

Martina Malberti – Curriculum Vitae

Education

- 2007 Ph.D in Physics, Università di Milano-Bicocca
2004 Master Degree in Physics, Università di Milano-Bicocca

Positions

- 2017 - now Permanent researcher, INFN sezione di Milano-Bicocca
2016 – 2017 EU Marie Curie Individual Fellow, Università di Milano-Bicocca
2013 - 2016 Associate Project Scientist, University of California Riverside
2011 – 2013 CERN Research Fellow
2010 - 2011 Post-doc researcher, Università di Milano-Bicocca
2009 - 2010 CERN Associate - INFN Fellowship
2008 - 2010 Post-doc researcher, INFN sezione di Milano-Bicocca

Responsibility roles in the coordination of research

- 2023 – now CMS MTD Detector Performance Group coordinator
2018 – 2023 CMS MIP Barrel Timing Detector Test Beam analysis coordinator
2015 - 2017 Co-convenor of the $H \rightarrow \gamma\gamma$ analysis group of the CMS Collaboration
2014 - 2015 CMS Pixel Operation and commissioning co-coordinator
2009 – 2010 ECAL contact for the Physics Validation Team of the CMS experiment
2010 - 2012 Co-coordinator of the CMS ECAL Prompt Feedback Group
2009 - 2010 Co-coordinator of the Exotica High- p^T electrons working group of the CMS Collaboration
2008 - 2009 Co-coordinator of the W' gauge bosons searches working group of the CMS Collaboration
2008 – 2009 Monte Carlo Tools and Generator contact for the CMS Electroweak Physics working group

Scientific activity

My main research field is high energy experimental particle physics. Since 2004, I have worked in the CMS experiment at the CERN Large Hadron Collider. My research activity covers both instrumental aspects of the detector (the electromagnetic calorimeter, the silicon pixel detector and the MIP Timing detector proposed for the CMS experiment upgrade) and the analysis of some physics channels (electroweak measurements, Higgs boson physics and searches for processes beyond the standard model).

Instrumental activity

- 2003 – 2020 – Commissioning, calibration and monitoring of the CMS electromagnetic calorimeter (ECAL)
- 2013–2015 – Maintenance and re-commissioning of the CMS silicon forward pixel detector during the 2013-2014 shutdown before reinsertion in CMS for Run 2
- 2016 – now – Development of a timing detector for minimum ionizing particles with 30-40 ps time resolution (MTD – MIP Timing Detector) for the Phase 2 upgrade of the CMS experiment. Main contributions: development and characterization of prototypes for the MTD Barrel Timing Layer based on LYSO crystals read out by SiPMs; test beam analysis and performance coordination; performance studies and physics impact of MTD reported in the MTD Technical Design report.

Physics analyses

- 2004 - 2007: study of the prospects for a precision measurement of the W boson mass at the LHC (Ph.D thesis)
- 2007 – 2009: studies in preparation to first measurements of the W, Z production cross sections at CMS
- 2007 – 2010: search for new heavy charged vector bosons in the channel $W' \rightarrow l\nu$ ($l = e, \mu$)
- 2012-2014: development of algorithms for the mitigation of pile-up effects on jet reconstruction
- 2011 – now: search for the Higgs boson in the $H \rightarrow \gamma\gamma$ decay channel and characterization of its properties; study of the $t\bar{t}H$ associated production; search for the non-resonant production of Higgs bosons pairs in the $HH \rightarrow b\bar{b}\gamma\gamma$ channel

Presentations at conferences

- 2025 "Precision timing with the CMS Barrel Timing Layer", PD2025 Workshop
- 2023 "Performance of sensor module prototypes for the CMS Barrel Timing Layer", Phose2023 Workshop
- 2022 "CMS Phase 2 upgrade: the MIP timing detector", invited talk at Congresso Nazionale SIF 2022
- 2019 "Precision timing with LYSO:Ce crystals and SiPM sensors in the CMS MTD barrel timing layer", IPRD2019
- 2018 "Fast timing layers: the CMS example", invited talk at VBSCan
- 2017 "H(125) SM measurements at CMS", plenary talk, La Thuile 2017
- 2014 "Search for the Higgs boson decaying to two photons in CMS", parallel talk, PANIC2014
- 2014 "Operation and performance of the CMS tracker", poster, TIPP14
- 2012 "Search for the Higgs boson in the $H \rightarrow \gamma\gamma$ channel at CMS", parallel talk, Lake Louise Winter Institute
- 2011 "Resonances in leptonic channels, and $llq\bar{q}$ contact interactions: CMS", plenary talk, LPCC BSM Jamboree
- 2010 "Operation and performance of the CMS Electromagnetic Calorimeter", parallel talk, Kruger2010
- 2009 "Commissioning of the CMS ECAL calibration with muons from cosmic rays and beam dumps", IEEE2009
- 2009 "W and Z at the LHC", invited talk, IFAE
- 2008 "New heavy gauge bosons searches at CMS", plenary talk, CRIMEA08
- 2008 "Misure con W e Z dai primi dati a CMS", invited talk, "Workshop sui Monte Carlo, la Fisica e le Simulazioni"
- 2008 "Commissioning della fisica con W e Z (e, μ, τ)", plenary talk, V Workshop Italiano sulla fisica p-p a LHC
- 2007 "Fisica elettrodebole a LHC", invited talk, IFAE
- 2006 "W mass and width at the LHC", parallel talk, ICHEP06

Grants, prizes, acknowledgements

- 2023 PRIN 2022 – project "HHTime: HH searches at the HL-LHC exploiting Time information in event reconstruction"
- 2018 INFN Grant – project "FTC - Fast Timing with Crystals"
- 2016 EU Marie Curie Individual Fellowship – project "FasTER - Fast Timing Tools for Event Reconstruction at the high luminosity frontier"
- 2016 First prize "Giovani Talenti" Università di Milano-Bicocca con il Patrocinio dell'Accademia Nazionale dei Lincei
- 2014 CMS achievement award for the commissioning of the CMS forward pixel detector

