Thermal Compensation System
- 2019-... Member of the Einstein Telescope Steering Committee
- 2019-... Member of the Einstein Telescope Pathfinder Scientific and Technical Advisory Committee
- 2020-... Member of the Virgo Organization Committee (8 senior Collaboration members), appointed to define the new Virgo Collaboration Statute (Collaboration governance and functioning rules for the governing bodies)
- 2020-... Local responsible for the project AHEAD2020 (Integrated Activities for the High Energy Astrophysics Domain) - H2020-INFRAIA-2019-1
- 2021- Chair of the Virgo post O5 Committee (12 members), appointed to draw the roadmap for the future of Virgo in the 2025-2035 decade

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
- 2011-2019 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
- 2013-2021 Delegate of the Faculty of Science in the Tor Vergata University Board for Learning, Orientation and Tutoring
- 2015-2017 Invited member in the Tor Vergata University Board for the International Relations and Cooperation
- 2015-2018 Member of the Tor Vergata Physics Department Executive Board
- 2021-... Member of the Administration Board of the Fondazione Universitaria CEIS – Economia – Tor Vergata

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

- 2010 Chair of the Selection Committee for the GWIC (Gravitational Wave International Committee) Thesis Prize
- 2021 Member of the Selection Committee for the Guido Horn D’Arturo Prize of the Italian Astronomical Society
- Referee for international journals
- Referee for national agencies

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 in Science and Technology for Media)

- Academic Year 2007/2008 - ... : Gravitational Waves (Laurea Magistrale in Physics)
- Academic Year 2016/2017 - ... : General Physics – Mechanics and Thermodynamics (Laurea in Physics)
- 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 from 2013 to 2021

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
- Convener of the session Second Generation Interferometer Commissioning at the “GDADW – Gravitational Wave Advanced Detectors Workshop”, May 19-25, 2019
- Member of the SOC of the 2nd GRAvitational – wave Science&technology Symposium (GRASS 2019), October 17-18, 2019 (Padova, Italy)
- Convener of the session Beyond Second Generation at the “GDADW – Gravitational Wave Advanced Detectors Workshop”, May 17-21, 2021

Participation with invited talks in many international conferences

Publications

- Author of more than 330 peer-reviewed publications on international journals. h-index: 78 (Web of Science)
- Books:
 - “Gravitational Physics: from Quantum to Waves” in Multiple Messengers and Challenges in Astroparticle Physics, Springer International Publishing Switzerland, 2018
 - “Thermal Adaptive Optics” in Advanced Interferometric Gravitational Wave Detectors, World Scientific, 2019

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) from 1992 to 2016 and in the interferometric detector Virgo (European Gravitational Observatory in Cascina - Pisa) since 2006
- 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 – Marco Cavaglià

Work Address

Physics Department
Missouri University of Science and Technology
1315 N. Pine St., Rolla, MO 65409, USA

Academic Education and Present Position

- **January 2019 - present: Professor** at the Physics Department, Missouri University of Science & Technology, USA.
- **July 2017 - December 2018: Professor** at the Department of Physics and Astronomy, University of Mississippi, USA.
- **July 2010 - June 2017: Associate Professor** at the Department of Physics and Astronomy, University of Mississippi, USA.
- **January 2004 - June 2010: Assistant Professor** at the Department of Physics and Astronomy, University of Mississippi, USA.
- **October 2003 - December 2003: Adjunct Professor** at the Department of Physics and Astronomy, University of Mississippi, USA, and **Visiting Professor** at the Department of Theoretical Physics, University of Torino, Italy.
- **October 2002 - September 2003: Lecturer** at the Institute of Cosmology and Gravitation, University of Portsmouth, U.K.
- **September 2000 - August 2002: Bruno Rossi Postdoctoral Fellow** at the Center for Theoretical Physics, M.I.T., Cambridge MA, USA.
- **October 1999 - August 2000: Postdoctoral Research Associate** at the Department of Physics, University of Beira Interior, Covilhã, Portugal.
- **September 1997 - September 1999: Postdoctoral Position** at the Max-Planck-Institut für Gravitationsphysik, Albert-Einstein-Institut, Golm, Germany.
- **January 1997 - August 1997: Research Associate** at Tufts University, Dept. of Physics and Astronomy, Medford MA, USA.
- **October 28th, 1996: Ph.D. Degree in Astrophysics.** Title of the Thesis: *Quantisation of Gauge Systems: Application to Minisuperspace Models in Canonical Quantum Gravity*. Supervisors: Prof. Vittorio de Alfaro, Prof. Dennis W. Sciama; External Examiner: Prof. Carlo Rovelli.
- **November 1992 - October 1996: Ph.D. Course in Astrophysics** at the International School for Advanced Studies (SISSA). All examinations passed with honors. From December 1st, 1994 to November 31st, 1995: National Community Service.
- **July 1992: University Degree (*Laurea*, equivalent to MSc.) in Physics**, University of Torino. Title of the Thesis: *Anisotropic Electromagnetic Wormholes*. Graduating marks: 110/110 Summa cum laude and Honorable Mention.

