

Pier Andrea Mandò, born 20/08/1950

Master of Science in Physics, magna cum laude, Univ. of Florence, July 1973
- thesis in experimental nuclear physics at the Technische Universität
Munich where I was gast Forscher for 8 months (grant of the Della Riccia
Foundation) at the Tandem accelerator Laboratory.

1978, Assistant Professor, Faculty of Science, Florence Univ.

1985, Associate Professor of General Physics

Since 2000, **Full Professor** of General Physics - subsequently of Applied
Physics, Florence Univ.

Teaching activity

Several basic and advanced courses for students of Physics, Mathematics,
Biology, Heritage Science.

Applied Physics lectures in Masters of Italian Universities, PhD courses and
International Schools.

Tutor of a few tens of Master Degree students, and of ten PhD students
(theses in Physics and in Heritage Science).

Scientific activity

In the first decade after my MSc I dealt with problems in basic experimental
nuclear physics (spectroscopy of $f_{7/2}$ and $g_{9/2}$ nuclei), working at the
Accelerator Lab at Garching (Munich), at the AV Cyclotron Lab in Milan, at
the electrostatic accelerator laboratories of the Laboratori Nazionali di
Legnaro of the INFN. Since the mid-Eighties, I increasingly engaged with
applications of nuclear techniques to Cultural Heritage and environment,
converting to this purpose an old Van de Graaff accelerator available in the
Physics Dpt. I progressively formed a group of younger researchers, which
soon became a reference point at an international level in those fields.

I also was among the promoters, in 1985, of the installation of a particle
accelerator (AGLAE) in the Laboratoire de Recherche des Musées de France
at the Louvre, which was then inaugurated in 1989; in the following years I
contributed to the development of the laboratory with a close collaboration,
and I was called to be a member of the AGLAE Scientific Committee.

As a result of a number of relevant achievements of my group at the
Florence Physics Dpt. in the previous 15 years, at the beginning of the years
2000 a dedicated laboratory (LABEC, Laboratorio di tecniche nucleari per
l'Ambiente e i Beni Culturali) was formally established in Florence by the
INFN. A Tandem accelerator was purchased by INFN, and installed in the
premises of the new Science Campus of the Florence University. The superior
performance of the new accelerator greatly increased the potentials of the
applications of ion beam techniques for the compositional analysis of
materials, previously developed at the old accelerator. Innovative
methodologies and set-ups (external beams, high-efficiency detection set-
ups, scanning ion microprobe in air), already implemented there, were
significantly upgraded at LABEC. The Tandem also allowed us to open a new
important activity: radiocarbon dating using Accelerator Mass Spectrometry

(AMS), in which, too, my group soon reached a sound international reputation.

Throughout the over 30 years of my activity in applied nuclear physics, I established many collaborations with scholars in the SH area. Just to mention some:

a) with the Universities of Rome and Cassino, with the Vatican Library and with the Medicean Library, to investigate the time evolution in the use of painting materials for illuminations from the Middle Ages to the Renaissance, and other aspects of techniques and materials for the production of ancient codices;

b) with the National Library in Florence, the Berlin Max Planck Institut für WissenschaftsGeschichte and other Italian and foreign scholars, to solve open problems in the chronology of Galileo's undated hand-written notes on the laws of motion. To answer the questions, ion beam analysis was used to detect the ink composition in a large number of undated notes and compare it to the composition detected in dated Galileo's manuscripts (e.g. letters). Ink production at those times was not industrial and its quantitative composition varied from period to period; a number of answers was thus obtained from the comparison;

c) with many archaeologists on questions concerning Etruscan metallurgy (excavations in Southern Tuscany); absolute dating of stratigraphic sequences from Roman to Medieval ages (in Florence downtown); new data from the Bronze Age (excavations in Cyprus, in this case also dealing with methodological aspects of the reliability of radiocarbon dating of bones, by also measuring quality indicators such as the collagen C/N ratio).

The collaboration in the SH field that was perhaps most influential in my career has been the one with art historians and restorers of the **Opificio delle Pietre Dure (OPD)**, the prestigious Research and Conservation Institution of the Italian Ministry of Culture, with whom I established a closer and closer cooperation since the mid-Nineties. Together we performed a large number of analyses, using accelerator-based techniques, on many typologies of artworks, to learn about materials and techniques used in the past, sometimes to investigate authenticity also through the dating, and to help in the decisions to be taken for the conservation interventions. Among the works analysed with accelerator-based techniques, the Rosano Crucifix by Maestro Guglielmo (one of the most ancient examples of Italian painting), the Madonna dei Fusi by Leonardo, the Ritratto Trivulzio by Antonello da Messina, a Madonna col Bambino by Mantegna, drawings on paper by Leonardo and Filippino Lippi, the painted drawings in the Taccuino by Giovannino de' Grassi, parts of the Pala Albergotti by Vasari. In the field of radiocarbon datings, besides the "routine" activity in support of the archaeologists and sometimes also of the art-historians, we first proposed the idea to exploit the so-called "bomb-peak" effect in the years after 1950 to detect possible fakes of modern art. Great echo, also in the media, had e.g. the discovery made in my laboratory that an alleged painting by Fernand Léger was indeed a fake painted after 1959.

