

G. BAIOTTO

## Short Curriculum Vitæ of Dr. GIORGIO BAIOTTO



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Date of birth and citizenship: 15/06/1984, Italian

### Positions:

January 2016 - present: Research fellow (“*Ricercatore a tempo determinato*”) in the [Radiobiology and Radiation Biophysics](#) group, Head of the group: A. Ottolenghi, Department of Physics, University of Pavia (UniPv), Pavia, Italy

January 2013 - December 2015: Postdoc Fellow (“*Assegnista*”) in the same group at UniPv

March 2012 - December 2012: Postdoc Fellow (“*Assegnista*”), in the Nuclear Physics group, Head of the group: M. Bruno, Department of Physics, University of Bologna (UniBo), Bologna, Italy

### Degrees:

March 2012: [PhD in Physics](#), Thesis co-direction between the University of Bologna, Italy, and the University of Caen - Lower Normandy, Caen, France

October 2008 M.Sc. *cum laude* and October 2006 B.Sc. *cum laude* in Physics at the University of Bologna, Italy

*Links to selected publications in the text - for the complete list see please visit: [http://fisica.unipv.it/personale/PersFiles/Publ\\_333.pdf](http://fisica.unipv.it/personale/PersFiles/Publ_333.pdf)  
update June 2017 - **54 publications** in **peer-reviewed ISI-indexed journals**  
**citations** Scholar/WOS: **309/277** **h-index** Scholar/WOS: **10/9***

**The current research** is focused on the effects of ionizing radiation on biological structures, particularly in the development of theoretical models and simulations, experiment design and data analysis. Applications go from radiation therapy to diagnostics and radiation protection, especially for the effects of low doses and for space radiation. This includes Monte Carlo calculations of radiation interactions with tissues, both at the macroscopic level, with transport codes, and at the microscopic sub-cellular level with biophysical track structure codes (PARTRAC, in direct collaboration with the main code developer W. Friedland), down to the evaluation of cellular endpoints as *e.g.* DNA damage induced by different qualities of radiation (*e.g.* secondary neutrons in particle therapy, see [ANDANTE](#) below) and by different distributions of radioactive sources (*e.g.* internal electron emitters, see [Siragusa et al., 2017](#), accepted for publication). Within the research activities of the Radiobiology and Radiation Biophysics group of the Physics Department in Pavia I contribute in particular to the theoretical aspects of the investigation of the perturbation of cellular signaling cascades (*e.g.* inflammatory response mediated by NF-κB signaling, see [Babini et al. 2016](#)), modulated by low up to moderate doses of ionizing radiation of different qualities, and to the interpretation and analysis of biological data (*e.g.* for studies of individual radiosensitivity also for rare diseases - [Morini et al. 2015](#), statistical analysis, image analysis, *etc.*). Research activities in space radiation include future actions for improving knowledge on the effects of Galactic Cosmic Rays - [Norbury et al. 2016](#); and the coordination of projects funded by the European and Italian Space Agencies ([PERSEO](#), see below), for the development of innovative radiation protection systems for deep space exploration missions, with an important involvement of industrial partners. I'm also currently active in EURADOS - particularly in WG6: Computational dosimetry. Finally, thanks to an ongoing collaboration with my previous research group of the University of Bologna ([NUCL-EX](#), see below) I still carry on research on low and intermediate energy nuclear reactions (both on the theoretical and experimental side), for fundamental studies of nuclear structure and also of great importance for applications in radiation detection, radiation protection and therapy.

### Research projects and Tasks:

- [TRANSAT](#) (H2020, Kick-Off in September 2017, Local Scientific Responsible for UniPv): leading the Task on Tritium Dosimetry (with dosimetry at organ/tissue/(sub)cellular scale) in the WP *Impact of tritiated products on environment and human health*;
- [PERSEO](#) (funded by the Italian Space Agency, June 2016 - ongoing, co-Principal Investigator together with A. Ottolenghi): coordination of the project involving industrial partners for the realization of a radiation shielding water-filled spacesuit prototype, to be tested on board the International Space Station; leading the WP on modeling dose reduction due to shielding in the space radiation environment;
- [ANDANTE](#) (EU-Fp7, concluded in January 2016, coordinated by UniPv): project focus on the cancer risk from neutrons relative to photons using stem cells and the induction of second malignant neoplasms following pediatric radiation therapy. Coordination on behalf of UniPv of the WP on *Physical*