- **1988 - 1992: 4-Year course in Physics** at the University of Torino. All examinations passed with honors.

Other Academic Positions

- **Visiting Professor** at the Institute for Pure and Applied Mathematics, University of California-Los Angeles (September 2021 - December 2021).
- **Adjunct Professor** at the Department of Physics and Astronomy, University of Mississippi, USA (January 2019 - December 2020).
- **Visiting scientist** at the California Institute of Technology, LIGO Laboratory. November 1st, 2007 - May 4th, 2009 and February 1st, 2015 - June 17, 2015.
- **Graduate Faculty** at the University of Alabama. Academic years 2007-08, 2014-15.

Honors and Professional Awards

- **December 2020:** 2020 Faculty Research Award, Missouri University S&T.
- **March 2019:** National Air and Space Museum's 2019 Current Achievement Trophy, shared with the LIGO Collaboration.
- **June 2017:** Princess of Asturias Award for Technical and Scientific Research, shared with Rainer Weiss, Kip S. Thorne and Barry C. Barish (main recipients) and the LIGO Scientific Collaboration.
- **January 2017:** AAS – Bruno Rossi Prize, shared with Gabriela Gonzalez (main recipient) and the LIGO Scientific Collaboration.
- **December 2016:** AAAS Science Breakthrough of the year, shared with the LIGO Scientific Collaboration.
- **October 2016:** 2016 National Space Club Huntsville Distinguished Science Award, shared with the LIGO Scientific Collaboration.
- **May 2016:** Special Breakthrough Prize for the detection of gravitational waves, shared with Ron Drever, Kip S. Thorne, Rainer Weiss (main recipients) and the LIGO Scientific Collaboration.
- **May 2016:** Gruber Cosmology Prize, shared with Ron Drever, Kip S. Thorne, Rainer Weiss (main recipients) and the LIGO Scientific Collaboration.
- **May 2003:** Honorable Mention in the *2003 Gravity Research Foundation competition* for the essay *Cosmic black holes*, by E.-J. Ahn and M. Cavaglia.
- **May 2002:** Third Prize in the *2002 Gravity Research Foundation competition* for the essay *A new era in high-energy physics*, by E.-J. Ahn and M. Cavaglia.

External awards

- **August 2020 - July 2023 (estimated):** *WoU-MMA: Enabling Multi-Messenger Astrophysics with Advanced LIGO: from Detector Calibration to Interpretation of Gravitational-Wave Signals* (PHY-2011334). PI: M. Cavaglia; Granting agency: National Science Foundation. Amount to date: \$269,439.00.

- **January 2019 - January 2022 (estimated):** *Improving Data Quality of Advanced LIGO Gravitational-Wave Searches* (PHY-1921006). PI: M. Cavaglia; Granting agency: National Science Foundation. Amount to date: \$398,453.00.
- **August 2014 - July 2019:** *Mississippi's Contribution to Advanced LIGO's Search for Gravitational Waves* (PHY-1404139). PI: M. Cavaglia. Granting agency: National Science Foundation. Amount to date: \$375,000.
- **July 2011 - June 2015:** *Mississippi Participation in LIGO's Search for Gravitational Waves: Getting Ready for Advanced LIGO* (PHY-1067985). PI: M. Cavaglia. Granting agency: National Science Foundation. Amount: \$343,038.
- **April 2009 - March 2015:** *Catching a New Wave: Gravitational-wave Astronomy as a Probe of the Universe* (PHY-0852870). PI: M. Cavaglia. Granting agency: National Science Foundation. Amount: \$950,237.
- **July 2008 - 2011:** *Mississippi's participation in LIGO's search for gravitational waves* (PHY-0757937). PI: M. Cavaglia. Granting agency: National Science Foundation. Amount: \$260,160.

Current and Past Research Activities

Most of my research activity has been devoted to the study of experimental and theoretical gravitational-wave detection, classical and quantum models of gravity, high energy cosmic rays, cosmology and applied mathematics.

