UNIVERSITÀ DEGLI STUDI
DI TRENTO

Curriculum vitae – prof. Paolo Zuccon

Nome e cognome:	Paolo Zuccon
Nato a:	Treviso 17 Ottobre, 1972.
Cittadinanza:	Italiana
Indirizzo:	Dipartimento di Fisica, via Sommarive 14, 38123, Trento (TN), Italia
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Posizioni e risultati accademici:

2021 – :	Professore associato, Dipartimento di Fisica, Università di Trento, Italia.
2018 – 2020:	RTD/b, Dipartimento di Fisica, Università di Trento, Italia.
2019:	Abilitazione Scientifica Nazionale: Professore Associato (02/A1 - II Fascia)
2012 – 2017:	Assistant Professor of Physics – MIT, Cambridge, USA
2014:	Abilitazione Scientifica Nazionale: Professore Associato (02/A1 - II Fascia)
2005 – 2011:	Ricercatore a tempo determinato (art. 23) INFN - Sezione di Perugia.
2003 – 2005:	Assegno di Ricerca INFN - Sezione di Perugia
1999 – 2002:	Studente di dottorato presso l'Università degli Studi di Perugia. Difesa della tesi 24 Gennaio 2003. Titolo della tesi: "*A Monte Carlo simulation of the cosmic rays interactions with the near Earth environment*", Relatori prof. R. Battiston e prof. B. Bertucci.
1998 – 1999:	Scuola di Specializzazione in Fisica, Università degli Studi di Padova
1998:	Laurea in Fisica (curriculum Fisica Sperimentale Particellare) voto 110/110, presso l'Università degli Studi di Padova. Relatore prof. M. Baldo Ceolin, titolo tesi: "*Primi risultati dell'esperimento NOMAD*"

Attività di didattica:

2020 - : Università di Trento: Laboratorio di Fisica I per fisici

2019: Università di Trento: Laboratorio di Fisica I per fisici

2018: Università di Trento: Fisica I per Ingegneria Industriale

2017:	MIT Spring:	Junior Lab I/II course for Physics majors (8.13, 8.14)
2016:	MIT Fall:	Junior Lab II course for Physics majors (8.13)
	MIT Spring:	Junior Lab II course for Physics majors (8.13)
2015:	MIT Fall:	Junior Lab I course for Physics majors (8.13)
	MIT Spring:	Junior Lab II course for Physics majors (8.14)
2014:	MIT Fall:	Honors class in Electricity and magnetism (8.022)
	MIT Spring:	Junior Lab II course for Physics majors (8.14)
2013:	MIT Fall:	Honors class in Electricity and magnetism (8.022)
2012:	MIT Fall:	Honors class in Electricity and magnetism (8.022)
	MIT Spring:	Junior Lab II course for Physics majors (8.14)

2004 – 2009: Università di Perugia: assistenza alla didattica per il corso di Cosmologia e Astroparticelle

2007: Università di Perugia: Titolare del corso “Informatica per Fisici III”

2004: Università di Perugia co-relatore della tesi di dottorato di D. Caraffini dal titolo: “*Anti-proton flux detection and indirect search for dark matter with the AMS-02 experiment*”

2007: Università di Perugia co-relatore della tesi di dottorato di A. Oliva“*High Charge Cosmic Rays Measurement with the AMS-02 Silicon Tracker”*

2017: MIT Advisor dalla Ph.D. thesis di I.A.Chen dal titolo *“Measurement of Cosmic Antiprotons with the Alpha Magnetic Spectrometer aboard the International Space Station”*

2017: MIT Advisor della Ph.D. thesis di M. Behlmann *“Measurement of the $^{3}He/^{4}He$ ratio in cosmic rays with AMS-02”*

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Attività accessorie:

- Seminario pubblico per: “Pint Of Science” maggio 2019, Trento.
- Guest editor per Sensors, special issue, 2019
- Referee per Entropy, molteplici articoli, 2019
- Referee per Sensors, molteplici articoli, 2019
- Referee per NIM A, molteplici articoli, 2011.
- Referee per CHEP 2010 proceedings, 2010.
- Referee per MIUR, Italia, “Valutazione dei Progetti Premiali”, 2013
- Referee per MIUR, Italia, “Futuro in Ricerca 2013”
- China Scholarship Foundation, Membro commissione per la selezione di candidati per una scholarship at CERN, 2014
- Referee for MIUR, Italia “Programma per Giovani Ricercatori 2015”
- Referee for Austrian Science Fund (FWF), 2015
- Referee: for NWO Physics, The Netherlands, 2016
- Giudice del premio “ISSNAF Young Scientist Award” (sezione Fisica/Astronomia e Matematica) per ISSNAF (Italian Scientists and Scholars of North America Foundatation) edizioni 2013, 2015, 2016 e 2017.
- Membro del Local Organizing Committee della conferenza Vertex 2006
- Membro del Local Organizing Committee della conferenza SpacePart 2006
- Membro del comitato organizzatore della scuola di fisica “Methods of Analysis for Physics in Space (MAPS)”, tenuta a Perugia il 22 e 23 Ottobre 2009.
- Membro del board della proto-collaboration COMPASS++/AMBER, 2019.
- Membro del “bylaws drafting committee” della proto-collaboration COMPASS++/AMBER, 2019.

Attività di Ricerca:

Il prof. Zuccon è il coordinatore del Laboratorio di Fisica AstroParticlle del Dipartimento di Fisica della Università di Trento. La sua attività di ricerca è focalizzata alla fisica dei raggi cosmici e allo sviluppo di rivelatori avanzati per impieghi nello spazio. E’ membro della collaborazione AMS e dal 2020 e’ il responsabile nazionale di AMS per l’Italia. Collabora attivamente al progetto CSES/LIMADOU dove e’ il responsabile dello sviluppo della acquisizione dati del tracciatore al silicio. Ha un ruolo di leadership nel nuovo esperimento AMBER al CERN dove ha proposto misure di sezioni d’urto rilevanti per la ricerca di materia oscura nella nostra galassia. Presenta regolarmente il suo lavoro a conferenze internazionali, il più delle volte come invitato. Ha firmato più di 100 pubblicazioni, su di riviste di grande prestigio come PRL.

PERSONAL INFORMATION

Dr. Alessandra Bisio

Salita dei Molini 35, 38122 Trento, Italy
04611903305 +393487560881
alessandra.bisio@unitn.it ; alessandra.bisio@gmail.com

Sex Female | Date of birth 11/05/1976| Nationality Italian

POSITION

Assistant Professor at CIBIO, University of Trento,
Via Sommarive 9, 38123 Povo (TN)

EDUCATIONAL STUDIES

January 2007 to December 2009	PhD program Student (XXII° Cycle) in Oncological Genetics and Biology of Differentiation at Biomedical Science and Technology School - University of Genoa
12 June 2005	Professional qualification of Biologist.
24 November 2004	University Degree in Biological Science at University of Genoa (Thesis title: Molecular mechanisms of Organophophate Pestcides action on cellular growth in NT-2 cell line – Advisors: Prof. C. Falugi, Prof. M. Vallarino)
July 1995	General Certificate of Education at "Leonardo da Vinci" Scientific High School of Genoa

Qualification to function as associate professor

- 5 December 2017: Scientific area 05/I1 Genetics
- 7 December 2017: Scientific area 05/E2 Molecular Biology
- 18 September 2018: Scientific area 05/F1 Applied Biology

WORK EXPERIENCE

18 th December 2016 – to date	Assistant Professor at Centre of Integrative Biology (CIBIO) - University of Trento, Italy
16th May 2016 – 18 th December	Post-Doc Fellow at Armenise-Harvard Cancer Biology & Genetics, Centre of Integrative Biology (CIBIO) - University of Trento, Italy
3rd May 2010 – 6 th May 2016	Post-Doc Fellow at Laboratory of Transcriptional Networks, Centre of Integrative Biology (CIBIO) - University of Trento, Italy
1st January 2010 to 30 April 2010	Temporary researcher at Molecular Mutagenesis and DNA Repair Unit, National Institute for Cancer Research IST, Genoa
12th January 2009 to 4th December 2009	Visiting Fellow at Centre of Integrative Biology (CIBIO) - University of Trento, Italy
5th May 2008 to 23rd December 2008	Visiting Fellow at Fraunhofer-Institut für Toxikologie und Experimentelle Medizin-Hannover, Germany
4th February 2008 to 4th May 2008	Visiting Fellow at Centre of Integrative Biology (CIBIO) - University of Trento, Italy
1st January 2007 to 31st December 2009	PhD program (XXII° Cycle) in Oncological Genetics and Biology of Differentiation at Biomedical Science and Technology School - University of Genoa, winner of a Fellowship issued by University of Genoa
1st January 2006 to 31 st December 2006	Pre-Doc fellow at Molecular Mutagenesis and DNA Repair Unit, National Institute for Cancer Research IST, Genoa
2nd February 2005 to 31st December 2005	Pre-Doc fellow in the Molecular Genetic and Gene expression Laboratory directed by Prof. G.B. Ferrara, Pathological Anatomy Department, University of Genoa
1st December 2004 to 31st January 2005	Collaboration with the same Laboratory due to an assignment of a Pre-Doc fellow position
November 2002 to December 2004	Undergraduate Internship for the preparation of the experimental thesis, Embriology and Cytotoxicology Laboratory of Department of Biology, University of Genoa

TEACHING EXPERIENCE

September 2018 to date	Assignment of a teaching position in Laboratory of Molecular Biology of the Cell, Biomolecular Sciences and Technology, University of Trento, Italy
18 September 2017 to date	Assignment of a teaching position in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy
18 September 2017 to 22 December 2017	Assignment of a teaching position (for the academic year 2017-2018) in Laboratory of Molecular Biology, Biomolecular Sciences and Technology, University of Trento, Italy
14 September 2015 to 12 February 2016	Assignment of a assistant teaching position (for the academic year 2015-2016) in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy
3 October 2015 to date	Assignment of a teaching position in Cell and Molecular Biology in the contest of the CLIL (Content and Language Integrated Learning), Liceo G. Prati
15 September 2014 to 13 February 2015	Assignment of a assistant teaching position (for the academic year 2014-2015) in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy
7 March to 13 June 2014	Assignment of a teaching position for the disciplinary block " Laboratorio didattico di Scienze della vita" in the PAS (Percorsi Abilitanti Speciali classe A059) course, University of Trento, Italy
16 September 2013 to 14 February 2014	Assignment of a assistant teaching position (for the academic year 2013-2014) in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy
18 February to 31 May 2013	Assignment of a assistant teaching position (for the academic year 2012-2013) for the Course of Molecular Genetic and Epigenetic of Tumors, Biomolecular Sciences and Technology, University of Trento, Italy
17 September to 21 December 2012	Assignment of a assistant teaching position (for the academic year 2012-2013) in Laboratory of Single Gene Diseases, Biomolecular Sciences and Technology, University of Trento, Italy
17 September to 21 December 2012	Assignment of a assistant teaching position (for the academic year 2012-2013) in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy
14 September to 21 December 2011	Assignment of a assistant teaching position (for the academic year 2011-2012) in Laboratory of Genetics, Biomolecular Sciences and Technology, University of Trento, Italy

PERSONAL SKILLS

Mother tongue(s)	Italian
Other language(s)	English fluent
Computer skills	Good command of Microsoft Office™ tools, Prism, Sequence Navigator and other scientific tools.

TECHNICAL SKILLS

In the time frame of the years indicated above I had the chance to develop a huge experience in the field of Molecular and Cellular Biology:

- DNA, RNA and Proteins manipulation from different sample/organism types (purification, modification, horizontal and vertical gel electrophoresis, PCR, RT-PCR, PCR in Real Time; Western Blot; many different types of cloning as direct or PCR tailed cloning, TOPO-TA cloning); polysomal RNA extraction; RNA Immuno Precipitation;
- Genetic manipulation and culturing of lower evolutionistically organisms as yeast and bacteria (different transformation methods, GAP Repair assay, qualitative and quantitative transcriptional assays, modifications at genomic level; "Delitto Perfetto" Approach, Fluorescence microscopy using Bimolecular Fluorescence Complementation technique);
- In vitro manipulation of cell lines from higher organisms (human/mouse/rat) cellular cultures in sterile working environment; sterility control and mycoplasma test using Hoechst coloration or PCR; quantitative transcriptional assays; transient and stable transfections using different protocols (Fugene HD, TransIT-LT1, Lifpofectamine 2000 and LTX, Effectene and Calcium Phosphate); differential treatments with cancerogenic/chemiotherapeutic agents. Primary culture obtained from surgical samples. Cell growth analysis (Crystal violet). Cytotoxicity tests (MTS, MTT). Apoptosis analysis using acridina orange/ethydium bromide staining, Annexin V, loss of mitochondrial potential, caspases activation, DNA fragmentation and FACS analyses, Gene reporter Assays; CRISPR/Cas9
- Retroviral manipulation for cellular delivery;
- Immunohistochemistry and immunofluorescence on cell culture. Staining for identification of nuclei, mitochondria and Golgi apparatus. DAPI, DAB and alkaline phosphatase staining.

AWARDS - GRANTS

- 2019: Winner of a "Bando Starting Grant Giovani Ricercatori" issued by University of Trento
- 2016: Winner of a CARITRO Grant (40.000€) used to hire a Post-Doc fellow
- 2014: Winner of a "Bando Starting Grant Giovani Ricercatori" issued by University of Trento
- 2010: Winner of a Meeting bursary issued by European Association for Cancer Research (EACR) to participate at 21st Meeting of the European Association for Cancer Research 26 - 29 June 2010, Oslo Norway
- 2010: Winner of "Pezcoller Begnudelli Award" for best poster and selected for an oral presentation at 22th Pezcoller Symposium "RNA Biology and Cancer", Trento, Italy, 10 – 12 June 2010.

- 2010: Winner of a Meeting bursary issued by Association for International Cancer Research (AICR) to participate at AICR 30th Anniversary Conference 7-9 April 2010, St Andrews, Scotland
- 2007: Winner of a PhD program Fellowship issued by University of Genoa

PUBLICATIONS

1. Alaimo, A., Lorenzoni, M., Ambrosino, P., Bertossi, A., **Bisio, A.**, Macchia, A., Zoni, E., Genovesi, S., Cambuli, F, Foletto, V., De Felice, D., Soldovieri, M.V., Mosca, I., Gandolfi, F, Brunelli, M., Petris, G., Cereseto, A., Villarroel, A., Thalmann, G., Carbone, F.G., Kruithof-de Julio, M., Barbareschi, M., Romanel, A., Taglialatela, M., Lunardi, A. Calcium cytotoxicity sensitizes prostate cancer cells to standard-of-care treatments for locally advanced tumors. *Cell Death and Disease,* 2020, 11(12), 1039. DOI: 10.1038/s41419-020-03256-5
2. Tosato M, Verona M, Caeran M, Borgna F, Vettorato E, Corradetti S, Zangrando L, Sgaravatto M, Verlato M, Asti M, Marzaro G, Mastrotto F, Di Marco V, Maniglio D, **Bisio A,** Motta A, Quaranta A, Zenoni A, Pastore P, Realdon N, Andrighetto A. Preliminary evaluation of the production of non-carrier added 111Ag as core of a therapeutic radiopharmaceutical in the framework of ISOLPHARM_Ag experiment. *Applied radiation and isotopes.* 2020, 164, 109258. DOI: 10.1016/j.apradiso.2020.109258
3. Monti P, Ciribilli Y, Foggetti G, Menichini P, **Bisio A**, Cappato S, Inga A, Divizia MT, Lerone M, Bocciardi R, Fronza G. P63 modulates the expression of the WDFY2 gene which is implicated in cancer regulation and limb development. *Biosci Rep.* 2019 Dec 20;39(12). doi: 10.1042/BSR20192114.
4. Hamadou MH, Kerkatou M, Gatto P, Pancher M, **Bisio A**, Inga A, Menad A, Benayache S, Benayache F, Ameddah S. Apigenin rich-Limonium duriusculum (de Girard) Kuntze promotes apoptosis in HCT116 cancer cells. *Nat Prod Res.* 2019 Oct 9:1-5. doi: 10.1080/14786419.2019.1672070.
5. Gomes S, Bosco B, Loureiro JB, Ramos H, Raimundo L, Soares J, Nazareth N, Barcherini V, Domingues L, Oliveira C, **Bisio A**, Piazza S, Bauer MR, Brás JP, Almeida MI, Gomes C, Reis F, Fersht AR, Inga A, Santos MMM, Saraiva L. SLMP53-2 Restores Wild-Type-Like Function to Mutant p53 through Hsp70: Promising Activity in Hepatocellular Carcinoma. *Cancers (Basel)* 2019 Aug 10;11(8) doi: 10.3390/cancers11081151.
6. Helm A, Ebner DK, Tinganelli W, Simoniello P, Marchesano V, Bisio A, Durante M, Yamada S, Shimokawa T. Combining heavy ion therapy with immunotherapy: Update on recent developments. *International Journal of Particle Therapy*. 2018 Sep 21;5(1):84-93. doi: 10.14338/IJPT-18-00024.1
7. Ebner DK, Tinganelli W, Helm A, **Bisio A**, Simoniello P, Natale F, et al. Generating and grading the abscopal effect: Proposal for comprehensive evaluation of combination immunoradiotherapy in mouse models. *Translational Cancer Research.* 2017;6:S892-S9. doi: 10.21037/tcr.2017.06.01
8. Bruno W, Andreotti V, **Bisio A**, Pastorino L, Fornarini G, Sciallero S, et al. Functional analysis of a CDKN2A 5'UTR germline variant associated with pancreatic cancer development. *PLoS ONE*. 2017;12(12). doi: 10.1371/journal.pone.0189123
9. Ebner DK, Tinganelli W, Helm A, **Bisio A**, Yamada S, Kamada T, et al. The immunoregulatory potential of particle radiation in cancer therapy. *Frontiers in Immunology.* 2017; Feb 6;8:99. doi: 10.3389/fimmu.2017.00099. eCollection 2017.

10. Soares J, Raimundo L, Pereira NAL, Monteiro Â, Gomes S, Bessa C, Pereira C, Queiroz G, **Bisio A**, Fernandes J, Gomes C, Reis F, Gonçalves J, Inga A, Santos MM, Saraiva L.Reactivation of wild-type and mutant p53 by tryptophanolderived oxazoloisoindolinone SLMP53-1, a novel anticancer small-molecule. *Oncotarget.* 2016;7(4):4326-43. doi: 10.18632/oncotarget.6775
11. Andreotti V*, **Bisio A***, Bressac-de Paillerets B, Harland M, Cabaret O, Newton-Bishop J, et al. The CDKN2A/p16INK4a5'UTR sequence and translational regulation: Impact of novel variants predisposing to melanoma. *Pigment Cell and Melanoma Research*. 2016;29(2):210-21. doi: 10.1111/pcmr.12444
12. Tebaldi T, Zaccara S, Alessandrini F, **Bisio A**, Ciribilli Y, Inga A. Whole-genome cartography of p53 response elements ranked on transactivation potential. *BMC Genomics.* 2015;16(1). doi: 10.1186/s12864-015-1643-9
13. Soares J, Pereira NAL, Monteiro Â, Leão M, Bessa C, Dos Santos DJ Raimundo L, Queiroz G, **Bisio A,** Inga A, Pereira C, Santos MM, Saraiva L. Oxazoloisoindolinones with in vitro antitumor activity selectively activate a p53-pathway through potential inhibition of the p53-MDM2 interaction. *European Journal of Pharmaceutical Sciences.* 2015;66:138-47. doi: 10.1016/j.ejps.2014.10.006
14. Sharma V, Jordan JJ, Ciribilli Y, Resnick MA, **Bisio A**[§], Inga A[§]. Quantitative analysis of NF-κB transactivation specificity using a yeast-based functional assay. *PLoS ONE.* 2015;10(7). doi: 10.1371/journal.pone.0130170
15. Ozretić P, **Bisio A**, Musani V, Trnski D, Sabol M, Levanat S, et al. Regulation of human PTCH1b expression by different 5' untranslated region cis-regulatory elements. *RNA biology.* 2015;12(3):290-304. doi: 10.1080/15476286.2015.1008929
16. Garritano S, Romanel A, Ciribilli Y, **Bisio A**, Gavoci A, Inga A, et al. In silico identification and functional validation of alleledependent AR enhancers. Oncotarget. 2015;6(7):4816-28. doi: 10.18632/oncotarget.3019
17. **Bisio A**, Latorre E, Andreotti V, Paillerets BB, Harland M, Scarra GB, et al. The 5'-untranslated region of p 16INK4amelanoma tumor suppressor acts as a cellular IRES, controlling mRNA translation under hypoxia through YBX1 binding. *Oncotarget.* 2015;6(37):39980-94. doi: 10.18632/oncotarget.5387
18. Zaccara S, Tebaldi T, Pederiva C, Ciribilli Y, **Bisio A**, Inga A. P53-directed translational control can shape and expand the universe of p53 target genes. *Cell Death and Differentiation.* 2014;21(10):1522-34. doi: 10.1038/cdd.2014.79
19. Monti P*, Ciribilli Y*, **Bisio A***, Foggetti G, Raimondi I, Campomenosi P, et al. ΔN-p63a and ta-p63a exhibit intrinsic differences in transactivation specificities that depend on distinct features of dna target sites. *Oncotarget.* 2014;5(8):2116-30. doi: 10.18632/oncotarget.1845
20. **Bisio A**, Zámborszky J, Zaccara S, Lion M, Tebaldi T, Sharma V, et al. Cooperative interactions between p53 and NFκB enhance cell plasticity. *Oncotarget.* 2014;5(23):12111-25. doi: 10.18632/oncotarget.2545
21. **Bisio A,** Ciribilli Y, Fronza G, Inga A, Monti P. TP53 mutants in the tower of babel of cancer progression. *Human Mutation.* 2014;35(6):689-701. doi: 10.1002/humu.22514.
22. Raimondi I, Ciribilli Y, Monti P, **Bisio A**, Pollegioni L, Fronza G, et al. P53 Family Members Modulate the Expression of PRODH, but Not PRODH2, via Intronic p53 Response Elements. *PLoS ONE.* 2013;8(7). doi: 10.1371/journal.pone.0069152
23. Lion M, **Bisio A**, Tebaldi T, De Sanctis V, Menendez D, Resnick MA, et al. Interaction between p53 and estradiol pathways in transcriptional responses to chemotherapeutics. *Cell cycle.* 2013;12(8):1211-24. doi: 10.4161/cc.24309
24. Leão M, Pereira C, **Bisio A**, Ciribilli Y, Paiva AM, Machado N, et al. Discovery of a new small-molecule inhibitor of p53-MDM2 interaction using a yeast-based approach. *Biochemical pharmacology.* 2013;85(9):1234-45. doi: 10.1016/j.bcp.2013.01.032

25. Ciribilli Y, Monti P, **Bisio A**, Nguyen HT, Ethayathulla AS, Ramos A, et al. Transactivation specificity is conserved among p53 family proteins and depends on a response element sequence code. *Nucleic Acids Research.* 2013;41(18):8637-53. doi:10.1093/nar/gkt657
26. **Bisio A**, De Sanctis V, Del Vescovo V, Denti MA, Jegga AG, Inga A, et al. Identification of new p53 target microRNAs by bioinformatics and functional analysis. *BMC cancer.* 2013;13. doi: 10.1186/1471-2407-13-552
27. Ozretić P, **Bisio A**, Inga A, Levanat S. The growing relevance of cap-independent translation initiation in cancer-related genes. *Periodicum Biologorum.* 2012;114(4):471-8. ISSN 0031-5362
28. Monti P, Perfumo C, **Bisio A**, Ciribilli Y, Menichini P, Russo D, et al. Dominant-negative features of mutant TP53 in germline carriers have limited impact on cancer outcomes. Molecular *Cancer Research.* 2011;9(3):271-9. doi: 10.1158/1541-7786.MCR-10-0496
29. Andreotti V, Ciribilli Y, Monti P, **Bisio A**, Lion M, Jordan J, et al. P53 transactivation and the impact of mutations, cofactors and small molecules using a simplified yeast-based screening system. *PLoS ONE.* 2011;6(6). doi: 10.1371/journal.pone.0020643
30. **Bisio A**, Nasti S, Jordan JJ, Gargiulo S, Pastorino L, Provenzani A, et al. Functional analysis of CDKN2A/p16INK4a5′ -UTR variants predisposing to melanoma. *Human Molecular Genetics.* 2010;19(8):1479-91. doi: 10.1093/hmg/ddq022
31. Monti P, Ciribilli Y, Russo D, **Bisio A**, Perfumo C, Andreotti V, et al. Rev1 and Polζ influence toxicity and mutagenicity of Me-lex, a sequence selective N3-adenine methylating agent. *DNA Repair.* 2008;7(3):431-8. doi: 10.1016/j.dnarep.2007.11.015
32. Trombino S, **Bisio A**, Catassi A, Cesario A, Falugi C, Russo P. Role of the non-neuronal human cholinergic system in lung cancer and mesothelioma: Possibility of new therapeutic strategies. *Current Medicinal Chemistry - Anti-Cancer Agents.* 2004;4(6):535-42. DOI: 10.2174/1568011043352687

* Co-first authors
§ Co-last authors

SUBMITTED PAPERS

- Ciribilli Y*, **Bisio A***, Zemlin R, Reymann S, Spanel R, Jordan J.J., Inga A and Borlak J. Molecular insight into Doxorubicin-induced cardiomyopathy: a genome wide study identifies a disease associated Abl1 cis – element gene signature and Abl1 co-factor activity for p53 mediated apoptosis. *Ready to be submitted to Science Translation Medicine.*

PRESENTATIONS

- **"**Functional analysis of CDKN2A/p16INK4a 5'UTR variants predisposing to melanoma**"** 22th Pezcoller Symposium "RNA Biology and Cancer", Trento, Italy, 10 – 12 June 2010
- "The CDKN2A/p16INK4A 5'UTR Sequence & Translational Regulation: Impact of Variants Associated with Melanoma". HDIR-2 Second Meeting of the Croatian Association for Cancer Research, Zagreb November 8 and 9, 2012.
- "An internal ribosomal entry site in the 5'-untranslated region of p16INK4A mRNA provides a novel mechanism for the regulation of its translation." BIO Days 3-4 June 2013 Trento

- "Modeling and Verification for Ion beam Treatment planning: update on hypoxia chambers and RBE phantom." MoVe-IT 2nd Annual Meeting 21-22 June 2018 Catania
- "Development of specific devices for spatially resolved proton RBE measurement" MoVe-IT 3rd Annual Meeting, June 2019: Alghero, Italy.

