Antonio De Luca

Curriculum Vitae et Studiorum

CONTACT

Prof. Antonio De Luca
Physics Department & CNR-NANOTEC
University of Calabria
I-87036 Rende (CS), Italy
Tel. +39 0984 496124; Fax +39 0984 494401
Mobile +39 3284744918
e-mail: antonio.deluca@fis.unical.it
Scopus: 14123028900; **Orcid**: 0000-0003-2428-9075; **ResearcherID**: P-6976-2018
Researchgate.net/profile/Antonio_De_Luca

CURRENT POSITION

- **Associate Professor** (Legge 240/10)– "02/D1 - Fisica Applicata, Didattica e Storia Della Fisica" at Physics Department – Univ. of Calabria;

- **Habilitation as Full Professor (2017)** (02/B1, Fisica Sperimentale della Materia), art. 18, comma 4, Legge n. 240/2010;

PERSONAL DEVELOPMENT

Department of Physics – Case Western Reserve University

Senior Research Associate – October 2013 – February 2014
October 2012 – March 2013

CNRS – Bordeaux (France):

Visiting Researcher for a two weeks period in the framework of the building of a new Pump-probe

Ellipsometric Set-up, July 2012

CNR-INFM Department of Physics - University of Calabria:

Research Fellowship - Level III – March 2009 – October 2010

Department of Physics – Case Western Reserve University:

Senior Post-Doctoral Scholar – February 2007-February 2008

Institute for the Physics of Matter (INFM):

Scholarship June 1999 – December 1999 "Realization of a software to control the laser pulse length"

Physics Department, University of Calabria, Rende - Italy:

Post-Doctoral Scholar – December 2004-February 2007; March – December 2008

PhD Physics – January 2005, Dissertation Title: "*Nonlinear Optical Propagation in Liquid Crystals: Spatial Solitons and Organic Micro-Lasers*"

MS Physics – May 1999, Dissertation Title: "*Study of interaction between short laser pulses and liquid crystalline materials: linear and nonlinear effects*"

TEACHING EXPERIENCE (LAST 5 YEARS)

2015-2019	Responsible of the course "Electromagnetic Properties of Materials" - University of Calabria
2015-2019	Teaching Assistant of the course "Soft Matter" - University of Calabria
2018-2019	Teaching Assistant of the course "Physical characterization of materials" - University of Calabria
2016-2018	Teaching Assistant of the course "Physics of Innovative Materials" - Unical
2015-2016	Teaching Assistant of the course "Liquid Crystals" - University of Calabria
2014-2015	Teaching Assistant of the course "Physics for Biology" - University of Calabria
2014-2015	Teaching Assistant of the course "Soft Matter" - University of Calabria
2013-2104	Responsible of the Doctorate Course in "Experimental Techniques for Optical Investigation in Soft-composite and Plasmonic Materials", belonging to the "Physical, Chemical and Material Science and Technologies" doctorate program – XXX Cycle, Dept. of Physics - UNICAL
2013-2014	Teaching Assistant of the course "Physics for Natural Science" - University of Calabria
2013-2014	Teaching Assistant of the course "Physics for Biology" - University of Calabria
2013-2014	Teaching Assistant of the course "Soft-Matter" for Material Science- University of Calabria

SUPERVISION OF MS-PH.D-POSTDOC THESIS AND PH.D PROGRAMS

- **Master and Bachelor Thesis Supervisor**:

1) Physics Thesis: M. Ferraro, D. Pagnotto, G. Jacucci, V. Bruno,
2) Materials Science Thesis: S. De Cicco, A. Condello, M. Pipita, M. Amato, Y. Conti, A. Tiano

