

DALDOSSO NICOLA

SHORT BIOGRAPHY

PROFESSOR PHYS-03/A - Experimental Physics of Matter and Applications
Department of ENGINEERING for INNOVATION MEDICINE
Engineering and Physics section
UNIVERSITY of VERONA - ITALY



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Nicola Daldosso was born in Verona, Italy, 1972. He graduated in Physics at the University of Trento in 1997. He received the Ph.D. degree in Physics of Matter at Université J. Fourier of Grenoble, France, in 2001. From 1998 to 2000, he was at the Italian beamline GILDA at ESRF (European Synchrotron Radiation Facilities) in Grenoble. Since 2001 he is at the University of Trento, Physics Department in the Nanoscience Laboratory as associate researcher.

His research interests include structural and optical properties of nanostructured materials (in particular nano-silicon), and integrated optoelectronics (photonics) on silicon and development and characterization of materials for NanoMedicine. Specifically, research activities concentrate on the fabrication, functionalization (chemical and physical), and characterization of nano-systems, including nanoparticles and micro/nano-porous materials, for applications in drug delivery and diagnostics, primarily in the field of Nanomedicine, but also in environmental contexts. A key aspect of this research involves investigating the effects of different nanoparticles (functionally modified and loaded with anticancer and anti-inflammatory drugs) on cells, through in vitro experiments, as well as the study of immunological reactions.

Another line of research focuses on the structural characterization and modeling of glasses and ceramic materials.

His main research contribution has been done in the field of interactions of matter with particles and radiation, in which photoluminescence and fluorescence techniques as well as Raman and IR spectroscopies were used to study the optical and structural properties of matter.

He has been involved in several European and national research projects on Si-based Photonics and material science. He is author of 120 papers, co-author of 8 chapter books/books, holds 1 patent. He has been invited at 21 international conferences, he has been chair and organizer of international symposium and workshops, and he is referee of several international scientific journals.

Research sector (ERC) - ORCID: 0000-0002-5578-4223

PE3_10 - Nanophysics: nanoelectronics, nanophotonics, nanomagnetism, nanoelectromechanics, etc.

PE3_13 - Structure and dynamics of disordered systems: soft matter (gels, colloids, liquid crystals, etc.), glasses, defects, etc.

Sum of the Times Cited: 2993 [without self-citations: 2206]

Citing Articles: 1482; 84.2% of documents in the top 25% journals by CiteScore; 42.9% of documents in the top 25% most cited documents worldwide

h-index: 29

INDEX

SHORT BIOGRAPHY	1
INDEX.....	2
EDUCATION and TRAINING.....	3
RESEARCH ACTIVITY.....	4
RESEARCH POSITIONS.....	
SCIENTIFIC QUALIFICATION	
RESEARCH PROJECTS	
INTERNATIONALISATION PROJECTS and AGREEMENTS	
PATENTS	
INVITED TALKS at INTERNATIONAL CONFERENCES and FORUM	
SCHOOL and CONFERENCE ORGANIZATION and MANAGEMENT	
SCIENTIFIC AWARDS	
TEACHING ACTIVITY.....	9
ASSISTANT PROFESSOR	
ASSISTANT SUPERVISOR OF MASTER STUDENTS	
ASSISTANT SUPERVISOR OF PHD STUDENTS	
SUPERVISOR OF STAGE STUDENTS	
SUPERVISOR OF MASTER STUDENTS	
SUPERVISOR OF PHD STUDENTS	
MEMBER OF INTERNATIONAL PHD JURY	
INSTITUTIONAL ACTIVITY.....	11
TEACHING COMMITTEES AND STUDENT SERVICE WORKING GROUPS.....	
COLLEGIAL BODIES (MEMBER)	
REVIEWER ACTIVITY.....	
FULL LIST OF PUBLICATIONS.....	122
BOOKS and BOOK'S CHAPTERS.....	24

EDUCATION and TRAINING

High school graduated at Liceo Scientifico, Istituto Don Bosco, Verona (Italy), 1991. Grade: **54/60**.

LAUREA (bachelor + master) in Physics at University of Trento (I) on 25/3/1997: “Studio della struttura locale del silicio poroso mediante Total Electron Yield (TEY) ed X-ray Excited Optical Luminescence (XEOL)” in collaboration with CeFSA (Centro di Fisica degli Stati aggregati) ITC-CNR, Trento (dr. F. Rocca)

Supervisor: prof. G. Dalba, Department of Physics, University of Trento - Grade “**110/110 cum laude**”.

PhD degree in Physics on 30/10/2001 at Université J. Fourier Grenoble (F): “Study of the local structure and luminescence of optoelectronic materials by x-ray absorption spectroscopy”

Supervisor: prof. S. Mobilio, Department of Physics, Università Roma Tre, Roma (I)

Grade: “**très honorable**” from international jury (European PhD):

- J.R. Régnerd (Président du Jury), Université J. Fourier e CENG-DRFMC, Grenoble (F)
- R. Pettifer (rapporteur), Department of Physics, University of Warwick, Coventry (UK)
- P. Lagarde (rapporteur), LURE Centre Universitaire Paris-Sud, Orsay, Paris (F)
- G. Dalba (examineur), INFN- Department of Physics, Università di Trento, Trento (I)
- S. Mobilio (supervisor), Department of Physics, Università Roma Tre, Roma (I)

SCHOOLS

- *ESRS Summer School (Applications of Synchrotron Radiation to Materials Science and Physics)*, Luso – Portugal (May 1998)
- *International School of Physics “Enrico Fermi” (Silicon-based microphotonics: from basics to applications)*, Varenna – Italy (July 1998)
- *I Optoelectronic and Photonic Winter School (Micro-optoelectronics: Materials, Devices and Integration)*, Trento – Italy (March 2001)
- *II Optoelectronic and Photonic Winter School (Advances on molecular and hybrid photonics)*, Trento – Italy (Feb. 2003)
- *III Optoelectronic and Photonic Winter School (Optical Interconnects)*, Trento – Italy (March 2005)
- *IV Optoelectronic and Photonic Winter School (Biophotonics)*, Trento – Italy (Feb. 2007)
- *Alp Nano Bio Int. School (Micro and nanotechnologies in cancer diagnostics and therapy)*, Vipiteno, Bolzano – Italy (Gen. 2010)

TRAINING

- *OPTOmism, Executive and Investor Forum*, San José, California – USA (18-20 May 2009)
- *Venture Academy, Trentino Technology Tour*, Trento Italy (27 May 2009)
- *R2B days, Research to Business*, Forum Internazionale della Ricerca Industriale, Bologna – Italy (Nov. 2009)
- *Intensive Training (short master) “Entrepreneurship in Photonics”*, Brussels – Belgium (25 Gen. – 5 Feb. 2010)
- *Crash course in intellectual properties and research funding*, Trento – Italy (March 2010)
- *Invest Photonics 2010 - International Partnering Convention*, International forum of investors and experts in Photonics, Bordeaux, France (18-19 March 2010)
- *Si Photonics Forum*, Leuven - Belgium (30 Apr. 2010)
- *“La via Europea alla NanoMedicina”*- Assobiotech Workshop, Milano – Italy (2 Dec. 2010)
- *NanoForum 2011*, Micro and Nano Technologies, University La Sapienza, Roma – Italy (14-15 Sept. 2011)
- *Fluorescence Workshop and Course* – HORIBA Scientific, Munich – Germany (29 Nov. – 2 Dec. 2011)
- *Italy towards Europe 2020*, Italian Ministry of Economic Development, Roma – Italy (26 June 2012)
- *Innovation and competitiveness of the Made-in-Italy* – Italian GreenTECH Forum, Bratislava - Slovakia (17-21 June 2013)
- *ICT’s days 2014*, Trento – Italy (2-4 April 2014)
- *LET’S 2014 (Leading Enabling Technology for Societal Challenge)*, track: “Building cross-cutting Sciences and Technologies”, EU-CNR Workshop, Bologna – Italy (20 Sept. – 1 Oct. 2014)
- *ICT’s days 2015*, Trento – Italy (18-20 March 2015)
- *HORIZON 2020 National Info DAY*, University La Sapienza, Roma – Italy (30 Sept. 2015)
- *LEAN management intensive course*, Camera di Commercio di Brescia – Italy (25-26 Nov. 2015)
- *“Past, Present, Future of Mass Spectrometry”*, Fiera di Primiero (Trento) – Italy (18-21 Oct. 2016)
- *“Business plan in HORIZON 2020”*, APRE Univ. Verona, Verona (17 Nov. 2016)