ABSTRACTS and MEETING PRESENTATIONS

- Trombino S., **Bisio A**., Sgro M., Aluigi MG., Angelini C., and Falugi C. "Effects of Organophosphate and Carbamate pesticides on NT2 cell growth: something more than cholinesterase inhibition"**.** (2004) *VIIIth International Meeting on Cholinesterases*
- Monti P., Ciribilli Y., **Bisio A.**, Russo D., Menichini P., Inga A., Gold B., Fronza G. "REV3 and REV1 are involved in the mutation fixation process of the Me-lex induced lesion"– VIII° Convegno FISV, Riva del Garda, 28 September-1 October 2006.
- **Bisio A.,** Monti P., Ciribilli Y., Menichini P., Inga A., Fronza G. "Study on the functional interactions between p53 and p73 using an yeast-based assay"**-** VIII° Convegno FISV, Riva del Garda, 28 September-1 October 2006.
- Monti P., Ciribilli Y., Russo D., **Bisio A**., Menichini P., Perfumo C., Andreotti V., Inga A., Gold B. and Fronza G. **"**REV1 and Pol ζ influence toxicity and mutagenicity of Me-lex, a sequence-selective N3-Adenine methylating agent." – ZIMY 2007, Meeting of the Italian Yaest Group, Firenze, 7 - 9 June (selected for an oral presentation)
- **Bisio A.,** Nasti S., Gargiulo S., Provenzani A., Quattrone A., Inga A., Bianchi-Scarrà G. "Functional analysis of CDKN2A 5'UTR variants associated with family history of melanoma." 20th European Cancer Organization (ECCO), Lyon, France, 5 – 8 July 2008
- Sparapani F.*, **Bisio A.***, Del Vescovo V., Tonelli C., Ciribilli Y., De Sanctis V., Jegga A.G., Denti M.A., Inga A. "MiRNA-based, p53 dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation." 21th Pezcoller Symposium, "Unconventional Therapeutic Targets in Cancer", Trento, Italy, 11 – 13 June 2009.
- Alessandra Bisio, Sabina Nasti, Jennifer Jordan, Sara Gargiulo, Lorenza Pastorino, Alessandro Provenzani, Alessandro Quattrone, Giovanna Bianchi-Scarrà, Paola Ghiorzo and Alberto Inga. "Functional analysis of CDKN2A/p16INK4a 5'UTR variants predisposing to melanoma." XI° Convegno FISV, Riva del Garda, 23-25 September 2009.
- Sparapani F.*, **Bisio A.*,** Del Vescovo V., Tonelli C., Ciribilli Y., De Sanctis V., Jegga A.G., Denti M.A., Inga A. "MiRNA-based, p53 dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation." XI° Convegno FISV, Riva del Garda, 23-25 September 2009.
- **Alessandra Bisio**, Valerio Del Vescovo, Veronica De Sanctis, Yari Ciribilli, Francesca Sparapani, Claudia Tonelli, Anil G. Jegga, Michela A. Denti, Alberto Inga. "MicroRNA-based, p53 dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation." AICR 30th Anniversary Conference 7-9 April 2010, St Andrews, Scotland
- Y. Ciribilli, V. Andreotti, D. Menendez, **A. Bisio**, V. De Sanctis, G. Schoenfelder, M.A. Resnick and A. Inga. "The coordinated p53 and Estrogen Receptor cis-regulation at an FLT1 promoter SNP is specific to genotoxic stress and estrogenic compound". AICR 30th Anniversary Conference 7-9 April 2010, St Andrews, Scotland
- **Alessandra Bisio**, Sabina Nasti, Jennifer J. Jordan, Sara Gargiulo, Lorenza Pastorino**,** Alessandro Provenzani, Alessandro Quattrone, Michela A. Denti, Giovanna Bianchi- Scarrà, Paola Ghiorzo, and

Alberto Inga**. "**Functional analysis of CDKN2A/p16^{INK4a} 5'UTR variants predisposing to melanoma**"** 22th Pezcoller Symposium "RNA Biology and Cancer", Trento, Italy, 10 – 12 June 2010 (selected for an oral presentation).

- **Alessandra Bisio***, Yari Ciribilli*, Valerio Del Vescovo, Veronica De Sanctis, Claudia Tonelli, Mattia Lion, Anil G. Jegga, Michela A. Denti, Alberto Inga. "MicroRNA-based, p53 dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation." 22th Pezcoller Symposium "RNA Biology and Cancer", Trento, Italy, 10 – 12 June 2010.
- **Alessandra Bisio**, Sabina Nasti, Jennifer J. Jordan, Sara Gargiulo, Lorenza Pastorino**,** Alessandro Provenzani, Alessandro Quattrone, Michela A. Denti, Giovanna Bianchi- Scarrà, Paola Ghiorzo, and Alberto Inga**. "**Functional analysis of CDKN2A/p16^{INK4a} 5'UTR variants predisposing to melanoma**"** 21st Meeting of the European Association for Cancer Research 26 - 29 June 2010, Oslo Norway
- **Alessandra Bisio***, Yari Ciribilli*, Valerio Del Vescovo, Veronica De Sanctis, Claudia Tonelli, Mattia Lion, Anil G. Jegga, Michela A. Denti, Alberto Inga. "MicroRNA-based, p53 dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation." 21st Meeting of the European Association for Cancer Research 26 - 29 June 2010, Oslo Norway
- Tebaldi T., Sanguinetti G., Niranjan M., **Bisio A**., Ciribilli Y**.,** Inga A., Quattrone A. Inferring translationally active RNA binding proteins - mRNA interactions from polysomal profiling data with a Bayesian inference approach. The European Conference on Computational Biology (ECCB10), Ghent, Belgium, september 26-29
- Raimondi I., Ciribilli Y., **Bisio A.,** De Sanctis V., Inga A. and Campomenosi P. Identification and validation of the response elements for the p53 family members in the gene coding the mithocondrial tumor suppressor proline dehydrogenase 1st Annual Workshop of the PhD School of Biological and medical Sciences, University of Insubria, Castel Ivano, Ivano Fracena (TN), Italy, october 6-8
- **Bisio A.,** Ciribilli Y., De Sanctis V., Del Vescovo V., Tonelli C., Jegga A.G., Gowrisankar S., Denti M.A., Inga A. p53-miR-dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation. The 15th International p53 Workshop, University of Pennsylvania School of Medicine, Philadelphia, PA, USA, october 8-12
- Ciribilli Y., Lion M., **Bisio A.,** De Sanctis V. and Inga A. Transcriptional and post-transcriptional control of the FLT1 gene by p53 and Estrogen Receptor. EMBO Workshop, RNA control of cell dynamics, Kibbutz Ein Gedi, Israel, november 15-18
- **Ciribilli Y.,** Bisio A., Lion M. and Inga A. Genotoxic stress-dependent, p53-directed post-transcriptional controls of the VEGFR-1, FLT1 gene. 102nd American Association for Cancer Research (AACR) Annual Meeting, Orange County Convention Center, Orlando, Florida, USA, april 2-6
- Lion M., Ciribilli Y**., Bisio A.**, Monti P., Andreotti V., Fronza G., Menichini P., Resnick M.A. and Inga A. p53 transactivation and the impact of mutations, cofactors and small molecules using a simplified yeast-based screening system. 5th Mutant p53 Workshop, Palazzo Chigi, Ariccia, Rome, Italy, May 22-25
- Monti P., Perfumo C., Bisio A., **Ciribilli Y.,** Menichini P., Russo D., Umbach D.M., Resnick M.A., Inga A. and Fronza G. Dominant-negative features of mutant p53 in germline carriers have limited impact on cancer outcomes. 5th Mutant p53 Workshop, Palazzo Chigi, Ariccia, Rome, Italy, May 22-25
- Raimondi I., **Ciribilli Y.,** Bisio A., De Sanctis V., Inga A. and Campomenosi P. p53 transactivation and the impact of mutations, cofactors and small molecules using a simplified yeast-based screening system. 5th Mutant p53 Workshop, Palazzo Chigi, Ariccia, Rome, Italy, May 22-25
- Ciribilli Y., **Bisio A.,** Lion M. and Inga A. Genotoxic stress-dependent, p53-directed post-transcriptional controls of the VEGFR-1, FLT1 gene. 22th Pezcoller Symposium, "Engineering in Cancer Research", Trento, Italy, June 11-13
- **Alessandra Bisio,** Virginia Andreotti, Sara Gargiulo, Elisa Latorre, Valerio Del Vescovo, Yari Ciribilli, Alessandro Provenzani, Alessandro Quattrone, Giovanna Bianchi- Scarrà, Michela A. Denti, Paola Ghiorzo, Alberto Inga. CDKN2A/P16INK4A 5'UTR variants in melanoma predisposition: lost in translation,

somewhere. AACR Annual Meeting March 31- April 4 2012 in Chicago, Illinois

- Yari Ciribilli, **Alessandra Bisio**, Veronica De Sanctis, Valerio Del Vescovo, Mattia Lion, Anil G. Jegga, Michela A. Denti and Alberto Inga. p53-miR-dependent post-transcriptional circuits: mechanisms, targets and inter-individual variation. AACR Annual Meeting March 31- April 4 2012 in Chicago, Illinois
- Petar Ozretic, **Alessandra Bisio**, Vesna Musani, Maja Sabol, Yari Ciribilli, Diana Car, Sonja Levanat, and Alberto Inga. Functional Analyses of PTCH1 Gene 5'-UTR: The Impact of CGG Triplet Repeat Sequence Variants. mRNA fate 2012. Life and Death of mRNA in the Cytoplasm Riva del Garda, Italy 23-26 May
- **Alessandra Bisio**, Virginia Andreotti, Elisa Latorre, Valerio del Vescovo, Margherita Grasso, Alessandro Provenzani, Giovanna Bianchi- Scarrà, Michela Denti, Paola Ghiorzo, Alberto Inga. The CDKN2A/p16INK4a 5'UTR sequence & translational regulation: impact of variants associated with melanoma. 22st Meeting of the European Association for Cancer Research (EACR) 7 - 10 July 2012, Barcelona, Spain
- Mattia Lion, **Alessandra Bisio**, Veronica De Sanctis, Yari Ciribilli, Toma Tebaldi, Daniel Menendez, Mike Resnick, Alberto Inga. Transcriptional Cooperation Between p53 and Estrogen Receptors in a Breast Cancer Model. 22st Meeting of the European Association for Cancer Research (EACR) 7 - 10 July 2012, Barcelona, Spain
- Yari Ciribilli, **Alessandra Bisio**, Mattia Lion, Anna Estevan Barber, Alberto Inga Genotoxic Stress-dependent, p53-directed Post-transcriptional Control of the VEGFR-1, FLT1 Gene. 22st Meeting of the European Association for Cancer Research (EACR) 7 - 10 July 2012, Barcelona, Spain
- Judith Zámborszky, Sara Zaccara, **Alessandra Bisio**, Mattia Lion, Toma Tebaldi, Yari Ciribilli, Alberto Inga. Functional Crosstalk Between the P53 and NF-kB Transcription Factors. 22st Meeting of the European Association for Cancer Research (EACR) 7 - 10 July 2012, Barcelona, Spain
- M. Leão, C. Pereira, **A. Bisio**, Y. Ciribilli, J. Soares, A. Paiva, E. Sousa, M. Pinto, A. Inga, L. Saraiva. Discovery of a New Inhibitor of P53/MDM2 Interaction Using a Yeast Target-based Screening Strategy. 22st Meeting of the European Association for Cancer Research (EACR) 7 - 10 July 2012, Barcelona, Spain
- Leao M., Pereira C., Soares J., Bassa C., **Bisio A**., Ciribilli Y., Paiva A., Pinto M., Inga A., Saraiva L. Discovery of a new inhibitor of p53-MDM2 interaction using a yeast target-based screening strategy. 20th Euroconference on Apoptosis, European Cell Death Organization (ECDO), Rome, Italy, September 14 – 17.
- Lion M., **Bisio A.,** De Sanctis V., Ciribilli Y., Tebaldi T., Menendez D., Resnick M.A., Inga A. Transcriptional cooperation between p53 and estrogen receptors in a breast cancer model. The 5th EMBO meeting, Nice, France, September 22 – 25.
- **Alessandra Bisio**, Judit Zámborszky, Sara Zaccara, Mattia Lion, Toma Tebaldi, Yari Ciribilli and Alberto Inga. Functional crosstalk between the p53 and NF-kB transcription factors. AACR Annual Meeting April 6-10 2013 in Washington, DC
- Ciribilli Y**.,** Monti P., **Bisio A**., Nguyen H.T., Ethayathulla A.S.,Foggetti G., Menichini P., Menendez D., Resnick M.A., Viadiu H., Fronza G. and Inga A. Transactivation specificity is conserved among p53 family proteins and depends on a response element sequence code. AACR Annual Meeting April 6-10 2013 in Washington, DC
- **Alessandra Bisio,** Virginia Andreotti, Elisa Latorre, Alessandro Provenzani, Giovanna Bianchi- Scarrà, Paola Ghiorzo, Alberto Inga. An internal ribosomal entry site in the 5'-untranslated region of p16INK4a mRNA provides a novel mechanism for the regulation of its translation. AACR Annual Meeting April 5-9 2014 in San Diego, CA
- Sara Zaccara, Toma Tebaldi, Yari Ciribilli, **Alessandra Bisio**, Alberto Inga.p53-directed translational control can shape and expand the universe of p53 target genes. AACR Annual Meeting April 5-9 2014 in San Diego, CA
- Yari Ciribilli, **Alessandra Bisio**, Paola Monti, Giorgia Foggetti, Ivan Raimondi, Paola Campomenosi, Paola Menichini, Gilberto Fronza, Alberto Inga.ΔN-p63α and TA-p63 α exhibit intrinsic differences in transactivation specificities that depend on distinct features of DNA target sites. AACR Annual Meeting April 5-9 2014 in San Diego, CA

- **Alessandra Bisio**, and Alberto Inga. Cis-mediated regulation of mRNA translation initiation of p53 family members.. AACR Annual Meeting April 18-22 2015 in Philadelphia, PA
- **Bisio A**, Latorre E, Andreotti V, Paillerets BB, Harland M, Cabaret O, Newton-Bishop J, Pastorino L, Bruno W, Bertorelli R, De Sanctis V, menin C, FronzaG, Queirolo P, Scarrà GB, Spitale RC, Provenzani A, Inga A, Ghiorzo P. Impact of novel CDKN2A/p16INK4a 5'UTR variants predisposing to melanoma on p16 translational regulation. AACR Annual Meeting April 16-20 2016 in New Orleans, LA
- Sara Gomes, Joana B. Loureiro, Joana Soares,Valentina Barcherini, **Alessandra Bisi**o, Alberto Inga, Maria M. M. Santos, Lucília Saraiva. SLMP53-2 binds to mutant p53Y220C restoring wild-type-like antitumor activity. annual reunion of the Portuguese Pharmacology Society February 2-4 2017 Coimbra, Portugal
- W. Tinganelli, A. Helm, D. Ebner, **A. Bisio**, S. Yamada, T. Kamada, T. Shimokawa, M. Durante. Charged particle combination radio- and immunotherapy. 56th Annual Conference of the Particle Therapy Co-operative Group May 8-13 2017 in Yokohama, Japan
- Helm A, Tinganelli W, Simoniello P, **Bisio A,** Marchesano V, Kurosawa F, Ebner DK, Durante M, and Shimokawa T. "Combination immunotherapy-radiation therapy using particles with Ipilimumab and Nivolumab in mouse models". September 2018 3rd ImmunoRad Annual Meeting, The International Conference on Immunotherapy Radiotherapy Combination, Gustave Roussy Cancer Campus, Paris, France.
- Helm A, Tinganelli W, **Bisio A,** Simoniello P, Marchesano V, Azuma R, Ebner DK, Durante M, and Shimokawa T. "Potential of particle therapy in combination with Ipilimumab and Nivolumab in B16 melanoma and LM8 osteosarcoma mouse models". May 2018 PTCOG-57: Particle Therapy Co-Operative Group. Cincinnati, United States.
- Bevilacqua R, Pinamonti V, Marchesano V, Pellizzaro G, Quartieri M, Verroi E, Tommasino F, **Bisio A** "The lack of p21 sensitizes HCT116 cells to radiation-induced apoptosis". September 2019 4th ImmunoRad Annual Meeting, The International Conference on Immunotherapy Radiotherapy Combination, Weil Cornell University, New York City, United States.
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Other Experiences and Professional Memberships

Member of European Association for Cancer Research (EACR), International PhD program in Biomolecular Sciences at University of Trento, Board of Advisors, American Association for Cancer Research (AACR), Italian Genetics Association (AGI).

I served as reviewer for several respected scientific journals such as, Oncotarget, Molecules, and Computational Biology and Chemistry.

I supervised 12 Bachelor as well as 7 Master students (one currently), and I also supervised 2 different PhD students both as Senior PostDoc before and as independent Group Leader. From fall 2016 I enrolled in my newly established laboratory a PostDoc.

Ongoing Research Support

CARITRO Trento Fall 2016 - Fall 2018: used to hire a PostDoc Fellow
Role of DD1α in the induction of post-radiation induced Phoenix Rising Effect Role: PI
Direct cost per year: 20000 Euro

INFN (National Institute for Nuclear Physics) Feb 2017 – Jan 2019
MoVe-IT - Modeling and Verification for Ion beam Treatment planning Role: external collaborator
Direct cost per year: 20000 Euro

INFN (National Institute for Nuclear Physics) Jan 2020 –Dec 2023
Isolpharm EIRA Role: external collaborator

Faculty Resources Grant, University of Trento Fall 2016 - Fall 2019 Role: PI

Role of p53 in the response to different source of radiation therapy
Direct cost per year: 2,500 Euro

Fondo di finanziamento per le attività base di ricerca (FFABR), MIUR - 2018
Direct cost per year: 3000 Euro

Trento, 04/11/2019

Alessandra Bisio PhD

Assistant Professor
Dipartment -CIBIO, University of Trento
Via Sommarive, 9
38123, Povo (TN)

Albino Perego

Department of Physics
University of Trento
Via Sommarive 14
38123 Trento
Italy

Phone: +39 0461 282035
Office: 1-47
Email: albino.perego@unitn.it
Homepage: albinoperego.eu

Appointments

December 2018–present
Assistant Professor (Ricercatore Tempo Determinato tipo B)
Department of Physics
University of Trento

July 2017– December 2018
Postdoctoral Research Associate (Assegnista di Ricerca)
Istituto Nazionale di Fisica Nucleare (INFN)
Sezione di Milano Biccoca e Gruppo Collegato di Parma
Theoretical Nuclear and Relativistic Astrophysics

January 2013–June 2017
Postdoctoral Research Associate
Technische Universität Darmstadt
Institute for Nuclear Physics – Theory center
Theoretical Nuclear Astrophysics

April–May 2016, Paternity Leave (full-time)

March & June–December 2016, Part-time job (75% time) for parental care

October 2008–December 2012
Postgraduate Researcher and Teaching Assistant
Basel University
Physics Department
Theoretical Physics, Theoretical Nuclear Astrophysics group

May–September 2008,
Postgraduate Scholarship
University of Milano-Bicocca
Theoretical Astrophysics

Education

Ph.D. Theoretical Physics
Basel University
Thesis title: *"Neutrino treatment in multidimensional astrophysical simulations: a new spectral approach"*
Supervisor: Prof. Friedrich-Karl Thielemann
Received: 13 December 2012, Grade: Summa Cum Laude

Laurea Specialistica in Fisica (M.Sc. in Physics)
University of Milano.
Curriculum: Theoretical Physics.
Thesis title: *"Spin evolution in supermassive black hole binaries"*
Supervisors: Prof. Pierre Pizzocchero, Prof Monica Colpi
Received: April 2008, Grade: 110/110 Cum Laude

Laurea Triennale in Fisica (B.S. in Physics)
University of Milano.
Thesis title: *"Production of W+jets in hadron colliders"*

Supervisors: Prof. Stefano Forte
Received: October 2005, Grade: 110/110 Cum Laude

Research Interests

Theoretical and Nuclear Astrophysics, High Energy Astrophysics, Relativistic Astrophysics, Computational Physics, Neutrino Physics, Binary Neutron Star Mergers, Supernovae

Memberships

International Collaborations

Member of ENGRAVE, *Electromagnetic Counterparts of Gravitational Wave sources at the Very Large Telescope*, the largest European Consortium for the electromagnetic follow-up and interpretation of gravitationa wave sources, since March 2018. Coordinator of the Theory Working group since September 2018.

Member of GRAWITA, *Gravitational Wave INAF Team*, Italian team for the electromagnetic follow-up and interpretation of gravitational sources, since November 2017.

Member of Virgo Collaboration (Prometeo theory group) since November 2018.

Member of INFN TEONGRAV Initiative since July 2017. Responsabile locale for INFN-TIFPA since 2020.

Member of *CoRe* (Computational Relativity) collaboration since July 2017.

Research Networks

Member of PHAROS, *The multi-messenger physics and astrophysics of neutron stars* (ESF-COST Action CA16214) since January 2018.

Member of GWVerse, *Gravitational waves, black holes and fundamental physics* (COST Action CA16104), Group leader of WG1c (Numerical relativity/SPH with GR+matter+plasma) since January 2018.

Member of NewCompStar, *Exploring fundamental physics with compact stars* (MPNS COST Action MP1304), 2013–2017

Member of Supernova HP2C Project, Basel University, January 2010–December 2012

Member of CompStar, *The physics of compact stars* (ESF-funded RPN Action), 2009–2012

Member of EuroGrad Doctoral School, Basel University, October 2008–October 2010

Grants, Honours, & Awards

September 2019, Abilitazione Scientifica Nazionale (ASN) for Associate Professor, class 02/A2 (Theoretical Physics of Fundamental Interactions).

September 2019, Abilitazione Scientifica Nazionale (ASN) for Associate Professor, class 02/C1 (Astronomy, Astrophysics, Earth and planetary Physics).