Teaching activity

- 2024 Teacher of the Laboratory course of nuclear and subnuclear physics, Master Degree in Physics, Università di Milano Bicocca (42 hours, 3.5 CFU)
- 2022 Tutor, Advanced foundations of physics for AI, Master Degree in Artificial intelligence for science and technology, Università di Milano Bicocca
- 2021 Teacher of the Laboratory course of nuclear and subnuclear physics, Master Degree in Physics, Università di Milano Bicocca (42 hours, 3.5 CFU)
- 2006-10 Teaching assistant for the Physics and Medical Technology Course, Master degree in Medicine and Surgery, Università San Raffaele, Milano
- 2008 Tutor, Laboratory Course of Electromagnetism and Optics, Master Degree in Physics, Università di Milano-Bicocca
- 2007 Teaching assistant, Physics Course, Master Degree in Geological Sciences, Università di Milano Bicocca
- 2005 Tutor, Introductory Laboratory Course of numerical computation for Physics, Master Degree in Physics, Università di Milano-Bicocca

Selection of publications

- M. Malberti, X. Sun, "Precision timing detectors", Physics Reports 1156 (2026) 1–39
- F. Addesa, M. Malberti et al, "The CMS Barrel Timing Layer: test beam confirmation of module timing performance", Nucl.Instrum.Meth.A 1081 (2026) 170823
- F. Addesa, M. Malberti et al, "Optimization of LYSO crystals and SiPM parameters for the CMS MIP timing detector", 2024 JINST **19** P12020
- CMS MTD Collaboration, "Test beam characterization of sensor prototypes for the CMS Barrel MIP Timing Detector", JINST 16 (2021) P07023
- CMS Collaboration, "A MIP Timing Detector for the CMS Phase-2 Upgrade", CERN-LHCC-2019-003 ; CMS-TDR-020
- CMS Collaboration, "Measurements of Higgs boson properties in the diphoton decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV", JHEP 11 (2018) 185
- CMS Collaboration, "Technical proposal for a MIP timing detector in the CMS experiment Phase 2 upgrade", CERN-LHCC-2017-027 ; LHCC-P-009

- CMS Collaboration, “*Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8 TeV*”, Eur. Phys. J. C75 (2015) no.5, 212
- CMS Collaboration, “*Observation of the diphoton decay of the Higgs boson and measurement of its properties*”, arXiv:1407.0558, Eur. Phys. J. C (2014) 3076
- CMS Collaboration, “*Energy calibration and resolution of the CMS electromagnetic calorimeter in pp collisions at $\sqrt{s} = 7$ TeV*”, 2013 JINST **8** P09009
- CMS Collaboration, “*Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC*”, Phys.Lett. B716 (2012) 30-61
- CMS Collaboration, “*Search for the standard model Higgs boson decaying into two photons in pp collisions at $\sqrt{s} = 7$ TeV*”, Phys.Lett. B710 (2012) 403-425
- CMS Collaboration, “*Search for a heavy gauge boson W' in the final state with an electron and large missing transverse energy in pp collisions at $\sqrt{s} = 7$ TeV*”, Phys.Lett. B698 (2011) 21-39
- CMS Collaboration, “*Performance and operation of the CMS electromagnetic calorimeter*”, JINST **5** T03010 (2010)
- CMS Collaboration, “*The CMS experiment at the CERN LHC*”, JINST 0803:S08004 (2008)
- CMS ECAL Group: P. Adzic et al., “*Intercalibration of the barrel electromagnetic calorimeter of the CMS experiment at start-up*”, JINST **3** P10007 (2008)
- V. Büge, A. Ghezzi, C. Jung, M. Malberti, G. Quast and T. Tabarelli de Fatis, “*Prospects for the precision measurement of the W mass with the CMS detector at the LHC*”, J. Phys. G: Nucl. Part. Phys. 34 (2007) N193-N220

Milano, December 4th 2025

LUCIA CANONICA – CURRICULUM VITAE

Email:

Current Position: Assistant Professor (RTD-B), University of Milano-Bicocca; Associated member INFN (since Dec 2023)

Education & Qualifications

- Ph.D. in Physics, University of Genova (2012)
- M.Sc. in Physics, University of Genova (2008)
- National Scientific Qualification (ASN) for Associate Professor (02/A1), valid until Oct 2028

Previous Positions

- Technologist (PNRR – IRIS), INFN Milano (2023)
- Postdoctoral Researcher, Max Planck Institute for Physics, Munich (2018–2023)
- Postdoctoral Researcher, MIT – Laboratory for Nuclear Science (2016–2018)
- Postdoctoral Researcher, INFN Gran Sasso National Laboratory (2012–2016)

Grants & Coordination activities

- Since 2026, management of INFN-LEGEND activities at Milano Bicocca (~80 k€/year)
- Seed Money Grant “Diamond detectors for low-mass dark matter searches”, Origins Cluster (2020) 31.5 k€
- 2016-2017 Management of INFN- CRESST activities at LNGS (~50 k€/year)

Teaching & Supervision

- since 2024: Course Assistant: General Physics I, Laboratory I – University of Milano-Bicocca
- Lecturer in international Ph.D. schools on cryogenic detectors
- Co-supervision of many Bachelor and Master theses

Editorial & Reviewing Activity

- Guest Editor, Communications Physics (2024)
- Reviewer for SNSF, Nature, Physical Review Letters, Physical Review D, EPJ, JLT Phys.

Scientific Output (Summary)

- H-index: 32 (Scopus)
- Publications: 180+ peer-reviewed papers
- Invited speaker at major international conferences

Scientific profile (Summary)

Experimental activity focused on the development of cryogenic detectors for particle and astroparticle physics, with a long-standing emphasis on phenomena beyond the Standard Model, in particular neutrino properties, direct dark matter searches, and novel experimental approaches to gravitational-wave detection. Major coordination roles have

been held within leading international collaborations, including CUORE, CRESST and LEGEND, with substantial contributions to the design, commissioning, and physics exploitation of state-of-the-art detectors. The recent research activity also includes the development of cryogenic resonant sensors for the exploration of high-frequency gravitational-waves.

