Antonio Andrea MURA

ACADEMIC CAREER:

· 1990-2000. Researcher at Faculty of Engineering, University of Cagliari, Italy

· 2000 to 2018. Associate Professor, Faculty of Engineering, University of Cagliari, Italy.

· 2001-2003 Fellow of the network "Organic semiconductors"- INFM-CNR.

· 2004-2018. Member of the scientific board of "Centro Grandi Strumenti "(Center of large instruments) CGS- University of Cagliari.

· 2004 to present. Member of PhD school in Condensed Matter Physics University of Cagliari.

· 2002 to present. Vice-director of the Department of the Physics University of Cagliari.

· 2008 to present. Fellow of the executive committee of INFM-CNR SLACS laboratory.

· 2013 to 2016. Permanent Visiting Professor at the Zernike Institute for Advanced Materials, Rijksuniversiteit Groningen (Photophysics and Optoelectronics group).

· 2014 to 2016. Responsible of the innovative teaching of the Faculty of Engineering, University of Cagliari.

· 2014 to present. Member of Governing Council of CeSAR laboratories, University of Cagliari.

· 2015 to present. Member of the Scientific Board of AUSI.

· 2015 to present. Member of the Board Faculty of Engineering, University of Cagliari.

· 2015 to present. Head of section Quantum Efficiency of the CREATE AUSI laboratories.

· 2016 to present. Guest Professor (Photophysics and Optoelectronics group, Rijksuniversiteit Groningen. The Netherlands)

· 2017 to present. Director of the Museum of Physics of the University of Cagliari

· 2019 to present. Full Professor Experimental Physics (S.C. 02/B1)

RESEARCH FIELDS

AM is an experimental physicist with a long-standing research activity in linear, nonlinear and ultrafast spectroscopy. Investigations addressed or/and address the following research topics:

LOW DIMENSIONAL SEMICONDUCTORS

Optical nonlinearities near the optical gap in quantum wells and microcavities: optical gain, band gap renormalization, four-wave-mixing and exciton-polariton amplifier

MOLECULAR PHOTONICS

Excited state properties, excited state dynamics, optical nonlinearities and optical gain in: linear p-conjugated molecular semiconductors; self-assembled molecular nanofibers; organolanthanides: er3+ emission sensitized by molecular antennae for telecom applications. Devices. Laser.

NANOSTRUCTURED ORGANIC/INORGANIC MATERIALS FOR PHOTONICS AND OPTOELECTRONICS

Excited state properties, excited state dynamics, optical nonlinearities and optical gain in host-guest nanostructured materials, hybrid nanostructured organic/inorganic systems, colloidal nanocrystals. Devices: Photodetectors and photovoltaic cells.

TEACHING:

1996-2001, Physics of Metals for Material Science

2001-present, General Physics 1 for Engineering

2001-2003, Physics of Semiconductor Devices for Engineering

2014-2016, Physics Laboratory 2

2017-present, Physics for Toxicology

SUPERVISION:

5 PhD Students, 6 Research fellows (Total activity: 17 years), 2 Post Doc (Total activity: 4 years), undergraduate students and scholarship holders (>30).

Member of several international PhD committee (Rijksuniversiteit Groningen,NL)

PUBLICATIONS:

More than 180 papers in peer reviewed international journals.

Some relevant publications:


· Excited State Properties of Hybrid Perovskites. Acc. Chem. Res 49, 166–173 (2016)

· "Correlated electron–hole plasma in organometal perovskites". Nature Communications, 2014

· "Light-induced charged and trap states in colloidal nanocrystals detected by variable pulse rate photoluminescence spectroscopy". ACS Nano, 7, 229 (2013)

· "Charged excitons, Auger recombination and optical gain in CdSe/CdS nanocrystals". Nanotechnology, vol. 23,(2012)

· "Organic−organic heteroepitaxy of red-, green-, and blue-emitting nanofibers". ACS Nano 4, 6244 (2010)

· “Exciton-exciton interaction and optical gain in colloidal cdse/cds dot/rod nanocrystals” Adv. Mater. 21, 1482 (2009)

· “Solution processable near infrared photodetectors based on electron transfer from PbS nanocrystals to fullerene derivatives”, Adv. Mater. 21, 683 (2009)

· “Temperature tuning of nonlinear exciton processes in self-assembled oligophenyl nanofibers under laser action”, Adv. Mater. 9999, 1-5 (2008)

· “Organic nanostructured host-guest materials containing three dyes“,Adv. Mater. 16, 1716 (2004)

· “Random laser action in self-organized para-sexiphenyls nanofibers grown by hot-wall hepitaxy”,Appl. Phys. Lett. 84, 4454 (2004).