But besides the specific applications to case studies, my activity has been since the beginning aimed at developing novel methodologies and instrumentation, and this attitude was gratified by significant acknowledgements from the international community, witnessed in particular by the **award, in 2009, of the IBA Europhysics Prize** - assigned every second year by the European Physical Society to the scientist who made the most important contributions to Applied Nuclear Science and Nuclear Methods - with the motivation:

for outstanding and seminal contributions to the application of the Ion Beam Analysis techniques in the field of Cultural Heritage studies, favouring the birth of a new interdisciplinary research area that brings together scientific and humanistic skills.

The same attitude led to the development of new portable instruments for material composition analysis that we undertook more recently at LABEC, designing and implementing innovative portable XRF (X Ray Fluorescence) systems, to overcome the only limitation of ion beam analysis in the field of Cultural Heritage (i.e., the need of taking the artworks to the accelerator). Compared to the XRF portable systems available from the market when we started this activity, the home-built instruments had a sensitivity largely extended to lower-Z elements (Na, Mg, Al, Si, P), an important improvement for Cultural Heritage issues. Also, a great plus of our most recently developed XRF systems for the representativeness of the results is their operation in a scanning-mode to produce "elemental maps" (i.e. showing the space distribution of the detected elements) which can be thus compared to the optical image of the analysed artwork in order to associate the elements to the different details of the work. One of these systems is now permanently at disposal in the OPD laboratories, others are used for *in-situ* analysis of e.g. wall paintings. Among others, XRF measurement campaigns have been performed in the past few years on frescoes by Giotto in Santa Croce, by Beato Angelico in the Museum of San Marco, by Piero della Francesca in Sansepolcro, and in other sites such as the Archaeological Museum in Naples. At the OPD, paintings by Raffaello (the "Madonna del Granduca", the portrait of a woman "la Muta", the portrait of Leo X with two cardinals), by Leonardo (Adorazione dei Magi), by Botticelli (Sant'Agostino nello Studio), by Simone Martini (a painted Crucifix), by Rogier van der Weyden (Compianto e sepoltura di Cristo), besides some modern art paintings, have been analysed with our XRF system.

In the last few years, during my directorship of the Florence INFN Unit, I strongly fostered the birth of a national network (CHnet), which is now actually coordinating the many activities of the various INFN Structures throughout all Italy in the field of Heritage Science; I also strongly encouraged a close collaboration with other Institutions, CNR and ENEA in particular, in order to further strengthen the overall Italian expertise in Heritage Science.

Papers, conference talks, seminars

Author of about 120 papers on peer-reviewed scientific journals, of many other papers in publications of important impact in the humanistic field, of some contributions as book chapters or entries in encyclopaedias

Invited speaker for plenary talks in about twenty International Conferences

Invited to give tens of scientific seminars, or public lectures to a larger audience, about accelerator techniques applied to Cultural Heritage, in Italy and abroad (Austria, France, Germany, Greece, Slovenia, Spain, Switzerland, UK, USA, Algeria, Egypt, Morocco, Syria, Turkey, United Arab Emirates)

Main organisational and management activities

Principal investigator of several Italian national projects, in the University ("ex-40%", "PRIN") and in the INFN, and of regional ones

Member of the 5th INFN Scientific Committee (1988-1994, and 2000-2005)

From 2008 to 2016, member (appointed by Conferenza Stato-Regioni) in the **Management Committee of the OPD**

In 2009 and 2010, member of the **General Evaluation Panel of CNR**, heading the team of evaluation of all the CNR activities related to "Heritage Science"

Since 2012 up to present, member of the **USIP** (User Selection Panel for Interdisciplinary Research) of the **Laboratori Nazionali di Legnaro of the INFN**

From June 2008 to June 2015, **Director of the Florence Unit of the INFN**

Referee of international research projects

Referee of several scientific journals

Managing editor of EPJ+ (European Physics Journal Plus), Springer Verlag

Member of permanent Conference Committees: European Conf. on Accelerators in Applied Research and Technology (ECAART); Intern. PIXE Conf.

Member of the Accademia delle Arti del Disegno, the most ancient Italian Academy of Fine Arts.