Post-doc Supervision and Mentoring

- **Dr. Sudarshan Karki**, Post-doctoral Research Associate, Missouri University of Science and Technology (2019 - present).
- **Dr. Ryan Quitzow-James**, Post-doctoral Research Associate, Missouri University of Science and Technology (2019 - present).
- **Dr. Evan Goetz**, Post-doctoral Research Associate, Missouri University of Science and Technology (2019).
- **Dr. Shivaraj Khandasamy**, Post-doctoral Research Associate, University of Mississippi (2013-2016 and 2018).
- **Dr. Alexander Dietz**, Post-doctoral Research Associate, University of Mississippi (2011-2012).
- **Dr. Vitor Cardoso**, Post-doctoral Research Associate, University of Mississippi (2005-2008).

Graduate Student Supervision

- **Ms. Syeda Nasim**, graduate student, Missouri University of Science and Technology (2021 - present).
- **Ms. Emma Lockyer**, graduate student, Missouri University of Science and Technology (2021 - present).
- **Mr. Sushant Chaudhary Sharma**, graduate student, Missouri University of Science and Technology (2020 - present).

- **Ms. Yanyan Zheng**, Ph.D. candidate, Missouri University of Science and Technology (2019 - present).
- **Ms. Dripta Bhattacharjee**, Ph.D. candidate, Missouri University of Science and Technology (2017 - 2021). Title of Dissertation: *Reduced calibration uncertainties for the global network of gravitational-wave observatories and the impact on sky localization of burst-like sources.*
- **Mr. Kentaro Mogushi**, Ph.D., Missouri University of Science and Technology (2016 - 2021). Title of Dissertation: *Improving the Data Quality in Gravitational-wave Detectors by Mitigating Transient Noise Artifacts.*
- **Mr. Sumeet Kulkarni**, M.Sc. candidate, University of Mississippi (2017-19).
- **Dr. Shaoqi Hou**, Ph.D. in Physics, University of Alabama (2010-2016). Principal advisor: Dr. Benjamin Harms, University of Alabama. Title of dissertation: *Bounds on large extra dimensions from the simulation of black hole events at the Large Hadron Collider.*
- **Mr. Cody Arceneaux**, M.Sc., University of Mississippi (2011-2015). Title of Dissertation: *FScan Code Development for LIGO Detector Characterization.*
- **Ms. Brooke A. Rankins**, M.Sc., University of Mississippi (2007-2011). Title of Dissertation: *DQTunePipe: A set of Python tools for LIGO detector characterization.*
- **Dr. Arunava Roy**, Ph.D., University of Mississippi (2005-2009). Title of Dissertation: *Particle Phenomenology of Gravitational Events at the TeV Scale.*
- **Mr. Jericho Cain**, University of Mississippi (2006-2009).
- **Mr. Jun-Qi Guo**, M. Sc., University of Mississippi (2005-2008).

Undergraduate Student Supervision and Mentoring

- **Mr. Mason Labrot**, B.S. in Physics, Missouri University of Science and Technology (2020 - present).
- **Mr. Alexander Love**, B.S. in Physics, 2021 FYRE Fellow, Missouri University of Science and Technology (2020).
- **Mr. Matthew Miller**, B.S. in Physics, Missouri University of Science and Technology (2020).
- **Mr. Nathaniel Page**, B.S. in Physics, Missouri University of Science and Technology (2020).
- **Ms. Elizabeth Caputa-Hatley**, B.S. in Physics, 202 MOSGC NASA Fellow, Missouri University of Science and Technology (2019 - 2020).
- **Mr. Jacob McQuerrey**, B.S. in Physics, 2020 FYRE Fellow, Missouri University of Science and Technology (2019 - 2020).
- **Mr. Ethan Hisle**, B.S. in Physics, Missouri University of Science and Technology (2019 - 2020).
- **Mr. Hunter Gabbard**, B.S. in Physics, Honors College, University of Mississippi (2013 - 2016). Title of dissertation: *A Study on the Characterization and Implementation of Tools for Advanced LIGO.*
- **Mr. Daniel Duddlestone**, B.S. in Physics, Honors College, University of Mississippi (2013 - 2014). Title of Dissertation: *Detector Characterization Analysis of the Initial Laser Interferometer Gravitational-wave Observatory using Principal Component Analysis.*

- **Mr. Alfonso Corrado**, B.S. in Physics, University of Naples, Italy (summer 2019).
- **Mr. Giorgio Nicolini**, Univ. of Pisa (summer 2018).
- **Mr. Luciano Errico**, Univ. of Naples, and **Mr. Nicola De Lillo**, Univ. of Trento (summer 2016).
- **Ms. Martina Adamo**, Univ. of Naples, and **Mr. Michele Valentini**, Univ. of Trento (summer 2015).
- **Mr. Olmo Cerri** and **Mr. Camillo Cocchieri**, University of Pisa (summer 2014).
- **Mr. Giovanni Rabuffo**, University of Pisa (summer 2013).
- **Mr. Daniele Trifirò**, University of Pisa (2012 - 2017).
- **Ms. Domizia Chericoni**, University of Pisa (summer 2012).
- **Mr. Andrew W. Watson**, Moravian College (summer 2011).
- **Ms. Fabrizia Canfora** and **Mr. Carlo Enrico Petrillo**, University of Naples, **Mr. Alessandro Manzotti**, University of Parma (summer 2011).
- **Mr. Michele Mancarella** and **Ms. Laura Torino**, University of Pisa (summer 2010).

