Massimo Manghisoni

Curriculum of Scientific Activity

Education and Academic Appointments

1997	**Degree in Electronic Engineering** (Summa cum Laude) from the University of Pavia.
1999-2002	**Fellowship (Borsa di studio)** with **STMicroelectronics** and with the **Department of Electronics** of the University of Pavia.
2002-2016	**Assistant Professor of Electronics** (SSD ING-INF/01 Elettronica) at the Department of Engineering and Applied Sciences, University of Bergamo.
2016-2021	**Associate Professor of Electronics** (SSD ING-INF/01 Elettronica) at the Department of Engineering and Applied Sciences, University of Bergamo.
2022-today	**Full Professor of Electronics** (SSD IINF-01/A - Elettronica) at the Department of Engineering and Applied Sciences, University of Bergamo.

Scientific activity

Research activity

The research activity and the scientific area of interest of Massimo Manghisoni are in the field of low-noise devices and integrated circuits for analog signals processing.

After serving in the Italian army from 1998 to 1999 as an officer of the Corps of Engineers, Massimo Manghisoni conducted his research activity within the Electronic Instrumentation group directed by Prof. Valeria Speziali at the University of Pavia, from 1999 to 2002. In 2002 he joined the Microelectronics Group of the University of Bergamo directed by Prof. Valerio Re.

Massimo Manghisoni has carried out, and still carries out, his research activity in the frame of several national projects funded by the Italian Institute for Nuclear Physics (INFN) and by the Italian Ministry for Education, University and Research. He is also involved in international research projects funded, among others, by the European Union (EU), NASA, INFN and Italian Space Agency (ASI). As part of these activities, he has taken on various positions of responsibility as workpackage leader and as local coordinator of the University of Bergamo and INFN Pavia units.

During an almost twenty-year period of research activity, Massimo Manghisoni had the opportunity to collaborate with several international research institutions such as the Fermi National Accelerator Laboratory (FNAL) in Chicago, the Center for European Nuclear Research (CERN) in Geneva, the Deutsches Elektronen-Synchrotron (DESY) in Hamburg, the Max-Planck Institut (MPI) in Munich and the Massachusetts Institute of Technology (MIT) in Boston. Massimo Manghisoni regularly spends periods of work every year in these laboratories, carrying out part of his scientific research activity there and presenting reports on the results obtained.

Massimo Manghisoni is a Technology Research Fellow with INFN and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

The research activity of Massimo Manghisoni, which is documented by more than 200 publications on international scientific journals or international conference proceedings, can be summarised into the following main sectors:

- study and modeling of electronic noise in semiconductor devices;
- electronic instrumentation for noise measurements in electronic devices;
- study and modeling of ionizing radiation damage in semiconductor devices;
- readout electronics for semiconductor detectors in particle tracking;
- MAPS in planar and vertical integration (3D) CMOS technology;
- development of electronics for X-ray imaging at FEL and synchrotron light sources;
- readout electronics for strip detectors in astroparticle physics applications.

The research activity is described in more details in the following.

1. **Study and modeling of electronic noise in semiconductor devices**

   Massimo Manghisoni has studied the evolution of noise sources in the drain and gate currents of bulk CMOS, Fully-Depleted Silicon-On-Insulator (FD-SOI) CMOS devices and of non-planar fin-FET devices belonging to deep submicron and nano-scale technologies. Starting from the 350 nm node down to the 14 nm generation, he has constantly followed the evolution of the scaling of CMOS technologies. The complete list of the processes he has investigated includes the following nodes: 350 nm, 250 nm, 180 nm, 130 nm, 110 nm, 90 nm, 65 nm, 14 nm. Moreover, for the same technology node, he has measured devices belonging to different foundries. The main goal of this activity is to evaluate how scaling down of the CMOS device features may affect the performance of low noise analog circuits. Furthermore, in order to evaluate the performance of non-planar technologies, that are considered as an effective way to extend the scaling roadmap beyond the limitations of bulk CMOS, Massimo Manghisoni has investigated a 14 nm fin-FET technology. For each technology node, he has studied the behavior of the $1/f$ and white noise terms as a function of the device polarity, of the gate length and width and of the current density. In order to comply with low power dissipation constraints, he has characterized devices biased at drain currents from several tens of μA to 1 mA, that is in the weak and moderate inversion regions.

