

## Curriculum vitae Marco Toppi

### PERSONAL INFORMATION

Family name, First name: Toppi, Marco

Researcher unique identifier ORCID: 0000-0002-0392-0895

Date of birth: 10/10/1983

Nationality: Italian



### ● CURRENT AND PREVIOUS POSITIONS

- 10/2022 – now      Researcher (RTD B)  
Settore concorsuale 02/A1 Fisica sperimentale delle interazioni fondamentali - Settore scientifico- disciplinare FIS/01 Fisica sperimentale)  
Dipartimento di Scienze di Base e Applicate per l'Ingegneria (SBAI)  
Sapienza Università di Roma - Italy
- 01/2020 – 10/2022      Researcher (RTD A)  
*Measurement Techniques for Light Ions Nuclear Reactions and study of their application in Particle Therapy*  
(Settore concorsuale 02/A1 Fisica sperimentale delle interazioni fondamentali - Settore scientifico- disciplinare FIS/01 Fisica sperimentale)  
Dipartimento di Scienze di Base e Applicate per l'Ingegneria (SBAI)  
Sapienza Università di Roma - Italy
- 03/2016 – 2019      Post.Doc  
*Development of integrated technologies for monolithic pixel trackers, aimed at upgrading the ALICE Inner Tracking System and for nuclear fragmentation experiments for applications in Particle Therapy*  
Laboratori Nazionali di Frascati (LNF)  
Istituto Nazionale di Fisica Nucleare (INFN) - Italy
- 11/2014 – 2016      Post.Doc

*Nuclear Techniques applied to Medical Physics*

Istituto Nazionale di Fisica Nucleare (INFN) at Dipartimento di Scienze di Base e Applicate per l'Ingegneria (SBAI) - Italy

- **EDUCATION**

- PhD – Excellence: *Fragmentation measurements with the FIRST experiment*, Physics Tor Vergata University, Rome – Italy - PhD Supervisors: Prof. Annalisa D'Angelo, Prof. Vincenzo Patera
- Master Degree - 110/110 cum laude. *Study of the electric discharge in gases by analyzing waveforms induced in RPC with gaps of various sizes* - Physics Tor Vergata University, Rome – Italy - Master Supervisor: Prof. Rinaldo Santonico, Dr. Barbara Liberti
- Bachelor Degree - 108/110. *Forme di Dinamica Relativistica* - Physics Tor Vergata University, Rome – Italy - Master Supervisor: Prof. Emanuele Pace

- **SCIENTIFIC RESPONSIBILITIES and COORDINATION ACTIVITIES**

2023 – now **Physics Coordinator** of the FOOT collaboration

2023 – now **Responsabile locale SBAI (dipartimento di Scienze di Base e Applicate per l'Ingegneria, Sapienza) e Substitute PI del progetto “reSPECT: Towards a new family of nuclear imaging gamma detectors”** – Funding: 304 keuro. PRIN U 40: PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – Bando Prin 2022 - Decreto Direttoriale n. 104 del 02-02-2022 - Prot. 2022Z72Y3K risultato tra i vincitori per la realizzazione di una nuova generazione di SPECT per imaging diagnostico, basati su scintillatori plastici arricchiti con elementi ad alto-Z.

2023 – now **Responsabile locale SBAI (dipartimento di Scienze di Base e Applicate per l'Ingegneria, Sapienza) e Substitute PI del progetto “CETRA: an innovative imaging tool for adaptive IOeRT”** – Funding: 216 keuro. PRIN U 40: PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – Bando Prin 2022 PNNR - Decreto Direttoriale n. n. 1409 del 14-09-2022 - Prot. P2022LCYEW risultato tra i vincitori per lo sviluppo di un device per imaging intraoperatorio per terapia IORT basato sulla rivelazione di onde acustiche.

2021 – 2023 **FlashDC** (Flash Dosimeter Counter) - “Progetti di Gruppi di Ricerca 2020” of

Regione Lazio (150 keuros). Responsible for the WP1: Detector development of a dosimeter for FLASH radiotherapy.

2021 – 2022 **Deputy Software Coordinator** of the FOOT collaboration for the fragments reconstruction and identification in the FOOT apparatus

2020 – 2022 **3DIT: 3D plastic scintillator** - University calls for research, SAPIENZA University, (10keuro), I work at the characterisation of 3D printed samples of organic-metallic scintillator for low cost, high rate SPECT imaging.

2019 – 2021 **PAPRICA (Pair Production Imaging Chamber)** - INFN CSN5 national project (75keuros). Local Coordinator for the experiment at LNF: coordination of the building of a range monitor device for proton therapy treatment.