April 2018, Best Presentation Prize, XVII Incontri di Fisica delle Alte Energie 2018 (IFAE 2018), Milano Bicocca, Italy

June 2016, First price for the Best Poster Award, XIV Nuclei in the Cosmos Symposium, Niigata, Japan

2010, 2011 & 2012, Best Teaching Assistant Award, Basel University, Switzerland

January 2010, Compstar Short Visit Grant to visit Jacobs University, Bremen, Germany

HPC Grants at the TGCC Supercomputing Center (France)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

April 2020 – March 2021, PI of the PRACE proposal "MicroBNS", 15M SU @ Irene-AMD-Rome (TGCC)

HPC Grants at the Gauss Supercomputing Center (Germany)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

November 2018 – November 2019, CI of the proposal "Simulating gravitational-wave and electromagnetic signals from neutron star collisions", 75M SU @ Leibnitz Supercomputing Center (LRZ)

HPC Grants at the Italian Supercomputing Center (CINECA)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

August 2018 – July 2019, PI of the proposal "TASMANIA: targeted simulation in Numerical Relativity", 4.5M SU

HPC Grants at the Swiss Supercomputing Center (CSCS)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

April 2016–March 2018, PI of the proposal "Neutrinos in the aftermath of neutron star mergers", 10M SU

April 2013–March 2016, CI of the proposal "Matter accretion on compact objects: the role on neutrinos, magnetic field and equation of state", 36M SU

April 2013–March 2016, CI of the proposal "ELEPHANT: a 3D supernova model for efficient parameter studies with spectral neutrino transport", 15M SU

January 2010–December 2012, CI of the proposal "Productive 3D models of stellar explosions"

Professional services

Fall 2019–present, Organization of department Colloquia, Physics Department, Trento University

January 2018, Organization of the workshop *Four challenges in gravitational-wave astronomy with neutron stars*, Parma, 16-17 January 2018

2015–present, Referee for Physical Review Letter, Physical Review C, The International Journal of Modern Physics D, Journal of Physics G: Nuclear and Particle Physics, The Astrophysical Journal, The Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, Monthly Notices of the Royal Astronomical Society Letters, Journal of High-Energy Astrophysics

Spring Semester 2011, Organizer of the Journal Club Seminars, Basel University

Teaching

International Graduate School

March 2019, 4 hours Lecture at the Pharos PhD school: *Multimessenger Physics and Astrophysics with Compact binary mergers*, Jena (DE)

November 2018, 6 hour lecture at the Pharos Training school: *Electromagnetic counterparts of neutron star mergers*, Bertinoro (IT)

May 2018, 2 hour lecture at the *Waves on the lake* SIGRAV school, Como, Villa del Grumello (Lecture: Modelling of binary neutron star mergers in numerical relativity, in collaboration with Prof. Sebastiano Bernuzzi)

March 2018, Tutor at the *Frontiers in Nuclear and Hadronic Physics* school, Firenze, Galileo Galilei Institute (Lecture: Nuclear Astrophysics, in collaboration with: Prof. G. Martinez-Pinedo)

March 2017, 45' Lecture at Rußbach School on Nuclear Astrophysics, Rußbach am PaßGschütt (AT)

Università degli Studi di Trento

Since 2019, 56 hours lectures on Quantum Field Theory (Master degree lectures)

Since 2020, 28 hours lectures on General Physics III (Bachelor degree lectures)

Università degli Studi di Parma

Spring Semester 2018, 4 hours lecture on Nucleosynthesis in Supernovae and binary Compact Mergers for the course: Selected themes in Theoretical Physics (Prof. S. Bernuzzi and Prof. Massimo Pietroni)

Università degli Studi di Milano Bicocca

Spring Semester 2018, 2 hours lecture for the Gravitational Waves course (Prof. M. Colpi)

Fall Semester 2017, 10 hours lecture on Supernovae for the Stellar Astrophysics course (Prof. M. Colpi)

TU Darmstadt

Fall Semester 2015, Teaching Assistant, General Relativity (Prof. Wambach, Prof. A. Arcones)

Spring Semester 2013 & 2015, Teaching Assistant, Introduction to Theoretical Astrophysics (Prof. Arcones)

Fall Semester 2013 & 2014, Tutor for Students, Computational aspects of strong interaction physics

Spring Semester 2013, Tutor for Students, Nuclear Structure and Nuclear Astrophysics

Basel University

Spring Semester 2009, 2010 & 2012, Teaching Assistant, Nuclear Astrophysics II (Dr. T. Rauscher)

Fall Semester 2011, Teaching Assistant, Nuclear Astrophysics I (Dr. T. Rauscher)

Spring Semester 2011, Teaching Assistant, Electrodynamics (Prof. F.-K. Thielemann)

Fall Semester 2010, Teaching Assistant, Introduction to Astrophysical Plasma (Dr. M. Liebendörfer)

Fall Semester 2009, Teaching Assistant, Mathematical Method III (Dr. Andreas Aste)

Student Mentoring and Advising

advisor of one PhD students (Alessandro Camilletti, since Nov 2020)

external co-advisor of two PhD students (Stockholm University and GSSI-L'Aquila)

co-advisor of six master students

co-advisor of six bachelor students

Outreach

October 2018, Educational article for the INFN magazine Asimmetrie on the topic "Multimessenger"

October 2018,Interview for the Italian magazine Focus about Neutron stars

3 May 2018, Public talk "Binarie di stelle di neutroni in coalescenza: laboratori cosmici di fisica fondamentale per la neonata astrofisica multimessenger", University of Milano, Milano

13 November 2017, Master class "GW170817: cosa è successo il 17 Agosto 2017 e perché è così importante per l'astrofisica del futuro", Osservatorio Astronomico di Brera, Milano

16 Ottobre 2017, "Gravity under a new light: nuovi segnali dal cosmo", public event to announce the first binary neutron star observation, University of Parma, Parma

29 September 2017, partecipation to the European Researchers' night, University of Parma, Parma

24 October 2016, Talk "Aspettando l'onda: binary NS mergers come laboratorio di fisica fondamentale", Public event "GR100+1: Suoni dal Cosmo", University of Milano-Bicocca

23-25 June 2011, Public exhibition for the Scientific Committee of the EU parlamient, Royal Belgian Institute for Natural Science, Bruxelles

Publications

Papers

74 articles published (or accepted for publication) in peer-reviewed journals (November 2009– March 2021)

- 8 articles as first author
- 18 articles as second or third author
- 51 short author list papers

11 articles submitted to peer-reviewed journals (March 2021)

> 7000 citations (NASA-ADS, March 2021)

h-index: 37 (March 2021)

Conference proceedings

15 conference proceedings published in peer-reviewed journals (4 as first author, 2 as second author)

Seminar and Conference Presentations

19 Invited Talks at International Conferences and Workshops

27 Seminars at International Academic Institutions

27 Contributing Talks at National and International Conferences and Workshops

3 Posters presented at International Conferences and Workshops

Personal

Citizenship: Italian

Date of Birth: 23 September 1983

Place of Birth: Lecco

Status: Married, one Child (born in January 2016)

Languages

- Mother tongue: Italian
- Advanced knowledge of written and spoken English (C1)
- Good knowledge of written and spoken German (B2)
- Elementary knowledge of written and spoken French (A2)

Last updated: March 1, 2021

CURRICULUM VITAE of GIAN-FRANCO DALLA BETTA

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Trento, February 25, 2021

I authorize the use of my personal data in compliance with Legislative Decree 196/03.

In witness whereof Gian-Franco Dalla Betta

1. PERSONAL INFORMATION

First Name	:	Gian-Franco
Family Name	:	Dalla Betta
Date of Birth	:	May 7th, 1967
Place of Birth	:	Venice, Italy
Sex	:	Male
Nationality	:	Italian
Marital Status	:	Married
Permanent Address	:	Via Ciocche, 16 - 31044 Montebelluna (Treviso), Italy Phone +39-0423-302207, Mobile +39-3485928003
Office Address	:	Department of Industrial Engineering, University of Trento Via Sommarive, 9 – Polo Ferrari 2 – 38123 Trento, Italy
Office Ph. Number	:	+39-0461283904
Office Fax Number	:	+39-0461281977
Office Email	:	gianfranco.dallabetta@unitn.it
Skype	:	dallabe
Web Page	:	https://webapps.unitn.it/du/en/Persona/PER0003161/Curriculum

Military service	:	Alternative Civil Service fulfilled at the "Patronato ACLI", Padua, Italy (from November 1992 to November 1993**).**

2. EDUCATION

September 1997: received the "Dottore di Ricerca" degree (i.e., the Italian Ph.D.) in Microelectronics from the University of Trento, Trento, Italy. Thesis title: "Design, fabrication and characterization of silicon radiation detectors"; Supervisor: Professor Giovanni Soncini.

December 1992: enabled to operate as a professional electronic engineer by passing the public examination for engineers at the University of Bologna, Italy.

July 1992: received the "Laurea" degree (equivalent to a M.Sc. degree) in Electronic Engineering from the University of Bologna, Bologna, Italy, summa cum laude. Thesis title: "Design of CMOS programmable Cellular Neural Networks"; Supervisor: Professor Guido Masetti.

July 1985: received High School Diploma of Scientific Liceum from "Pio X" Institute in Treviso, Italy with grade 60/60.

3. EMPLOYMENT HISTORY

December 2015-today: **Full Professor of Electronics** at the University of Trento, Trento, Italy. Member of the Department of Industrial Engineering.
Currently, at the same University:

- Responsible for the Laboratory of Electronics and Microsystems (2012-today);
- Member of the Steering Committee (2013-today) for the International Doctorate School in "Materials, Mechatronics, and Systems Engineering" (MMSE);
- Dean of the same School (November 2018-today).

November 2002-November 2015: **Associate Professor of Electronics** at the University of Trento, Trento, Italy. Member of the Department of Industrial Engineering (since 2012) and previously member of the Department of Information Engineering and Computer Science (November 2002 - October 2012).

May 2005 – October 2005: **Visiting Scientist at the Santa Cruz Institute for Particle Physics**, University of California Santa Cruz, Santa Cruz, CA, USA.

January 1997 – October 2002: **Researcher at the Centre for Scientific and Technological Research (ITC-irst)**, Trento, Italy. Main project: Silicon Radiation Detectors. Responsible for sensor design and simulation, responsible for Lithography in the Microfabrication Facility. Responsible for the development of detectors with integrated electronics.

July 1992 – November 1992: **Research Fellow** at the Department of Electronics, Information Technology and System Engineering, University of Bologna, Bologna, Italy. Main project: Cellular Neural Networks.

4. DESCRIPTION OF THE RESEARCH ACTIVITY

The research activity of Gian-Franco Dalla Betta is concerned with the design, simulation, fabrication and experimental characterization of silicon integrated devices and circuits, with emphasis on radiation sensors over a broad range of radiation types and energies, from visible light to charged particles.
The most important research topics are described hereafter with reference to the primary field of Silicon Radiation Detectors and to the secondary ones.

A. SILICON RADIATION DETECTORS

This is the main research activity. It started in 1994 within the Ph.D. activity and it has continued until today, involving many different detector types and applications. The most important achievements are briefly summarized in the following.

A.1. PIN diode and drift detectors for X-ray spectroscopy and imaging

This activity initiated the development of radiation detection processes on high-resistivity silicon at ITC-IRST of Trento in 1994. As such, it was crucial in establishing a production capability for radiation detectors that is unique in Italy. Achievements included: (i) the development of a state-of-the-art, low leakage process for the fabrication of PIN diode detectors, making use of extrinsic gettering techniques; (ii) the design, modeling, and experimental characterization of PIN diode detectors with good electro-optical and spectroscopic properties; (iii) the study of the accuracy of generation lifetime measurements in high-resistivity silicon using gate-controlled diodes and the design and characterization of optimized test structures; (iv) the development of PIN diode arrays coupled to CsI scintillators to be used in an X-ray imaging system for the on-line inspection of materials and structures; (v) the development of a fabrication process for drift detectors, and the fabrication of the first prototypes of these detectors ever made in Italy.

Publications:
International journals: [IJ.5], [IJ.14], [IJ.28]
International conference proceedings: [IC.2], [IC.5], [IC.14], [IC.20]
Italian journals: [NJ.1], [NJ.2]
Italian conference proceedings: [NC.1], [NC.4]

A.2. Strip and pixel detectors for tracking of charged particles

This activity, strongly fostered by INFN, allowed to fully accomplish the goal to establish at ITC-IRST, within a relatively short period of time, a production capability of medium volumes of advanced detectors for tracking of charged particles in High Energy Physics and space experiments. Achievements included: (i) the development of the critical process steps (e.g., integrated coupling capacitors, bias resistors, etc.) for microstrip detectors; (ii) the design, fabrication and electrical characterization of several prototype batches of double-sided microstrip detectors with excellent electrical properties and very low defect density; (iii) the development of an analytical model for the interstrip resistance on the ohmic-side of double-sided microstrip detectors; (iv) the development of an automatic test method for the electrical characterization of double-sided microstrip detectors and of a computerized analysis tool for process defect identification; (v) the development of a state-of-the-art process for double-sided pixel sensors of the n-on-n type, oriented to the ATLAS Pixel Detector.
Results were so good that ITC-IRST was included among the few silicon foundries at world level entitled to bid for the tenders relevant for the production of radiation detectors for CERN experiments, and it soon obtained important achievements: the production of 600 double-sided microstrip detectors for the silicon tracker of the AMS2 experiment (installed on board of the International Space Station), and 800 double-sided microstrip detectors for the silicon tracker of the ALICE experiment (one of the main experiments at CERN-LHC). Both productions

were completed in due time and with very good results, both in terms of detector quality and of fabrication yield.
Later, double-sided striplet detectors and pixel detectors were designed, fabricated on thin silicon substrates (200 μm), and fully characterized with good results. These detectors represented the baseline option for the Layer 0 of the foreseen SuperB Silicon Vertex Tracker, but the project was cancelled at the end of 2012 and these developments had to stop.

Publications:
International journals: [IJ.11], [IJ.15], [IJ.20], [IJ.22], [IJ.23], [IJ.25], [IJ.26], [IJ.27], [IJ.42], [IJ.77], IJ.114], [IJ.117], [IJ.120], [IJ.126], [IJ.132], [IJ.139], [IJ.154], [IJ.157]
International conference proceedings: [IC.8], [IC.11], [IC.17], [IC.81], [IC.92], [IC.105], [IC.112]
Italian conference proceedings: [NC.8]

A.3. Radiation damage effects and radiation tolerant detectors

Theoretical and experimental studies have been carried out to investigate radiation damage effects on radiation detectors, and to develop new technological/design solutions for radiation-hard detectors to be used at future experiments at the High-Luminosity LHC Upgrades and in X-ray Free Electron Lasers.
Achievements included: (i) the TCAD analysis and experimental characterization of irradiated FOXFET transistors to be used as bias structures in microstrip detectors; (ii) the TCAD analysis of the edge-generated leakage current in single-sided microstrip detectors irradiated beyond the type-inversion fluence; (iii) the development of special fabrication technologies by means of substrate engineering (e.g., oxygen and carbon enrichment of Float Zone substrates, pre-irradiation of Float Zone substrates by high fluences of fast neutrons, use of oxygen-rich substrates such as epitaxial, Czochralsky or Magnetic Czochralsky wafers); (iv) the design, fabrication and characterization of radiation-hard detectors featuring the above mentioned substrate engineering options; (v) the design, fabrication and characterization of thin radiation detectors obtained by local thinning of the substrate by TMAH etching; (vi) the measurement of the impact ionization coefficient of electrons in highly irradiated silicon; (vii) the development and validation of a comprehensive TCAD model of bulk and surface radiation damage in highly irradiated silicon sensors. For their importance and impact on the recent research activity, 3D and active edge detectors are described separately.

Publications:
International journals: [IJ.3], [IJ.17], [IJ.34], [IJ.38], [IJ.48], [IJ.51], [IJ.57], [IJ.59], [IJ.62], [IJ.68], [IJ.72], [IJ.83], [IJ.85], [IJ.91], [IJ.96], [IJ.101], [IJ.137],[IJ.196], [IJ.201], [IJ.207], [IJ.212], [IJ.225], [IJ.245]
International conference proceedings: [IC.3], [IC.13], [IC.16], [IC.29], [IC.33], [IC.35], [IC.38], [IC.40], [IC.53], [IC.54], [IC.56], [IC.133], [IC.143], [IC.148]
Papers of the CERN-RD50 Collaboration: [RD50.1], [RD50.2], [RD50.3], [RD50.4]

A.4. Multiple guard-ring edge terminations for radiation detectors

The edge termination is one of the most important problems in the design of radiation detectors. Dedicated efforts were devoted to this purpose with very good results. Achievements included: (i) the design, TCAD optimization and characterization of termination structures with multiple guard rings enabling the high voltage (>1000V) behavior of silicon radiation detectors both before irradiation and after heavy particle irradiation; (ii) the introduction of a new termination principle (namely the "all-p-type" multiple guard ring termination) aimed at improving the long term stability of radiation detectors subject to varying environmental conditions while using a simplified fabrication technology; (iii) the design, TCAD simulation and experimental characterization of several variants of the "all-p-type" termination (e.g., by using different combinations of inward and outward field plates) under different environmental conditions and irradiation scenarios.

Publications:
International journals: [IJ.4], [IJ.10], [IJ.16], [IJ.32], [IJ.36], [IJ.44], [IJ.49]
International conference proceedings: [IC.6], [IC.9], [IC.22], [IC.30], [IC.34]
Italian journals: [NJ.3]

A.5. Radiation detectors with integrated electronics

The integration of the radiation detector and at least part of the front-end electronics on the same high-resistivity substrate can significantly improve the noise performance, owing to the reduction of the stray capacitances associated with the connections from the charge collecting electrode and the preamplifier. For this reason, and also as a demonstration of the advanced processing capabilities achievable at ITC-IRST, an important R&D effort was started in the mid 90's and continued for about 10 years, leading to interesting results.
Achievements included: (i) the development of a fabrication process (the so called JSD technology) for detector-compatible n-channel JFETs; (ii) the design, fabrication and characterization of a test chip, demonstrating the feasibility of JFETs with good electrical properties while maintaining a very low detector leakage current; (iii) the design and characterization of PIN diode detectors with integrated JFETs, showing good electrical and spectroscopic performance; (iv) the modification of the JSD technology to allow for other active and passive devices to be fabricated (e.g., MOS transistors, BJT transistors, poly-Si resistors, coupling capacitors); (v) the design and fabrication of JFET-based charge sensitive amplifiers monolithically integrated on the detectors substrate and their extensive characterization, including radiation damage effects; (vi) the TCAD study and explanation of some anomalies in the JFET characteristics, causing excess noise, and the optimization of the fabrication process by implementing a high-energy p-well implant to fix these issues; (vii) the successful demonstration of the low noise features of modified JFET transistors and of JFET-based detectors and integrated amplifiers; (viii) the design, fabrication and characterization of microstrip detectors with embedded, JFET-based source-follower amplifier; (ix) the design,

fabrication and characterization of arrays of active pixels featuring JFET and MOSFET transistors embedded within the charge collection element.

Publications:
International journals: [IJ.2], [IJ.9], [IJ.12], [IJ.19], [IJ.21], [IJ.29], [IJ.30], [IJ.31], [IJ.35], [IJ.39], [IJ.41], [IJ.43], [IJ.50], [IJ.52], [IJ.64], [IJ.66], [IJ.69], [IJ.80], [IJ.90], [IJ.106], [IJ.184]
International conference proceedings: [IC.4], [IC.21], [IC.23], [IC.27], [IC.28], [IC.31], [IC.32], [IC.36], [IC.49], [IC.72]

A.6. Radiation detectors based on bipolar junction transistor

Initially obtained as a side-product of the JSD process (see A.5), radiation detectors based on bipolar junction transistors (BJT) were extensively characterized and optimized, finally leading to their use in a commercial product. Achievements included: (i) the TCAD analysis and experimental characterization of BJT-based radiation sensors featuring different design and technological options; (ii) the design, implementation and experimental validation of different bias methods for BJT detectors; (iii) the design, implementation and characterization of an original detector concept featuring monolithic arrays of BJT detectors with shared collector (substrate) and emitters shorted by a metal grid; (iv) the development of an alpha particle detector system based on BJT detectors and suited for Radon concentration measurements.

Patents: [P.3], [P.4], [P.5]
Publications:
International journals: [IJ.40], [IJ.45], [IJ.47], [IJ.53], [IJ.60], [IJ.63], [IJ.65], [IJ.67], [IJ.109], [IJ.118], [IJ.128], [IJ.156]
International conference proceedings: [IC.39], [IC.61], [IC.67], [IC.85], [IC.90], [IC.103], [IC.107]
Italian conference proceedings: [NC.11], [NC.14], [NC.15]
Magazines: [M.1]

A.7. Radiation detectors for medical imaging

Some of the detector technologies developed for High Energy Physics experiments were adapted to fabricate other types of detectors aimed medical imaging applications. Achievements included: (i) the optimization of the technological processes for very thick substrates (up to 1mm), as required for increased detection efficiency for X-rays; (ii) the design, fabrication and experimental characterization of several batches of pixel detectors for digital mammography, compatible with the read-out chips of the MEDIPIX family; (iii) the design, fabrication and experimental characterization of arrays of PIN diodes coupled to scintillators for γ-ray detection, to be used in a functional imaging instrument for scintigraphy.

Publications:
International journals: [IJ.37], [IJ.46], [IJ.56], [IJ.61], [IJ.70], [IJ.74]

International conference proceedings: [IC.41], [IC.46], [IC.50], [IC.71]
Italian conference proceedings: [NC.6]

A.8. Silicon photomultipliers

Silicon photomultipliers (SiPM) have been the hottest topic in photodetection for the past 15 years and candidate themselves to replace photomultiplier tubes in most applications. Achievements included: (i) the development of the first prototypes of silicon photomultipliers at ITC-IRST(FBK) by contributing to the design, the definition of the fabrication process, and the experimental characterization, in particular of the timing properties; (ii) the development of a compact model for the circuit simulation of SiPM; (iii) the development of a SiPM-based detection system for Positron Emission Tomography; (iv) the feasibility study of a novel SiPM-based detection system for Positron Time-of-Flight measurements, to be used for defect analysis in material science.

Publications:
International journals: [IJ.76], [IJ.81], [IJ.82], [IJ.93], [IJ.98], [IJ.112], [IJ.113], [IJ.115], [IJ.116], [IJ.141], [IJ.144]
International conference proceedings: [IC.55], [IC.57], [IC.58], [IC.64], [IC.65], [IJ.114]
Italian journals: [NJ.4], [NJ.5], [NJ.6]

A.9. Radiation detectors with three-dimensional electrodes (3D detectors)

This research activity has been the most important one for Gian-Franco Dalla Betta in the past 15 years. His contribution was fundamental in bringing 3D detectors from their infancy to their maturity, leading to their first application in a High Energy Physics experiment at CERN-LHC (e.g., ATLAS Insertable B-Layer), and paving the way for their use in other experiments (e.g., AFP, CT-PPS, ATLAS ITk, etc.). Moreover, other activities later started based on 3D detector technology, as reported in the following.
Achievements included: (i) the introduction of modified 3D detector concepts, alternative to the original one proposed by S. Parker (e.g., single-type column 3D detectors; double-sided double-type column 3D detectors with partially-through and full-through electrodes; single-sided full 3D detectors on Si-Si direct wafer bonded substrates), and the development of the related technologies; (ii) the design, fabrication and experimental characterization of a lage number of batches of 3D detectors in different configurations (e.g., pad, strip, pixels) and featuring different design and technological options; (iii) the study and TCAD analysis of non idealities in non irradiated and irradiated 3D detectors; (iv) the first observation of charge multiplication effects in irradiated 3D detectors; (v) the development and industrialization of 3D pixel detectors for the ATLAS Insertable B-Layer; (vi) the optimization of 3D detector design and technology for higher breakdown voltage; (vii) the development of original designs and technological solutions for a new generation of downscaled (smaller and thinner) 3D pixel detectors for future applications at the High-Luminosity LHC; (viii) the development of new 3D trenched-electrode sensors with optimized timing properties.

