

Curriculum Vitae of Francesca Ballarini

Associate Professor, University of Pavia, Physics Department (SSD FIS/07), from 01/12/2017

Abilitazione Scientifica Nazionale – I fascia (SC 02/D1, SSD FIS/07-Fisica Applicata), obtained on 12/09/2018

President of the Applied Nuclear Energy Laboratory of the University of Pavia

Past President of the Italian Society for Radiation Research (SIRR)

Scopus:

Publications: 109

H-index: 31

Citations: 2045

Education, Research and Publications

Francesca Ballarini got her Physics “Laurea” (MSc) in 1997 (grade: 110/110 *cum laude*) at the University of Milano with a Thesis work on the modelization of radiation-induced chromosome damage, which was awarded by the Italian Society for Radiation Research (SIRR). Afterwards, FB continued her research activity in the field of ionizing radiation, for which a specific PhD course was not available, by means of several non-permanent contracts (mainly, research scholarships and fellowships), among which a research fellowship provided by the Houston University and funded by NASA Johnson Space Center (Houston, TX). In 2005 FB won a permanent research fellow position at the University of Pavia, in 2013 she got the National Scientific Qualification (ASN) as Associate Professor, and in 2017 she won a position as Associate Professor at the University of Pavia, and in 2018 she got the National Scientific Qualification (ASN) as Full Professor.

FB leads the group of Computational Radiobiology of the Pavia Physics Department; the activity of the group is focused on the development of biophysical models and Monte Carlo codes that simulate the action of ionizing radiation in biological targets, with particular attention to applications for cancer ion therapy, or „hadrontherapy“. In particular, FB is main author of the model/code BIANCA (BIophysical ANalysis of Cell death and chromosome Aberrations), which simulates the induction of cell death and chromosome damage in cells irradiated by photons and by different ions, including those used in hadrontherapy. Recently, the model has been validated for *in vitro* and *in vivo* animal irradiation by protons, C-ions and He-ions; a pilot study on C-ion cancer patients showed that the BIANCA predictions are in line with those provided by the two models currently used in clinics for C-ion patient treatment. Furthermore, FB worked

on the radiobiological modelization in the field of Boron Neutron Capture Therapy (BNCT) and on the calculation of astronaut doses following space radiation exposure.

On these topics, starting from 1998 FB published 109 articles in journals indexed in Scopus and/or ISI-WoS (plus other 55 articles in non-indexed journals) and 3 book chapters, she delivered 40 invited talks at national or international conferences (plus 22 contributed presentations), she gave numerous seminars at Italian and foreign institutions, and she got several awards, including a support by NASA-Johnson Space Center in the framework of the NASA/JSC Radiation Program.

Honors and awards

FB is currently President of the Applied Nuclear Energy Laboratory (LENA) of the University of Pavia; in the past, she was President of the Italian Society for Radiation Research (SIRR) and member of the Board of Councillors of IARR - International Association for Radiation Research. Furthermore, FB is peer-reviewer for the main international journals in the field and she was project reviewer for the Swedish Space Agency, the French National Alliance for Life and Health Sciences (jointly with the French National Cancer Institute), and the Czech Science Foundation (the main public funding institution for research in the Czech Republic); she is editor of the international journals *Frontiers in Oncology* and *AIMS Biophysics* (indexed in ISI/WoS and Scopus), she was guest editor for the international journals *Int. J. of Molecular Sciences* and *Advances in Space Research*, she was Editor-in-Chief of the Italian journal *Radiazioni – Ricerca e Applicazioni* and she was member of the scientific and/or organizing committee of several national or international conferences and schools.

For the University of Pavia, FB is member of „Presidio di Qualità“, she is „Preposto“ for ionizing radiation at the Physics Department, she was member of the PhD Colloquia Committee at the Physics Department, she is responsible for the contacts between the Physics Department and CNAO for the „LM plus“ project, and she was member of the Committee that revised the Statute of the University of Pavia according to the 240/2010 law („legge Gelmini“).

Projects and collaborations

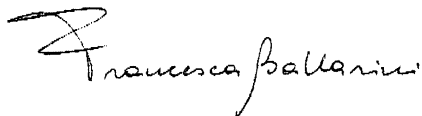
The aforementioned research activities are carried out in the framework of many national and international collaborations. Those currently ongoing include the following institutions: CNAO - Centro Nazionale di Adroterapia Oncologica (*M Pullia, A Facchetti et al.*); HIT - Heidelberg Ion-beam Therapy centre (*A Mairani et al.*); NUAA - Nanjing University of Aeronautics and Astronautics, China; Istituto Nazionale Tumori di Milano (*T Rancati et al.*); INFN-Milano (*P. Sala, A Ferrari and G Battistoni*). FB is also member of the *Radiobiology working group of ISNCT-International Society of Neutron Capture Therapy* and of RENOVATE, an international research network on BNCT; finally, in 2019 FB participated in an international collaboration consisting of the main experts in the field, which led to the definition of a new standard for the simulation of radiation-induced DNA damage.

FB participated in many national and international research projects mainly funded by EU, MIUR, Italian Space Agency and INFN-National Institute of Nuclear Physics), also as (local) PI and „external advisor“.

Teaching and supervising

At the University of Pavia, FB currently teaches basic Physics, Radiation Protection, and Physics of Innovative Oncological Therapies, as well as Applied Physics in two Medical Specialization Schools and Radiobiology in the Radiation Protection Master of the Physics Department; she is also member of the teaching staff of a PhD course on *Computational Mathematics and Decision Sciences* (cycle XXXIV). In the past, FB gave Radiobiology lectures for a Master of the *European School of Advanced Studies on Nuclear and Ionizing Radiation Technology* of the IUSS Institute in Pavia, for the PhD in Physics of the University of Pavia and for the Health Physics Specialization School of the University of Milan. Until now, FB was supervisor or co-supervisor of 40 Thesis works (including BSc, MSc and PhD).

Pavia, June 10th, 2024

A handwritten signature in black ink that reads "Francesca Ballarini". The signature is written in a cursive style with a large, stylized initial 'F'.

Francesca Ballarini

University of Pavia

Physics Department

e-mail: francesca.ballarini@unipv.it

Tel.: ++39 0382 987949