Chairman of the 9th ECAART, Florence 2007, ~200 delegates

Co-chairman of the 11th Intern. Conf. on AMS, Rome 2008, ~300 delegates

Co-chairman of the 13th Intern. Nucl. Phys. Conf., Florence 2013, ~750 delegates

AGOSTINO LANZA – INFN Pavia

Personal Information

- Date of Birth: August 28th, 1957
- Citizenship: Italian

Employment and Education

- 2007 – today: Technologist Director (Dirigente tecnologo) at the Istituto Nazionale di Fisica Nucleare (INFN)
- 2001 – 2006: II-Level Technologist (Primo tecnologo) at the INFN
- 1992 – 2000: Permanent position at the INFN as III-Level Technologist (Tecnologo)
- 1991: VIII-Level Technical Graduate (Tecnico laureato) at the Dipartimento di Fisica Nucleare e Teorica of the Pavia University
- 1988 – 1990: VII-level Technical Graduate (Tecnico laureato) at the Dipartimento di Fisica Nucleare e Teorica of the Pavia University
- 1985 – 1988: Teacher in two Technical High Schools (Istituto Tecnico Industriale and Istituto Professionale di Stato per l'Industria e l'Artigianato)
- 1983: Summer Student at CERN, tutor Hans Jurgen Hilke
- 1981 – 1987: Teacher in the Technical Evening School organized by the Regione Lombardia
- 1981: Degree in Physics at the Pavia University
- 1976: High School Diploma at the Liceo Scientifico "Taramelli" in Pavia

Management and Institutional Positions

- 2017 – today: member of the National Committee for Technological Transfer of INFN (CNTT, Comitato Nazionale Trasferimento Tecnologico)
- 2014 – today: Co-project Manager of the XPR project, the new irradiation facility at Centro Nazionale di Adroterapia Oncologica (CNAO) in Pavia
- 2014 – 2016: Coordinator of the Comitato Paritetico INFN - CAEN for the application of the framework agreement signed between INFN and the CAEN Company
- 2014 – today: Services Coordinator and Steering Group (SG) member of the New Small Wheel (NSW) upgrade project of the ATLAS experiment
- 2013 – 2015: President of the INFN Pavia Committee for the conferment of the local postdoc grants
- 2012 – today: INFN Pavia Coordinator of the V National Scientific Committee (CSN5)
- 2012 – today: Responsible of the Services and Integration Activities of the Fast Tracker (FTK) upgrade project of the ATLAS experiment
- 2011 – today: Pavia Representative in the INFN Technological Transfer organization
- 2005 – today: Services Manager of the ATLAS Muon Spectrometer
- 2004: Chair of the ATLAS Muon committee in charge of drawing up the specification document of the MDT chamber commissioning at CERN
- 2001 – 2004: Technologist Delegate in the Consiglio di Sezione of INFN Pavia
- 1988 – 2001: Manager of the INFN Pavia Electronics Service

Institutional and Educational Activities

- Member of 7 examination boards for the assignment of permanent or temporary research and technical positions at the INFN and the Cabibbo Lab , 1 as President
- Member or President of 11 national and 8 international tender committees
- Reviewer of the Final Design Review (FDR) and the Production Readiness Review (PRR) of the ATLAS Pixel Services, and of the PRR of the LV Power Supplies of the ATLAS LAr calorimeters
- Organizer of 3 INFN national trainings in the field of electronics
- Tutor of 10 degree theses at the Pavia University

Research Experience

ATLAS main activities

- 2013 – today: I joined the ATLAS NSW project, first as member of the Pavia group involved in the construction of the Micromegas detector, and from beginning of 2014 as Services Coordinator and NSW SG member
- 2011 – today: I am involved in the FTK project, from 2011 to 2012 as a designer of the Associative Memory (AM) new mezzanine board, and from 2013 to today as responsible of Services and Integration in USA15
- 2008 – today: I am responsible of the maintenance of the ATLAS MDT, RPC and CSC power supply systems (HV and LV)
- 2005 – 2010: ATLAS Muon Services Manager. From 2008 to 2009 I was responsible of the ATLAS Muon Detector Safety System (DSS)
- 2001 – 2005: I was responsible of the on-chamber services of 116 ATLAS Muon chambers
- 1997 - 2008: I was responsible of the design and production of the MDT HV and LV power systems
- 1997 – 2005: I was responsible of the design, production, test and distribution of the HV hedgehog boards for all the ATLAS MDT chambers

