Curriculum Vitae di: Roberto Cimino
(fino a Ottobre 2020)

Formazione scolastica:

1981 to 1986	Laurea in Fisica (Vecchio Ordinamento) dal 1981 al 1986 presso l' 'Università di Roma, La Sapienza". Tesi dal titolo "Studio delle proprietà elettroniche dei semiconduttori amorfi e delle loro interfacce mediante spettroscopia di fotoemissione con radiazione di Sincrotrone". Tesi discussa l' 11 Dicembre 1986 con risultato finale: "110/110 e Lode".

Posizione attuale:

16/01/91 ad oggi	membro del personale permanente della divisione di ricerca dei Laboratori Nazionali di Frascati dell'INFN.
01/01/09 *31/5/2019*	"Primo "Ricercatore" dell'INFN previo concorso per titoli e colloquio.
31/5/2019 ad oggi	*"Dirigente di Ricerca"* dell'INFN previo concorso per titoli.
22/2/2021 ad oggi	*"Consulente scientifico" per l'Internazionalizzazione* presso il MUR.

Posizioni precedenti:

1/11/2013 30/10/15	Collaboratore scientifico per selezione competitiva presso la divisione CERN-LHC-Vacuum, Ginevra, Svizzera.
01/01/02 to 30/06/03	Collaboratore scientifico per selezione competitiva presso la divisione CERN-LHC-Vacuum, Ginevra, Svizzera.
01/09/98 to 01/09/00	Mobilità interna a Trieste presso la sezione INFN-TS.
01/02/97 to 31/07/97	Professore ospite presso l'Istituto di Fisica Sperimentale della "Karl Franzens Universität Graz" (Austria).
01/01/89 to 15/01/91	Ricercatore a tempo determinato (ex art. 36) per selezione competitiva presso l'Istituto di Struttura della Materia del Consiglio Nazionale delle Ricerche (ISM-CNR), Frascati, Italia.
15/02/87 to 31/12/89	Ricercatore Post doc presso il "Fritz Haber Institut der Max Plank Gesellschaft" (F.H.I. der M.P.G.) Berlino Ovest.

Supervisione di assegnisti post-dottorato, dottorandi e laureandi:

2005 – 2018	Numero di Assegnisti post doc: 6 *Numero di tesi di Dottorato di ricerca*: 3 Numero di tesi di laurea triennale: 8

Incarichi Istituzionali:

4-2017/4-2020 Membro nominato dal Presidente dell'INFN del "Machine Advisory Committee (MAC)" in qualità di esperto in tecnologie di Vuoto e coatings applicate agli acceleratori. Il MAC ha funzione consultiva per i progetti nazionali e per le partecipazioni a progetti europei finalizzati alla realizzazione di grandi infrastrutture di ricerca per lo sviluppo di tecnologie nel campo della fisica degli acceleratori, individuati dalla Giunta Esecutiva dell'INFN che ne richiede valutazione scientifica e del loro impatto e corrispondente fabbisogno di risorse finanziarie e di personale.

2005 - 2011 Rappresentante e Coordinatore eletto da e per i LNF nel Comitato nazionale scientifico dell'INFN (gruppo V) per la revisione, la promozione e il finanziamento di attività di ricerca nel campo della fisica e della ricerca e sviluppo per acceleratori, rivelatori e ricerche interdisciplinari all'interno dell'INFN. Principale responsabile della valutazione di circa 15 progetti nazionali presentati alla commissione V.

Produzione scientifica (ad oggi):

- Autore di piu' di 130 articoli pubblicati su riviste scientifiche internazionali con referee (10 sulla rivista Physical Review Letters, 1 su Nature Astronomy)
- H-Index 25 (Scopus)
- Organizzatore di conferenze Internazionali (Ecloud 12, 18, 22) etc.
- Autore di oltre 55 note interne.
- Autore di 6 monografie scientifiche
- Presentatore di oltre 60 Seminari su invito in conferenze internazionali e istituti di ricerca. (elencato in seguito).
- Presentatore di oltre 70 contributi a conferenze scientifiche internazionali.

CURRICULUM VITAE

Rosanna Larciprete

CNR- Istituto dei Sistemi Complessi (ISC)
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EDUCATION AND WORK EXPERIENCE

March 2020 to date	• Reseach Director at CNR- Istituto dei Sistemi Complessi (ISC) Roma (Italy)
July 2004 –March 2020	• Senior scientist at CNR- Istituto dei Sistemi Complessi (ISC) Roma (Italy)
December 2001 – July 2004	• Senior scientist at CNR- Istituto di Metodologie Inorganiche e dei Plasmi (IMIP) Tito Scalo (PZ) Italy
March 2009 - December 2001	• Beamline scientist at Elettra- Sincrotrone Trieste - On leave from ENEA
April 1988 - December 2001	• Staff scientist at ENEA – CRE Frascati (RM), Italy
April 1986 - March 1988	• Fellow at ENEA – CRE Frascati (RM), Italy
August 1985 - March 1986	• Fellow at Max Planck Institut Biophys. Chemie, Göttingen (D)
16 July 1985	• Degree in Physics, 110/110 cum laude, Università di Roma “Sapienza

RESEARCH FIELDS

Study of the electronic, chemical and structural properties of surfaces, interfaces and nanostructured systems and of surface chemical reactions by means of photoelectron spectroscopy (XPS, UPS, ARPES) with laboratory sources and synchrotron radiation, low energy electron (LEED), photoelectron diffraction (XPD), x-ray absorption spectroscopy (XAS) and Raman spectroscopy.

Graphene and 2D materials

- Growth of graphene and other 2D materials (h-BN, MoS2) by chemical vapour deposition (CVD) in ultra high vacuum and low pressure furnace
- Study of the fundamental properties of graphene and other 2D monolayers
- Hydrogenation and nitruration of graphene
- Interaction of graphene and graphite with oxygen atoms
- Material (SiO_2, silicides, Al_2O_3) synthesis below epitaxial graphene by element intercalation.
- Fabrication of rare gas filled graphene nanoblisters by intercalation
- Ultrafast charge transfer in graphene monolayers depending on the coupling with the supporting substrate (core-hole clock technique)
- Water molecule dissociation and hydrogen storage at the graphene/metal interface
- Characterization of the chemical and electronic properties of 2D MXenes.

Nanostructured C compounds

- Carbon nanotube self-assempling processes
- Electronic properties of nanostructured C materials (C60, C70, endohedral fullerenes, nanotubes)
- Alkali metal doping of fullerenes and nanotubes
- Graphite and nanotube growth from thermal decomposition of C and Si terminated 6H-SiC surfaces
- Interaction between C nanotubes and molecular adsorbates

Materials for energy

Determination of the electronic structure of pristine and doped mixed perovskite deposited as thin fims to be used as active layers in solar cell devices. Effect of the stress due to external agents on the material stability.

Materials with low secondary electron yield

Study of the secondary emission properties of metallic surfaces before and after the deposition of passivating layers (mostly graphite-like films), with the aim to mitigate the onset of electron cloud in particle accelerators, satellites and high power radio frequency systems (in collaboration with INFN).

Organic/inorganic interfaces

Determination of the electronic structure and surface ordering in self-assembled layers of organic molecules (porphirines, pentacene also functionalized) on inorganic substrates by using electronic spectroscopies with synchrotron radiation combined with nanoscale probe techniques.

Luminescent nanostructures

Formation and characterization of microsized and nanosized luminescent structures. We used using, for the first time, a focussed x-ray beam to create color centers in LiF crystals obtaining luminescent structures with lateral dimension of ~ 500 nm, interesting for the realization of optical nanodevices.

