

CURRICULUM VITAE ALDO DI CARLO

BORN

January 10, 1967 Rome (Italy)

ADDRESS

University of Rome "Tor Vergata"
Dept. Electronics Engineering
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EDUCATION

1991 Laurea degree in Physics with honours, University of Rome "La Sapienza" (Italy)
1995 PhD, Technical University of Munich (Germany)

EMPLOYMENT

Dec 2012 - Full Professor,
Chair of Optoelectronics and Nanoelectronics
Dept. of Electronics Engineering,
University of Rome "Tor Vergata", Rome (Italy)
Nov 2001 – Nov 2012 Associate professor,
Chair of Optoelectronics
Dept. of Electronics Engineering,
University of Rome "Tor Vergata", Rome (Italy)
Nov 1996 – Oct 2001 Research Assistant
Dept. of Electronics Engineering,
University of Rome "Tor Vergata", Rome (Italy)

RESEARCH AT THE UNIVERSITY OF ROME "TOR VERGATA"

Leader of the Nano&Optoelectronic research group - <http://www.optolab.uniroma.it> at the Department of Electronic Engineering and member of the IEEE Electron Devices Society. His research activity concerns the study of electronic and optical properties of nanostructured devices, their analysis, optimization and technology. The development of the non-equilibrium theory for the microscopic description of the transport process in organic/inorganic devices and thermal processes at nanoscale has been the subject of invited talks at international conferences and University seminars. In the last years his researches have focussed on the study and fabrication of organic devices. Research activities in carbon nanotubes have been quite successful leading to the realization cold cathode vacuum triode based on CNT cathode for THz generation. The research activity of organic optoelectronic devices has been consider of excellence and the Lazio Region has sponsored this activity funding the "Polo Solare Organico della Regione Lazio", namely the Center for Hybrid and Organic Solar Energy (CHOSE) where Prof. A. Di Carlo is co-director. The aim of the Center is the study and development of organic photovoltaic cells and their industrialization. Prof. Di Carlo has organized, together with Prof. Lugli, IEEE 2004 Nanotechnology Conference in Munich. Prof. Di Carlo is author/co-author of more than 300 scientific publications in international journals, several reviews on electronic and optoelectronic devices, 7 patents, several book chapters and co-author of two books (in Italian language) and has been invited to more than 40 invited talk at international conferences. Prof. Di Carlo has an h-factor > 35. The results of his research have been used to realize 5 spin-off companies dealing with ICT and Energy technologies.

PROJECT COORDINATION AND MANAGEMENT

Aldo Di Carlo is local coordinator of H2020 Project, MOSTOPHOS (multiscale simulation of electronic devices), FP7 IP NEWLED, FP7 EU CHEETAH (on photovoltaics), FP7 GRAPHENE Flagship and FP7 EU PEOPLE ITN "Destiny" and

has been coordinator of two FP7 European projects, OPTHER (THz technology) and ULTRADSSC (Solar Cells technology). He has been local scientific coordinator of several National and International projects: Two European Marie Curie Project (CLERMONT and CLERMONT II on Microcavities), European STREP Project (SMASH on nanoLED Technology, STIMSCAT on Polariton Lasers, HYMEC on organic memories), MADESS II Project, (Semiconductor Optical Amplifiers), INFM-PRA Project (Experimental and theoretical investigation of optical and transport phenomena in superlattice long-wavelength infrared quantum cascade lasers), Progetto Finalizzato Nanoelettronica PF22 (Organic Semiconductor Light Emitters), DYECCELLS (development of industrial process for Dye Solar Cells), several PRIN project (Italian Ministry of University and Education). Since 2006 he is coordinator of the Lazio Region project "Polo Solare Organico". He is/has been coordinator of several research project devoted to technology transfer to Large and Small-Medium Enterprises.

TEACHING AND OTHER ACTIVITIES AT THE UNIVERSITY OF ROME "TOR VERGATA"

Management

President of the Engineering Faculty Library (2005 -)
Coordinator of the PhD program in Electronic Engineering

Current teaching

Lecturer, Optoelectronics, Master Level, 45 lectures (2 hours each)
Lecturer, Nanoelectronics, Master Level, 30 lectures (2 hours each)

Summary of past teaching

Lecturer, Design of Micro and Nanoelectronic devices, Master Level, 60 lectures (2 hours each)
Lecturer, Optoelectronics 2, Master Level, 25 lectures (2 hours each)
Lecturer, Biological and molecular electronics, Master Level, 25 lectures (2 hours each)
Lecturer, Advanced Optoelectronics, Master Level, 25 lectures (2 hours each)

TECNOLOGY TRANSFER AND INDUSTRY RELATED ACTIVITIES

Involvement in Spin-Off and other research companies

- INFM Spin-Off , **I-CODE** "Internet Computing on Demand", now I-Code S.R.L. (www.i-code.it)
- FILAS, Busines Lab Spin-Off , **RAPTECH** "RFID systems", now RAPTECH S.R.L. (www.raptech.it)
- University of Rome "Tor Vergata" Spin-Off "**TiberLAB**", (www.tiberlab.com)
- University of Rome "Tor Vergata" Spin-Off "**Dyers**", (www.dyers.it)
- University of Rome "Tor Vergata" Spin-Off "**Intellienergia**" (www.intellienergia.com/)
- CTO of the **Dyepower** research company. Dyepower is research company for industrialization of dye solar cell for building integration formed by two Large Enterprises (ERG Renew and Permasteelisa) and three universities.