Other Selected Student Mentorship and Service

- **Faculty advisor** and financial signatory officer for the Women in Physics Group at S&T. APS award UM-0066918. PI: D. Bhattacharjee, co-PI: Y. Zheng, M. Cavaglia. Period: January 2021 - present. Amount to date: \$725.
- **Research mentor** for high-school student Mr. Vikram Bhamre, London, UK (2020 - present).
- **Research mentor** for high-school student Mr. Cole Johnson, Washington DC, USA (2020 - 2021).
- **Research mentor** for high-school student Ms. Ashini Modi, Caddo Parish Magnet High School, 1601 Viking Dr., Shreveport, LA 71101, USA (2019 - present).
- **Research mentor** for high-school student Mr. Teerth Gill, Prescott, AZ (2018 - 2019).
- **External examiner** for Dr. Ronaldas Macas' PhD Viva examination, Cardiff University, Fall 2020.

Teaching Experience

- **Undergraduate courses:** Electromagnetic Theory, Astrophysics, Mathematical Physics, Quantum Mechanics, Selected Topics in Physics, Physics for Pharmaceutical Sciences, Cosmology, General Physics, General Relativity, Fluids and Electromagnetic Waves, Relativistic Astrophysics, Stellar Structure, Astronomy, Interdisciplinary Science for non-STEM Majors, Engineering Physics.
- **Graduate courses:** Advanced Quantum Mechanics, General Relativity, Research Seminar, Advanced Electromagnetic Theory, Quantum Field Theory, Constrained Systems and Quantum Gravity, String Theory, Special Topics (General Relativity).

