Updated May 28, 2020

Personal information

Surname / First name

Personal Email

Professional Email

Home page

Nationality

Date of birth

O 1

Gender

Pinto, Massimo

massimo.pinto@me.com

massimo.pinto@enea.it

http://massimopinto.github.io

Italian

July 9, 1973

Male

Current Position

Research Scientist, Dosimetry Division, Italian National Institute of Ionizing Radiation Metrology

Radiation Metrolog

Since 2020 Ad interim Contact person for the calibration services for radiation protection

and diagnostic radiology dosimetry

Since 2018 Contact person for the *proficiency testing* services for radiation protection

and diagnostic radiology dosimetry

Since 2010 Contact person for the primary standards of air kerma for radiation protection and diagnostic radiology dosimetry, and standards of absorbed dose to water

in low dose-rate brachtherapy and kV x-rays dosimetry

Research Interests

Since 2010

Experimental and computational dosimetry of ionizing radiation, using freeair chambers, cavity chambers, graphite calorimeters, Monte Carlo codes of radiation transport Penelope and EGSnrc, the automation of laboratory instruments control using Visual C++ based programs, and automation of data analysis using Python in or outside of Jupyter notebooks.

Before 2010

DNA damage and repair in human cultured cells using pulsed-field gelelectrophoresis, bystander effects and adaptive responses using micronuclei and survival assays, flow cytometry and cell sorting, immunofluorescence.

Post-Doctoral Research Experience

2006 – 2010

Ionising Radiation and Biophysics and Biomedical Physics Unit, Istituto Superiore di Sanità, Rome, Italy. Project: "Background low dose rate ionizing radiation and its potential adaptive behaviour in the human lymphoblastoid line TK6". Funded by Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi. Principal Investigators: Luiqi Satta and Mauro Belli



2003 - 2006

Radiation Research Division, UMDNJ, New Jersey Medical School, NJ, USA. Project: "Radiation-induced bystander effects and their adaptive behaviour in three dimensional in vitro human culture models labelled with radiopharmaceuticals". Principal Investigator: Roger W. Howell

2002 - 2003

Biophysics Department, Faculty of Sciences, University of Naples Federico II, Naples, Italy. Project: "Murine cell survival after exposure to accelerated Lithium ions". Principal Investigator: Giancarlo Gialanella

Education

1998 – 2002 Рн.D.

1992 – 1998 B.Sc.

Cell and Molecular Biophysics, Gray Cancer Institute and Oncology Department, University College London, UK. Ph.D. in radiation-induced DNA damage and repair. Advisers: *Kevin M. Prise* (GCI), *Barry D. Michael* (GCI), and *John Hartley* (UCL). Thesis title: "Induction and rejoining of DNA double strand breaks in human cells after exposure to ionising radiation: an experimental and modelling approach"

Faculty of Sciences, University of Naples Federico II, Naples, Italy. BSc in Physics, perfect score cum laude. Thesis Advisors: *Gianfranco Grossi* (Naples, Italy) and *Kevin Prise* (Gray Cancer Institute, UK). Thesis title: "Molecular alterations induced by sparsely ionising radiations: experimental and theoretical studies"

Languages

Mother tongue

 $Self\text{-}assessment\\ European\ level^{(\star)}$

English

French

Italian

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
C2 Proficient user	C2 Proficient user	C2 Proficient user	C2 Proficient user	C2 Proficient user
A2 Basic user	B1 Independent user	A2 Basic user	A2 Basic user	A2 Basic user

^(*) Common European Framework of Reference (CEF) level

International expert missions

2017

National Institute of Standards, Cairo, Egypt, Training on CMC procedures related to ACAA priorities and peer-review of draft CMCs, Project: "Building the Capacity of the Egyptian National Institute of Standards (NIS) in the Field of Metrology", February 26th - March 2nd, funded by the European Union

2016

National Metrology Institue of Ethiopia (NMIE), Addis Ababa, Ethiopia, Assessment of the current measurement capabilities of the NMIE SSDL in the field of radiation dosimetry, Project: "Enhancing the National Quality Infrastructure in Metrology and Radiation Safety", November 28th - December 2nd, funded by the IAEA