Support to SME and Large Enterprises(contracts, consultancy etc)

- Contract NMP for development of THz electronics. Company: **Selex SI**
- Contract for development of nanovacuum triodes. Company: **Selex SI**
- Contract for training course on Photovoltaic plant design. Company: **Ericsson**
- Contract for development of organic photovoltaic. Company: **PPG Industries**
- Contract for integration of photovoltaic in UAV. Company: **Selex Galileo**
- Contract for Optoelectronic identification system. Company **AISIGO S.r.l.**
- Contract for Design and Simulation of Wide Band Gap Devices. Company: **Alenia Marconi Systems**
- Consultant for Innovation project of **Commerce Chamber of Rome**
- Consultant in the field of thin-film photovoltaic. Company: **Altran**
- Consultant in the field of concentrating photovoltaic. Company: **ERG**

TRACK RECORD

1. The top 10 publications, as senior author

1. Frauenheim, T; Seifert, G; Elstner, M; Niehaus, T; Kohler, C; Amkreutz, M; Sternberg, M; Hajnal, Z; Di Carlo, A; Suhai, S, Atomistic simulations of complex materials: ground-state and excited-state properties, JOURNAL OF PHYSICS-CONDENSED MATTER, 14 (11), 3015-3047 (2002) - cite 214
2. Pecchia, A; Di Carlo, A, Atomistic theory of transport in organic and inorganic nanostructures, REPORTS ON PROGRESS IN PHYSICS 67 (8), 1497- 1561(2004) – cite 118
3. Malpuech, G; Di Carlo, A; Kavokin, A; Baumberg, JJ; Zamfirescu, M; Lugli, P, Room-temperature polariton lasers based on GaN microcavities, APPLIED PHYSICS LETTERS 81 (3), 412-414 (2002) - cite109
4. Malpuech, G; Kavokin, A; Di Carlo, A; Baumberg, JJ, Polariton lasing by exciton-electron scattering in semiconductor microcavities PHYSICAL REVIEW B 65 (15) 153310 (2002) cite 97
5. Morkoc, H; Di Carlo, A; Cingolani, R, GaN-based modulation doped FETs and UV detectors, SOLID-STATE ELECTRONICS 46(2), 157-202 (2002) – cite 73
6. Solomon, GC; Gagliardi, A; Pecchia, A; Frauenheim, T; Di Carlo, A; Reimers, JR; Hush, NS, Understanding the inelastic electron-tunneling spectra of alkanedithiols on gold, JOURNAL OF CHEMICAL PHYSICS 124(9), 94704 (2006) – cite 58
7. Butte, R; Delalleau, G; Tartakovskii, Al; Skolnick, MS; Astratov, VN; Baumberg, JJ; Malpuech, G; Di Carlo, A; Kavokin, AV; Roberts, JS, Transition from strong to weak coupling and the onset of lasing in semiconductor microcavities , PHYSICAL REVIEW B 65 (20), 205310 (2002) - cite (57)
8. Di Carlo, A; Piacenza, F; Bolognesi, A; Stadlober, B; Maresch, H, Influence of grain sizes on the mobility of organic thin-film transistors APPLIED PHYSICS LETTERS 86 (26), 263501 (2005) – cite 56
9. Bolognesi, A; Berliocchi, M; Manenti, M; Di Carlo, A; Lugli, P; Lmimouni, K; Dufour, C, Effects of grain boundaries, field-dependent mobility, and interface trap states on the electrical characteristics of pentacene TFT, IEEE TRANSACTIONS ON ELECTRON DEVICES, 51 (12). 1997-2003 (2004) - cite 51
10. Di Carlo, A Microscopic theory of nanostructured semiconductor devices: beyond the envelope-function approximation SEMICONDUCTOR SCIENCE AND TECHNOLOGY, 18(1), R1-R31 (2003) – cite 50