- Doctorate Thesis Supervisor
  - Dr. Rakesh Dhama, Ph.D Thesis: "*Across Scales Approach Based on Exciton-Plasmon Coupling for Low Loss Optical Metamaterials*"
  - Dr. Vincenzo Caligiuri, Ph.D Thesis: "*Dielectric and Resonant Gain Singularities in Multilayered Nanostructures*"
  - Dr. Giuseppe E. Lio, Ph.D Project: "*Plasmonic optical elements for superfocusing in 2 photons direct laser writing*"
- Post Doctoral Supervisor
  - Dr. Luigia Pezzi, Project: "*Models for loss compensation in systems with metal nanoparticles with gain for optical metamaterials applications and plasmonic nanolasers*"
  - Dr. Giovanna Palermo, Project: "*Study of the optical and thermoplasmonic properties of metamaterials and metallic nanostructures at the nano and micro-scale*"
- **2014/2019** - Member of the Collegium of the Doctoral program "SCIENZE E TECNOLOGIE FISICHE, CHIMICHE E DEI MATERIALI" – **XXX-XXXIV** Cycle - Department of Physics – UNICAL
- **2013** - Member of the Collegium of the Doctorate School "SCUOLA DI SCIENZA E TECNICA BERNARDINO TELESIO" – **XXIX** Cycle – Department of Physics – UNICAL
- **2012** - Member of the Collegium of the Doctorate School "SCUOLA DI SCIENZA E TECNICA BERNARDINO TELESIO" – **XXVIII** Cycle – Department of Physics – UNICAL
- **2011** – Member of the Collegium of the Doctorate School "SCUOLA DI SCIENZA E TECNICA BERNARDINO TELESIO" – **XXVII** Cycle – Department of Physics – UNICAL

RESEARCH EXPERIENCE

SCIENTIFIC RESEARCH AREAS OF INTEREST

Loss Compensation in Metamaterials/ Plasmonic Nanostructures in presence of gain/ Nanolasing/ Hyperbolic Metamaterials (HMM)/ Gain Assisted HMM / Spatial cancellation of reorientational effects in soft materials/ Molecular reorientation in LCs/ Observation/Characterization of Spatial Solitons/ Discrete Diffraction and Discrete Solitons/ Band Gap Materials / Organic Lasers, Lasers in confined structures/ Random Lasers in NLC / Nanotomography in NLC by means of an NSOM probe / Levitation of fluids and Rayleigh-Taylor instability experiments /

- *Realization and characterization of particular liquid crystal (LC) cells to study the formation and propagation of bulk "spatial solitons" (optical waveguide able to confine another optical beam)*
- ***Solitons steering over large walk-off angles***
- *Discrete diffraction and discrete solitons in periodic and a-periodic structures*
- ***Lasing action in periodic DFB micro-cavity systems***
- *Confinement of helixed liquid crystals in micro-cylinders: observation of radial and axial laser action*
- ***Random Lasing in partially-ordered liquid crystalline systems and in freely suspended NLC films***
- *Atomic Scanning Microscop*
- ***Near-Field Scanning Optical Microscopy (SNOM)** measurements in LC for 3D orientation reconstruction*
- *Fluids levitation and Rayleigh-Taylor instability experiments with precise and arbitrary control of the initial interface shape*
- *Loss Compensation in Soft-Metamaterials - gain-functionalized and gain assisted metal nanoparticles comparison*
- *Selective mitigation of absorptive losses in plasmonic nanostructures*
- *Plasmonic mediated absorption cross section enhancement of quantum dots embedded in a plastic matrix (PDMS)*
- ***Hyperbolic Metamaterials: extreme optical properties** by the inversion point of coexisting anisotropies*
- *Resonant Gain singularity in epsilon_NZP Hyperbolic Metamaterials*
- *Thermo-Plasmonics in solutions and rigid substrate*
- *Active Plasmonics on flexible substrates*

- Ph.D Thesis in Physics

University of Calabria, Dept. of Physics 2005

"Nonlinear Optical Propagation in Liquid Crystals: Spatial Solitons and Organic Micro-Lasers".

In this period the main results derived from the collaboration with University of Roma Tre, Optoelectronic section (Prof. G. Assanto). During this period, I worked on the possibility to realize particular liquid crystal cells in order to observe the formation of "spatial solitons", self-induced and self-sustaining light waveguides created with the aid of very small external electric field.
The presence of an input interface through which it is possible to control the director anchoring direction as well as in the bulk, allowed us to induce the soliton formation on distances of more than 3500 microns, that is many tenths of diffraction lengths. In these particular cells we have observed also the propagation of two and three solitons together, with the possibility to create a cross link between them, all-optical switching and steering on walk-off angles of about 7 °. The high nonlinear and nonlocal response of nematic liquid crystals allows to observe such phenomena at mW powers, instead of common Kerr materials which require much higher light intensities.