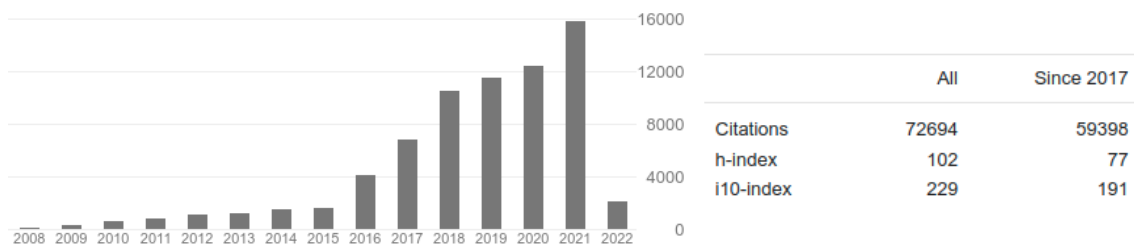
Other Scientific Activities

- **Main organizer** of the Midwest Session of the Conference for Undergraduate Women in Physics (CUWIP) to be held at the Missouri University of Science and Technology, January 2024.
- **Founder and director** of the *Institute of Multi-messenger Astrophysics and Cosmology* at the Missouri University of Science and Technology (2019 - present).
- **Member of the Organizing Committee** of the semester-long program *Mathematical and Computational Challenges in the Era of Gravitational Wave Astronomy*, to be held at the Institute for Pure and Applied Mathematics, UCLA, in fall 2021. Semester-long visiting scientist at UCLA in fall 2021 with UCLA institutional support for participant cost (teaching replacement “buyout”).
- **Main organizer** of the BIRS 2021 workshop proposal *Detection and analysis of gravitational waves in the era of multi-messenger astronomy: From mathematical modelling to machine learning*, to be held in Oaxaca, Mexico, Nov 14 - Nov 19, 2021.
- **Member of the Organizing Committee** of the *Computational Challenges in Gravitational Wave Astronomy* workshop, Institute for Pure and Applied Mathematics, UCLA, January 28 - February 2, 2019.
- **Founder and first director** of the *Center of Multi-messenger Astrophysics* at the University of Mississippi (2018).
- **Co-organizer** with Dr. Cecille Labuda and Dr. Luca Bombelli (University of Mississippi) of the Southeastern Session of the Conference for Undergraduate Women in Physics (CUWIP) to be held at the University of Mississippi, January 16th -18th, 2015.
- **Member of the Organizing Committee** of the *Second Mediterranean Conference on Classical and Quantum Gravity* (MCCQG-2), Veli Lošinj, (Croatia) June 9th - 15th, 2013 and the *First Mediterranean Conference on Classical and Quantum Gravity* (MCCQG), Kolymbari, Crete (Gr-eece) September 14th - 18th, 2009.
- **Organizer** of the *Fourth Gulf Coast Gravity Meeting*, Oxford MS, March 7th-8th, 2008. **Co-organizer** of the *Seventh Gulf Coast Gravity Meeting*, Oxford MS, April 19th - 20th, 2008.
- **Organizer** of the Second School and Workshop on gravity and theoretical physics, University of Mississippi, January 8th - 11th, 2007.
- **Organizer** of the Physics and Astronomy Departmental Colloquia, University of Mississippi, spring semester 2006-07, fall semester 2008-09.
- **Co-organizer** of the First Minischool on Quantum Gravity for graduate students, University of Mississippi, January 9th - 13th, 2006.
- **Member of the Organizing Committee** of the *Fourth Meeting on Constrained Dynamics and Quantum Gravity* (QG05), Cala Gonone, Sardinia (Italy) September 12th - 16th, 2005, the *Third Meeting on Constrained Dynamics and Quantum Gravity* (QG99), Villasimius (Italy) September 13th - 17th, 1999, the *Second conference on Constrained Dynamics and Quantum Gravity*, (QG96) Santa Margherita Ligure (Italy), September 17th - 21st, 1996, and the International Meeting *Constrained Dynamics and Quantum Gravity*, Dubna, Russia, July 5th - 7th, 1995.
- **Grant reviewer and panelist** for the National Science Foundation, Department of Energy, NASA, Research Corporation for Science Advancement, South Africa National Research Foundation, Japan Society for the Promotion of Science, Georgia Shota Rustaveli National Science Foundation, Netherlands Organisation for Scientific Research, Oak Ridge Associated Universities.

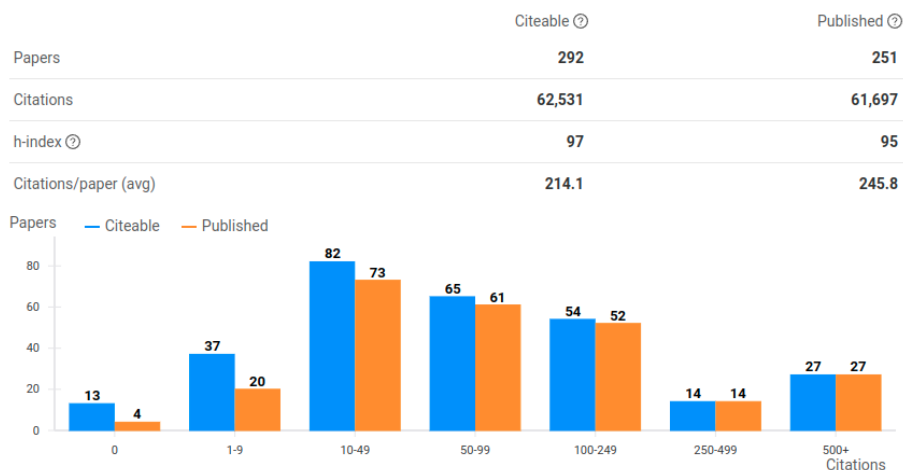
- **Rapporteur** for the European COST Action scientific program (2019 - present).
- **Member of the Editorial Board** of the journal *Universe* (October 2018 - present).
- **Member of the Advisory Panel** of the journal *Classical and Quantum Gravity* (March 2009-2018).
- **Referee** for *American Journal of Physics*, *Annals of Physics*, *Astroparticle Physics*, *Astrophysical Journal*, *Astrophysics and Space Science*, *Cambridge University Press*, *Classical and Quantum Gravity*, *Entropy*, *European Physical Journal C*, *Foundations of Physics Letters*, *General Relativity and Gravitation*, *International Journal of Modern Physics A*, *International Journal of Modern Physics D*, *International Journal of Theoretical Physics*, *Journal of Cosmology and Astrophysics*, *Modern Physics Letters A*, *Nuclear Physics B*, *Physics Letters A*, *Physics Letters B*, *Physical Review D*, *Physical Review Letters*, *Universe*.
- **Reviewer** for the American Mathematical Society (Mathematical Reviews). More than 200 papers and two books reviewed.