Surface laser processing

Study of laser-induced photochemical processes in gas phase molecules; laser deposition of thin films by photodissociation of molecular precursors (laser CVD); laser applications for material processing (cleaning, alloying, melting, recrystallization); laser ablation; Pulsed Laser Assisted Epitaxy (PLAE) for semiconductor heteroepitaxy. Laser-CVD growth of nanostructured oxide films for gas sensors. Development of optical diagnostics for the in-situ monitoring of surface processes.

SCIENTIFIC PROJECT MANAGEMENT

- Project LazioInnova *Production and storage of hydrogen in nanostructured graphene/Nickel systems* (hPRIDE) (2019-2021)
- MAE-Project of Scientific and Technological Collaboration Italy-Turkey *Characterization of the production processes and developing of fundamental knowledge on semiconductor nanocrystal based materials* (2007-2010)
- Project FP6 NMP4-CT-505285 SEMINANO "*Physics and Technology of elemental, alloy and compound semiconductor nanocrystals: materials and devices*" (2005-2007) (Responsible for CNR- ISC - 2007)
- MIUR Project –*Preparation and characterization of* $Sr_{2-x}La_xFeMoO_6$ *thin films for application in magnetic sensors working at room temperature (2004-2005)*
- Principal investigator in 32 research projects at synchrotron radiation facilities (ESRF, ELETTRA)

CONFERENCE AND WORKSHOP ORGANIZATION

- Member of the Scientific Committee of the European Workshop on Epitaxial Graphene and 2D Materials (EWEG/2D) (2014 – 2016 and 2018 editions)
  http://eweg.neel.cnrs.fr/
  http://eweg2d.ph2.uni-koeln.de/about.html
  https://wp.icmm.csic.es/eweg2d-2018/

- Workshop REGINA “New challenges for REsearch on Graphene: from growth and state-of-the-art characterization towards Industrial Applications”
  Trieste – 3-4/12/2013 (co-chair)
  http://www.elettra.eu/Conferences/2013/REGINA/

- Turkish Italian Workshop on the Frontiers in Nanomaterial Research and Applications
  Istanbul 8-10/12/2010 (co-chair)
  http://events.unitn.it/en/istanbul2010

PUBBLICATIONS

orcid.org/0000-0002-1109-7368

Total number of articles published on ISI journals: 179

among them 1 Nat.Physics, 1 Nat. Materials, 3 NanoLett, 7 ACS Nano, 2 Nanoscale, 7 Phys. Rev. Lett.,1 Nat.Comm, 1 Nano Energy, 1 Sci. Rep., 17 Phys. Rev. B, 8 Appl. Phys. Lett, 3 2D Materials,

H-index: **32**, citations: 3991 **(SCOPUS)**

Pubblications on ISI journals (2012-2021)

Transition metal carbides (MXenes) for efficient NiO-based inverted perovskite solar cells
D Saranin, S Pescetelli, A Pazniak, D Rossi, A Liedl, A Yakusheva, L Luchnikov, D Podgorny, P Gostischev, S Didenko, A Tameev, D Lizzit, M Angelucci, R Cimino, R Larciprete, A Agresti, A Di Carlo
Nano Energy 82, 105771 (2021)

Ion Implantation as an Approach for Structural Modifications and Functionalization of Ti3C2Tx MXenes
H Pazniak, M Benchakar, T Bilyk, A Liedl, Y Busby, C Noël, P Chartier, S. Hurand, M. Marteau, L. Houssiau, R. Larciprete, P. Lacovig, D. Lizzit, E.I Tosi, S. Lizzit, J. Pacaud, S. Celerier, V. Mauchamp, M.-L. David.
ACS nano 15, 4245-4255 (2021)

Mixed Cation Halide Perovskite under Environmental and Physical Stress
R Larciprete, A Agresti, S Pescetelli, H Pazniak, A Liedl, P Lacovig, D. Lizzit, E. Tosi, S. Lizzit, A. Di Carlo
Materials 14 , 3954 (2021)

Impact of the substrate work function on self-assembling and electronic structure of adsorbed ruthenium phthalocyanine
S Colonna, G Zanotti, AM Paoletti, G Pennesi, P Alippi, F Filippone, A. Amore Bonapasta, R. Larciprete, F. Ronci, G. Mattioli...
J. Chem. Phys. C 124 , 23295-23306 (2020)

Minimum thickness of carbon coating for multipacting suppression
M Angelucci, A Novelli, L Spallino, A Liedl, R Larciprete, R Cimino
Physical Review Research 2, 032030 (2020)

Titanium-carbide MXenes for work function and interface engineering in perovskite solar cells
A Agresti, A Pazniak, S Pescetelli, A Di Vito, D Rossi, A Pecchia, M Auf der Maur, A Liedl, R Larciprete, Denis V Kuznetsov, D Saranin, A Di Carlo
Nature Materials 18 (11), 1228-1234 (2019)

SEY and low-energy SEY of conductive surfaces
R Cimino, M Angelucci, LA Gonzalez, R Larciprete
J. Electron Spectr. Rel. Phenom. (2019)

On the compatibility of porous surfaces with cryogenic vacuum in future high-energy particle accelerators
L Spallino, M Angelucci, R Larciprete, R Cimino
Appl.Phys. Lett. 114, 153103 (2019)

Electron–phonon coupling in single-layer MoS2
SK Mahatha, AS Ngankeu, NF Hinsche, I Mertig, K Guilloy, PL Matzen, M Bianchi, J A Miwa, H Bana, E Travaglia, P Lacovig, L Bignardi, D Lizzit, R Larciprete, Baraldi, S Lizzit, P Hofmann
Surf. Sci. 681, 64-69 (2019)

Growth and structure of singly oriented single-layer tungsten disulfide on Au (111)
L Bignardi, D Lizzit, H Bana, E Travaglia, P Lacovig, CE Sanders, Mj Dendzik, M Michiardi, M Bianchi, M Ewert, L Buß, J Falta, J I Flege, A Baraldi, R Larciprete, P Hofmann, S Lizzit
Phys. Rev. Materials 3 (1), 014003 (2019)

Dual-Route Hydrogenation of the Graphene/Ni Interface
D Lizzit, MI Trioni, L Bignardi, P Lacovig, S Lizzit, R Martinazzo, R Larciprete
ACS Nano 13 (2), 1828-1838 (2019)

Secondary electron emission and yield spectra of metals from Monte Carlo simulations and experiments
M Azzolini, M Angelucci, R Cimino, R Larciprete, NM Pugno, S Taioli, M Dapor
J. f Phys.: Cond. Matter 31 (5), 055901 (2018)

Photoemission investigation of oxygen intercalated epitaxial graphene on Ru (0001)
S Ulstrup, P Lacovig, F Orlando, D Lizzit, L Bignardi, M Dalmiglio, M Bianchi, F Mazzola, A Baraldi, R Larciprete, P Hofmann, S Lizzit
Surf. Sci. 678, 57-64 (2018)

Epitaxial growth of single-orientation high-quality MoS2 monolayers
H Bana, E Travaglia, L Bignardi, P Lacovig, CE Sanders, M Dendzik, M Michiardi, M Bianchi, D Lizzit, F Presel, D De Angelis, N Apostol, P K Das, J Fujii, I Vobornik, R Larciprete, Ao Baraldi, P Hofmann, S Lizzit
2D Materials 5 (3), 035012 (2018)

The adsorption of silicon on an iridium surface ruling out silicene growth
M Satta, P Lacovig, N Apostol, M Dalmiglio, F Orlando, L Bignardi, H Bana, E Travaglia, A Baraldi, S Lizzit, R Larciprete
Nanoscale 10 (15), 7085-7094 (2018)

Reduction and shaping of graphene-oxide by laser-printing for controlled bone tissue regeneration and bacterial killing
V Palmieri, M Barba, L Di Pietro, S Gentilini, MC Braidotti, C Ciancico, F Bugli, G Ciasca, R Larciprete, W Lattanzi, M Sanguinetti, M De Spirito, C Conti, M Papi
2D Materials 5 (1), 015027 (2017)

