

Daniele Passeri

Associate Professor, Ph.D.

Università degli Studi di Perugia

Department of Engineering

☎ Contact: +39 348 1516425

✉ daniele.passeri@unipg.it

Via G. Duranti 93, 06125 Perugia (Italy)



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SHORT CV

- Daniele Passeri was born in Perugia, Italy on December 31, 1967.
- Since 2016 he is Associate Professor of Electronics (IINF-01/A - Electronics) at the University of Perugia, Italy. In August 2018 he received the qualification “National Scientific Endorsement” (ASN) for the Full Professor position (09/03 - ING-INF/01 Electronics).
- The scientific activity of Daniele Passeri has evolved along several main research topics, which are both interconnected and chronologically structured, in particular physical modelling and numerical analysis of semiconductor devices; TCAD numerical modelling of radiation damage effects in semiconductors; VLSI design and characterization of radiation detectors based on active pixel sensors integrated in CMOS sub-micrometer technology and CMOS vertical scale (3D) technology; TCAD numerical modelling of diamond and silicon on diamond (SoD) device/circuits; numerical modelling of amorphous silicon devices; modelling and optimization of Low Gain Avalanche Diodes (LGAD) fabricated in silicon and silicon carbide (SiC).
- Since 2000, Daniele Passeri has been teaching courses in Microelectronics, Nanometer IC CMOS Design, Electronic Devices and Technologies and Digital Electronic Systems.
- He has been tutor/supervisor of more than 150 B.Sc. and M.Sc. degrees students' theses, as well as supervisor and co-supervisor of several Ph.D. students.
- He was involved in leading roles as Principal Investigator or Research Unit Responsible in several Italian and International research projects.
- He was involved in several institutional duties and services, in particular he is Vice Director of the Department of Engineering at the University of Perugia and Rector's sub-delegate for Orientation.
- Since 2017 is IEEE Senior Member. Since 1996 he has been associated with the CERN (European Organization for Nuclear Research) and the INFN (Italian National Institute for Nuclear Physics).
- He is first author or co-author of more than 250 scientific papers, in particular more than 160 papers in peer reviewed Journals and 90 proceedings on International Conferences (Citation 54362; H-index 36; i10-index 118 - source Google Scholar https://scholar.google.com/citations?user=S9EF_4EAAAAJ&hl=it&oi=ao). He has also presented more than 30 papers at International Conferences as invited talks and oral contributions.

BIOGRAPHICAL NOTES and ACADEMIC TITLES

Daniele Passeri was born in Perugia, Italy on December 31, 1967. In March 1994 he received the Laurea Degree in Electronic Engineering from the University of Perugia, Italy with “magna cum laude”. In June, 1994 he was admitted to the Italian Engineers professional association with a score of 100/100. From December 1986 to November 1987 he served in the Italian Army.

- He is currently Associate Professor of Electronics (IINF-01/A - Electronics) at the University of Perugia, Italy.
- He is **Vice Director** of the Department of Engineering and **Rector's sub-delegate for Orientation**.
- In **August 2018** he received the qualification “National Scientific Endorsement” (ASN) for the Full Professor position (09/03 - ING-INF/01 Electronics).
- In **November 2016** he was appointed as **Associate Professor** of Electronics (09/E3 – ING-INF/01) at the Department of Engineering, University of Perugia, Italy.
- In 2012 he received the qualification “National Scientific Endorsement” (ASN) for the Associate Professor position (09/03 - ING-INF/01 Electronics).
- In **November 2000** he was appointed as **Assistant Professor** of Electronics (K01X) at the Department of Electronics and Information Engineering, University of Perugia.
- In November 1998 he won the public competition for a Research Fellowship position at the Faculty of Engineering, University of Perugia, concerning the “Analysis and design of solid state radiation sensors fabricated in low resistivity silicon substrates”.
- In **August 1998** he received the degree of Doctor of Philosophy (**Ph.D.**) in Electrical Engineering from the University of Perugia, Italy, discussing a thesis on “Numerical analysis of microstrip radiation sensors integrated in silicon”.
- Since **1996** he is associated with **CERN** (European Organization for Nuclear Research) and **INFN** (Italian National Institute for Nuclear Physics).

SCIENTIFIC ACTIVITIES

The scientific activity of Daniele Passeri has evolved along several main research topics, which are both interconnected and chronologically structured as described below and summarised in the picture.

1. Physical modeling and numerical analysis of semiconductor devices.
2. Optimization of geometry and fabrication technology of solid state radiation detectors.
3. Numerical modeling of radiation damage effects in semiconductor devices.
4. VLSI design and characterization of radiation detectors based on active pixel sensors integrated in CMOS sub-micron technology.
5. Design and characterization of CMOS VLSI vertical scale integrated circuits (3D IC).
6. Development of an integrated dosimeter for medical application in interventional radiology.
7. TCAD numerical modeling of diamond and silicon on diamond (SoD) device/circuits.
8. TCAD combined bulk and surface radiation damage effects modelling at high fluences/doses.
9. Numerical modelling of Hydrogenated amorphous Silicon (a:Si-H) devices.
10. Modelling and Optimization of Low Gain Avalanche Diode (LGAD) for particle detection.
11. Silicon Carbide (SiC) devices modeling and characterization.

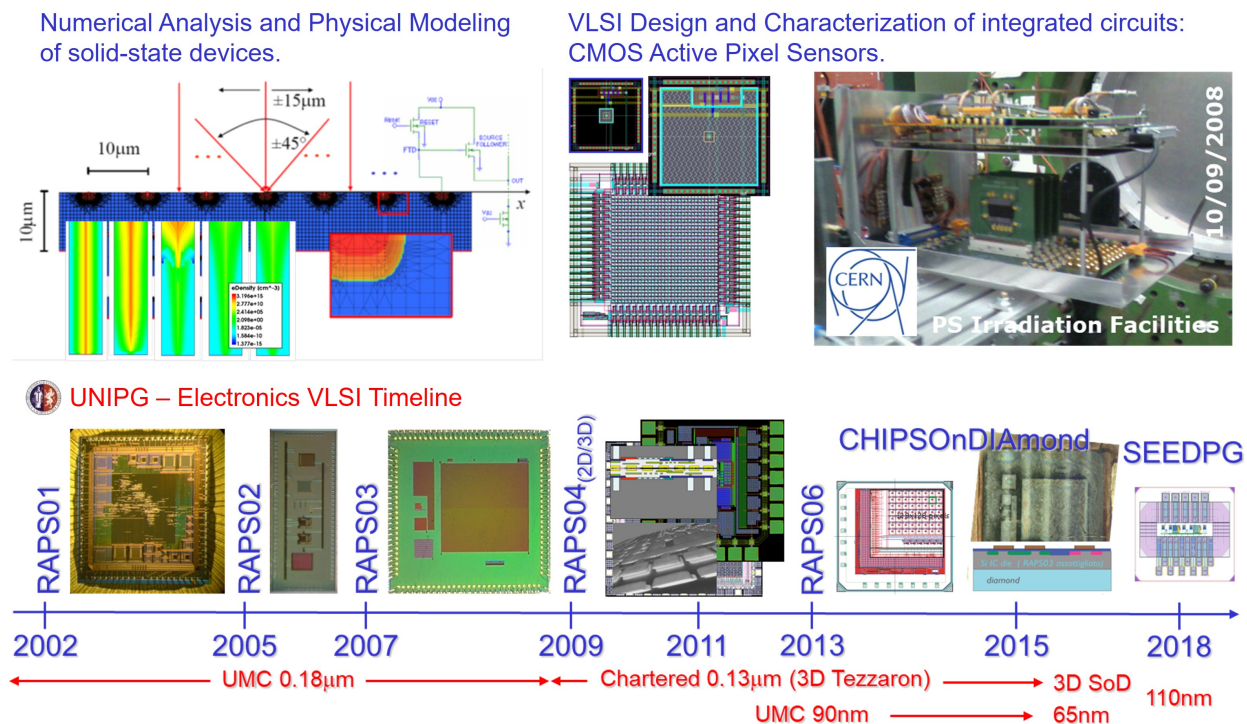


Figure 1: TCAD simulations, CMOS VLSI design and characterization of solid-state radiation sensors: timeline of the fabricated chips.