Publications:
International journals: [IJ.55], [IJ.71], [IJ.79], [IJ.84], [IJ.87], [IJ.88], [IJ.89], [IJ.92], [IJ.94], [IJ.95], [IJ.99], [IJ.100], [IJ.102], [IJ.103], [IJ.104], [IJ.108], [IJ.110], [IJ.111], [IJ.121], [IJ.123], [IJ.125], [IJ.127], [IJ.129], [IJ.131], [IJ.133], [IJ.135], [IJ.136], [IJ.138], [IJ.143], [IJ.145], [IJ.146], [IJ.147], [IJ.149], [IJ.150], [IJ.151], [IJ.152], [IJ.153], [IJ.158], [IJ.160], [IJ.161], [IJ.162], [IJ.164], [IJ.166], [IJ.172], [IJ.173], [IJ.176], [IJ.178], [IJ.179], [IJ.190], [IJ.191], [IJ.193], [IJ.195], [IJ.202], [IJ.210], [IJ.217], [IJ.220], [IJ.224], [IJ.227], [IJ.231], [IJ.232], [IJ.235], [IJ.236], [IJ.240], [IJ.242], [IJ.243], [IJ.244], [IJ.247], [IJ.251], [IJ.253], [IJ.254], [IJ.255],[IJ.259], [IJ.260]
International conference proceedings: [IC.60], [IC.62], [IC.63], [IC.66], [IC.68], [IC.69], [IC.78], [IC.79], [IC.80], [IC.88], [IC.89], [IC.91], [IC.99], [IC.100], [IC.101], [IC.104], [IC.108], [IC.109], [IC.111], [IC.118], [IC.135], [IC.137], [IC.144], [IC.145], [IC.147], [IC.150], [IC.152], [IC.155]
Italian journals: [NJ.7], [NJ.8]
Italian conference proceedings: [NC.16], [NC.17], [NC.18]
Books: [B.1]
Book Chapters: [BC.1]

A.10. Active-edge and slim-edge terminations for radiation detectors

Based on the experience with 3D technology, active-edge and slim-edge detectors have been developed allowing for the minimization of the dead-area at the edge and for the realization of large area seamlessly tiled detector matrices. Achievements included: (i) the development of fabrication technologies and design solutions for planar active-edge detectors; (ii) the design, TCAD simulation, fabrication, and experimental characterization of planar active-edge diode and strip detectors; (iii) the introduction of original slim-edge concepts in double-sided 3D detectors, also suitable for planar detectors, and their implementation in the ATLAS IBL design; (iv) the design, TCAD simulation, fabrication, and experimental characterization of different slim-edge structures in double-sided 3D detectors, with minimum dead area at the edge; (v) the contribution to the validation of the scribe-cleave-passivate (SCP) post-processing technique for slim edge in 3D detectors; (vi) the development of high-efficiency, active-edge and slim-edge planar pixel sensors for experiments at next generation Free Electron Lasers (FELs).

Publications:
International journals: [IJ.140], [IJ.142], [IJ.152], [IJ.159], [IJ.165], [IJ.168], [IJ.175], [IJ.177], [IJ.180], [IJ.187], [IJ.188],[IJ.189], [IJ.194], [IJ.198], [IJ.200], [IJ.206], [IJ.213], [IJ.228], [IJ.229], [IJ.234], [IJ.256]
International conference proceedings: [IC.102], [IC.120], [IC.126], [IC.127], [IC.128], [IC.130], [IC.132], [IC.138], [IC.140], [IC.141], [IC.151]
Italian conference proceedings: [NC.16], [NC.17]

Books: [B.1]
Book Chapters: [BC.1]

A.11. Hybrid neutron detectors

Also based on the experience with 3D technology, hybrid detectors of neutrons have been developed. Achievements included: (i) the design of novel 3D sensors for neutron detection, also compatible with pixelated read-out chips for neutron imaging; (ii) the fabrication and experimental characterization of prototype hybrid detectors based on 3D sensors and different converter materials for the detection of both thermal and fast neutrons; (iii) the optimization of the 3D sensors by GEANT4 simulations and the design of a new batch with enhanced efficiency; (iv) the fabrication and experimental characterization of 3D sensors from the second batch, with emphasis on the feasibility neutron/gamma discrimination by means of proper choice of the bias voltage.

Publications:
International journals: [IJ.169], [IJ.181], [IJ.197], [IJ.214]
International conference proceedings: [IC.116], [IC.119], [IC.131], [IC.134],
Italian conference proceedings: [NC.17], [NC.18]

A.12. Low Gain Avalanche Detectors

Low Gain Avalanche Detectors (LGADs) are radiation sensors with intrinsic signal amplification based on the avalanche effect. LGADs are a recent, hot topic in the field of radiation detectors, since they promise to open several new application opportunities, in particular owing to the possibility to provide an excellent timing resolution (~10s of ps) besides the usual high spatial resolution. Achievements included: (i) the contribution to the optimization of design parameters of LGADs; (ii) the proposal of a new, double-sided LGAD concept to allow for segmented detectors with uniform gain; (iii) the definition of a fabrication process, the design, and the experimental characterization of the first batch of double-sided LGADs; (iv) the definition of a fabrication process and the design of several other batches of thin, single-sided LGADs; (v) the experimental characterization of different LGAD structures from several batches, showing enhanced radiation hardness and timing properties.

Patent: [P.6]
Publications:
International journals: [IJ.182], [IJ.183], [IJ.199], [IJ.204], [IJ.205], [IJ.211], [IJ.222], [IJ.226], [IJ.233], [IJ.237], [IJ.241], [IJ.248], [IJ.249], [IJ.252], [IJ.257]
International conference proceedings: [IC.146], [IC.153], [IC.154], [IC.156], [IC.157], [IC.158]
National conference proceedings: [NC.19]

A.13. Monolithic Active Pixel Sensors

Within a large collaboration project funded by INFN, Monolithic Active Pixel Sensors (MAPS) have been developed for particle tracking in high-energy physics experiments (in particular for the Layer 0 of SuperB project). The specific role of Gian-Franco Dalla Betta has been the design and numerical simulation of CMOS radiation sensors embedded in the MAPS pixels. Achievements included the design and experimental characterization of several chips of the so-called APSEL family in 0.13 um CMOS technology, featuring pixels with full signal processing capabilities and on-chip data sparsification, also suited to vertical integration. The experimental characterization in the laboratory and at beam tests confirmed the high tracking efficiency of these devices.

Publications:
International journals: [IJ.78], [IJ.105], [IJ.107], [IJ.114], [IJ.119], [IJ.124], [IJ.126], [IJ.130], [IJ.132], [IJ.139], [IJ.154], [IJ.155], [IJ.163], [IJ.167]
International conference proceedings: [IC.59], [IC.70], [IC.81], [IC.105], [IC.112]

B. CMOS PHOTODETECTORS AND IMAGE SENSORS

This activity includes both a device-related part aimed at the realization of non-standard photodetectors in commercial CMOS technologies and a circuit/system part devoted to the realization of pixel arrays for different imaging applications.
Achievements included: (i) the design, modeling and experimental characterization of photon mixing devices based on different structures (e.g., MSM, interdigitated photodiodes, pinned photodiodes) suitable for the implementation of the Indirect Time-of-Flight technique at the pixel level for distance measurements; (ii) the development of versatile models for the simulation of optical sensors at the circuit level; (iii) the design, modeling and experimental characterization of avalanche based photodetectors, operated either in the linear mode (APD) or in the Geiger mode (SPAD) in different sub-micron CMOS technology nodes; (iv) the porting of a Current-Assisted Photonic Demodulator (CAPD) to a 0.18um CMOS process; (v) the design and characterization of smart pixels based on the previously mentioned sensors and their implementation in functional 3D image sensors with good performance; (vi) the design, modeling and characterization of CMOS SPAD-based pixel arrays with time-resolved readout channels, which enable single photon imaging with sub-ns resolution, for time resolved fluorescence measurements; (vii) the design and implementation of image sensors featuring novel active pixel concepts enabling outstanding performance in terms of dynamic range (higher than 130 dB); (viii) the design and characterization of a prototype hybrid camera based on a CMOS chip coupled to an array of organic photodiodes, aimed at the development of an image sensor with chemically-tunable spectral response also extending to the infrared; (ix) the design and experimental characterization of dual-tier SPAD sensor arrays for coincidence charged particle detection.

Patent: [P.2]
Publications:

International journals: [IJ.18], [IJ.33], [IJ.54], [IJ.73], [IJ.75], [IJ.97], [IJ.134], [IJ.148], [IJ.170], [IJ.171], [IJ.174], [IJ.186], [IJ.203], [IJ.207], [IJ.209], [IJ.215], [IJ.223], [IJ.230], [IJ.238] , [IJ.246], [IJ.250], [IJ.258]
International conference proceedings: [IC.18], [IC.24], [IC.43], [IC.44], [IC.45], [IC.47], [IC.51], [IC.52], [IC.73], [IC.74], [IC.75], [IC.76], [IC.77], [IC.82], [IC.83], [IC.84], [IC.86], [IC.87], [IC.93], [IC.94], [IC.95], [IC.96], [IC.97], [IC.98], [IC.106], [IC.110], [IC.113], [IC.115], [IC.117], [IC.121], [IC.122], [IC.123], [IC.124], [IC.125], [IC.136], [IC.139], [IC.142], [IC.149]
Italian conference proceedings: [NC.2], [NC.9], [NC.10], [NC.13]
Book Chapters: [BC.2], [BC.3]
Magazines: [M.2]

C. DEVICES AND CIRCUITS FOR SENSING APPLICATIONS

Achievements included: (i) the design, fabrication and experimental characterization of high performance optical sensors (photodiodes, phototransistors, photoASICs) for position encoders to be used in industrial control applications; (ii) the development and successful demonstration of technological modules (p-channel JFET, filterless color sensor based on multiple overlapped junctions, LED structures based on MOS diodes biased in the Fowler-Nordheim regime) fully compatible with the CMOS process available at ITC-IRST, and aimed at enhancing the design flexibility; (iii) the design and implementation of novel blue-sensitive optical transducers (finger shaped photodiodes and BJT phototransistors) for gas sensing (electro-optical noses), showing good response down to 300 ppm concentration of ethanol; (iv) the design and implementation of CMOS circuits (main building blocks and full interfaces) for optical sensors and chemical sensors; (v) the development of silicon nanowires featuring palladium gate contacts for hydrogen detection; (vi) the TCAD and experimental validation of an active method to improve the reliability of RF-MEMS switches.

Patent: [P.1]
Publications:
International journals: [IJ.6], [IJ.7], [IJ.8], [IJ.13], [IJ.58], [IJ.86], [IJ.122].
International conference proceedings: [IC.12], [IC.15], [IC.19], [IC.25], [IC.26], [IC.37], [IC.42], [IC.48]
Italian conference proceedings: [NC.3], [NC.5], [NC.7], [NC.12]

D. CMOS ANALOG CELLULAR NEURAL NETWORKS

This activity was started at the University of Bologna for the M.Sc. thesis, and then was reprised for some time while at ITC-IRST. Achievements included: (i) the design and simulation of novel CMOS implementations of analog programmable Cellular Neural Networks (CNNs), considering small area occupation and low power consumption as main constraints; (ii) the design, fabrication, and test of an original CMOS test structure for the mismatch characterization of MOS transistors, based on a circuit topology typical of neural

circuits; (iii) the design and test of prototype CNN circuits showing good electrical figures and correct performance in some basic image processing applications (noise removal, hole filling, edge detection, shadow detection, etc).

Publications:
International journals: [IJ.1], [IJ.24]
International conference proceedings: [IC.1], [IC.7], [IC.10]

5. PUBLICATIONS AND BIBLIOMETRIC INDICATORS

On the above topics, he has authored or co-authored more than 450 scientific papers, among them ~260 papers published in refereed international journals (including ~50 papers in IEEE journals), ~160 papers published in proceedings of international conferences, 1 book, and 3 book chapters. The full list of publications is reported in Section 19.

His **bibliometric indicators** are:
- Google Scholar: entries ~500, H index 35, citations ~5800
- Scopus: entries ~420, H index 28, citations ~3680
- Publons (Web of Science): entries ~385, H index 26, citations ~3050

6. INVITED TALKS AND LECTURES, SEMINARS

He gave the following **invited talks**:
1. "Tecnologie per la fabbricazione di rivelatori di radiazioni in silicio", Giornata di Studio AEI sul Tema "Prospettive per i sistemi di imaging radiografico a bassa dose in applicazioni medicali", Bari (Italy), June 6, 2000.
2. "Silicon radiation detectors: Review of production and R&D activities at ITC-IRST", 8th Italian Conference on Sensors and Microsystems, Trento, Italy, February 11-14, 2003.
3. "Development of 3D detectors", 16th Workshop on Vertex Detectors (Vertex 2007), Lake Placid (U.S.A.), September 23 – 28, 2007.
4. "High-Sensitivity Photodetectors in CMOS Technology for 3-D Imaging", 21st IEEE LEOS Annual Meeting, Newport Beach (U.S.A.), November 9-13, 2008.
5. "Development of modified 3D sensor technologies for HEP experiments", 2010 CMOS Emerging Technologies Workshop, Whistler (Canada), May 19-21, 2010.
6. "3D pixel sensors for the ATLAS IBL", Symposium Honoring Sherwood Parker, SLAC National Accelerator Laboratory (USA), March 31, 2012.
7. "3D Irradiation Results", 21st Workshop on Vertex Detectors (Vertex 2012), Jeju (Republic of Korea), September 16 – 21, 2012.
8. "Edgeless and slim-edge solutions for silicon pixel sensors", 22nd Workshop on Vertex Detectors (Vertex 2013), Lake Starnberg (Germany), September 15 – 20, 2013.

9. "Characterization of New FBK Double-Sided 3D Sensors with Improved Breakdown Voltage", IEEE Nuclear Science Symposium, Seoul (Republic of Korea), October 27 – November 2, 2013.
10. "3D Silicon Detectors", IFD2014, INFN Workshop on Future Detectors for HL-LHC, Trento (Italy), March 11-13, 2014.
11. "State of the art of 3D sensors", 2014 CMOS Emerging Technologies Workshop, Grenoble (France), July 6-8, 2014.
12. "Pixelated low gain avalanche detectors", Symposium on Advanced Semiconductor Detector for Medical Applications, Munich (Germany), February 13, 2015.
13. "3D sensors developments", TALENT ITN Final Conference, CERN (Geneve, Switzerland), November 23-26, 2015
14. "New Sensors", IFD2015, INFN Workshop on Future Detectors, Torino (Italy), December 16-18, 2015.
15. "Small pitch 3D devices", 25th Workshop on Vertex Detectors (Vertex 2016), La Biodola, Isola d'Elba (Italy), September 26 – 30, 2016.
16. "Small pitch thin 3D pixel sensors for phase 2 upgrades at LHC", Journée thématique: Fabrication de détecteurs semiconducteurs, Paris (France), July 14, 2017.
17. "Sensor developments for Phase 2 ATLAS and CMS pixel detectors", 103° Congresso della Società Italiana di Fisica, Trento (Italy), Sept. 11-15, 2017.
18. "3D trenched-electrode sensors for charged particle tracking and timing", ULITIMA 2018 – Ultrafast imaging and tracking instrumentation, methods & applications, Chicago (USA), Sept. 11-14, 2018.

He gave the following **invited lectures**:

1. "Advanced photodetectors based on single photon avalanche diodes for 3D vision and medical imaging", Electronics and Communications PhD Summer School of the University of Padova, Bressanone (Italy), July 6, 2007.
2. "Surface effects and breakdown voltage", MC-PAD Training Event, Lubiana (Slovenia), September 26-30, 2010.
3. "Why and How Pixels are becoming more and more intelligent", Second international Summer School on "Intelligent Signal Processing for Frontier Research and Industry", Paris (France), July 14 – 25, 2014.
4. "Principles of semiconductor detectors", VII International School on Detectors and Electronics for High Energy Physics, Astrophysics, Space Applications and Medical Physics, Legnaro (Italy), April 3-7, 2017.
5. "Principles of semiconductor detectors", VIII International School on Detectors and Electronics for High Energy Physics, Astrophysics, Space Applications and Medical Physics, Legnaro (Italy), April 1-5, 2019.

Moreover, he gave **seminars** dealing with silicon optical sensors and radiation detectors at: CERN (Geneve, Switzerland), SCIPP (Santa Cruz, USA), DESY (Hamburg, Germany), Albert

Ludwig University of Freiburg (Freiburg, Germany), University of Manchester (Manchester, United Kingdom), University of Ljubljana (Ljubljana, Slovenia), ENEA (Frascati, Italy), as well as at several Italian Universities and INFN Chapters.

7. RESEARCH CONTRACTS

He has participated in numerous funded research programs, including:

- European Project H2020-INFRAINNOV-2020-2 "Advancement and Innovation for Detectors at Accelerators (AIDAinnova)", years 2021-2025 **(research-unit leader)**
- European Project ATTRACT (grant Agreement 777222), "INSTANT (Imaging iN Space–Time ANd Tracking), Coordinator Dr. Adriano Lai, INFN Cagliari, years 2019-2020 **(research-unit leader)**
- INFN Project (National Scientific Committee V), ARCADIA experiment "Advanced Readout CMOS Architectures with Depleted Integrated sensor Arrays", National Coordinator Dr. Manuel Dioniso, INFN Torino, Research-Unit Leader Dr. Lucio Pancheri, INFN TIFPA, years 2019-2021.
- INFN Project (National Scientific Committee V), TIMESPOT experiment "TIME and SPace real-time Operating Tracker", National Coordinator Dr. Adriano Lai, INFN Cagliari, years 2018-2021 (**research-unit leader and work package coordinator**)
- INFN Project (National Scientific Committee V), DEEP_3D experiment "Detectors for neutron imaging with Embedded Electronics Produced in 3D technology", National Coordinator Dr. Roberto Mendicino, INFN TIFPA, years 2018-2020.
- INFN Project (National Scientific Committee I), FASE2_ATLAS experiment, National Coordinator Dr. Davide Boscherini, INFN Bologna, years 2018-2021 **(research-unit leader)**.
- European Project H2020-INFRAIA-1-2014-2015 Excellent Science "Advanced Infrastructure for Detectors at Accelerators (AIDA-2020)", years 2015-2020 **(research-unit leader and manager of Task 7.2 "TCAD Simulations" within WorkPackage 7 "Advanced hybrid pixel detectors").**
- CERN Large Hadron Collider, ATLAS Experiment; Spokeperson Prof. Karl Jakobs, University of Freiburg; years 2015-today **(research-unit leader).**
- INFN Project (National Scientific Committee I), ATLAS experiment, National Coordinator Prof. Marina Cobal, University and INFN Udine, years 2011-today **(research-unit leader)**
- INFN Project (National Scientific Committee I), RD_FASE2 experiment, National Coordinators Dr. Roberto Ferrari, INFN Pavia (until September 2017), Dr. Stefano Veneziano, INFN Roma 1, years 2014-2017 **(project leader for ATLAS ITk system and research-unit leader)**.
- INFN Project (National Scientific Committee V), APIX2 experiment "Development of an avalanche pixel sensor for tracking applications", National Coordinator Prof. Pier Simone Marrocchesi, INFN Pavia, Research-Unit Leader Dr. Lucio Pancheri, INFN TIFPA, years 2014-2017.

- INFN Project (National Scientific Committee V), PIXFEL experiment “Enabling technologies, building blocks and architectures for advanced X-ray Pixel cameras at FELs”, National Coordinator Prof. Lodovico Ratti, INFN Pavia, Research-Unit Leader Dr. Lucio Pancheri, INFN TIFPA, years 2014-2016 (**task manager)**.
- INFN Project (National Scientific Committee V), HYDE experiment “HYbrid DEtectors for Neutrons”, National Coordinator Prof. Alberto Quaranta, INFN Legnaro, years 2012-2014 **(research-unit leader)**.
- INFN Project (National Scientific Committee I), P-SuperB experiment, National Coordinator Dr. Roberto Calabrese, INFN Ferrara, years 2012-2013 **(research-unit leader).**
- European Project FP7-INFRASTRUCTURES-2010-1, title “Advanced European Infrastructures for Detectors at Accelerators (AIDA)”, years 2011-2014.
- European project, FP7 ICT-2009.3.7, STREP “Fully Networked, Digital Components for Photon-starved Biomedical Imaging Systems (SPADNET)”, years 2010-2013, Coordinator Prof. E. Charbon (TU Delft, NL), Responsible for FBK: Ing. D. Stoppa **(responsible for a sub-contract from FBK: "Characterization of CMOS SPAD based devices for gamma ray detection").**
- INFN Project (National Scientific Committee V), TRIDEAS experiment "Development and optimization of silicon detectors with 3-D Electrodes and Active edgeS", years 2009-2012 **(national coordinator and research-unit leader).**
- INFN Project (National Scientific Committee V), VIPIX experiment “Vertical Integrated PIXels”, National Coordinator Prof. Valerio Re, INFN Pavia, years 2009-2011 **(research-unit leader).**
- Project VIGONI 2008, Title “CMOS image sensors based on Organic Photodetectors (CIOP)", Partner Technical University of Munich, Germany (Prof. Paolo Lugli), years 2009-2010 **(research-unit leader).**
- Call “Grandi progetti 2006”, funded by Provincia Autonoma of Trento, title: “A NAno on MIcro approach to a multispectral analytical system for protein assays (NAoMI)”, scientific coordinator: Dr. Cecilia Pederzolli, FBK, years 2008-2012 **(research-unit leader).**
- CERN ATLAS 3D Sensor Collaboration, Title: “Development, testing and industrialization of Full-3D active-edge and Modified-3D silicon radiation pixel sensors with extreme radiation hardness. Results, Plans”; Spokeperson: Prof. Cinzia Da Via, University of Manchester, years: 2007-2012 **(research-unit leader and responsible for the design of 3D pixel sensors installed in the ATLAS Insertable B-Layer).**
- MIUR (Italian Ministry for Instruction, University and Research), 2007 PRIN project, Title: "Time-of-Flight Range Image Sensor", years 2008-2010 **(national coordinator and research-unit leader).**
- INFN Project (National Scientific Committee V), DASIPM2 experiments “Development and Applications of SiPM to Medical Physics and Space Physics”, National Coordinator Prof. Alberto Del Guerra, INFN Pisa, years 2007-2010 **(research-unit leader).**

- INFN Project (National Scientific Committee V), SLIM5 experiment “Silicon detector with Low Interaction with Material”, National Coordinator Prof. Francesco Forti, INFN Pisa, Research-Unit Leader Prof. Giovanni Soncini, INFN Trento, years 2006-2008 (**task manager).**
- MIUR (Italian Ministry for Instruction, University and Research), 2005 PRIN project, Title: "Development of monolithic active pixel and thin strips detectors for charged particle trackers"; National Coordinator: Prof. Marcello Giorgi, University of Pisa; Title of the specific program of the research unit “Design, simulation and characterization of thin silicon microstrip detectors”, years 2006-2007 **(research-unit leader).**
- INFN Project (National Scientific Committee V), DASIPM experiments “Development and Applications of SiPM to Medical Physics and Space Physics”, National Coordinator Prof. Alberto Del Guerra, INFN Pisa, year 2006 **(research-unit leader).**
- INFN Project (National Scientific Committee V), TREDI experiment “Development of fabrication technologies and design solutions for the realization of silicon radiation detectors with three-dimensional electrodes and active edge”, National Coordinator Prof. Luciano Bosisio, INFN Trieste, years 2005-2008 **(research-unit leader).**
- MIUR (Italian Ministry for Instruction, University and Research), 2003 PRIN project, Title: "Development of monolithic pixel detectors with integrated electronics", National Coordinator: Prof. Marcello Giorgi, University of Pisa; Title of the specific program of the research unit: “Design and characterization of pixel detectors with integrated electronics on high resistivity silicon”; years 2004-2005 **(research-unit leader).**
- CERN Project LHCC-2002-003-P6-RD50, “Development of Radiation Hard Semiconductor Devices for Very High Luminosity Colliders"; Spokeperson Prof. Mara Bruzzi, University of Florence; Research-Unit Leader Dr. M. Boscardin, ITC-IRST, Trento, years 2002-2007.
- Call “Fondo Unico per la Ricerca 2001”, funded by Provincia Autonoma of Trento, title: “Development of pixel detectors on high resistivity silicon for X-ray medical imaging (PDX)", scientific coordinator: Dr. Nicola Zorzi, ITC-IRST, Responsible for the Research Unit: Prof. Giovanni Soncini, University of Trento, years 2002-2004 **(task manager).**
- INFN Project (National Scientific Committee V), SISPES experiment “Development of n^+/n pixel detectors on thick silicon substrates”, National Coordinator Prof. Valeria Rosso, INFN Pisa, years 2002-2003 (**task manager at aggregate partner ITC-IRST).**
- MIUR (Italian Ministry for Instruction, University and Research), 2001 PRIN project, Title: “Silicon detectors of different thickness and with integrated electronics”, National Coordinator: Prof. Marcello Giorgi, University of Pisa; Research-Unit Leader: Prof. Luciano Bosisio, University of Trieste, years 2001-2003 **(task manager at aggregate partner ITC-IRST).**
- MIUR (Italian Ministry for Instruction, University and Research), 2001 PRIN project, Title: “Electro-optical nose”, National Coordinator: Prof. A. D'Amico, University of Rome Tor Vergata; Research-Unit Leader: Prof. G. Soncini, University of Trento, years 2001-2003.

