Guido Goldoni - Curriculum Vitae

(May 2020, synthesis)

Place and date of birth Carpi, Italy, September, 16th 1963.

Orcid id 0000-0002-6870-2071

Academic degrees Physics degree *cum laudae*, 1988, University of Modena (supervisor Prof C Calandra)

Ph.D. in Physics of Condensed Matter, 1993, International School for Advanced Studies (SISSA), Trieste (supervisor Prof A Fasolino)

Current position Associate professor in the Physics of Matter, Department of Physics, Informatics and Mathematics, University of Modena and Reggio Emilia (SSD FIS/03, SC 02/B2)

Previous positions

2001-2013	Assistant Professor, Dept. of Physics, UNIMORE
9/2009	Visiting professor, Dept. of Physical and Analytical Chemistry, University of Castello, Spain
1996-2000	post-doc, Dept. of Physics, University of Modena
1994-1995	post-doc, Dept. of Physics, University of Antwerp (Belgium)
1989-1993	Ph.D. fellow, International School for Advanced Studies (SISSA), Trieste

Memberships Associate researcher at CNR-Institute of Nanoscience

Member of the board of the Graduate School in Physics and Nanoscience at UniMoRe

Didactical activity Since 2001 I taught condensed matter physics, statistical physics, and theoretical physics within the B.Sc. and M.Sc in Physics, and within the Graduate School of Physics and Nanoscience at UniMoRe

Academic management

2016- present	Coordinator of the M.Sc. in Physics program
2012-2016	Department Coordinator for public engagement and high-school educational activities
2008-2015	Member of the executive board of the department

Evalutation commitees Research project reviewer for several agencies and programs, including MIUR (REPRISE, VQR), EU Rita Levi Montalcini, EU PRACE, SNSF (CH), CINECA (IT), CNR (IT)

Member of several committees for the selection of academic staff in Italian universities (UniPv, PoliTo) as well as in selection and final dissertation of international PhD programs in Italy (UniMoRe, PoliTo) and abroad (Spain, Iceland)

Research fundings EU - Marie Curie IIF "Optical properties of hybrid organic/inorganic nano-particles for photovoltaic applications: toward a predictive computational approach" (2010/2012)

Executive Program of Science and Technology Cooperation Italy-Japan "Control and manipulation of spin states in nano-scale quantum devices' ("projects of special interest"), (2008/2009).

EU - Marie Curie IEF "Signatures of few-body quantum correlations in semiconductor nanostructures" (2006/2008)

	MIUR-FIRB "Quantum Phases in semiconductor heterostructures at very low electronic density" (2002/2005). UNIMORE, Grant “Nano- and emerging materials and systems for sustainable technologies” (2014)
HPC projects	Supercomputing projects within the Parallel Computing Initiative (INFM) HPC projects within the Italian SuperComputing Resource Allocation (ISCRA)
Recent collaborations	P. Wójcik (U. Krakov); L. Sorba (SNS, Pisa); S. Corni (U. Padova); V. Pellegrini (NEST-NANO CNR, Pisa); J. Planelles (Universitat Jaume I, Castello); M. Gurioli (University of Firenze); P. Hawrylak (NRC-IMS, Ottawa); F. Valee (CNRS, Lyon); U. Banin (Hebrew Univ., Jerusalem); G. Abstreiter (WSI, Munich); P. Plochocka (University of Toulouse)
Past collaborations	A. Fasolino (U. Nijmegen), U. Hohenester (U. Graz), F. M. Peeters (U. Antwerpen), R. Cingolani (U. Lecce); S. Tarucha (U. Tokyo); M. J. Caldas (U. Sao Paulo); F. Rossi (Politecnico di Torino);
Editorial activities	Associate Editor of Physica Scripta Editor of the proceedings of the 17th Int Conf on Electronic Properties of Two-Dimensional Systems (EP2DS-17) Editor of the proceedings of the 13th Int Conf on Modulated Semiconductor Structures (MSS-13)
Scientific publications	Co-author of >135 publications, including 20 letters (Nature Phys, Phys Rev Lett, Appl Phys Lett, Europhys Lett, Opt. Lett), and 3 contributions to monographs. The publications have received ~1900 citations (without self-citations), H-index 26 (ISI WoS, May 2020).
Conference organization	(chair) Int’l Workshop on Hybrid Excitations in Nano-Materials - HYEX 2011, Modena, 18-20 December, 2011 (hyex2011.nano.cnr.it) (organizing committee) 17th Int Conf on Electronic Properties of Two-Dimensional Systems (EP2DS-17), Genova, 2007 (organizing committee) 13th Int Conf on Modulated Semiconductor Structures (MSS-13), Genova, 2007
Mentoring (last 10 years)	5 PhD students 7 post-docs (most currently holding a permanent position)
Honours	Oustanding referee for APS, year 2016 Oustanding referee for IOP, year 2017
Research group	The joint UNIMORE-CNR-NANO research group, composed by two permanent staff members (GG, A. Bertoni), hosted several Ph.D. and Post-docs over the years. A. Delgado (Private company), N. Climente (U. Jaume I), M. Royo (U. Barcelona), F. Buscemi (Private company), G Ferrari (Private company), F. Grasselli (SISSA), G. Perez (U. Padova), E Cancellieri (U. Lancaster)
Scientific activity	The scientific activities focus on the quantum theory of condensed matter, with a theoretical/computational character, and emphasis on correlation and spin-orbit

coupling effects in semiconductor quantum nano-structures, and macromolecular systems.

Recent research topics of interest for the present project include:

- Electron gas and spin-orbit coupling in nanowires and nanowire-based heterostructures
- Quantum simulation of excitronic devices
- Ab-initio modelling of nano-molecules and nano-hybrids

Theoretical methods are chosen as to provide a quantitative description of, and direct comparison with, optical and transport spectroscopies, using or developing in-house state-of-the-art methods. These include:

- K.p formulations with inclusion of non-perturbative electric and magnetic fields
- Atomistic descriptions (tight-binding or pseudo-empirical Hamiltonians)
- mean-field methods (density functional or Hartree-Fock)
- configuration interaction methods
- evolutionary methods for optimization.

Didactical innovation

I coordinating a running project (**www.nanolab.unimore.it**) for didactical innovation and teachers training to develop hands-on, nano-material based teaching modules to foster physics of matter in high-school curricula. The project led to several teacher's training courses, a self-training website, a school textbook on nanotechnology, and the formulation of a laboratory kit.

Recent research papers

S Wu et al. "*Anisotropies of the g-factor tensor and diamagnetic coe_cient in crystal-phase quantum dots"* Nano Research 12, 2842-2848 (2019)
P Wojcik et al. "*Enhanced Rashba spin-orbit coupling in core-shell nanowires by the interfacial effect"* App. Phys. Lett. 114, 073102 (2019)
F Grasselli et al. "*Time-dependent scattering of a composite particle: A local self-energy approach for internal excitations"* Phys. Rev. B 94, 125418 (7 pp) (2016)
G Gil et al "*Predicting signatures of anisotropic resonance energy transfer in dye-functionalized nanoparticles"* RSC Adv. 6, 104648-104656 (2016)
J Jadczak et al. "*Unintentional high-density p-type modulation doping of a GaAs/AlAs core-multishell nanowire"* Nano Letters 14, 2807-2814 (2014)
S. Funk et al. *"High mobility one- and two- dimensional electron systems in nanowire-based quantum heterostructures"*, Nano Letters 13, 6189-6196 (2013)