1. Physical modelling and numerical analysis of semiconductor devices

The first steps of his Ph.D. activities focused on the **numerical analysis and physical modelling of semiconductor devices**, aiming at the development and testing of TCAD simulation tools, mainly at the device level. In particular, in collaboration with researchers from the Universities of Bologna and Trento, he contributed to the development of a simulation program for electrochemical sensors based on electrolyte-insulator-semiconductor structure (EIS). The solution of the characteristic equations of such structures, obtained by appropriate discretization techniques and coupled to the solution of the transport equations in the semiconductor, enabled the analysis of ion-sensitive devices such as **ISFET** (Ion-Sensitive Field Effect Transistor) and **LAPS** (Light Addressable Potentiometric Sensors), and to correlate their transduction characteristics to the fabrication technological parameters.

Afterwards, in collaboration with the **National Institute for Nuclear Physics (INFN)** and with the **European Organization for Nuclear Research (CERN)**, Geneva (Switzerland) he collaborated in the research experiment **Compact Muon Solenoid (CMS)** being defined at **Large Hadron Collider (LHC)** at CERN. In this framework, his work was focused on the extension of numerical analysis techniques, usually applied to "conventional" microelectronic devices, to the analysis of peculiar devices used in High Energy Physics (HEP) experiments, in particular radiation sensors/particle detectors. Indeed, the transduction mechanisms exploited by solid-state particle detectors are not considered in the analysis of standard electronic devices. It has therefore been necessary to develop and adapt specific numerical models to account for the effects of a single ionizing particle interacting with semiconductor devices, with particular attention to the charge generation of a high-energy particle crossing a semiconductor substrate.

2. Optimization of geometry and fabrication technology of solid-state radiation detectors

Within the R&D phase of the CMS experiment, Daniele Passeri has developed a simulation program aiming at the **optimization of the geometry and fabrication technology of solid state radiation detectors** used in the CMS inner tracker. In particular, silicon microstrip detectors were analyzed, by applying numerical modeling techniques to the evaluation of the parasitic components, critical for what concerns the signal/noise ratio, depending on the manufacturing process. The effect of different contact geometries on "critical" electric field have been simulated, aiming at reducing early breakdown effect. Transient simulations were used to model the mechanism of collection of the charge generated by incident radiation using multiple parallel microstrips.

Within this context, he spent several months at the **Centre d'Electronique et de Microtechnique (CSEM)**, Neuchâtel, Switzerland (candidate production center of the detectors used in the CMS) and numerous periods of time at CERN, being involved in the definition and validation of design specifications of the CMS detector. In particular, he was a member of the group whose goal was to analyze and define some geometrical and physical parameters of the detection subsystem of the CMS tracker based on silicon microstrip detectors (CMS Silicon "Task Force"). The outcomes of this activity contributed in defining some design parameters of microstrip sensors of the CMS experiment, as detailed in the CMS Technical Design Report.

He also contributed to the research activities of the international **ROSE collaboration (R & d On Silicon for future Experiments)** whose purpose was to develop integrated silicon particle detectors "radiation resistant", e.g. capable to operate beyond the limits of current devices, providing good performance for a long period (several years) in hostile environments subjected to high fluences/doses of radiation. Actually, the next generation of experiments in High Energy Physics impose the radiation resistance as a primary design concern.

3. Numerical modeling of radiation damage effects in semiconductor devices

An effective **numerical modeling of radiation damage effects in semiconductor devices** has been obtained by introducing deep energy level traps or recombination centers. The net generation/recombination rate within the charge continuity equations have been then properly generalized according to the Shockley-

Read-Hall statistics based on multiple levels. The simulation environment developed, validated through comparison with experimental data, helped to understand the behavior of "irradiated" devices, at the same time allowing a predictive insight within the electrical properties of particle detectors under different environmental conditions and, in particular, in conditions of progressive damage. Further model improvements allowed to model even the direct interaction of deep level defects where a standard SRH statics can no longer be applied and to extend the analysis to non-conventional operating conditions, for example at **cryogenic temperatures** to reduce the effect of radiation damage.

He was a member of the EU Horizon 2020 - CERN AIDA-2020 collaboration (Advanced European Infrastructures for Detectors at Accelerators) as co-responsible of Task WP7.2 (TCAD Simulation). The main outcome was the development of a **combined bulk and surface radiation damage modelling** scheme at device level. More recently, he worked on the further development of the so called "Perugia Radiation Damage Model" toward its application in high fluences environments and for the design and optimization of innovative, 4D tracking devices such as Low Gain Avalanche Diode (LGAD).

4. VLSI design and characterization of radiation detectors based on active pixel sensors integrated in CMOS sub-micron technology

The extensive use of technology CAD (TCAD) tools along with the gained expertise in the field of solid-state radiation sensors merged in the research activity focused on **VLSI design and characterization of radiation detectors based on Active Pixel Sensors integrated in CMOS submicron technology**. This approach represented a breakthrough in the particle detection application, thanks to the possibility of the simultaneous integration on a standard CMOS substrate of the sensitive element and the related local amplification and conditioning electronics (on-pixel). This allows to compensate for the reduced sensitivity of the standard CMOS substrates to the charge generation, when compared to substrates with high resistivity.

The extensive use of technology CAD (TCAD) tools along with the gained expertise in the field of solid-state radiation sensors merged in the research activity focused on **VLSI design and characterization of radiation detectors based on Active Pixel Sensors integrated in CMOS submicron technology**. This approach represented a breakthrough in the particle detection application, thanks to the possibility of the simultaneous integration on a standard CMOS substrate of the sensitive element and the related local amplification and conditioning electronics (on-pixel). This allows to compensate for the reduced sensitivity of the standard CMOS substrates to the charge generation, when compared to substrates with high resistivity.

In this context, Daniele Passeri was the **national coordinator** of the **RAPS** project funded by the National Institute of Nuclear Physics (INFN) - Group V for the years 2001 to 2004 and whose aim was to exploit the progress recently achieved in the CMOS sensor applications in the field of visible radiation, extending their use to the detection of single particles. To this purpose, a proper re-design and optimizing the of the pixel sensing element as a function of specific operational and functional characteristics of the ionizing radiation has been carried out. In particular, it is possible to obtain significant benefits (compared to similar classes of sensors) in terms of resolution and signal / noise ratio by integrating "local" processing electronics associated with each sensor element (pixel). Moreover, the use of commercial advanced CMOS technologies will allow "smart" read-out mode of an entire array of pixels based on innovative architectures specifically dedicated to the detection of individual particles, speeding up the read-out operations with respect to classical schemes used in charge-coupled devices. The first prototype chip was fabricated in spring 2003 in **CMOS UMC 0.18 μ m technology (RAPS01)** and the first test results were particularly encouraging, demonstrating the validity of the principle of revelation and the innovative approach followed. The project was then developed and a second prototype chip was implemented, including advanced reading and operating procedures (RAPS02).