Milano, 5 January 2026

Lucia Canonica

CURRICULUM VITAE

Mattia Bruno

Personal information

Institution: Università degli Studi di Milano-Bicocca
Physics Dept. “Giuseppe Occhialini”
Address: Piazza della Scienza 3 - 20126 MILANO
Contacts: email:

Research Career

2024-present: Associate Professor
Physics Dept., Università degli Studi di Milano-Bicocca, Italy
2021-2024: “Rita Levi Montalcini” Fellow (Tenure track)
Physics Dept., Università degli Studi di Milano-Bicocca, Italy
2018-2021: Postdoctoral Fellow
Theoretical Physics Department, CERN, Switzerland.
2015-2018: Research Associate
High Energy Theory Group, Brookhaven National Laboratory, USA.
2012-2015: PhD Student
NIC Research Group, DESY Zeuthen, Germany.

Education

July 2015: **Ph.D. in Theoretical Physics**
NIC Research Group, DESY Zeuthen, Germany.
Humboldt-Universität zu Berlin, Germany, *summa cum laude*.
Thesis: *The energy scale for the 3-flavour Lambda parameter of QCD*. Supervisor: Rainer Sommer.
December 2012: Diploma at Scuola di Studi Superiori
Università degli studi di Torino, Italy.
July 2012: **M.Sc. in Theoretical Physics (Laurea Specialistica)**
Università degli studi di Torino, Italy, *cum laude*.
Thesis: *Thermal properties of non-abelian lattice gauge theories in four dimensions*. Supervisor: Michele Caselle.

Research interests

- Non-perturbative predictions of quantities relevant for physics beyond the Standard Model (e.g. hadronic contributions to the muon anomaly or weak kaon decays)
- Renormalization problems in Quantum Field Theories and Lattice Field Theories
- Development of methods to study amplitudes from Lattice simulations
- Algorithms and computational strategies for Lattice QCD

Research output

Papers: 41 citeable papers, with over 3700 total citations
Publications: 22 published papers in peer-reviewed journals with over 3400 total citations and average of 150 citations per paper
ORCID: [0000-0002-5127-4461](https://orcid.org/0000-0002-5127-4461)
InSpireHEP: [Mattia Bruno](#)

Institutional responsibilities

2022-present: member of the Open Science Working Group for the INFN (Gruppo Lavoro Open Science GLOS)

Service for the community

Organized workshops: Member of the scientific committee for

- *Advances in Lattice Gauge Theories 2019*
CERN TH Institute, Switzerland.
- *Phase transitions in particle physics*
GGI event, Florence, Italy. March 2022.

Journal reviewer for: Physical Review D
Modern Physics Letters A
European Physical Journal C, D
Software packages: Developer and maintainer of [pyobs](#) a python library to analyze Lattice QCD Observables. Active contributor/developer of [gpt](#) and [Grid](#).

Milano, January 5, 2026

Maurizio Martinelli

University of Milano Bicocca
Piazza della Scienza, 3 - 20126 Milano, Italy
☎ +39

Curriculum Vitae - January 7, 2026

PERSONAL INFORMATION

Languages Italian (mother tongue); English (proficient - C2); French (upper intermediate - B2)

RESEARCH EXPERIENCE

- 2021– today **Associate Professor**,
University of Milano Bicocca, Milano, Italy
- 2019– 2021 **Tenure-Track Assistant Professor**,
University of Milano Bicocca, Milano, Italy
- 2018– 2019 **CERN Fellow**,
European Center for Nuclear Research, Meyrin, Switzerland
- 2014– 2018 **Postdoctoral Researcher**,
École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland
- 2011– 2014 **Postdoctoral Researcher**,
Nikhef, Amsterdam, The Netherlands
- 2011 **Postdoctoral Scholar**,
SLAC National Accelerator Laboratory, Menlo Park, CA, USA

EDUCATION

- 2008– 2011 **Ph. D. in Experimental Physics (thesis defended on May 19, 2011)**,
University of Bari and Istituto Nazionale di Fisica Nucleare (INFN), Bari, Italy
- 2005– 2007 **Master's Degree in Nuclear and Particle Physics (thesis defended on October 25, 2007)**,
University of Bari, Bari, Italy
- 2002– 2005 **Bachelor's degree in Physics (thesis defended on September 24, 2005)**,
University of Bari, Bari, Italy

POSITION OF RESPONSIBILITY

- 2024 **Team Leader of Milano Bicocca DRD4 group**,
INFN, Milano Bicocca
- 2023 **Deputy Team Leader of Milano Bicocca LHCb group**,
INFN, Milano Bicocca
- 2024– 2026 **Coordinator of DRD4 “Software” working group**,
DRD4 Collaboration, CERN
- 2018– 2020 **Coordinator of LHCb “Charm” working group**,
LHCb Collaboration, CERN
- 2016– 2018 **Coordinator of LHCb “Charm Mixing and CP violation” sub-working group**,
LHCb Collaboration, CERN
- 2012– 2018 **Responsible for LHCb tracker alignment**,
LHCb Collaboration, CERN
- 2012– 2015 **Coordinator of LHCb “Tracking and Alignment” working group**,
LHCb Collaboration, CERN

2012– 2015 **Member of LHCb Physics Planning Group**,
2018– 2020 *LHCb Collaboration*, CERN

FELLOWSHIPS AND GRANTS

2024 **PRIN**,
MUR, Italy

2017 **CERN Fellowship**,
CERN, Switzerland

2014 **Future in Research**,
Regione Puglia, Italy

2011 **SLAC/DOE**,
SLAC National Accelerator Laboratory, CA, USA

2007 **Doctoral Fellow**,
Università degli Studi di Bari, Italy

SCIENTIFIC ACTIVITY

2024– today Editor for *Symmetry*.

2013– today Referee for *Physical Review Letters*, *Physical Review D*, *European Physics Journal C*.

2021– today Expert for *Agence National de la Recherche (ANR) - France*.

2022– today Selection Committee for *Università degli Studi di Bergamo (22RTDB002)*.