R&D activities

- 2011 – 2013: I was project leader of the R&D APOLLO, funded by the INFN CSN5
- 2007 – 2010: I participated to an R&D on the next generation LV power supplies for the LHC phase 2, funded by the Italian Ministry of Education and Research (MIUR)
- 1991 -1994: I joined the Tracking & Timing (T&T) collaboration, an R&D on the read-out electronics for the Resistive Plate Counter (RPC) detector
- 1990 – 1992: I was project leader of the R&D NEUNET, funded by the INFN CSN5

Electronics Service activities

- 2013 – today: I am involved in two tasks of the framework agreement between the INFN and the Centro Nazionale di Adroterapia Oncologica (CNAO), approved by the INFN Consiglio Direttivo in 2013
- 1993 – 2001: I designed the front-end board and the acquisition systems of the GDH (verification of the Gerasimov-Drell-Hearn sum rule) experiment, taking data at the MAMI accelerator of the Mainz University (Germany)
- 1992 – 1994: I designed the front-end and the read-out electronics of the Radiative Pion Decay (RAPID) experiment, installed at the Paul Scherrer Institute (PSI) in Villigen (Switzerland)

Past activities

- 1992 – 1998: I participated to the Neutrino Oscillation Magnetic Detector (NOMAD) experiment at the CERN SPS, designing the front-end electronics for the lead-glass calorimeter, and the electronics for the calorimeter trigger. I was also responsible for the calorimeter services
- 1988 – 1991: I was involved in the E771 experiment at Fermilab, Batavia (USA), for which I participated to the design of the front-end electronics and to its installation and commissioning
- 1988 – 1993: I worked in the MINI experiment at the INFN Bari, participating to the construction of the RPC-made horizontal telescope to detect backward muons
- 1987 – 1988: I participated to the first phase of the Imaging Cosmic And Rare Underground Signals (ICARUS) experiment
- 1981 – 1987: My first experiment was the Neutron Antineutron Doublet Investigation by Reactor (NADIR), installed at the Laboratorio di Energia Nucleare Applicata (LENA) of the Pavia University by a collaboration among the INFN Pavia, INFN Roma and CESNEF Milano

Publications

- More than 400 publications on international peer-review journals.

Agostino Lanza



PERSONAL INFORMATION

Massimo Alberto Franceschi



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 alberto.franceschi@lnf.infn.it

 <http://www.lnf.infn.it/dtecnica>

Sex Male | Date of birth 23 September 1964 | Nationality Italian

WORK EXPERIENCE

15 Feb 95 - Present

"Dirigente Tecnologo" (Technologist Manager), 2009-present

"Primo Tecnologo" (Senior Technologist), 2005-2008

"Tecnologo" (Technologist), 1995-2005

Istituto Nazionale di Fisica Nucleare - Laboratori Nazionali di Frascati , Frascati (Italy)

Head of Mechanics Design and Construction Department, 1998-2015.

This department (up to 20 people) provides technical (mechanics) support for design, construction and installation of particle physics experiments.

Planning, coordinating and managing the activity of 5 Units composing the Department: Mechanical Design, Metrology, Metal Carpentry, Metal Warehouse, Machine Shop.

Major contribution to INFN particle physics experiments:

DARKSIDE (LNGS)

Engineering Integration of the experiment. Experiment local Coordinator (LNF).

Detectors of the DarkSide program use several innovative techniques to positively identify dark matter signals and to understand and suppress the various backgrounds. These techniques include the use of **argon from underground gas wells** rather than atmospheric sources, to drastically lower the radioactive ³⁹Ar background; an **active neutron veto** to strongly suppress neutron backgrounds; and comprehensive measures to control background sources in the detector and photosensors.

CUORE (LNGS)

Engineering Coordinator in charge to integrate all the sub-systems in an ultra cold (1 ton detector @ 0,01 K) and ultra pure (radiation) experiment for Neutrinoless Double Beta Decay study.

In charge of mechanical installations in underground Lab. Experiment local Coordinator (LNF).

OPERA (LNGS)

Project Leader of mechanical structure for target support (mass 1700 t, extra target material 0,4%); LNF responsible for target production (Brick Assembly Machine: 200.000 "bricks" in 1.5 years).

LHCb (CERN)

Designing the mechanical support structure of 5 Muon Stations (450 m², 6400 kg, radiation length <0,04 X₀ for first station, 1 mm precision).

ATLAS (CERN)

Overseeing design, construction and commissioning of an automatic machine for wiring the tubes for Muon Chambers (30.00 units production, 100 units/day, precision 20micron); designing a transportation system for road transfer from LNF to CERN for assembled chambers.

KLOE (LNF)

Responsible engineer for design, construction and installation of all the mechanical parts of the experiment: Iron Yoke (mass 800 t), EMC Endwall (4 modules, mass 10 t each), EMC Barrel (24 modules, mass 4 t each). Coordinating roll-in (15 m), uplift (1.4 m) and aligning (precision 1 mm) of the whole experiment (mass 1000 t, size 8 m x 13 m x 10 m).

