M.Alessandra Papa

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POSITIONS HELD

FACULTY

Present: Senior scientist and Independent Research Group Leader Max Planck Institute for Gravitational Physics Hannover
Professor of Gravitational Wave Astronomy, Leibniz University, Hannover
2017, Visiting Professor for Research Activities 2016 Fellowship award, University ``La Sapienza", Roma, Italy
1/2007-2022, Adjunct Professor (part-time), University of Wisconsin Milwaukee, USA
2000-2005, Visiting Associate Professor, University of Wisconsin Milwaukee, USA

STAFF SCIENTIST AND POST-DOC

2005-2007, Senior scientist, with tenure, University of Wisconsin Milwaukee, USA
7/1999-9/2005, Staff scientist (tenured from 2003), MPI für Gravitationsphysik, Golm
1/1999-7/1999, Post-doctoral fellow, INFN Laboratories, Frascati, Italy
6/1997-1/1999, Post-doctoral Fellow, MPI für Gravitationsphysik, Golm

EDUCATION

PhD, 1997, supervisors: Prof. V. Ferrari and Prof. G. Pizzella, University of Rome "Tor Vergata"
Laurea, 1993, supervisor: Dr. S. Frasca, University of Rome "La Sapienza"

SCIENTIFIC LEADERSHIP AND MENTORING

STATEMENT

I lead a permanent independent research group that comprises about 15 scientists at the MPI for gravitation physics in Hannover. My goal is to detect continuous gravitational waves -- very weak signals that have not yet been observed but that will tell us a great deal on neutron stars and potentially on fundamental physics. For these reasons the first detection of continuous gravitational waves will be a milestone result.
I have devoted my career to this effort and, since its inception in the very early 2000s, my group has been leading the field. Throughout the early 2000s and up to 2018, I have consistently held positions of scientific leadership in the LIGO Scientific Collaboration, both in relation to the continuous gravitational wave search efforts, and to the data analysis activities across the entire spectrum of different searches. However in mid August 2018 I left the Collaboration in order to concentrate on my specific research interests and to pursue them with greater independence and agility.

RECENT PROFESSIONAL SERVICE

- Reviewer for National Science Foundation (USA), National Science Centre (Poland), Israel Science Foundation, UK Science and Technology Facilities Council
- Referee for Physical Review, Physical Review Letters, Astrophysical Journal, Astrophysical Journal Letters, Astronomy &Astrophysics, Classical and Quantum Gravity, European Physical Journal C
- Editor Board member of Journal of Cosmology and Astroparticle Physics (JCAP), ISSN 1475-7516

- 2023-2026 Representative of the Scientists of the MPG for Gravitational Physics at the Max Planck Section
- 2024-2026 Member of the Oversight Board of the GWDG (Gesellschaft für Wissenschaftliche Datenverarbeitung mbH Göttingen - Society for Scientific Data Processing)
2023-2027, Lead evaluator of the ``Einstein Telescope Preparatory Phase" project for the Research Infrastructures of Horizon Europe program
- 2025 Evaluator of HORIZON-INFRA-2025-01-TECH-02 (Implementing research infrastructure technology roadmaps) for the European Commission

- 2022, 2025, La Caixa Foundation ``Postgraduate Fellowships Abroad" evaluation panel expert
- 2024 European Research Council (ERC) PE9, StG grant panel Chair
- 2024 Lise Meitner Award committee member
- 2023 Summit Grant evaluator for the Dutch National Science Council (NWO)
- 2022 European Research Council (ERC) PE9, StG grant panel Chair
- 2022, 2023, 2024 European Research Council (ERC) Marie Curie grant panel expert/liason

RECOGNITION

- 2017 Bruno Rossi Prize of the American Astronomical Society (shared with the LIGO Scientific Collaboration)
- 2017 Group achievement award of the Royal Astronomical Society (shared with the LIGO Scientific Collaboration)
- 2017 Princess of Asturias Award (shared with the LIGO Scientific Collaboration)
- Foreign Policy's 100 Leading Global Thinkers of 2018 award recipient (on behalf of the LIGO Scientific Collaboration), Washington DC, December 2016
- 2016 Breakthrough Prize in Fundamental Physics (with LIGO)
- 2016 Gruber Cosmology Prize (with LIGO)
- 2014 Elected Fellow of the American Physical Society *For numerous key contributions to gravitational-wave astronomy, including devising new data analysis methods for gravitational waves from pulsars and coordinating the worldwide exchange and analysis of data*