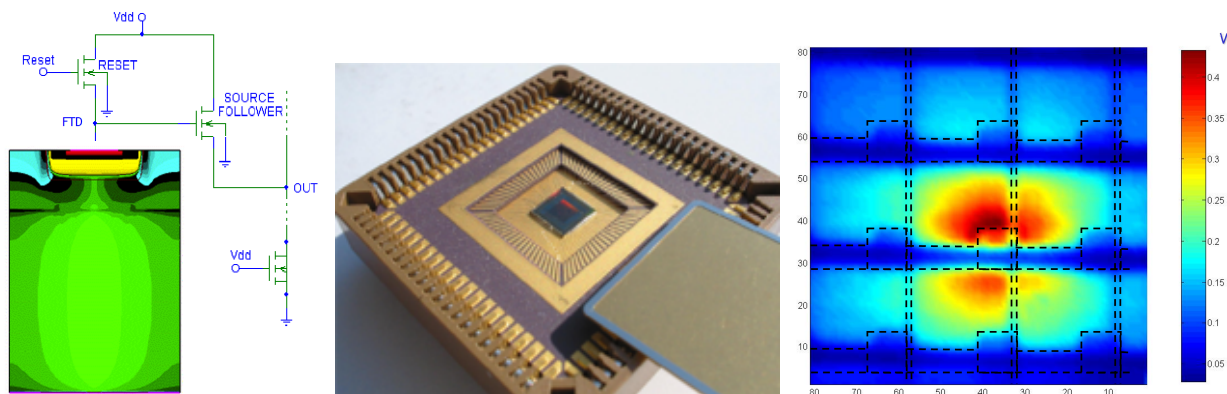


Figure 2: RAPS01 chips: pixel architecture (a), die (b) and IR laser test (c).

Along the same research line, he was **national responsible** of the project **SHARPS** (Self-resetting high-gain Radiation Pixel Sensor) funded by the National Institute of Nuclear Physics (INFN) - V group dealing with the design and implementation of **radiation detectors systems based on matrix of active pixel sensors integrated in CMOS technology**. Innovative architectures of pixel matrices have been proposed and implemented, aiming at the detection of ionizing particles both within HEP experiments than medical "imaging" using soft X-rays. At the same time, the functionality of the third generation of active pixel chip integrated in standard 0.18 μ m CMOS technology (RAPS03) have been evaluated through the development of a sophisticated **optical test-bench based on monochromatic laser at different wavelengths with micrometric focusing and positioning capabilities**. The latter activity in particular has led to a collaboration with **Micron Technology** Italy on related issues, in particular the **characterization of advanced image sensors fabricated in CMOS technology** for visible imaging and the development of a micro-radiographic sensor for medical applications.

5. Design and characterization of CMOS VLSI vertical scale integrated circuits (3D IC)

Afterwards, Daniele Passeri's research interests have focused on the **design of microelectronic devices integrated on a vertical scale**, leveraging the evolution of high-density microelectronic technologies. These technologies have seen a growing interest in vertical interconnection processes in recent years. These processes allow in fact the manufacture of three-dimensional integrated circuits (**3DIC**), which enable an effective addressing of the fundamental problems of "scaling" of the CMOS technologies (length of interconnections, integration density) and to design different layers (tiers) of the integrated circuit according to different criteria, optimized for a specific application (analog layer, digital layer, sensitive layer).

Within this research framework different collaborations have been started, e.g. participating in an international consortium (<http://3dic.fnal.gov/>) led by **Fermi National Accelerator Laboratory (FNAL)** and in a dedicated national project (VIPIX) funded by INFN, in collaboration with the **University of Pavia** and the **University of Bergamo**, aimed at exploiting the potential of this technology for the realization of high-performance multilayer particle sensors, capable to measure both coordinate and direction of the trajectory of a single ionizing particle. In particular, the adoption of the **130nm Tezzaron/Chartered GlobalFoundries** technologies enabled the fabrication of an innovative integrated multi-layers detector based on monolithic active pixel sensors (VIPIX01/RAPS04). The two tiers version of the detector has been tested on the SPS proton beam at CERN. The good results proved the suitability of the innovative approach to the simultaneous detection of a particle position and direction with multi-tier monolithic pixel sensors.

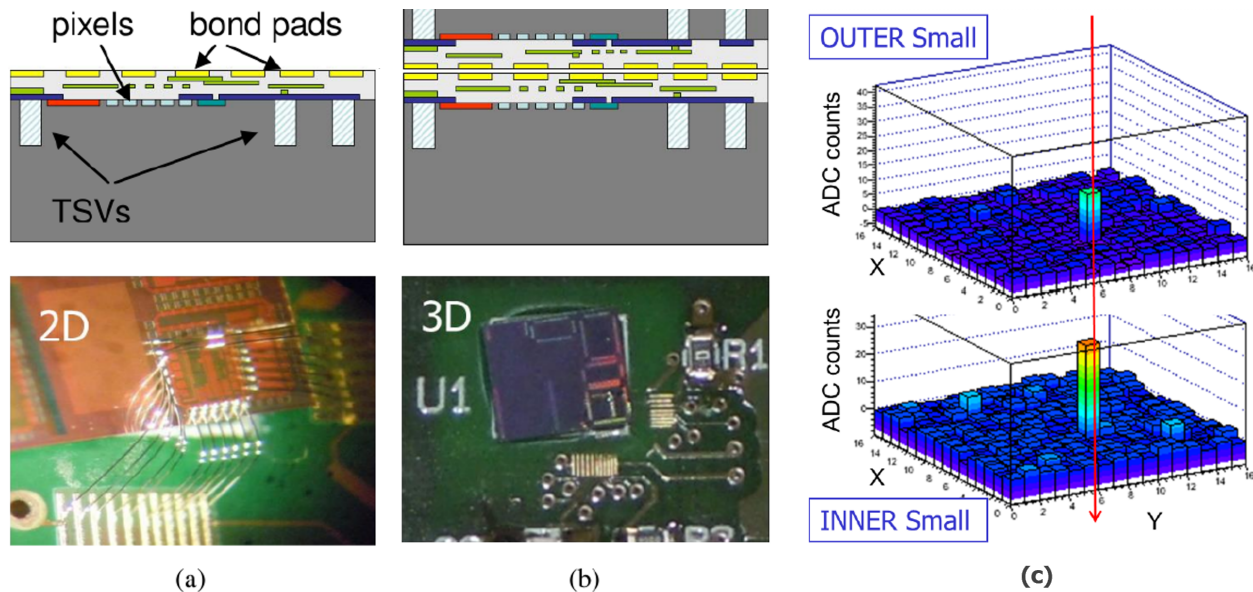


Figure 3: Schematic cross-sections and micro-photos of the different VIPIX structures: (a) 2D, (b) 3D. Responses of the outer and inner layers to the same hit (coincidence responses) (c).

