Prof. Luigi Gaioni

CURRICULUM VITAE

__Current Position__

Associate Professor at University of Bergamo, Department of Engineering and Applied Sciences (December 2020-today)

__Previous Positions__

- Assistant Professor at University of Bergamo, Department of Engineering and Applied Sciences (December 2017-November 2020)
- Fellow at University of Bergamo (Jan. 2017 - Nov. 2017, Aug. 2015 - Dec. 2016, Jun. 2014 - May 2015, Jun. 2012 - Sep. 2012)
- Fellow at Italian Institute for Nuclear Physics (INFN), Sezione di Pavia (Sep. 2012 - May 2014, May 2010 - May 2012, Jun. 2006 - Dec. 2006)
- PhD student at University of Pavia, from November 1 2006 to October 31 2009.

__Education__

- December 21, 2005: Master Degree (Summa cum Laude) in Computer Engineering at University of Bergamo
- January 28, 2010: PhD in Microelectronics at University of Pavia

__Scientific publications__

Luigi Gaioni is author or coauthor of more than 100 scientific publications.
Bibliometric indicators (as extracted from Scopus):
Entries: 182
Citations: 1457
h-index: 18

__Research activity__

Luigi Gaioni's main research interests are in the fields of the design of mixed-signal circuits for the readout of radiation detectors, of the characterization of advanced microelectronics processes (mainly CMOS technologies) from the standpoint of electronic noise and ionizing radiation tolerance and of the development of instrumentation for electronic device and circuit characterization.
Luigi Gaioni has contributed to the development of monolithic active pixel sensors (MAPS) matrices in 100-nm regime CMOS technologies, exploiting sparsification techniques and time stamp information at the pixel level. He has been also investigating static and noise degradation effects that are observed in deep submicron CMOS devices after the exposure to high doses of ionizing radiation.

Presently, the research activity of Luigi Gaioni is focused on nanoscale CMOS technologies for the design of front-end electronics for radiation detectors and on the development of readout circuits for the future upgrades of the Large Hadron Collider (LHC) experiments.

__Research projects__

Since 2006, Luigi Gaioni has been working, as a participant, in several projects funded by the Italian Institute for Nuclear Physics (P-ILC, VIPIX, P-SuperB, CHIPIX65) by the Italian Ministry for Education University and Research (PRIN 2007, PRIN 2009) and by the European Union (EUDET - I3, AIDA, AIDA-2020). These projects are mainly focused on the development of pixel detectors for particle tracking.
From 2013 to 2024 Luigi Gaioni has been working in the framework of the international RD53 Collaboration, hosted by CERN, for the development of advanced pixel readout chips for the High-Luminosity (HL) upgrades of CMS. He was the responsible of the analog front-end integration of the pixel readout chips developed by the RD53 collaboration, and member of the Management Board of RD53.
From 2021 to 2023 Luigi Gaioni was head of the Bergamo unit in the INFN Falaphel project (P.I. Fabrizio Palla, INFN Pisa), focused on the system-in-package integration of Silicon Photonics optical devices (high-speed Mach-Zehnder modulators and ring resonator modulators) and high-speed electronics for high rate data transmission in high energy physics experiments.
Luigi Gaioni is currently the principal investigator of the PRIN2022 PiHEX project, focused on the development of front-end channels in a 28 nm CMOS process for pixel detectors in future High Energy physics colliders and advanced X-ray imaging instrumentation.
In the framework of the “Centro Nazionale per la Mobilità Sostenibile” - MOST Spoke 5, Luigi Gaioni is currently responsible of the Work Package 4.1 and of the project EcoBike (Flagship - LINE B), focused on the development of sensor networks supporting light and active mobility.

__Workshops and Conferences Organization__

Convener of the “Analog and Digital" session of the 2012 IEEE Nuclear Science Symposium, Medical Imaging Conference.

__Editorial boards & Editorial Services__

- Editorial Board Member of The Scientific World Journal (section Electronics), 2013-2016
- Reviewer of Journal of Sensors, from 2017
- Reviewer of the 2018 IEEE International Symposium on Circuits and Systems
- Reviewer of Nuclear Instruments and Methods in Physics Research Section A, from 2018
- Reviewer of Journal of Instrumentation, from 2019
- Reviewer of Review of Scientific Instruments, from 2019

- Reviewer of IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, from 2019
- Reviewer of IEEE Transactions on Nuclear Science, from 2021
- Guest-Editor of Electronics (ISSN 2079-9292), special issue “Electronic Noise and Radiation Tolerant Electronics”

__Teaching activity__
Luigi Gaioni is currently responsible for the Courses “Elettronica e Elaborazione Segnali Biomedici”, “Laboratorio di Elettronica”, and “Strumentazione Elettronica” at the University of Bergamo.

Bergamo, 1 dicembre 2025

Luigi Gaioni