RESEARCH ACTIVITY

RESEARCH POSITIONS

Research grant to cover PhD (1997-2000)

- 1997-2000, INFN and CNR at GILDA beamline (ESRF- Grenoble), winner of public selection of CNR (call CNR n. 203.13.01/3, Nov. 28, 1997)
- 2000, CeFSA (Centro di Fisica degli Stati aggregati) ITC-CNR

Post-DOC grant (2000-2002)

- apr 00-apr 01, INFN (supervisor prof. G. Dalba), winner of public selection of INFN (call n°325, 20 Jan. 2000)
- apr 01-dec 02, INFN (supervisor prof. L. Pavesi), winner of public selection of INFN (call n°456, 12 March 2001) RAMSES project, Radiation Amplification of Stimulated Emission in Silicon nanostructures

Research contracts (2003-2010)

Research contracts at Physics Department of University of Trento within the following funded projects:

- PROFILL project (Processi per dispositivi elettro-ottici basati sul riempimento di Microcavità) from Fondo Unico della Provincia Autonoma di Trento (2003-2006)
- PHOLOGIC project (NanoPHOTonic LOGIC gates) IST-NMP no 17158 EU (2006-2007)
- LANCER project (Light Amplifiers with NanoClusters and Erbium) FP6-033574 (2007-2008)
- HELIOS project (pHOTonics Electronics functional Integration on CMOS) FP7-224312 (2008-2010)

Research grant (2010-2011)

- winner of public selection (call n. 57-Dip-FIS Univ. Trento, 26 May 2010) on *CMOS Photonics*
- winner of public selection (call n. 133-Dip-FIS Univ. Trento, 1 Dec. 2010) on *Silicon Photonics Biosensing*

Research grant (2011)

- May – Oct. 11, winner of public selection (call AdR1602/11 Univ. Verona, 31 March 2011): *Studio della dinamica vibrazionale e delle proprietà strutturali di ossidi cristallini ternari, con metodi empirici e di calcolo “ab-initio”* – resp. Prof. G. Mariotto
- **WINNER** of the comparative evaluation procedure for **Ricercatore Universitario** (researcher) - D.D. 298/2008 – 2008 – at University of Verona (from 1/1/11)
SSD: FIS/01 – Experimental physics
- **WINNER** of the comparative evaluation procedure for **Professore Associato** – at University of Verona
Area: 02 – Scienze Fisiche
Macrosettore: 02/B1 – Fisica sperimentale della materia
Settore Concorsuale: 02/B1 – Fisica sperimentale della materia
Settore Scientifico Disciplinare: FIS/01 – Fisica sperimentale

SCIENTIFIC QUALIFICATION

- **QUALIFIED** at the National Scientific Qualification 2011 for **ASSOCIATE PROFESSOR** role in **Italian Universities** (art. 16 of the law 30 December 2010, n. 240) Italian Ministry of Education, University and Research (MIUR): *validation of the qualification from 11/12/2013 to 11/12/2019*.
Area: 02 – PHYSICS
- **Technical responsible** of the **Fluorescence Laboratory** for optical (VIS-IR) characterization of materials (absorption, photoluminescence, excitation/emission mapping, lifetimes, quantum yield).
The Fluorescence Lab is part of the **Technological Platforms Centre** of University of Verona – *Spectroscopic Platform* – and it gives access and assistance to both internal and external experiments.
- **Nicola Daldosso is leader** of a small research group **Fluorescence and Raman Spectroscopic Lab** within the **Experimental and Applied Physics Research AREA**.

RESEARCH PROJECTS

Experiments at Synchrotron beamlines, **13 proposals accepted** for a total of 133 machine shifts (which corresponds to about 40 days of machine time)

- LURE, Orsay-F: 5 proposals for 52 machine shifts (1996-2000)
- ESRF, Grenoble-F: 7 proposals for 69 machine shifts (1998-2000)
- BESSY, Berlin-D: 1 proposal for 12 machine shifts (1999)

“Active” participation at funded research projects of NanoScience Laboratory, Physics Dep. Univ. Trento (Prof. L. Pavesi)
(proposal writing and submission, workplan definition, scientific and financial reporting, project meeting preparation and participation, students coordination, experimental activities planning and supervising)

National (3)

- RAMSES (*Radiation Amplification by Stimulated Emission in Silicon*), FIRB INFM (Istituto Nazionale di Fisica della Materia) (2000-2003)
- PROFILL (*Electro-optical devices based on liquid crystal filled microcavities*), Fondo Unico della Provincia Autonoma di Trento (2002-2005)
- NAOMI (*NAno-on-Micro approach for multispectral analysis of proteins*), Fondo Unico della Provincia Autonoma di Trento (2008-2012)

European (4)

- SINERGIA (*Si nanocrystals and erbium co-doped glasses for optical amplifiers*), IST-2000-29650 EU (2001-2004)
- PHOLOGIC (*NanoPHOtonic LOGIC gates*), IST-NMP n° 17158 EU (2005-2008)
- LANCER (*Light Amplifiers with NanoClusters and Erbium*) IST-2005033574 (2006-2009), **member of the “Technical Committee”**
- HELIOS (*pHotonics Electronics functional Integration on CMOS*) FP7-224312 (2008-2012)

International collaborations (2)

- INTEL, research project: “*Novel Scheme for a Silicon nanocrystals based LED*” (2006-2007)
- NSERC Strategic Project of National Research of Canada: “*Strain Microscopy for Process and Product Optimization of Opto-Electronic Materials*” (2010-2013)

Research project as Principal investigator – positive evaluated but not funded

- **OBSID** project (*Biosensore Fotonico per Rivelazione di Ioni Metallici Alcalini*) – Thematic area “Bio-Nano Technologies”, 285.000 euro (2 years)
“*Call 2: Team 2009 – Incoming*” PAT (Provincia Autonoma di Trento), - Marie Curie Action - COFUND - progetto Trentino
Score: 68/80, 8th in the approved list (Jan. 2010), financed only up to 6th position.
- **POBSID** project (*Portable Optical BioSensors for Ions Detection*) – Thematic area “Life Science/Multidisciplinary”
ERC Starting Grant 2009, 1.320.000 euro (4 years)
Score: 4.67/8 (soglia minima 4/8) – approved for Phase 1, not called for Phase 2
- “*Luminescent Silicon and Metal NanoParticles for Bio-Medical Applications*” – Thematic area “Life Science/Multidisciplinary” - FIRB 2012 1.500.000 euro (3 years)
Score 1: 88/100; Score 2: 95/100, positive evaluated but not funded.