6. Development of an integrated dosimeter for medical applications in interventional radiology

The adoption of CMOS active pixel sensor for the detection of different radiation spectra (e.g. apart from the visible light) fostered the application of this kind of sensors in medical application, in particular within the field of Interventional Radiology. A research activity aiming at the development of an **integrated prototype for individual dosimetry for x-rays** has been started. The added value of such an approach relies on the **real-time measure and transmission of the absorbed dose**. This is of utmost importance for intra-operational radiology, where doctors and operators (beside the patient) undergo long exposure times and therefore high radiation doses. On the long terms, this could result in severe diseases in particular for hands and eyes. The knowledge of the dosimetric information in real-time and over a broader spectrum (lower energies with respect to commercial dosimeters) would enable real-time counter-measurements, efficiently scheduling the different operators and doctors shifts, in any case within the allowed limits-

7. TCAD numerical modeling of diamond and silicon on diamond (SoD) device/circuits

Looking at potential extensions of the commercial TCAD tool applications the research activity of Daniele Passeri is also focused on TCAD modelling and numerical simulation (device/circuit) of **diamond** and **silicon on diamond (SoD)** devices. This innovative class of devices conjugates the excellent stability and biocompatibility properties of synthetic diamond and CMOS VLSI integrated electronics functionalities.

In particular, he contributed to the development of material libraries and simulation methodologies for mono- and poly-crystalline diamond, usually not included within the state-of-the-art commercial TCAD suite tools. Such a tools, once specified and with the new diamond material libraries, can be proficiently exploited for the development of innovative 2D and 3D sensors based on silicon/diamond structure as well as graphitic 3D detectors.

Within the context of different INFN project (**3DSOD** and more recently **3DOSE**), in collaboration with the **University of Firenze** and the **University of Manchester**, different Silicon-on-Diamond (SoD) (CHIPSONDIAMOND) chips have fabricated and tested in laboratory and on particle beam. Thanks to a unique laser bonding procedure, thinned silicon wafer where CMOS active pixel matrices have been integrated and mono- or poly-crystalline diamond substrates can be bonded together. This new kind of devices, conjugating the excellent properties of diamond substrates (carrier mobility, biocompatibility) with

the CMOS electronics peculiar characteristics, drives the research activity towards innovative bio-sensing devices such as pixelated BioFET and Micro Electrode Arrays.

8. TCAD combined bulk and surface radiation damage effects modelling at high fluences/doses

The need for a comprehensive modelling of radiation damage effects on solid-state devices calls for the combination of the displacement damage (bulk effects) as well as ionizing effects (surface damage) typically localized at the silicon-silicon dioxide interfaces. An **advanced model combining oxide charge build-up and interface trap states formation as well as deep-level traps and/or recombination centres** creation for device-level simulations of radiation detectors operating at very high fluences (i.e. above 2×10^{16} 1 MeV neq/cm²) has been developed.

In particular, a surface damage model has been developed by introducing the relevant parameters (oxide trapped charge, interface trap states densities) extracted from experimental measurements carried out on dedicated test structures after gamma irradiation. Moreover, an extended bulk model, by considering impact ionization and deep-level cross-sections variation, was included as well.

9. Numerical modelling of Hydrogenated amorphous Silicon (a-Si-H) devices

Aiming at the extension of commercial TCAD tools application to the analysis and design of non conventional solid-state devices, the research activity of Daniele Passeri recently focused on an innovative **simulation methodology for Hydrogenated amorphous silicon (a-Si:H)**. This material has emerged as an attractive alternative for particle detectors, driven by its high bandgap, which translates to minimal leakage current, and the potential for cost-effective large-area deposition on diverse substrates. Within the Synopsys Sentaurus TCAD a new material has been included, featuring the main parameters of a-Si:H (e.g. band-gap, density of states, e/h creation energy) and an articulated picture of energy of states of defects. Moreover, a **brand-new mobility model**, derived from the Pool- Frenkel one, has been developed and included as external add-on, accounting for the influence on the mobility of the potential/electric field distribution inside the device and of the temperature.

10. Modelling and Optimization of Low Gain Avalanche Diode (LGAD) for particle detection

The development of detectors able to couple position resolution below 10 μm with a timing resolution of about 10 ps (4D detectors) will represent a key aspect in the design of future 4D silicon trackers in HEP experiments beyond the HL-LHC timescale. Thanks to the introduction of controlled low gain and the optimization of the sensor design, the **Low-Gain Avalanche Diode (LGAD)** technology has become one of the choices for building 4D trackers. Indeed, it offers an intrinsic timing resolution of few tens of ps and, being a planar technology, it is accessible by many vendors. The major limitation to its use is radiation damage, manifested as initial acceptor removal, which causes the progressive loss of signal multiplication capability. The design of innovative LGAD devices with the specific constrain of the radiation hardness has been tackled thanks to ad-hoc advanced Technology CAD (TCAD) modelling, accounting for both technological issues, e.g. **sensitivity of the gain layer**, as well as physical aspects such as **different avalanche generation models** and **combined surface and bulk radiation damage effects** modelling at high fluences.

11. Silicon Carbide (SiC) devices modeling and characterization

Silicon Carbide (SiC)'s properties as a wide-bandgap materials offers unique advantages for radiation detection applications, in particular ionizing particle detection in the most harsh irradiation environments. Taking advantage of the rapid development of industrial investment in SiC power electronic devices and the fabrication process on SiC substrates, it is now possible to develop and exploit the latest advancements in SiC processing. Still, some unique features are less studied and known. **SiC has not yet been properly modeled in TCAD**, and many parameters have not been studied. With a displacement energy of 35 eV, it could potentially be more radiation hard than silicon. The high thermal conductivity and very low

dark currents, even after high irradiation fluences, would make cooling of devices unnecessary. The main objective of the research activity is the development, simulation, fabrication and characterization of **Low gain Avalanche Diode in SiC** with a gain layer obtained by **ion implantation** , with performances in terms of efficiency, charge collection, signal-to-noise ratio, and temporal resolution comparable to those of silicon ones or even better.

TEACHING ACTIVITIES

Since his appointment as Assistant Professor in 2000, Daniele Passeri has been teaching courses in Microelectronics, Nanometer IC CMOS Design, Electronic Devices and Technologies and Digital Electronic Systems.

- 2025-26 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica (magistrale)*.
- 2024-25 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica (magistrale)*.
Numerical Simulation of Electronic Devices with TCAD Tools (3 CFU), *Ph.D. in Industrial and Information Engineering*.
- 2023-24 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
Sensors and Microsystems for Cloud Computing (1 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
- 2022-23 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
Sensors and Microsystems for Cloud Computing (3 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
- 2021-22 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
Sensors and Microsystems for Cloud Computing (3 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
- 2020-21 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
Numerical Simulation of Electronic Devices with TCAD Tools (3 CFU), *Ph.D. in Industrial and Information Engineering*.
- 2019-20 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.
- 2018-19 **Tecnologie e Dispositivi Elettronici (6 CFU)**, *L8 - Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), *LM29 - Ingegneria elettronica per l'Internet of Things (magistrale)*.