- MIUR (Italian Ministry for Instruction, University and Research), Law 297 Project, Title: "Three-dimensional vision system for a scene detection (OPTO-3D)", Coordinator Dr. G. Alessandretti, Centro Ricerche FIAT, Trento; Research-Unit Leader Dr. L. Gonzo, ITC-IRST, Trento, years 2000-2003.
- MIUR (Italian Ministry for Instruction, University and Research), 1999 PRIN project, Title: "Feasibility study of microelectrode detectors on high resistivity silicon with integrated electronics", National Coordinator: Prof. Marcello Giorgi, University of Pisa; Responsible for the Research Unit: Prof. Giorgio Pignatel, University of Trento, years 1999-2001 **(task manager at aggregate partner ITC-IRST).**
- National Research Council (CNR) "Materials and Devices for Solid-State Electronics MADESS)", Title: "Development of an imaging system for baggage control security based on an array of X-ray sensors", Research-Unit Leader Prof. G. U. Pignatel, University of Trento, years 1998-2000 **(task manager at aggregate partner ITC-IRST).**
- National Research Council (CNR) "Materials and Devices for Solid-State Electronics MADESS)", Title: "Integrated electronics for sensors", Research-Unit Leader Prof. G. Soncini, University of Trento, years 1998-2000 **(task manager at aggregate partner ITC-IRST)**.
- MURST (Italian Ministry for University and Scientific and Technological Research), 60% Project, Title: "Microelectronic and nanoelectronic technologies", Title of the specific program of the research unit: "Silicon integrated X-ray microsensors and detectors", Research-Unit Leader Prof. G. Soncini, University of Trento, years 1997-1999 **(task manager at aggregate partner ITC-IRST).**
- European Project ESPRIT-FUSE 24575, Title: "Optoelectronic Microsystem for Encoders (OPE)", Prime Industrial Contractor ELTRA s.r.l., Sarego (Vicenza), Italy; Research-Unit Leader Dr. M. Zen, ITC-IRST, Trento, Italy; year 1997.
- Framework Agreement between Istituto Trentino di Cultura (ITC) and Istituto Nazionale di Fisica Nucleare (INFN), Title: "Protocollo di intesa per una collaborazione al fine di sviluppare e fabbricare rivelatori in silicio a microstriscia per esperimenti di fisica delle alte energie'", Research-Unit Leader Dr. M. Zen, ITC-IRST, Trento; years 1996-1999 (**task manager**).
- European Project ESPRIT 1500, MEPI-T-DIM 157, Title: "X-ray Spectrometer for Environmental Chemical Analysis (XSECA)", Prime Industrial Contractor Silena s.p.a., Milan, Research-Unit Leader Dr. M. Boscardin, ITC-IRST, Trento, Italy; years 1996-1997
- INFN Project (National Scientific Committee V), LAST experiment "Development of fabrication processes for detectors of radiation and charged particles with integrated front-end electronics", National Coordinator Prof. Marcello Giorgi, INFN Pisa, Research-Unit Leader Prof. Giovanni Soncini, INFN Trento, years 1995-1997 **(task manager at aggregate partner ITC-IRST).**
- MURST (Italian Ministry for University and Scientific and Technological Research), 60% Project, Title: "Microelectronic and nanoelectronic technologies", Title of the specific program of the research unit: "Development of JFET-CMOS technological modules on

Czochralsky and Float Zone silicon", National Coordinator and Research-Unit Leader Prof. G. Soncini, University of Trento, year 1996.

8. SCHOLARSHIPS AND AWARDS:

October 2004: received a "Certificate for outstanding contributions in the field of nuclear radiation measurements" from the Radiation Instrumentation Steering Committee of the IEEE Nuclear & Plasma Science Society.

May 2004: received the 2004-2005 grant for the International Mobility Program between the University of Trento and the University of California.

July 1996: received a scholarship to attend the "Advanced Summer School on New Detectors for Radiation Measurements and Related Applications", CNR/TESRE, Bologna (Italy), July 1-12, 1996.

July 1995: received a scholarship to attend the "International School on Materials Science and Technology: Silicon-Germanium high-speed electronics", NATO Advanced Study Institute, Erice (Italy), July 13-25, 1995.

9. SCIENTIFIC AND INDUSTRIAL COLLABORATIONS

During his research activity, he has collaborated with several universities in Italy and with:

- Fondazione Bruno Kessler (formerly ITC-IRST, Trento, Italy)
- Optoelettronica Italia s.r.l. (Trento, Italy)
- CERN (Geneve, Switzerland)
- CSEM (Neuchatel, Switzerland)
- Italian National Institute of Nuclear Physics (INFN)
- Jozef Stefan Institute (Ljubljana, Slovenjia)
- ST Microelectronics (Catania, Italy)
- Santa Cruz Institute for Particle Physics (Santa Cruz, USA)
- Stanford Linear Accelerator Center (SLAC, Stanford, USA)
- FERMILAB (Batavia, USA)
- Purdue University (West Lafayette, USA)
- University of New Mexico (Albuquerque, USA)
- Technical University of Munich (Munich, Germany)
- Czech Technical University in Prague (Prague, Czech Republic)
- Albert Ludwig University of Freiburg (Freiburg, Germany)
- University of Manchester (UK)
- University of Edinburgh (UK)
- LPNHE (Paris, France)

- CNM (Barcelona, Spain)
- IFAE (Barcelona, Spain)
- SINTEF (Oslo, Norway)

10. PROFESSIONAL SOCIETIES

- Member of the Trento Unit of SIE (formerly the Italian Electronics Group) since 1994; responsible of the same Unit in the period 2004-2017;
- Member of the Institute of Electrical and Electronics Engineers (IEEE) from 1994 to 2006, **Senior Member of IEEE** since 2006 (Electron Devices, Solid-State Circuits, Photonics, and Nuclear and Plasma Sciences Societies);
- Member of the International Society for Optics and Photonics (SPIE) since 2011
- Member of the Optical Society of America (OSA) since 2011;
- Member of the International Association of Engineers (IAENG) since 2014;
- **Chair** of the **Italian Chapter of the IEEE Nuclear and Plasma Science Society** since May 2016;
- Member-at-Large for the 2017-2019 term of the Radiation Instrumentation Steering Committee (RISC) of the IEEE Nuclear and Plasma Sciences Society;
- Vice-Chair (2019-2019) and **Chair** (2020-2021) of the **Joint Oversight Subcommittee** (JOS) of the Radiation Instrumentation Steering Committee (RISC) and Nuclear Medical Imaging Sciences Committee (NMISC) of the IEEE Nuclear and Plasma Sciences Society.

11. BOOK, JOURNAL AND CONFERENCE ROLES

He has been a co-author of the book "**Radiations sensors with 3D electrodes**", ISBN 9781498782234, CRC Press, Boca Raton (USA), January 2019.

He has been the editor of the open-access book "**Advances in photodiodes**", ISBN 978-953-7619-X-X, INTECH, Rijeka, Croatia, March 2011. The book was cited 160 times on Web of Science), with a total of more than 63,500 downloads of all chapters (as of November 2020).

He has been an **Associate Editor of the "IEEE Transactions on Nuclear Science"** (ISSN 0018-9499) since May 2008.

He has been **Senior Editor of the "IEEE Transactions on Nuclear Science"** (ISSN 0018-9499) for the special issue dedicated to the 2019 ANIMMA Conference.

He has been **Senior Editor of the "IEEE Transactions on Nuclear Science"** (ISSN 0018-9499) for Radiation Instrumentation since June 2020.

He has been an **Associate Editor of the "Frontiers in Physics - Radiation Detectors and Imaging"** (Electronic ISSN 2296-424X) since 2019.

He has been a member of the Editorial Board of "Informacije MIDEM – Journal of Microelectronics, Electronic Components and Materials" (ISSN 0352-9045) since May 2012.

He has been a member of the Editorial Board of "Sensors and Materials" (ISSN 0914-4935) since November 2012.

He has been a member of the Editorial Board of MDPI "Sensors" (ISSN 1424-8220) since November 2018.

He has been a member of the Editorial Board of MDPI "Journal of Nuclear Engineering" (ISSN 2673-4362) since April 2020.

He has been a member of the Technical Program Committee as a reviewer and topic convener for the International Conference "IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS-MIC)" since 2005.

He has been a member of the Organizing Committee as Publication Co-Chair for the International Conference "IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS-MIC)" in 2019.

He has been a member of the Technical Program Committee for the Conference on "Ph.D. Research in Microelectronics and Electronics (PRIME)" since 2011.

He has been a member of the Scientific Committee for the International Conference on "Radiation Effects on Semiconductor Materials, Detectors and Devices (RESMDD)" since 2012.

He has been a member of the Scientific Committee for the International Conference on "International Conference on Advancements in Nuclear Instrumentation Measurement Methods and Their Applications (ANIMMA)" since 2019.

He has been a member of the Organizing Committee of the International Conference ULITIMA 2020 to be jointly held with ICHSIP 33 (International congress on high-speed imaging and photonics) in San Diego (USA) in August 2020 (postponed to 2021).

He has been session Chair at the: 2005, 2006, 2009, 2010, 2012, 2014, 2016, 2017, 2018, and 2019 IEEE Nuclear Science Symposium; the 6th (2006), 7th (2009) and 9th (2013) International "Hiroshima" Symposium on the Development and Application of Semiconductor Tracking

Detectors; the 7th Conference on Ph.D. Research in Microelectronics and Electronics (PRIME 2011), the 9th (2012) and 10th (2014) International Conference on Radiation Effects on Semiconductor Materials, Detectors and Devices.

He has been a topic convener for the Italian IFAE conference in 2017.

He has been a reviewer for several other international conferences, e.g., Vertex, ICECS, MIDEM, EESMS, ISCAS, etc.

He has been a reviewer of scientific books for CRC Press (Taylor and Francis group) and IOP Publishing.

He has been a **reviewer for the following international journals** (in alphabetical order):

- Analog Integrated Circuits & Signal Processing
- Applied Optics
- Applied Physics B
- Applied Radiation and Isotopes
- Chinese Optical Letters
- IEEE Electron Device Letters
- IEEE Journal of Selected Topics in Quantum Electronics
- IEEE Journal of Solid-State Circuits
- IEEE Sensors Journal
- IEEE Transactions on Circuits and Systems – II
- IEEE Transactions on Electron Devices
- IEEE Transactions on Nuclear Science
- IEEE Transactions on Radiation and Plasma Medical Sciences
- International Journal of Numerical Modelling: Electronic Networks, Devices and Fields.
- Journal of Applied Physics
- Journal of Instrumentation
- Journal of Photonics for Energy
- Journal of Physics D: Applied Physics
- Material Science in Semiconductor Processing
- MDPI Micromachines
- MDPI Sensors
- Measurement Science and Technology
- Micro and Nano Letters
- Microelectronics Engineering
- Microelectronics Journal
- Nuclear Instruments and Methods in Physics Research A

- Nuclear Instruments and Methods in Physics Research B
- Optical Engineering
- Optics Express
- Physica E: Low-Dimensional Systems and Nanostructures
- Sensors and Actuators A: Physical
- Sensors and Actuators B: Chemical
- Solid-State Electronics

12. PROJECT REVIEW

He has been a **reviewer of scientific projects** for the following funding agencies:
1. Provincia Autonoma di Trento (PAT): Progetti Legge 6
2. Italian Ministry for Education, University and Research (MIUR): Progetti FIRB
3. Agence Nationale de la Recherche (ANR, France)
4. Czech Science Foundation (Czech Republic)
5. Austrian Science Fund (FWF, Austria)
6. Qatar National Research Fund (QNR, Qatar)
7. Dutch Technology Foundation (STW, The Netherlands)
8. Norwegian Council (Norway)

He has also been a **reviewer for CERN projects**:
a) Sensor Engineering Design Review of LHCb VELO Upgrade project;
b) Reviews for ATLAS ITk pixel pitch for Layer0/Layer1 and Layer0 Radius

13. PhD THESIS REVIEW

He was an **external reviewer of PhD Theses** for:
- the University of Edinburgh (UK) in 2012
- the Polytechnic of Milan (Italy) in 2012
- the University of Padua (Italy) in 2013
- the University of Turin (Italy) in 2017
- the University of Udine (Italy) in 2018
- the University of Cagliari (Italy) in 2019

14. EVENT ORGANIZATION

In 2014, he was among the initiators, and since then he has been the Co-Organizer of the Summer School on "Neutron Detectors and Related Applications (NDRA)", which celebrated its 3rd anniversary edition in Riva del Garda in 2018. The 4th edition had been planned to take place in Riva del Garda (Italy), June 22-25, 2020, but had to be postponed due to Covid-19.

In 2005, he was among the initiators, and since then he has been a member of the organization committee for the "Trento Workshop on Advanced Silicon Radiation Detectors", which celebrated its 16th anniversary edition on Feb. 16-18, 2021.

He was the General Co-Chair of the "XVIII AISEM Annual Conference", Trento (Italy), February 3-5, 2015.

He was the local organizer of the "1st INFN Workshop on Future Detectors for HL-LHC (IFD2014)", Trento, March 11-13, 2014.

He was the General Co-Chair for the "7th Conference on Ph.D. Research in Microelectronics and Electronics (PRIME 2011)", Madonna di Campiglio (Italy), July 4-8, 2011.

He was the local organizer of the "41st Annual Meeting of the Italian Group of Electronics (GE2009)", Trento, June 17-19, 2009, and of the related Doctorate School, Trento, June 15-17, 2009.

He was a member of the organizing committee for the Workshop honoring Prof. Giovanni Soncini "Trentino as a lab: the role of Electronics", Trento, March 17, 2009.

He was the local organizer for the course "CMOS Analog Integrated Circuit Design", given by Prof. Phillip E. Allen, Georgia Institute of Technology (Atlanta, USA), Trento, October 13-17, 2003 that was attended by more than 70 people from all over Italy.

15. TECHNOLOGY TRANSFER

He has been **co-inventor of 6 patents**:

P.1. European Patent nr. 0907208 of 18/12/2002, title: "A process for manufacturing JFET devices and related device"

P.2. Italian Patent n. TO2004A000543 of 02/08/2004, title: "Dispositivo per la rivelazione di radiazione elettromagnetica, pixel e matrice di pixel comprendenti siffatti dispositivi, e sensori ottici comprendenti una matrice di pixel"

P.3. Italian Patent n. TO2004A000901 of 23/12/2004, title: "Procedimento per la realizzazione di un rivelatore di radiazioni ionizzanti a stato solido"

P.4. European Patent n. WO/2012/172490 A1 (PCT/IB2012/052975) of 20/12/2012, title: "A containment apparatus for a sensor"

P.5. US Patent n. US 20140151556 A1 of 05/06/2014, title: "Device and method for estimating the concentration of gas radon"

P.6. US Patent n. US 20190198704 A1 of 12/07/2017, title: "Particle detector capable of separating in-time signals from out-of-time signals"

In 2011, he **co-founded RSens**, a joint **spin-off company** of the University of Trento and the University of Modena e Reggio Emilia, that operated in the field of Radon gas monitoring systems until 2018.

16. TEACHING AND STUDENT SUPERVISION

February 2000 – today: He has been the **official instructor of 64 courses in Electronics** (SSD ING-INF/01) at the University of Trento, at both the undergraduate (32) and graduate (32) level, covering the following fields: semiconductor devices, microelectronic technologies, basic analog and digital circuits, solid-state sensors and detectors, numerical simulations.

April-May 1997 & January 1998: **Teaching Assistant** of "Materials, Technologies and Components for Electronics" (Lecturer: Prof. Giovanni Soncini) at the Materials Engineering School of the University of Trento, Trento, Italy.

February 1994-June 1996: **Electronics Laboratory Assistant** at the Materials Engineering School of the University of Trento, guiding students during laboratory experience for the courses of "Circuit Theory" and "Materials, Technologies and Components for Electronics".

He was thesis **advisor or co-advisor of 21 Ph.D. students** at the University of Trento:

- Andrea Ficorella, "Application of avalanche detectors in scientific and industrial measurement systems", PhD Thesis in Materials, Mechatronics and Systems Engineering, Advisor Prof. Lucio Pancheri, Co-Advisor Prof. Gian-Franco Dalla Betta, a.y. 2017-2018
- Mostafa Ahmed Soliman Khatib, "THz Radiation Detection Based on CMOS Technology", PhD Thesis in Materials, Mechatronics and Systems Engineering, Advisor Dr. Matteo Perenzoni, Co-Advisor Prof. Gian-Franco Dalla Betta, a.y. 2017-2018
- Andrea Capuano, "Design, microfabrication and characterization of a split-flow thin fractionation (SPLITT) electrical device for continuous extraction or binary separation of proteins", PhD Thesis in Materials, Mechatronics and Systems Engineering, Advisor Dr. Leandro Lorenzelli, Co-Advisors Dr. Andrea Adami, Prof. Gian-Franco Dalla Betta, a.y. 2017-2018
- Olufemi Akindele Olomudeji, "Memristor-Based Computing Architecture with Advanced Signal Processing Capabilities", PhD Thesis in Materials, Mechatronics and Systems Engineering, Advisor Dr. Massimo Gottardi, Co-Advisor Prof. Gian-Franco Dalla Betta, a.y. 2016-2017

- DMS Sultan, “Development of small-pitch, thin 3D sensors for pixel detector upgrades at HL-LHC”, PhD Thesis in Materials, Mechatronics and Systems Engineering, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2016-2017
- Roberto Mendicino, “Development of 3D Silicon radiation detectors for neutrons and high energy charged particles”, PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2015-2016
- Hesong Xu, “Solid-state single-photon detectors and CMOS readout circuits for positron emission tomography applications”, PhD Thesis in ICT, Advisor Dr. David Stoppa, Co-Advisor Prof. Gian-Franco Dalla Betta, a.y. 2014-2015
- Ekaterina Panina, "Design and characterization of SPAD based CMOS analog pixels for photon-counting applications", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, Co-Advisor Dr. Lucio Pancheri, a.y. 2012-2013
- Elisabetta Mazzuca, "A novel high-efficiency SiPM-based system for Ps-TOF", PhD Thesis in ICT, Advisor Dr. Claudio Piemonte, Co-Advisors Prof. Gian-Franco Dalla Betta, Dr. Alberto Gola, a.y. 2012-2013
- Marco Povoli, "Development of enhanced double-sided 3D radiation sensors for pixel detector upgrades at HL-LHC", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2011-2012
- Olga Shcherbakova, "3D camera based on gain-modulated CMOS avalanche photodiodes", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, Co-Advisor Dr. Lucio Pancheri, a.y. 2011-2012
- Vladyslav Tyzhnevyi, "BJT Detector for Alpha Particle and Radon Detection and Monitoring", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2010-2011
- Michele Benetti, "Simulation and Characterization of Single Photon Detectors for Fluorescence Lifetime Spectroscopy and Gamma-ray Applications", PhD Thesis in ICT, Advisors Prof. Gian-Franco Dalla Betta and Dr. David Stoppa, a.y. 2010-2011
- Quazi Delwar Hossain, "Design and characterization of a Current Assisted Photo Mixing Demodulator for TOF based 3D CMOS Image Sensor", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2009-2010
- Marina Repich, "Development of a simulation environment for the analysis and the optimal design of fluorescence detectors based on single photon avalanche diodes", PhD Thesis in ICT, Advisors Prof. Gian-Franco Dalla Betta and Dr. David Stoppa, a.y. 2008-2009
- Alena Repchankova, "Anti-Stiction And Self-Recovery Active Mechanisms for High Reliability RF-MEMS Switches", PhD Thesis in ICT, Advisors Prof. Gian-Franco Dalla Betta and Dr. Jacopo Iannacci, a.y. 2008-2009

- Andrea Zoboli, "Development of radiation detectors with three-dimensional electrodes for future high energy physics experiments", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2007-2008 (Best Doctorate Student Award, University of Trento)
- Francesco Ficorella. "3DJAM: A Linear CMOS Sensor for 3D Vision with Merged i-TOF and OT Techniques", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2005-2006
- Lucio Pancheri, “Design and characterization of novel silicon photodetectors for 3D imaging applications", PhD Thesis in ICT, Advisor Prof. Gian-Franco Dalla Betta, a.y. 2004-2005 (Best Doctorate Student Award, University of Trento)
- Arianna Tibuzzi, "An Innovative Electro-Optical Nose for Artificial Olfaction Applications", PhD Thesis in ICT, Advisor Prof. Giovanni Soncini, Co-Advisors Prof. Arnaldo D’Amico, Prof. Gian-Franco Dalla Betta, a.y. 2003-2004 (Best Doctorate Student Award, University of Trento)
- David Stoppa, "Integrated CMOS optical sensors for advanced applications", PhD thesis in “Electronic Devices”, Advisor Dr. Gian-Franco Dalla Betta, a.y. 2001-2002.

He is currently **advisor** or **co-advisor of 4 Ph.D. students** in Materials, Mechatronics and Systems Engineering at the University of Trento:

- Thomas Corradino, XXXVI cycle
- Neeraj Yadav, XXXV cycle
- Mayara Cristina Bertolini, XXXIV cycle
- Md. Arif Samy, XXXIV cycle

He was thesis **co-advisor of 2 Ph.D. students** at the University of Costantine 1, Algeria:

- Mohamed El Amine Benkechkache, 2018
- Abderrezak Boughedda, under way

At the University of Trento, he was **advisor** or **co-advisor of**:

- 6 graduate students for their 2nd Level Professional Master thesis in Nano- and Micro-Electro-Mechanical-Systems
- 9 students for their MSc theses in Materials Engineering
- 2 students for their MSc theses in Physics
- 37 students for their MSc theses in Telecommunication Engineering
- 3 students for their MSc theses in Mechatronics Engineering
- 74 undergraduate students for their theses in Telecommunication Engineering
- 75 undergraduate students for their theses in Electronics and Telecommunication Engineering

- 70 undergraduate students for their theses in Industrial Engineering
- 1 undergraduate student for his thesis in Civil Engineering

He was **co-advisor of MSc theses at other Universities**:

- 1 student for his MSc thesis in Electronics Engineering at the University of Padua, Italy
- 2 students for their MSc theses in Physics at the University of Turin, Italy

He was **supervisor of the final year internships at the University of Trento for**:

- 3 MSc students from the Birla Institute of Technology and Science (BITS), Pilani (India)
- 1 MSc student from the Universitat Politecnica de Catalunya, Barcelona (Spain)

He was also **supervisor for the internships at the University of Trento** for students from the US within **the INFN-DOE exchange program**:

- 2 MSc students from the University of California Santa Cruz
- 1 MSc student from the University of Hawaii

He was also **supervisor for the internships at the University of Trento** for PhD students within **the Erasmus-Averroes and Free Mover Exchange mobility programs**:

- 2 PhD students from the University of Constantine, Algeria
- 1 PhD student from the University of Batna, Algeria

17. FACULTY AND DEPARTMENT SERVICE

Since his appointment as Associate Professor (01/11/2002), Gian-Franco Dalla Betta has carried out several organizational and service activities at the University of Trento.

a. Faculty of Engineering

- Member of the Library Commission (2002-2012)
- Member of the Commission for the “Study Regulations of the Master of Science in Telecommunication Engineering” (2002-2003)
- Member of the Commission for the "Study of the minimum criteria for access to the Faculty of Engineering” (2003-2004)
- Member of the Commission for the “Equipment for teaching” (2005-2011), President of the same Commission (2009-2012)
- Member of the Commission for Construction (2009-2012)
- Member of the Commission for the evaluation of curricular requirements and the assessment of personal preparation for the Admission to Graduate Studies in Information Engineering (2010-2012)
- Member of final graduation exams in Telecommunication Engineering and Materials Engineering (2002-2012)
- Effective Member of the Commission for the public examination for the license to practice as a professional engineer in 2004 and 2012.

