



Giuseppe Iannaccone

Date of birth: 28 April 1968 – Citizenship: Italian

Address: Via Armando Diaz 4, 56123 Pisa, Italy

Tel: +39 366 6709149 – email: giuseppe@iannaccone.org

Personal website: www.iannaccone.org

official Univ. Pisa roster (short url): goo.gl/fQGXDS

ORCID ID: orcid.org/0000-0003-3375-1647

Google Scholar: goo.gl/ienm4A

CURRENT POSITIONS

2016 – now Chairman of the Board of the Inter-University Italian consortium on nanoelectronics **IU.NET**, with 13 Italian Universities.

2012 – now Full Professor of Electronics, University of Pisa, Italy

PREVIOUS POSITIONS

2001 – 2012 Associate Professor of Electronics, University of Pisa, Italy

1996 – 2000 Assistant Professor of Electronics, University of Pisa, Italy

1996 – 1996 Research Scientist (Tenured position), National Research Council, Pisa, Italy.

1992 – 1993 Digital Equipment Research Fellowship at the Italian National Institute of Physics (INFN)

EDUCATION

1996 PhD, Dept. Information Engineering, University of Pisa, Italy

1992 MSEE, Dept. Information Engineering, University of Pisa, Italy (summa cum laude)

FELLOWSHIPS AND AWARDS

2015 **Fellow of the American Physical Society (APS)** for “contributions to the theory of quantum transport and noise in mesoscopic and nanoelectronic devices and to their application in electronics”

2014 **Fellow of the Institute of Electrical and Electronics Engineers (IEEE)** for “contributions to modeling of transport and noise in nanoelectronic devices” (2014)

1993 Italian Naval Academy “**Mariponave Sabre**” Award (1st among 416 in officer cadet class of 1992).

1992 Texas Instruments award for MSEE Thesis on resonant tunneling devices.

1988 Three-year “P. Liguori” fellowship as undergraduate student (1988-1990).

RESEARCH HIGHLIGHTS:

Broad expertise on quantum transport, materials/device engineering for electronics, design of analog and mixed-signal integrated circuits for artificial intelligence, analog circuit design, systems for the Internet of Things. Unique blend of interdisciplinary research and technology transfer.

- **Discovery of the enhanced shot noise phenomenon in resonant tunnelling diodes** (PRL paper in 1998, featured in commentaries in Nature (by R. Landauer, Vol. 392, p. 358, 1998) and Science (by M. Buttiker, Vol. 284, p. 275, 1999).
- **Co-inventor of the bilayer graphene Tunnel FET** ([Fiori 2009] featured in IEEE Spectrum, 31 Aug 2009)
- **Co-inventor of the lateral heterostructure field-effect transistor** (Iannaccone, Fiori US Patent 9620634, presented at IEDM 2011, published in Fiori ACS NANO 2012).
- **Top 0.2% most-cited paper with “RFID”** (WoS: among 20500+ results from search on topic “RFID”) and 15th most-cited excluding review papers [De Vita 2005].
- **Top 1% most-cited papers on “voltage reference” OR “bandgap reference” circuits** (among 2200+ results from search on WoS) [Magnelli2011] and [DeVita2007].
- **Top 1% most-cited paper on “two-dimensional materials”** (among 2400+ search results from WoS)[Fiori2014].
- **Top 2% most-cited paper on “graphene nanoribbon(s)”** (WoS: among 6100+ search res.)[Fiori2007]
- **Founding leader and then core developer of NanoTCAD**, an atomistic device simulator released as open source on <http://vides.nanotcad.com> and used in 100+ publications by many research groups worldwide.