Research project as Principal investigator – funded

- “*NanoMaterials characterization for Clean Tech applications (antidust and antibacterial)*”
PRG-FSE POR 2007/2013 Reg. Veneto call **2012**, in partnership with Galvani Clean Technology srl and Veneto Innovazione SpA: **€ 24.000,00 (1 year)**
- “*Fluorescence characterization of apo-transferrin forms*”
Research contract committed by Legal Medicine section of the Department of Diagnostics and Public Health, University of Verona (prof. F. Tagliaro), 2013: **€ 14.000,00**
- “*Spectroscopic characterization and validation of new biomarkers for alcoholic abuse*”
University of Verona, Computer Science Department in collaboration with Department of Diagnostics and Public Health, FUR internal call AdR **2014**: **€ 46.200,00 (2 years)**
- “*Characterization of light emitting porous Silicon as biocompatible and traceable Drug Delivery System*”
University of Verona, Computer Science Department, FUR internal call AdR **2016**: **€ 24.000,00 (1 year)**
- **RIBA 22** from Area Ricerca University of VERONA progetto nanoHERCULES (2023-2024): → **€ 26.000**

Research project as Participant – funded

- **VERONA NANO-MEDICINE INITIATIVE** (Preclinical and Clinical NanoMedicine): Thematic area “BioMedicine”
Cariverona Foundation call 2010, Research Unit for Optical and spectroscopic (micro Raman and IR) characterization (WP1: Technological Platforms), Oct. 2011: **€ 2.000.000 (3 years)** → **€ 160.000** to the Unit Mariotto-Daldosso

- **NAMED-PEM**, *Advanced NAnocomposite Membranes and innovative Electrocatalysts for Durable Polymer Electrolyte Membrane fuel cells* (Feb. 2013- Feb. 2016) - PRIN 2010-11 funded by MIUR (Ministry of Education, Universities and Research). Member of the Research Unit of VERONA (lead by prof. G. Mariotto) - € 1.195.000 (3 years) → € 140.000 to the Verona Unit
- **SOLSA** - *Sonic Drilling coupled with Automated Mineralogy and chemistry On-Line-On-Mine-Real-Time* (Feb. 2016 – Jan. 2020) – Call: H2020-SC5-2015-one-stage project n. SC5-11d – 689868. Member of the Research Unit of VERONA (lead by prof. G. Mariotto) - € 9.791.000 (4 years) → € 976.000 to Verona Unit (Mariotto-Daldosso)
- **PRIN 22-24** (PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – Bando 2022 Prot. 2022JESYNS) “Nanoparticles for HERitage and CULTure in Environmental Sustainability (nanoHERCULES)” (feb. 25 – feb 27): → € 88.000

Research contracts

- **Arsmetica Technologies srl**: “Experimental test and data analysis of **PiGRECO system**” (2020-2022) – Computer Science Department: → € 45.000 + iva
- **University of Trento** (Dipartimento di Ingegneria Industriale) in the project “From polymers to covalent glasses: a structural evolution study (PolGla)”: Raman measurements to determine the structural evolution of the glasses as a function of the different preparations and thermal conditions (Dec. 2022), – Computer Science Department: → € 10.000

INTERNATIONALISATION PROJECTS and AGREEMENTS

- **Visiting Call 2022 for applications, cat. B INCOMING** (Univ. Verona)
prof. Tommaso Del Rosso, PUC-Rio Department of Physics (Brasil) – 1 month for Research –
“ OPTICAL SPECTROSCOPIC CHARACTERIZATION OF METAL-ORGANIC NANOCOMPOSITES FOR BIO-MEDICAL APPLICATION”
- **CAPES PRINT 2023** - PROGRAMA INSTITUCIONAL DE INTERNACIONALIZAÇÃO (Ministério da Educação – MEC Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES PRINT nº 41/201, BRASIL)
Prof. Nicola Daldosso, Department of Engineering for Innovative Medicine, University of Verona @ PUC-Rio Department of Physics (Brasil) – 3 weeks for Research&Teaching
“Inorganic nano particles: from synthesis to nano-medicine applications” short course to PhD Program
- **Visiting Call 2024 for applications, cat. B INCOMING** (Univ. Verona)
prof. Tommaso Del Rosso, PUC-Rio Department of Physics (Brasil) – 3 weeks for Research&Teaching –
“OPTICAL AND RAMAN CHARACTERIZATION OF LASER SYNTHESIZED NANOMATERIALS FOR NANOMEDICINE”
- **MoCoSvi Call for International Development Cooperation mobility 2024** (Univ. Verona)
Dr. Guilherme Conceição Concas, PUC-Rio Department of Physics (Brasil) – 2 months for Research
- **AGREEMENT** between “Università degli Studi di Verona” (ITALIA) and “Faculdades Catolicas, sponsor of Pontificia Universidade Catolica do Rio de Janeiro” (BRASIL): 10 years, date of signature 11/5/2020 – prot. N. 144191, repertorio N. 2001/2020
- **MEMORANDUM OF UNDERSTANDING** between “University of Verona, Department of Engineering for Innovation Medicine” (Italia) and “National Technical University of Athens, School of Electrical and Computer Engineering” (Greece) for academic and research collaboration in the area of nano-materials for energy, environment & medicine – 5 years (7 nov. 2024)

BOOK and BOOK'S CHAPTERS (8)

- 1) **"Porous Silicon"**, Z. Gaburro, N. Daldosso, L. Pavesi in *Encyclopedia of Condensed Matter Physics* edited by Franco Bassani, Jerry Liedl and Peter Wyder (Elsevier Ltd) – Academic Press (2005) Academic Press - Hardbound, 3000 pages. ISBN-13:978-0-12-227610-1; ISBN-10: 0-12-227610-8.
- 2) **"Nanostructured Silicon for Photonics – from materials to devices"**, Z. Gaburro, P. Bettotti, N. Daldosso, M. Ghulinyan, D. Navarro, M. Melchiorri, F. Riboli, M. Saiani, F. Sbrana, and L. Pavesi, *Materials Science Foundation 27-28*, TransTech Publications LTD (2006). ISBN/ ISBN-13:0-87849-488-x / 978-0-87849-488-0.
- 3) **"Low dimensional Silicon as a photonic material"**, N. Daldosso and L. Pavesi, in *Nanosilicon* edited by Vijay Kumar, Vijay Kumar Foundation, Chennai, India, Elsevier Ltd (2007). ISBN-13:978-0-08-044528-1; ISBN-10:0-08-044528-4.
- 4) **"Low dimensional silicon to enable silicon photonics"**, O. Anopchenko, P. Bettotti, M. Cazzanelli, N. Daldosso, L. Ferraioli, Z. Gaburro, R. Guider, D. Navarro-Urrios, A. Pitanti, S. Prezioso, R. Spano and L. Pavesi in *Highlights on Spectroscopies of Semiconductors and Nanostructures*, edited by G. Guizzetti, L.C. Andreani, F. Marabelli and M. Patrini, *Società Italiana di Fisica, Conference Proceedings vol. 94 (Pavia, 13 June 2007) pag. 231-242* ISBN 978-88-7438-035-0.
- 5) **"Silicon nanocrystals enabling Silicon Photonics"**, N. Daldosso and L. Pavesi, in *Silicon Nanophotonics: Basic Principles, Present Status and Perspectives* edited by Leonid Khriachtchev, University of Helsinki, Finland, World Scientific Publishing (2008). Hardbound, 472 pages, (Aug-2008). ISBN 978-981-4241-11-3.
- 6) **"Photonics applications"**, A. Anopchenko, N. Daldosso et al., in *Silicon nanocrystals: physics and applications* edited by L. Pavesi and R. Turan, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Hardcover; 648 pages, (March 2010) ISBN: 978-3-527-32160-5
- 7) **"Silicon Nanocrystals Enabling Silicon Photonics"**, Nicola Daldosso in *Silicon Nanophotonics - Basic Principles, Present Status, and Perspectives (Second Edition)* by Leonid Khriachtchev (*University of Helsinki, Finland*) Hardback 503 pages 2016-09-30
- 8) **"Porous Silicon"**, Z. Gaburro, N. Daldosso, L. Pavesi in *Reference Module in Materials Science and Materials Engineering 2016 - current as of 28 October 2015*, available on line 1 December 2015.
Edited by M.S.J. Hashmi (Elsevier Ltd) ISBN: 978-0-12-803581-8 DOI: 10.1016/B978-0-12-803581-8.01134-6.