- 2017-18 **Tecnologie e Dispositivi Elettronici (6 CFU)**, L8 - *Ingegneria informatica ed elettronica*.
Nanometer CMOS IC Design (9 CFU), LM29 - *Ingegneria elettronica per l'Internet of Things (magistrale)*.
- 2015-16 **Microelettronica (9 CFU)**, LM04 - *Ingegneria elettronica e delle telecomunicazioni (magistrale)*.
- 2014-15 **Microelettronica (9 CFU)**, LM04 - *Ingegneria elettronica e delle telecomunicazioni (magistrale)*.
- 2013-14 **Microelettronica (9 CFU)**, LM04 - *Ingegneria elettronica e delle telecomunicazioni (magistrale)*.
- 2012-13 **Microelettronica (9 CFU)**, LM04 - *Ingegneria elettronica e delle telecomunicazioni (magistrale)*.
- 2011-12 **Microelettronica (9 CFU)**, LX031 - *Ingegneria Elettronica e delle Telecomunicazioni – (magistrale)*.
Tecnologie Elettroniche (6 CFU), LX001 - *Ingegneria Informatica ed Elettronica (triennale)*.
- 2010-11 **Microelettronica (9 CFU)**, LX031 - *Ingegneria Elettronica e delle Telecomunicazioni – (magistrale)*.
Tecnologie Elettroniche (6 CFU), LX001 - *Ingegneria Informatica ed Elettronica (triennale)*.
- 2009-10 **Microelettronica (5 CFU)**, LS04 *Ingegneria elettronica (specialistica)*.
Tecnologie Elettroniche (6 CFU), T08A - *Ingegneria informatica ed elettronica (triennale)*.
Sensori Rivelatori e Microsistemi (1 CFU), LS04 - *Ingegneria elettronica (specialistica)*.
- 2008-09 **Microelettronica (5 CFU)**, T08A - *Ingegneria informatica ed elettronica (triennale)*.
Tecnologie Elettroniche (6 CFU), T08A - *Ingegneria informatica ed elettronica (triennale)*.
Sensori Rivelatori e Microsistemi (1 CFU), LS04 - *Ingegneria elettronica (specialistica)*.
- 2007-08 **Microelettronica (5 CFU)**, T08A - *Ingegneria informatica ed elettronica (triennale)*.
Sistemi Ottici Integrati, Master II Livello *Tecnologie Micro e Nanoelettronica (Università di Roma La Sapienza)*.
Elettronica 2, Master II Livello *Progettazione Integrata Sistemi Meccatronici*.
Sensori Rivelatori e Microsistemi (1 CFU), LS04 - *Ingegneria elettronica (specialistica)*.
- 2006-07 **Microelettronica (5 CFU)**, *Ingegneria Informatica ed Elettronica*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Sistemi Elettronici Digitali (4 CFU), *Ingegneria Gestionale (TR)*.

- 2005-06 **Microelettronica (5 CFU)**, *Ingegneria Informatica ed Elettronica*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Elettronica 2, *Scuola S.S.I.S.*.
- 2004-05 **Microelettronica (5 CFU)**, *Ingegneria Informatica ed Elettronica*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
- 2003-04 **Microelettronica (9 CFU)**, *Ingegneria dell'Informazione*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Elettronica Digitale, *Scuola S.S.I.S.*.
Progettazione Elettronica - Corso, *Scuola S.S.I.S.*.
Progettazione Elettronica - Laboratorio Scuola S.S.I.S..
- 2002-03 **Microelettronica (9 CFU)**, *Ingegneria dell'Informazione*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Tecnologie Mat. per l'Elettronica (4 CFU), *Ingegneria dei Materiali (TR)*.
Elettronica Digitale, *Scuola S.S.I.S.*.
Tecnologie Elettroniche, *Scuola S.S.I.S.*.
- 2001-02 **Microelettronica (9 CFU)**, *Ingegneria dell'Informazione*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Tecnologie Mat. per l'Elettronica (4 CFU), *Ingegneria dei Materiali (TR)*.
- 2000-01 **Microelettronica (9 CFU)**, *Ingegneria dell'Informazione*.
Elettronica dei Sistemi Digitali (5 CFU), *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Corso Aziendale Tecnologie Elettroniche, *GA Engineering*.
- 1999-00 **Elettronica dei Sistemi Digitali (5 CFU)**, *Ingegneria Informatica e delle Telecomunicazioni (Orvieto)*.
Microelettronica (Lab Classes).
- 1998-99 **Microelettronica (Lab Classes)**.
Elettronica Applicata I (Lab Classes).

He has been tutor/supervisor of more than 150 B.Sc. and M.Sc. degrees students' theses, as well as **supervisor and co-supervisor** of several **Ph.D. students**, among whom:

- 2007 – 2010 Daniele Biagetti, ***Characterization and development of radiation sensors in CMOS technology***, Università degli Studi di Perugia Dottorato di Ricerca in Ingegneria dell'Informazione XXII ciclo
- 2010 – 2013 Stefano Meroli, ***Silicon pixel detectors for high precision measurements***, Università degli Studi di Perugia Dottorato di Ricerca in Fisica XXV ciclo
- 2014 – 2017 Arianna Morozzi, ***Development and application of state-of-the-art device/circuit level TCAD simulation tools for the optimization of innovative Silicon-on-Diamond (SoD) semiconductor devices***, Università degli Studi di Perugia Dottorato di Ricerca in Ingegneria Industriale e dell'Informazione XXIX Ciclo
- 2018 – 2021 Gabriele Lombardi, ***Development of an X-ray imaging/sensing system for industrial applications***, Università degli Studi di Perugia Dottorato di Ricerca in Ingegneria Industriale e dell'Informazione XXXIII Ciclo
- 2024 – now Tommaso Croci, ***Innovative radiation-hard silicon particle detectors for 4D tracking in future high-energy physics experiments***, Università degli Studi di Padova, Dottorato di Ricerca Nazionale in Technologies for Fundamental Physics and Astronomy XXXIX Ciclo.
- 2025 – now Alessandro Fondacci, ***TCAD design and optimization of silicon sensors for extreme radiation hard environments***, Università degli Studi di Perugia, Dottorato di Ricerca in Fisica XL Ciclo.

INSTITUTIONAL DUTIES AND SERVICES

Daniele Passeri was involved in several institutional duties and services, among which:

- 2025 – now **Vice Director of the Department of Engineering** - University of Perugia.
- 2025 – now **Rector's Sub-Delegate for Orientation** to Bachelor's and Integrated Master's Degree Programmes.
- 2022 – now Technical-Scientific Area Coordinator for the University of Perugia for orientation and guidance of prospective students.
- 2023 – now Member of the Academic Board of the National Ph.D. School in Technologies for Fundamental Physics and Astronomy, Università di Padova
- 2013 – now Member of the Academic Board of the Ph.D. School in Industrial and Information Engineering, Università di Perugia
- 2004 – now Responsible for the TCAD and CMOS VLSI Laboratory at the Dipartimento di Ingegneria, UNIPG.
- 2001 – now EURORACTICE Responsible for UNIPG
- 2019 – 2025 Department of Engineering Deputy for Student's guidance and tutoring.
- 2018 – 2024 Representative for the Research Unit of Perugia within the Società Italiana di Elettronica (SIE)
- 2017 – 2023 EURORACTICE Responsible for the INFN - Perugia
- 2015 – 2018 Scientific Responsible for the collaborations between the Università degli Studi di Perugia and LFoundry S.r.L.

- 2014 – 2016 Researchers' Representative within the restricted Council (Giunta) of the Engineering Department, UNIPG.
- 2008 – 2013 Member of the Academic Board of the Ph.D. School in Information Engineering, Università di Perugia
- 2005 – 2010 Scientific Responsible for the collaborations between the Università degli Studi di Perugia and Micron Technology Italia
- 2001 – 2006 Researchers' Representative at the Consiglio della Facoltà di Ingegneria - UNIPG

Daniele Passeri has been a member of Assistant Professor (RTDa and RTDb) position committees at the following Universities:

- RTDa IINF-01/A "Elettronica", Università di Perugia, Italy, 2024;
- RTDb ING-INF/01 "Elettronica", Università di Padova, Italy, 2023;
- RTDa ING-INF/01 "Elettronica", Università di Parma, Italy, 2023;
- RTDa ING-INF/01 "Elettronica", Università di Parma, Italy, 2021;
- RTDa ING-INF/01 "Elettronica", Università di Parma, Italy, 2018;

He has also been a member of Ph.D. committees for final examination at the following Ph.D. Schools:

- Information Technology, Politecnico di Milano, Italy, 2026
- Information and Communication Technology, Università di Trento, Italy, 2026
- Electrical, Electronics and Communications Engineering, Politecnico di Torino, Italy, 2025
- Physics, Università di Trento, Italy, 2023
- Information and Communication Technology, Università di Trento, Italy, 2017
- Industrial and Information Engineering, Università di Perugia, Italy, 2017

ORGANIZATION, DIRECTION AND MANAGEMENT OF RESEARCH PROJECTS

He was involved in leading roles, as Principal Investigator (**PI**) or research Unit Responsible (**UR**) in several Italian and international research projects, as detailed below (Years / Funding Institution / Project Title / Role / Approx Overall Budget).