Another important topic was the creation of an organic micro-laser array by using doped chiral liquid crystals. Holographic micro-channels have been obtained in order to embed the helixed liquid crystals with a gain medium. The goal of this micro-system was the final direction of the helix of the periodic material, which was constrained to orient along the micro-channels. By using the photonic band gap properties of helixed liquid crystals, together with the gain introduced by the dye material, a micro-laser action was obtained along the micro-channels, with the possibility to control the emission intensity as well as the wavelength shift by acting on external fields (electric, temperature, etc.)

GRANTS AWARDED

1) (2018) Research Base Activities – Unical - ANVUR n. 20/2017 del 15-06-2017 **(Principal Investigator)**

2) (2014-2017) National Project PRIN 2102 funded for three years. Title: "*Gain-Plasmon Coupling in Metal-Dielectric Nanostructures: Loss Compensation towards Laser Action*" – **(Principal Investigator)**

3) (2009-2013) **NMP** (Nanosciences and Nanotechnologies, Materials and New Production Technologies) – 7th Framework Programme, "*Nanochemistry and self-assembly routes to metamaterials for visible light - METACHEM*". **(Key-Personnel)**

4) (2006) Research Projects "Young Researcher", "*Studio Delle Proprieta' Ottiche e Morfologiche di Micro e Nanostrutture Fotoniche Periodiche e Quasi-periodiche: Fluorescenza, Emissione Spontanea Amplificata e Azione Laser*". **(Principal Investigator)** (CIVR Area: 15c - Scienze e Tecnologie Dei Nano/Microsistemi)

Scientific Affiliations

SIF – Società Italiana di Fisica
SIOF – Società Italiana di Ottica e Fotonica
SICL - Società Italiana Cristalli Liquidi
CNR - NANOTEC Istituto per i Processi Chimico Fisici, Unità di Cosenza
CNISM - Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia
ANOMA - Novel Optical Materials and Applications

Collaborations

CNR-Nanotec Lecce – M. Cuscunà, V. Tasco, A. Passaseo, M. Esposito
Universidad San Francisco de Quito – Ecuador – Prof. Dario Niebieskikwiat, Dr. Alessandro Veltri, Dr. Melissa Infusino
CNRS – Bordeaux – Prof. Philippe Barois – Dr. Ashod Aradian – Dr. Virginie Ponsinet
University of Genève – **Switzerland** - Prof. Thomas Bürgi
Università di Siena – Dr. Matteo Albani
University of Bordeaux – Prof. Serge Ravaine
LOF – Bordeaux – Dr. Jacques Leng, Dr. Jean-Baptiste Salmon
CNR-IPCF Bari – Dr. Lucia Curri, Dr. Roberto Comparelli
University of Manchester - Dr. A. Gregorenko
Università di Roma TRE -Prof. G. Assanto
Center for Research and Education in Optics and Lasers, University of Central Florida, Orlando, USA; Beam Co. Dott. N. Tabiryan, Dott. S. Nersisyan,
Engineering and Electronics Dept., Penn State University, USA - Prof. I.C. Khoo

Other Activities

May, 19th 2004	Winner of the action "Enterprise creation sustainability and diffusion of entrepreneurial culture in technological-scientific faculties" within "Oracolo – Azione 5" project – Scientific Research, Technological Development, High Formation 2000-2006, University of Calabria.
10-2003/04-2004	Participation to the action "Enterprise creation sustainability and diffusion of entrepreneurial culture in technological-scientific faculties" within "Oracolo – Azione 5" project – Scientific Research, Technological Development, High Formation 2000-2006, University of Calabria Faculty of Sciences, University of Calabria. Enterpreneurial proposal: "Development of electro-optical devices with high technological content".

Publications in Peer-Reviewed Journals (H_{INDEX} = 22, Citations > 2000)