Research Publications and talks

- Author/co-author of 251 published articles in peer-review journals (22 since January 1, 2021).
- Author/co-author of 22 articles in conference proceedings.
- Author/co-author of 24 other scientific publications.
- Co-editor of 5 conference proceedings books.
- Over 150 talks and seminars.
- Google scholar metrics (February 18, 2022):



- INSPIRE-HEP metrics (February 18, 2022):



Selected Service and Outreach Activities

To the LIGO Scientific Collaboration and the public at large:

- **Co-chair** (elected) of the LIGO Scientific Collaboration Burst Source Data Analysis working group (March 2019 - present).
- **Member** (appointed) of the LIGO Scientific Collaboration Management Team.
- **Senior member** (elected) of the LIGO Scientific Collaboration Academic Advisory Committee (October 2018 - March 2021).
- **Assistant Spokesperson** (elected) of the LIGO Scientific Collaboration and member of LSC Executive Committee (January 2012 - March 2017).
- **Founding chair** of the LIGO Scientific Collaboration Diversity Committee (March 2012 - August 2015).
- **Founding chair** of the LIGO Education and Public Outreach working group (2008 - April 2012).
- **Member** of stochastic group review committee of the LIGO Scientific Collaboration (2008 - 2011).
- **Member** of annual MOU review panel committee of the LIGO Scientific Collaboration (2009 - 2016).
- **Co-editor** of the LIGO Magazine (2012 - 2017).
- **Conceived and directed** the LIGO outreach project “Astronomy’s New Messengers” (2009 - 2015). Nationwide tour of the LIGO exhibits to over two dozens of educational institutions and science museums across the U.S. and participation to the NYC 2009-10 World Science Festivals.
- **Scientific consultant** for the production of the documentary film “*LIGO: A Passion for Understanding*” by Over The Sun LLC, Director: Kai Staats, 2014, and “*LIGO: Detection*” by Over The Sun LLC, Director: Kai Staats, 2017. **Scientific consultant and producer** (through NSF grant PHY-1067985) of the documentary film “*LIGO: Generations*” by Over The Sun LLC, Director: Kai Staats, 2015.
- **Coordinated** the 100 Hours of Astronomy webcast *Around the World in 80 Observatories* for the LIGO Observatory (April 2009).
- **Organized** the teacher development workshop “Waves here there everywhere” for teachers grade 6-12 (June 6-7, 2016) in collaboration with the University of Mississippi Center for Mathematics and Science Education.
- **Exhibitor** for the LIGO Scientific Collaboration at the 2009 Joint Annual Meeting of the NSBP+NSHP. Coordinator and exhibitor for the LIGO Scientific Collaboration at the USA Science and Engineering Expo, Washington D.C., October 2010 and April 2012, at the Aspen (CO) Street Science Festival, August 2013, and at the St. Louis Engineering Fest, February 2020 and February 2022.
- **External evaluator** of the IREU program in gravitational-wave physics of the University of Florida (2009).
- **Organized** graduate student visits to the Gravitational Wave Observatory LIGO, Livingston LA, April 2006 and April 2008.

- **Participated** to tour and activities for Oxford School District students, on the occasion of the display of the LIGO Traveling Exhibit at the University Museum. Coordinated after-school activities with kids.
- **Conceived and sponsored** LIGO “amazing fact” on NASA’s outreach website Space Place. Companion column and article published on Astronomy Club Newsletters and magazines across the U.S.
- **Collaborator** of Einstein Online (Max-Planck Institut Outreach Program), Scienza per tutti (INFN Outreach Program), National Geographic Documentary film director Thomas Lucas, National Geographic KIDS Magazine, Astronomy Magazine.

To the local community:

- **Founder and Organizer** of the *Oxford Science Café*, free monthly conversations about science open to the public (October 2012-2018).
- **Conceived and Organized** Halloween Physics Nights (Spooky Physics Demonstrations) at the University of Mississippi (2007-2018).
- **Point of contact** for International year of Astronomy celebrations at the University of Mississippi.
- **Participated** to the concerts of the Mockingbird Ensemble “Music of the Spheres” at the University Museum (November 8, 2009) and at the All Saints Episcopal Church, Memphis (November 9, 2009). Reader and translator of Galileo and Kepler writings. Prepared and set up a slide show of astronomical pictures for the concerts.
- **Organized** two outreach interdisciplinary concerts by renowned composer and percussionist Andrea Centazzo at the University of Mississippi (Nutt Auditorium, - February 5th and 6th, 2009).
- **Organized** the picture exhibit *The World at Night* at the University of Mississippi Library (March 31st - April 30th, 2009).
- **Co-organized** the exhibit *The Artist’s Universe* at the University of Mississippi’s Museum (2009).
- **Public lectures and organization** of countless STEM educational and outreach events in schools, libraries and museums, associations and festivals (2004-present).