- Aggregate member of the Commission for the public examination for the license to practice as a professional engineer in 2006.
- Initial proponent and Member of the Executive Committee of the 2nd Level Professional Master in "Nano- and Micro-Electro-Mechanical-Systems (NEMS-MEMS), co-managed by the University of Trento and Fondazione Bruno Kessler (FBK) of Trento (2006-2010)
- Vice-President of the Board for Undergraduate and Graduate Programs in Information Engineering (2005-2007)

b. Department of Information Engineering and Computer Science
   - Member of the commission for the evaluation of scientific publications (2005- 2012)
   - Responsible of the "Nano and Microsystems" Research Program (2006-2012)
   - Member of the commission for the evaluation of Application Labs proposals in 2008
   - Member of the interdepartmental commission for the research laboratory network (2009-2012)

c. International Doctorate School in Information and Communication Technology
   - Member of the committee for graduate studies and of the steering committee of the School (2003-2012)
   - Member of the commission for the Manifesto of Studies (2003-2004)
   - Member of the commission for the Comprehensive Exam (2002-2004)
   - Member of the commission for the Qualifying Exam from (2004-2005)
   - President of the commission for the Qualifying Exam from (2005-2008)
   - President of the Admissions Committee in 2006, 2009, and 2010
   - Member of theses defense Committees (2006-2014).
   - Deputy-Dean of the School (2008- 2012)
   - Temporary Dean of the School (July-October 2012)

d. Department of Industrial Engineering
   - Member/President of Commissions for the final graduation exams in Industrial Engineering and Mechatronics Engineering (2012-today)
   - Member of the interdepartmental working group for the university library (2013-2014)
   - Member of the Joint Faculty-Student Committee (2013-2015)
   - Delegate for Digital University Project (2015-2019)
   - Member of the Committee for the Review of Quality Assurance in the Course of Mechatronics Engineering (2015-today)
   - Delegate for Quality Assurance of Research (2015-2018)

e. International Doctorate School in Materials, Mechatronics and Systems Engineering
   - Member of the committee for graduate studies and of the executive committee of the School (2013-today)
   - Member of the Admissions Committee in 2013, 2015, 2017, and 2019
   - Dean of the School (2018-today)

18. SERVICE AT OTHER UNIVERSITIES AND RESEARCH CENTERS

- Member of the theses defense Committee for the PhD in Electronic Engineering at the University of Padua (Padua, Italy) in 2007.
- Member of the Selection Committee for a position of Research Assistant in Electronics at the Polytechnic University of Marche (Ancona, Italy) in 2008.
- Member of the theses defense Committee for the PhD in Electronic Engineering at the Mediterranean University of Reggio Calabria (Reggio Calabria, Italy) in 2010.
- Member of the Admissions Committee for the PhD School of Microelectronics at the University of Pavia (Pavia, Italy) in 2010.
- Member of the Examination Committee for the degree of PhD by Research at the University of Edinburgh (Edinburgh, UK) in 2012.
- Member of the theses defense Committee for the PhD in Physics and Astrophysics at the University of Turin (Turin, Italy) in 2013, 2014, 2015, and 2017.
- Member of the Selection Committee for Grants for Senior Researchers in Information Engineering at the University of Padua (Padua, Italy) in 2014.
- Member of the Selection Committee for a position of III Level Technologist at INFN Chapter of Turin (Turin, Italy) in 2015.
- Lecturer of Ph.D. course in "Sensors and microelectronic systems" at the University of Bergamo (Bergamo, Italy) in academic years 2015-2016 and 2018-2019.
- Member of the theses defense Committee for the PhD in Technologies for Energy and Environment at the University of Bergamo (Bergamo, Italy) in 2016.
- Member of the Selection Committee for a position of Associate Professor of Electronics at the University of Bergamo (Bergamo, Italy) in 2016.
- Member of the Commission for the National Scientific Qualification (ASN) for field 09/E3 – Electronics (2016-2018).
- President of Pre-Selection Committee for candidates to the INFN CSN5 Call to award funding for six projects presented by young researchers in 2017.
- Member of the Selection Committee for a position of Tenure Track Research Assistant in Electronics at the Polytechnic of Turin (Turin, Italy) in 2018.
- President of the Selection Committee for a position of Tenure Track Research Assistant in Electronics at the University of Florence (Florence, Italy) in 2018.
- President of the theses defense Committee for the PhD in Industrial and Information Engineering at the University of Udine (Udine, Italy) in 2019.
- Member of the Selection Committee for a position of Tenure Track Research Assistant in Electronics at the University of Padua (Padua, Italy) in 2019.
- Member of the Selection Committee for a position of Research Assistant in Electronics at the University of L'Aquila (L'Aquila, Italy) in 2019.
- Member of the Selection Committee for a position of Full Professor of Electronics at the University of Florence (Florence, Italy) in 2020.

- Member of the Selection Committee for a position of Associate Professor of Electronics at the Free University of Bolzano (Bolzano, Italy) in 2020.
- Member of the Selection Committee for a position of Research Assistant in Electronics at the University of Milano (Milan, Italy) in 2020.
- President of the theses defense Committee for the PhD in Information Technology at Politecnico di Milano (Milan, Italy) in 2021.

19. LIST OF PUBLICATIONS

[IJ] Papers published in international journals

[IJ.1] **G. F. Dalla Betta**, S. Graffi, Zs. M. Kovacs, G. Masetti, "CMOS implementation of ananalogically programmable cellular neural network", **IEEE Trans. on Circuits Systems-II**, vol. 40(3), pp. 206-215, 1993

[IJ.2] **G. F. Dalla Betta**, G. Verzellesi, G. U. Pignatel, S. Amon, M. Boscardin, G. Soncini, "Design of an n-channel JFET on high-resistivity silicon for radiation-detector on-chip front-end electronics", **Nucl. Instr. and Meth. A**, vol. 365, pp. 473-479, 1995

[IJ.3] A. Paccagnella, M. Ceschia, G. Verzellesi, **G. F. Dalla Betta**, P. Bellutti, P.G. Fuochi, G. Soncini, "Forward and reverse characteristics of irradiated MOSFET's", **IEEE Trans. on Nuclear Science**, vol. 43(3), pp. 797-804, 1996

[IJ.4] M. Da Rold, A. Paccagnella, A. Da Re, G. Verzellesi, N. Bacchetta, R. Wheadon, **G. F. Dalla Betta**, A. Candelori, G. Soncini, D. Bisello, "Radiation effects on breakdown characteristics of multiguarded devices", **IEEE Trans. on Nuclear Science**, vol. 44(3), pp. 721-728, 1997

[IJ.5] **G. F. Dalla Betta**, G. U. Pignatel, G. Verzellesi, M. Boscardin, "Si-PIN X-ray detector technology", **Nucl. Instr. and Meth. A**, vol. 395, pp. 344-348, 1997

[IJ.6] L. Ravezzi, D. Stoppa, **G. F. Dalla Betta**, "A simple, high-speed CMOS current comparator", **Electronics Letters**, vol. 33, nr. 22, pp. 1829-1830, 1997

[IJ.7] **G. F. Dalla Betta**, G. U. Pignatel, G. Verzellesi, P. Bellutti, M. Boscardin, L. Ferrario, N. Zorzi, A. Maglione, "Design and optimisation of an npn silicon bipolar phototransistor for optical position encoders", **Microelectronics Journal**, vol.28(1), pp. 45-54, 1998

[IJ.8] L. Ravezzi, D. Stoppa, **G. F. Dalla Betta**, "Current-mode A/D converter", **Electronics Letters**, vol. 34, nr. 7, pp. 615-616, 1998

[IJ.9] **G. F. Dalla Betta**, M. Boscardin, G. U. Pignatel, G. Verzellesi, L. Bosisio, L. Ferrario, M. Zen, G. Soncini, "Development of detector-compatible JFETs on high-resistivity silicon", **Nucl. Instr. and Meth. A**, vol. 409, pp. 346-350, 1998

[IJ.10] N. Bacchetta, D. Bisello, A. Candelori, M. Cavone, **G. F. Dalla Betta**, M. Da Rold, G. De Liso, R. Dell'Orso, P.G. Fuochi, A. Messineo, O. Militaru, A. Paccagnella, G. Tonelli, P.G. Verdini, G. Verzellesi, R. Wheadon, "High voltage operation of silicon devices for LHC experiments", **Nucl. Instr. and Meth. A**, vol. 409, pp. 139-141, 1998

[IJ.11] **G. F. Dalla Betta**, M. Boscardin, L. Bosisio, "A comparative evaluation of integrated capacitors for AC-coupled microstrip detectors", **Nucl. Instr. and Meth. A**, vol. 411, pp. 369- 375, 1998

[IJ.12] **G. F. Dalla Betta**, G. Verzellesi, M. Boscardin, L. Bosisio, L. Ferrario, G. U. Pignatel, M. Zen, G. Soncini, "Silicon PIN radiation detectors with on-chip front-end junction field effect transistors", **Nucl. Instr. and Meth. A**, vol. 417, pp. 325-331, 1998

[IJ.13] **G. F. Dalla Betta**, P. Bellutti, M. Boscardin, L. Ferrario, G. Soncini, N. Zorzi, "An all-implanted p-channel Si JFET fully compatible with CMOS technology", **Microelectronics Journal**, vol. 30(3), pp. 281-285, 1999

[IJ.14] G. Verzellesi, **G. F. Dalla Betta**, L. Bosisio, M. Boscardin, G. U. Pignatel, G. Soncini, "On the accuracy of generation lifetime measurement in high-resistivity silicon using PN gated diodes", **IEEE Trans. on Electron Devices**, vol. 46(4), pp. 817-820, 1999

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[IJ.16] M. Da Rold, N. Bacchetta, D. Bisello, A. Paccagnella, **G.F. Dalla Betta**, G. Verzellesi, O. Militaru, R. Wheadon, P.G. Fuochi, C. Bozzi, R. Dell'Orso, A. Messineo, G. Tonelli, P. G. Verdini, "Study of breakdown effects in silicon multiguard structures", **IEEE Trans. on Nuclear Science**, vol. 46(4), pp. 1215-1223, 1999

[IJ.17] G. Verzellesi, **G. F. Dalla Betta**, G. U. Pignatel, G. Soncini, "Two-dimensional numerical simulation of edge-generated currents in type-inverted, p^+-n single-sided silicon microstrip detectors", **IEEE Trans. on Nuclear Science**, vol. 46(4), pp. 1253-1257, 1999

[IJ.18] L. Ravezzi, **G. F. Dalla Betta**, D. Stoppa, A. Simoni, "A versatile photodiode SPICE model for optical microsystem simulation", **Microelectronics Journal**, vol. 31(4), pp. 277-282, 2000

[IJ.19] A. Fazzi, G. U. Pignatel, **G. F. Dalla Betta**, M. Boscardin, V. Varoli, G. Verzellesi, "Charge preamplifier for hole collecting PIN diode and integrated tetrode N-JFET", **IEEE Trans. On Nuclear Science**, vol. 47(3), pp. 829-833, 2000

[IJ.20] G. U. Pignatel, M. Boscardin, **G. F. Dalla Betta**, "Recent developments in silicon radiation detectors at IRST", (Invited paper), **Informacije MIDEM**, vol. 30(4), pp. 191-198, 2000.

[IJ.21] **G. F. Dalla Betta**, G. U. Pignatel, G. Verzellesi, M. Boscardin, A. Fazzi, L. Bosisio, "Monolithic integration of PIN diodes and n-channel double-gate JFET's for room temperature X-ray spectroscopy", **Nucl. Instr. and Meth. A**, vol. 458, pp. 275-280, 2001

[IJ.22] **G. F. Dalla Betta**, M. Boscardin, L. Bosisio, I. Rachevskaia, M. Zen, N. Zorzi, "Development of a fabrication technology for double-sided AC-coupled silicon microstrip detectors", **Nucl. Instr. and Meth. A**, vol. 460, pp. 304-313, 2001

[IJ.23] M. Boscardin, L. Bosisio, **G. F. Dalla Betta**, P. Gregori, I. Rachevskaia, N. Zorzi, "Development of ALICE microstrip detectors at IRST", **Nucl. Instr. and Meth. A**, vol. 461, pp. 188-191, 2001

[IJ.24] L. Ravezzi, **G. F. Dalla Betta**, G. Setti, "Compact CMOS Implementation of a low-power, current-mode programmable Cellular Neural Network", **International Journal of Circuit Theory and Applications**, vol. 29(3), pp. 299-310, 2001

[IJ.25] M. Boscardin, **G. F. Dalla Betta**, P. Gregori, M. Zen, N. Zorzi, "Fabrication of ATLAS pixel detector prototypes at IRST", **Nucl. Instr. and Meth. A**, vol. 465, pp. 83-87, 2001

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[IJ.27] M. Boscardin, N. Carmel Barnea, **G. F. Dalla Betta**, L. Ferrario, M. Zen, L. Bosisio, "A computerised analysis tool for the electrical characterisation of microstrip detectors", **Nucl. Instr. and Meth. A**, vol. 477, pp. 114-120, 2002

[IJ.28] G. Verzellesi, **G. F. Dalla Betta**, G.U. Pignatel, M. Boscardin, L. Bosisio, "Extraction of bulk and surface generation lifetimes in high resistivity silicon by means of gated diodes", **Nucl. Instr. and Meth. A**, vol. 477, pp. 220-225, 2002

[IJ.29] **G. F. Dalla Betta**, G. Batignani, S. Bettarini, M. Boscardin, L. Bosisio, M. Carpinelli, S. Dittongo, F. Forti, M. Giorgi, P. Gregori, A. Lusiani, M. Manghisoni, G. U. Pignatel, M. Rama, L. Ratti, V. Re, F. Sandrelli, V. Speziali, F. Svelto, N. Zorzi, "Feasibility studies of microelectrode silicon detectors with integrated electronics", **Nucl. Instr. and Meth. A**, vol. 478, pp. 372-376, 2002

[IJ.30] G. Simi, C. Angelini, G. Batignani, S. Bettarini, M. Bondioli, M. Boscardin, L. Bosisio, **G. F. Dalla Betta**, S. Dittongo, F. Forti, M. Giorgi, P. Gregori, M. Manghisoni, M. Morganti, G. U. Pignatel, L. Ratti, V. Re, G. Rizzo, V. Speziali, N. Zorzi, "Design and characterization of integrated transistors in a micro-strip detector technology", **Nucl. Instr. and Meth. A**, vol. 485, pp. 193-198, 2002

[IJ.31] **G. F. Dalla Betta**, M. Boscardin, P. Gregori, N. Zorzi, G. U. Pignatel, G. Batignani, M. Giorgi, L. Bosisio, L. Ratti, V. Speziali, V. Re, "A fabrication process for silicon microstrip detectors with integrated electronics", **IEEE Trans. on Nuclear Science**, vol. 49(3), pp. 1022-1026, 2002

[IJ.32] **G. F. Dalla Betta**, M. Boscardin, L. Bosisio, S. Dittongo, P. Gregori, I. Rachevskaia, G. Verzellesi, N. Zorzi, "A Novel Silicon Microstrip Termination Structure with All-P-Type Multiguard and Scribe-Line Implants", **IEEE Trans. on Nuclear Science**, vol. 49(4), pp. 1712-1716, 2002

[IJ.33] D. Stoppa, A. Simoni, L. Gonzo, M. Gottardi, **G. F. Dalla Betta**, "Novel CMOS image sensor with a 132-dB dynamic range", **IEEE Journal of Solid-State Circuits**, vol. 37(12), pp. 1846-1852, 2002

[IJ.34] A. Candelori, D. Bisello, R. Rando, A. Kaminsky, J. Wyss, A. Litovchenko, **G. F. Dalla Betta**, M. Lozano, M. Boscardin, C. Martinez, M. Ullan, and N. Zorzi, "Radiation Hardness of Silicon Diodes for High Energy Physics Applications", **IEEE Trans. on Nuclear Science**, vol. 50(4), pp. 1121-1128, 2003

[IJ.35] M. Manghisoni, L. Ratti, V. Re, V. Speziali, G. Traversi, **G. F. Dalla Betta**, M. Boscardin, G. Batignani, M. Giorgi, L. Bosisio, "JFET front-end circuits integrated in a detector-grade silicon substrate", **IEEE Trans. on Nuclear Science**, vol. 50(4), pp. 942-947, 2003

[IJ.36] M. Boscardin, L. Bosisio, A. Candelori, **G. F. Dalla Betta**, S. Dittongo, P. Gregori, C. Piemonte, I. Rachevskaia, S. Ronchin, N. Zorzi, "An Improved Termination Structure for

Silicon Radiation Detectors with All-P-Type Multiguard and Cut-line Implants", **IEEE Trans. on Nuclear Science**, vol. 50(4), pp. 1001-1007, 2003

[IJ.37] M. Novelli, S. R. Amendolia, M. G. Bisogni, M. Boscardin, **G. F. Dalla Betta**, P. Delogu, M. E. Fantacci, M. Quattrocchi, V. Rosso, A. Stefanini, L. Venturelli, S. Zucca, "Design of semiconductor detectors for digital mammography", **Nucl. Instr. and Meth. A**, vol. 509, pp. 283-289, 2003

[IJ.38] S. Dittongo, M. Boscardin, L. Bosisio, **G. F. Dalla Betta**, I. Rachevskaia, "Studies of radiation damage by 900 MeV electrons on standard and oxygen enriched silicon devices", **Nucl. Instr. and Meth. A**, vol. 512, pp. 77-84, 2003

[IJ.39] **G. F. Dalla Betta**, M. Manghisoni, L. Ratti, V. Re, V. Speziali, "JFET preamplifiers with different reset techniques on detector-grade high-resistivity silicon", **Nucl. Instr. and Meth. A**, vol. 512, pp. 199-206, 2003

[IJ.40] D. J. Han, G. Batignani, M. G. Bisogni, A. Del Guerra, **G. F. Dalla Betta**, M. Boscardin, L. Bosisio, M. Giorgi, F. Forti, "High-gain Float-Zone silicon bipolar detector", **Nucl. Instr. And Meth. A**, vol. 512, pp. 572-577, 2003

[IJ.41] **G. F. Dalla Betta**, M. Manghisoni, L. Ratti, V. Re, V. Speziali, G. Traversi, "Effects of γ-rays on JFET devices and circuits fabricated in a detector-compatible process", **IEEE Trans. on Nuclear Science**, vol. 50(6), pp. 2474-2480, 2003

[IJ.42] P. Bellutti, M. Boscardin, A. Collini, **G. F. Dalla Betta**, P. Gregori, A. Lui, G. Pucker, M. Zen, N. Zorzi, "Fabrication of AMS microstrip detectors at ITC-IRST", **Nucl. Instr. and Meth. A**, vol. 518, pp. 147-149, 2004

[IJ.43] **G. F. Dalla Betta**, M. Boscardin, G. Batignani, S. Bettarini, M. G. Bisogni, L. Bosisio, M. Carpinelli, M. Ciacchi, S. Dittongo, F. Forti, M. Giorgi, P. Gregori, M. Manghisoni, M. Novelli, C. Piemonte, I. Rachevskaia, M. Rama, L. Ratti, V. Re, S. Ronchin, F. Sandrelli, G. Simi, V. Speziali, V. Rosso, G. Traversi, N. Zorzi, "Recent results from the development of silicon detectors with integrated electronics", **Nucl. Instr. and Meth. A**, vol. 518, pp. 354-356, 2004

[IJ.44] S. Dittongo, M. Boscardin, L. Bosisio, M. Ciacchi, **G. F. Dalla Betta**, P. Gregori, C. Piemonte, I. Rachevskaia, S. Ronchin, N. Zorzi, "Characterization and TCAD modelling of all-p-type termination structures for silicon radiation detectors", **Nucl. Instr. and Meth. A**, vol. 518, pp. 362-365, 2004

[IJ.45] G. Batignani, M. G. Bisogni, M. Boscardin, L. Bosisio, **G. F. Dalla Betta**, A. Del Guerra, S. Dittongo, F. Forti, M. Giorgi, D. J. Han, S. Linsalata, G. Marchiori, C. Piemonte, I. Rachevskaia, S. Ronchin, "High-gain phototransistors on high resistivity silicon substrate", **Nucl. Instr. and Meth. A**, vol. 518, pp. 569-570, 2004

[IJ.46] M. G. Bisogni, M. Boscardin, **G. F. Dalla Betta**, P. Delogu, M. E. Fantacci, P. Gregori, L. Linsalata, M. Novelli, C. Piemonte, M. Quattrocchi, V. Rosso, A. Stefanini, N. Zorzi, S. Zucca, "Design and characterization of Si pixel detectors of different thickness", **Nucl. Instr. and Meth. A**, vol. 518, pp. 418-420, 2004

[IJ.47] G. Batignani, C. Angelini, M.G. Bisogni, M. Boscardin, S. Bettarini, M. Bondioli, L. Bosisio, F. Bucci, G. Calderini, M. Carpinelli, M. Ciacchi, **G. F. Dalla Betta**, S.

Dittongo, F. Forti, M.A. Giorgi, P. Gregori, D.J. Han, P.F. Manfredi, M. Manghisoni, G. Marchiori, N. Neri, M. Novelli, E Paoloni, C. Piemonte, I. Rachevskaia, M. Rama, L. Ratti, V. Re, G. Rizzo, S. Ronchin, V. Rosso, G. Simi, V. Speziali, A. Stefanini, N. Zorzi, "Detection of ionizing particles with phototransistors on high resistivity thick silicon substrates", **Nucl. Instr. and Meth. A**, vol. 530, pp. 98-104, 2004

[IJ.48] S. Ronchin, M. Boscardin, **G. F. Dalla Betta**, P. Gregori, V. Guarnieri, C. Piemonte, N. Zorzi, "Fabrication of PIN diode detectors on thinned silicon wafer", **Nucl. Instr. and Meth. A**, vol. 530, pp. 134-138, 2004

[IJ.49] C. Piemonte, M. Boscardin, L. Bosisio, A. Candelori, M. Ciacchi, **G. F. Dalla Betta**, S. Dittongo, I. Rachevskaia, N. Zorzi, "Investigation of the Radiation Tolerance of All-P-Type Termination Structures for Silicon Detectors All-P-Type Termination Structures for Silicon Detectors", **IEEE Trans. on Nuclear Science**, vol. 51(4), pp. 1747-1751, 2004

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[IJ.51] A. Candelori, D. Bisello, **G. F. Dalla Betta**, P. Giubilato, A. Kaminsky, A. Litovchenko, M. Lozano, J. R. Petrie, R. Rando, M. Ullan, J. Wyss, "Lithium Ion Irradiation of Standard and Oxygenated Silicon Diodes", **IEEE Trans. on Nuclear Science**, vol. 51(5), pp. 2865-2871, 2004

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[IJ.53] C. Piemonte, G. Batignani, S. Bettarini, M. Bondioli, M. Boscardin, L. Bosisio, **G. F. Dalla Betta**, S. Dittongo, F. Forti, M. A. Giorgi, P. Gregori, I. Rachevskaia, S. Ronchin, N. Zorzi, "Characterisation of BJT-based particle detectors", **Nucl. Instr. and Meth. A**, vol. 535, pp. 433-437, 2004

[IJ.54] L. Pancheri, M. Scandiuzzo, **G. F. Dalla Betta**, D. Stoppa, F. De Nisi, L. Gonzo, A. Simoni, "A Si Metal-Semiconductor-Metal photodetector macromodel for circuit simulations", **Solid-State Electronics**, vol. 49, no. 2, pp. 175-181, 2005

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[IJ.56] N. Zorzi, M. G. Bisogni, M. Boscardin, **G. F. Dalla Betta**, P. Gregori, M. Novelli, C. Piemonte, M. Quattrocchi, S. Ronchin, V. Rosso, "Fabrication and characterization of n-on-n silicon pixel detectors compatible with the Medipix2 readout chip", **Nucl. Instr. and Meth. A**, vol. 546, pp. 46-50, 2005

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Curriculum dell'attività svolta nel periodo da settembre 1997 a marzo 2021.

Nel periodo considerato l'attività della candidata si è svolta presso la Sezione di Trieste e TIFPA(Trento) dell'INFN, nell'ambito di diversi esperimenti e progetti accomunati dallo sviluppo o dall'impiego di rivelatori al silicio.
La candidata ha fatto 6 presentazioni alle conferenze internazionali e ha 135 articoli pubblicati.

Esperimento BaBar
Durante gli anni 1997-2001 la candidata ha partecipato al test di controllo qualità sulla produzione dei sensori a microstriscia con lettura a doppia faccia per l'esperimento BaBar [5, 11, 14, 21, 22, 24][1].
Ha inoltre collaborato allo studio degli effetti dell'irraggiamento con elettroni di alta energia su questi rivelatori e sui relativi dispositivi di test. La candidata ha partecipato agli irraggiamenti presso l'acceleratore lineare della "Società Sincrotrone Trieste" e ha eseguito la caratterizzazione dei dispositivi con misure elettriche [9, 10, 20, 27].