National Institute of Standards, Cairo, Egypt, Feasibility Studies on calibration activities and training on calibration issues, Project: "Building the Capacity of the Egyptian National Institute of Standards (NIS) in the Field of Metrology", 16-20 October, funded by the European Union

Major scientific publications in peer-reviewed journals: Radiation Dosimetry

2020

Andreo P, Burns, D, Kapsch R-P, McEwen M, Vatnitsky S, Andersen C E, Ballester F, Borbinha J, Delaunay F, Francescon P, Hanlon M, Mirzakhanian L, Muir B, Ojala J, Oliver C, Pimpinella M, **Pinto M**, de Prez L, Seuntjens J, Sommier L, Teles P, Tikkanen J, Vijande J and Zink K, 2020, "Determination of consensus $k_{\rm Q}$ values for megavoltage photon beams for the update of IAEA TRS-398", Physics in Medicine and Biology, **65** 095011, doi:10.1088/1361-6560/ab807b

Tikkanen J S, Zink K, Pimpinella M, Teles P, Borbinha J, Ojala J, Siiskonen T, Gomà C, and **Pinto M**, 2020, "Calculated beam quality correction factors for ionization chambers in MV photon beams", Physics in Medicine and Biology, **65** 075003, doi:10.1088/1361-6560/ab7107

Santurio G V, **Pinto M**, and Andersen C E, "Evaluation of the ionization quenching effect in an organic plastic scintillator using kV x-rays and a modified Birks model with explicit account of secondary electrons", Radiation Measurements **131** 106222

2019

Pimpinella M, Silvi L and **Pinto M**, 2019, "Calculation of kQ factors for Farmer-type ionization chambers following the recent recommendations on new key dosimetry data", Physica Medica **57** 221–30

2018

Pinto M, Andersen C E, Delaunay F, de Prez L A, Donois M, Duane S, Gomà C, Kosunen A, Ojala J, Pimpinella M, Rapp B, Siiskonen T, Sommier L, Teles P, Tikkanen J and Zink K, 2018, "The RTNORM contribution to the update of the k_{Q,Q_0} factors for the International Dosimetry Code of Practice TRS 398", 115th Scientific Meeting of the JSMP vol **38**, pp 41—4

2017

D'Arienzo M, **Pinto, M**, Sandri, S and Zagarella, R, 2017, "Radiological and Nuclear Events: Challenges, Countermeasures and Future Perspectives, in: Cyber and Chemical, Biological, Radiological, Nuclear, Explosives Challenges", edited by Martellini, M. and Malizia, A., Springer, 129–154

2016

L. Büermann, A.S. Guerra, M. Pimpinella, M. Pinto, J.A. de Pooter, L. de Prez, B. Jansen, M. Denoziere, and B. Rapp, 2016, "First international comparison of primary absorbed dose to water standards in the medium-energy X-ray range". Metrologia 53 1A.

M. Pinto, M. Pimpinella, M. Quini, M. D'Arienzo, I. Astefanoaei, S. Loreti, A.S. Guerra, 2016, "A graphite calorimeter for absolute measurements of absorbed dose to water: application in medium-energy x-ray filtered beams", Physics in Medicine and Biology **61**(4)

2015

C. Kessler, M. Pinto, G. Cappadozzi, C. Silvestri, M. Bovi, and M.P. Toni, 2015, "Key comparison BIPM.RI(I)-K1 of the air-kerma standards of the ENEA-INMRI, Italy and the BIPM in ⁶⁰Co gamma radiation", Metrologia **52** (1A)

C Kessler, D T Burns, P Roger, M P Toni, **M Pinto**, M Bovi, G Cappadozzi, and C Silvestri, 2015, "Key comparison BIPM.RI(I)-K7 of the air-kerma standards of the ENEA-INMRI, Italy and the BIPM in mammography x-rays", Metrologia **52** (1A)