*update - June 2017*

*measurement and modelling of neutron fields*; combination of radiation transport and track structure modeling to derive the *ab-initio* neutron RBE model published in [Baiocco et al., 2016](#), [Baiocco et al. 2015](#), and applied to secondary neutrons in proton pencil beam scanning at PSI ([Schneider et al., 2016](#)); conception, design and characterization of experimental set-ups for neutron irradiations *e.g.* at PTB Braunschweig, set-up assembly, dosimetry (**Buttler, Zwar et al.**, submitted). *Awards for activities related to this project*: Young Investigator Travel Award by the European Radiation Research Society to participate to the ICRR 2015, Kyoto, Japan; best young contributor award by the Italian Radiation Research Society at the 2014 SIRR congress in Pavia;

- **Innovative Radiation Shielding Approaches - Ariadna** (call for ideas funded by the European Space Agency, concluded in July 2015): contractor's Representative for UniPv (for technical matters, together with A. Ottolenghi); coordination of the research activities involving scientists from Thales Alenia Space - Italy; material and design and design study for a wearable radiation protection spacesuit (**Vuolo & Baiocco et al.**, submitted);
- **(DoReMi) INITIUM** (Eu-Fp7, concluded): modeling track structures and initial events, to assess the issue of radiation quality dependence (results also in [Alloni et al. 2015](#)) and **(DoReMi) TREND** (Eu-Fp7, concluded): modeling damage at ions' track ends, with results also in [Friedland et al., 2017](#);
- **MERIDIAN** (funded by INFN, concluded): project focus on the effects of radiation on immunity and differentiation; data analysis and interpretation, results also in [Babini, Morini et al. 2017](#);
- **RADIOSTEM** (funded by INFN, concluded): project focus on mechanisms of the radiobiological response to photons and charged particles of cancer and healthy stem cells; coordination of simulation activities of the UniPv Unit;
- **NUCL-EX** (funded by INFN, ongoing): continuing collaboration on modeling nuclear reactions at low and intermediate energy; analysis and interpretation of data for measurement campaigns at *e.g.* Legnaro National Laboratories (LNL) ([Bruno et al. 2013](#)), particularly aiming at investigating the interplay between nuclear structure and reactions in light nuclei reactions and at benchmarking of radiation transport codes, also adopted in applications to radiation protection. Development of the Monte Code HFI ([Baiocco et al. 2013](#), [Morelli et al. 2014](#)). Past: spokesperson of measurements at LNL and first author of a Letter of Intent for the exotic beam facility SPES@LNL.

#### **Education and Training / Teaching Activities**

- **CONCERT** (H2020, ongoing): co-director of the Concert Training Course: *Modeling radiation effects from initial physical events* (Pavia, together with A. Ottolenghi, 2017 Edition held in May/June and 2018 Edition approved for funding); Lecturer in the previous 2016 edition; Topics of lectures: Interaction Radiation Matter; Nuclear Interactions; Transport Codes; Modeling DNA Damage; Space Radiation;
- **EUTEMPE-NET** (EUTEMPE-RX follow-up based on a MoU among partners): co-director of the *Course Radiation Biology for Medical Physicists* (together with A. Ottolenghi, next Edition foreseen in January 2018);
- **EUTEMPE-RX** (Eu-Fp7, concluded): coordination activities for the course: *Radiation Biology for Medical Physicists*, Pavia, April 2015, in particular for the sessions: *Interventional Radiology and Radiobiology; Diagnostics and Radiobiology - Discussion of clinical situations / cases presented by radiologists and medical physicists*;
- **DoReMi** (Eu-Fp7, concluded): Lecturer at the DoReMi Training Course: *Modeling radiation effects from initial physical events*, Pavia, Editions 2013, 2014, 2015;
- Lecturer at **UniPv** for: *Semeiotica strumentale* (1ECTS) for *Medicina e Chirurgia* and *Instrumental Semeiotics* (1ECTS) for *Medicine & Surgery* (2015 - present); *Diagnostic Techniques* (3ECTS) for the M.Sc. in Physics (AY. 2014/2015). Supervisor of BSc (S. Barbieri, M. El Ais) and MSc (M. Siragusa) theses in Physics at UniPv.

#### **Continuing Education - latest, selection**

- **NASA Space Radiation Summer School** (financed by the Universities Space Research Association upon successful application for 16 candidates worldwide), June 2015, Brookhaven National Laboratory, Upton, NY - USA
- **Geant4-DNA Tutorial**, November 2014, ESA-ESTEC, Noordwijk, Holland
- **EPIRADBIO Training** Modeling in Radiation Epidemiology and Radiation Biology, April 2013, Herrsching (Ammersee), Germany

**Personal and Technical Skills:** written and oral proficiency in English (also with certificate of attendance of an English-Italian translator course, Herzog Literary Agency, Milan, 2014), French and German. Programming skills in C/C++, computing skills in software for data (*e.g.* ROOT, gnuplot) and image analysis (*e.g.* Image J), familiar with Windows, Mac OSs and Linux OSs.