SELECTED TEACHING AND OUTREACH

- *Lectures "Foundations of Probability"* Summer and Winter Semesters since 2023, Leibniz University Hannover
- *Four Lectures "Continuous Gravitational Waves Searches"* Summer School on Continuous Gravitational Waves, Peking University, Beijing, China, July 2024
- *Round Table "Women in Science"* Peking University, Beijing, China, July 2024
- *Three Lectures on Continuous Gravitational Waves* School on Fundamental Fields in Strong Gravity, Lisbon, Portugal, July 2024
- *Lectures "The Analysis of the Data"* Winter semester 2022 Leibniz University Hannover
- *Student Seminar and lectures "Gravitational Wave Astronomy: methods and results"* Spring 2022 Leibniz University Hannover
- *"Join us on a journey into the depths of our Galaxy"* 2022 https://youtu.be/mV4-DUaLJ5I
- *Golden Webinars in Astrophysics Series : panel member for "Gravitational Waves: A New Window on Our Universe"* 5/2021 https://youtu.be/7xIAHdDipNg
- *Searching for continuous gravitational waves* 2020 https://youtu.be/7xIAHdDipNg
- TedX talk *The Origins* 2019 https://youtu.be/t8A2L5dG4S0

PUBLICATIONS AND PRESENTATIONS

> 250 papers, h-index = 104. For the full publication list : ORCID 0000-0002-1007-5298

RECENT PUBLICATIONS (2022-11/2025)

- J. Ming, M.A. Papa et al, "Observational constraints on the spin/anisotropy of the CCOs of Cassiopeia A, Vela Jr. and G347.3-0.5 and a single surviving continuous gravitational wave candidate" , arxiv:2512.15672, submitted for publication in ApJ
- G Pagliaro, M.A. Papa , J, Ming and D. Misra, "Sco X-1 as a continuous gravitational waves source: modelling the secular evolution using MESA", accepted for publication in Monthly Notices of the Royal Astronomical Society, 10.1093/mnras/staf2194
- C.J. Clark et al, "Einstein@Home Searches for Gamma-ray Pulsars in the Inner Galaxy", Astrophys.J. 994 (2025) 2, 149
- B. McGloughlin et al., "Einstein@Home all-sky "bucket" search for continuous gravitational waves in LIGO O3 public data", arXiv:2508.16423, Accepted for publication in ApJ
- B. McGloughlin, B. Steltner, J. Martins, M.A. Papa et al., "High-frequency continuous gravitational waves searched in LIGO O3 public data with Einstein@Home" , arXiv:2508.20073, submitted for publication to ApJ
- J. Martins, M.A. Papa et al., "A Bayesian Framework to Follow-up Continuous Gravitational Wave Candidates from Deep Surveys", arXiv:22508.18204, accepted for publication in Phys. Rev. D
- Dergachev, V.; Papa, M. A., "Early release of low-frequency atlas of continuous gravitational waves", arXiv:2507.12161, submitted to Physical Review D
- Dergachev, V.; Papa, M. A., "Expanded atlas of the sky in continuous gravitational waves", Phys.Rev.D 112 (2025) 4, 042005
- Dergachev, V.; Papa, M. A., "First loosely coherent search for continuous gravitational wave sources with substellar companions in the Orion spur", Phys. Rev. D 112, 062005