2011– today **Member of LHCb Collaboration**
data analysis, software development for track reconstruction and upgrade studies

2008– 2015 **Member of BaBar Collaboration**
data analysis and software development for track reconstruction

ACADEMIC ACTIVITY

Member of the evaluation committee for 5 Doctoral theses.

Supervised 5 post-graduate students.

Supervised 3 master theses.

Supervised 3 bachelor theses.

Supervised 2 summer students.

Taught various physics topics within the academic offer of my universities.

Organised some local outreach events.

PUBLICATIONS

TOP 5 PUBLICATIONS

2017 *Measurement of matter-antimatter differences in beauty baryon decays*, Aaij, Roel and others (LHCb Collaboration). *Nature Phys.* 13 (2017) 391–396.

2021 *Observation of the Mass Difference Between Neutral Charm-Meson Eigenstates*, Aaij, Roel and others (LHCb Collaboration). *Phys. Rev. Lett.* 127 (2021) 111801.

2019 *Search for CP violation through an amplitude analysis of $D^0 \rightarrow K^+ K^- \pi^+ \pi^-$ decays*, Aaij, Roel and others (LHCb Collaboration). *JHEP* 02 (2019) 126.

2019 *Novel method for measuring charm-mixing parameters using multibody decays*, Di Canto, A. and Garra Ticó, J. and Gershon, T. and Jurik, N. and Martinelli, M. and Pilař, T. and Stahl, S. and Tonelli, D.. *Phys. Rev. D* 99 (2019) 012007.

2016 *Estimating $r_B^{D\pi}$ as an input to the determination of the CKM angle γ* , Kenzie, Matthew and Martinelli, Maurizio and Tuning, Niels. Phys. Rev. D 94 (2016) 054021.

MEMBER OF INTERNATIONAL COLLABORATIONS

2011-today 750 publications in peer-review journals together with the LHCb Collaboration

2008-2015 160 publications in peer-review journals together with the BaBar Collaboration
BOOKS

2014 *The Physics of the B Factories*, Bevan, A. J. and others (BaBar, Belle Collaboration).
Eur. Phys. J. C 74 (2014) 3026.

CONFERENCES

Conference Talks: 19.

Invited Talks: 5.

Organisation of Conferences: 1.

Stefano Della Torre

Curriculum vitae

ORCID:0000-0002-7669-0859

Contratti o incarichi di ricerca

- da Gen. 2023 - attuale **Ricercatore a Tempo Indeterminato di II livello professionale**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca
- da Ott. 2018 - Dic. 2022 **Ricercatore a Tempo Indeterminato di III livello professionale**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca
- da Mar. 2018 - Sett. 2018 **Ricercatore a Tempo Determinato di III livello professionale (Rif. MIB-R3-718)**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca
- da Ott. 2013 - Mar. 2018 **Ricercatore a Tempo Determinato di III livello professionale (Rif. MIB-R3-392)**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca
- da Sett. 2012 - Sett. 2013 **Assegno di Ricerca (bando n. 14725)**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca
- da Gen. 2012 - Dic. 2012 **Associated member of the personel**, *CERN*, CH-1211 Genève 23, Switzerland;
- da Sett. 2010 - Sett. 2012 **Borsa di Studio INFN nei settori informatico, elettronico, strumentale e acceleratori bando n.13587/09**, *Istituto Nazionale di Fisica Nucleare*, Sez. Milano-Bicocca

Sintesi dell'Attività Scientifica

- 2024–attuale **VIRGO**
 - PI del virgo-group Milano-Bicocca.
 - Parte del gruppo per il mantenimento e aggiornamento dell'infrastruttura di low latency (LLAI) per la segnalazione alla rete degli osservatori di potenziali eventi di onde gravitazionali.
 - costruzione e mantenimento di un cluster K3S come area di sviluppo e test per l'infrastruttura LLA.
- 2022–2025 **ICSC – Centro Nazionale HPC, Big Data e Quantum Computing, Spoke 3 – Astrophysics and Cosmos Observations**
 - WP-Leader del *WP-1 HPC Codes Enabling and Optimization*.
 - Porting su GPU di codici di propagazione raggi cosmici nell'eliosfera.
 - Applicazioni di Machine Learning per il calcolo di effetti sistematici in esperimenti spaziali.
- 2021–attuale **LiteBIRD**
 - Studio degli effetti Sistematici dovuti all'impatto dei raggi cosmici sul piano focale del telescopio (Coordinatore del gruppo di studio).
 - Studio di radiation hardness dell'elettronica dell'apparato.
- 2021–2025 **ASIF, Space Radiation Environment Workpackage**
 - WP-Leader del *WP-5000*.
 - Deputy WP-Leader del *WP-3000*.
 - Sviluppo tool online per la modulazione solare di spettri galattici di raggi cosmici.
 - Manutenimento e sviluppo tool online per il forecast del flusso di raggi cosmici all'interno del sistema solare.
 - Analisi dei dati di rilevatori spaziali per la calibrazione del programma HelMod sulle missioni nel deepspace.

2011–attuale **AMS-02**

- Coordinatore dei gruppi di analisi delle basse energie (2014–2018)
- Analisi dati per la determinazione del flusso di protoni e Elio cosmici in funzione del tempo.
- Misura dell'ampiezza della componente di dipolo dell'anisotropia dei positroni rispetto agli elettroni.
- Svolgimento turni per il monitoraggio di AMS-02 nei ruoli di *Lead* e *Data expert*.
- Sviluppo di tools informatici per il monitoring qualità del sistema data transfer.
- Implementazione software di ricostruzione offline del campo di vista di AMS-02.
- Calibrazione on-orbit del sistema di determinazione del campo di vista di AMS-02 tramite StarTracker.
- Calcolo delle mappe di *cutoff* geomagnetico.
- Studio Eventi Solari.