The secondary electron yield of noble metal surfaces
LA Gonzalez, M Angelucci, R Larciprete, R Cimino
AIP Advances 7 (11), 115203 (2017)

Spin-dependent electron-phonon coupling in the valence band of single-layer WS2
NF Hinsche, AS Ngankeu, K Guilloy, SK Mahatha, AG Čabo, M Bianchi, M. Dendzik, C. E Sanders, J. A Miwa, H. Bana, E. Travaglia, P. Lacovig, L. Bignardi, R. Larciprete, A. Baraldi, S. Lizzit, K. Sommer Thygesen, P. Hofmann
Physical Review B 96, 121402 (2017)

Unexpected Rotamerism at the Origin of a Chessboard Supramolecular Assembly of Ruthenium Phthalocyanine

G Mattioli, R Larciprete, P Alippi, A Amore Bonapasta, F Filippone, P. Lacovig, S. Lizzit, AM Paoletti, G. Pennesi, F. Ronci, G. Zanotti, S. Colonna
Chemistry-A European Journal (2017)

Illuminating the earliest stages of the soot formation by photoemission and Raman spectroscopy
M Commodo, A D'Anna, G De Falco, R Larciprete, P Minutolo
Combustion and Flame 181, 188-197 (2017)

Key Role of Rotated Domains in Oxygen Intercalation at Graphene on Ni (111)
L Bignardi, P Lacovig, MM Dalmiglio, F Orlando, A Ghafari, L Petaccia, A. Baraldi, R. Larciprete, S. Lizzit
2D Materials 4, 025106 (2017)

The effect of structural disorder on the secondary electron emission of graphite
LA Gonzalez, R Larciprete, R Cimino
AIP Advances 6 (9), 095117 (2016)

Graphene-based field effect transistors for radiation-induced field sensing
A Di Gaspare, A Valletta, G Fortunato, R Larciprete, L Mariucci, A. Notargiacomo, R. Cimino
Nucl.Instr. Meth. A, 824(2016) 392

On the hydrophilic/hydrophobic character of carbonaceous nanoparticles formed in laminar premixed flames
M Commodo, G De Falco, R Larciprete, A D'Anna, P Minutolo
Experimental Thermal and Fluid Science 73, 56-63 (2016)

Unveiling the mechanisms leading to H2 production promoted by water decomposition on epitaxial graphene at room temperature
A Politano, M Cattelan, DW Boukhvalov, D Campi, A Cupolillo, S Agnoli, NG Apostol, P. Lacovig, S. Lizzit, D. Farías, G. Chiarello, G. Granozzi, R. Larciprete
ACS Nano 10 (4), 4543-4549(2016)

Crystal to Quasicrystal Surface Phase Transition: An Unlocking Mechanism for Templated Growth
D Curcio, E Miniussi, P Lacovig, S Lizzit, R Larciprete, JA Smerdon, VR Dhanak, R. McGrath, A. Baraldi
J. Chem. Phys. C 120 (10), 5477-5485

Self-assembly of graphene nanoblisters sealed to a bare metal surface
R Larciprete, S Colonna, F Ronci, R Flammini, P Lacovig, N Apostol, A Politano, P Feulner, D Menzel, S Lizzit
Nano Lett. 16 (3), 1808-1817 (2016)

Synthesis of nitrogen-doped epitaxial graphene via plasma-assisted method: role of the graphene–substrate interaction
F Orlando, P Lacovig, M Dalmiglio, A Baraldi, R Larciprete, S Lizzit
Surf. Sci. 643, 214-221 (2016)

Detailed investigation of the low energy secondary electron yield of technical Cu and its relevance for the LHC
R Cimino, LA Gonzalez, R Larciprete, A Di Gaspare, G Iadarola, G Rumolo
Phys. Rev. Special Topics-Acceler. Beams 18 (5), 051002 (2016)

Evolution of the secondary electron emission during the graphitization of thin C films
R Larciprete, DR Grosso, A Di Trolio, R Cimino
Appl. Surf. Sci. 328, 356-360 (2015)

Chemical gating of epitaxial graphene through ultrathin oxide layers
R Larciprete, P Lacovig, F Orlando, M Dalmiglio, L Omiciuolo, A Baraldi, S. Lizzit
Nanoscale 7 (29), 12650-12658 (2015)

Epitaxial growth of a single-domain hexagonal boron nitride monolayer
F Orlando, P Lacovig, L Omiciuolo, NG Apostol, R Larciprete, A Baraldi, S. Lizzit
ACS Nano 8 (12), 12063-12070 (2014)

Bottom-up approach for the low-cost synthesis of graphene-alumina nanosheet interfaces using bimetallic alloys
L Omiciuolo, ER Hernández, E Miniussi, F Orlando, P Lacovig, S Lizzit, TO Menteş, A Locatelli, R Larciprete, M Bianchi, S Ulstrup, P Hofmann, D Alfè, A Baraldi
Nature Comm. 5, ncomms6062 (2014)

Bis (triisopropylsilylethynyl) pentacene/Au (111) interface: Coupling, molecular orientation, and thermal stability
A Gnoli, H Ustunel, D Toffoli, L Yu, D Catone, S Turchini, S Lizzit, N Stingelin, R Larciprete
J. Phys. Chem C 118 (39), 22522-22532 (2014)

Effect of the surface processing on the secondary electron yield of Al alloy samples
DR Grosso, M Commisso, R Cimino, R Larciprete, R Flammini, R Wanzenberg
Phys. Rev. Special Topics-Acceler. Beams 16 (5), 051003 (2014)

Controlling hydrogenation of graphene on Ir (111)
R Balog, M Andersen, B Jørgensen, Z Sljivancanin, B Hammer, A Baraldi, R Larciprete, P Hofmann, L Hornekær, S Lizzit
ACS Nano 7 (5), 3823-3832 (2013)

Ultrafast Charge Transfer at Monolayer Graphene Surfaces with Varied Substrate Coupling
S Lizzit, R Larciprete, P Lacovig, KL Kostov, D Menzel
ACS Nano 7 (5), 4359-4366 (2013)

Graphene-induced substrate decoupling and ideal doping of a self-assembled iron-phthalocyanine single layer
M Scardamaglia, S Lisi, S Lizzit, A Baraldi, R Larciprete, C Mariani, MG Betti
J. Phys. Chem C 117 (6), 3019-3027 (2013)

Secondary electron yield of Cu technical surfaces: Dependence on electron irradiation
R Larciprete, DR Grosso, M Commisso, R Flammini, R Cimino
Phys. Rev. Special Topics-Acceler. Beams 16 (1), 011002 (2013)

Fine tuning of graphene-metal adhesion by surface alloying
D Alfe, M Pozzo, E Miniussi, S Günther, P Lacovig, S Lizzit, R Larciprete, R. Larciprete, B. Santos Burgos, T. O. Menteş, A. Locatelli, A. Baraldi
Sci. Reports 3, 2430, (2013)

Substrate-Driven Formation of Bidimensional Arrays of Co Nanocrystals in TiO2 Thin Films
T Li, R Larciprete, S Turchini, N Zema, A Bonanni, A Di Trolio

J. Phys. Chem. C 117 (1), 687-691 (2012)

Oxygen switching of the epitaxial graphene–metal interaction
R Larciprete, S Ulstrup, P Lacovig, M Dalmiglio, M Bianchi, F Mazzola, L Hornekær, F Orlando, A Baraldi, P Hofmann, S Lizzit
ACS Nano 6 (11), 9551-9558 (2012)

Nature of the decrease of the secondary-electron yield by electron bombardment and its energy dependence
R Cimino, M Commisso, DR Grosso, T Demma, V Baglin, R Flammini, R Larciprete
Phys. Rev. Lett. 109 (6), 064801 (2012)