Memberships

- **American Physical Society (APS)**
- **International Astronomical Union (IAU)**
- **American Association for the Advancement of Science (AAAS)**



Giacomo Ciani

 Address:

WORK EXPERIENCE

[29 Mar 2020 – Current] **Associate Professor**

University of Padova

City: Padua

Country: Italy

Main activities and responsibilities:

Advanced Virgo and Advanced Virgo Plus vacuum squeezing injection, mode matching and stray light suppression. R&D for present and future ground-based gravitational wave detectors, in particular Einstein Telescope.

[1 Apr 2017 – 31 Aug 2017] **Visiting scientist**

University of Florida

City: Gainesville, FL

Country: United States

[29 Mar 2017 – 28 Mar 2020] **Assistant professor**

University of Padova

City: Padua

Country: Italy

Main activities and responsibilities:

Advanced Virgo and Advanced Virgo Plus vacuum squeezing injection and mode matching. R&D for present and future ground-based gravitational wave detectors.

[8 Jul 2012 – 28 Mar 2017] **Assistant scientist**

University of Florida

City: Gainesville, FL

Country: United States

Main activities and responsibilities:

Advanced LIGO Input Optics and Thermal Compensation System. R&D for ground and space-based gravitational wave detectors

[1 Oct 2009 – 7 Jul 2012] **Post-doctoral scholar**

University of Florida

City: Gainesville, FL

Country: United States

Main activities and responsibilities:

Advanced LIGO input Optics and Thermal Compensation System. R&D for next generation gravitational waves detectors.

Supervisors: prof. David Reitze, prof. David Tanner, prof. Guido Mueller

[21 Dec 2007 – 30 Sep 2009] **Post-doctoral scholar**

University of Trento

City: Trento

Country: Italy

Main activities and responsibilities:

Development and ground testing of the LISA/LISA Pathfinder Gravitational Reference Sensor and associated noise model.

Supervisors: prof. Stefano Vitale, prof. Rita Dolesi, prof. William J Weber

EDUCATION AND TRAINING

[Nov 2004 – Nov 2007] **PhD in Physics**

University of Trento

Address: Trento, Italy

2nd level (1st level + 2 years) degree in Applied Physics

University of Pisa

Address: Pisa, Italy

[1 Sep 1998 – 25 Oct 2002] **1st Level degree (3 years) in Physics**

University of Pisa

Address: Pisa, Italy

FUNDING AND SCIENTIFIC RESPONSIBILITIES

[18 Dec 2020 – Current]

Co-Chair of the Squeezed-Light (quantum noise reduction) Work Package for the Einstein Telescope project

[2018 – Current] **Research fellow (“incarico di ricerca”) at INFN Padova section**

[Sep 2017 – Current] **Courtesy Assistant Scientist, Department of Physics, University of Florida**

[2019 – 2022] **PI of funded proposal for a 2-year research project (UniPD BIRD call)**

"Thermal Noise in Solids in Non-Equilibrium Steady States"

[2017 – 2019] **PI of funded proposal for a postdoctoral position (UniPD BIRD call)**

Quantum noise reduction in the Advanced VIRGO gravitational wave detector

[2014 – 2017] **Co-investigator of funded NASA APRA proposal**

13-APRA13-0046: “Optical Bench for LISA-like missions”

MAIN RESEARCH PROJECTS AND EXPERI- ENCES

[2020 – Current] **Coordination of the quantum noise reduction effort for Einstein Telescope**

I am co-chairing the Squeezed Light (quantum noise reduction) working group of the Optics Division inside the ET Instrument Science Board.

I coordinated the writing of a document outlining the Italian community's R&D plan for quantum noise reduction in Einstein Telescope.

[2017 – Current] **R&D for Advanced Virgo and Einstein telescope**

I'm co-leading a research group at the University of Padova and INFN-Padova with an extensive R&D program for current and future gravitational wave detectors, including laser-cavities mode matching sensing and control, thermal noise out of thermodynamic equilibrium, stray light modeling and mitigation, cryogenic materials characterization and optical coating research.

I am directly involved in the design, implementation and commissioning of these techniques in Advanced Virgo.

[2012 – 2017]

Development and testing of a gravitational reference sensor for space-based geodesy and GW missions

I have coordinated an interdisciplinary group of students and researchers for the development of a Gravitational Reference Sensor, for use in geodesy and gravitational waves space missions, and an associated torsion-pendulum based testing facility with interferometric readout.

[2009 – 2017] **Construction of the Advanced LIGO gravitational wave detector**

I participated in the design, installation and commissioning of the Advanced LIGO Input Optics subsystem.

I led the development, from design to commissioning, of the small optics suspensions for the isolation and actuation of critical input optics components.

I also contributed to the development of the Thermal Compensation System, and in particular supervised the performance optimization, the testing and the production of the "ring heaters" used to compensate thermal aberrations in the core optics.