2009–attuale **Studio Fenomenologico dei Raggi Cosmici in Eliosfera**

- Sviluppatore principale del Codice HelMod.
- Sviluppo del codice COSMICA.
- Sviluppo delle librerie in python per l'analisi dei risultati di HelMod/COSMICA.
- Studio del metodo numerico SDE-Monte Carlo.
- Studio effetti della carica nella propagazione dei raggi cosmici in Eliosfera.
- Descrizione dei parametri di modulazione in funzione dell'evoluzione temporale.
- Studio della distribuzione spaziale dei raggi cosmici.
- Calcolo dei Local Interstellar Spectra (LIS) di raggi cosmici galattici primari e secondari.
- Studio dell'interfaccia tra HelMod e GALPROP
- Studio Sorgenti primarie e aggiuntive per l'interpretazione degli eccessi negli spettri raggi cosmici galattici.
- Studio Fenomenologia Eventi solari.

Titoli di studio

- 2012 **Dottorato in Astronomia e Astrofisica**, *Università degli Studi dell'Insubria*, 27 Novembre 2012
Titolo Tesi: "*Diffusive Propagation of charged particles in the interplanetary medium, developing of a 2D Monte Carlo stochastic simulation of Cosmic Rays propagation in Heliosphere*"
- 2009 **Laurea Specialistica in Astrofisica e Fisica dello Spazio**, *Università degli Studi di Milano-Bicocca*, 6 luglio 2009, votazione 110/110 e lode
Titolo Tesi: "*Effetti di deriva sulla propagazione dei raggi cosmici in eliosfera*"
- 2006 **Laurea in Fisica**, *Università degli Studi di Milano-Bicocca*, 24 ottobre 2006, votazione 106/110
- 2003 **Diploma di Perito Industriale Capotecnico Specializzato Settore Informatico**, *I.T.I.S "Magistri Cumacini"*, Como, votazione 95/100

Elenco delle attività di collaborazione con le università

- 2019 **doctoral thesis examiner**, *Faculty of natural and agricultural Sciences, North-West University (South-Africa)*
Tesi: A Stochastic approach to the modelling of cosmic rays in the heliosphere, Raath J.L.
- 2021–attuale **membro commissione di esame**, *corso raggi cosmici del corso di laurea magistrale in Astrofisica e fisica dello spazio*, dipartimento di Fisica dell'Università degli Studi di Milano-Bicocca
- giugno 2021 **Componente della Commissione Giudicatrice**, *selezione n. 21PTA003*, dipartimento di Fisica dell'Università degli Studi di Milano-Bicocca
- maggio 2022 **Componente della Commissione Giudicatrice**, *selezione n. 22PTA011*, dipartimento di Fisica dell'Università degli Studi di Milano-Bicocca
- 2025 **doctoral external examiner**, *School of Engineering and Digital Sciences, Nazarbayev University (Kazakhstan)*
Tesi: efficient computational approaches to gpu-based monte carlo radiation transport, Askar T.
- 2025–26 **Professore a contratto**, *Laboratorio di Calcolo e Statistica, (ssd FIS/01)*, dipartimento di Fisica dell'Università degli Studi di Milano-Bicocca
- 2025 **doctoral external examiner**, *Dipartimento di Fisica e Astronomia, Alma Mater Studiorum - Università di Bologna*, Corso di Dottorato in Fisica - XXXVIII Ciclo
Tesi: Antideuteron Search in Cosmic Rays with the Alpha Magnetic Spectrometer on the International Space Station, F. D'Angelo

Conoscenze informatiche

Sistemi Unix/Linux, Windows
script language bash, python, Jupyter
Programmi Microsoft Office, \LaTeX , Jupyter

Linguaggi C/C++, CUDA-C, ROOT, MySQL
Web php, HTML, javascript
Grafica Adobe Lightroom, Adobe Photoshop

Produzioni scientifiche

- Autore in 66 articoli pubblicati su riviste internazionali con referee.
- Autore in 32 atti di convegno.
- Autore in 4 note interne.
- Relatore di 32 contributi a conferenze internazionali.
- Relatore di 10 contributi a workshop.

Elenco dei seminari, lezioni, articoli, video e prodotti diversi di comunicazione della scienza, singoli o nell'ambito di manifestazioni più ampie

- 31 gennaio 2025 **Seminario universitario**, *AstroP&Cosmo seminars – Univeristà degli studi di Torino*, numero soggetti coinvolti: ca.20.
Titolo intervento: Understanding Solar Modulation of Galactic Cosmic Rays: Advances and Insights
- 30 settembre 2024 **Seminario per studenti universitari**, *SPACE AND COSMIC RAY PHYSICS ONLINE SEMINAR – UMD Space Physics Group – University of Maryland*, numero soggetti coinvolti: ca.30.
Titolo intervento: Solar Modulation of Galactic Cosmic Rays with HelMod-4, DOI:10.15161/oar.it/211812
- 10 novembre 2022 **Seminario per studenti universitari**, *Corso di Informatica II - Corso di laurea Ingegneria Fisica - Università degli studi di Ca' Foscari*, numero soggetti coinvolti: ca.100.
Titolo intervento: Calcolo della Fluena dei Raggi Cosmici nel Sistema Solare per Missioni Spaziali
- 24 maggio 2022 **Seminario per studenti universitari**, *Corso di Raggi Cosmici - Università degli studi di Milano-Bicocca*, numero soggetti coinvolti: ca.50.
Titolo intervento: Space Particle Radiation Research @MiB
- 21 aprile 2022 **Seminario per studenti universitari**, *AstroBicocca seminar cycle, Dipartimento di fisica - Università degli studi di Milano- Bicocca*, numero soggetti coinvolti: ca.30.
Titolo intervento: Low Energy Excesses in Galactic Cosmic Rays from astrophysical sources
- 12 maggio 2021 **Lezione interattiva per studenti di scuola secondaria I Grado**, *I.C. POIRINO (TO) - THAON DI REVEL*, numero soggetti coinvolti: ca.60.
Titolo intervento: Pillole di Fisica dello Spazio
- marzo 2020 **Articolo su rivista periodica**, *Rivista "Scautismo" - Anno LIX N° 2, Marzo 2020, rivista a carattere tecnico-professionale registrazione n. 7755 del 16 novembre 1960 tribunale di Roma, associato all'USPI (unione stampa periodica italiana) ITISSN 0036-5696*, numero soggetti coinvolti: ca. 13'500
Titolo contributo: Con il naso all'insù, Costellazioni: cosa sono e dove trovarle
- 30 ottobre 2019 **Seminario per studenti universitari**, *Corso di Raggi Cosmici - Università degli studi di Milano-Bicocca*, numero soggetti coinvolti: 50.
Titolo intervento: Heliospheric Propagation
- 28 marzo 2018 **Lezione interattiva per studenti di scuola secondaria I Grado**, *Scuola S.Anna Opera Barolo di Moncalieri (TO)*, numero soggetti coinvolti: ca.30.
Titolo intervento: Astrofisica e Astronomia
- 12 dicembre 2016 **Seminario per studenti universitari**, *Institute of Experimental and Applied Physics, Departments Extraterrestrial Physics, Christian-Albrechts-Universität zu Kiel*, numero soggetti coinvolti: 50.
Titolo intervento: The Solar Modulation in the AMS-02 Era