- 1 Jun 93 - 19 Dec 94 **Guest Engineer**
Fermi National Accelerator Laboratory , Chicago (USA)
 Working in Research Division/Collider Detector Department for **CDF** experiment:

SVX II Silicon Detector
 Mechanical design of whole detector, thermal and structural FEM analysis;
 mechanical and fluid dynamic design of Be bulkhead, thermal and fluid dynamics tests.

SVX' Silicon Detector
 Cooling system construction, test and installation;
 detector installation inside CDF experiment (supervised by Joe Incandela).

- 5 Feb 93 - 31 May 93 **Independent Consultant**
Istituto Nazionale di Fisica Nucleare - Sezione di Pisa , Pisa (Italy)
 Engineering and designing (CAE/CAD) for particle physics experiments: **CDF , VIRGO**.

- 4 Jan 93 - 4 Feb 93 **Independent Consultant**
Università "La Sapienza" - Mechanics and Aeronautics Department , Roma (Italy)
 Fluid dynamics measures: Laser Doppler Anemometry, Particle Image Velocimetry.

- 3 Oct 91 - 3 Jan 93 **"Sottotenente - Genio Aeronautico" (Liutenant - Aeronautical Engineering)**
Aeronautica Militare (Italian Air Force) , Amendola (Foggia) (Italy)
 Managing Maintenance Dept. Personnel (40 people) in absence of Dept. Commander;
 teaching aerodynamics to trainees flying officers;
 testing technical equipment to be furnished to Italian Air Force.

EDUCATION AND TRAINING ■

- 17 Jun 92 **"Abilitazione professionale" (Qualification to practice as Engineer)**
 Ministero dell'Università e della Ricerca Scientifica e Tecnologica, Roma (Italy)

- 9 Jul 91 **"Laurea: Ingegneria Aeronautica" (Degree: Aerospace Engineering)** 110/110
 Università "La Sapienza", Roma (Italy)

- Jul 83 **"Diploma di Maturità Scientifica" (Scientific High School)** 57/60
 Liceo Scientifico "Amedeo Avogadro", Roma (Italy)

PERSONAL SKILLS ■

Mother tongue(s) Italian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	B2	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
[Common European Framework of Reference for Languages](http://www.cedefop.europa.eu)

Organisational / managerial skills

Excellent leadership, decision making and team managing skills (responsible for teams up to 20 people and coordinator of mechanical engineering in experiments up to 150 people).

Excellent organizational skills with long-term experience in activity planning, personnel training, as well as in maintenance, upgrading and acquisition of technical equipment.

Job-related skills

Solid experience in project managing: preliminary study, design, engineering, analysis, construction and installation.

Direct experience (direction) in installation of big structures and apparatuses in limited and uneasy spaces, dealing also with transport, logistic and safety issues.

Long-term experience in design, analysis, construction, of low mass, high precision mechanical parts.

Massimo Alberto Franceschi

A handwritten signature in black ink, reading "Massimo Alberto Franceschi", written in a cursive style.

CURRICULUM VITAE di ELEONORA LUPPI

- nata a Ferrara il 27 giugno 1958;
- laureata in Fisica presso l'Università di Ferrara nel 1981, con lode;
- titolare di una borsa di studio della Comunità Europea dal 1982 al 1983;
- membro del Gruppo di Ricerca in Fisica delle Alte Energie del Dipartimento di Fisica dell'Università di Ferrara e associata all'INFN, dal 1983;
- professore associato in Fisica Sperimentale presso il Dipartimento di Fisica dell'Università di Ferrara dal 2001 (dal 1 ottobre 2012, Dipartimento di Fisica e Scienze della Terra);
- professore ordinario di Fisica Sperimentale presso il dipartimento di Fisica e Scienze della Terra dell'Università di Ferrara dal 1 febbraio 2016.