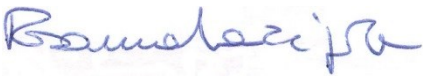
Transfer-free electrical insulation of epitaxial graphene from its metal substrate
S Lizzit, R Larciprete, P Lacovig, M Dalmiglio, F Orlando, A Baraldi, L Gammelgaard, L Barreto, M Bianchi, E Perkins, P Hofmann
Nano letters 12 (9), 4503-4507 (2012)

Fundamental Role of the H-Bond Interaction in the Dissociation of NH 3 on Si (001)−(2× 1)
M Satta, R Flammini, A Goldoni, A Baraldi, S Lizzit, R Larciprete
Phys. Rev. Lett. 109 (3), 036102 (2012)

Atomic oxygen on graphite: chemical characterization and thermal reduction
R Larciprete, P Lacovig, S Gardonio, A Baraldi, S Lizzit
J. Phys. Chem. C 116 (18), 9900-9908 (2012)

Local electronic structure and density of edge and facet atoms at Rh nanoclusters self-assembled on a graphene template
A Cavallin, M Pozzo, C Africh, A Baraldi, E Vesselli, C Dri, G Comelli, C Dri, G Comelli, R Larciprete, P Lacovig, S Lizzit, D Alfe
ACS Nano 6 (4), 3034-3043 (2012)

Roma 12/10/2021



ANDREA MOSTACCI
Curriculum Vitae

Place **Rome**
Date **22 May 2018**

Part I – General Information

Full Name	**Andrea Mostacci**
Place and date of Birth	[redacted]
Passport Number	[redacted]
Citizenship	Italian
Permanent Address	[redacted]
Mobile Phone Number	[redacted]
E-mail	Andrea.Mostacci@uniroma1.it
Spoken Languages	Italian (mother tongue), English, French (basic knowledge)

Part II – Education

Type	Year	Institution	Notes (Degree, Experience …)
University graduation	1997	Sapienza University of Rome	**Electronic Engineering** degree with a dissertation on "Coupling impedance of pumping holes for LHC beam pipe" - **110/110 cum laude**
Post-graduate studies	1997	European Scientific Institute, Archamps (France)	Joint Universities Accelerator School, Course on **Particle Accelerator Physics**
Post-graduate studies	1999	CERN Accelerator School, Bénodet (France)	Course on **General Accelerator Physics**, Intermediate Level
PhD	2001	Sapienza University of Rome	Applied Electromagnetism and Electro-Physical Science, XIII cycle. Thesis on "**Beam wall interaction in the LHC liner**"
Licensure	1997	Sapienza University of Rome	Licensure for the profession of engineer
Licensure	2013	MIUR Ministry of Education, University and Research	National Academic Qualification as Associate Professor 2012 in Area 02-A1 **Experimental Physics of Fundamental Interactions**
Licensure	2013	MIUR Ministry of Education, University and Research	National Academic Qualification as Associate Professor 2012 in Area 02-B3 **Applied Physics**

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
1/2018	Today	Sapienza University of Rome	**Associate Professor** at the Department of Basic and Applied Science for Engineering (SBAI)
11/2006	12/2017	Sapienza University of Rome	**Assistant Professor** at the Department of Basic and Applied Science for Engineering (SBAI), former Energetics Department
04/2006	10/2006	Sapienza University of Rome	**Researcher** on Accelerator Physics (Co.Co.Co.) at the Department of Basic and Applied Science for Engineering (SBAI), former Energetics Department
04/2002	03/2006	Sapienza University of Rome	**Researcher** on Experimental techniques for accelerators and particle physics (Assegno di Ricerca) at the Department of Basic and Applied Science for Engineering (SBAI), former Energetics Department
04/2008	06/2008	Sapienza University of Rome	Member of the "Research and cultural activity'' working group of the Faculty of Engineering
09/2015	09/2015	Sapienza University of Rome	**Member of the selection board** for the PhD in Accelerator Physics
		Sapienza University of Rome	**Supervisor** of theses in Electronic Engineering, Nuclear Engineering and **assistant supervisor of PhD thesis** in Applied Electromagnetism and Accelerator Physics
		Sapienza University of Rome	**Member of several boards for selection** of research and post-doc grants at the SBAI Department
2011	Today	Sapienza University of Rome	Member of the Professor Board of **Electronic Engineering**
2012	Today	Sapienza University of Rome	Member of the Professor Board of **Electrical Engineering**
2016	Today	Sapienza University of Rome	**Member of Professor Board of the PhD** in Sciences and Technologies for Complex Systems
2004	2009	Sapienza University of Rome	Member of the Professor Board of **Aerospace Engineering**

IIIB – Research Appointments

Coordination of national and international researcher teams

Start	End	Institution	Position
11/2015	Today	Sapienza, University of Rome	**Coordination of Work Package on "Accelerator prototyping and experiments at Test facilities"** (WP12) of the project "Compact European Plasma Accelerator with superior beam quality" (EUPRAXIA); Horizon 2020 grant agreement No 653782
01/2015	Today	INFN-Laboratori Nazionali di Frascati (LNF) Sapienza, University of Rome	**Coordination of diagnostics group** for the linear accelerator of the Compton Gamma Source being built in the Extreme Light Infrastructure for Nuclear Physics (ELI-NP), Magruele (Romania)
05/2002	Today	SBAI Department-Sapienza	**Coordination** of the activity in the **Accelerator Laboratory** (former Accelerator and Detector Lab. of the Energetic Dep.)
2012	2014	SBAI Department-Sapienza	**Coordination of the Work Package "Accelerators: Novel compact particle sources"** (WP6) of the project "Cluster of Research Infrastructures for Synergies in Physics" (CRISP) in the framework of FP7-INFRASTRUCTURES-2011-1
2006	2013	INFN-Laboratori Nazionali di Frascati (LNF)	**Coordination of the data analysis** of all the experiments executed on the SPARC photo injector at the LNF-INFN

Research activity in qualified international institutions

Start	End	Institution	Position
04/2014	07/2014	CERN-Geneva (CH)	**Visiting Scientist** (2 weeks)
07/2013	07/2013	CERN- Geneva (CH)	**Visiting Scientist** (1 month)
08/2002	08/2002	CERN- Geneva (CH)	**Visiting Scientist** (1 month)
05/2001	04/2002	CERN- Geneva (CH)	**Research Fellowship**

Research activity in qualified national institutions

Start	End	Institution	Position
2012	Today	INFN-Roma 1 Section	**Research appointment** renewed yearly on particle accelerators activities
2008	2011	INFN-Laboratori Nazionali di Frascati (LNF)	**Research appointment** renewed yearly on particle accelerators activities
1998	2007	INFN-Laboratori Nazionali di Frascati (LNF)	**Association appointment** renewed yearly on particle accelerators activities
		INFN-Laboratori Nazionali di Frascati (LNF)	**Member of various selection boards** for research and technologist in Accelerator Science

Integration in the Accelerator Physics international community

Start	End	Institution	Position
05/2014	Today	Sapienza, University of Rome	**Governing board of EuroGammaS**, the European Consortium for the delivery of a High Intensity Gamma Beam System to the Extreme Light Infrastructure for Nuclear Physics (ELI-NP)
2008	Today	American Physical Society	**Referee** of Physical Review - Accelerators and Beams (former PRST-AB)
2006	Today	Elsevier	**Referee** of Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment

IIIC – Other Appointments

Start	End	Institution	Position
06/1999	05/2001	CERN- Geneva (CH)	**Doctoral Student**
12/1997	07/1998	CERN- Geneva (CH)	**Technical Student**