J Farah, A Trianni, O Ciraj-Bjelac, I Clairand, C De Angelis, S Delle Canne, L Hadid, C Huet, H Jarvinen, A Negri, L Novák, **M Pinto**, T Siiskonen, M J Waryn, and Ž Knežević, 2015, "Characterization of XR-RV3 GafChromic® films in standard laboratory and in clinical conditions and means to evaluate uncertainties and reduce errors", Medical Physics **42**(7)

2014

D T Burns, C Kessler, **M Pinto**, G Cappadozzi, C Silvestri, and M P Toni, 2014, "Key comparison BIPM.RI(I)-K3 of the air-kerma standards of the ENEA, Italy and the BIPM in medium-energy x-rays", Metrologia **51** Tech Suppl 06020

H Palmans, H Rabus, A L Belchior, M U Bug, S Galer, U Giesen, G Gonon, G Gruel, G Hilgers, D Moro, H Nettelbeck, **M Pinto**, A Pola, S Pszona, G Schettino, P H G Sharpe, P Teles, C Villagrasa, and J J Wilkens, 2014, "Future development of biologically relevant dosimetry", The British Journal of Radiology 88(1045)

2012

M P Toni, M Pimpinella, M Pinto, M Quini, G Cappadozzi, C Silvestri, and O Bottauscio, 2012, "Direct determination of the absorbed dose to water from 125I low dose-rate brachytherapy seeds using the new absorbed dose primary standard developed at ENEA-INMRI", Metrologia 49(5)

2011

D T Burns, C Kessler, P Roger, M P Toni, **M Pinto**, M Bovi, G Cappadozzi, and C Silvestri, 2011, "Key comparison BIPM.RI(I)-K2 of the air-kerma standards of the ENEA-INMRI, Italy and the BIPM in low-energy x-rays", Metrologia **48** Tech Suppl 06010

Major technical reports: Radiation Dosimetry

2019

Pinto, M and Pimpinella, M, "16NRM03 RTNORM WP1 Report on ENEA-INMRI measurements of Farmer Chambers in water and in air (A1.2.2), activity 1.2.4 (cross calibrations), 1.2.6, and early contribution to Activity 1.2.8"

Pinto, M, D'Arienzo M, Bovi M, Alonzo, M, Pimpinella M and Toni M P 2019, "Report to the CCRI section I on the activity carried out at ENEA-INMRI on photon and charged-particles dosimetry in the period 2017- 2019", 25th CCRI(I) Committee Meeting, BIPM, France

2017

Pinto M, D'Arienzo M, Bovi M, Guerra A S, Pimpinella M and Toni M P 2017, "Report to the CCRI section I on the activity carried out at ENEA-INMRI on photon and charged-particles dosimetry in the period 2015- 2017", 24th CCRI(I) Committee Meeting, BIPM, France

McEwen M, Burns D T, D'Arienzo M, de Pooter J A, **Pinto M** and Rapp B 2017, "Report to CCRI(I) on the recommendations of ICRU Report 90", 23rd CCRI(I) Committee Meeting, BIPM, France

2015

Pinto M, D'Arienzo M, Bovi M, Guerra A S, Pimpinella M and Pia Toni M P, 2015, "Report to the CCRI section I on the activity carried out at ENEA-INMRI on photon and charged-particles dosimetry in the period 2013- 2015", 22nd CCRI(I) Committee Meeting, BIPM, France

Massimo Pinto, Maria Pimpinella, Maurizio Quini, Marco D'Arienzo, Iordana Astefanoaei, Stefano Loreti, and Antonio Stefano Guerra, "Absorbed dose to water measurements in medium energy filtered x-ray beams by a new in-water-phantom graphite calorimeter", Report D.1.2.3 in EMPIR MetrExtRT