- 2026 – Now **INFN Gr. V CALL**, *STaRS Space Time Tracker with Resistive LGAD Sensors*, UR, 760 k€.
- 2022 – 2026 **MUR / PNRR**, *Investimento 1.6 Orientamento attivo nella transizione Scuola Università*, sUR, 250 M€.
- 2019 – 2023 **MIUR / PRIN**, *4DInSide Innovative Silicon Detectors for particle tracking in 4D*, UR, 972 k€.
- 2019 – 2021 **MIUR / POT**, *INGEGNERIA.POT*, UniPG, UR. 2.35 M€
- 2018 – 2021 **INFN Gr. V CALL**, *Timespot TIME and SPace real-time Operating Tracker*, UR, 980 k€.
- 2015 – 2020 **EU Horizon 2020**, *AIDA-2020 Advanced European Infrastructures for Detectors at Accelerators*, Co-responsible Task WP7.2.
- 2015 – 2018 **INFN Gr. V**, *SEED Sensor with Embedded Electronics Development*, UR.
- 2015 – 2016 **UniPG**, *Sviluppo di modelli per la simulazione numerica di sensori di radiazione ad elevatissima fluenza*, PI.
- 2008 – 2012 **INFN Gr. V**, *VIPIX: Vertically Integrated PIXels*, UR.
- 2007 – 2008 **MIUR / PRIN**, *Un tomografo PET per piccoli animali ad altissima risoluzione spaziale basato su fotomoltiplicatori al silicio ad alta granularità*, UR.
- 2005 – 2008 **INFN Gr. V**, *SHARPS: Self-resetting High-gAin Radiation Pixel Sensors*, PI.
- 2001 – 2005 **INFN Gr. V**, *RAPS: Radiation Active Pixel Sensors*, PI.
- 1999 – 2000 **UniPG**, *Caratterizzazione e ottimizzazione della resistenza alla radiazione di rivelatori di particelle in silicio*, PI.

SCIENTIFIC COLLABORATIONS

Daniele Passeri has been a visiting researcher at the European Organisation for Nuclear Research (CERN) in Geneva, Switzerland, since 1996, working in different time slots.

He was and he is still involved in several research collaborations with the Italian Universities of Trento, Bologna, Parma, Pavia, Bergamo, Torino, Firenze and International research Institutions, in particular FNAL (Fermi National Accelerator Laboratory) Batavia, Illinois (USA), DESY (Deutsches Elektronen-Synchrotron) Hamburg (Germany), University of Manchester (UK), University of Wollongong (Australia).

NATIONAL AND INTERNATIONAL RESEARCH AWARDS

- Best oral paper 6th IEEE International Workshop in Sensors and Interfaces IWASI 2015, Gallipoli (Italy) 18-19 June 2015.
- Assipe - Fortronic Design-In Award - IV ed., Padova (Italy), 7-9 maggio 2003 – Mention for the Best Innovative applied research project Radiation Active Pixel Sensor (RAPS).
- 4th prize PicoQuant Application Gallery 2011 - CMOS Active Pixel Sensor chip layout scan with microfocused laser (driver PDL 800-B+ laser head LDH-P-780).

EDITORIAL, ORGANIZING COMMITTEE AND REVIEWER ACTIVITIES

- Associated Editor of IEEE Transactions on Nuclear Science since 2025.
- Guest Editor for 2022 Sensors, Special Issue "CMOS Sensors for Tracking Applications".
- Review Editor for Frontiers in Physics (Editorial Board of Radiation Detectors and Imaging) since 2019.
- Guest Editor for the review Nuclear Instruments and Methods in Physics Research, Section A (NIMA), special issue for the 15th Int. Workshop on Vertex Detection (Vertex 2006).
- Senior Member IEEE (40187080).
- Member of the TPC of the Conference on Ph.D. Research in Microelectronics and Electronics (PRIME) since 2013.
- Member of the LOC VI International Meeting on Front End Electronics (FEE2006), 17 - 20 May 2006, Perugia, Italy.
- Member of the LOC 15th International Workshop on Vertex Detectors (VERTEX2007), 25-29 September 2007, Perugia, Italy.
- Member of the LOC TWEPP 2013 Topical Workshop on Electronics for Particle Physics, 23-27 September 2013 - Perugia, Italy.

Since 2000 he has been serving as a reviewer for several international journals, among which:

- IEEE Transactions on Nuclear Science
- IEEE Electron Device Letters
- IEEE Sensors Journal
- IEEE Transactions on Circuits and Systems
- Sensors and Actuators: A. Physical
- Nuclear Instruments and Methods in Physics Research A
- Journal of Physics D: Applied Physics
- Semiconductor Science and Technology.

INVITED TALKS AND PRESENTATIONS AT INTERNATIONAL CONFERENCES

Invited Talks (IT)

- IT1 D. Passeri, P. Placidi, L. Verducci, F. Moscatelli, P. Ciampolini, G. Matrella, A. Marras, G.M. Bilei, ***Device Simulations of Silicon Detectors: a Design Perspective***, VERTEX 2002, 11th Int. Workshop on Vertex detectors, Kailua-Kona, Hawaii, USA, November 3-8, 2002.
- IT2 D. Biagetti, G.M. Bilei, P. Ciampolini, P. Delfanti, A. Marras, G. Matrella, D. Passeri, P. Placidi, L. Servoli, ***Characterization of Active Pixel Sensor fabricated in CMOS 0.18um technology***, VERTEX 2006 15th International Workshop on Vertex Detectors, San Clemente Perugia, Italy, September 25 - 29, 2006.
- IT3 Passeri D., Servoli L., Meroli S., Placidi P., Marras A., ***2D/3D MAPS in the Tezaron/Chartered Technology: Preliminary Characterization***, 8th Front End Electronics Meeting, Bergamo (Italy), May 24-27, 2011.
- IT4 D. Passeri, ***Electronics for Particle Physics in Perugia***, TWEPP 2013 - Topical Workshop on Electronics for Particle Physics, Perugia (Italy), September 23-27, 2013.
- IT5 D. Passeri, F. Moscatelli, A. Morozzi, ***Modelling radiation damage in TCAD***, VERTEX 2017, 26th Int. Workshop on Vertex detectors, Las Caldas (Spain), September 10-15, 2017.
- IT6 D. Passeri, ***TCAD simulation: an insight instrument for radiation detectors***, IEEE Nuclear and Plasma Science Society, Italy Chapter Award Ceremony Gatti Manfredi PhD Award 2024, Milano, 13 December 2024.