[2004 – 2009]

Testing campaign of the Flight Model Replica (i.e. Qualification Model) of the LISA/LTP gravitational reference sensor

I developed a torsion-pendulum facility to test spurious forces at the fN level; I designed and performed a substantial portion of the ground testing campaign of the LISA Pathfinder gravitational reference sensor flight model replica.

SUPERVISOR ACTIVITY

Postdocs and fellows

2017-19 - M. Vardaro: "Quantum noise reduction in the Advanced VIRGO gravitational wave"

2020-21 - S. Bordignon: "Thermal Noise in Solids in Non-Equilibrium Steady States"

PhD Students

2020-present - G. Chiarini

2020-present - L. Bonavena

Master Thesis

2019-20 - M. Carlassara: "A novel technique for laser mode-matching in gravitational wave detectors"

2017-18 - N. Pisani: "Development of an electro-optical lens for laser-cavity coupling measurements using radio-frequency modulation"

2018 - A. Pizzella: "Study of thermal noise in solids in non-equilibrium steady states"

Undgraduate Thesis

2017-18 - G. Galloni: "Optimization of an adaptive thermal lensing device for ground-based gravitational wave interferometers"

2017-18 - M. Martinazzo: "Implementation of a interferometric measurement system for the stability of macroscopic structure at the level of picometre"

MEMBERSHIPS AND OTHER SCIENTIFIC ACTIVITIES

[2018]

Member of the Scientific Organizing Committee of the SBH2018 PhD summer school: "Black Holes and their Host Galaxies"

Asiago Astrophysical Observatory, Asiago (VI), Italy

[2018 – 2019]

Editor and referee of the proceedings of the GRAvitational-waves Science&technology Symposium (GRASS)

[2018 – 2019]

Member of the Scientific Advisory Committee and Local Organizing Committee of the GRAvitational-waves Science&technology Symposium (GRASS)

Palazzo Moroni, Padova, Italy

[2017 – Current] **Member of the VIRGO scientific collaboration**

[2014 – 2018] **Member of the American Physical Society (Division of Gravitational Physics)**

[2014] **Member of the Local Organizing Committee of the LISA Symposium X**

University of Florida, Gainesville, Florida (USA)

[2014] **Editor and referee of the proceedings of the LISA Symposium X**

[2009 – 2017] **Member of the LIGO Scientific Collaboration**

Referee activity

Review of Scientific Instruments since 2020

Journal of Optics and Laser Technology since 2018

ERC starting grants since 2018

NASA Postdoctoral Program since 2016

Classical and Quantum Gravity since 2012

INVITED TALKS

[26 Aug 2020] **Detecting Gravitational Waves**

IAPS remote meeting on GW, remote

[25 May 2020]

The (glorious) past, (exciting) future and (foreseeable) future of gravitational wave detectors

Warsaw Spring Workshop, Jagiellonian University , remote

[24 Sep 2018 – 30 Sep 2018] **Gravitational Wave astronomy with Virgo and the GW detectors network**

NTIHEP 2018, Budva, Montenegro

[11 Apr 2016] **LISA Pathfinder: (free-)falling like never before**

Seminar, University of Minnesota, Minneapolis, Minnesota, USA

[17 Dec 2014 – 23 Dec 2014] **Advanced LIGO project status: getting ready to listen to the universe**

CGC Conference Miami, Fort Lauderdale, Florida, USA

[15 Dec 2011 – 20 Dec 2011] **Advanced LIGO and the 2nd generation of gravitational wave detectors**

CGC Conference Miami, Fort Lauderdale, Florida, USA

[22 Sep 2008 – 8 Oct 2008] **LISA – A space-borne gravitational wave observatory**

13th Summer Institute at LNGS, Gran Sasso National Labs, Italy

OTHER CONFERENCES

Contributed talks

I have presented about 15 contributed talks at international conferences and collaboration meetings

Posters

I am co-author on about 30 posters at international conferences and collaboration meetings

HONOURS AND AWARDS

[2020] **IOP Outstanding reviewer award for Classical and Quantum Gravity**

[2017] **Albert Einstein Medal**

Shared with the LIGO-Virgo scientific collaboration

[2017] **AAS - HEADS Bruno Rossi Prize**

Shared with the LIGO scientific collaboration

[2017] **Princess of Asturias Award for Technical and Scientific Research**

Shared with the LIGO scientific collaboration

[2017] **Royal Astronomical Society Group Achievement Award**

Shared with the LIGO scientific collaboration

[2016] **Special Breakthrough Prize in Fundamental Physics**

Shared with the LIGO-Virgo scientific collaboration

[2016] **Gruber Cosmology prize**

Shared with the LIGO Discovery Team

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C1

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Padova, 8 Feb 2022

Giacomo Ciani