

## **Curriculum Vitae**

**Susanna Reggiani** is Full Professor at the University of Bologna. She is currently in charge of the courses of "Electronics" for the B. S. degree in Electrical Engineering and "Microelectronics" for the M. S. Degree in Electronic Engineering. She received the Ph.D. degree in Electrical Engineering from the University of Bologna in 2001. Since 2002, she is with the Department of Electrical, Electronic, and Information Engineering (DEI) and with the Advanced Research Center for Electronic Systems ARCES, University of Bologna. She was the Head of the ARCES Center from 2018 to 2021. She is member of the PhD Board in Electronics Engineering, Telecommunications and Information Technology at DEI.

Her scientific activity has been devoted to the physics, modeling and characterization of electron devices, with special emphasis on transport models in semiconductors. She has been involved in research activities concerning advanced CMOS and beyond-CMOS transistors. She contributed to the development of physical models in the frame of a deterministic solution of the Boltzmann transport equation based on the expansion of the distribution function in spherical harmonics. She worked in the field of quantum computing, devising a new solid-state physical system based on quantum nanowires. She contributed to the measurement of mobility and impact-ionization coefficients in silicon up to temperatures of 700 K and more, and developed models that are currently available in the frame of the commercial tools by Synopsys. She is also involved in the study of quantum-confined devices, such as silicon nanowires (NW), carbon nanotubes (CNT) and graphene nanoribbons (GNR), which represent possible candidates for future generations of the nanoelectronic technology.

From 2007 to 2017, she has been the Task Leader of Projects funded by the American Semiconductor Research Corporation (SRC) in collaboration with Texas Instruments (Dallas, Texas), dealing with the modeling, design and TCAD analysis of power MOSFETs. She worked on the modeling and characterization of hot-carrier stress degradation in LDMOS power devices featuring the shallow-trench isolation. A fast numerical degradation approach suited for commercial TCAD tools was proposed and extensively verified against experiments for the first time. The model has been recently implemented in the frame of the Synopsys SDevice TCAD tool. More recently, she has been involved in research activities concerning the package influences on high-voltage semiconductor FETs. The proposed study focuses on the role of the ionic and electronic charge transport within typical packaging layers on top of silicon chips. A model has been recently developed based on specific test-chip characterizations.

In 2013 she was involved in the European project "Energy-Efficient Converters using GaN Power Devices" (E2COGAN) and implemented new TCAD-based approaches for the numerical simulation of GaN-on-Si HEMTs up to the avalanche regime by accounting for the effects of the transition-layer stack. In 2013 she was also involved as staff researcher in the European Project "Technology CAD for III-V Semiconductor-based MOSFETs (III-V-MOS)" on the development of physically based mobility models for InGaAs channels accounting for the role of interface traps and mechanical strain.

She is presently involved in the European Project "300mm Pilot Line for Smart Power and Power Discretes" (R3-POWERUP) as staff member on the development of TCAD approaches accounting for charge injection and hot-carrier-stress degradation. She is also involved in the European Project "Wide band gap Innovative SiC for Advanced Power (WINSIC4AP)" and in the European Project "first and euRopEAn siC eigTh Inches piLOt liNe (REACTION)" as Scientific team leader of the UniBo group on the activities concerning the development of physically-based models for TCAD simulation of SiC-based power devices.

She is Principal Investigator of two international research projects:

- “3D Analysis of High-Voltage ESD Protection Cells” with Texas Instruments inc., Dallas, Texas, on the numerical simulation of ESD protection cells for a deep understanding of the role played by impact-ionization generation and self-heating in next-generation Smart Power technology;
- “TCAD model calibration and simulation of Diamond-Like Carbon layers for high power semiconductor devices” with ABB Switzerland Ltd, investigating the role of the silicon-DLC interface electronic structure, localized energy states in the DLC material, polarization effects and conductivity mechanisms within the DLC layer on the electrical parameters of a high-power diode.

She has published 230 papers in various high-quality peer-reviewed journals and qualified international conferences.

She is currently Editor of the IEEE Journal of the Electron Devices Society and of the MDPI journal Energies.

She serves as reviewer of many international journals:

- IEEE Transactions on Electron Devices
- IEEE Electron Device Letters
- IEEE Transactions on Device and Materials Reliability
- Electronics Letters
- Solid State Electronics
- Semiconductor Science and Technology
- Japanese Journal of Applied Physics
- Applied Physics Letters
- Journal of Computational Electronics
- Microelectronics Reliability
- IET Power Electronics
- International Journal of Numerical Modeling
- Energies

She has been part of the Technical Program Committee of the following conferences:

- IEEE International Workshop on Design and Test of Nano Devices, Circuits and Systems (NDCS)
- International Conference on Simulation of Semiconductor Processes and Devices (SISPAD)
- IEEE International Electron Devices Meeting (IEDM)

She is currently part of the Technical Program Committee of the following conferences:

- European Solid-State Device Conference (ESSDERC)
- IEEE International Integrated Reliability Workshop (IIRW)
- IEEE European Symposium on Reliability of Electron Devices, Failure Physics and Analysis (ESREF)

### ***Publication Report***

The analysis of documents is carried out in [www.scopus.com](http://www.scopus.com).

- Total number of publications on refereed international journals, book chapters and proceedings of international conferences: 230
- Total number of citations: 3010
- H-index: 28