1) (2018) **Interface Focus, 9, 1, 20180050,** G. Jacucci , O. D. Onelli , A. De Luca , J. Bertolotti , R. Sapienza and S. Vignolini, "*Coherent backscattering of light by an anisotropic biological network*"
2) (2018) **Nanoscale, 10, 16556-16561,** G. Palermo, U. Cataldi, A. Condello, R. Caputo, T. Bürgi, C. Umeton, A. De Luca "*Flexible thermo-plasmonics: an opto-mechanical control of the heat generated at the nanoscale*"
3) (2018) **Advanced Optical Technologies, 7, 5, 273-289,** R. Caputo, A. De Luca, G. Strangi, R. Bartolino, C. Umeton*, L. De Sio, A. Veltri, S. Serak and N. Tabirya, "*The POLICRYPS liquid-crystalline structure for optical applications*"
4) (2018) **Liquid Crystals, doi.org/10.1080/02678292.2018.1515370,** G. Palermo, A. Guglielmelli, L. Pezzi, U. Cataldi, L. De Sio, R. Caputo, A. De Luca, T. Bürgi, N. Tabiryan, C. Umeton "*A command layer for anisotropic plasmonic photo-thermal effects in liquid crystal*"
5) (2018) **ACS Photonics, 5 (8), pp 3399–3407** D. Simeone, M. Esposito, M. Scuderi, G. Calafiore, G. Palermo, A. De Luca, F. Todisco, D. Sanvitto, G. Nicotra, S. Cabrini, V. Tasco, A. Passaseo and M. Cuscunà, "*Tailoring Electromagnetic Hot Spots towards Visible Frequencies in Ultra-Narrow Gap Al/Al2O3 Bowtie Nanoantennas"*
6) (2018) **ACS Photonics, 5, 6, 2431-2436**, F. D'apuzzo, M. Esposito, M. Cuscunà, A. Cannavale, S. Gambino, G. E. Lio, A. De Luca, G. Gigli, S. Lupi, "*Mid-Infrared Plasmonic excitation in Indium Tin Oxide micro-hole arrays*"