1. ATTIVITÀ DI RICERCA - CRONOLOGIA

1980 – 1983: Fisica medica

1983 – 2000: Studio dei fattori di forma dei nucleoni (esperimenti PS170, FENICE, E760, E835)

1986 – 2006: Spettroscopia del charmonio (esperimenti E760, E835, BaBar)

1986 – oggi: sviluppo di rivelatori per esperimenti di fisica delle particelle e ricerca di nuova fisica (esperimenti E760, FENICE, E835, BaBar, LHCb, AXIOMA)

2000 – oggi: Tecnologie di calcolo distribuito per la fisica sperimentale

2002 – oggi: Studio dei decadimenti dei mesoni B (esperimenti BaBar, LHCb)

2006 – oggi: Studio della fisica del Flavour e ricerca di nuova fisica (esperimenti BaBar, LHCb)

2. ATTIVITÀ DI NATURA SCIENTIFICO-ORGANIZZATIVA

Ruoli ricoperti:

- Osservatore nella Commissione Calcolo Nazionale dell'Istituto Nazionale di Fisica Nucleare (INFN) dal 1984 al 1989;
- Membro della Commissione Calcolo Nazionale dell'INFN dal 1989 al 1995;
- Membro del Technical Board di INFN-Grid dal 2000 al 2012;
- Membro dell'Executive Board di INFN-Grid dal 2001 al 2012;
- Membro della Giunta del Dipartimento di Fisica dell'Università di Ferrara dal 2006 al 2009;
- Membro del collegio dei docenti del dottorato in Matematica e Informatica dell'Università di Ferrara dal 2006 al 2010;
- Membro del Consiglio della Ricerca dell'Università di Ferrara dal 2007 al 2012;
- Rappresentante delle aree di Matematica, Fisica e Scienze della Terra nella Commissione tecnica del Consiglio della Ricerca dell'Università di Ferrara dal 2007 al 2011;
- Membro del Computing Steering Committee della collaborazione SuperB dal 2007 al

2013;

- Delegato di Facoltà per l'Internazionalizzazione dal 2008 al 2012;
- Membro del collegio dei docenti del dottorato in Fisica dell'Università di Ferrara dal 2011 a oggi;
- Vice chairman dello Speaker Bureau di SuperB dal 2012 al 2013;
- Delegato del Dipartimento di Fisica e Scienze della Terra nella Commissione Area Internazionale dell'Università di Ferrara dal 2012 al 2015;
- Delegato del Dipartimento di Fisica e Scienze della Terra nella Commissione Mobilità Internazionale dell'Università di Ferrara dal 2012 al 2015;
- Membro della Giunta Del Dipartimento di Fisica e Scienze della Terra dal 2/2013;
- Delegato del Rettore all' Area internazionale dal 9/2014 al 10/2015.
- Delegato del Dipartimento di Fisica e Scienze della Terra per le questioni attinenti all'internazionalizzazione dal 2015.
- Delegato del Rettore per la Valutazione della Qualità della Ricerca dal 2/2016.
- Membro del Consiglio della Ricerca dell'Università di Ferrara dal 2017.
- Chair del Comitato Tecnico Scientifico dell'INFN-CNAF dal 5/2018

Responsabilità scientifica per progetti di ricerca, internazionali e nazionali, che prevedano la revisione tra pari:

- FENICE (LNF): Study of neutron-antineutron production and measurement of the nucleon form factors, 1992-1996 (Responsabile locale)
- INFN-GRID: Special Project to develop Grid services for HEP community, 2000-2012 (Responsabile locale)
- PRIN 2002: Misura di precisione dei fattori di forma scalari e tensoriali nei decadimenti semileptonici dei mesoni K carichi, 2002-2004 (Partecipante)
- BaBar-Grid Project: Distributed Computing for the SLAC BaBar experiment, 2002-2008 (Responsabile Progetto)
- PRIN 2005: Sviluppi tecnologici per esperimenti di alta sensibilità sulla violazione di CP, 2006-2008 (Responsabile Unità)
- SuperB (Cabibbo-Lab): Study of flavour physics at very high intensity collider, 2009-2013 (Responsabile locale)
- INFRA/C3S: Sviluppo di una infrastruttura di calcolo e storage Grid/cloud distribuita, 2013-oggi (Responsabile locale)
- EU-TORUS - Toward an Open Resources Upon Services: Cloud Computing of Environmental Data, 2015 - oggi (Responsabile Unità)

Formazione alla ricerca:

Nel corso degli anni è stata relatrice di oltre 50 tesi di laurea e di 12 tesi di dottorato e responsabile scientifico di 4 borsisti e 7 assegnisti di ricerca, sia per attività di sviluppo di rivelatori e tecnologie innovative per la fisica sperimentale, sia per attività di analisi dati.

Guida dagli anni 90 il gruppo di ricerca di Ferrara nel campo del calcolo per la fisica delle alte energie.

Laureandi, dottorandi e assegnisti di cui ha seguito l'attività di ricerca lavorano in

importanti università e istituzioni in Italia e in Europa (INFN, GARR, CERN, Cambridge, Brema, UN-HCR...) o in aziende di alto profilo.

