Curriculum Vitae of Lucio Claudio Andreani

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Lucio Claudio ANDREANI (date of birth: 15-07-1962) obtained the degree in Physics in 1985 at the University and Scuola Normale Superiore, Pisa, and the PhD in Physics in 1989 at the Scuola Normale Superiore. Until 1992 he was a post-doc at the Institut Romand de Recherche Numérique en Physique des Matériaux (IRRMA) of the Ecole Polytechnique Fédérale de Lausanne. Since the academic year 1992/1993 he is researcher, since 1998/1999 associate professor, since 2006/2007 full professor at the University of Pavia. In 2006-2007 he has been the coordinator of Doctorate in Physics at the University of Pavia. Since 1/11/2007 and until 29/02/2012 he has been Director of the Department of Physics "A. Volta" of the University of Pavia, now merged into the Physics Department: http://fisica.unipv.it From 2014 until 2021 he has been again coordinator of the Doctorate in Physics at the University of Pavia.

His research interests span several areas in condensed matter physics, including electronic and photonic nanostructures (electronic states and radiation-matter interaction in semiconductor heterostructures, excitons and polaritons in microcavities, photonic crystals) and strong correlations (Kondo systems). His most significant works concern binding energies and the radiative recombination of excitons in quantum wells, radiation-matter interaction and polariton states in semiconductor microcavities, and more recently the theory of photonic crystal waveguides and of intrinsic and disorder-induced losses in these systems. His theoretical research is characterized by a close relation with experiments, as shown by the numerous works in collaboration with Italian and foreign experimental groups. Since about 2000 his research activity is largely focused on nanophotonics, especially photonic crystals, concerning both the theory and the interpretation of optical experiments performed in Pavia and in other laboratories. More recently, this research evolved into activities related to photovoltaics, silicon photonics, plasmonics, chiral photonics. A full list of publications is available on the Department web site: http://fisica.unipv.it/personale/Persona.php?ID=17

Lucio Andreani has been scientific manager of several projects concerning Si- and III-V-based photonic crystals. The main themes are related to the control of light emission and propagation, as well as nonlinear optics and photovoltaic conversion, in photonic structures of various dimensionalities. His current projects concern nanophotonics, silicon photonics, and metasurfaces. He is strongly committed to performing and promoting applied research and technological transfer towards research centers and industries. He is responsible of research contracts with ST Microelectronics (light emission in silicon) and with ENI (development of photovoltaic cells based on fluorescent concentrators and photonic crystals). Lucio Andreani is author/coauthor of more than 250 scientific papers in international journals or books and of a few patents, gave several invited talks at national and international conferences, and is member of committee or co-organizers of international conferences (SPIE Photonics Europe, CLEO, OSA meetings).

A list of projects under the direct responsibility of Lucio Andreani is:

Ricerca sul Sistema Energetico – RSE S.p.A. research contract 2021 “Optimization and characterization of nanostructured antireflection coatings”. Responsible for the contract. Status: Completed.

MIUR PRIN 2017 NOnlinear photonics with MEtal-less Nanoantennas and metasurfaces (NOMEN). Involved units: Brescia, PoliMI, CNR-LNESS Como, Pavia. Responsible of Pavia Unit. Status: running. See https://sites.google.com/a/unibs.it/nomen/

Ricerca sul Sistema Energetico – RSE S.p.A. research contract 2016-2018 “Optimization and characterization of nanostructured antireflection coatings”. Responsible for the contract. Status: Completed.

EU FP7 STREP project 2011-2015 FABULOUS - "FDMA Access By Using Low-cost Optical Network Units in Silicon Photonics". Responsible for UNIPV-Physics. Status: completed. See http://www.fabulous-project.eu/

EU FP7 Marie Curie ITN Network 2011-2014 PROPHET - "Postgraduate Research in Photonics as an Enabling Technology". Large EU ITN network: responsible for UNIPV. Status: Completed. See http://www.prophet-itn.eu/

ENI S.p.A. research contract 2011-2014 "Photonics for photovoltaic systems based on fluorescent concentrators". Responsible for the contract. Status: completed.

Fondazione Cariplo 2010-2013 "Nanophotonics for thin-film photovoltaics"
Responsible of the project. Status: Completed.

ENI S.p.A. research contract 2009-2011 "Photonic crystals for photovoltaic cells".
Responsible for the contract. Status: Completed.

Fondazione Banca del Monte di Lombardia 2010-2011 "Laboratorio per il Fotovoltaico"
Responsible for the project. Status: Completed.

MIUR-FAR project 2007-2011 “Silicon laser” (legge 297/99)
Units: ST Microelectronics, Catania, Firenze, Cagliari, Pavia. Responsible for UNIPV. Status: completed. Waiting for payment ☺

Fondazione Cariplo 2007-2010 "Manipulation of light on nanometric scales for photonic and plasmonic applications".
Responsible for the project. Status: Completed.

ST Microelectronics research contract 2007 "Silicon laser".
Responsible for the contract. Status: Completed.

Fondazione Cariplo 2005-2007 "All-optical switching in photonic crystals: towards the optical transistor"
Responsible for the project. Status: completed.