7) (2018) **RSC Adv. 8, 29, 16314-16318,** A. Aprile, G. Palermo, A. De Luca, R. Pinalli, E. Dal Canale, P. Pagliusi "*Assessment of EtQxBox complexation in solution by steady-state and time-resolved fluorescence spectroscopy*"
8) (2018) **Optics Letters, Vol. 43, Issue 9, pp. 1947-1949,** J. P. Yunda, B. Zappone, D. Alj, A. De Luca, and M. Infusino "*Optical vortices generated by edge dislocations in electro-convective instability arrays of nematic liquid crystals*"
9) (2018) **Adv. Optical Mater., 1701380,** V. Caligiuri, R. Lento, L. Ricciardi, R. Termine, M. La Deda, S. Siprova, A. Golemme, and A. De Luca, "*Environmental Control of the Topological Transition in Metal/Photoemissive-Blend Metamaterials*"
10) (2018) **ACSNano, 12 (1), pp 504–512,** R. Dhama, V. Caligiuri, L. Petti, A. Rahimi Rashed, M. Rippa, R. Lento, R. Termine, H. Caglayan, A. De Luca, "*Extra-Ordinary Effects in Quasi-Periodic Gold Nano-Cavities: Enhanced Transmission and Polarization Control of Cavity Modes*"
11) (2017) **Nanoscale, 9, 19279-19289,** L. Ricciardi, L. Sancey, G. Palermo, R. Termine, A. De Luca, E. I. Szerb, I. Aiello, M. Ghedini, G. Strangi and M. La Deda, "*Plasmon-mediated cancer phototherapy: the combined effect of thermal and photodynamic processes*"
12) (2017) **J. Phys. Chem. C, 121, 43, 24185–24191,** G. Palermo, D. Pagnotto, L. Ricciardi, L. Pezzi, M. La Deda and A. De Luca "*Thermo-Plasmonic Effects in Gain-Assisted Nanoparticle Solutions*"
13) (2017) **Journal of Physics D: Applied Physics, 50, 43** L. Pezzi, G. Palermo, A. Veltri, U. Cataldi, T. Bürgi, T. Ritacco, M. Giocondo, C. Umeton and A. De Luca, "*Photo-thermal study of a layer of randomly distributed gold nanoparticles: from nano-localization to macro-scale effects*"
14) (2017) **Molecular Crystals and Liquid Crystals, 649, 45-49**, G. Palermo, U. Cataldi, L. Pezzi, T. Bürgi, C. Umeton & A. De Luca, "*Thermo-plasmonic effects on E7 nematic liquid crystal*"
15) (2017) **Molecular Crystals and Liquid Crystals, 649, 31-37,** L. Pezzi, G. Palermo, C. Umeton & A. De Luca, "*Determination of NLC refractive index dispersion in wavelength and temperature for plasmonic applications*"
16) (2017) **PHOTONICS LETTERS OF POLAND, VOL. 9 (2), 17-19,** G. Palermo, R. Caputo, A. De Luca, and C. Umeton, "*Control of the optically induced heating of gold nanoparticles*"
17) (2017) **CRYSTALS, 2017, 7, 14,** G. Palermo, T. Ritacco, D. M. Aceti, L. Pezzi, M. Giocondo and A. De Luca, "*Photo-Thermal Effects in 1D Gratings of Gold Nanoparticles*"
18) (2017) **ACS Nano, 11, 1012–1025,** V. Caligiuri, L. Pezzi, A. Veltri and A. De Luca, "*Resonant Gain Singularities in 1D and 3D Metal/Dielectric Multilayered Nanostructures*"
19) (2016) **Optics Express, 24, Issue 13,** R. Dhama, A. R. Rashed, V. Caligiuri, M. El. Kabbash, G. Strangi and A. De Luca, "*Broadband optical transparency in plasmonic nanocomposite polymer films via exciton-plasmon energy transfer*"
20) (2016) **Journal of Nanomaterials, 2016,** M. El Kabbash, A. R. Rashed, K. V. Sreekanth, A. De Luca, M. Infusino and G. Strangi, "*Plasmon-Exciton Resonant Energy Transfer: Across Scales Hybrid Systems*"
21) (2016) **Nature Materials, 15, 621-627,** K.V. Sreekanth, Y. Alapan, M. ElKabbash, E. Ilker, M. Hinczewski, U. A. Gurkan, A. De Luca and G. Strangi, "*Extreme sensitivity biosensing platform based on hyperbolic metamaterials*"
22) (2016) **Journal of Physics D: Applied Physics,** 49, 8, Caligiuri, V., De Luca, A. – "*Metal-semiconductor-oxide extreme hyperbolic metamaterials for selectable canalization wavelength*"
23) (2016) **Sci. Rep. Nature, 6, 20002**, V. Caligiuri, R. Dhama, K. V. Sreekanth, G. Strangi & A. De Luca, "*Dielectric singularity in hyperbolic metamaterials: the inversion point of coexisting anisotropies*"
24) (2015) **Rendiconti Lincei, vol. 26, p. 127-128**, G. Strangi, A. De Luca, R. Bartolino, "*From Life to Life: through new materials and plasmonics*"
25) (2015) **Rendiconti Lincei, vol. 26, p. 161-174,** A. De Luca, R. Bartolino, M.A. Correa-Duarte, M.L. Curri, N.F. Steinmetz, G. Strangi - "*Gain-assisted plasmonic metamaterials: mimicking nature to go across scales*"
26) (2015) **RSC Adv., 5, 53245**, A. R. Rashed, A. De Luca, R. Dhama, A. Hosseinzadeh, M. Infusino, M. El Kabbash, S. Ravaine, R. Bartolino and G. Strangi "*Battling absorptive losses by plasmon–exciton coupling in multimeric nanostructures*"
27) (2015) **Bioconjugate Chem. 26 (1), pp 51–62**, A. M. Wen, M. Infusino, A. De Luca, D. L. Kernan, A. E. Czapar, G. Strangi and N. F. Steinmetz, "*Interface of Physics and Biology: Engineering Virus-Based Nanoparticles for Biophotonics*"
28) (2014) **J. Opt. 16 - 105103 (8pp)**, K. V. Sreekanth, A. De Luca and G. Strangi, "*Excitation of volume plasmon polaritons in metal-dielectric metamaterials using 1D and 2D diffraction gratings*"
29) (2014) **Sci. Rep. Nature,** 4 , 6340, K. V. Sreekanth, K. H. Krishna, A. De Luca and G. Strangi, "*Large spontaneous emission rate enhancement in grating coupled hyperbolic metamaterials*"
30) (2014) **J. of Appl. Phys. 116,** 104303, A. De Luca, A. Iazzolino, J.-B. Salmon, J. Leng, S. Ravaine, A. N. Grigorenko and G. Strangi, "*Experimental evidence of exciton-plasmon coupling in densely packed dye doped core-shell nanoparticles obtained via microfluidic technique*"
31) (2014) **App. Phys. Lett. 104,** 171904 K. V. Sreekanth, A. De Luca and G. Strangi, "*Improved transmittance in metal-dielectric metamaterials using diffraction grating*".
32) (2014) **ACS Photonics, 1,** 371-376 M. Infusino, A. De Luca, A. Veltri, C. Vázquez-Vázquez, M. A. Correa-Duarte, R. Dhama and G. Strangi, "*Loss-Mitigated Collective Resonances in Gain-Assisted Plasmonic Mesocapsules*"