Collaborazione tra INFN e FBK/IRST
Nell'ambito del programma di collaborazione tra INFN e IRST dedicato allo sviluppo di una tecnologia per la fabbricazione di rivelatori a microstriscia strutturati sulle due facce, la candidata ha svolto un ruolo crescente nella caratterizzazione delle prime tre serie di prototipi realizzati [1, 2], e ha poi condotto interamente il test della quarta serie di questi rivelatori [3].
Ha poi svolto un ruolo primario nelle seguenti attività effettuate in collaborazione con IRST:
- Test di caratterizzazione e controllo qualità di 30 rivelatori a microstriscia a doppia faccia, prodotti da IRST per il tracciatore di vertice dell'esperimento BaBar a SLAC.
- Misure comparative di caratterizzazione degli ossidi utilizzati come dielettrico nei condensatori d'accoppiamento, su fette fabbricate da IRST e da Micron Semiconductor.
- Misure di caratterizzazione elettrica di dispositivi comprendenti diodi rivelatori (in configurazione a microstriscia o a pixel) e transistori JFET e MOSFET per il trattamento del segnale, integrati sul medesimo substrato ad alta resistività [17].
- Misura delle caratteristiche elettriche di rivelatori con amplificazione interna, basati sull'effetto transistore bipolare [25].
- Misura delle caratteristiche elettriche di sensori e di dispositivi per la caratterizzazione del processo di fabbricazione, relativi a diversi lotti fabbricati da FBK/IRST (pixel su substrato epitassiale, sensori in tecnologia 3D [36, 46], rivelatori a deriva).
- Caratterizzazione di dispositivi fabbricati da IRST allo scopo di provare una nuova tecnica per la stabilizzazione del bordo delle giunzioni, in particolare in prossimità delle linee di taglio, utilizzando un processo di fabbricazione più semplice e con minore difettosità rispetto a quello impiegato normalmente [8, 15, 16, 18].

Queste attività hanno richiesto l'esecuzione di una grande quantità e varietà di misure, sia per la caratterizzazione elettrica dei sensori e dei dispositivi di test associati, sia per la verifica della loro resistenza alla radiazione.

Irraggiamenti
Prove d'irraggiamento con elettroni di alta energia (~1 GeV) sono state eseguite presso l'acceleratore lineare della "Società Sincrotrone Trieste". Sono stati irraggiati e caratterizzati con misure elettriche prototipi di rivelatori a microstriscia per gli esperimenti BaBar e ALICE, e dispositivi di test per lo studio dettagliato degli effetti della radiazione [7, 13]. Nel Luglio 2001 la candidata ha presentato alla

conferenza RD01, tenutasi a Firenze, i risultati di questi studi [7].
La candidata ha poi partecipato a uno studio degli effetti dell'irraggiamento con elettroni su dispositivi fabbricati su substrati non standard, ad es. diffusi con ossigeno [12].
Negli anni 2010-2012 ha contribuito ad una campagna di irraggiamento con neutroni (presso il reattore di Lubiana) su prototipi di Monolithic Active Pixel Sensors in tecnologie CMOS a tripla e quadrupla well. La candidata si è occupata delle misure sui diodi 'deep n-well' e su altri dispositivi di test, necessarie per interpretare gli effetti della radiazione sui sensori MAPS [69, 76, 78, 82].

L'esperimento Alice

La vasta esperienza acquisita sia nell'uso della strumentazione, sia nell'interpretazione dei risultati delle misure, ha permesso alla candidata svolgere un ruolo primario nella caratterizzazione di rivelatori a microstriscia per l'esperimento ALICE [23, 28,30, 34, 37, 38]. La fornitura dei 2098 sensori a strip per i due layer esterni dell'ITS (Inner Tracking System) è stata suddivisa fra tre ditte (Canberra, SINTEF e ITC/IRST (ora FBK) e si è conclusa a metà del 2006. Le misure di qualificazione dei prototipi e i test di controllo qualità di tutti i sensori sono stati eseguiti presso la Sezione INFN di Trieste, e hanno riguardato più di 2500 rivelatori, includendo quelli risultati fuori specifica.
La candidata ha sviluppato i programmi LabView per il controllo della strumentazione di misura e per l'esecuzione automatica delle sequenze di test, ha condotto parte dei test e supervisionato il lavoro degli altri collaboratori, ha scritto programmi per l'analisi statistica dei risultati dei test.
Il lavoro di caratterizzazione dei sensori della preserie è stato oggetto di una presentazione orale della candidata alla "6th International Conference on Large Scale Applications and Radiation Hardness of Semiconductor Detectors", Firenze, settembre 2003 [23].
La candidata ha presentato i risultati complessivi del test dei sensori a strip per l'esperimento Alice al "Xth Pisa Meeting on Advanced Detectors", Isola d'Elba, 21-27 maggio 2006 [38].
Le strip per l'esperimento Alice sono polarizzate tramite '*Punch-Through'* da un anello impiantato (*Bias Ring*) che circonda le strip. Per verificare gli effetti della radiazione su questo aspetto dei sensori state eseguite prove d'irraggiamento con elettroni di alta energia (1 GeV) presso l'acceleratore lineare della "Società Sincrotrone Trieste".
Numerosi test sono stati inoltre effettuati per determinare l'origine dell'instabilità delle correnti di fuga, riscontrata su alcuni sensori [29, 39].
Durante il primo anno di funzionamento dell'Inner Tracking System (ITS) di ALICE, alcuni '*ladder'* del rivelatore a strip hanno mostrato un forte aumento della corrente di fuga. Per capire l'origine del problema, la candidata ha eseguito in laboratorio numerose misure di stabilità della corrente dei sensori, in diverse condizioni di umidità. Dallo studio dell'intero sistema di moduli del Rivelatore a Strip e dalle misure eseguite in laboratorio, si è concluso che l'aumento delle correnti era legato all'umidità elevata e alla presenza di sottili strisce di carta impiegate per isolare i sensori da quelli adiacenti. In conseguenza di questo studio, una macchina per il controllo dell'umidita è stata acquistata e installata nel sistema di ventilazione dell'ITS. Da quel momento le correnti dei *ladder* sono rimaste al di sotto dei limiti impostati.
Nel 2010 la candidata ha partecipato alla definizione del progetto di una nuova versione del rivelatore ITS, per adeguarne le prestazioni alle mutate condizioni funzionamento dell'LHC previste per la fine del decennio. In quest'ambito la candidata si è occupata di studiare la fattibilità del tab-bonding a elevata densità (passo inferiore a 50 μm), necessario per permettere la realizzazione di rivelatori a microstrip con segmentazione raddoppiata rispetto a quelli attualmente impiegati nell'ITS.

Misure di rumore su rivelatori a microstriscia

Nel 2006 è iniziato presso la Sezione di Trieste uno studio dei contributi di rumore di rivelatori a

[1] I riferimenti corrispondono all'elenco di tutte le pubblicazioni.

microstrip, motivato inizialmente dalla necessità di meglio comprendere le prestazioni dei sensori per l'esperimento ALICE e spiegare alcune differenze osservate tra i dispositivi di diversi fornitori. È stato determinato il contributo al rumore del meccanismo di polarizzazione per *'punch-through'* e sono stati evidenziati alcuni contributi di rumore inattesi, che sono stati interpretati correlandoli a misure di ammettenza delle strip in funzione della frequenza [65, 68]. Successivamente questo studio è stato esteso ad una misura del contributo di rumore delle strutture di *'p-stop'* impiegate per isolare le strip sul lato *n* del sensore [86]. La candidata si è inizialmente occupata delle misure di ammettenza delle strip, e in seguito anche delle misure di rumore, eseguite con una catena di amplificazione a basso rumore e tempo di formatura variabile.

Wire-Bonding

La candidata ha appreso le tecniche di microsaldatura a ultrasuoni (*wire-bonding*) per l'interconnessione di sensori e circuiti di lettura del segnale. Ha eseguito prove per valutare il tasso di difetti causati dal *bonding* sui condensatori d'accoppiamento delle strip: sono stati microsaldati e misurati molti rivelatori a microstrip fabbricati da IRST con varie tecnologie. Nel 2008 la candidata ha seguito un corso di *bonding* con macchina automatica presso la ditta MIPOT. In seguito, la macchina è stata spostata presso la Sezione INFN di Trieste. La candidata è l'unica in Sezione in grado utilizzare questa macchina, con la quale ha eseguito numerose serie di bond su dispositivi per vari esperimenti (ALICE, SLIM5, Factor, MICE, SuperB).

Programmi PRIN e SLIM5

Nell'ambito dei progetti Prin2005 e SLIM5 (Gr.V), la candidata ha eseguito il test di rivelatori a microstrip a doppia faccia di piccola area, utilizzati sia per il telescopio di SLIM5, con lettura tramite i chip FSSR2, sia per alcuni moduli con chip VA2TA. Sono stati assemblati e testati moduli per un telescopio di fascio e moduli con sensori a *striplets* a doppia faccia. Il telescopio e i moduli a *striplets* sono stati usati in un beam test al CERN nel settembre 2008 [48, 58, 59,], al quale la candidata ha preso parte, e in un successivo test nel settembre 2011.

La candidata ha eseguito la caratterizzazione statica di rivelatori a microstriscia su substrato epitassiale e di rivelatori a microstriscia con JFET integrato, realizzati su silicio di alta resistività.

Lo sviluppo di rivelatori sottili a microstriscia è stato ostacolato dai problemi tecnologici emersi nel primo lotto (SLIM1) prodotto da ITC/IRST. Questo lotto includeva substrati epitassiali spessi 100 μm e 50 μm e per confronto alcuni wafer *float zone* (FZ) spessi 300 μm. Mentre le strutture di test del lotto SLIM1 hanno mostrato un comportamento normale, i rivelatori a microstrip hanno evidenziato una struttura particolare della corrente di buio, con corrente alta per tutte le strip tranne le prime e le ultime, quelle entro una distanza di circa 600 μm dell'anello di bias. L'effetto era presente sia sui wafer epitassiali sia su quelli FZ standard. Dopo numerosi test, il problema è stato collegato alla contemporanea presenza nel processo di fabbricazione del nitruro e dell'ossido di silicio, depositato con processo CVD TEOS. La combinazione di questi due materiali causa importanti sforzi superficiali, che creano stati interfacciali e accrescono la corrente di generazione superficiale. La tecnologia è stata di conseguenza modificata eliminando l'ossido TEOS e ciò ha consentito di fabbricare i rivelatori a *striplets* utilizzati per i test su fascio. La candidata ha presentato i risultati di questo studio al "Xth Pisa Meeting on Advanced Detectors", Isola d'Elba, 24-30 maggio 2009 [47].

Programma FACTOR

Nell'ambito del progetto di Gr.V denominato FACTOR (Fiber Apparatus for Calorimetry and Tracking with Optoelectronic Readout), la candidata ha preso parte alla caratterizzazione e allo sviluppo di SiPM.

Il contributo della candidata è consistito in una serie di misure elettriche sui dispositivi fabbricati da FBK, Hamamatsu e Photonique (CPTA-Obninsk, Russia).
È stato condotto uno studio sistematico dei danni da radiazione (sia di bulk sia di superficie) su SiPM realizzati da diversi produttori. I tipi di radiazione usati sono raggi X (presso i Laboratori di Legnaro dell'INFN) e neutroni (presso il reattore nucleare dell'Istituto Josef Stefan di Lubiana). Sono stati irraggiati a diverse dosi 24 SiPM prodotti da tre diversi produttori. La candidata ha eseguito tutte le misure elettriche pre- e post-irraggiamento, queste ultime ripetute a diversi intervalli di tempo per valutare gli effetti di annealing [33,41,42,72].

SuperB
Nella previsione della costruzione del tracciatore di vertice al silicio (SVT) per l'esperimento SuperB, la candidata ha studiato e ottimizzato le soluzioni possibili per assemblare i 5 layer dell'SVT con diverse dimensioni dei sensori e con diversi schemi di collegamento delle strip 'lato *z*' per mezzo di circuiti flessibili ('fanout') [49, 50, 54]. Sono stati stimati i parametri delle strip (correnti di fuga, capacità, resistenza in serie e di bias) e dei fanout, necessari per stimare il rumore elettronico di readout. Per eseguire accurate misure di capacità in diverse configurazioni di connessione ('*pairing*') delle strip, due sensori a strip a doppia faccia sono stati montati su PCB e sono stati realizzati tramite *wire-bonding* diversi schemi di collegamento delle strip sul lato *p* e sul lato *n* .
La candidata ha presentato i risultati di questo studio al "XIIth Pisa Meeting on Advanced Detectors", Isola d'Elba, 20-26 maggio, 2012 [70].

Belle II
La candidata ha eseguito la caratterizzazione di un primo quantitativo di rivelatori a microstriscia per il Silicon Vertex Detector (SVD) dell'esperimento Belle II. La fornitura dei sensori è stata commissionata a due ditte: Micron Semiconductor per i sensori 'in avanti', di forma trapezoidale, e Hamamatsu per tutti gli altri. La candidata ha sviluppato nuovi programmi LabView per il controllo della strumentazione di misura e per l'esecuzione automatica delle sequenze di test, adattati alle particolari caratteristiche di questi sensori, e ha scritto i programmi per l'analisi dei risultati dei test automatici.
Il test dei sensori trapezoidali fabbricati da Micron Semiconductor ha evidenziato un cattivo contatto verso le strip impiantate sul lato *p*, ma ulteriori misure approfondite hanno portato a concludere che questo non avrà conseguenze significative sul funzionamento del sensore.
Il test dei sensori fabbricati da Hamamatsu per il Layer 3 di SVD ha mostrato problemi di isolamento delle strip sul lato *p* – non rilevati nei test eseguiti da Hamamatsu – che sono stati attribuiti, con l'ausilio di numerose misure di approfondimento, a inversione locale dell'interfaccia silicio-ossido. Inoltre, le differenze riscontrate nella distribuzione delle strip difettose hanno indotto Hamamatsu ad ammettere delle inadeguatezze nella loro procedura di test, e a ripetere il test di questi sensori. [99, 101, 103, 112].

Limadou
La candidata ha eseguito il test e la completa caratterizzazione di 71 sensori di doppia faccia fabbricati presso FBK sui wafer da 6 pollici, di cui 50 sensori sono stati qualificati idonei per l'esperimento. Dopo la caratterizzazione e l'analisi dei test e dei difetti dei primi lotti è stato cambiato il processo di fabbricazione dei sensori, che ha portato all'aumento della qualità dei sensori e della resa di produzione. [113, 115, 121, 134]. Questo lavoro è stato presentato nella conferenza Vertex2016. [109].

ReDSoX. ReDSoX2
La candidata ha eseguito il test di sensori a deriva di diversi design e dimensioni, fabbricati da FBK [95,100,105,107]. Sono state eseguite numerose misure sulle strutture di test di diversi lotti di sviluppo

della tecnologia, fabbricati su wafer di diametro 100 mm e 150 mm nell'ambito della collaborazione REDSOX, e REDSOX2 per verificare la qualità e le caratteristiche dei processi di fabbricazione impiegati. I 10 lotti (~20 wafer ciascuno) sono stati fabbricati presso FBK sui wafer da 6 pollici. I wafer comprendono diversi sensori per vari esperimenti e applicazioni. Queste attività hanno richiesto l'esecuzione di una grande quantità e varietà di misure. I sensori scelti e catalogati sono stati poi montati negli esperimenti Xafs [117]., Sesame [131], HERMES [123]., FLARES [110, 116]., THESEUS [108]. ed altri esperimenti nell'ambito del progetto.
I migliori esemplari di un altro rivelatore a deriva, con geometria trapezoidale, sono stati selezionati per il montaggio su una scheda di readout per l'esperimento TwinMic presso Sincrotrone Elettra a Trieste. [106,118, 133].
Per l'accoppiamento con un chip di readout ASIC a rumore particolarmente basso, sviluppato presso il Politecnico di Milano, sono stati testati sensori a deriva di piccole dimensioni realizzati in diversi lotti di produzione. I migliori dispositivi, con la più bassa corrente, hanno permesso di ottenere ottimi risultati di risoluzione energetica [94, 96].
Per il progetto dell'esperimento LOFT la candidata ha misurato le caratteristiche elettriche di sensori a deriva di dimensioni molto grandi (~85 cm^2) fabbricati su wafer da 150 mm. [89,91,122, 124].
Per verificare i danni derivanti dall'impatto di piccole particelle solide su sensori nello spazio, sono state eseguite prove di bombardamento con piccole particelle di metallo (debris) di diverse dimensioni (1-3 μm). Sono state misurate le caratteristiche *I-V* di alcuni diodi prima e dopo il bombardamento con particelle metalliche di diametro 3 μm [91].
Per ottenere ottimi risultati sulla risoluzione energetica nelle misure spettroscopiche a temperatura ambiente sono state scelte camere a deriva con la corrente più bassa. La candidata ha partecipato al disegno delle maschere dei sensori e delle strutture di test.
Le strutture PixDD sono un nuovo sviluppo in ambito di REDSOX2, progettate per la rilevazione di raggi X con lettura veloce. La candidata ha eseguito le misure delle caratteristiche elettriche e le misure di stabilità di strutture PixDD, ed i test di sensori PixDD dopo le prime prove di bumb bonding. La candidata ha eseguito le misure delle caratteristiche elettriche e le misure di stabilità di strutture PixDD 4x4, ed i test di sensori PixDD 4x4 dopo le prime prove di bumb bonding. Le prime prove di deposizione dei bump sulle strutture PixDD 32x32 sono state effettuate in marzo del 2018 presso Karlsruhe. I resultati di misure e test effettuati sulle strutture hanno dimostrato la possibilità di integrazione verticale delle strutture PixDD con i chip di lettura. I test di sensori PixDD32x32 hanno mostrato la variazione del drogaggio dei wafer usati per la produzione dei sensori. [119].
La candidata ha eseguito gli studi dei processi e della proprietà dei wafer di tutti i lotti tramite approfondite misure delle strutture di test presenti nei wafer. Queste misure su tutti i lotti di Redsox hanno dato un contributo importante allo sviluppo del processo di produzione di camere a deriva a FBK sui wafer da 6 pollici ed un aumento di resa di produzione fino all'80 %.

<u>SESAME</u>
Il sistema di detector XAFS-SESAME è stato progettato e implementato per la Fluorescenza a Raggi X (XRF) e gli esperimenti XAFS (XAFS - X-ray Absorption Fine Structure). Il sistema è composto da 8 array monolitici rettangolari di SDD, con un'area sensibile totale di 570 mm^2, ognuno di array ha 8 celle quadrate di 9 $mm^{2.}$. La candidata ha eseguito il test e la caratterizzazione elettrica di array di sensori. Il sistema è ottimizzato per funzionare in un intervallo di energia di 3-30 keV. Il sistema ha un'ottima risoluzione energetica alla temperatura ambiente e 64 canali perfettamente funzionanti. [135]. Il sistema è stato installato sulla beamline XRF-XAFS del Sincrotrone Sesame in Giodania nel dicembre 2019.

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ENGLISH SUMMARY

Emanuele Scifoni graduated as Master in Chemistry in Rome and got the PhD in Genoa. After an education and initial career mostly based on molecular physics, mainly with theoretical and computational methods, then, moving to FIAS (Frankfurt Institute for Advanced Studies, Goethe University) from November 2007 he focused his research interests in biophysical modelling of ion beams for hadrontherapy. He further developed and expanded this research after his move to the Biophysics department at GSI (Helmholtz Center for Heavy Ions research) in Darmstadt, where he carried on also intense activity in ion track structure simulations, dosimetry modeling and experimental verification with ion beam irradiations. At GSI he was deputy director of the modelling group, led by Michael Kraemer, and has substantially contributed to the new developments in research treatment planning software TRiP98. He finally moved to Trento in May 2016 where he was appointed as Primo Ricercatore at TIFPA-INFN, Trento Institute for Fundamental Physics and Applications, and Contract Professor at the University of Trento.

He's presently PI for the large INFN project Call "MoVe IT"- Modeling and verification for Ion Beam Treatment Planning – (around 40 researchers, founded with 960kEUR) funded till 2021 and contributed to several successful European and international grants and proposals in the field of hadrontherapy, such as EU COST proposal "nano-IBCT" – nanoscale insights in ion beam cancer therapy – 2010-2014, and Marie Curie ITN "ARGENT" – Advanced radiotherapy generated by exploiting nanoprocesses and technologies – 2014-2018, for which hhe was Leader of Workpackage 7 ("Preclinical Evaluation") .

He presented over 30 contributions as invited speaker at international conferences and International Schools and has a long teaching experience matured through several university classes at "La Sapienza" (Rome) Darmstadt University of Technology (TUD) and Trento University, as well as organizing an international Training course for PhD students. He co-supervised 4 PhD and 6 Master students.

He published over 70 peer-reviewed articles (H-index 21), including several invited reviews, and papers in collaborations with all the major centers for particle therapy such as HIT, NIRS, MedAustron and CNAO. He's usual referee for several journals ranging from Molecular and Nuclear to Medical Physics, Guest Editor for European Physical Journal D, and Editorial board member for Frontiers is Oncology.

He has been referee and committee member for national and international PhD and external reviewer of International grant applications.

He recently got the ASN Habilitation (Abilitazione Scientifica Nazionale) for Applied Physics sector (FIS07), both as a Full (I fascia) and Associate (II fascia) professor.

ATTIVITA' SCIENTIFICA:

POSIZIONE ATTUALE

da Maggio 2019 - - Primo Ricercatore a TI

da Maggio 2016 a Aprile 2019-

- Primo Ricercatore a TD

INFN-TIFPA, Trento Institute for Fundamental Physics and Applications, Istituto Nazionale di Fisica Nucleare, c/o Dipartmento di Fisical, Universita' di Trento http://www.tifpa.infn.it

Principali attivita' di ricerca:

- PI Call grupp V INFN "MoVe IT"- Modeling and verification for Ion Beam Treatment Planning – su sviluppi modellistici e sperimentali per treatment planning in adroterapia
- Fisica Medica di fasci di protoni: analisi di nuovi effetti fisici e riadiobiologici
- Analisi fisico-chimica dei meccanismi di radiation damage nanoscopici in fasci di ioni.
- Modeling per dosimetria, microdosimetria e nanodosimetria. (contributo a exp INFN NADIR)
- Set up, sviluppo, assistenza e mantenimento linea sperimentale fasci di protoni terapeutici a TIFPA

Principali Collaborazioni:

GSI - Hemholtz Center, Darmstadt (Germania), HIT, Ion Beam Therapy Center Heidelberg (Germania), Laboratori Nazionali del Sud (LNS-INFN), Catania (Italia), CNAO (Centro Nazionale di Adroterapia Oncologica, Pavia (Italia), Universita' di Alicante (Spagna), Namur University (Belgio), Universite' Paris Sud (Francia), NIRS National Institute for Radiological Sciences, Chiba (Giappone)

Da Luglio 2016 a 30 Settembre 2017-

- Professore a Contratto

Titolare del corso "Radiation Biophysics", Dipartmento di Fisica, Universita' di Trento http://www.physics.unitn.it/ -

PRECEDENTI INCARICHI DI RICERCA.

da Luglio 2010 a Aprile 2016

- Senior Post Doc – deputy group leader

Biophysics Department , GSI, Helmholtz center for Heavy Ions research, Darmstadt (Germany) www.gsi.de (con Prof. M. Durante e Dr. M.Kraemer)

Funding: EU network ULICE ("Union of Light Ion Centres in Europe", FP7 n. 228436) e Helmholtz Portfolio Technology&Medicine

Principali attivita' di ricerca:

- Adaptive treatment planning in adroterapia: modelli fisici e radiobiologici.
- Simulazioni Monte Carlo di struttura di traccia per fasci di ioni.
- Anallisi dell'effetto ossigeno e di nanoparticelle sulla radiosensibilita' in fasci di ioni.
- Modelli dell'efficienza della risposta di dosimetri in fasci di ioni.
- Verifica sperimentale dei modelli con dosimetria fisica e biologica.

Principali Collaborazioni:

HIT, Ion Beam Therapy Center Heidelberg (Germania) CNAO (Centro Nazionale di Adroterapia Oncologica , Pavia (Italia), Namur University (Belgio), ,Universite' Paris Sud (Francia), NIRS National Institute for Radiological Sciences, Chiba (Giappone)

da Nov. 2007 a Giu. 2010

- FIAS Fellow (Post Doc)

FIAS, Frankfurt Institute for Advanced Studies, Goethe University Frankfurt am Main www.fias.uni-frankfurt.de (Prof. A. Solov'yov group)

Prinicipali attivita' di ricerca

- Modellizzazione del radiation damage indotto da fasci di ioni a livello molecolare
- Sviluppo di un modello analitico di radiation transport per adroterapia a livello multiscale.
- Descrizione degli elettroni secondari generati da ioni e loro propagazione in acqua liquida.