Elenco Tesi Supervisionate

- Dic. 2010 **Tutor Tesi Triennale,**
- Nov. 2011 **Tutor Tesi Triennale,**
- Lug. 2012 **Tutor Tesi Magistrale,**

Mar. 2013 **Collaboratore Tesi Magistrale**, *S e altre sonde*

Set. 2013 **Correlatore Tesi Magistrale**, , Corso di Laurea in Astrofisica e Fisica dello Spazio, Università degli studi di Milano-Bicocca

Giu. 2015 **Collaboratore per Tesi Dottorato**,

Ott. 2016 **Correlatore Tesi Triennale**, *Studio di eventi solari c, .*, Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Mar. 2018 **Relatore Tesi Triennale**, *Trattazione dinamica dell'eliosfera all'interno*

Feb. 2019 **Correlatore Tesi Triennale**, *Studio della distribuzione spaziale dei raggi cosmici* Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Nov. 2019 **Correlatore Tesi Triennale**, *Analisi della dipendenza*
Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Mar. 2020 **Correlatore Tesi Triennale**, *Ricerca di Sorgenti Primarie di* ,
Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Mar. 2020 **Correlatore Tesi Triennale**, *Evidenza di Dark Matter nel Flusso di*, Corso
di Laurea in Fisica, Università degli studi di Milano-Bicocca

Nov. 2020 **Correlatore Tesi Magistrale**, *Caratterizzazione del flusso*

Mar. 2021 **Correlatore Tesi Triennale**, *Ricerca di Dark Matter nel* , Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Oct. 2021 **Correlatore Tesi Magistrale**, *Inferring the diffusion coefficient in the heliosheath*

Nov. 2021 **Correlatore Tesi Magistrale**, *Ricerca di segnali di Materia Oscura negli antiprotoni cosmici*,

Nov. 2022 **Correlatore Tesi Triennale**, *Abbondanze isotopiche nei raggi cosmic* , Corso

Nov. 2023 **Correlatore Tesi Triennale**, *Studio sulla composizione dei raggi cosmici e* Corso di Laurea in Fisica, Università degli studi di Milano-Bicocca

Nov. 2024 **Correlatore Tesi Triennale**, *Nuovo approccio al coefficiente di*

Ott. 2025 **Correlatore Tesi Triennale**

Ott. 2025 **Correlatore Tesi Triennale**,

Allegati

Il sottoscritto Stefano Della Torre, ai sensi del D. Lgs. 196/2003 sulla riservatezza dei dati personali, dichiara di essere stato compiutamente informato delle finalità e modalità del trattamento dei dati personali consapevolmente forniti nel presente curriculum e di autorizzarne l'utilizzo e l'archiviazione in banca dati.

Milano, 5 dicembre 2025

Raffaella Burioni - Curriculum Vitae

Personal data and contacts

Surname Burioni
First name Raffaella
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Università di Parma
Parco Area delle Scienze 7/a, 43124 Parma, Italy
E-mail
Webpage <https://personale.unipr.it/en/ugovdocenti/person/18825>

Research Interests

Equilibrium and Non Equilibrium Statistical Physics. Complex Systems. Graph Theory and Spectral Graph Theory. Stochastic Processes and Large Deviations, Diffusion, Random Walks on graphs and Transport Properties in Complex Environments. Synchronisation and Inference in Neural Networks. Interdisciplinary applications of Statistical Physics to Biological Systems and Neuroscience.

Current Position

2021 - present Full Professor in Theoretical Physics (02/A2) - Università di Parma, Italy

Previous Professional Appointments

2010 - 2020 Associate Professor in Theoretical Physics of Matter (02/B2) - Università di Parma, Italy
1999 - 2009 Assistant Professor in "Theoretical Physics and Mathematical Modelling" (FIS/02) Università di Parma, Italy
1997 - 1999 "Outstanding Young Researchers" Position, INFN, Istituto di Fisica della Materia, Università di Parma, Italy
1995 - 1996 Post Doc Fellow, Department of Physics, Università di Milano - Italy
1994 - 1995 Post Doc Fellow, Laboratoire de Physique Théorique, Ecole Normale Supérieure, Paris

Education

- 1990 Laurea (Master Degree) in Physics - II Università di Roma, 110/110 *Magna cum Laude*
- 1994 Ph.D. in Theoretical Physics - Sapienza Università di Roma.