33) (2014) **Appl. Phys. Lett., 104,** 103103, A. De Luca, R. Dhama, A. R. Rashed, C. Coutant, S. Ravaine, P. Barois, M. Infusino and G. Strangi, "*Double strong exciton-plasmon coupling in gold nanoshells infiltrated with fluorophores*"

34) (2014) **J. Mater. Sci.** 49, 1805–1811, M. Infusino, A. De Luca, F. Ciuchi, A. Ionescu, N. Scaramuzza, G. Strangi, "*Optical and electrical characterization of a gold nanoparticle dispersion in a chiral liquid crystal matrix*"

35) (2013) **Sci. Rep. Nature** 3, 3291, K.V. Sreekanth, A. De Luca, and G. Strangi, "*Experimental demonstration of surface and bulk plasmon polaritons in hypergratings*" - DOI:10.1038/srep03291

36) (2013) **Liq. Cryst. Rev., 1,** 2-9, "*POLICRYPS composite structures: realization, characterization and exploitation for electro-optical and all-optical applications",* L. De Sio, A. Veltri, R. Caputo, A. De Luca, G. Strangi, R. Bartolino and Cesare P. Umeton

37) (2013) **Appl. Phys. Lett., 103,** 023107, "*Negative refraction in graphene-based hyperbolic metamaterials*", K. V. Sreekanth, A. De Luca and G. Strangi

38) (2013) **Nanoscale, 5,** 6097-6105, "*Plasmon Mediated super-absorber flexible nanocomposites for metamaterials*", A. De Luca, N. Depalo, E. Fanizza, M. Striccoli, M. L. Curri, M. Infusino, A. R. Rashed, M. La Deda, G. Strangi

39) (2013) **Mol. Cryst. Liq. Cryst., 572 (1) ,** 59-65, "*Effects of gold nanoparticle dispersion in a chiral liquid crystal matrix"*, M. Infusino, A. De Luca, F. Ciuchi, A. Ionescu, N. Scaramuzza, G. Strangi

40) (2012) **JOSA B, Vol. 29, Iss. 11,** 3170 "*POLICRYPS Visible Curing for Spatial Light Modulator Based Holography*", M. Infusino, A. Ferraro, A. De Luca, R. Caputo and C. Umeton

41) (2012) **Nonlinear Optics Quantum Optics, Vol. 43, Issue 1-4,** 269-279 "*Light propagation, discrete diffraction, discrete solitons and discrete beats in periodic and non-periodic POLICRYPS structures*", L. Pezzi, A. De Luca, A. Veltri, C. Umeton.

42) (2012) **Rivista del Nuovo Cimento, Vol. 35, N. 11 - 575-606** "*Soft matter structures: from switchable diffraction gratings to active plasmonics*", L. De Sio, A. Veltri, R. Caputo, A. De Luca, G. Strangi, R. Bartolino and C. P. Umeton

43) (2012) **Optics Express, 23138, 20, 21,** "*Periodic and aperiodic liquid crystal-polymer composite structures realized via spatial light modulator direct holography*", M. Infusino, A. De Luca, V. Barna, R. Caputo and C. Umeton

44) (2012) **Lab on Chip, 2012, 12, 3760-3765,** "*Electro-switchable polydimethyl siloxane-based optofluidics*", L. De Sio , M. Romito , M. Giocondo , A. E. Vasdekis , A. De Luca and C. Umeton

45) (2012) **Journal of Materials Chemistry, 22, 8846-8852,** "*Gain functionalized core-shell nanoparticles: the way to selectively compensate absorptive losses*", A. De Luca, M. Ferrie, S. Ravaine, M. La Deda, M. Infusino, A. R. Rashed, A. Veltri, A. Aradian, N. Scaramuzza and G. Strangi

46) (2011) **Optoelectronics and Advanced Materials-Rapid Communications, 5 (11), p. 1154 - 1158** "*Amplification of light and random laser action in partially ordered dye-doped nematics*", V. Barna, G. Strangi, A. De Luca, S. Ferjani