COORDINATION OF RESEARCH PROJECTS AWARDED WITH COMPETITIVE CALLS
Total funding secured: 21.5+ MEUR
<ul style="list-style-type: none"> • PI and Consortium Coordinator of the 8 following collaborative research Projects <ul style="list-style-type: none"> ○ European Project QUEFORMAL Quantum Engineering for Machine Learning (Contract n. 829035, H2020 – FET OPEN)[2019-2022]: Consortium of 6 academic and industrial partners ○ European Project AUTOCAPSULE Autonomous multimodal implantable endoscopic capsule for the gastrointestinal tract (Contract 952118 FET PROACTIVE 2020-2024): ○ European Project Authentic Secure authentication with high-entropy silicon physical unclonable functions (Contract n. 101034814) H2020-EU.1.2.1. [2021-2022] ○ European Project DEWINT Device Electronics based on nanoWires and NanoTubes (Contract n. 05-FONE-FP-008, European Science Foundation & FP6) [2007-2010] ○ European Project NANOTCAD Nanotechnology Computer Aided Design (Contract n. IST-1999-10828 - FP5 – FET OPEN) [2000-2003] ○ National Project PRIN 2017 (Italian Ministry of University and Research) “Five2D” [2019-2022] ○ National MISE FAR Project “CleverHome” (Ministry of Economic Development) [2012-2015] ○ National Project PRIN 2004 (Italian Ministry of University and Research “Advanced architectures and models for nanoMOSFETs” [2005-2006]
<ul style="list-style-type: none"> • PI (in charge of a consortium partner) for 22 collaborative projects (European and National): <ul style="list-style-type: none"> ○ 18 EC Framework Programme Research Projects: <ul style="list-style-type: none"> ▪ CHARM Challenging environments tolerant Smart systems for IoT and AI (Contract n. ID: 876362 – H2020-ECSEL)[2020-2022]. ▪ WASP Wearable Applications enabled by electronic Systems on Paper (Contract n. 825313 - H2020-ICT)[2019-2021]. ▪ ARROWHEAD TOOLS (Contract n. 826452 H2020-ECSEL – as third party of IUNET)[2019-2022]. ▪ REACTION - first and euRoPEan siC eigTh Inches piOt line (Contract n. 783158 H2020-ECSEL – as third party)[2018-2022] ▪ CONNECT - Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid (Contract n. 737434 – H2020-ECSEL – as third party)[2017-2020]. ▪ LAB4MEMS II MOEMS: Micro-Optical MEMS, micro-mirrors and pico-projectors (Contract n. 621176 – FP7_JTI-ENIAC – partner IUNET)[2014-2017] ▪ GRADE Graphene-based Devices and Circuits for RF Applications (Contract n.317839-FP7)[2012-2016] ▪ LAB4MEMS Lab Fab for smart sensors and actuator MEMS (Contract n. 325622 – FP7-JTI-ENIAC – Univ. Pisa as third party) [2013-2015] ▪ E2SG – Energy to smart grid (Contract n. 296131 – FP7-JTI-ENIAC-as third party)[2012-2015] ▪ ERG – Energy for a Green Society (Contract n. 270722 – FP7-JTI-ENIAC – as third party)[2011-2014] ▪ STEEPER - Steep subthreshold slope switches for energy efficient electronics (Contract n. 257267 – FP7 – as third-party)[2010-2013] ▪ MODERN - MOdeling and DEsign of Reliable, process variation-aware Nanoelectronic devices, circuits and systems (contract n. 120003 – FP7-JTI-ENIAC – as third party)[2009-2012]. ▪ OneLab2:An Open Federated Laboratory Supporting Network Research for the Future Internet (Contract n. 224263 - FP6)[2008-2010] ▪ Nanosil -Silicon-based nanostructures and nanodevices for long term nanoelectronics applications (Contract n. 216171 – FP7-ICT – as third party) [2008-2011] ▪ OneLab: An open networking laboratory supporting communication Network research across heterogeneous environments (contract. n. 034819 - FP6)[2007-2008] ▪ PuLiNano PULLing the limits of NANOCmos electronics (contract n. 026828 - FP6 IP),[2006-2009] ▪ SINANO Silicon-based Nanodevices (contract n. 506844 - FP6 Network of excellence) [2004-2007] ▪ FinFLASH FINfet structures for FLASH devices(contract n. 16917 - FP6-NMP) [2005-2007] ○ 4 National projects: <ul style="list-style-type: none"> ▪ “Advanced technologies for the development of high-density non-volatile memories” – FIRB project call [2008-2010] ▪ “Nanokeys” development of RFID transponders for the secure identification of objects based on

unclonable hardware authentication circuitry, Pisa Foundation [2005-2007].

- “Single Electron Devices” (PRIN Italian Ministry of Education and Research) [2002-2003]
- “TCAD for nanoscale MOSFETs” (Pisa Foundation) [2001-2003].