2. **Electronic instrumentation for noise measurements in electronic devices**

   Massimo Manghisoni has designed original electronic instrumentation purposely developed for measurements of the spectral noise density in CMOS and bipolar junction transistors.

3. **Study and modeling of ionizing radiation damage in semiconductor devices**

   Massimo Manghisoni has investigated static and noise degradation effects that are observed in nanoscale bulk CMOS transistors, from the 350 nm to the 65 nm technology node, after the exposure to high levels of Total Ionizing Dose (TID) of X and γ rays. In the frame of this activity, he provided useful hints in the design of low-noise rad-hard CMOS circuits in space, medical and X-ray imaging and high energy physics (HEP) applications. He has also carried out the evaluation of ionizing radiation tolerance in bipolar junction transistors belonging to a Bi-CMOS SOI technology and in junction field-effect transistors (JFET).

4. **Readout electronics for semiconductor detectors in particle tracking**

   This activity has been mainly focused on the use of high density technologies, such as planar and vertical integration CMOS processes, for the design of mixed-signal integrated circuits for the processing of signals delivered by hybrid and monolithic pixels sensors and microstrip silicon detectors, for particle tracking applications.

5. **MAPS in planar and vertical integration (3D) CMOS technology**

   Massimo Manghisoni has been involved in the development of the deep n-well monolithic active pixel sensors (DNW MAPS) in CMOS technologies in the 100-nm regime, in view of applications to detector systems for experiments at high luminosity colliders and for imaging at high data rate. The DNW MAPS approach takes advantage of the properties of triple well structures to lay out a pixel with relatively large area of the charge collecting electrode (as compared to standard three transistor MAPS) and low pitch to meet the severe resolution requirements set by high energy physics applications. In the frame of this activity, Massimo Manghisoni has also investigated 3D integration processes based on vertical interconnection of the active sensor layer and the layer with the signal processing electronics. This solution allows for high density and low material budget interconnections, with the goal of fabricating devices which overcome the present limitations of MAPS and of hybrid pixel detectors. This activity has been carried out in the frame of the 3D-IC consortium hosted by Fermilab.

6. **Development of electronics for X-ray imaging at Free Electron Laser (FEL) and synchrotron light sources facilities**

   This activity was mainly carried out in three projects: one developed in the frame of the DSSC Consortium and funded by the European XFEL GmbH (Germany) and the other two, named PixFEL and XDET, funded by the INFN.

   Massimo Manghisoni is the Bergamo Research Unit coordinator of the DSSC (DEPFET Sensor with Signal Compression) Consortium, that includes several German and Italian institutes: European XFEL GmbH, MPG Halbleiterlabor, PNSensor GmbH, University of Heidelberg, DESY, Politecnico di Milano and University of Bergamo. The DSSC Consortium has developed a Megapixel camera for X-ray imaging at the European X-ray Free Electron Laser (Eu-XFEL) facility in Hamburg. The DSSC detector system is based on Si sensors and is composed of 1024×1024 hexagonal pixels covering a total active area of about 505 cm^2. The pixel array comprises 32 monolithic sensors with 128×256 pixels each. The first Mpixel camera is equipped with miniaturized silicon drift detector (MiniSDD) pixel arrays. For the upgraded version of the camera, which is under development, DEPFET pixel arrays will be used instead. Each sensor is bump-bonded to eight mixed signal readout ASICs. The ASICs are designed using 130 nm CMOS technology and provide full parallel readout of 64×64 sensor pixels having a rectangular shape with a size of 229 μm×204 μm. Each ASIC channel provides signal shaping, analog-to-digital conversion and data storage. In the framework of this project, Massimo Manghisoni took care of the design and characterization of basic building blocks (injection circuit and LVDS driver) to be used for calibration and readout of the imaging DEPFET detector. Furthermore, he took care of the validation procedure of the hybrid bare modules, comprised of a monolithic sensor bump bonded to 8 readout ASIC, for the selection of the good devices to be used for the final camera assembly.