2. Research monographs, chapters in collective volumes and any translations

1. A. Di Carlo A. Pecchia L. Latessa T. Frauenheim G. Seifert Tight-binding DFT for molecular electronics (gDFTB) in "Introducing molecular electronics", G. Cuniberti, G. Fagas, K.Richter eds., Springer (2005) - Chap. 5, pages 153 - 84
2. A. Pecchia, L. Latessa, A. Gagliardi, Th. Frauenheim, A. Di Carlo The gDFTB tool for molecular electronics in "Molecular Nano Electronics: Analysis, Design and Simulation (Elsevier) (2007) - pages 205
3. A. Di Carlo, A. Pecchia, Microscopic description of molecular devices, in Proceedings of Fermi School in Physics From Nanostructures to Nanosensing Applications, A. D'Amico, G. Balestrino and A. Paoletti Eds., Elsevier and SIF dist. (2005)
4. Christoph Erlen, Paolo Lugli, Alessandro Pecchia and Aldo Di Carlo Simulation Tools in Molecular Electronics in Nano and Molecular Electronics Handbook, Editor Sergey Edward Lyshevski, Series: Nano- and Microscience, Engineering, Technology and Medicine Volume: 9 (CRC publisher) (2007)
5. A. Di Carlo, A. Reale, T.M. Brown, M. Cecchetti, F. Giordano, G.Roma, M.Liberatore, V. Mirruzzo, V.Conte Smart materials and concepts for photovoltaics: Dye sensitized solar cells NATO series on Science for Peace "Smart materials for Energy, Communication and Security", Eds I. Luk'yanchuk and D. Mezzane, pages 97-126 Book Series NATO Science for Peace and Security Series B: Physics and Biophysics ISSN 1874-6500 Publisher Springer Netherlands
6. T. M. Brown, A. Reale, A. Di Carlo "Organic and Hybrid Solar Cells" in Thin Film Solar Cells: Current Status and Future Trends, Nova Science Publisher, Inc. (2011) - pages 249-286
7. Lorenzo Dominici, Daniele Colonna, Daniele D'Ercole, Girolamo Mincuzzi, Riccardo Riccitelli, Francesco Michelotti, Thomas M. Brown, Andrea Reale and Aldo Di Carlo "Dye Solar Cells: Basic and Photon Management Strategies", in Solar Cells - Dye-Sensitized Devices, ISBN 978-953-307-735-2, Edited by Leonid A. Kosyachenko, InTech publisher (2011).

3. Granted International patents

1. "Metodo per il controllo della risposta temporale di un sensore per sostanze chimiche", D'AMICO Arnaldo, DI CARLO Aldo, DI NATALE Corrado, LUCCI Massimiliano, PAOLESSE Roberto, REALE Andrea, TERRANOVA Maria Letizia PCT/IT2004/000743 (30/12/2004), WO/2006/070420 (06/07/2006)
2. "Spectroscopic system for the punctual detection of the characteristic of absorption of a device" DI CARLO Aldo, LUGLI Paolo, MENCHERINI Paolo, REALE Andrea, REGOLIOSI Pietro, PCT/IB2005/050812 (04/03/2005), WO/2006/092672 (08.09.2006)
3. "High frequency, cold cathode, triode-type, field emitter vacuumtube and process for manufacturing the same" Brunetti Francesca, Di Carlo Aldo, Lucci Massimiliano, Orlanducci Silvia, Riccitelli Riccardo, Terranova Maria Letizia, PCT/IT2006/000883 (29/12/2006), WO/2008/081482 (10.07.2008)
4. "High frequency triode-type field emission device and process for manufacturing the same", A.Di Carlo, C. Paoloni, E.Petrolati, F.Brunetti, R.Riccitelli, PCT/IT2007/000931 (28/12/2007), WO 2009/084054 (09.07.2009)
5. "Power supply system for transportable apparatuses and equipment", Terribili R.; Di Carlo A.; Pastorini G.; Berliocchi M.; Buriani M., WO2008IT00514 (29/7/2008)

6. "Sintering process of metal oxide based formulations", Di Carlo Aldo, Mincuzzi Girolamo, Brown Thomas Meredith, Reale Andrea, WO2012140684 (2012-10-18)
7. "Light emitting system according to a polariton mode with electrical injection of quantum wells", Malpuech Guillaume; Solnyshkov Dmitry; Di Carlo Aldo; Petrolati Eleonora, US2011261851 (A1) (2011-10-27)

4. Invited presentations to peer-reviewed, internationally established conferences and/or international advanced schools (if applicable). Last 15