Part IV – Teaching experience

IV A – Teaching experience at Sapienza University of Rome

Year	Faculty	Lecture/Course
From 2015-16 to Today	Electrical Engineering (Bachelor degree)	**Physics II** (9 CFU, about 80 students)
	Electronic Engineering (Master degree)	Multidisciplinary Electronic Laboratory (**RF measurement module**, 3 CFU, 40 students)
2014-15	Electrical Engineering (Bachelor degree)	**Physics II** (9 CFU, about 80 students)
	Electronic Engineering (Master degree)	Multidisciplinary Electronic Laboratory (**RF measurement module**, 3 CFU, 30 students)
2013-14	Electrical Engineering (Bachelor degree)	**Physics II** (9 CFU, about 40 students)
	Electronic Engineering (Master degree)	**High Frequency measurement laboratory** (6 CFU, module of the course High Frequency system, 5 students)
2012-13	Electrical Engineering (Bachelor degree)	**Physics II** (9 CFU, about 40 students)
	Electronic Engineering (Master degree)	**High Frequency measurement laboratory** (6 CFU, module of the course High Frequency system, 5 students)
2011-12	Electronic Engineering (Master degree)	**High Frequency measurement laboratory** (6 CFU, module of the course High Frequency system, 5 students)
2009-10	Mechanical Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (3 CFU, about 30 students)
2008-09	Aerospace Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (4 CFU, about 90 students)
2007-08	Aerospace Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (4 CFU, about 90 students)
	Clinical Engineering (Bachelor degree)	**Physics I** (5 CFU, about 80 students)
	Science for Engineering (Master Degree)	**Modern Physics Laboratory** (4 CFU, about 10 students)
2006-07	Aerospace Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (4 CFU, about 90 students)
	Science for Engineering (Master Degree)	**Modern Physics Laboratory** (4 CFU, about 10 students)
2005-06	Aerospace Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (60 hours, about 90 students)

2004-05	Aerospace Engineering (Bachelor degree)	**Laboratory of Experimental Physics** (60 hours, about 90 students)
2003-04	Environmental Engineering (Bachelor degree), Rieti site	**Physics II** (6 CFU, about 20 students)
2002-03	Transportation Engineering (Bachelor degree), Civitavecchia site	**Physics II** (6 CFU, about 10 students)
	Transportation Engineering (Bachelor degree), Civitavecchia site	**Physics I** (6 CFU, about 10 students)

IV B – International University level teaching experience

Year	Place	Lecture/Course
2017-2019	ESI course, Joint University Accelerator School, Archamps (France)	**Introduction to RF**
2014	Accelerator Laboratory, SBAI Department, Sapienza University	**RF measurements**, 1 week intensive course for CERN researchers

Part V - Society memberships, Awards and Honours

Year	Title
From 2013	**Member of SIF** (Italian Physical Society) and EPS (European Physical Society)
September 2014	**Notice for oral communication** at Annual Meeting of the Italian Physical Society: "**Comb beam for particle driven plasma based accelerators**".
May 2001 April 2002	Awarded of **Fellowship** by CERN, Geneva – CH
June 1999 April 2001	Awarded of **Doctoral Student grant** by CERN, Geneva – CH
December 1997 July1998	Awarded of **Technical Student grant** by CERN, Geneva – CH
January 1997	**Winner** (6th classified over 30 positions available) in the competition organized by the INFN for grants for undergraduates, for starting the research activity at the INFN – LNF.
June 2001	**APS/IEEE Student Travel Award** to join the Particle Accelerator Conference 2001, Chicago (USA).
June 2000	**Financial Support for Young Scientists** to join the European Particle Accelerator Conference 2000, Vienna.
March 2009	**Student Fellowship** to join the Particle Accelerator Conference 1999, New York (USA).

Invited Talks

Date	Conference	Title
11/2004	**Care-HHH Workshop** "Beam Dynamics in Future Hadron Colliders and Rapidly Cycling High-Intensity Synchrotrons", CERN, Geneva (Switzerland)	RF coupling impedance measurements versus simulations
06/2011	**China-Italy Bilateral Workshop** "New Advanced Coherent Light Sources'', Beejing (China)	SPARC/SPARX activity at LNF
09/2011	**International Particle Accelerator Conference** (IPAC 2011), San Sebastian (Spain)	Advanced Beam Manipulation Techniques at SPARC FEL Facility
10/2013	**International Seminar** "Advanced Accelerator and Radiation Physics", Adyge State University, Maykop (Russia)	Frontiers in modern accelerator physics
04/2014	**ICFA Workshop** on "Electromagnetic wake fields and impedances in particle accelerators'' Erice, Italy	History and development of bench measurement techniques for impedance evaluation
11/2014	1st Particle Accelerator Components Metrology and Alignment to the Nanometre scale (**PACMAN**) Workshop, CERN, Geneve (Switzerland)	Stretched wire measurements and impedance matching
04/2015	**Advances in X-ray Free-Electron Lasers Instrumentation**, SPIE Optics Optoelectronics, Prague (Czech Republic)	Operational experience on the generation and control of high brightness electron bunch trains at SPARC-LAB
11/2015	**EuCARD-2 XBEAM-XRING-XLINAC** Workshop "Beam Dynamics meets Diagnostics"	Measurements of small impedances
03/2016	**ICFA Workshop** "Physics and Applications of High Brightness Beams", Havana, Cuba	ELI: New frontiers of particle acceleration and radiation sources
08/2017	**IBIC 17** "International Beam Instrumentation Conference", Grand Rapids, USA	Overview of the Diagnostics of the ELI-NP Gamma Beam System: Challenges for the Electron-Photon Interaction Point Diagnostics
09/2017	**ICFA Workshop** on "Impedances and Beam Instabilities in Particle Accelerators", Benevento, Italy	Challenges and Pitfalls for impedance measurements in the lab

Paper awards

The series of Virtual Journals in the physical science are designed by American Institute of Physics and the American Physical Society to highlight papers considered relevant to Nanoscience and Nanotechnology, Ultrafast Science, Biophysics, Quantum Information and Superconductivity.
A publication of A. Mostacci has been selected for Virtual Journal of Ultrafast Science:

> M. Ferrario, **A. Mostacci**, et al., "**Direct measurement of the double emittance minimum in the beam dynamics of the SPARC high-brightness photoinjector**", selected for Virtual Journal of Ultrafast Science, **January 2008** Vol. 7, Issue 1 - High Field Physics.

Part VI - Funding Information

VI A – Grants as **Principal Investigator**

Year	Title	Program	Grant Value
2018	Fondo per il finanziamento delle attività base di ricerca	ANVUR-FABR	3k€
2018	Beam energy measurement in advanced linear particle accelerators for electrons	**Sapienza Research Projects** (Medium Size)	About 13k€
2017	Advanced beam position monitors for the Compton Gamma Source of the Extreme Light Infrastructure	**Sapienza Research Projects** (Medium Size)	About 38k€
2014-16	Plasma based acceleration at SPARC-LAB	**National Scientific Committee V** of INFN (research unit responsible)	About 40k€
2013-16	European FEL Design Study (EuroFEL project)	**National Scientific Committee V** of INFN (research unit responsible)	About 300k€
2012-15	Generation of high brightness electron beams from plasma-based accelerators	**FIRB**-Futuro in Ricerca 2012 (research unit responsible) RBFR12NK5K_002	About 180k€