In the frame of the PixFEL and XDET INFN R&D projects, Massimo Manghisoni has been responsible for the INFN-Pavia Research Unit and leader of the work package (WP2) on the design of the analog channel and the fundamental building blocks for the readout of an innovative pixel detector in a 2D X-ray imager. This work is concerned with the design of a readout chip for application to experiments at the next generation X-ray Free Electron Lasers (FEL) and synchrotron light sources. An original result of this work has been the design of a novel active signal compression technique, implemented at the front-end level, by exploiting the non-linear feature of a MOS capacitor in the feedback network of a Charge Sensitive Amplifier. The ASIC has been designed in a 65 nm CMOS technology and consists of 32×32 pixels. Each cell covers an area of 110×110 $\mu\mathrm{m}^2$ and includes a low-noise charge sensitive amplifier (CSA) with dynamic signal compression, a time-variant shaper used to process the preamplifier output signal, a 10-bit successive approximation register (SAR) analog-to-digital converter (ADC) and digital circuitry for channel control and data readout. The readout channel can be operated in such a way to cope with the high frame rate (exceeding 1 MHz) foreseen for future X-ray FEL machines.

7. Readout electronics for strip detectors in astroparticle physics applications

Massimo Manghisoni is currently responsible for the design of the GAPS (General AntiParticle Spectrometer) balloon front-end electronics. GAPS is an international collaboration funded by NASA, INFN, ASI, JAXA, and other research and academic institutions. The scientific goal of the experiment is to detect low-energy cosmic antinuclei since they are considered as a promising indirect signature of dark matter. Massimo Manghisoni has designed a low-noise analog channel in a 180 nm CMOS technology for the readout of the lithium-drifted silicon (Si(Li)) strip detectors that will be used in the tracker of the GAPS experiment. To comply with the severe requirements of the experiment, he has designed original solutions that have been implemented in the channel, such as the dynamic signal compression which extends the input range from 10 keV up to 100 MeV and the capability to operate the channel with an external or an internal trigger. The tracker of the experiment is realized with 10 planes of 12×12 Si(Li) detectors each and is assembled with a modular structure. Each module includes 4 Si(Li) detectors (segmented in 8 strips each), a readout ASIC and a 6 layers, mixed signal PCB. To comply with this structure, the aforementioned channel has been integrated in a 32 channels readout ASIC.

Scientific publications

Massimo Manghisoni is author or coauthor of 262 scientific publications. The full publication list includes:

161 papers on international scientific journals;
100 conference proceedings;
1 book chapter.

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Bibliometric indicators, as extracted from Web of Science:
Entries: 249
Citations: 2071
h-index: 21

Bibliometric indicators, as extracted from Scopus:
Entries: 285
Citations: 2745
h-index: 25

Bibliometric indicators, as extracted from Google Scholar:
Entries: 357
Citations: 7189
h-index: 32

Oral communications at scientific conferences and workshops

Massimo Manghisoni gave 17 oral communications, 6 on invitation, at international peer-reviewed scientific conferences.

2003 "X-ray effects on the noise performances of 0.18 and 0.25 μm CMOS processes for front-end applications", 8^{th} International Conference on Advanced Technology and Particle Physics, Villa Olmo, Como (Italy), 6-10 October, 2003.

2005 "0.13 μm CMOS Technologies for Analog Front-end Circuits in LHC Detector Upgrades", 11^{th} Workshop on Electronics for LHC and future Experiments, 12-16 September, 2005, Heidelberg, Germany.