PATENTS

Nicola Daldosso owns 1 Italian patent: **SR011 IT (2003)**: "Fabrication of an integrated Fabry-Perot microcavity on silicon" – related to the PROFILL project (*Electro-optical devices based on liquid crystal filled microcavities*, 2001-2003). International extended on 28 Dec. 2004, **patent N° PCT/EP2004/053719**

He contributed to another Italian patent, **BI790F (2008)**: "Multimode pumping scheme for Si-nc sensitized EDWAs based on high power LEDs in the visible" – owned by Scuola Superiore Sant'Anna Pisa, Italy.

INVITED TALKS at INTERNATIONAL CONFERENCES and FORUM

Nicola Daldosso has been invited **25 times** to present his scientific results to international conferences and workshops, among them **2 keynote talks, 1 selected lecture and 1 best project**.

- 1) LURE Users' Meeting, Orsay–Paris (2001), **the best 6 projects** performed in 2000: "Light emitting silicon nanoparticles studied by XEOL"
- 2) NATO Advanced Research Workshop, Ilmenau-Germany (2003): "On the Route Towards a Monolithically Integrated Silicon Photonic"
- 3) EMRS 2004, Strasbourg, France (25-28 June 2004), Symposium I: "A further step towards an all silicon based photonics: optical gain in Si nanocrystals"
- 4) MPLP'04, 4th International Symposium Modern Problems of Laser Physics, Novosibirsk-Russia (22-28 August 2004): "Towards a Si laser: optical gain in Si nanocrystals"
- 5) ICSI-4, 4th International Conference on Silicon Epitaxy and Heterostructures, Awaji Island, Hyogo – Japan (23-26 May 2005): "Light emission and optical gain from nanostructured Silicon"
- 6) **Selected Lecture** to "Nanotecnologia: la nueva revolucion tecnologica" UIMP, Pontevedra – Spain (5-9 September 2005): "Si nanostructures for Photonics: from basic to devices"
- 7) International Conference on MEMS and Semiconductor NANO Technology, IIT Kharagpur- India (20-22 December 2005): "Si nanostructures for Photonics"
- 8) EMRS 2006, Nice, France (29 May -1 June 2006), Symposium D: "Optical losses and gain in silicon-rich silica waveguides containing Er ions"

- 9) "Silicon Photonics: the challenges and future" OIDA Forum (Optoelectronics Industry Development Association), Santa Clara, CA, USA (22 Feb. 2007): "Low dimensional silicon for Photonics": 1 over 2 European representatives
- 10) ECS 212th Meeting: Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices, Washington DC, USA (9 Oct. 2007): "Photoluminescence of silicon nanocrystals"
- 11) LEOS Annual Meeting, Integrated Optics and Optoelectronics, Orlando, FL, USA (21-25 Oct. 2007): "Erbium and Silicon Nanocrystal for Light Amplification"
- 12) Photonics West – "Silicon Photonics (OE12)" SPIE International Symposium on Integrated Optoelectronic Devices OPTO 2008, San José, CA, USA (19-24 Jan. 2008): "Erbium and Silicon Nanocrystal for Light Amplification"
- 13) ICPS 2008 29th International Conference on the Physics of Semiconductors, Rio de Janeiro, Brasil (27-31 July 2008): "NanoSilicon for Photonics"
- 14) MRS 2008 Fall Meeting, Boston, MA, USA (1-5 Dec. 2008): "Towards and Er doped silica amplifier sensitized by silicon nanoclusters" (joint session Symposium MM and E)
- 15) SIBET 2009 (Silicon-based Emission Technologies), Manchester, UK (14-17 June 2009): "NanoSilicon for Photonics" - **keynote speaker**
- 16) IBEDM 2009 (Impurities Based Electroluminescent Devices and Materials), Tossa de Mar, Spain (Sept. 30 – Oct. 3, 2009): "NanoSilicon light emission devices"
- 17) Nanoscience and Nanotechnology Conference 2015, Frascati, Roma, Italy (28 Sept - 2 Oct. 2015): "Photoluminescent Mesoporous Silicon for NanoMedicine"
- 18) 5th International Conference on Materials Engineering and Metallurgy (iMAT 2016), Shiraz, Iran (8-9 Nov. 2016): "Nanomaterials for Theranostics: the case of porous silicon" - **keynote speaker**
- 19) 17th International Conference and Exhibition on Nanomedicine and Nanotechnology in Health Care (Nanomedicine 2017), Melbourne, Australia (23-24 Nov. 2017): "Inorganic coating of luminescent porous silicon for Nanomedicine applications"
- 20) Silicon Nanoparticles Workshop, Bertinoro, Italy (October 1-3, 2018): "Organic and inorganic coating of porous Si for theranostics"
- 21) International Conference on Photonics Research (INTERPHOTONICS 2018), Kemer, Antalya, Turkey (8-12 Oct. 2018): "Luminescent porous silicon for Nanomedicine"
- 22) SBPMat 22, SESSION C: Materials in Medicine, Nanotoxicology and Nanoregulation, Foz de Iguassu' BRASIL (25-29 Sept, 2022): "Porous Silicon Microparticles enhancing the immunologic response"
- 23) ICACC23, Symposium S17: Advanced Ceramic Materials and Processing for Photonics and Energy– Daytona Beach USA (23-27 Jan 2023): "Functionalized light emitting silicon nano-particles"
- 24) 3rd International Conference on Medical Optics (MEDOPTICS), Oludeniz in Mugla, Turkey (8-11 Oct., 2024): "Light emitting porous nano-silicon as a multimodal platform for theranostics"
- 25) World Congress on Nanoscience and Nanotechnology NanoTECH-2024, Honk Kong, Cina (8-10 Nov. 2024): "Porous silicon as a multimodal platform for nanomedicine"

SCHOOL and CONFERENCE ORGANIZATION and MANAGEMENT

- **Chair and organizer** of the International Workshop *SEDWAL (Sensitized Er doped waveguide amplifier/laser)*, Levico Terme – Trento (13-15 Apr. 2008): 80 participants.
- **Chair and organizer** of the International Workshop "*Bio-Sensing on silicon*" – Trento (18 Marzo 2009)
- **Scientific Director and organizer** of the 5th Optoelectronic and Photonic Winter School "*CMOS Photonics*", Trento (15-21 March 2009): 50 students and 20 speakers.
- **Organizer** of the International workshop "*New trends in NanoPhotonics*", Trento (27 Feb. 2010)
- **Chair and organizer** of Symposium "*Nanoscaled Si, Ge based materials*", E-MRS 2010 Fall Meeting, Warsaw – Poland (13-17 Sept. 2010): 60 scientific papers.
- **Organizer** of 1st Annual SOLSA Project meeting, Verona (18-20 Jan. 2017)

SCIENTIFIC AWARDS

- **Best 6 research projects** performed in 2000 at synchrotron LURE, Orsay – Paris (France).
- **Best POSTER** presented at the 11th International Conference on Nanosciences & Nanotechnologies (NN14), Thessaloniki, Greece; 07/2014: "*Mesoporous Silicon as a Potential Candidate for Nanotheranostics*".
- **Best PAPER** presented at Symposium R: Multifunctional nanostructures for diagnostic and therapeutic of diseases, E-MRS 2016 Spring Meeting, Lille, France (2-6 May 2016): "*Surface Modification of Luminescent Porous Silicon for Drug Delivery*".