Talks (O)

- O1 B. Fringuelli, D. Passeri, L. Rosi, ***Fuzzy Logic Techniques for an Intelligent Low Cost Thermoregulator System***, Proc. of 4th Low Cost Automation Symposium (LCA), Buenos Aires, Argentina, pp. 97-102, Sept. 13-15, 1995.
- O2 R. Della Marina, D. Passeri, P. Ciampolini, G. M. Bilei, ***Silicon strip detectors for LHC: comprehensive process and device analysis***, 4th International conference on position sensitive detectors (PSD 96), (Manchester, United Kingdom), Sept. 9-13, 1996.
- O3 D. Passeri, P. Ciampolini, G. Bilei, A. Santocchia, ***2D Numerical Modeling of Si Microstrip Detectors under Heavy Radiation-Damage Conditions***, 3rd Int. Conf. on Large Scale Applications and Radiation Hardness of Semiconductor Detectors, (Firenze, Italy), Oct. 1-3, 1997.
- O4 D. Passeri, P. Ciampolini, G. M. Bilei, ***A CAD investigation of depletion mechanisms in irradiated silicon microstrip detectors***, 2nd Int. Conf. on Radiation Effects on Semiconductor Materials, Detectors and Devices, (Firenze, Italy), Mar. 1998.

- O5 D. Passeri, G. M. Bilei, P. Ciampolini, ***TCAD optimizaton of charge-collection efficiency in silicon microstrip detectors***, 8th European Symposium on Semiconductor Detectors, (Schloss Elmau, Germany), June 1998.
- O6 D. Passeri, P. Ciampolini, G. M. Bilei, ***A numerical study on radiation hardness of low-resistivity Si-microstrip detectors***, IEEE Nuclear Science Symposium 98 (NSS 98), Toronto (Canada), 8-14, 1998.
- O7 D. Passeri, G. M. Bilei, P. Ciampolini, ***Charge Collection Analysis of Low-Resistivity Si-Microstrip Detectors***, 4th ROSE Workshop on Radiation Hardening of Silicon Detector, (Geneve, CH), Dec. 1998.
- O8 D. Passeri, P. Ciampolini, G. M. Bilei, G. Casse, F. Lemeilleur, ***Analysis of the transient response of led-illuminated diodes under heavy-radiation damage***, 1st European Network on Defects Engineering of Advanced Semiconductor Devices (ENDEASD) Workshop, Santorini, (Greece), Apr. 1999.
- O9 D. Passeri, P. Ciampolini, A. Scorzoni, F. Moscatelli, G. M. Bilei, ***Modeling of critical electric field within irradiated Si-microstrip detectors***, IEEE Nuclear Science Symposium 99 (NSS 99), (Seattle, WA), 24-30, 1999.
- O10 D. Passeri, P. Ciampolini, G.M. Bilei, L. Berta, ***Parasitic capacitances in thick-substrate silicon microstrip detectors***, 3rd Int. Conf. on Radiation Effects on Semiconductor Materials, Detectors and Devices, (Firenze, Italy), June 2000.
- O11 Passeri, D.; Ciampolini, P.; Bilei, G.M.; Angarano, M.M.; Moscatelli, F., ***Analysis and test of overhanging-metal microstrip detectors***, IEEE Nuclear Science Symposium, October 15-20, 2000 Lyon (France).
- O12 D. Passeri, P. Placidi, L. Verducci, G.U. Pignatel, P. Ciampolini, G. Matrella, A. Marras, G.M. Bilei, ***Active Pixel Sensor Architectures in Standard CMOS Technology for Charged-Particle Detection***, PIXEL 2002 International Workshop on Semiconductor Pixel Detectors for Particles and X-Rays, Carmel (CA), September 2002.
- O13 D. Passeri, P. Placidi, L. Verducci, P. Ciampolini, G. Matrella, A. Marras, G. M. Bilei, ***RAPS: an Innovative Active Pixel for Particle Detection Integrated in CMOS Technology***, 9th Pisa Meeting on Advanced Detectors, La Biodola, Isola d'Elba (Italy), May 25-31, 2003.
- O14 Passeri, D.; Marras, A.; Placidi, P.; Delfanti, P.; Biagetti, D.; Servoli, L.; Bilei, G.M.; Ciampolini, P., ***Radiation Detectors for HEP Applications Using Standard CMOS Technology***, Nuclear Science Symposium, October 29 – Nov. 4, San Diego, California, 2006. IEEE Volume: 2 Oct. 29 2006-Nov. 1 2006 Page(s): 1253-1256.
- O15 Passeri, D.; Marras, A.; Placidi, P.; Delfanti, P.; Biagetti, D.; Servoli, L.; Bilei, G.M., ***CMOS APS sensor characterization with infrared, visible and ultraviolet laser sources***, Nuclear Science Symposium, 2007. Honolulu (USA), NSS '07. IEEE Volume: 2 Oct. 26 2007-Nov. 3 2007 Page(s): 936-939.

- O16 D. Passeri, L. Servoli, S. Meroli, ***Analysis of 3D Stacked Fully Functional CMOS Active Pixel Sensor Detectors***, Pixel 2008 International Workshop, 23-26 September 2008, Fermilab, Batavia, IL (USA).
- O17 Biagetti, D.; Delfanti, P.; Passeri, D.; Marras, A.; Placidi, P.; Servoli, L.; Ciampolini, P., ***CMOS Active Pixel Sensors for soft X-rays detection applications***, IEEE Nuclear Science Symposium, 2008. Dresden (Germany) 19-25 Oct. 2008.
- O18 Passeri D., Servoli L., Meroli S., Magalotti D., Placidi P., Marras A., ***3D Monolithically Stacked CMOS Active Pixel Sensor Detectors for Particle Tracking Applications***, WIT 2012 Workshop on Intelligent Trackers, Pisa (Italy) May 03-05, 2012.
- O19 D. Passeri, A. Morozzi, A. Scorzoni, G. Parrini, S. Sciortino, S. Lagomarsino, L. Servoli, ***Numerical Simulation of Silicon-on-Diamond Structures for Electronics Interface to Biological Neuronal Networks***, 3rd International Conference on Bio-Sensing Technology, Sitges (Spain), 12-15 May 2013.
- O20 D. Passeri, L. Servoli, S. Meroli, D. Magalotti, P. Placidi, A. Marras, ***A Two-Tier Monolithically Stacked CMOS Active Pixel Sensor to Measure Charged Particle Direction***, 15th Int. Workshop on Radiation Imaging Detectors, 23-27 June, 2013, Paris (France).
- O21 D. Passeri, L. Servoli, A. Morozzi, D. Magalotti, L. Piperku, ***Particle Tracking with 3D Monolithically Stacked CMOS Active Pixel Sensors***, 9th "Trento" Workshop on Advanced Silicon Radiation Detectors, Genova (Italy), 26-28 February 2014.
- O22 D. Passeri, K. Kanxheri, A. Morozzi, A. Scorzoni, ***Numerical Simulation of ISFET Structures for BioSensing Devices with TCAD Tools***, IWBBIO 2014 Int. Work-Conf on Bioinformatics and Biomedical Engineering, April 7-9, Granada, Spain.
- O23 D. Passeri, A. Morozzi, L. Servoli, K. Kanxheri, S. Lagomarsino, S. Sciortino, ***TCAD simulations of poly-crystalline diamond devices***, RD42 Meeting, CERN (Geneve), 2015/12/11-12.
- O24 A. Morozzi, F. Moscatelli, D. Passeri, G.M. Bilei, V. Hinger, T. Bergauer, ***Characterization of irradiated p-type silicon detectors for TCAD surface radiation damage model validation***, 21st International Workshop on Radiation Imaging Detectors 7-12 July 2019, Crete (Greece).
- O25 D. Passeri, A. Morozzi, L. Servoli, M. Menichelli, M. Pedio, D. Caputo, N. Lovecchio, G. De Cesare, M. Petasecca, ***TCAD Simulations and Measurements of a-Si:H devices for particle detection***, 10th IEEE International Workshop on Advances in Sensors and Interfaces, Manfredonia, Italy, 3-4 July 2025.