2005 "Noise Performances of 0.13 μm CMOS Technologies for Detector Front-end Applications", 2005 IEEE Nuclear Science Symposium, October 23-29, 2005, Puerto Rico.

2006 "Resolution Limits in 130 nm and 90 nm CMOS Technologies for Analog Front-end Applications", 2006 IEEE Nuclear Science Symposium, October 29 - November 4, 2006 - San Diego, California.

2007 "Impact of Gate-leakage Current Noise in sub-100 nm CMOS Front-end Electronics", 2007 IEEE Nuclear Science Symposium and Medical Imaging Conference, October 28 - November 3, 2007, Honolulu, Hawaii.

2011 “Noise and radiation hardness of 65 nm CMOS transistors and pixel front-ends”, Topical Workshop on Electronics for Particle Physics 2011, 26-30 September, 2011, Vienna, Austria. **Invited**

2011 “Analog Design Criteria for High-granularity Detector Readout in the 65 nm CMOS Technology”, IEEE 2011 Nuclear Science Symposium, October 23-29, 2011, Valencia, Spain. **Invited**

2011 “Design and tests of pixel readout circuits in 65 nm CMOS”, 8th International Meeting on Front-End Electronics (FEE2011), 24-27 May, 2011, Bergamo, Italy.

2014 “Novel Active Signal Compression in Low-noise Analog Readout at Future XFEL Facilities”, International Workshop on Semiconductor Pixel Detectors for Particles and Imaging (PIXEL2014), 1-5 September, 2014, Niagara Falls, Canada.

2016 “Readout Channel with Dynamic Range Compression for Signal Processing in Applications at Future X-ray FEL”, 10th International Meeting on Front-End Electronics, 30 May-3 June, 2016, Krakow, Poland. **Invited**

2018 “Dynamic Compression of Signals in Charge Sensitive Amplifiers”, 11th International Meeting on Front-End Electronics (FEE2018), Jouvence, Canada, 20-25 May, 2018. **Invited**

2018 “The analog front-end for the Si-Li tracker of the GAPS experiment to search for Dark Matter”, 11th International Meeting on Front-End Electronics (FEE2018), Jouvence, Canada, 20-25 May, 2018. **Invited**

2019 “The Integrated Analog Signal Processor for the Readout of the GAPS Si(Li) Tracker”, 2019 IEEE Nuclear Science Symposium and Medical Imaging Conference, October 26-November 2, 2019, Manchester (UK).

2020 “pSLIDER32 a 32 channels mixed-signal Processor for the GAPS Si(Li) tracker”, 2020 IEEE Nuclear Science Symposium and Medical Imaging Conference, October 31-November 7, 2020, Boston (USA), Online format.

2021 “pSLIDER32 a 32 channels mixed-signal Processor for the GAPS Si(Li) tracker”, International Conference on Technology and Instrumentation in Particle Physics (TIPP 2021), May 24-28, 2021, Online format.

2023 “The SLIDER32 front-end chip for X-ray spectrometry and tracking in the GAPS experiment”, 12th International Meeting on Front-End Electronics (FEE2023), Torino, 12-16 June, 2018. **Invited**

2025 “DTMOS Feedback Network for Dynamic Signal Compression in Low-Noise Charge Amplifier”, 2025 IEEE Nuclear Science Symposium and Medical Imaging Conference, November 1-8, 2025, Yokohama (Japan).

Massimo Manghisoni gave 3 communications, on invitation, at national workshops.