· “High-temperature ultrafast polariton parametric amplification in semiconductor microcavities”, Nature 414, 731 (2001).

CONFERENCES:

More than 100 national and international conferences

Serveral oral/poster presentation

AWARDS and HONORS:

· 2018- The article "Direct or indirect bandgap in hybrid lead halide perovskites?" was included in the Best of Advanced Optical Materials 2018. (https://onlinelibrary.wiley.com/page/journal/21951071/homepage/best-of-advanced-optical-materials-2018.html) DOI: 10.1002/adom.201701254

· 2015- Cover Picture: Ln3Q9 as a Molecular Framework for Ion-Size-Driven Assembly of Heterolanthanide (Nd, Er, Yb) Multiple Near-Infrared Emitters (Chem. Eur. J. 10/2015). DOI: 10.1002/chem.404435

· 2015- Cover Picture: Bithiophene-based polybenzofulvene derivatives with high stacking and hole mobility (Polymer Chemistry 42/2015). DOI:10.1039/c5py00904a

· 2013- Cover Picture: Organic Nanofibers; Advanced Optical Materiels, ADOM-1-2-Frontispiece.indd (2013), DOI: 10.1002/adom.201370015

· 2013-Cover Picture: Tracing charge transfer states in polymer:fullerene bulck-heterojunctions. Journal
of Materials Chemistry A, vol 1, number 25, (2013)

· 2012- The article “Charged Excitons, Auger Recombination and Optical Gain in Cdse/Cds Nanocrystals”, M. Marceddu et al, NANOTECHNOLOGY 23, 015201 (2012) was recently discussed in the Research Highlights of Nature Photonics, Vol. 6, pag. 71 February 2012.

· 2002- The article “Intrinsic excitonic luminescence in odd and even numbered oligothiophenes” by F. Meinardi et al. Phys. Rev. Lett. 89, 157403 (2002) was reported in the “Highlights-2002” of the Istituto Nazionale Fisica della Materia (INFM).

· 2001- The article “Ultrafast Formation of Nonemissive States in Organic Semiconductors” by M.A.Loi et al, Phys. Rev. Lett. 86, 732 (2001) was reported in the “Highlights-2001” of the Istituto Nazionale Fisica della Materia (INFM).

· 2000- Best experiment at the Fourth International Topical Conference on Optical Probes of Conjugated Polymers and Photonic Crystals, February 2000 Salt Lake City, Utah, USA.

CITATION REPORT:

Number of citations: 4500

h-index: 36

(Source: ISI, Scopus, Google Scholar, Date:06/12/2021)

NATIONAL and INTERNATIONAL SCIENTIFIC CONFERENCE ACTIVITIES:

2021- International Meeting: Organizing Board “ETSF Young Researchers' Meeting. European Theoretical Spectroscopy Facility” Cagliari (IT), September 6-10 2021

2018: Organizing Board, ISOPHOS International School on Hybrid and Organic Photovoltaics, September 02-06, 2018; Italy (http://www.chose.uniroma2.it/ISOPHOS-2018/school-program.html)

· 2017: Conference Chair, ISOPHOS–MAPHEBIO International School on Hybrid and Organic Photovoltaics and IV School on Advanced Materials for Photonics, Electronics and Bioelectronics, September 03-07, 2017; Italy

· 2010: Co-organizer of the International School “European Spring School 2010 Supramolecular Organized Nanostructured Materials for Optoelectronic Applications”

· 2009: Director of the National School and workshop on “Advanced organic material for photonics and optoelectronics”

· 2006: Director of the National School and workshop on “Advanced organic material for photonics and optoelectronics”

· 2001: Director of the National School and workshop on “Advanced organic material for photonics and optoelectronics”

