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## Curriculum Vitae – Marco Cavaglia

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### Work Address

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### Academic Education and Present Position

- **July 2017 - present: 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 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

- **June 2017:** Princess of Asturias Award for Technical and Scientific Research, shared Rainer Weiss, Kip S. Thorne and Barry C. Barish (main recipient) 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. Cavaglià.

- **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. Cavaglià.

## Extramural awards

- **August 2017 - July 2020 (estimated):** *Improving Data Quality of Advanced LIGO Gravitational-Wave Searches* (PHY-1707668). PI: M. Cavaglià; Granting agency: National Science Foundation. Amount to date: \$120,000.00;

- **August 2014 - July 2018 (estimated):** *Mississippi's Contribution to Advanced LIGO's Search for Gravitational Waves* (PHY-1404139). PI: M. Cavaglià. 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. Cavaglià. 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. Cavaglià. 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. Cavaglià. 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. Shivaraj Khandasamy**, Post-doctoral Research Associate, University of Mississippi (2013-2016).

- **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 and Undergraduate Student Supervision

- **Ms. Dripta Bhattacharjee**, Ph.D. candidate, University of Mississippi (2018-present).

- **Mr. Sumeet Kulkarni**, Ph.D. candidate, University of Mississippi (2017-present).

- **Mr. Kentaro Mogushi**, Ph.D. candidate, University of Mississippi (2016-present).

- **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. 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 Duddleston**, 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. 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**, PhD 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).
- **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-).
- **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).

## 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.
- **Graduate courses:** Advanced Quantum Mechanics, General Relativity, Research Seminar, Advanced Electromagnetic Theory, Quantum Field Theory, Constrained Systems and Quantum Gravity, String Theory.

## Other Scientific Activities

- **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** 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.

- **Member of the Advisory Panel** of the journal *Classical and Quantum Gravity* (March 2009-present).

- **Referee** for American Journal of Physics, Annals of Physics, Astroparticle Physics, Astrophysics and Space Science, Cambridge University Press, Classical and Quantum Gravity, Entropy, 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.

- **Reviewer** for the American Mathematical Society (Mathematical Reviews). More than 200 papers and two books reviewed.

## Research Publications and talks

- Author/co-author of 187 published articles
- Author/co-author of 19 articles in conference proceedings
- Author/co-author of 20 other scientific publications
- Co-editor of 5 conference proceedings books
- Over 120 talks and seminars

## Selected Service and Outreach Activities

**To the LIGO Scientific Collaboration and the public at large:**

- **Assistant Spokesperson** of the LIGO Scientific Collaboration and member of LSC Executive Committee (January 2012-March 2017).
- **Chair** of the LIGO Scientific Collaboration Diversity Committee (March 2012-August 2015).
- **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, and at the Aspen (CO) Street Science Festival, August 2013.
- **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-present).
- **Conceived and Organized** Halloween Physics Nights (Spooky Physics Demonstrations) at the University of Mississippi (2007-present).
- **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).
- **Organized** various public/family science events in schools, Oxford Public Library, University Library, University Museum, Boy Scouts of Oxford, Double Decker Festival (2004-present).

## Memberships

- **American Physical Society (APS)**
- **American Association for the Advancement of Science (AAAS)**

## Language skills

- **English** (Oral: Excellent, Written: Excellent, Reading: Excellent)
- **Italian** (Oral: Excellent, Written: Excellent, Reading: Excellent)
- **French** (Oral: Good, Written: Good, Reading: Excellent)
- **Portuguese** (Oral: Fair, Written: Fair, Reading: Good)
- **German** (Oral: Fair, Written: Fair, Reading: Fair)
- **Spanish** (Oral: Fair, Written: Fair, Reading: Fair)