TEACHING ACTIVITY

Setting up of the exhibition “**Cento anni di Raggi X – 100 years of X-rays**” at Physics Department of University Trento (resp. Prof. P. Fornasini) – May 1997

ASSISTANT PROFESSOR

Assistant professor at University of Trento

- 1999-2005: Physics 1 (*fundamentals of mechanics and thermodynamics*) - Fisica Generale 1 - Bachelor's degree in Mathematics and Physics (Prof. G. Dalba): I module (Mechanics), II module (System Mechanics), III module (Thermodynamics)
- 2003-2009: Optoelectronics, Master degree in Physics and Telecommunication Engineering (Prof. L. Pavesi)
- 2005-2009: Laboratory of Optoelectronics, Master degree in Physics and Telecommunication Engineering (Prof. L. Pavesi)
- 2005-2007: Laboratory of Physics 2 (*electronics and optics*), Master degree in Physics (Prof. L. Pavesi)
- 2007-2009: Laboratory of Physics 3 (*electronics*), Master degree in Physics (Prof. L. Pavesi)

PROFESSOR (Master and Bachelor Degree)

Professor at University of Trento

International 2nd Level Master on Nano-Micro Materials (in English), *Università di Trento and Fondazione Bruno Kessler, Trento - Italy*

- 2006-2009: Sensors for Photonics
- 2009-2010: Optoelectronics
- 2009-2010: Photonics and Photonics Laboratory

Professor at University of Brescia

- 2006: Solid State Physics 2, Master degree in Physics, Università Cattolica Sacro Cuore (Brescia)

Professor at University of Verona

- 2012-now: Physics 1 with Laboratory (12 teaching units), Bachelor's Degree in Applied Mathematics
- 2014-now: Physics Education Laboratory (6 teaching units), in English, Master Degree in Mathematics
- 2023-now: Physics with elements of Mathematics (3 teaching units), combined Bachelor and Master's Degree in Pharmacy

PROFESSOR (Master 2° Level)

Coordinator of the teaching curriculum “*Photonics and Alternative Energies*” International Master 2° level (Nano-Micro), (2010): Coordination and organization of courses (6 courses) and teaching staff (about a dozen instructors).

- 2006-2009: Sensors for Photonics, International Master 2° level (Nano-Micro), Università di Trento e Fondazione Bruno Kessler (Trento)
- 2009-2010: Optoelectronics, Photonics Laboratory, and Photonics International Master 2° level (Nano-Micro), Università di Trento e Fondazione Bruno Kessler (Trento)

PROFESSOR (PhD programs)

- 2011-2014: Optical properties of Nanomaterials, seminars in the **PhD program** “*Nanotechnologies and Nanomaterials for bio-medical applications*” – University of Verona
- 2016: Nanomaterials for biomedical applications seminars in the **PhD program** “*Nanoscience and Advances Technologies*” – University of Verona
- **Photonics Course**, intensive course (2 days) at PhD School of UIMP (Universidad Internacional Menéndez Pelayo), doctoral program “*Nanotecnología: la nueva revolución tecnológica*”, Pontevedra – Spain (Sett. 2005)
- **Short course** (9 hours) at Physics PhD program of the Pontificia Universidade Católica (PUC) do Rio de Janeiro (BRASIL): - “*Inorganic nano particles: from synthesis to nano-medicine applications*” (March 2023)
- **Theranostics: from materials to devices (12 hours)**, in the **PhD program** “*Intelligent Systems Engineering*” - University of Verona (Feb. 2025)

ASSISTANT SUPERVISOR OF MASTER STUDENTS

University of Trento, Telecommunication Engineering (supervisor Prof. L. Pavesi):

- M. Girardini: “Caratterizzazione di guide d’onda in silicio per circuiti ottici integrati” (2002)
- R. Dallapiccola: “Design di un interferometro Mach-Zehnder integrato in silicio” (2003)
- M. Gionta: “Sviluppo di un apparato m-line per caratterizzazione di guide d’onda nella terza finestra telecom” (2004)
- G. Dalfollo: “Misura di parametri caratteristici di guide d’onda per ottica integrata in silicio” (2004)

ASSISTANT SUPERVISOR OF PHD STUDENTS

University of Trento, Physics Department (supervisor Prof. L. Pavesi):

- dr. F. Riboli: “Classical and Photonic Crystal Waveguides for Novel Silicon Integrated Optical Components” – Trento, Dic. 2005 – PROFILL EU project (2002-2005)
- dr. M. Melchiorri: “Silicon based optical waveguides and photonic devices” – Trento, Feb. 2006 - PROFILL EU project (2002-2005)
- dr. L. Ferraioni: “Dielectric and luminescent properties of low dimension silicon structures formed in various matrices” – Trento, Nov. 2007 - SEMINANO EU project (2004-2007)
- dr. R. Spano: “Nonlinear optical properties of silicon nanocrystals and their application in photonic devices” – Trento, Dic. 2008 - PHOLOGIC EU project (2005-2008)
- dr. R. Guider: “Novel materials and optical waveguide systems for silicon photonics” – Trento, Gen. 2010 - PHOLOGIC EU project (2005-2008)
- dr. A. Pitanti: “Light-matter interaction in silicon nanophotonic structures” – Trento, Apr. 2010 - LANCER EU project (2006-2009)
- dr. N. Prtljaga: “Study of light emitting properties of silicon nanocrystals and their possible applications in various contexts ranging from bio-imaging to erbium ion sensitization” - Trento, March 2012
- dr. A. Marconi: “Electroluminescence from Nanocrystalline-Si/SiO₂ Multilayers” – Trento, 2012 - HELIOS EU project (2008-2010)

SUPERVISOR OF STAGE STUDENTS

University of Verona, Computer Science Department

- tutor of high school students for 2-weeks stage in a Research Lab (2016 – now)

SUPERVISOR OF MASTER STUDENTS

University of Verona, DEPARTMENT OF COMPUTER SCIENCE

- dr. Michele Imperio: “Physics experiments for teachers: setup, execution, data analysis and cards of some *significant laboratory sessions*” - Master degree in Mathematics Curriculum Mathematics for education”, October 2020

SUPERVISOR OF PHD STUDENTS

University of Verona, Natural Sciences and Engineering PhD SCHOOL

- dr. Ali Ghafarinazari: “Luminescent Porous Silicon for Nanotheranostics” - doctoral program in Nanotechnology and Nanomaterials for Biomedical Applications – Verona, March 2016
- dr. Elena Chisté: “doctoral program in “Nanoscience and Advanced Technologies”, March 2016
- dr. Alessia Sambugaro: doctoral program in “Nanoscience and Advanced Technologies” Verona, October 2022