Scientific Honors & Fellowships

- 2020 - present Fellow - European Centre for Living Technology - ECLT - Cà Foscari University - Venice - Italy
- 2018 American Physical Society Outstanding Referee
- 2014 Fellow Award - ISI Institute For Scientific Interchange, Torino, Italy
- 2014 - 2017 Fellowship of the ISI Institute For Scientific Interchange, Torino, Italy
- 1997 - 1999 Fellowship for "Young outstanding researchers" from INFN, National Institute for the Physics of Matter, Italy
- 1988, 1989 "Enrico Persico" Prize of the *Accademia Nazionale dei Lincei*, Italy

Professional Organisations

- 2010 - present Statistical Physics and Complex System Group Leader - Parma
- 2021 - present INFN project "DYNamics and non equilibrium states of complex SYStems: MATHematical methods and physical concepts", National coordinator
- 2019 - 2021 INFN project "DYNamics and non equilibrium states of complex SYStems: MATHematical methods and physical concepts", Local coordinator - Parma Unit
- 2005 - 2019 INFN project "Biological application of theoretical physics methods", (iniziativa Specifica) Local coordinator - Parma Unit
- 2006 - present INFN - National Institute for Nuclear Physics - In charge of Research

Editorship

- 2024 - present Editorial Board Member - *Physical Review E* - APS
- 2019 - present Editorial Board Member - *JSTAT Journal of Statistical Mechanics*
- 2018 - present Editorial Board Member - *Journal of Physics A: Mathematics and General*
- 2014 - 2023 Editorial Board Member - *Nature Scientific Reports*
- 2014 - 2017 Editorial Board Member - *Advances in Mathematical Physics*
- 2015 - present Reviewer for Oxford University Press on book proposals

Recent Fundings and Grants

- 2023 - present NextGenerationEU - PNRR Project "A multiscale integrated approach to the study of the nervous system in health and disease (MNESYS)", Co-PI
- 2023 - present FIL project "Collective and self-organised dynamics: kinetic and network approaches", University of Parma - Co-PI
- 2022 - present INFN project "DYNamical systems and non equilibrium states of complex SYStems : MATHematical methods and physical concepts", (iniziativa Specifica) - National coordinator
- 2022 - present NextGenerationEU PNRR Project "MOST", "National Center for Sustainable Mobility", Co-PI

2020 - 2022	Project “Alte competenze per la ricerca e per il trasferimento tecnologico”, Emilia Romagna - PON FSR “ <i>Big data sensing e temporal networks: network reconstruction and prediction of mobility patterns</i> ” - PI
2019	CSEIA Foundation Parma - Interdepartmental call Open Up - “ <i>Big jump analysis, complex time series and reliable estimates of risks from Big Data</i> ” - PI
2018 - 2022	INFN project “ <i>DYNAmical systems and non equilibrium states of complex SYStems : MATHematical methods and physical concepts</i> ”, (iniziativa Specifica) Local coordinator - Parma Unit
2005 - 2018	INFN project “ <i>Biological application of theoretical physics methods</i> ”, (iniziativa Specifica) Local coordinator - Parma Unit
2015	Nvidia Hardware Grant “ <i>Dynamics and Inference in Neural Networks</i> ” - PI

Selected Commissions of Trust and Advisory Activity

2025	Member of the Committee for the Selection of the President of the European Physical Society - 2025
2024	Member of the Committee for the Baldo Ceolin Prize - INFN
2023	Member of the Committee for the selection of the Director of the “Institute for Complex Systems” - CNR - Italy
2023	Member of the International Committee “Haut conseil de l'évaluation de la recherche et de l'enseignement supérieur” for the Evaluation of the “Laboratoire de Physique Théorique de la Matière Condensée (LPTMC) - Paris - France
2022	Member of the Committee for the Conscienze Ph.D. and Master Degree Prizes - National Conference of the Presidents and Directors of University Structures of Science and Technology
2019	Member of the Committee for the “Erdos-Renyi” Award - Network Society
2019	Review Panel for the FARE Projects - MIUR
2019	Review Panel for the Minerva Grants - Israel-Germany
2019	Review Panel for the Fellini Marie Curie Grants Program - INFN - Italy
2019 - present	Reviewer for Montalcini Grants
2017	Member of the Committee for the Della Riccia Grants
2016	Review Panel for the Vinci Program - France
2016 - present	Review Panel the German Research Foundation
2016	Remote Referee and Panelist in Bruxelles - Fondation Nationale de la Recherche - Luxembourg
2016 - present	Review Panel for Belgium Flanders - FWO Funding - Theoretical Physics
2016	Remote Referee e Panelist Expert in Bruxelles - FET Proactive - Horizon 2020 - Bruxelles
2016	Review Panel for the FONDECYT Foundation - Chile
2016	Review Panel for the Vienna Science Institute
2015	Review Panel for PISCOPIA projects - Marie Curie Actions - EU 7th FrameworkProgramme
2013	Review Panel for the Fubini grant - INFN
2013	Review Panel for FIRB projects - Futuro in Ricerca - MIUR
2012	Reviewer for Netherlands Organization for Scientific Research and Innovation - Innovative Research Scheme
2000 - present	Member of > 40 National and International Ph. D. Final Juries
2005 - present	Member of > 45 MIUR Committees for Permanent Researcher positions, Associate Professor and Full Professor positions and Tenure Tracks in Italian and foreign Universities
2007 - present	Member of > 20 Committees for the admission to Ph.D Grants in Italian Universities

Organised conferences & Committees

2025	Organizer and Chair of the Focus Session “Networks and Materials” - APS March Meeting - Anaheim CA - USA
2025	Organizer of WE- Heraeus Conference “Complex spreading phenomena: From bacteria to innovations” - Bad Honnef - Germany
2024	Organizer of CT@Brixen - Conference on Condensed Matter - Bressanone - Italy
2024	Organizers and Chair of the Focus Session “Statistical Physics of Networks: Theory and Applications to Complex Systems II” - APS March Meeting Minneapolis - USA
2023 - 2025	Member of the Organizing Committee of Statphys29 - IUPAP
2022	Organizer of the School “Complex Networks: from socio-economic systems to biology and the brain”, Lipari, 2022
2020	Program Co-Chair of NETSCI2020 - Rome
2019	Coordinator of the Topic Committee: “Rigorous Results”, IUPAP StatPhys27, Buenos Aires
1997 - present	Organizer of the Conference in Statistical Physics and Complex Systems, Parma, Italy - now SIFS conference
2015 - present	Member of the Program Committee of > 15 International Conferences
2019	Organizer of the Netsci2019 Satellite “Networks Neuroscience”, Burlington, US - 2019
2018	Organizer of the Netsci2018 Satellite “Networks Neuroscience”, Paris , France 2018
2017	Organizer of the Netsci2017 Satellite “Networks Neuroscience”, Indianapolis, US, 2017
2015	Organizer of the Netsci2015 Satellite “Brain Networks”, Zaragoza, Spain
2010 - 2012	Organizer of the INFN Conference on Theoretical Physics, Scuola Normale, Cortona, Italy
2012	Organizers of the Workshop: “ Concetti e Tecniche della Probabilità in Fisica, Biologia e Scienze Sociali”, Urbino
2000	Organizer of the Workshop <i>Statistical mechanics and Graph Theory</i> , ICTP, Trieste

Keynote and Invited Talks

- 4 Keynote Lectures, > 70 invited talks at International conferences; > 40 invited seminars and colloquia.