2015 “Hybridization, interconnection advances”, IFD 2015, INFN Workshop on Future Detectors, December 16-18, 2015, Torino, Italy. **Invited**

2018 “Dynamic Compression of Signals in Charge Sensitive Amplifiers”, 2018 IEEE Emilio Gatti and Franco Manfredi Best Ph.D.Thesis Award in Radiation Instrumentation Award Ceremony, December 21st, 2018, Università di Pavia, Italy. **Invited**

2022 “The evolution of the charge amplifier for reading detectors in wide dynamic range applications”, 53rd Annual Meeting of the Associazione Società Italiana di Elettronica (SIE-2022), September 7, 2022, Pizzo (VV), Italy. **Invited**

Responsibility and participation in research projects

Since 2000, Massimo Manghisoni has been working in several projects funded by the Italian Institute for Nuclear Physics (INFN), by the Italian Ministry for Education, University and Research (PRIN projects), by the European Union (EU), by the Italian Space Agency (ASI) and by other international institutions (NASA, JAXA).

In the frame of these activities he has, or has had, **positions of responsibility** for the following national and international projects:

PixFEL (2014-2016) INFN R&D project “Enabling technologies, building blocks and architectures for advanced X-ray pixel cameras at FELs”. Massimo Manghisoni was responsible for the INFN-Pavia Unit and leader of the work package (WP2) on the design of the fundamental building blocks for the readout of a pixel detector in a 2D X-ray imager to be operated at FELs.

XDET (2018-2019) INFN R&D project “Hybrid and monolithic pixel detectors for X-ray imaging at FELs and synchrotron light sources”. Massimo Manghisoni was responsible for the INFN-Pavia Unit and leader of the work package (WP2) addressing the design of the processing chain to be integrated in the monolithic sensor layer and the fabrication of low density, peripheral under-pad TSVs for backside interconnection.

DSSC (2009-2023) International project for the development of the “Large Format X-ray Imager with Mega-Frame Readout Capability based on the DEPFET Active Pixel Sensor”. The project is funded by the European XFEL GmbH (Germany) and includes the following German and Italian institutes: European XFEL GmbH, MPG Halbleiterlabor, PNSensor GmbH, University of Heidelberg, DESY, Politecnico di Milano and University of Bergamo. Massimo Manghisoni is the coordinator of the Bergamo Research Unit, responsible for the validation procedure of the hybrid bare modules to be used for the final assembly of the imaging DEPFET camera at the European XFEL at Deutsches Elektronen-Synchrotron (DESY), Hamburg.

GAPS (2017-today) International project for the development of the “General AntiParticle Spectrometer” that aims to study dark matter through sensitive observations of cosmic-ray antiprotons, antideuterons, and antihelium. The project is funded by NASA, INFN, ASI, JAXA, and other research and academic institutions. The GAPS collaboration includes the following Japanese, US and Italian institutes: Institute of Space and Austronautical Science (ISAS), Japan; Massachusetts Institute of Technology (MIT), Boston, USA; Oak Ridge National Laboratory, USA; University of California, Berkeley, USA; University of California, Los Angeles, USA; University of Hawaii at Manoa, USA, INFN and University of Bergamo. In the frame of the GAPS experiment, Massimo Manghisoni is responsible for the design of the front-end electronics for the readout of the Si(Li) tracker that is at the base of the experiment detection system.

Massimo Manghisoni also participated as a member in the approved and funded projects listed in the following.

Projects funded by the Italian Ministry for Education, University and Research.

PRIN 2003	(2003-2005) “Development of monolithic pixel sensors with integrated electronics”, national coordinator: Prof. Marcello Giorgi, Università di Pisa.
PRIN 2005	(2005-2007) “Development of monolithic active pixel and thin strip detectors for charged particle trackers”, national coordinator: Prof. Marcello Giorgi, Università di Pisa.
PRIN 2007	(2008-2010) “Pixel systems for thin charged particle trackers based on high density microelectronics technologies”, national coordinator: Prof. Marcello Giorgi, Università di Pisa.
PRIN 2009	(2011-2013) “High space-time resolution pixel detection systems”, national coordinator: Prof. Marcello Giorgi, Università di Pisa.

Projects funded by the Italian Institute for Nuclear Physics (INFN).