#### ● **TEACHING ACTIVITIES AND SUPERVISION OF STUDENTS**

2023 – now **Professor** of the course of General Physics (for the module of Electromagnetism) for the Degree course of “Ingegneria Informatica e Automatica” in the faculty of “Ingegneria dell’Informazione, Informatica e Statistica” - Sapienza Università di Roma - Italy

2023 – 2024 **Professor** of the course of LABORATORIO DI FISICA SPERIMENTALE for the Degree course of “Ingegneria Meccanica” in the faculty of “Ingegneria Civile e Industriale” - Sapienza Università di Roma - Italy

2020 – 2023 **Professor** of the course of General Physics 2 (Electromagnetism and Optics) for the Degree course of “Ingegneria Civile e Industriale” and “Ingegneria dell’Informazione, Informatica e Statistica” at Latina - Sapienza Università di Roma - Italy

#### ● **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2019 – now Member of the FOOT collaboration [<https://web.infn.it/foot/en/home/>]

2016 – 2024 Associate Member of CERN as member of the ALICE collaboration in LNF

2016 – 2024 Member of the ALICE collaboration @ CERN

2011 – 2016 Member of the FIRST collaboration (FIRST – Fragmentation of Ions Relevant for Space and Therapy)

- **RESEARCH ACTIVITIES**

My research focuses on the field of **Nuclear Physics** within the ALICE collaboration and on the application of nuclear and particle physics to the field of medical physics and in particular to Particle Therapy, Radioprotection and Space Radioprotection. The bulk of my research activity, since my PhD, was focused on the study of the nuclear fragmentation and in the development of new detectors.

For the total number of publications, I can quote:

- **h-index of 44** with more than 333 publications in refereed international journals for a total of more than 6577 citations (<http://www.scopus.com>) (conference proceedings excluded);
- **5** publication as first author and **3** publication as corresponding author (excluding conferences' proceedings)

- **SCIENTIFIC PRODUCTS (selected publications)**

1. **M.Toppi** et al., “Monitoring carbon ion beams transverse position detecting charged secondary fragments: results from patient treatment performed at CNAO”, *Front. Oncol.* doi: 10.3389/fonc.2021.601784.
2. **M.Toppi** et al., “*PAPRICA: The Pair Production Imaging Chamber-Proof of Principle*”. *Front. Phys.* 9 (2021) 568139. doi: 10.3389/fphy.2021.568139.
3. G.Battistoni et al. (**M.Toppi corresponding author**), “*Measuring the Impact of Nuclear Interaction in Particle Therapy and in Radio Protection in Space: the FOOT Experiment*” *Frontiers in Physics* 8 (2021) 568242 doi: 10.3389/fphy.2020.568242.
4. **M.Toppi** et al., “*The MONDO Tracker: Characterisation and Study of Secondary Ultrafast Neutrons Production in Carbon Ion Radiotherapy*” *Frontiers in Physics* 8 (2020) 567990 doi: 10.3389/fphy.2020.567990.
5. M. Fischetti et al. (**M.Toppi corresponding author**), “*Inter-fractional monitoring of <sup>12</sup>C ions treatments: results from a clinical trial at the CNAO facility*” *Scientific Reports* 10 (1) (2020) 20735 doi: 10.1038/s41598-020-77843-z.

6. S. Acharya et al. (ALICE collaboration), “Production of charged pions, kaons, and (anti-) protons in Pb-Pb and inelastic pp collisions at  $\sqrt{s_{NN}}=5.02$  TeV”, *Physical Review C*, 2020, 101, 4, doi: 10.1103/PHYSREVC.101.044907
7. S. Acharya et al. (ALICE collaboration), “Multiplicity dependence of light-flavor hadron production in pp collisions at  $\sqrt{s}=7$  TeV”, *Physical Review C*, 2019, 99, 2, doi: 10.1103/PhysRevC.99.024906
8. **M. Toppi** et al. (FIRST Collaboration), “*Measurement of fragmentation cross sections of  $^{12}\text{C}$  ions on a thin gold target with the FIRST apparatus*”, *Phys. Rev. C* 93 (2016) 064601, doi: 10.1103/PhysRevC.93.064601.
9. De Simoni M, et al., (Toppi M corresponding author) (2022) A Data-Driven Fragmentation Model for Carbon Therapy GPU-Accelerated Monte- Carlo Dose Recalculation. *Front. Oncol.* 12:780784. doi: 10.3389/fonc.2022.780784
10. Acharya S. et al., Multiplicity dependence of  $\pi$ , K, and p production in pp collisions at  $\sqrt{s}=13$  TeV. *European Physical Journal C* Volume 80, Issue 81 August 2020 Article number 693. 10.1140/epjc/s10052-020-8125-1
11. **Toppi M** (2022), Elemental fragmentation cross sections for a  $^{16}\text{O}$  beam of 400 MeV/u kinetic energy interacting with a graphite target using the FOOT  $\Delta\text{E}$ -TOF detectors. *Front. Phys.* 10:979229. doi: 10.3389/fphy.2022.979229

Quanto dichiarato in queste pagine corrisponde a verità, ai sensi degli articoli 46 e 47 del D.P.R. 445 del 2000

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".

DATA, 20/09/2024

FIRMA