Massimo Pinto, Maria Pimpinella, and Antonio Stefano Guerra, "ENEA-INMRI Report to the EURAMET.RI(I)-S13 comparison of primary absorbed dose to water standards in the medium-energy x-ray range" 2013 M.P. Toni, M. Pinto, M. D'Arienzo, A.S. Guerra, M. Pimpinella, M. Bovi, 2013, "Report to the CCRI section I on the activity carried out at ENEA-INMRI on photon and charged-particles dosimetry in the period 2011-2013", 21st CCRI(I) Committee Meeting, BIPM, France 2012 Maurizio Bovi, Marco Capogni, Claudio Caporali, Marco D'Arienzo, Pierino De Felice, Antonio Stefano Guerra, Maria Pimpinella, Massimo Pinto, Maria Pia Toni, "Ionizing radiation metrology in cancer radiation therapy", Energia, Ambiente ed Innovazione, 3 2011 M.P. Toni, M. Pinto, A.S. Guerra, M. Pimpinella, M. Bovi, S Loreti, 2011, "Report to the CCRI section I on the activity carried out at ENEA-INMRI on photon and charged-particles dosimetry in the period 2009-2011", 21st CCRI(I) Committee Meeting, BIPM, France Partecipation in the European Area Metrology Research Programmes 2019-2022 Workpackage I Leader, "Primary standards and traceable measurement methods for X-ray emitting electronic brachytherapy devices (EMPIR 18NRM02 PRISM-eBT)", http://www.ebt-empir.eu/ Coordinator, 2017-2019 "kQ factors in modern external beam radiotherapy applications to update IAEA TRS-398 (EMPIR 16NRM03 RTNORM)", http://www.rtnorm.eu 2012-2015 Workpackage I Leader, "Metrology for Radiotherapy using Complex Radiation fields (EMRP MetrExtRT)", http://radiotherapy-emrp.eu Workpackage IV Leader, "Biologically-Weighted Quantities in Radiotherapy (EMRP BioQuaRT)", https://www.ptb.de/emrp/bioquart-home.html 2009-2011 "Increasing Cancer Treatment Efficacy Using 3D brachytherapy (iMera Plus Brachytherapy)" Ad hoc peer review in radiation dosimetry Metrologia, Medical Physics, Radiation Measurements, Journal of Contermporary Brachytherapy, International Journal of Environmental Research and Public Health, Nuclear Instruments and Methods A, Physica Medica in radiation biology Radiation Research, International Journal of Radiation Biology, British Journal of Radiology, Molecular Cancer Research, International Journal of Epidemiology, Journal of Pharmacy and Farmacology 2019

Teaching Experience

Lecturer, Joint ICTP-IAEA Workshop on Uncertainty Estimations for Radiation Measurements in SSDLs and Hospitals, December 2019, International Center for Theoretical Physics, Trieste, Italy

Lecturer, First and Second Level Master's Course in Protection in Chemical, Radiological, Biological, Nuclear and Explosives Events, June and July 2018, University Tor Vergata, Rome, Italy

2018

2016 Lecturer, First and Second Level Master's Course in Protection in Chemical, Radiological, Biological, Nuclear and Explosives Events, March and April 2016, University Tor Vergata, Rome, Italy

2008 Lecturer, Lazio Region Science Festival "Apriamo la Mente", May 16-17, Lazio Region, Italy

Assistant Lecturer, Radiation Biology module, Radiology Residence Training, New Jersey Medical School (New Jersey, USA)

Assistant Lecturer, Electromagnetism module, Physics course for Biology BSc students, University of Naples Federico II, Naples, Italy

Invited Lectures

2006

2002

International Conference on Dosimetry Standards and Applications IDOS2019, June 2019, "The contribution of the RTNORM EU consortium to the update of the kQ factors for the International Dosimetry Code of Practice IAEA TRS 398"

Japanese Medical Physics Society, April 2018, "The RTNORM contribution to the update of the kQ factors for the international dosimetry Code of Practise IAEA TRS 398", Annual Meeting, Yokohama, Japan

Brasilian Congress of Ionizing Radiation Metrology, November 2018, "The contribution of a primary standards dosimetry laboratory: ENEA-INMRI, Italy", Rio de Janeiro, Brasil

2016 Elettra Sincrotrone Trieste, Italy, March 9, 2016, "I campioni nazionali e la riferibilità delle misure dosimetriche con radiazione fotonica di bassa energia (< 50 keV) per scopi medici e radioprotezionistici"