BEAMON	(2001-2004) INFN Research Project (CSN 5), “A radiation tolerant beam monitor for the Large Hadron Collider”.
BTeV	(2002-2005) INFN Research Project (CSN 1), “Development of the monolithic mixed-signal front-end system for the readout of silicon microstrip detectors in the BTeV experiment”.
ELRAD	(2003-2005) INFN Research Project (CSN 5), “Study of new generation SOI and bulk CMOS technologies for low-noise, rad-hard monolithic front-end electronics”.
P-ILC	(2006-2009) INFN Research Project (CSN 1), “Development of monolithic CMOS active pixel sensors for the vertex detector at the International Linear Collider”.
SLIM5	(2006-2009) INFN Research Project (CSN 5), “Silicon detectors with Low Interaction with Material”.
VIPIX	(2009-2012) INFN Research Project (CSN 5), “Pixel systems for thin charged particle trackers based on vertical integration technologies”.
P-SuperB	(2009-2012) INFN Research Project (CSN 1), “SuperB - Super Flavor Factory”.
CHIPIX65	(2014-2016) INFN Call Project (CSN 5), “Innovative electronics in CMOS 65 nm tecnhnology for a new generation pixel chip at future High Energy Physics colliders” (http://chipix65.to.infn.it).
RD53	(2014-today) CERN R&D Project for the “Development of pixel readout integrated circuits for extreme rate and radiation” (www.cern.ch/RD53).
CMS	(2014-today) member of the CMS collaboration. The Compact Muon Solenoid (CMS) experiment is one of two large general-purpose particle physics detectors built on the Large Hadron Collider (LHC) at CERN.

Projects funded by the European Union (EU).

AIDA	(2011-2015) WP3 (Microelectronics and interconnection technology) in the “Advanced European Infrastructures for Detectors at Accelerators” project, European Call FP7-INFRASTRUCTURES-2010-1. (www.cern.ch/aida)
AIDA-2020	(2015-2020) WP4 (Microelectronics and interconnections) in the “Advanced European Infrastructures for Detectors at Accelerators” project, European Call H2020 INFRAIA-1-2014-2015. (https://aida2020.web.cern.ch)
AIDA-Innova	(2021-2025) WP5 (DMAPS, Depleted Monolithic Active Pixel Sensors) and WP11 (Microelectronics) in the “Advanced European Infrastructures for Detectors at Accelerators - Innova” project, European Call NFRAINNOV-04-2020 Grant Agreement n. 101004761.

Collaboration in industrial research and technology transfer projects

SMART AGING	(2013-214) Project funded by MIUR (Italian Ministry of Education, Universities and Research) “Piattaforma di servizi per acquisizione e elaborazione di dati personali per il prolungamento della vita attiva e il miglioramento del benessere, della cura e della prevenzione nella popolazione anziana”.
SMART BREAK	(2014-2015) Project funded by Regione Lombardia - Smart Cities and Communities (POR FESR 2007-2013 - az. E) “SMART Bialetti Restoration Adaptive Kit” (http://www.smartbreakproject.it).
e-BLACK BOX	(2018-2019) Project funded by: Regione Lombardia (Call Smart Living). “Management of safety and preventive maintenance of lift systems with IoT Technologies”.
TETI	(2021-2023) Project funded by MIUR (Italian Ministry of Education, Universities and Research) in the frame of the PON R&I 2014-2020 program. “Tecnologie innovative per il controllo, il monitoraggio e la sicurezza in mare”.
FALCON	(2021-2022) Research contract, funded by Argonne National Laboratory (ANL), aiming at developing a new pixel detector for X-ray ptychography. The groups at the Universities of Bergamo and Pavia will collaborate with FNAL and Argonne National Laboratory (ANL) to the development of a new readout chip for the FALCON pixel detector. This chip will be designed in a 65 nm CMOS technology. The Bergamo group will have the task to design the analog front-end circuits in the pixel readout cell, collaborating with FNAL and ANL to integrate them in the pixel readout chip.