MIUR Cofin 2004-2006 "Silicon-based photonic crystals for the control of light propagation and emission"
Involved units: Pavia, Trento, Torino, Trieste, Firenze. Project coordinator. Status: completed.

MIUR Cofin 2002-2004 "Silicon-based photonic crystals: technology, optical properties and theory"
Involved units: Pavia, Trento, Torino, Trieste, Firenze. Project coordinator. Status: completed.

INFM PRA 2002-2005 "GaAs-based photonic crystals: fabrication, optical properties and theory"
Involved units: Pavia, Trieste, Lecce, Firenze. Project coordinator. Status: completed.

INFM PAIS 2001 "Fabrication and optical characterization of two-dimensional photonic crystals"
Involved units: Trieste, Lecce, Pavia. Project coordinator. Status: completed.

MIUR Cofin 2000-2002 "One- and two-dimensional photonic crystals: growth, theory and optical properties". Involved units: Pavia and Trento. Project coordinator. Status: completed.

Bibliometric data – Scopus, 11-07-2023: 366 total cited papers, 11116 total citations, 23 papers with > 100 citations, H-factor=53

List of publications and patents by Lucio Andreani
(updated 11 July 2023)

Publications (including book chapters):

[1] A. Quattropani, L.C. Andreani, F. Bassani: *Quantum Theory of Polaritons with Spatial Dispersion: Exact Solutions*, Il Nuovo Cimento D **7**, 55 (1986).

[2] **Review paper** - F. Bassani, L.C. Andreani*: Exciton-Polariton States in Insulators and Semiconductors*, in Excited State Spectroscopy in Solids, edited by U. Grassano and N. Terzi (Editrice Compositori, Bologna, 1987), p. 1.

[3] A. Quattropani, L.C. Andreani, F. Bassani: *Quantum Theory of Polaritons*, in Excitons in Confined Systems, edited by R. Del Sole, A. D'Andrea, A. Lapiccirella (Springer-Verlag, Berlin, 1988), p. 74.

[4] L.C. Andreani, A. Pasquarello, F. Bassani: *Hole Subbands in Strained GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells: Exact Solution of the Effective-Mass Equation*, Phys. Rev. B **36**, 5887 (1987).

[5] L.C. Andreani, A. Pasquarello: *Electronic Structure and Optical Properties of Superlattices*, in Highlights of Spectroscopies of Semiconductors and Insulators, edited by A. Balzarotti, A. Stella, M. Capizzi, and G. Guizzetti (World Scientific, Singapore, 1988), p. 33.

[6] L.C. Andreani, A. Pasquarello: *Effect of Subband Coupling on Exciton Binding Energies and Oscillator Strengths in GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells*, Europhys. Lett. **6**, 259 (1988).

[7] L.C. Andreani, F. Bassani, A. Quattropani*: Longitudinal-Transverse Splitting in Wannier Excitons and Polariton States*, Il Nuovo Cimento D **10**, 1473 (1988).

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[9] L.C. Andreani, A. Pasquarello: *Theory of Excitons in GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells Including Valence Band Mixing*, Superl. Microstr. **5**, 59 (1989).

[10] A. Pasquarello, L.C. Andreani*: Binding Energies of p-type Shallow Acceptor States in GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells*, Helv. Phys. Acta **62**, 872 (1989).

[11] A. Pasquarello, L.C. Andreani: *Binding Energies of Excited Shallow Acceptor States in GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells*, Phys. Rev. B **40**, 5602 (1989).

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[13] L.C. Andreani, F. Bassani: *Exchange Interaction and Polariton Effects in Quantum Well Excitons*, Phys. Rev. B**41**, 7536 (1990).

[14] A. Pasquarello, L.C. Andreani: *Interpretation of Three-Photon Spectra in Alkali Halides*, Phys. Rev. B **41**, 12 230 (1990).

[15] L.C. Andreani, S. Fraizzoli, A. Pasquarello: Comment to: *Effect of Biaxial Strain on Acceptor-Level Energies in $In_yGa_{1-y}As/Al_xGa_{1-x}As$ (on GaAs) Quantum Wells*, Phys. Rev. B **42**, 7641 (1990).

[16] L.C. Andreani, A. Pasquarello: *Accurate Theory of Excitons in GaAs-$Ga_{1-x}Al_xAs$ Quantum Wells*, Phys. Rev. B 42, 8928 (1990).

[16bis] M.W Berz, L.C. Andreani, E.F. Steigmeier, F.-K. Reinhart: *Exchange splitting of light-hole excitons in $Al_xGa_{1-x}As$-GaAs quantum wells*, Solid State Commun. **80**, 553 (1991).

[17] F. Tassone, F. Bassani, L.C. Andreani: *Resonant and Surface Polaritons in Quantum Wells*, Il Nuovo Cimento D **12**, 1673 (1990).

[18] **Review paper -** L.C. Andreani: *Exciton-Polaritons in Quantum Wells*, Physica Scripta **T35**, 111 (1991).

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[47] **Review paper** - L.C. Andreani: *Optical Transitions, Excitons, and Polaritons in Bulk and Low-Dimensional Semiconductor Structures*, in Confined Electrons and Photons: New Physics and Devices, edited by E. Burstein and C. Weisbuch (Plenum Press, New York, 1995), p. 57.

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