CV of the Denis Garoli

Professional Background: Denis Garoli, born in Padova. He is interested in several research topics such as: material science, nanofabrication, plasmonics, biosensing, single-molecule detection and manipulation, DNA nanotechnology, 1D and 2D materials and nanoelectronics.
From 2016 to 2019 he co-coordinated the Horizon 2020 FET project ProseqO (budget 3ME): PROtein SEQuencing using Optical single molecule real-time detection. The project regarded the development of new technologies for single molecule detection and manipulation with the final goal of DNA/RNA and protein sequencing. Within this project he also started a continuous collaboration with the Biotech company AbAnalitica in Padova (partner in FET project) where he is still coordinating and supporting different R&D projects and activities.
In 2020 he won the Horizon 2020 FET project DNA-Fairylights (coordinator role – budget 3.1 ME). The project regards the development of a disruptive new technology for DNA data storage.
In 2022 he won the Horizon EU MSCA doctoral network project DYNAMO (coordinator role – budget 2.7ME). This project regards the development of single molecule spectroscopic techniques to perform protein analysis. The project will be focused on the training of a large number of PhD candidates.
Finally, in 2022 he won the Horizon EU – Pathfinder Open project 3D-BRICKS (coordinator role – budget 3.6 ME). The project regards the development of a disruptive new technology for 3D bio-nanoelectronics.
The main results of his research during these years regard the design, fabrication and test of innovative plasmonic devices for several applications, from material science, to biosensing and optical beam manipulation.

Education:

27/09/2011 • ***Master Degree in Biotechnology*** at the University of Padova with the thesis "Integrated Biosensing techniques. The case of Mycobacterium TB mutations identification".

28/3/2008 • ***Ph.D. in Space Science and Technology*** at the Center of Studies and Activities for Space "G. Colombo", University of Padova, with the thesis "Development of Innovative Sensors for Ultraviolet Measurements".

15/12/2003 • ***Master's degree in Physics*** at the University of Padova with the thesis "Development of a new sensor for the measurements of the total effective irradiance of sun beds".

Professional experiences and Fellowships

01/09/2023 to present • Università degli Studi di Modena e Reggio Emilia
Position: Associate Professor

01/09/2014 to present • IIT – Istituto Italiano Tecnologia
Position: Senior researcher
Duties: Team leader and EU grants PI, Design and development of nanofabricated devices. Supervisor of PhD students and Post-doc researchers

1/10/2020 to 1/11/2021• Free University of Bozen
Position: Assistant Professor
Duties: Team leader, teacher of electronics and Supervisor of PhD students and Post-doc researchers

10/04/2014 to 1/09/2020 • ABAnalitica – Advanced Biomedicine
Position: Researcher
Duties: Development of RT-PCR and NGS kit for human diagnostic.

01/05/2009 - 31/03/2014 • University of Padova – Laboratory for nanofabrication and nanotecnologies (LANN)
Position: Researcher
Duties: Electron Beam and Ion Beam Lithography process. Plasmonic systems. Thin film deposition and characterization. PVD and CVD system design. Raman spectroscopy. SNOM microscopy

01/11/2007 – 30/04/2009 • Media-Lario Technologies
Position: Process Engineer and Project Manager
Duties: Design and development of new facilities for thin films deposition and characterization. Thin films development.

01/01/2004 – 31/12/2007 • CNR-INFM, National Institute for the Physics of the Matter.
Position: Collaborator and PhD Student.

Duties: Coating Design and characterization for UV monitoring and EUV lithography and Solar Physic.

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Research

Principal Research fields (present to past)

- Design and development of innovative technologies for 3D CNT-nanoelectronics. Within a Pathfinder OPEN Horizon 2023 project (with coordinator role – 3.6M euros budget) I'll investigate breakthrough technological solutions for next generation nanoelectronics components (FETs, memories and digital logic gates) by means of DNA and nanomaterials. In particular I've conceived, new approaches and designs to implement, via biofabrication, a brand new family of Carbon-NanoTubes (CNTs) 3D transistors.
- Design and development of innovative technologies for DNA data storage. Single molecule spectroscopy. Within a FET OPEN Horizon 2021 project (with coordinator role – 3.1M euros budget) I'm investigating breakthrough technological solutions for next generation data storage by means of DNA and nanomaterials. In particular I've conceived, theoretically and experimentally demonstrated new approaches to store digital data by means of natural DNA decorated with nanoparticles.
- Design and development of innovative technologies for DNA and protein sequencing. Single molecule spectroscopy. Within a FET OPEN Horizon 2020 project (with co-coordinator role – 3M euros budget) and a MSCA H2020 project (coordinator role – 2.6M euros budget) I'm investigating breakthrough technological solutions for third generation sequencing of biomolecules. In particular I've conceived, theoretically and experimentally demonstrated new plasmonics nanopores based approaches for single molecule detections and sequencing.

Research results (summary)
Google Scholar: https:// scholar.google.com/citations?user=MVkX4rIAAAAJ&hl=it&oi=ao
97 publications in international peer-reviewed journals (25 as first author; 23 as last or corresponding author)
25 conference proceedings
Number of citations: >2960 – *h index: 30*