Vatican Scientific Academy, Rome, Italy, December 20, Invited oral presentation on the "Cosmic Silence" experiment

Keynote lecture, Annual Meeting of the Italian Association for Medical Physics, September, Congress Center "Il Ciocco", Castelvecchio Pascoli (Lu), Italy

Computing skills

OS Linux, Unix, Mac, Windows

Languages C++, Visual C++, FORTRAN 90, Python, LATEX

Data Viz DataGraph, Matplotlib, Seaborn

versioning Git DataGraph, Matplotho, Seaborn

databases MySQL

Web Wordpress, GitHub pages and Jekyll

Major scientific publications in peer-reviewed journals: Radiation Biology

Testa A, Ballarini F, Giesen U, Gil O M, Carante M P, Tello J, Langner F, Rabus H, and Palma V, **Pinto M** and Patrono C, 2018, "Analysis of Radiation-Induced Chromosomal Aberrations on a Cell-by-Cell Basis after Alpha-Particle Microbeam Irradiation: Experimental Data and Simulations", Radiat Res **189**(6)

- 2015 C Patrono, O Monteiro Gil, U Giesen, F Langner, **M Pinto**, H Rabus and A Testa, 2015 "'BioQuaRT' project: design of a novel in situ protocol for the simultaneous visualisation of chromosomal aberrations and micronuclei after irradiation at microbeam facilities", Radiation Protection Dosimetry **166** (1-4)
- G. Esposito, A. Campa, M. Pinto, G. Simone, M. A. Tabocchini and M. Belli, 2011, "Adaptive Response: Modeling and Experimental Studies", Radiation Protection Dosimetry, 143 (2-4)
- 2010 M. Pinto, E.I. Azzam, and R.W. Howell, 2010, "Investigation of Adaptive Responses in Bystander Cells in 3D Cultures Containing Tritium-Labeled and Unlabeled Normal Human Fibroblasts", Radiation Research, 174(2)
- Carbone, M. C., Pinto, M., Antonelli, F., Amicarelli, F., Balata, M., Belli, M., Conti Devirgiliis, L., Ioannucci, L., Nisi, S., Sapora, O., Satta, L., Simone, G., Sorrentino and E., Tabocchini, M.A., 2009, "The Cosmic Silence Experiment: on the putative adaptive role of environmental ionizing radiation", Radiat. and Environ Biophysics, 48
- Antonelli, F., Belli, M., **Pinto, M.**, Sapora, O., Sorrentino, E., Simone, G., Tabocchini, M. A., Amicarelli, F., Conti De Virgiliis, L., Carbone, M. C.. Balata, M., Ioannuci, L., Nisi, S. and Satta, L. 2008, "PULEX: Influence of environment radiation background on biochemistry and biology of cultured cells and on their response to genotoxic agents", Il Nuovo Cimento C
- Pinto, M and Howell, R. W. "Concomitant quantification of targeted drug delivery and biological response in individual cells", Biotechniques Jul;43(1)
 Howell, R. W., Neti, P. S. V., Pinto, M., Gerashchenko, B. I., Narra, V. R. and Azzam, E. I., 2007, "Challenges and Progress in Predicting Biological Responses to Incorporated Radioactivity", Radiat Prot Dosimetry 122, 521-27
- 2006 **Pinto, M.**, Azzam, E. I. and Howell, R. W., 2006, "Bystander Responses in human 3D cultures containing radiolabeled and unlabeled cells", Radiat Prot Dosimetry **122**
- 2005 **Pinto, M.**, Prise, K. M. and Michael, B. D., 2005, "Evidence for complexity at the nanometer scale of radiation induced DNA DSB as a determinant of rejoining kinetics", Radiation Research **164**(1)
- 2004 **Pinto, M.**, Prise, K. M. and Michael, B. D., 2004, "A Monte Carlo model of DNA double-strand break clustering and rejoining kinetics for the analysis of pulsed-field gel electrophoresis data", Radiation Research **162**(4)
- 2002 **Pinto, M.**, Prise, K. M. and Michael, B. D., 2002, "Quantification of radiation induced DNA double-strand breaks in human fibroblasts by PFGE: testing the applicability of random breakage models", Int J of Radiation Biology, **78**
 - **Pinto, M.**, Prise, K. M. and Michael, B. D., 2002, "DSB rejoining after irradiation of human fibroblasts with X-rays or alpha-particles: PFGE studies and numerical models", Radiat Prot Dosimetry, **99**
- Prise, K. M., Pinto, M., Newman, H. C. and Michael, B. D., 2001, "A review of studies of ionizing radiation-induced double-strand break clustering",
 Radiation Research, 156
- 2000 **Pinto, M.**, Newman, H. C., Prise, K. M. and Michael, B. D., 2000, "Quantification of DNA damage by PFGE: development of an analytical approach to correct for the background distribution", Int J of Radiation Biology, **76**