TECHNOLOGY TRANSFER

- **2015-2016: Chairman of the University of Pisa Technical Committee for Patents (member: 2006-2016)**, technical body in charge of IP and patent protection of inventions, management of the Univ. Pisa patent portfolio, IP licensing and transfer deals.
- **Principal Investigator** of 8 bilateral contracts for industrial research or technology transfer (**0.8 MEUR**)
 - **GaN FET** project (2016-2018) **funded by Infineon, Villach (AT)** on GaN-on-Si transistors for power applications.
 - **Energy Scavenger** project (2014-2016) funded by **Dialog Semiconductor (DE)** on inductorless DC-DC energy scavenging converters for internet-of-things sensors.
 - **FinFET** project (2008-2010) funded by **NXP semiconductor (BE)** on bulk-FinFET technology.
 - **Port Center** project (2013-2015) funded by **Port System Authority of North Tyrrhenian Sea (IT)**
 - **Wellness lab** project (2009-2010) by **ENEL S.p.A** on smart home / smart energy integration (IT)
 - **Building Automation for energy saving** (2008) by **ENEL (IT)**
 - **TCAD technology transfer grant 1** (2002) **and grant 2** (2003-2005) with Silvaco International, (USA) on transfer of research on semiconductor device modelling to commercial technology CAD
- **Founder of Quantavis s.r.l.**, spin off company of the University of Pisa (funded 2007). Dedicated to nanotechnology TCAD, hardware and software solutions for cybersecurity and the Internet of things. (headcount of 10).
- **International Patents:** Patent Grant US9620634B2 (Lateral heterostructure field-effect transistor based on 2D materials), presented at filed 2011, granted 2017.

INTERNATIONAL PRESENCE

- **Visiting scientist in international institutions:**
 - 1994 Institute of Microstructural Sciences - NRC– Ottawa – Canada (3 months)
 - 1996 Institute of Microstructural Sciences - NRC – Ottawa – Canada (1 month)
 - 1997 Beckman Institute, University of Illinois at Urbana Champaign – USA (1 month)
 - 2018 Department of EECS, University of California Berkeley – USA (1 month).
- **Fellow of the largest International Professional Associations of physicists and engineers**
 - Fellow of the American Physical Society (APS – elevated 2015)
 - Fellow of the Institute of Electrical and Electronics Engineers (IEEE – elevated 2014)
- **PI of 22 EC Framework programme projects (consortium coordinator of 5 of them) and of 6 research contract with international companies** (listed above).
- **Review panels of Research Proposal for International Organizations:** ENIAC JU (2012-2015), Science Foundation Ireland (from 2004), Research Grants Council Hong Kong (from 2005), Austrian Science Foundation (from 2007), ANR France (from 2007), Swiss National Science Foundation (2012), Czech Science Foundation (2018), US Department of Energy (2015-2016), EC-h2020 (2019).
- **Technical Program committees of international conferences:**
 - IEDM International Electron Devices Meeting (2007-2008-2022)
 - Graphene (International Graphene Conference) (2019).
 - ESSDERC European Solid-state Device Conference (2004-2013).
 - IMW International Memory Meeting (previously ICMTD/NVSMW) (2005,2008,2009,2010).
 - IWCE International Workshop on Computational Electronics (2006,2009)
 - ENS European Nano Systems (2004-2007) ○ Noise and Information in nanoelectronics (2003-2007).

OUTREACH

- Consortium Coordinator of the European Project SHINE! (FP7-People contract n. 609878)[2013] dedicated to the organization of Researchers’night in all 9 main cities in Tuscany.
- Organizer and curator of **TEDxPisa**, edition 2012.
- Host and editor of the i21 podcast, 2021.
- YouTube channel dedicated to lectures/seminars (6K+ subscribers)
- Commentaries and interviews appeared on Repubblica, Corriere della Sera, Il Tirreno, IEEE Spectrum.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

1998 – 2022 Total number of Postdocs supervised and co-supervised: 20 (currently 2)
 Total number of Ph.D Students supervised: 20 (3 current, 17 graduated)

TEACHING ACTIVITIES (only main activities)