Trasferimento tecnologico:

- Tutor scientifico di una borsa di studio (Consorzio Spinner, dr. A. Beccati) di trasferimento tecnologico per un progetto di dosimetria con accesso su rete geografica (DBI) - 2003
- Tutor scientifico di un progetto di spin-off per una idea imprenditoriale innovativa ad alto contenuto di conoscenza, finanziata dal FSE, per lo sviluppo di servizi informatici automatizzati remoti, utilizzabili dalle unità operative di medicina nucleare e fisica sanitaria, e relativi centri di eccellenza, per la pratica delle terapie radio-metaboliche (METAMED) - 2004
- Referente scientifico per un *Industrial research and development project*, per il finanziamento di una borsa di dottorato da parte della società Meteorological and Environmental Earth Observation - MEEEO S.r.l., per lo sviluppo di un sistema di analisi di dati satellitari per l'estrazione di mappe relative alla concentrazione di particolato per la valutazione della qualità dell'aria dal 2009 al 2011;
- Responsabile scientifico del contratto di ricerca in collaborazione con la società MEEEO S.r.l., per sviluppare un prototipo di sistema per l'implementazione di servizi avanzati di processing e distribuzione on-demand e on-line di dati multi-sensore da telerilevamento (MDDS - Multi-sensor Data Distribution System) – dal 2014 al 2016;
- Co-proponente di una progetto Erasmus+ ("*Capacity-building projects in the field of higher education*") con paesi del sud-est asiatico per l'istituzione di un master internazionale interdisciplinare sul cloud computing per l'analisi di dati ambientali, TORUS – dal 2015.

3. PUBBLICAZIONI E INDICATORI BIBLIOMETRICI

Ha pubblicato, come autore o coautore, oltre 850 articoli su rivista internazionale con revisore; h_index 87 (fonte ISI WoS)

Indicatori bibliometrici secondo i più diffusi database:

Ha inoltre presentato numerose relazioni e relazioni su invito a conferenze e workshop internazionali e nazionali.

4. ATTIVITA' DIDATTICA

Ha svolto, principalmente, la propria attività didattica nell'ambito dei corsi di studio di Fisica e Informatica dell'Università di Ferrara svolgendo corsi di laboratorio di Fisica, trattamento statistico di dati sperimentali e tecnologie di calcolo.

Ruoli di natura organizzativa

- Rappresentante della Facoltà di Scienze Matematiche Fisiche e Naturali nella Commissione Unica di Ateneo, 2009-2012
- delegata all'orientamento del Consiglio Unico dei corsi di Studio in Fisica, 2010-2012

- Membro della commissione bilaterale del corso di laurea magistrale a doppio titolo con l'Università di Paris-Sud, A.A. 2013/14- oggi
- Coordinatore delle Ferrara School of., il percorso di eccellenza che valorizza la formazione degli studenti meritevoli e interessati a svolgere un percorso di studi internazionale, 2013-2015
- Membro della commissione bilaterale del corso di dottorato in Fisica a doppio titolo con l'Accademia delle Scienze di Cracovia, A.A. 2013/14- oggi
- Coordinatore della Laurea Magistrale a doppio titolo in Fisica con l'Università di Paris-Saclay, 1/2015 - oggi

Ha partecipato a numerose commissioni di accesso ai corsi di laurea, di selezione per studenti Erasmus, di laurea, di ammissione ai corsi di dottorato e per gli esami finali di dottorato.

CURRICULUM VITAE

PERSONAL DATA

TROPEA Paola
E-mail: Paola.Tropea@cern.ch

Nationality: Italian
Date of birth: 08/08/1974

SHORT PROFILE

Mechanical engineer with more than 15 years' experience in thermodynamics, fluid mechanics, cooling systems for particle detectors and general infrastructure for large particle physics experiments. Section leader for the Fluidic Systems Section (team of 25 people); project manager for large cooling and infrastructure projects (up to 2 MCHF), direct supervision of physicists, engineers, technicians and students.

PROFESSIONAL EXPERIENCE

Staff at CERN, Experimental Physics Department, Detector Technologies Group (since 2009)

Section leader of the Fluidic Systems section in the Experimental Physics Department since 2015

- Coordination of common activities within the Gas systems & Detector Cooling Projects of the group (15 staff, ~20 students and fellows) serving all CERN experiments (design, construction, operation & maintenance). Setting direction for collaboration between the section projects and the different CERN experiments: M&O agreements, work-packages, budgeting and scheduling.
- Direct supervision of 4 CERN Scientific STAFF (2 engineers, 2 physicists), several fellows, students and technicians.