PUBLICATIONS

He is first author or co-author of more than 250 scientific papers, in particular more than 160 papers in peer reviewed journals and 90 proceedings on international conferences (Citation 54362; H-index 36; i10-index 118 - source Google Scholar https://scholar.google.com/citations?user=S9EF_4EAAAAAJ&hl=it&oi=ao). He has also presented more than 30 papers at international conferences as invited talks and oral contributions.

Journal Papers

- [J1] R. Della Marina, D. Passeri, P. Ciampolini, and G. Bilei, "Silicon strip detectors for LHC: Comprehensive process and device analysis," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 392, no. 1-3, pp. 178–182, 1997.
- [J2] D. Passeri, P. Ciampolini, M. Baroncini, A. Santocchia, G. Bilei, B. Checcucci, and E. Fiandrini, "Comprehensive modeling of silicon microstrip detectors," *IEEE Transactions on Nuclear Science*, vol. 44, no. 3 PART 1, pp. 598–605, 1997.
- [J3] D. Passeri, P. Ciampolini, G. Bilei, A. Santocchia, and L. Roselli, "Numerical simulation of silicon microstrip detectors," *Nuclear Physics B - Proceedings Supplements*, vol. 54, no. 3, pp. 293–298, 1997.
- [J4] G. Verzellesi, L. Colalongo, D. Passeri, B. Margesin, M. Rudan, G. Soncini, and P. Ciampolini, "Numerical analysis of ISFET and LAPS devices," *Sensors and Actuators, B: Chemical*, vol. 44, no. 1-3, pp. 402–408, 1997.
- [J5] G. Bilei, S. Albergo, M. Angarano, P. Azzi, N. Bacchetta, G. Bagliesi, P. Bartalini, A. Basti, U. Biggeri, D. Bisello *et al.*, "The CMS silicon tracker at LHC," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 409, no. 1-3, pp. 105–111, 1998.
- [J6] R. D'Alessandro, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, G. Bagliesi, P. Bartalini, A. Basti, U. Biggeri *et al.*, "The CMS silicon tracker," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 419, no. 2-3, pp. 538–543, 1998.
- [J7] D. Passeri, M. Baroncini, P. Ciampolini, G. Bilei, A. Santocchia, B. Checcucci, and E. Fiandrini, "TCAD-based analysis of radiation-hardness in silicon detectors," *IEEE Transactions on Nuclear Science*, vol. 45, no. 3, pp. 602–608, 1998.
- [J8] S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. Bilei *et al.*, "Comparative study of $\langle 111 \rangle$ and $\langle 100 \rangle$ crystals and capacitance measurements on Si strip detectors in CMS," *Nuovo Cimento della Societa Italiana di Fisica A*, vol. 112, no. 11, pp. 1261–1269, 1999.
- [J9] S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. Bilei *et al.*, "High-voltage breakdown studies on Si microstrip detectors," *Nuovo Cimento della Societa Italiana di Fisica A*, vol. 112, no. 11, pp. 1271–1283, 1999.
- [J10] S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. Bilei *et al.*, "The silicon microstrip tracker for CMS," *Nuovo Cimento della Societa Italiana di Fisica A*, vol. 112, no. 11, pp. 1307–1316, 1999.

- [J11] S. Albergo, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, P. Bartalini, A. Basti, U. Biggeri, G. Bilei *et al.*, "Test results of heavily irradiated Si detectors," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 422, no. 1-3, pp. 238–241, 1999.
- [J12] N. Bacchetta, S. Albergo, P. Azzi, E. Babucci, A. Bader, G. Bagliesi, P. Bartalini, A. Basti, U. Biggeri, G. Bilei *et al.*, "CMS silicon microstrip detectors: Research and development," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 426, no. 1, pp. 16–23, 1999.
- [J13] L. Feld, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Barr, P. Bartalini *et al.*, "R&D for the CMS silicon tracker," *Nuclear Physics B - Proceedings Supplements*, vol. 78, no. 1-3, pp. 322–328, 1999.
- [J14] E. Focardi, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, P. Bartalini, A. Basti *et al.*, "The CMS silicon strip tracker," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 435, no. 1-2, pp. 102–108, 1999.
- [J15] D. Pandoulas, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, P. Bartalini, A. Basti *et al.*, "The silicon microstrip tracker for CMS," *Nuclear Physics B - Proceedings Supplements*, vol. 78, no. 1-3, pp. 315–321, 1999.
- [J16] D. Passeri, P. Ciampolini, G. Bilei, and A. Santocchia, "2D numerical modeling of Si microstrip detectors under heavy radiation damage conditions," *Nuovo Cimento della Societa Italiana di Fisica A*, vol. 112, no. 1-2, pp. 35–42, 1999.
- [J17] D. Passeri, P. Ciampolini, and G. Bilei, "CAD investigation of depletion mechanisms in irradiated silicon microstrip detectors," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 426, no. 1, pp. 131–134, 1999.
- [J18] D. Passeri, G. Bilei, and P. Ciampolini, "A comprehensive analysis of low-resistivity silicon radiation detectors," *IEEE Transactions on Nuclear Science*, vol. 46, no. 3 PART 1, pp. 260–265, 1999.
- [J19] D. Passeri, G. Bilei, and P. Ciampolini, "Numerical study on radiation hardness of low-resistivity Si-microstrip detectors," *IEEE Nuclear Science Symposium and Medical Imaging Conference*, vol. 1, pp. 324–326, 1999.
- [J20] G. Tonelli, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, P. Bartalini, A. Basti *et al.*, "The R&D program for silicon detectors in CMS," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 435, no. 1-2, pp. 109–117, 1999.
- [J21] N. Demaria, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri *et al.*, "New results on silicon microstrip detectors of CMS tracker," *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 447, no. 1, pp. 142–150, 2000.
- [J22] E. Focardi, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri *et al.*, "CMS silicon tracker," *Nuclear Instruments and*

Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, vol. 453, no. 1-2, pp. 121–125, 2000.

- [J23] M. Meschini, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri *et al.*, “Performance of CMS silicon microstrip detectors with the APV6 readout chip,” *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 447, no. 1, pp. 133–141, 2000.
- [J24] D. Passeri, P. Ciampolini, G. Bilei, G. Casse, and F. Lemeilleur, “Analysis of the transient response of LED-illuminated diodes under heavy radiation damage,” *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 443, no. 1, pp. 148–155, 2000.
- [J25] D. Passeri, P. Ciampolini, A. Scorzoni, and G. Bilei, “Physical modeling of silicon microstrip detectors: Influence of the electrode geometry on critical electric fields,” *IEEE Transactions on Nuclear Science*, vol. 47, no. 4 PART 1, pp. 1468–1473, 2000.
- [J26] D. Passeri, P. Ciampolini, and G. Bilei, “TCAD optimization of charge collection efficiency in silicon microstrip detectors,” *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 439, no. 2, pp. 270–274, 2000.
- [J27] G. Lindström, M. Ahmed, S. Albergo, P. Allport, D. Anderson, L. Andricsek, M. Angarano, V. Augelli, N. Bacchetta, P. Bartalini *et al.*, “Developments for radiation hard silicon detectors by defect engineering - Results by the CERN RD48 (ROSE) Collaboration,” *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 465, no. 1, pp. 60–69, 2001.
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(Daniele Passeri)