MEMBER OF INTERNATIONAL PHD JURY

- dr. Daniel Navarro-Urrios – **Universidad de La Laguna**, La Laguna, Spain (12/5/2006)
“Obtención, caracterización y aplicaciones de dispositivos ópticos basados en nanoestructuras de silicio” – PhD in Physics
- dr. Youcef Lebour – **University of Barcelona**, Barcelona, Spain (29/10/2010)
“Studies of Silicon Nanostructures for Integrated micro-Photonics Applications” – PhD in Physics
- dr. Federico Ferrarese Lupi – **University of Barcelona**, Barcelona, Spain (7/5/2012)
“Optically active Si-rich Si₃N₄ μ -cavities for sensoristic applications” – PhD in Physics

INSTITUTIONAL ACTIVITY

TEACHING COMMITTEES AND STUDENT SERVICE WORKING GROUPS

- **Coordinator** of the “Photonics and Alternative Energies” track of the *International 2nd Level Master on Nano-Micro Materials*, University of Trento and Fondazione Bruno Kessler, Trento – Italy (2010)
- Member of the **Academic Board** of the PhD program in “Nanosciences and Advanced Technologies” (coordinator: Prof. F. Tagliaro) of the Doctoral School in Natural and Engineering Sciences, University of Verona (since 2011)
- Member of the “**Syllabus**” Working Group for the Bachelor’s Degree in Applied Mathematics, Department of Computer Science, University of Verona (since 2016)
- Member of the “**Tutor**” Working Group, Department of Computer Science, University of Verona (since 2016)
- Member of the **Safety Team**, University of Verona (since 2013)
 - ✓ High-Risk Fire Safety Certification
 - ✓ First Aid Certification
 - ✓ Additional Course for Supervisors
 - ✓ General Workplace Safety Training - 2017 Edition
- Participation in **examination boards** for the Master’s Degree in Mathematics and the Bachelor’s Degree in Applied Mathematics, Department of Computer Science, University of Verona (since 2013)
- **Head of the Cyber-Physical Laboratory** for instruments and materials related to Experimental Physics Teaching activities, Department of Computer Science, University of Verona. Main role: design, purchase, maintenance, and management of materials and experimental setups (mechanics, optics, and electronics) — since 2013.
- Member of the **PLS** (National Scientific Degree Plan, 2015-2017) for the National Physics Program – Verona unit (coord. F. Monti) to improve physics teaching.
- Joint participation in the Raman Spectroscopy Laboratory as part of “Department Laboratory Visits” for students and schoolteachers during “Research Day” and “Open Week” events.

COLLEGIAL BODIES (MEMBER)

- Teaching Committee del Corso di Laurea Magistrale a ciclo unico in Farmacia - Medicine and Surgery
- Computer Science Teaching Committee - Department Computer Science
- Teaching Committee of PhD course in Nanotecnologie e nanomateriali per applicazioni biomediche - Department Biotechnology
- QUALITY ASSURANCE committee - Computer Science Committee - Department Computer Science
- INTERNATIONALIZATION Committee - Department Department of Engineering for Innovation Medicine
- Committee REGOLAMENTO DI DIPARTIMENTO - Department Department of Engineering for Innovation Medicine
- Committee for the EVALUATION of CANDIDATES for TEACHING and TUTORING ASSIGNMENTS- Department Department of Engineering for Innovation Medicine

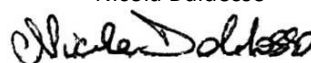
REVIEWER ACTIVITY

Peer Review **Referee** of several international journals on condensed matter, optics and optoelectronics. Among the others Applied Physics Letters e Journal of Applied Physics (American Institute of Physics), Journal of Physics: Condensed Matter (IOP Publishing), Surface Science e Journal of Luminescence (Elsevier), Optics Express e Optics Letters (Optical Society of America), Physical Review B e Physical Review Letter (American Physical Society).

Reviewer of research projects for the Grant Agency of the Academy of Sciences of the Czech Republic Czech Science Foundation (Czech Republic) and for the “Austrian Science Fund – FWF” (Austria).

February 17th 2025

Nicola Daldosso



FULL LIST OF PUBLICATIONS

----- 1998-2000 -----

- 1) **X-Ray Absorption Spectroscopy on light emitting porous silicon by XEOL and TEY**
G. Dalba, N. Daldosso, P. Fornasini, R. Graziola, R. Grisenti, and F. Rocca
Journal of Non-Crystalline Solids **232**, 370-376 (1998).
- 2) **Local order in light emitting porous silicon studied by XEOL and TEY**
G. Dalba, N. Daldosso, D. Diop, P. Fornasini, R. Grisenti, and F. Rocca
Journal of Luminescence **80**, 103-107 (1999).
- 3) **On sensitivity of the X-ray Excited Optical Luminescence to the local structure of the luminescent Si sites of porous silicon**
G. Dalba, P. Fornasini, R. Grisenti, N. Daldosso, and F. Rocca
Applied Physics Letters **74**, 1454-1456 (1999).
- 4) **Quantum confinement in porous silicon as a function of size distribution of luminescent sites**
G. Dalba, N. Daldosso, P. Fornasini, M. Grimaldi, R. Grisenti, and F. Rocca
Electrochemical Society Proceedings **99-22**, 10-20 (1999).
- 5) **New EXAFS measurements by XEOL and TEY on porous silicon**
N. Daldosso, F. Rocca, G. Dalba, P. Fornasini, and R. Grisenti
Journal of Porous Materials **7** (1-3), 169-172 (2000).
- 6) **The structure of nanocrystalline materials analyzed by X-ray Absorption Fine Structure: the case of porous silicon**
F. Rocca, G. Dalba, and N. Daldosso
Asian Journal of Physics **9**, 759- 771(2000) – invited paper.
- 7) **Evidence of X-ray absorption edge shift as a function of luminescent wavelenght in porous silicon**
G. Dalba, N. Daldosso, P. Fornasini, M. Grimaldi, R. Grisenti, and F. Rocca
Physical Review B **62**, 9911- 9914 (2000).

----- 2001 - 2002 -----

- 8) **EXAFS studies on the local structure of Er ions in Al-codoped silica xerogels**
F. Rocca, M. Ferrari, A. Kuzmin, N. Daldosso, C. Duverger, and F. Monti
Journal of Non-Crystalline Solids **293-295**, 112-117 (2001).
- 9) **Monitoring penetration of ethanol in a porous silicon microcavity by photoluminescence interferometry**
Z. Gaburro, N. Daldosso, L. Pavesi, G. Faglia, C. Baratto, and G. Sberveglieri
Applied Physics Letters **78**, 3744-3746 (2001).
- 10) **Structural and optical properties of PECVD grown Silicon nanocrystals**
G. Vijaya Prakash, N. Daldosso, E. Degoli, F. Iacona, M. Cazzanelli, Z. Gaburro, G. Puker, P. Dalba, F. Rocca, G. Franzò, E. Ceretta Moreira, D. Pacifici, F. Priolo, C. Arcangeli, A.B. Filonov, S. Ossicini, and L. Pavesi
Journal of Nano Science and Nano Technology **1**, 159-168 (2001).
- 11) **Silicon nanostructures for Photonics**
L. Pavesi, P. Bettotti, M. Cazzanelli, S. Cella, N. Daldosso, L. Dal Negro, B. Danese, Z. Gaburro, C.J. Oton, L. Pancheri, and G. Vijaya Prakash
International Semiconductor Conference 2002, CAS 2002 Proceedings, vol. 1, 103-112 (2002) - invited paper