47) (2011) **Optics Express, 19, pp 23532-23537**, "*Silicon oxide deposition for enhanced optical switching in polydimethylsiloxane-liquid crystal hybrids*", L. De Sio, A. E. Vasdekis, J. G. Cuennet, A. De Luca, A. Pane and Demetri Psaltis

48) (2011) **ACSNano, 5 (7), pp 5823–5829**, "*Dispersed and Encapsulated Gain Medium in Plasmonic Nanoparticles: a Multipronged Approach to Mitigate Optical Losses*", A. De Luca, M. P. Grzelczak, I. Pastoriza-Santos, L. M. Liz-Marzàn, M. La Deda, M. Striccoli, and G. Strangi

49) (2011) **Appl. Phys. Lett., 98, 251912**, "*Gain induced optical transparency in metamaterials*", G. Strangi, A. De Luca, S. Ravaine, M. Ferrie and R. Bartolino, apparso anche in **Vir. J. Nan. Sci. & Tech., 24, 1 / OPTICAL PROPERTIES AND QUANTUM OPTICS**

50) (2011) **Physical Review E, 83, 041711**, "*Blue-shifted random-laser-mode selection in gain-assisted anisotropic complex fluids*", A. Veltri, M. Infusino, S. Ferjani, A. De Luca, and G. Strangi

51) (2010) **Romanian Reports in Physics, Vol. 62, No. 3, P. 444–454,** "*Efficient Random Laser Effect in a new dye-nematic liquid crystalline composite*", V. Barna, V. I. Vlad, A. Petris, I. Dancus, T. Bazaru, E. S. Barna, A. De Luca, S. Ferjani and G. Strangi.

52) (2010) **Optics Express, 18, 1,** "*Observation of hysteresis effects in POLICRYPS holographic gratings"*, L. De Sio, A. De Luca, G. Liveri, C. Umeton.

53) (2009) **J. Nonlin. Opt. Phys. Mater. Vol. 18, N°3,** "*Laser Action in Dye Doped Liquid Crystals: From Periodic Structures to Random Media",* A. De Luca, V. Barna, S. Ferjani, R. Caputo, C. Versace, N. Scaramuzza, R. Bartolino, C. Umeton and G. Strangi

54) (2009) **Optics Express, 17, 13435** "*Coherent backscattering and dynamical light localization in liquid crystals driven throughout chaotic regimes*", F. Carbone, A. De Luca, V. Barna, S. Ferjani, C. Vena, C. Versace, and Giuseppe Strangi

55) (2009) **Physical Review Letters, 102, 167801,** "*Direct measurement of surface-induced orientational order parameter profile above the nematic-isotropic phase transition temperature*" J. H. Lee, T. J. Atherton, V. Barna, A. De Luca, E. Bruno, R. G. Petschek and C. Rosenblatt

56) (2009) **Optics Express, 17, 3, 2042,** "*Thermo-recurrent nematic random laser*", S. Ferjani, A. De Luca, V. Barna, C. Versace and G. Strangi.

57) (2009) **J. Opt. A, Pure Appl. Opt. 11, 024017,** "*POLICRYPS: a liquid crystal composed nano/microstructure with a wide range of optical and electro-optical applications"*, R. Caputo, A. De Luca, L. De Sio, L. Pezzi, G. Strangi, C. Umeton, A. Veltri, R. Asquini, A. d'Alessandro, D. Donisi, R. Beccherelli, A. V. Sukhov and N. V. Tabiryan.

58) (2008) **Nature Physics, 4, 869** "*Optical Nanotomography of Anisotropic Fluids*", A. De Luca, V. Barna, T. J. Atherton, G. Carbone, M. E. Sousa and C. Rosenblatt, apparso anche in **Vir. J. Nan. Sci. & Tech. / Volume 18 / Issue 20 / MISCELLANEOUS**

59) (2008) **Physical Review E, 78, 011707**, "*Statistical analysis of random lasing emission properties in nematic liquid crystals*", S. Ferjani, L. Sorriso-Valvo, A. De Luca, V. Barna, R. De Marco and G. Strangi.

60) (2008) **Nanotechnology, 19, 325709** "*Nanoscale alignment and optical nanoimaging of a birefringent liquid*", V. Barna, A. De Luca and C. Rosenblatt.