- G Pagliaro, M.A. Papa , J, Ming and M. Muratore "Searching for continuous gravitational waves from slowly spinning neutron stars with DECIGO, Big Bang Observer, Einstein Telescope and Cosmic Explorer", Monthly Notices of the Royal Astronomical Society, Volume 540, June 2025
- Dergachev, V.; Papa, M. A., "Expanded atlas of the sky in continuous gravitational waves", arXiv:2503.11512, submitted to Physical Review D
- Morale, J., Ming, J. , Papa, M.A. , et al, "Results from an Einstein@Home search for continuous gravitational waves from Cassiopeia A and Vela Jr. using LIGO O2 data", Astrophys.J. 986 202 (2025)
- P.B. Covas, M.A. Papa and R. Prix, "Search for continuous gravitational waves from unknown neutron stars in binary systems with long orbital periods in O3 data", Astrophys.J. 985 (2), 192 (2025)
- Ming, J. , Papa, M.A. , Eggenstein, H.-B. et al, "Deep Einstein@Home search for Continuous Gravitational Waves from the Central Compact Objects in the Supernova Remnants Vela Jr. and G347.3-0.5 using LIGO public data", Astrophys.J. 977 (2), 154 (2024)
- Ashok, A; Covas, P. B.; Prix, R.; Papa, M. A. "Bayesian F-statistic-based parameter estimation of continuous gravitational waves from known pulsars", Phys.Rev.D 109 (2024) 10, 104002
- Dergachev, V.; Papa, M. A., "Early release of the expanded atlas of the sky in continuous gravitational waves", arXiv:2401.13173 , Phys. Rev. D 109 (2024), 2, 022007
- Pagliaro, G; Papa, M. A.; Ming, J; Lian, J.; Tsuna, D.; Maraston, C.; Thomas, D.; "Continuous gravitational waves from Galactic neutron stars: demography, detectability and prospects", The Astrophysical Journal 952 (2), 123 (2023)
- B. Steltner, M. A. Papa, H.-B. Eggenstein, R. Prix, et al. "Deep Einstein@Home all-sky search for continuous gravitational waves in LIGO O3 public data", The Astrophysical Journal 952 (1), 55 (2023)
- C.J. Clark et al "The TRAPUM L-band survey for pulsars in Fermi-LAT gamma-ray sources", Mon.Not.Roy.Astron.Soc. 519 (2023)
- A. Singh and M.A. Papa "Opportunistic Search for Continuous Gravitational Waves from Compact Objects in Long-period Binaries" Astrophys.J. 943 (2023) 2, 99
- Dergachev, V.; Papa, M. A., "A frequency resolved atlas of the sky in continuous gravitational waves", arXiv:2202.10598v, Phys. Rev. X 13 (2023), 2, 021020
- B. Steltner, T. Menne , M. A. Papa et al "Density-clustering of continuous gravitational wave candidates from large surveys" , Phys.Rev.D 106 (2022) 10, 104063
- Covas, P. B.; Papa, M. A.; Prix, R.; Owen , B. J " Constraints on r-modes and mountains on millisecond neutron stars in binary systems. ", The Astrophysical Journal Letters 929 (2), L19 (2022)
- J. Ming, M. A. Papa, H.-B. Eggenstein, B. Machenschalk, B. Steltner et al "Results from an Einstein@Home search for continuous gravitational waves from G347.3 at low frequencies in LIGO O2 data", The Astrophysical Journal 925 (1), 8 (2022)
- B. Steltner, M. A. Papa, H.-B. Eggenstein, "Identification and removal of non-Gaussian noise transients for gravitational wave searches" , Physical Review D 105 (2), 022005 (2022)

RECENT INVITED TALKS

- Invited panelist for ""Multi-band and Multi-messenger astronomy" at "GWPAW 2025", December 2025, Atlanta (USA)
- Invited Speaker at "GW10 Meeting", October 2025, IIT Gandinaghar (India)
- Invited Speaker at "First ACME workshop on the gravitational wave sky and complementary observations", April 2025, Toulouse (France)
- Invited Speaker at "Workshop on Gravitational Waves Detection", February 2025, Louisiana State University (USA)
- Invited Speaker at "I venerdi' dell'Universo" Ferrara, Italy, February 2025
- Physics Colloquium at University of Rome Tor Vergata , Italy, January 2025
- Invited Speaker at the "Whispers from the Dark Universe: particles and Fields in the Gravitational Wave Era" September 2024, DESY, Hamburg, Germany
- Invited Speaker at the "International Congress of Basic Sciences " July 2024, BIMSA, Huairou, China
- Invited Speaker at the "Continuous Waves Workshop", Beijing Normal University, Beijing, China, July 2024

- Invited Speaker at the “Vulcano Workshop 2024 - Frontier Objects in AstroPhysics and Particle Physics” June 2024, Ischia, Italy
- Invited Speaker for the Coloquio Arcado Poveda “The Next Big Gravitational Wave Discovery”, Istituto de Astronomia, UNAM (National Autonomous University of Mexico), Mexico City, Mexico, May 2024
- Astrophysics Colloquium at Berkeley U, (USA) , September 2023
- Physics Colloquium at Oregon State University, (USA) , August 2023
- Physics Colloquium at Middelbury College, (USA) , April 2023
- Physics and Astronomy Colloquium at Weizmann Institute of Science, Tel Aviv (Israel), March 2023
- Invited Speaker at the “Vulcano Workshop 2022 - Frontier Objects in AstroPhysics and Particle Physics” 26/9-1/10, 2022, Italy
- Invited Speaker at the “Physics and Astronomy World Forum” 12/02-04, 2021, Frankfurt, Germany.
- Invited Speaker at the “Marcel Grossman Meeting on General Relativity”, 5-10/7/2021 (online)
- Invited speaker at ICERM’s Semester Program Workshop “Statistical Methods for the Detection, Classification, and Inference of Relativistic Objects”, 16-20/11/2020 , Brown University, USA
- Colloquium at MPI for Radio astronomy, Bonn, 11/9/2020

PERSONAL

Birth

Rome, Italy, 6/6/1967

Current

I live in the Hannover Region, Germany.
I am married and have two children born in 2001 and 2004