 ----- 2003 -----

- 12) **Size and surface effects in porous Silicon studied by X-ray Absorption Spectroscopy**
N. Daldosso, P. Dalba, P. Fornasini, R. Grisenti, and F. Rocca
physica status solidi(a) **197** (1), 98-102 (2003).
- 13) **Chemical composition and local structure of PECVD Si nanocrystals and their embedding silica matrix**
 G. Dalba, N. Daldosso, P. Fornasini, R. Grisenti, F. Rocca, L. Pavesi, F. Priolo, G. Franzò, and F. Iacona,
Applied Physics Letter **82**, 889-891 (2003).
- 14) **X-ray absorption study of light emitting Si nanocrystals**
N. Daldosso, G. Dalba, R. Grisenti, F. Rocca, L. Pavesi, F. Priolo, G. Franzò, and F. Iacona
Physica E: Low-dimensional Systems and Nanostructures **16**, 321-325 (2003).
- 15) **Role of the interface region on the optoelectronic properties of silicon nanocrystals embedded in SiO₂**
N. Daldosso, M. Luppi, S. Ossicini, E. Degoli, R. Magri, G. Dalba, P. Fornasini, R. Grisenti, F. Rocca, L. Pavesi, S. Boninelli, F. Priolo, C. Bongiorno, and F. Iacona
Physical Review B **68**, 085327-1/085327-8 (2003).
- 16) **Stimulated emission in plasma enhanced chemical vapour deposited silicon nanocrystals**
 L. Dal Negro, M. Cazzanelli, N. Daldosso, Z. Gaburro, L. Pavesi, F. Priolo, D. Pacifici, G. Franzò, and F. Iacona
Physica E: Low-dimensional Systems and Nanostructures **16**, 297-308 (2003).
- 17) **Studies on the temperature dependence of the short range structure and local dynamics in silver borate glasses**
 G. Dalba, P. Fornasini, R. Grisenti, S. a Beccara, N. Daldosso, A. Sanson, F. Rocca, F. Monti, and A. Kuzmin
Phys. Chem. of Glasses **44** (2), 75-78 (2003).
- 18) **Experimental and theoretical joint study on the electronic and structural properties of Silicon nanocrystals embedded in SiO₂: active role of the interface region**
N. Daldosso, M. Luppi, G. Dalba, L. Pavesi, F. Rocca, F. Priolo, G. Franzò, F. Iacona, E. Degoli, R. Magri, and S. Ossicini
MRS Proceedings **770**, 87-92 (2003).
- 19) **Time-Resolved gain dynamics in Silicon nanocrystals**
 L. Dal Negro, M. Cazzanelli, N. Daldosso, L. Pavesi, F. Priolo, G. Franzò, D. Pacifici, and F. Iacona
MRS Proceedings **770**, 69-74 (2003).
- 20) **Silicon nanocrystal nucleation as a function of the annealing temperature in SiO_x films**
N. Daldosso, G. Das, G. Dalba, S. Larcheri, R. Grisenti, G. Mariotto, L. Pavesi, F. Rocca, F. Priolo, G. Franzò, A. Irrera,
 M. Miritello, D. Pacifici, and F. Iacona
MRS Proceedings **770**, 45-50 (2003).
- 21) **Scattering rings as tool for birefringence measurements in porous silicon**
 C. J. Oton, Z. Gaburro, M. Ghulinyan, N. Daldosso, L. Pancheri, P. Bettotti, L. Dal Negro, and L. Pavesi
MRS Proceedings **762**, 767-772 (2003).
- 22) **Will silicon be the photonics material of the third millennium?**
 L. Pavesi, L. Dal Negro, N. Daldosso, Z. Gaburro, M. Cazzanelli, F. Iacona, G. Franzò, D. Pacifici, F. Priolo, S. Ossicini, M. Luppi, and E. Degoli
in Physics of Semiconductors 2002 edited by A.R. Long and J.H. Davies, Institute of Physics, Conference Series Number 171 (Institute of Physics Publishing Bristol (UK), 2003) pag. 261-268.

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- 23) **On the route towards a monolithically integrated silicon photonics**
N. Daldosso and L. Pavesi
in "Frontiers in molecular scale science and technology of nanocarbon, nanosilicon and biopolymer integrated nanosystems", NATO Science Series E. Buzaneva and P. Scharff (eds.), Kluwer Academic Publishers, Dordrecht (The Netherlands), 287-298 (2004).
- 24) **Silicon based near infrared tunable filters filled with positive or negative dielectric anisotropic liquid crystals**
G. Pucker, A. Mezzetti, M. Crivellari, P. Bellutti, A. Lui, N. Daldosso, and L. Pavesi
Journal of Applied Physics **95**, 767-769 (2004).
- 25) **Silicon based near infrared tunable filters based on liquid crystals**
A. Mezzetti, G. Pucker, M. Crivellari, C. Kompocholis, P. Bellutti, A. Lui, N. Daldosso, F. Riboli, M. Saiani, Z. Gaburro, and L. Pavesi
SPIE Proceedings **5357**, 158-163 (2004).
- 26) **On the route towards a monolithically integrated silicon photonics**
N. Daldosso, M. Cazzanelli, D. Navarro, P. Bettotti, M. Melchiorri, F. Riboli, M. Ghulinyan, F. Sbrana, Z. Gaburro, and L. Pavesi
Proceedings of International Conference on Communication, Devices and Intelligent Systems (CODIS 2004) 8-10 Jan, 2004, Kolkata, India - invited paper
- 27) **Comparison among various Si₃N₄ waveguide geometries grown within a CMOS fabrication pilot line**
N. Daldosso, M. Melchiorri, F. Riboli, M. Girardini, G. Pucker, M., Crivellari, P. Bellutti, A. Lui, and L. Pavesi
IEEE- Journal of Lightwave Technology **22**, No 7, 1734-1740 (July 2004).
- 28) **Optical gain in mono-dispersed silicon nanocrystals**
M. Cazzanelli, D. Navarro-Urrios, F. Riboli, N. Daldosso, L. Pavesi, J. Heitmann, L.X. Yi, R. Scholz, M. Zacharias, and U. Gösele
Journal of Applied Physics **96**, 3164-3171 (2004).
- 29) **Spectroscopic characterization of thermally treated Si-rich oxynitride films deposited by PECVD on silicon substrate**
G. Das, G. Mariotto, N. Daldosso, and L. Pavesi
Proceedings of GNSR2003, 187-196 (2004).
- 30) **Birefringence in optical waveguides made by Si nanocrystal superlattices**
F. Riboli, D. Navarro-Urrios, A. Chiasera, N. Daldosso, L. Pavesi, C. J. Oton, J. Heitmann, L.X. Yi, R. Scholz, and M. Zacharias
Applied Physics Letter **85**, 1268-1270 (2004).
- 31) **Low loss silica waveguides containing Si nanocrystals**
C. Garcia, B. Garrido, P. Pellegrino, J.R. Morante, M. Melchiorri, N. Daldosso, L. Pavesi, E. Scheid, G. Sarraayrouse
MRS Proceedings **817**, 109-114 (2004).
- 32) **Silicon nanostructures for Photonics**
M. Ghulinyan, Z. Gaburro, N. Daldosso, L. Pavesi
Nanotechnology E-Bulletin – SPIE, **4**, 3-4 (Nov. 2004) – invited paper.
- 33) **Fabrication and optical characterization of thin two-dimensional Si₃N₄ waveguides**
N. Daldosso, M. Melchiorri, F. Riboli, F. Sbrana, L. Pavesi, G. Pucker, C. Kompocholis, M. Crivellari, P. Bellutti, and A. Lui
Material Science in Semiconductor Processing **7**, 453-456 (2004).