Selected invited and Keynote talks in the last years.

2025	Statphys Satellite Conference “Complex Networks” - Venezia - Italy
2025	Conference “Charting Complexity”, in honour of Alessandro Vespignani, Queen Mary and Royal Institution, London . UK
2025	Conference “Critical Transition in Socio-Ecological Systems” - Princeton Center for Theoretical Sciences - Princeton - USA
2025	Conference “Scaling Fluctuations and Flows” - ISC - CNR - Rome
2024	Venice meeting on “Fluctuations in small complex systems VII” - Venice- Italy
2024	Società Italiana di Fisica - SIF Conference - Bologna - Italy
2024	Quaranta Scienza, “L’Intelligenza artificiale contemporanea”, Accademia Nazionale delle Scienze detta dei XL - On line 2024
2024	Conference “Mathematical Physics and Beyond”, Accademia delle Scienze di Bologna, Italy
2023	Livi70 - Conference in Honour of Roberto Livi - Firenze - Italy
2023	American Physical Society March Meeting, Las Vegas - USA

2022	Conference “Rare events in physics and climate”, Ben-Gurion University - Israel
2022	Conference of the National Society of Neurology (SIN) , Milano , Italy
2022	35th Marian Smoluchowski Symposium on Statistical Physics, Jagellonian University, Krakov, Poland
2022	International School on Complexity XVII Course - Stochastic Forecasting in Complex Systems - Ettore Majorana Centre for Scientific Culture - Erice Italy - Invited lecturer
2022	47 Mecco Conference in Statistical Physics - Erice (PA) - Italy, Keynote Speaker
2021	European Physical Society Conference EPS - Statistical Physics and Complex Systems, ICTP Trieste
2020	ECLT Fellow talk - European Center for Living Technologies - Venice (on line)
2020	American Mathematical Society March Meeting, Invited talk at the Special Session on “Anomalous Diffusion” - Tufts - MA - USA (cancelled due to COVID restrictions)
2019	ICTP School and Workshop “Patterns of Synchrony: Chimera states, Synchronisation and beyond”, Trieste - Italy
2019	Summer School in Computational and Theoretical Models in Neuroscience, Venice
2018	Conference “Frontiers in Non Equilibrium Science”, King’s College, London
2018	Conference “Analysis and Modelling of Oscillatory Complex Systems”, Barcelona, Spain
2017	International Conference on Computational Neuroscience. Antwerp, Belgium.
2016	Statphys26, Lyon, France, invited speaker in the Topic “Interdisciplinary and Complex Systems”
2016	Workshop” Quantifying Complex Transport with Lévy Walks: From Cold Atoms to Humans and Robots”, Bad Honeff - Germany
2015	Conference NETSCI2015 - Saragoza, Spain
2015	Società Italiana di Fisica - SIF Conference - Roma - Italy
2014	ECCS European Conference in Complex Systems, Lucca Italy. Keynote Speaker
2014	COMPLENET Conference, Bologna, Italy. Keynote Speaker.
2014	Crossroads - ISI Award Conference. Torino, Italy, Keynote Speaker
2013	Workshop “From dynamics to Statistical Physics and Back”, Max Planck Institute, Dresden Germany
2013	Conference “Small systems, non equilibrium Fluctuations and Anomalous Dynamics” – Kavli Institute for Theoretical Physics - Beijing China
2013	CSP 2013 NATO Conference – Samarkand - Uzbekistan

Organizations & Memberships

2023 - present	Chair of the Board of the Division “Statistical and Non-Linear Physics” European Physical Society, EPS
2020 - present	C3 IUPAP commission for Statistical Physics: Member of the International Advisory Committee
2019 - present	Italian Society for Statistical Physics (SIFS): Vice-president
2019 - present	Italian Society for Statistical Physics (SIFS): Founder and Elected Board
2019 - present	Complex Systems Society, Italian Chapter, regional coordinator
2019 - present	American Physical Society - Member
2014 - present	Complex Systems Society - Member
2018 - present	Italian Society For Physics, SIF - Member

University Administration

Leadership roles

2024 - present Director of the Ph. D. School in Physics
2017 - 2023 Quality Manager (Responsabile della Qualità - RAQ) - Laurea Magistrale in Physics, University of Parma

Commissions

2022 - present Member of the Commission for Sustainability of the University of Parma
2017 - 2023 Member of the Commissione del Riesame - Laurea Magistrale in Physics, University of Parma
2009 - present Member of the PhD Committee (Collegio Docenti) in Physics - Università di Parma
2008 - 2021 Elected Member of the Evaluation Commission for the 02 Area (Physics) - Università di Parma (Comitato 102)
2004 - 2010 Commissione Didattica - Laurea in Scienza dei Materiali

Teaching

- Since 1998 regular teaching at Parma University in Physics at all levels (BS, MS and Ph.D.); *Statistical Physics II, Advanced Statistical Physics, Physics of Complex Systems, Analytical Mechanics and Statistical Physics, Mathematical Methods for Physics, Statistical Mechanics, Physics I and II, Theoretical Lab.*

Supervision of Students, Ph.D. and Postdoctoral Fellows

1999 - present Supervisor of 3 postdoctoral fellows, 17 Ph.D students, 26 Master students in Physics, 2 Master students in Mathematics, 1 Master student in Chemistry

Parma, January 3rd 2026