VI B – Grants as **Investigator**

Year	Title	Program
11/2015	**EUPRAXIA** – Compact European Plasma Accelerator with superior beam quality	**Horizon 2020**
2013	Optimization of a plasma-based short pulse laser amplifier	**Sapienza** Research Projects
2012-14	Cluster of Research Infrastructures for Synergies in Physics (**CRISP** project)	**FP7**-INFRASTRUCTURES
2012	ELI-NP	MIUR-FOE-INFN
2012	EUROFEL	MIUR-FOE-INFN
2012	ELI-NP	MIUR-FOE
2010	Charged particle beams from laser-plasma sources for medical applications	**Sapienza** Research Projects
2008	Innovative nanomaterials and nanostructures for photo-emission and field emission based devices	**FIRB** – Futuro in Ricerca - MIUR
2006	SPARX (phase II)	**FIRB** - MIUR
2004	SPARX (phase I)	**FIRB** - MIUR
2002	SPARC	**FISR** - MIUR
Since 2001	Projects related to particle accelerator	**Sapienza** Research Projects
Since 2001	Projects related to particle accelerator	**National Scientific Committee V** of INFN
Since 2001	Projects related to particle accelerator	**New Techniques of Acceleration** NTA-INFN

Part VII – Research Activities

Keywords	Brief Description
Circular accelerators, Coupling impedance,	The electromagnetic interaction between the beam in a particle accelerator and its surrounding (beam pipe) in a circular accelerator is studied with the coupling impedance. Such interaction can lead to energy losses (longitudinal impedance) or transverse instability (transverse impedance). Applying Electromagnetic theory, A. Mostacci studied several potential impedance source relevant for modern particle accelerators.
LHC liner	The beam pipe foreseen for the Large Hadron Collider (LHC) is rather unconventional. To shield the magnets cold bore from the synchrotron radiation emitted by 7 TeV protons, a beam screen (the so called "liner") has been introduced practically along all the machine. The design of the liner is a compromise among the beam stability issues, the vacuum requirements, the heat load on the cold bore, the electron cloud effects and the realization constraints. Three main potential sources of beam energy losses in the actual LHC liner are important, namely the interaction with the pumping holes, the (saw tooth) surface corrugation and the effect of an azimuthally inhomogeneous metallic beam pipe.
LHC liner Pumping holes	The pumping slots in the beam screen couple the inside of the beam pipe with the external coaxial region, leading to RF power flow with possibly power dissipation on the cold bore. Interference effects between the slots have been studied in details [J75, J76] and analytical estimates for the power dissipated in the cold bore as a function of the slot dimensions (hole width and wall thickness) has been given [J74]. For the actual slots dimensions, the losses were still within the safe limits. Such studies are being revisited in the context the the Future Circular Collider (FCC) studies where the availability of analytical formulae can simplify the design phase.
LHC liner Surface roughness	The artificial roughness (saw tooth corrugation) of the surface foreseen in the final design of the LHC beam pipe allows the propagation of surface waves synchronous with the beam and thus potentially dangerous for its stability. Using a field matching technique and assuming a periodically rough surface, the frequency of such waves is found to be very high (out of the relevant bunch spectrum): it scales with the inverse of the square root of the depth of the corrugation, that is in the range of microns. The potential dangers have been investigated for the nominal LHC bunch intensity [J72, J73].
LHC liner azimuthally inhomogeneous metallic beam pipe	Based on the Green's function approach, the field excited by a beam traveling in a pipe whose resistivity varies with the azimuth (but is constant in the z-axis direction) can be found (semi)analytically for an ultra-relativistic beam by using some approximated boundary conditions (for conductors) [J67].

Impedance studies	Even at relatively low frequencies (in the MHz range) it was found that the image currents do not avoid the low conductivity region (as you would expect in the limit of static solutions), thus implying potentially high power losses due to the longitudinal weldings in the LHC beam screen. Infact, the inner part of the beam screen is covered with a layer of copper (very good conductor) but the weldings have approximately the resistivity of stainless steel (bad conductor) which gives a big contribution to the losses. Numerical studies using the conventional electromagnetic CAD code confirmed such a conclusion. A prototype has been designed and built to experimentally verify the azimuthal distribution of the image currents, through very accurate Q-factor measurements in a coaxial resonator. The measured data confirmed the theoretical predictions. The theoretical environment built to study the LHC liner impedance issues has been subsequently applied to similar problem to give estimations of the impedance contribution in more complicated devices [J42, J52, J61, J65] in order to explain unexpected phenomena (e.g. heat load) suffered by the beam, particularly relevant in cryogenic machines.
RF devices, bead pull measurement,	In the "Accelerators" laboratory at the SBAI department, A. Mostacci designed, built and maintained a test bench to measure electromagnetic field inside closed RF structures (so called "bead-pull" method). Several devices installed in SPARC, the high brightness LINear Accelerator (linac) of Laboratori Nazionali di Frascati (LNF), have been tested in the laboratory [J68, J69]. Those measurements were calibrated to measure not only the field shape, but also the accelerating efficiency of the structure. Typical RF devices measured are deflector [J64, S20], electron gun and accelerating sections [J62] in the 3 to 12 GHz frequency range. The tuning procedure for 6GHz accelerating structures [J39] built at LNF have been defined and applied for the first time in the previously discussed test bench [J33]. The laboratory is equipped also with codes for electromagnetic CAD used both for designing novel devices [J56, J66] and for validating measurements on prototypes. A. Mostacci studied also on the bead-pull measurement theory for non-conventional RF structures.
Coupling impedance, bench measurements, coaxial wire method	Bench measurements nowadays represent an important tool to estimate the coupling impedance of any particle accelerator device. The well-known technique based on the coaxial wire method allows to excite in the device under test a field like the one generated by an ultra-relativistic point charge. The field of a relativistic point charge in the free space (or in a perfectly conducting beam pipe) is a Transverse Electric Magnetic (TEM) wave, namely it has only components transverse to the propagation direction. The amplitude scales inversely with the distance from the propagation axis and phase velocity is equal to the speed of light. The fundamental mode of a coaxial wave guide is a TEM wave as well, with the same amplitude

	dependence and the same propagation constant. Therefore, the excitation due to a relativistic beam in a given Device Under Test (DUT) can be "simulated" by exciting a TEM field by means of a conductor placed along the axis of the structure. With the coaxial wire method, A. Mostacci measured the coupling impedance of many particle accelerator devices of interest of CERN machines such as LHC and its injectors [J71]. A. Mostacci also performed beam experiments at CERN to compare bench measurement with direct beam measurement on the same devices. The coaxial line approach has also been used to bench measured the effect of coating in the secondary emission yield, relevant for LHC electron cloud issues [J70]. More recently the new generation of LHC collimators has been bench measured in order to estimate the coupling impedance and look for possible trapped modes in the moving jaws [J3].
SPARC, machine measurements	Since 2006, A. Mostacci joined SPARC commissioning and operation. SPARC is a high brightness linear accelerator initially conceived to drive proof-of-principle experiments in the generation of radiation with Free Electron Laser (FEL). Nowadays the SPARC accelerator has been upgraded to SPARC_LAB [J37, S06] with the installation of multi TW class lasers, allowing world-class, ground breaking experiments in accelerator and plasma physics as well as interdisciplinary research [J31]. Following the time line of the SPARC_LAB upgrades, the activity can be roughly divided in research on physics of high brightness electron beams, on FEL innovative schemes, on the generation of THz radiation, on novel plasma-based particle acceleration techniques and on Compton effect based radiation sources.
Physics of high brightness beam	Concerning the physics of high brightness electron beam, SPARC measured for the first time the emittance oscillation of beams generated by RF photocathodes [J60, S18], assessing the working point used world-wide in all the FELs based on RF guns. Such result has been possible due to a carefully conducted experiments [J55, S16] and data analysis [J57, S17]. In order to longitudinally compress the electron beam (to increase the bunch current), SPARC introduced and demonstrated the low energy compression (namely “velocity bunching”) properly tuning low energy focusing solenoids [J49, J54, S15], for the first time used there. Such velocity bunched beam exhibit non-negligible energy spread that must be considered in beam measurements [J47, S12] or exploited in to produce radiation [J53, S14] with non-conventional FEL configurations. SPARC high brightness beams are also used to propose and demonstrate novel concepts in beam diagnostics [J18, J20] or medical applications [J26] in electron based radiotherapy.
Free Electron Laser	SPARC contributed to develop and test innovative ideas on Free Electron Laser schemes which have been afterword applied in bigger FEL facilities; such results have possible also to extensive benchmarking of code against experiments [J51] and innovative diagnostics [J23]. For instance, SPARC