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- 34) **Birefringence characterization of mono-dispersed Silicon nanocrystals planar waveguides**
D. Navarro-Urrios, F. Riboli, M. Cazzanelli, N. Daldosso, L. Pavesi, C. J. Oton, J. Heitmann, L.X. Yi, R. Scholz, and M. Zacharias
Optical Materials **27**, 763-768 (2004).
- 35) **Pump-probe experiments on Er coupled Si-nanocrystals rib-loaded waveguides**
N. Daldosso, D. Navarro-Urrios, M. Melchiorri, L. Pavesi, F. Gourbilleau, M. Carrada, R. Rizk, C. Garcia, P. Pellegrino, B. Garrido, and L. Cognolato
MRS Proceedings **832**, F11.3, 355-360 (2005).
- 36) **Silicon nanostructures for photonics applications**
P. Bettotti, M. Cazzanelli, N. Daldosso, L. Ferraioli, Z. Gaburro, M. Ghulinyan, D. Navarro, M. Melchiorri, F. Riboli, S. Prezioso, L. Pavesi
Proc. of SEMINANO 2005 Workshop, Budapest, Hungary, Vol. **2**, 267-270, (September 2005).
- 37) **Pump-probe experiments on low loss silica waveguides containing Si nanocrystals**
D. Navarro-Urrios, N. Daldosso, M. Melchiorri, F. Sbrana, L. Pavesi, C. Garcia, P. Pellegrino, B. Garrido, J.R. Morante, E. Scheid, and G. Sarabayrouse
MRS Proceedings **832**, F10.11, 159-164 (2005).
- 38) **Low loss rib waveguides containing Si nanocrystals embedded in SiO₂**
P. Pellegrino, B. Garrido, C. Garcia, J. Arbiol, J.R. Morante, M. Melchiorri, N. Daldosso, L. Pavesi, E. Scheid, and G. Sarabayrouse
Journal of Applied Physics **97**, 74312 (2005).
- 39) **Propagation losses of silicon nitride waveguides in the near infrared range**
M. Melchiorri, N. Daldosso, F. Sbrana, L. Pavesi, G. Pucker, C. Kompochois, P. Bellutti, and A. Lui
Applied Physics Letters **86**, 121111 (2005).
- 40) **Absorption cross section and signal enhancement in Er-doped Si nanocluster rib-loaded waveguides**
N. Daldosso, D. Navarro-Urrios, M. Melchiorri, L. Pavesi, F. Gourbilleau, M. Carrada, R. Rizk, C. Garcia, P. Pellegrino, B. Garrido, and L. Cognolato
Applied Physics Letters **86**, 261103 (2005).
- 41) **Er³⁺ absorption cross section in Si-nanocrystal waveguides in SiO₂**
M. Melchiorri, N. Daldosso, D. Navarro-Urrios, L. Pavesi, F. Gourbilleau, M. Carrada, R. Rizk
Proc. of Group IV Photonics 2005, art. n°1516424, pp. 120-122, 2nd IEEE Int. Conf. on Group IV Photonics (Antwerp, Belgium, 21-23 Sept. 2005).
- 42) **Optical characterization of silicon nitride low-loss waveguides in the near infrared range**
M. Melchiorri, N. Daldosso, L. Pavesi, G. Pucker, C. Kompochois, P. Bellutti, A. Lui
Proc. of Group IV Photonics 2005, art. n°1516425, pp. 123-125, 2nd IEEE Int. Conf. on Group IV Photonics (Antwerp, Belgium, 21-23 Sept. 2005).
- 43) **Design of an Integrated Optical Switch Based on Liquid Crystal Infiltration**
F. Riboli, N. Daldosso, G. Pucker, A. Lui, and L. Pavesi
Journal of Quantum Electronics **41**, 1197-1202 (2005).
- 44) **Wide-band transmittance of one-dimensional photonic crystals carved in Si₃N₄/SiO₂ channel waveguides**
D. Gerace, M. Galli, D. Bajoni, G. Guizzetti, L. C. Andreani, F. Riboli, M. Melchiorri, N. Daldosso, L. Pavesi, G. Pucker, S. Cabrini, L. Businaro, and E. Di Fabrizio
Applied Physics Letters **87**, 211116 (Nov. 2005).

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- 45) **Photon recycling in Fabry-Perot micro-cavities based on Si₃N₄ waveguides**
F. Riboli, A. Recati, N. Daldosso, L. Pavesi, G. Pucker, A. Lui, S. Cabrini, E. Di Fabrizio
Photonics and Nanostructures – Fund. and Applications **4**, 41-46 (Feb. 2006).
- 46) **Integrated optical microcavity infiltrated by liquid crystals for CWDM applications**
F. Riboli, N. Daldosso, M. Melchiorri, K. Kompocholis, G. Pucker, A. Lui, and L. Pavesi
Optical and Quantum Electronics **38**, 249-255 (Apr. 2006)
- 47) **Refractive index dependence of the absorption cross section at 1.54 μ m in Er³⁺ coupled to Si nanoclusters**
N. Daldosso, D. Navarro-Urrios, M. Melchiorri, C. Sada, F. Gourbilleau, R. Rizk, and L. Pavesi
Applied Physics Letters **88**, 161901 (May 2006).
- 48) **Non-linear optical properties of Si nanocrystals**
M. Cazzanelli, R. Spano, N. Daldosso, Z. Gaburro, S. Hernandez, Y. Lebour, P. Pellegrino, B. Garrido, E. Jordana, J. M. Fedeli, and L. Pavesi
Proc. of Group IV Photonics 2006, 52-54, 3rd IEEE Int. Conf. (Ottawa, Canada, Sept. 2006).
- 49) **Signal enhancement improvement at 1535 nm of Si-nc: Er³⁺ waveguides**
D. Navarro-Urrios, N. Daldosso, F. Gourbilleau, R. Rizk, B. Garrido, and L. Pavesi
Proc. of Group IV Photonics 2006, 222-224, 3rd IEEE Int. Conf. (Ottawa, Canada, Sept. 2006).
- 50) **Dielectric matrix influence on the photoluminescence properties of silicon nanocrystals**
L. Ferraioli, M. Cazzanelli, N. Daldosso, V. Mulloni, P. Bellutti, S. Yerci, R. Turan, A.N. Mikhaylov, D.I. Tetelbaum, and L. Pavesi
Proc. of Group IV Photonics 2006, 225-227, 3rd IEEE Int. Conf. (Ottawa, Canada, Sept. 2006).
- 51) **Distance dependent interaction as a limiting factor for Si nanoclusters to Er energy transfer in silica**
B. Garrido, C. Garcia, P. Pellegrino, D. Navarro-Urrios, N. Daldosso, L. Pavesi, F. Gourbilleau, and R. Rizk
Applied Physics Letters **89**, 163103 (Oct. 2006).
- 52) **Optical losses and gain in silicon-rich silica waveguides containing Er ions**
D. Navarro-Urrios, M. Melchiorri, N. Daldosso, L. Pavesi, C. Garcia, P. Pellegrino, B. Garrido, G. Pucker, F. Gourbilleau, and R. Rizk
Journal of Luminescence **121**, 249-255 (Nov. 2006).
- 53) **Optical losses and absorption cross section of silicon nanocrystals**
N. Daldosso, M. Melchiorri, L. Pavesi, G. Pucker, F. Gourbilleau, S. Chausserie, Ali Belarouci, X. Portier, and C. Dufour
Journal of Luminescence **121**, 344-348 (Nov. 2006).
- 54) **Er coupled Si nanocluster waveguides**
N. Daldosso, D. Navarro-Urrios, M. Melchiorri, C. Garcia, P. Pellegrino, B. Garrido, C. Sada, G. Battaglin, F. Gourbilleau, R. Rizk, and L. Pavesi
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