61) (2008) **Optics Letters 33, No. 6**, "*Random Lasing in Freely Suspended Dye Doped Nematic Liquid Crystals*", S. Ferjani, V. Barna, A. De Luca, C. Versace and G. Strangi

62) (2007) **Physical Review Letters, 99, 204502**, "*Rayleigh-Taylor instability experiments with precise and arbitrary control of the initial interface shape*", Z. Huang, A. De Luca, T. Atherton, M. Bird, C. Rosenblatt, P. Carlés

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2. K.V Sreekanth, A. De Luca and G. Strangi, "Hyperbolic Metamaterials: Design, Fabrication, and Applications of Ultra-Anisotropic Nanomaterials" – "**Anisotropic Nanomaterials**", Edited by Quan Li – Springer, ISBN 978-3-319-18293-3
3. A. De Luca, M. Infusino, A. Veltri, K. V. Sreekanth, R. Bartolino and G. Strangi, "Plasmon-Gain Interplay in Metastructures" – "**Active Plasmonic Nanomaterials**", Edited by Luciano De Sio (University of Calabria, Italy), ISBN: 9789814613002
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CONFERENCES PARTICIPATION (LAST 7 YEARS)

(2018) SIF 2018 – 104° Congresso della Società Italiana di Fisica – Unical
Invited Oral: "*An extreme sensitive biosensing platform based on hyperbolic metamaterials*"

(2018) Plasmonica 2018 – Firenze
Oral: "*Extraordinary Effects in Quasi-Periodic Gold Nanocavities: Enhanced Transmission and Polarization Control of Cavity Modes*"

(2017) EOS 2017 - Capri - Italy – 3rd and 7th EOS Topical Meeting on Optics at the Micro and Nanoscale (SIOF)
Invited Oral: "*Extreme Sensitivity Biosensing Platform based on Hyperbolic Metamaterials*"

(2017) Plasmonica 2017 – Lecce (Italy) – International Workshop on Plasmonica
Poster: "*Resonant Gain Singularities in Hyperbolic Metamaterials*"
Poster: "*Plasmonics enables Nanotheranostic Systems: Synthesis, Photophysics and Cancer Phototherapy*"

(2016) META'2016 - Malaga - Spain - The 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics
Invited Oral: "*Dielectric singularity in hyperbolic metamaterials: the inversion point of coexisting anisotropies*"

(2015) Metamaterials'2015 - The 9th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics – Oxford (UK)
Oral: "*Toward the perfect lens with a simultaneous type I/type II hyperbolic metamaterial*"

(2015) COST Meeting – IC1208 – Ankara (Turkey)
Oral: "*Hyperbolic Metamaterials: a new class of anisotropic subwavelength media with extraordinary optical properties*"

(2014) International Conference "Metamaterials 2014", Copenhagen (Denmark)
Oral: "*Excitation of Bulk Plasmon Polaritons in 1D and 2D Hypergrating-based Optical HMMs with Highly Directional Spontaneous Emission Enhancement*"; A. De Luca et al.

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Poster: "*Mitigation of Optical Losses in Gain Assisted Mesoscaled Metamaterials*", R. Dhama, A. De Luca, M. Infusino, A.R. Rashed, M. Correa, S. Ravaine and G. Strangi

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Oral: "*Bringing Gain to Metamaterials: a Way to Selectively Compensate Absorptive Losses*", A. De Luca et al.

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Poster: "*Plasmonic nanoparticles self-organization in chiral liquid crystals*", M. Infusino, A. De Luca, A. Rahimi Rashed, N. Scaramuzza, G. Strangi, R. Bartolino

LANGUAGES

- Italian - native speaker
- English - fluent

REFERENCES

Prof. Giuseppe Strangi
Professor and Ohio Research Scholar - Endowed Chair Department of Physics, Case Western Reserve University, 10600 Euclide Avenue 44106-7079 Cleveland OH (USA)
GXS@Case.edu

Prof. Charles Rosenblatt
Department of Physics,
Case Western Reserve University,
10900 Euclid Ave, Rockefeller Building, Cleveland, Ohio 44106 USA, +1-216-368-4125
Rosenblatt@case.edu

Prof. Cesare P. Umeton
University of Calabria (Italy)
Physics Department,
Via P. Bucci, Cubo 31C,
87036 Rende (CS)
+39 0984 496117
Umeton@fis.unical.it