	introduced the undulator tapering to compensate energy spread [J45, S10, J53, S14] or demonstrated the generation of a super radiant pulse in the long radiator of a single stage cascaded FEL, by seeding the modulator with an external laser. Seeded FELs can operate either in the amplifier "direct seeding" scheme [J24, J48, S13], or in the high gain harmonic generation configuration [J44, S09], where the seed in a first undulator (modulator) is used to induce an energy-density modulation in the electron beam longitudinal phase space. This bunched beam then emits a higher order harmonics in a following undulator (radiator). This scheme can be repeated in a multiple stage cascade of modulators and radiators, extending the operation wavelength toward a range where seed sources are not available [J36, S05]. The versatility of the SPARC linac allowed also to send a train of bunches in the FEL undulator, resulting in a two colour FEL radiation [J32, S03], time modulated FEL radiation [J34, S04] and seeded two colours radiation [J21, S02]. Also, this scheme was pioneered at SPARC and it is now used in several other laboratories for pump-probe FEL experiments.
THz radiation	The generation of THz radiation at SPARC relies on the usage of sub-ps high brightness electron bunches when a broadband radiation is needed [J41], while longitudinally modulated electron beams allow for tunable narrow-band radiation [J22]. The generation is quite efficient since the velocity bunching imposes a longitudinal phase space distortion, leading to asymmetric current profiles with sharp rising charge distribution at the bunch head; therefore, high frequency (THz) radiation can be emitted if the bunch goes across a radiator (coherent transition radiation) [J17]. The resulting THz radiation is more intense than other sources and it has been used for advanced material studies [J16, S01].
Laser-plasma accelerators, CRISP project, FIRB project, Eupraxia project	Plasma-based accelerators represent the new frontier for the acceleration of high quality, i.e. high brightness, electron beams because of their capability to sustain extremely large accelerating gradients. In conventional Radio-Frequency (RF) linear accelerators, accelerating gradients are currently limited to ~100 MV/m, mainly due to breakdown occurring on the metallic walls of the devices. Ionized plasmas, however, can sustain electron plasma waves with electric fields three orders of magnitude higher than those achievable with actual RF technologies. Moreover, the accelerating field strength is tunable by adjusting the plasma density. Even though the principle of plasma-based acceleration has been proven by several groups, the so accelerated beams still suffer from large angular divergence, large energy spread [J40, S08], poor reproducibility, which prevent their use as an alternative to conventional RF accelerators which typically provide stable and high quality electron beams. A possible solution is to use innovative transport lines based on conventional technology, such quadrupole or solenoid based transport lines arranged in a clever way [J4, J46, S11]. Another approach towards plasma-accelerated high-brightness electron beams relies on the use of the plasma only as the active media, injecting electrons into a pre-formed

	plasma channel. A first scheme consists in injecting a witness electron bunch in a plasma where the plasma wave is excited by a high-power laser pulse, i.e. external injection in a Laser Wake Field Accelerator (LWFA) [J10, J27, J11]. The second scheme relies on the induction of coherent plasma oscillations with multiple electron bunches, that is a resonant Plasma Wake Field Accelerator (PWFA). Such idea relies on using a comb beam, i.e. a train of equidistant bunches, to increase the accelerating gradient. A scheme to produce comb-like beams was conceived at Laboratori Nazionali di Frascati and successfully tested at SPARC for the first time [J13, J25]. The additional benefit of resonant PWFA relies on the use of lower charge bunches in the train with respect to traditional PWFA, with the advantage of a better control of acceleration and transport [J6]. The proof of principle experiments of resonant wake field acceleration triggered improvements in the plasma generation schemes [J28], in active plasma lens for symmetric beam focusing [J2], in the SPARC synchronisation [J15], in standard bunch measurement [J8, J35] as well as in non-intercepting beam diagnostics [J29]; also, the betatron radiation emitted by electron moving in the plamsa channel can be used [J19]. Efforts are ongoing also in measurement the plasma channel properties with spectroscopic [J5, J9] and opto-acoustic [J14] methods. Moreover, to support the plasma source commissioning, simplified (but accurate) models are necessary to properly choose the machine working point. Those models, before being used, must be assessed against accurate Particle In Cell simulation [J30].
Compton Sources ELI-NP	High brightness linacs are used also in Gamma ray source based on Compton back scattering between electron and counter-propagating laser pulses. A possible design has been proposed in [J38, S07] investigating the bam dynamics as well as the issues due to the necessity of multi-bunch operation to increase the luminosity. A single bunch, proof of principle experiment has been done at SPARC_LAB [J12]. The Gamma Beam Source according to [J38, S07] is being built in Romania under the ELI-NP project supported by EU. One of the most relevant issues is the need of multi-bunch, high charge beams affecting the design and the operation of accelerating structures [J1] and diagnostics [J7].
Medical applications Hadroterapy, post-acceleration,	Hadroterapy protons are typically produced with Radio Frequency quadrupoles and then delivered to the patient with circular accelerators (even if recently hospital proton linacs are under construction). Few tens of MeV protons can also be produced with high energy laser pulse hitting a target; such scheme has interesting feature in terms of beam properties, versatility and compactness. In order to improve the beam properties up to medical requirements [J43, J50] proposed a post acceleration scheme based on modified hospital proton linac cavities.

Montecarlo, FLUKA	A. Mostacci has been involved in the design of particle detectors for biomedicine, joining the research on Treatment Planning Systems (TPS) for tumour hadroterapy with carbon ions [J59] using Monte Carlo techniques (FLUKA code, [J58]); he was involved in the FLUKA collaboration on the optics module in order to calibrate the simulations against measurements on Compton chamber for Single Photon Emission Computed Tomography [J63, S19].

Part VIII – Summary of Scientific Achievements

The scientific activity quality parameters computed on the whole scientific production are:

Product Type	Number	Data Base	Start	End
Papers (Journals and conferences)	193	SCOPUS	1997	2017

Total Citations	**1272** (SCOPUS)
Hirsch (H) index	**19** (SCOPUS)

Invited Review Papers

The **International Committee for Future Accelerators (ICFA)** is the reference international panel in accelerator physics and it is chaired by Yong Ho Chin, (KEK, Japan). The ICFA Beam Dynamics Newsletter of December 2016 collects 26 articles on the "Collective Effects in Particle Accelerators", edited by E. Métral (CERN, Switzerland); among them, **A. Mostacci wrote the review contribution on** "**Beam-Coupling Impedance and Wake Field – Bench Measurements".**

List of peer reviewed papers on international Journals (total number 81)

[J1]. L. Sabato, **A. Mostacci**, et al., *Effects of Correlations Between Particle Longitudinal Positions and Vertical Plane on Bunch Length Measurement: a case study on GBS Electron LINAC at ELI-NP*, accepted for publications in Meas. Sci. Technol. (**2017**).

[J2]. P.A. Walker, **A. Mostacci**, et al., *Horizon 2020 EuPRAXIA design study*, Phys.: Conf. Ser. 874, 012029 (2017).

[J3]. A. Marocchino, **A. Mostacci**, et al., *Experimental characterization of the effects induced by passive plasma lens on high brightness electron bunches*, Applied Physics Letters. (**2017**); doi: 10.1063/1.4999010.

[J4]. J. Zhu, **A. Mostacci**, et al., *Misalignment measurement of femtosecond electron bunches with THz repetition rate*, Phys. Rev. Accel. Beams (**2017**); doi: 10.1103/ PhysRevAccelBeams.20.042801.