Reviewer and editor activity for journals, conferences and research projects

Massimo Manghisoni currently serves as a reviewer of the following international journals in the field of microelectronics and instrumentation:

- IEEE Transactions on Nuclear Science;
- IEEE Transactions on Instrumentation and Measurement;
- Journal of Instrumentation (JINST);
- Electronics Letters.

He is in the official reviewer list for the IEEE Nuclear Science Symposium (NSS) international annual conference.

Massimo Manghisoni serves as Associate Editor for the IEEE TNS issue of the 7th International Conference on Advancements in Nuclear Instrumentation Measurement Methods and their Applications (ANIMMA 2021).

He served as a research project evaluator for the following international institutions:

- FWO Fonds Wetenschappelijk Onderzoek, Research Foundation, Brussel (BE);
- SNSF Swiss National Science Foundation, Berne (CH).

International scientific collaborations

During his research activity, Massimo Manghisoni has collaborated with the microelectronic design groups of the following international research institutions:

FNAL	Fermi National Accelerator Laboratory, Chicago, USA;
DESY	Deutsches Elektronen-Synchrotron, Hamburg, Germany;
CERN	Center for european nuclear research, Geneva, Switzerland;
MPI	Max-Planck Institut fur Physik und extraterrestrische Physik, Munich, Germany;
ZITI	Institute of Computer Engineering at Heidelberg University, Heidelberg, Germany.

He has also collaborated with other national and international institutes involved in the design of advanced imaging and radiation detection systems as listed below:

MIT	Massachusetts Institute of Technology, Laboratory of Nuclear Science, USA
FBK	Fondazione Bruno Kessler, Trento, Italy
ORNL	Oak Ridge National Laboratory, Physics Division, Oak Ridge, TN, USA.

Awards

2007 Outstanding Paper Award for the paper: M. Silvestri, S. Gerardin, A. Paccagnella, F. Faccio, L. Gonella, D. Pantano, V. Re, M. Manghisoni, L. Ratti, A. Ranieri, "Channel Hot Carrier Stress on Irradiated 130-nm NMOSFETs: Impact of Bias Conditions During X-ray Exposure", presented at the 9^{th} European Conference on Radiation and Its Effects on Components and Systems (RADECS 2007), Deauville, France, September 10-14 2007.

2011 "Premio Ricerca Scientifica 5×1000" awarded by the University of Bergamo for the paper: M. Manghisoni, L. Gaioni, L. Ratti, V. Re, G. Traversi, "Introducing 65 nm CMOS technology in low-noise read-out of semiconductor detectors", *Nucl. Instrum. Meth.*, vol. 624, pp. 373-378, 2010.

2013 "Premio Ricerca Scientifica 5×1000" awarded by the University of Bergamo for the scientific research activity carried out in 2012.

Workshop organization

2007 **Session Chair** of the Radiation Damage Effects Session in 2007 IEEE Nuclear Science Symposium and Medical Imaging Conference, Oct. 28-Nov. 3 2007, Honolulu, Hawaii.

2011 **Member of the organizing committee** for the 8^{th} International Meeting on Front-End Electronics (FEE2011), Bergamo, May 24-27 2011.

Membership and groups coordination

2001-2020	Scientific Research Fellow with **Italian Institute for Nuclear Physics (INFN)** Sezione di Pavia.
2021-today	Technology Research Fellow with **Italian Institute for Nuclear Physics (INFN)** Sezione di Pavia.
2011-2016	**Member of the Gruppo Italiano di Elettronica (GE)** for the University of Bergamo.
2017-today	**Member of the Società Italiana di Elettronica (SIE)** for the University of Bergamo. Massimo Manghisoni was the coordinator of the Bergamo Research Unit from 2018 to 2023.
2008-today	**Member (2008-2015) and Senior Member (since 2015) of the IEEE** (Institute of Electrical and Electronics Engineers).

Dalmine 10/12/2025