Principali Collaborazioni:

GSI - Hemholtz Center, Darmstadt (Germania), Oakland University (USA), Moskow State University (Russia)

da Nov. 2006 a Nov. 2007

- Marie Curie Experienced Researcher (Post Doc)

LAOG, Laboratoire d'Astrophysique de Grenoble, University J.Fourier, Grenoble (France), www-laog.obs.ujf-grenoble.fr (Dr. P. Valiron Group)

Marie Curie International Training Network "Molecular Universe".

Prinicipali attivita' di ricerca

- Dinamica di collisioni molecolari incontesto astrofisico
- Eccitazione collisionale dell'ammoniaca interstellare e suoi derivati, con elio e idrogeno molecolare: Analisi full-dimensionale.

da Maggio 2005 a Ott 2006

- "Assegnista di ricerca" INFM (Post Doc)

Dipartimento di Chimica and Istituto Nazionale di Fisica della Materia, University of Rome "La Sapienza" w3.uniroma1.it/gianturco

Prinicipali attivita' di ricerca

- Studio strutturale e di dinamica delle impurezze molecolari in cluster di elio.
- Analisi delle superfici di potenziale dello stato fondamentale ed eccitato e caratterizzazione dei meccanismi di reazione

Output di RICERCA

Pubblicazioni

- Oltre 50 Peer reviewed papers printed, 4 submitted (*vedi annessa Lista di Pubblicazioni per dettagli*)
  h-index=18, number of citations=1050
- oltre 15 Scientific/Technical reports.

Presentazioni a Conferenze Internazionali

Oltre 30 Invited Oral Presentations a Conferenze Internazionali peer-reviewed, fra cui:

- “DNA Damage by ion beams at a molecular level” - ISACC 2009, Ann Arbor (USA)
- "Hypoxia driven adaptive treatment planning for particle therapy and impact of OER measurements" - IOL 2013, NIRS, Chiba (Japan)
- “New challenges for biologically adapted Ion beam treatment planning: single and multi-ion approaches”- ICTR-PHE 2014, Geneva (CH)
- "Biologically adaptive treatment planning with particle therapy: new single and multi-ion possibilities" - ERRS 2014 Rhodes (Greece)
- “Protons and Nanoparticle sensitization” IBIBAM 2016 , International Symposium on Ion Beams in Biology and Medicine, Chennai (INDIA)
- “Biologically oriented Treatment Planning” (day opening long lecture) MICROS 2017 - 17th International Symposium on Microdosimetry, 5-10 November 2017, Venezia, Italy
- “Comparison of treatment plans with different light ions”, ENLIGHT 2018 , London (GB)

Invited Lectures a Scuole Internazionali

- “Radiobiological impact of nuclear physics simulations”- Lecture al XV Seminar on Software for Nuclear, Subnuclear and Applied Physics Sunday 27 May to Friday 1 June 2018, Alghero
- “Radiobiology of particle beams: Basics and Hot Topics” - Lecture per PhD International school on Medical Accelerators (CNAO, Pavia, Italy) dal 07-06-2017 al 08-06-2017
- “Ion beam Biophysics: Fundamentals and Research Challenges at GSI/FAIR”, Lecture e Training per la 5th International FAIR School dal 07-09-2017 al 08-09-2017 a Castiglione della Pescaia (I)
- “Research and Development for Hadrontherapy in Italy”, Lecture at the International School on Detectors and Electronics for High Energy Physics, Astrophysics, Space Applications and Medical PhysicsL 5.04.2019 Legnaro (I)

Abstracts

Oltre 100 Abstract contributions (oral/poster) a conferenze scientifiche internazionali

Seminari

Diversi invited Department seminars al Dipartimento di Chimica (Roma), MPI-DSO (Goettingen), LAOG (Grenoble), FIAS (Frankfurt), GSI (Darmstadt), HIT (Heidelberg), MAASTRO (Maastricht), NIRS (Tokyo)

Grants&Awards

- ECI (Early career Investigator) of the month Radiation Research Society, Jul 2020 ,
- ESTRO Grant for Scientific Exchange visit (per ospitare Jakob Tofteegaard da Aarhus University to GSI) – Nov. 2013
- Best Poster Award at ICTR-PHE 2016: E. Scifoni et al. “Helium and Oxygen beam models in TRiP98: implementation, treatment planning tests and experimental verification”
- ~10 proposte di Beam time accettate a HIT (Heidelberg) , GSI (Darmstadt), MIT (Marburg) HIMAC (Chiba, Japan), LNS e TIFPA (I).
- ~ 5 Travel Grants come invited speaker da Radiation Research Society, EU COST, IOL , etc..

Responsabilita' scientifica e di coordinamento

Principale Autore del Proposal finanziato da EU: COST Action "nano IBCT" Nanoscale insights in Ion Beam Cancer Therapy (MP1002); Budget 500000 EUR
dal 07-12-2010 al 06-12-2014

- Workpackage Leader del WP "preclinical evaluation" e coautore del progetto EU FP7 ARGENT " Advanced Radiotherapies Generated by Nanoprocessess and Technologies" (Marie Curie ITN), Finanziamento 4000000 EUR dal 01-03-2014 a oggi

- IOL (International Open Laboratory) - German-Japan collaboration- "Particle Beam Quality Research Unit" 2011-2013, Core research member per GSI.

- Responsabile Nazionale e autore principale progetto Call INFN CSN5 "MoVe IT" - Modeling and Verification for Ion Beam Treatment Planning. Finanziamento: 960000 EUR
dal 01-01-2017 a oggi

Altri Titoli

- Abilitazione come Professore Associato per Fisica Applicata (FIS07) dal 2017

- Abilitazione come Professore Ordinario per Fisica Applicata (FIS07) dal 2018

- Idoneita' per una posizione CNR (National Research Council) come Ricercatore ottenuta ai concorsi delle sezioni di Roma e Milano nel 2011

ATTIVITA' DI COORDINAMENTO:

Organizzazione di Conferenze e Scuole Internazionali

- Membro del Comitato Organizzatore del congresso internazionale "RADAM 2009" RadiationDamage in Biomolecular Systems", 30/6 - 5/7/2009, Frankfurt (D)
- Membro del comitato Organizzatore della conferenza internazionale ISIT 2016 – International Symposium on Ion Therapy , Milano
- Membro del Comitato Organizzatore del 103 Congresso nazionale SIF - Societa' Italiana di Fisica (11-15 Sett.2017 Trento)
- Membro comitato organizzatore conferenza internazionale ARGENT - Advanced Radiotherapy,Generated by Exploiting Nanoprocesses and Technologies, January 22-24, 2018, CNRS, Univ.Paris-Saclay, Gif-sur-Yvette (Paris region), France
- Membro comitato organizzatore conferenza "INFN 2018" - IV Incontro Nazionale di Fisica Nucleare - e responsabile sessione "Applicazioni di Fisica Nucleare". Catania 7-9 novembre 2018
- Membro del "Radiobiology Sub-Commette" di PTCOG (Particle Therapy Cooperation Group) dal 17-11-2016 a oggi
- Membro comitato Organizzatore della VI International Geant4 School , 26-30 November 2018 Trento, Italy
- Organizzatore del training course per studenti PhD "Treatment planning and Dose verification in hadrontherapy, Dicembre 2014, University Paris Sud, France

Editor

- Guest Editor per European Physical Journal D, Topical Issue: "Molecular Level Assessments of Radiation Biodamage" dal 01-09-2009 al 31-08-2010
- Editorial Board member per il giornale: Frontiers in Oncology, sezione Radiotherapy dal 02-03-2018 a oggi

Referee

- Referee abituale per le seguenti riviste attinenti al tema del concorso: Physics in Medicine and Biology, Scientific Report (Nature Group), International Journal of Radiation Oncology Biology Physics, Physica Medica, European Physical Journal D, Physical Review Letters, Physical Review E, Cancer Nanotechnology, Technology in Cancer Research and Treatment, British Journal of Radiology, Radiation Oncology
  dal 01-01-2008 a oggi

Revisore di progetti di Ricerca Internazionali

- Revisore in qualita' di Esperto Internazionale di un Grant Proposal per lo HRC, Health Research Center, (Nuova Zelanda), in tema Fisica Medica, Budget 1200000 NZD
  dal 18-12-2015 al 22-02-2016
- Revisore in qualita' di Esperto Internazionale di un Grant Proposal per lo SNSF Swiss National Science Fundation 2019

Commissario di Dottorato

- Membro del Training Supervisory Board dell' International Training Network (ITN) Marie Curie ARGENT (13 PhD Students): Organizzazione dei Corsi di "Core Skills" e "Complementary Skills" dal 01-09-2014 al 20-12-2014
- Membro di Commissione per Dottorato internazionale, presso la Universita' di Alicante (Spagna) 05-02-2016
- Membro di Commissione e Revisore Dottorato di Ricerca Politecnico di Torino (Gen-Lug. 2018)
- Membro di Commissione e Revisore Dottorato di Ricerca Univesrita di Torino (Gen 2019)

Altra atttivita' didattica e di supervisione studenti

- Collaborazione alle lezioni Universitarie a "La Sapienza" (Rome) per I corsi "Chimica Fisica II" "Meccanica Quantistica" e "Elementi di Informatica per Chimici".

- Lecturer per il corso "Radiation Biophysics" alla Technische Universitaet Darmstadt (TUD)
- Physics laboratory course (Dosimetry and X-ray radiation) al GSI per studenti del Master Modul "Strahlenbiologie" (Radiation Biology) alla TUD.

- Cosupervisione di 4 PhD e 6 Master students
- Tutor di 3 Summer Students

ATTIVITA' DI TERZA MISSIONE:

Divulgazione Scientifica, Organizzazione e partecipazione

- Membro del comitato organizzatore di "FISICITTA' La fisica come non l'avete mai vista", programma collaterale di eventi per coinvolgere la cittadinanza durante la SIF di Trento.
- Organizzazione in particolare come corresponsabile con G. Lattanzi dell'evento "Physics Tonight": 6 incontri ed esperimenti di fisica serali nei Pub del centro", e direzione del punto "ER Fisici in prima linea" sulle applicazioni di Fisica Nucleare in medicina.

- "Notte dei Ricercatori" 2017 al Muse. "Particelle sempre piu brave: La ricerca in Fisica Nucleare per
- avanzare la Adroterapia", poster e corner scientifico.

- Organizzazione di 4 visite di Studenti dei Licei Trentini al centro di protonterapia, con seminario e visita guidata del laboratorio fasci protoni di TIFPA e delle stazioni di irraggiamento cliniche (Gantry)

- Visite guidate al centro di protonterapia e sala sperimentale a diversi personaggi della politica locale e nazionale (ministri, assessori).

- "Porte aperte a UniTN" 2017, Seminario divulgativo sulll'attivita' del Gruppo Medical Physics

- "Biophysics week" 2018, Seminario divulgativo sulla ricerca in Biofisica delle Radiazioni

- Intervista su Radioprotezione nei viaggi su Marte a Radio NBC (2017) http://radionbc.it/

- Intervista in "LocalEuropa" di F. Cordio, documentario su Ricercatori Italiani all'estero (RAI3 2015)

- Esperimento di OER-driven Treatment planning (Luglio 2014, PI: E. Scifoni) documentato su Helmholtz Society Blog: http://blogs.helmholtz.de/beamon/2014/07/unter-zeitdruck/

Attivita' per Trasferimento Tecnologico

- "HDRF - High density ridge filter for proton beams" C. Manea, E. Verroi, E. Scifoni, Brevetto sottomesso all' ufficio TT -INFN (2017)

FORMAZIONE E TRAINING

da Feb. 2002 a Apr. 2005

PhD in Scienze Chimiche (Theoretical Chemical Physics) EQF 8

Co-supervisione Universita' di Genova (Prof. G. Dellepiane) www.chimica.unige.it - Universita' di Roms "La Sapienza" (Prof. F. Gianturco) " w3.uniroma1.it/gianturco

- Tesi PhD: "Quantum structures and molecular dynamics for the study of ionic nucleation in rare gas clusters"

da Sett . 2004 a Dic. 2004

Visiting Research Fellow

Max-Planck-Institut e for Dynamics and Self-Organization, Goettigen (Germany). Host: Prof R.Schinke www.ds.mpg.de

- Training su Quantum Molecular Dynamics calculations e collaborazione per un paper

Marzo 2002

Training School: "Il Fortran 90 per il calcolo scientifico intensivo"

Milano, organizzata by CILEA (Consorzio Interuniversitario Lombardo per l'Elaborazione Automatica, Italy)

Marzo 2003

- Esame di stato per l'abilitazione alla pofessione con votp 100/100.

July 2001

Laurea in Chimica (Indirizzo Chimica Fisica Teorica)

EQF 7

Ottenuta alla University of Rome "La Sapienza" (relatore Prof. F. Gianturco)

- Master Thesis: "Ionic Nucleation in Helium Clusters: Quantum Calculations on Structures"; voto 110/110

Sett 2000

- European Summer School in Quantum Chemistry

Bologna, organizzata da Lund University (Sweden)

- Theoretical/ practical tutorial on Molecular structure and dynamics calculations

LINGUE

Madrelingua: Italiano

Altre lingue

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
German	B1	B1	B1	B1	A2
French	A2	A2	A2	A2	A2
Spanish	A2	A2	A2	A1	A1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Publication List

h-index=21, Number of citations = 1640

Peer reviewed articles

1) **E. Scifoni,** F.A. Gianturco; *"Charged cores in ionized ^{4}He clusters: I: The He_2^+···He system"*; Eur. Phys. J. D, 21 (2002) 323-333
2) E. Bodo, **E. Scifoni,** F. Sebastianelli, F.A. Gianturco, A. Dalgarno; *"Rotational quenching in ionic systems at ultra-cold temperatures"*; Phys. Rev. Lett., 89, 283201 (2002)
3) M. Satta, **E. Scifoni**, F.A. Gianturco; *"Dynamical Ionization of the ^{4}He trimer: a new time-dependent modeling of its fragmentation"*; J. Chem. Phys., 118, No. 6 (2003), 2606-2611
4) C. Di Paola, I. Pino, **E. Scifoni**, F. Sebastianelli, F.A. Gianturco; *"Effects of Ionic cores in Small Rare Gas Clusters: positive and negative charges"*, in *Latest advances in atomic cluster collisions,* 149, Ed. J. P. Connerade and A. V. Solovyov, Imperial College Press (2004).
5) **E. Scifoni**, G. Dellepiane , F.A. Gianturco; *"Charged cores in ionized ^{4}He clusters: II: Ab initio calculations for the He_2^+ + He system and Many-Body fitting of the computed points";* Eur. Phys. J. D 30, (2004) 353-362 .
6) **E. Scifoni,** E. Bodo, G. Dellepiane , F.A. Gianturco; *"Charged cores in ionized ^{4}He clusters: III: A quantum modeling for the collisional relaxation dynamics";* Eur. Phys. J. D 30, (2004) 363-368 .
7) **E. Scifoni,** E. Bodo, F.A. Gianturco; *"Ionic reactions in He Nanodroplets: the $[LiHHe]^+$ complex and its possible patways from ab initio calculations";* J. Chem. Phys. 122 (2005), 224312.
8) **E. Scifoni***, F.A. Gianturco, S. Yu. Grebenschikov, R. Schinke; "*Energetics and spatial features in a linear trimer of identical particles: the $^4He_3^+$ $^2\sum_g^+$ case";* J. Chem. Phys. 125, (2006) 164304.
9) **E. Scifoni***, P.Valiron, A. Faure , C. Rist; "*Collisional excitation of interstellar ammonia by helium and hydrogen molecules: Towards a new interpretation of the inversion effect"*, Ed. J. L. Lemaire and F. Combes, in Molecules in Space and Laboratory, p.130, (2007).
10) M. Wernli, **E. Scifoni**, E. Bodo and F. A. Gianturco; *A quantum modeling of the chemistry of LiH+ with He from ab initio calculations: Ionic reactions in He nanodroplets ;* Int. J. Mass Spectr. 280, 57 (2009)
11) E.Surdutovich, O. I. Obolensky, **E. Scifoni**, I. Pshenichnov, I. Mishustin, A. V. Solov'yov, W. Greiner; *"Ion-induced electron production in tissue-like media and DNA damage mechanisms"*, Eur. Phys. J. D 51, 63 (2009).
12) **E. Scifoni*** E. Surdutovich, A. Solov'yov, I. Mishustin, I. Pshenichnov and W. Greiner, *"Ion-beam therapy: from electron production in tissue like media to DNA damage estimations",* AIP Conf. Proc. 1080, 40 (2008).
13) A.V. Solov'yov, E. Surdutovich, **E. Scifoni**, I. Mishustin, W. Greiner, *"A multi-scale approach to the physics of ion beam cancer therapy" ,* AIP Conf. Proc. 1080, 104 (2008).
14) A.V. Solov'yov, E. Surdutovich, **E. Scifoni**, I. Mishustin, W. Greiner, *"Physics of ion beam cancer therapy: a multi-scale approach"* ; Phys. Rev. E, 79, 011909 (2009).
15) S. Maret, A. Faure, **E. Scifoni** and L. Wiesenfeld *"On the robustness of the ammonia thermometer";* Mon. Not. R. Astron. Soc., 399, 1 (2009)
16) E. Surdutovich, **E. Scifoni,** A.V. Solov'yov, *"A multiscale approach to the physics of radiation damage",* AIP Conf. Proc. 1197, p.209-216, (2009)
17) **E. Scifoni***, E. Surdutovich, A.V. Solov'yov, "*Stopping power and secondary electrons in ion beam induced damage",* AIP Conf. Proc., New York 1197, p.217-227, (2009)
18) **E. Scifoni***, E. Surdutovich, A.V. Solov'yov, *"Spectra of secondary electrons generated in water by energetic ions",* Phys. Rev. E, 81, 021903 (2010).
19) Surdutovich**, E. Scifoni**, A.V. Solov'yov,*"Ion beam cancer therapy: News about a multiscale approach to radiation damage*", Mutat. Res. – Rev. Mutat., 704, 206 (2010).
20) I. Baccarelli, F. A. Gianturco, **E. Scifoni***, A. Solov'yov and E. Surdutovich, Editorial for the Topical Issue *"Molecular level assessments of radiation biodamage",* Eur. Phys. J. D 60, 1 (2010).
21) **E. Scifoni***, E. Surdutovich and A. Solov'yov, "*Radial dose distribution from carbon ion incident on liquid water",* Eur. Phys. J. D 60, 115 (2010).
22) L. Wiesenfeld, **E. Scifoni**, A. Faure and E.Roueff, *"Collisional excitation of doubly deuterated ammonia ND_2H by para-H2",* Mon. Not. R. Astron. Soc. 413, 509 (2011).

23) M. Krämer, **E. Scifoni**, C. Wälzlein and M. Durante, *"Ion beams in radiotherapy - from tracks to treatment planning",* JPCS 373, 012017 (2012).
24) **E. Scifoni***, W. Tinganelli, W. Kraft-Weyrather, M. Durante, A. Maier and M. Krämer, *"Including oxygen enhancement ratio in ion beam treatment planning: model implementation and experimental verification"*, Phys. Med. Biol. 58, 3871 (2013).
25) C. Wälzlein, M. Krämer, **E. Scifoni**, and M. Durante, *"Advancing Particle Therapy: from Track Structure to Treatment Planning"* Adv. Radiat. Isot. 83, 171 (2014).
26) N. Bassler, J. Toftegaard, A. Lühr, B.S. Sorensen, **E. Scifoni,** M. Krämer, O. Jäkel, L.S. Mortensen and J.B. Petersen. *"LET painting demonstrated on a head and neck cancer case"*, Acta Oncol. 53, 25 (2014) *– FEATURED ARTICLE: http://medicalphysicsweb.org/cws/article/research/55199*
27) C. Wälzlein, M. Durante **E. Scifoni** and M. Krämer, *"Low-energy electron transport in inhomogeneous media",* Nucl. Instr. Met. B. 320, 75 (2014).
28) C. Wälzlein, **E. Scifoni**, M. Krämer and M. Durante,*"Simulations of dose enhancement for heavy atom nanoparticles irradiated by protons",* Phys. Med. Biol. 59, 1441 (2014).
29) G. Fattori, M. Riboldi, **E. Scifoni**, M. Krämer, A. Pella, M. Durante, S. Ronchi, M. Bonora, R. Orecchia and G. Baroni*," Dosimetric effects of residual uncertainties in carbon ion treatment of head chordoma",* . Radiother. Oncol. 113, 66 (2014).
30) M. Krämer, **E. Scifoni**, F. Schmitz, O. Sokol and M. Durante *„Overview of recent advances in treatment planning for ion beam radiotherapy"*, Eur. Phys. J.D 68, 306 (2014).
31) **E. Scifoni***, *"Radiation biophysical aspects of charged particles: from the nanoscale to therapy" – Invited Review* - Mod. Phys. Lett. A 30, 1540019 (2015).
32) D. Boscolo, **E. Scifoni***, A. Carlino, C. La Tessa, T. Berger, M. Durante, V. Rosso and M. Krämer, *"TLD efficiency calculations for heavy ions: an analytical approach",* Eur. Phys. J. D 69, 286 (2015)
33) F. Tommasino, **E. Scifoni** and M. Durante, *" New ions for therapy" ,* Int. J. Part. Ther. 2, 428 (2015).
– FEATURED ARTICLE: http://medicalphysicsweb.org/ cws/article/research/63465
34) W. Tinganelli, M. Durante, R. Hirayama, M. Krämer, A. Maier, W. Kraft-Weyrather, Y. Furusawa, T. Friedrich and **E. Scifoni***, *" Kill-painting of hypoxic tumors in charged particle therapy" ,* Sci. Rep. 5, 17016 (2015).
– FEATURED ARTICLE: http://medicalphysicsweb.org/cws/article/research/63917
35) M. Krämer, **E. Scifoni**, C. Schuy, M. Rovituso, W. Tinganelli, A. Maier, R. Kaderka, S. Brons, T. Tessonnier, K. Parodi and M. Durante, *"Helium ions for radiotherapy? Physical and biological verification of a novel treatment modality",* Med. Phys. 43, 1995 (2016).
36) M. Krämer, **E. Scifoni**, and M. Durante, *"Reply to Comment: Helium ions for radiotherapy? Physical and biological verification of a novel treatment modality",* Med. Phys. 43, 5262 (2016).
37) M. Cerri, W. Tinganelli, M. Negrini, A. Helm, **E. Scifoni**, F. Tommasino, M. Sioli, A. Zoccoli and M. Durante "*Hibernation for space travel: Impact on radioprotection*", Life Sciences in Space Research, *11*, 1-9 (2016).
38) Sokol, O., **Scifoni, E.,** Tinganelli, W., Kraft-Weyrather, W., Wiedemann, J., Maier, A., Boscolo D., Friedrich T., Durante M. & Krämer, M. Oxygen beams for therapy: advanced biological treatment planning and experimental verification. Physics in Medicine & Biology, 62(19), 779 (2017).
– FEATURED ARTICLE: http://medicalphysicsweb.org/cws/article/research/70172
39) Lacombe, S., Porcel, E., & **Scifoni***, E. Particle therapy and nanomedicine: state of art and research perspectives. Cancer nanotechnology, 8(1), 9 (2017).
40) Rovituso, M., Schuy, C., Weber, U., Brons, S., Cortés-Giraldo, M. A., La Tessa, Piaseztki, E, Izraeli, , D.Schardt D., Toppi, M., **Scifoni**, E., Kraemer M., Durante M. Fragmentation of 120 and 200 MeV u− 1 4He ions in water and PMMA targets. *Physics in Medicine & Biology*, *62*(4), 1310 (2017).
41) Hespeels, F., Heuskin, A. C., **Scifoni**, E., Kraemer, M., & Lucas, S. Backscattered electron emission after proton impact on carbon and gold films: experiments and simulations. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, *401*, 8-17 (2017).
42) Tommasino, F., Rovituso, M., Fabiano, S., Piffer, S., Manea, C., Lorentini, S., Lanzone, S.; Wang, Z.; Pasini, M.; Burger, W. J.; La Tessa, C.; **Scifoni, E**.; Schwarz, M.; Durante, M.. & La Tessa, C. (2017). Proton beam characterization in the experimental room of the Trento Proton Therapy facility. *Nuclear Instruments and Methods A:*, *869*, 15-20. (2017).

43) Brownstein, J. M., Wisdom, A. J., Castle, K. D., Mowery, Y. M., Guida, P. M., Lee, C. , Tommasino., La Tessa, **Scifoni E.**, Gao J., Luo, L. (2018). Characterizing the potency and impact of carbon ion therapy in a primary mouse model of soft tissue sarcoma. *Molecular Cancer ther*,. 17, 858 (2018)
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