Project Engineer for particle detector cooling systems:

- Project Leader for the design, construction, installation and testing of the largest CO₂ cooling system ever built, for CMS Pixel Phase I Upgrade, including the design and installation of newly designed (smallest size and highest operating pressure for such application) vacuum insulated transfer lines on the detector. Supervised a team of 2 engineers, 5 technicians, budget of 2 MCHF.
- Participation in R&D projects on CO₂ cooling (operation aspects, material selection, integration aspects); major contribution in shaping the long-term plan for CO₂ cooling activities at CERN, including project organization and resources.
- Project Leader for the design, construction and commissioning of the LHCb Velo upgrade and Upstream Tracker CO₂ cooling systems for LS2 (team of about 6 people, budget of 600 kCHF)

Cooling Coordinator for the CMS experiment:

- Full responsibility for all CMS cooling systems: M&O supervisor, in-field supervision of teams working on detector distribution systems (~20), coordination of external teams in CERN Technical Departments and sub-detectors; validation of design & integration in CMS of all new detector cooling systems; preparation of quality assurance and testing procedures for CERN and outside institutes; performance verification for all new systems.
- Expert consultant for all CMS detector upgrade cooling design (Pixel, ECAL, GEMs, Tracker, HGCALE) and full responsibility for cooling long-term requests to the Technical Departments.

CMS Technical Coordination support:

- Reviewer for major CMS detector Engineering Changes, chair of reviews on Radiation Shielding, member of Cryogenic task force set in 2015 for assessing the CMS superconducting magnet lifetime.
- Engineering support for detector infrastructure activities: dry gas production and distribution systems for detector safety and environmental control, leak detection & monitoring systems for on-detector cooling, integration & feasibility studies for new infrastructure and safety systems.

Experiment Contact Person between CMS and DT

- Represent DT in CMS and entry point for technical requests and feedback from the experiment. Prepared a WP for 2017-2021, defining DT involvement in several M&O and detector upgrade projects. Participate to long term strategy planning for CERN CMS resources.

Fellow at CERN, PH-CMX-DS (2006-2009)

- Project engineer for the CMS Tracker, Pixels and Preshower cooling; coordination of the commissioning of the CMS Tracker cooling plant.
- Responsibility and supervision of contractors for installation and integration works (piping, insulation, mechanical assembly).

Project Associate at CERN, Technical Supp. Department, Cooling & Ventilation Group (2003-2006)

- Technical specification writing, call for tender and contract follow up, from the design to the construction phase of different water and fluorocarbon cooling systems.
- Technical responsible for the contractor building and commissioning the CMS Tracker cooling system.

Engineer-Assistant at EPFL (Ecole Polytechnique Fédérale de Lausanne – 2001-2003)

- Thermo-mechanical testing and Scanning Electron Microscope micro-structure observations of soldered joints and numerical (FEM) simulations to develop a fatigue damage model of lead-free bonding.
- Teaching assistant in Structure Mechanics, Laboratory for Applied Mechanics and Reliability Analysis.

Technical student at CERN, Main Magnet group & Researcher at University of Genova (1998-2001)

- Development of a finite element model (ANSYS) of the superconducting dipoles of the LHC (Large Hadron Collider) and experimental measurements of composite (superconductors-polyimide) material properties.
- Speckle interferometry measurements to evaluate the superconductor displacements on the cross-section of a loaded coil sample.

EDUCATION

2000 Master degree in Mechanical Engineering, University of Genova, Italy

OTHER COMMITMENTS

- Since 2018: Member of the CERN Contract Review Boards
- 2017: Author of the “The Phase-2 Upgrade of the CMS Tracker Technical Design Report”
- Since 2016: Member of the Scientific Committee of the “Laboratorio Subterráneo de Canfranc, Spain”
- Since 2015: Member of the organization committee of the yearly “Forum on Tracking Detector Mechanics”
- 2014 and 2016: Chair of Mechanics and Cooling session at 2nd and 3rd ECFA HL-LHC Workshop
- 2012: Author of the “CMS Technical Design Report for the Pixel Detector Upgrade”
- Contributions to 9 international conferences and 4 peer-reviewed articles
- 2016-2017: Expert reviewer for the LHCb Scintillating Fiber Tracker Cold Box project
- 2015- up to now: organizer of yearly stage program (1 week) for high school students at CERN
- 2011-2016: Referee for 5 LD2IC CERN applicants, external member for selection board
- 2011 up to now: CMS official guide and safety guide
- 2011-12: CMS central shifts and writing of shifter manual for reaction to infrastructure issues
- 2009-2011: CMS representative in the GTPM (Gestion Technique de Panne Majeure) project (LHC experiments and CCC Ti desk)
- 2004-2007: Scientific Secretary of JCOV (Joint Cooling and Ventilation Project for LHC detectors)

LANGUAGES

Italian: mother tongue
English: very good spoken, very good written, working language since 1998
French: very good spoken, very good written, working language since 2001