[J5]. L. Sabato, **A. Mostacci**, et al., *Effects of energy chirp on bunch length measurement in linear accelerator beams*, Meas. Sci. Technol. (**2017**); doi: 10.1088/1361-6501/aa6c8a.

[J6]. D. Alesini, **A. Mostacci**, et al, *Design of high gradient, high repetition rate damped C-band rf structures*, Phys. Rev. Accel. Beams (**2017**); doi: 10.1103/PhysRevAccelBeams. 20.032004.

[J7]. R. Pompili, **A. Mostacci**, et al., *Experimental characterization of active plasma lensing for electron beams*, Applied Physics Letters (**2017**); doi: 10.1063/1.4977894.

[J8]. N. Biancacci, **A. Mostacci**, et al., *Impedance simulations and measurements on the LHC collimators with embedded beam position monitors*, Phys. Rev. ST Accel. Beams (**2017**); doi: 10.1103/PhysRevAccelBeams.20.011003.

[J9]. M. Scisciò, **A. Mostacci**, et al., *Parametric study of transport beam lines for electron beams accelerated by laser-plasma interaction*, Journal of Applied Physics (**2016**); doi: 10.1063/1.4942626.

[J10]. F. Filippi, **A. Mostacci**, et al., *Spectroscopic measurements of plasma emission light for plasma-based acceleration experiments*, Journal of Instrumentation (**2016**); doi: 10.1088/1748-0221/11/09/C09015.

[J11]. E. Chiadroni, **A. Mostacci**, et al., *Beam manipulation for resonant plasma wakefield acceleration*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2017.01.017

[J12]. M. Marongiu, **A. Mostacci**, et al., *Thermal behavior of the optical transition radiation screens for the ELI-NP Compton Gamma source*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.07.040.

[J13]. A. Cianchi, **A. Mostacci**, et al., *Transverse emittance diagnostics for high brightness electron beams*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.11.063

[J14]. F. Filippi, **A. Mostacci**, et al., *Plasma density characterization at SPARC_LAB through Stark broadening of Hydrogen spectral lines*, Nucl. Instrum. Methods Phys. Res. A (**2016)**; doi: 10.1016/j.nima.2016.02.071.

[J15]. A.R. Rossi, **A. Mostacci**, et al., *Stability study for matching in laser driven plasma acceleration*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.02.015

[J16]. F. Bisesto, **A. Mostacci**, et al., *Laser–capillary interaction for the EXIN project*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.01.037.

[J17]. C Vaccarezza, **A. Mostacci**, et al., *The SPARC_LAB Thomson source*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.01.089.

[J18]. R. Pompili, **A. Mostacci**, et al., *Beam manipulation with velocity bunching for PWFA applications*, Nucl. Instrum. Methods Phys. Res. A (**2016**); doi: 10.1016/j.nima.2016.01.061

[J19]. A. Biagioni, **A. Mostacci**, et al., *Electron density measurement in gas discharge plasmas by optical and acoustic methods*, Journal of Instrumentation (**2016**); doi: 10.1088/1748-0221/11/08/C08003.

[J20]. R. Pompili, **A. Mostacci**, et al., *Femtosecond timing-jitter between photo-cathode laser and ultra-short electron bunches by means of hybrid compression*, New Journal of Physics (**2016**); doi: 10.1088/1367-2630/18/8/083033.

[J21]. F. Giorgianni, **A. Mostacci**, et al., *Strong nonlinear terahertz response induced by Dirac surface states in Bi2Se3 topological insulator*, Nature Communications (**2016**); doi: 10.1038/ncomms11421.

[J22]. F. Giorgianni, **A. Mostacci**, et al., *Tailoring of highly intense THz radiation through high brightness electron beams longitudinal manipulation*, Applied Sciences (**2016**); doi: 10.3390/app6020056.

[J23]. A. Cianchi, **A. Mostacci**, et al., *Six-dimensional measurements of trains of high brightness electron bunches*, Phys. Rev. ST Accel. Beams (**2015**); doi: 10.1103 /PhysRevSTAB.18.082 804

[J24]. B. Paroli, **A. Mostacci**, et al., *Coherence properties and diagnostics of betatron radiation emitted by an externally-injected electron beam propagating in a plasma channel,* Nucl. Instr. and Methods in Physics Research B (**2015**); doi: 10.1016/j.nimb.2015.03.070.

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Part IX– Selected Publications (citations according to SCOPUS on 13/12/2017)

		IF	Citations
S01	Giorgianni, F., Chiadroni, E., Rovere, A., Cestelli-Guidi, M., Perucchi, A., Bellaveglia, M., Castellano, M., Di Giovenale, D., Di Pirro, G., Ferrario, M., Pompili, R., Vaccarezza, C., Villa, F., Cianchi, A**.,** **Mostacci, A.**, Petrarca, M., Brahlek, M., Koirala, N., Oh, S., Lupi, S., **Strong nonlinear terahertz response induced by Dirac surface states in Bi2Se3 topological insulator**, Nature Communications (**2016**), DOI: 10.1038/ncomms11421	**11.3**	**10**
S02	Petrillo, V., Anania, M.P., Artioli, M., Bacci, A., Bellaveglia, M., Chiadroni, E., Cianchi, A., Ciocci, F., Dattoli, G., Di Giovenale, D., Di Pirro, G., Ferrario, M., Gatti, G., Giannessi, L., **Mostacci, A.**, Musumeci, P., Petralia, A., Pompili, R., Quattromini, M., Rau, J.V., Ronsivalle, C., Rossi, A.R., Sabia, E., Vaccarezza, C., Villa, F., **Observation of time-domain modulation of free-electron-laser pulses by multipeaked electron-energy spectrum** Physical Review Letters (**2013**), DOI: 10.1103/PhysRevLett.111.114802	**7.65**	**47**
S03	Ferrario, M., Alesini, D., Bacci, A., Bellaveglia, M., Boni, R., Boscolo, M., Castellano, M., Chiadroni, E., Cianchi, A., Cultrera, L., Di Pirro, G., Ficcadenti, L., Filippetto, D., Fusco, V., Gallo, A., Gatti, G., Giannessi, L., Labat, M., Marchetti, B., Marrelli, C., Migliorati, M., **Mostacci, A.**, Pace, E., Palumbo, L., Quattromini, M., Ronsivalle, C., Rossi, A.R., Rosenzweig, J., Serafini, L., Serluca, M., Spataro, B., Vaccarezza, C., Vicario, C., **Experimental demonstration of emittance compensation with velocity bunching** Physical Review Letters (**2010**), DOI: 10.1103/PhysRevLett.104.054801	**7,65**	**100**
S04	Ferrario, M., Alesini, D., Bacci, A., Bellaveglia, M., Boni, R., Boscolo, M., Castellano, M., Catani, L., Chiadroni, E., Cialdi, S., Cianchi, A., Clozza, A., Cultrera, L., Di Pirro, G., Drago, A., Esposito, A., Ficcadenti, L., Filippetto, D., Fusco, V., Gallo, A., Gatti, G., Ghigo, A., Giannessi, L., Ligi, C., Mattioli, M., Migliorati, M., **Mostacci, A.**, Musumeci, P., Pace, E., Palumbo, L., Pellegrino, L., Petrarca, M., Quattromini, M., Ricci, R., Ronsivalle, C., Rosenzweig, J., Rossi, A.R., Sanelli, C., Serafini, L., Serio, M., Sgamma, F., Spataro, B., Tazzioli, F., Tomassini, S., Vaccarezza, C., Vescovi, M., Vicario, C., **Direct measurement of the double mittance minimum in the beam dynamics of the sparc high-brightness photoinjector** Physical Review Letters (**2007**), DOI: 10.1103/PhysRevLett.99.234801	**7.65**	**52**