Scientific publications in other research areas

2020 S Biancotto, A Malizia, M Pinto, GM Contessa, A Coniglio, and M D'Arienzo, "Analysis of a dirty bomb attack in a large metropolitan area: simulate the dispersion of radioactive materials", Journal of Instrumentation **15**(02) P02019

2016 ESTRO Newsletter, Editors' pick, Physics Corner on: Pinto et. al., "A graphite calorimeter for absolute measurements of absorbed dose to water: application in medium-energy x-ray filtered beams", May-June 2016

> Vered Anzenberg Shaffer, Marjan Boerma, Manuela Buonanno, Sylvain Costes, Tracy Criswell, Geraldine Gonon, Badri Narain Pandey, Massimo Pinto, and Sara Rockwell, "Broadcasting in the airways: the fifth anniversary of the Radiation Research podcast", Radiation Research, 178

recognitions in Radiation Biology

2012

2006

2002

2001

2000

1999

Scholar in Training Travel Award, Radiation Research Society (RRS) 53rd meeting, Philadelphia, Pennsylvania, USA, 4-8 November. Oral presentation

Gallo Award for Outstanding Cancer Research, The Cancer Institute of New Jersey and The New Jersey State Commission on Cancer Research, Annual Retreat, Piscataway, NJ, USA, May 25. Oral presentation

2005 Young Investigator Award, 14th Symposium on Microdosimetry, Venezia, Italy, November 13-18. Oral presentation

> Young Investigator Award, Annual Biophysics School, Bressanone, Italy, September 10-13. Poster presentation

> Young Investigator Award, 7th International Workshop, Radiation Damage to DNA, Orleans, Nouans le Fuzelier, France, September 2-7. Oral presentation

> Young Investigator Award, 13th Symposium on Microdosimetry, Stresa, Lake Maggiore, Italy, May 27-June 1. Oral Presentation

> Young Investigator Award, Italian Society for Radiation Research (SIRR) 10th meeting, Frascati, Italy, November 19-22. Oral Presentation

> Young Investigator Award, Radiation Research Society (RRS) 47th meeting, Albuquerque, New Mexico, USA, 28 April-3 May. Oral and Poster presentation

> Young Investigator Award, Association for Radiation research (ARR) meeting, Bristol, UK, 10-12 April. Oral and Poster presentation. Also received a prize for one of the best three poster presentations at the meeting, ex aequo First prize for the best Laurea (BSc) graduation thesis in the field of radiation research in 1998, Italian Society for Radiation Research (SIRR), Annual Meeting, Padua, Italy. Also gave an oral presentation

Awards and

Other Scientific Interests

Science Communication

I have been a science communication blogger since 2006, writing on the Galileo science journal as guest research scientist blogger, and later on the multi-authored blog Fisici per il mondo. Between 2005 and 2013 I have directed the Podcast for the scientific monthly journal $Radiation\ Research$ of the Radiation Research Society

Radio (in Italian)

I am sporadically involved with the RAI Radio 3 programme Wikiradio, which publishes daily audio documentaries. I have written and read the story of the Meter Convention (on air on May 20st, 2019), and the story of the Radium Girls, on air on May 1st, 2020)