1. Aldo Di Carlo, T.M. Brown, A. Reale, C. Bignozzi, C. Bettiol, **Industrialization of Dye sensitized solar cells: Italian activities at the Centre for Hybrid and Organic Solar Energy (CHOSE)**, DSC-IND Conference, Nara (Japan) 23.4- 25.4 (2009)
2. M. Auf der Maur, M. Povolotskyi, F. Sacconi, G. Romano, G. Penazzi, A. Gagliardi, A. Pecchia, Aldo Di Carlo, **Multiscale-Multiphysics modeling of nanostructured devices: The TiberCAD project**. International Workshop on Computational Electronics (IWCE-13) Beijing, (China) 27-29 May 2009
3. Aldo Di Carlo, M. Auf Der Maur, A. Gagliardi, A. Pecchia, F. Sacconi, G. Penazzi, G. Romano **Multiscale simulations of nanostructured devices with TiberCAD**, ACAM/STFC-Daresbury/CECAM workshop on "Empirical methods in semiconductor nano-structures design and modelling" that will take place in Dublin on 21-22 June and in Manchester on 23-25 June 2010
4. Aldo Di Carlo, T.M. Brown, A. Reale, **Large Area Dye Solar Cells: from single cells to modules and panels**, Hybrid and Organic Photovoltaics Conference (HOPV) 2010, 23-27 Maggio 2010, Assisi (Italia)
5. Aldo Di Carlo, **DSC: Production, applications and market opportunity** Winter College on Optics and Energy Trieste, ICTP, 8 - 19 February 2010
6. Aldo Di Carlo, **Multiscale Modelling of Electronic Devices: From Atoms to Continuum** Workshop on Simulation and Modelling of Emerging Electronics, Hong-Kong (China) 6-10 December 2010
7. Aldo Di Carlo, M. Auf Der Maur, A. Gagliardi, A. Pecchia, F. Sacconi, G. Penazzi, G. Romano, **Multi-scale methods in electronic device simulation**, Progress and Future Challenges in Computational Materials Science, Bremen (Germany), March 27. – 30. 2011
8. Aldo Di Carlo, **Modeling of fundamental material properties: from *ab-initio* to balance equations**, tutorial in "Modeling and simulation of advanced CMOS devices (More Moore)", 37th European Solid-State Circuits Conference, ESSCIRC 2011 12 – 16 September 2011, Helsinki, Finland
9. Aldo Di Carlo, **Organic Photovoltaics**, Italy-Japan scientific and industrial collaboration for nanotechnology, Kyoto, 22 October 2011 – Plenary Speaker.
10. Aldo Di Carlo, **Dye Solar Cells for building Integration**, MRS – San Francisco (USA), 9-12 April 2012
11. SPIE symposium "Physics and Simulation of Optoelectronic Devices XXIII", 7-12 February 2015 (invited)
12. 2nd International Workshop on Nano Materials for Energy Conversion (NMEC-2), Ho Chi Minh, 17th-19th November 2014 (invited)
13. 3rd European Conference on NanoFilms (ECNF), Siville 7-11th July 2014 (invited)
14. Plastic Electronics 2013, Dresden (Germany) 8-10th October 2013 (invited)
15. 2nd International Conference on Advanced Electromaterials (ICAE-2), Jeju (Korea) 12-15th November 2013

5. Organisation of International conferences

1. General Chairman of the 15th International Conference on Nanotechnology (IEEE NANO2015), Rome, 27-30 July 2015
2. Chairman and organization of the NUSOD conference Rome, 5-8 September 2011
3. Organization of the 14th International Workshop on Inorganic and Organic Electroluminescence & the 2008 International Conference on the Science and Technology of Emissive Displays and Lighting (EL2008), Bagni di Tivoli, Roma, Italy, 9-12 September 2008
4. Organization of the IEEE Nanotechnology Conference, Munich (Germany) 14-19 August 2004
5. Organization of the International Workshop of Computational Electronics, Monte Porzio 25-28 May 2003 (Italy)
6. Chairman and organization of the Light-Matter Coupling in Nitrides (PLMCN-1) Rome, 26-29 September 2001

6. International Prizes/Awards/Academy memberships

1. ST microelectronic Award: GE Meeting Giardini di Naxos (ME), Italy 30-06/ 2 -07/ 2005
2. 2007 Nanophotonics Engineering Award: PLMCN 7, 12-17 April Avana, Cuba
3. Macro Polo Award of the Italian Science, Kyoto (Japan), 22 November 2011
4. Member of the IEEE Electronic Device Society
5. Member of the Italian Association for Electronics (GE)
6. Advisory committee member of the International Workshop on Computational Electronics (2000 -)
7. Steering committee member of the Numerical Simulation of Optoelectronic Devices Conference, NUSOD (2011-)
8. Program committee member of the Physics of Light-Matter coupling in Nanostructures (2001 -)
9. General Chairman of the 15th IEEE International Conference on Nanoelectronics (IEEE NANO 2015) 27th-30th July 2015, Rome (Italy)

7. Memberships to Editorials Boards of International Journals

1. Associate Editor of Journal of Computational Electronics (2007 -)
2. Associate Editor of Journal of Nanophotonics(2006 - 2009)
3. Member of the Editorial Board of Semiconductor Science and Technology (2004 - 2010)