2001 to present: Electronics (12 ECTS) for the BSEE curriculum
 2011 to present: Power electronics (6 ECTS) for the MSEE curriculum
 2015 to present: Electronic Systems (3 ECTS) for the MSCE curriculum
 2014 to 2010: Electronic Infrastructures (6 ECTS) for the MSEE curriculum
 2010 RFID and the Internet of Things (12 lecture hours) for PhD students

SUMMARY OF BIBLIOMETRIC DATA (data as of 7 July 2021)

Database Source	Num. Docs.	Total citations	h factor	Database Source
Google Scholar*	342 (349)	13018 (16443)	51 (52)	Google Scholar*
Scopus	341	9281	42	Scopus
Web of Science	324	8155	40	Web of Science

numbers in parentheses include reports of high-energy physics collaborations (with large number of authors)

12 selected publications, related citations and topics <i>Full citation (bibliometric data as of 30 June 2020)</i>	Pub. year	Citations (Google Scholar)	Area
G. Iannaccone, F. Bonaccorso, L. Colombo, G. Fiori, Quantum engineering of transistors based on 2D materials heterostructures, Nature Nanotechnology 13 , 183 (2018).	2018	246	Devices/ Materials
D. McManus, S. Vranic, F. Withers, V. Sanchez-Romaguera, M. Macucci, H. Yang, R. Sorrentino, K. Parvez, S.-K. Son, G. Iannaccone, K. Kostarelos, G. Fiori, C. Casiraghi, Water-based and biocompatible 2D crystal inks for all-inkjet-printed heterostructures, Nature Nanotechnology , 12 (4), pp. 343-350, 2017	2017	401	Devices/ Materials
E. Spanò, S. Di Pascoli, G. Iannaccone, "Low-Power Wearable ECG Monitoring System for Multiple-Patient Remote Monitoring", IEEE Sensors Journal 16 , 5452 (2016).	2016	196	IoT Systems
E. Spanò, L. Niccolini, S. Di Pascoli, G. Iannaccone "Last-Meter Smart Grid Embedded in an Internet-of-Things Platform", IEEE Trans. Smart Grids 6 , 468 (2015).	2015	161	IoT Systems
G. Fiori, F. Bonaccorso, G. Iannaccone, T. Palacios, D. Neumaier, A. Seabaugh, S. K. Banerjee, L. Colombo, "Electronics based on two-dimensional materials", Nature Nanotechnology v. 9 n. 10 pp. 768-779, 2014.	2014	2443	Devices/ Materials
G. Fiori, A. Betti, S. Bruzzone, G. Iannaccone, "Lateral Graphene-hBCN Heterostructures as a Platform for Fully Two-Dimensional Transistors", ACS Nano 6 , 2642 (2012).	2012	149	Devices/ Materials
L. Magnelli, F. Crupi, P. Corsonello, C. Pace, G. Iannaccone, "A 2.6 nW, 0.45 V Temperature-Compensated Subthreshold CMOS Voltage Reference", IEEE J. Solid-State Circuits 46 , 465 (2011).	2011	304	Circuits
G. Fiori, G. Iannaccone, "Ultralow-Voltage Bilayer Graphene Tunnel FET", IEEE Electron Device Letters 30 , 1096 (2009).	2009	186	Devices
G. Fiori, G. Iannaccone, "Simulation of Graphene Nanoribbon Field-Effect Transistors", IEEE Electron Device Letters Vol. 28, n. 8, pp. 760 – 762, 2007.	2007	358	Devices
G. De Vita, G. Iannaccone, "A Sub-1-V, 10 ppm/ °C, Nanopower Voltage Reference Generator", IEEE Journal of Solid-State Circuits , Vol.42, n. 7, pp. 1536-1542, 2007.	2007	258	Circuits
G. De Vita, G. Iannaccone, "Design criteria for the RF section of UHF and I microwave passive RFID transponders", IEEE Trans. Microwave Theory and Techniques 53 , pp. 2978-2990, 2005.	2005	533	Circuits
G. Iannaccone, G. Lombardi, M. Macucci, B. Pellegrini "Enhanced shot noise in resonant tunneling", Phys. Rev. Lett. 80 , 1054 (1998).	1998	205	Quantum transport

Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base art. 13 del D. Lgs. 196/2003