· 2009: Member of the Scientific Board and organizer of the “Convegno Nazionale sui Materiali Molecolari avanzati per Fotonica ed Elettronica”

· 2006: Member of the Scientific Board and organizer of the “Convegno Nazionale sui Materiali Molecolari avanzati per Fotonica ed Elettronica”

· 2003: Co-organizer of the International School “Molecules in Nanochannels, Synthesis, Spectroscopy, and Application”

· 2001: Member of the Scientific Board and organizer of the “Convegno Nazionale sui Materiali Molecolari avanzati per Fotonica ed Elettronica”

· 1999: Member of the Scientific Board and organizer of the “Convegno Nazionale sui Materiali Molecolari avanzati per Fotonica ed Elettronica”

· 2000-2007: Organizer of the “Giornate Internazionali della Scienza dei Materiali”, (annually from 2000 to 2007).

NATIONAL and INTERNATIONAL SCIENTIFIC PROJECTS:

· “PALFESAE: “Perovskiti Alogenate per Fotovoltaico Eco-Sostenibile ad Alta Efficienza”, Approval: Consiglio Scientifico AUSI, 05 Marzo 2019, (2019).

· “V-FASE: Vetri Fotovoltaici Attivi per la Sostenibilità Energetica”, PI, Delibera Cipe n.31/2015, determina DG 478 del 03/04/2017, (2017).

· Photophysics of hybrid perovskites under high hydrostatic pressure “, Visiting Scientific Joint Project UNICA-RUG, funded by UNICA (2016).

· “Processi fotocatalitici per le energie rinnovabili”, funded by AUSI 2013.

· NWO bezoekersbeurs, funded by RUG University of Groningen 2012

· “Complessi di lantanidi con proprietà di luminescenza nel vicino infrarosso per fotonica molecolare”, (2010-2012) within the regional programme -Promozione della ricerca scientifica e dell’innovazione tecnologica in Sardegna.

· “Design di nanomateriali ibridi organici/inorganici per l’energia fotovoltaica” (2010-2012), within the regional programme -Promozione della ricerca scientifica e dell’innovazione tecnologica in Sardegna.

· “Organic-inorganic hybryds solar cells”, Responsabile di progetto, Dipartimento di Fisica UNICA, Del. n°65/11S del CdA Unica del 20.09.(2011)

· “Supramolecular nanostrucutured organic/inorganic hybrid systems”, within the European programme FP6 “Marie Curie Research Training Network” 2007-2010 (NANOMATCH).

· “Molecular organic semiconductors for blue lasers” within MIUR-Italy-Austria bilateral project, 2004.

· “Synthesis of novel organic materials and supramolecular architectures for high efficiency optoelectronic and photonics systems”, within MIUR-FIRB project (2006-2009)

· “Laboratorio di misure spettroscopiche, di trasporto e magnetiche in materiali sottoposti a pressioni estreme”, within the Programma Operativo Nazionale (PON), 2003.

· “Laboratorio Interdisciplinare di Microscopie e Nanoscopie): proprietà elettroniche, ottiche, composizionali e strutturali di dispositivi e materiali naturali e di sintesi.”, within the Programma Operativo Nazionale (PON), 2003.

· “Molecules in Nanochannels, Synthesis, Spectroscopy, and Application”, within the European programme “Human Potential and Mobility of Researchers Programme” 2002 (NANOCHANNEL).

· “New light emitters for telecommunications based on organic complexes of lanthanides”, within MIUR-PRIN project (2002).

· “Artificial Organic Nanostructures for Photonic Applications”, within MIUR-FIRB project (2001).

· “Organic molecular nanostructures: novel light emitting materials”, within MIUR-PRIN project (1998).

· “Pressure effects on the electronic properties of organic semiconductors” INFM Project (1998).

· “Multistrati organici deposti in UHV per applicazioni optoelettroniche” INFM Project (1997)

· “Propriétés optiques des semiconducteurs: dynamique et cohérence des excitations” EPFL-FNS (Switzerland) (1994-1997)

LABORATORIES

AM is in-charge of the following laboratories:

· Ultrafast Spectroscopy (Physics Departement- CGS)

· High Hydrostatic Pressure (Physics Departement – MATPRESS)

· Thin Films (Physics Departement – CGS)

· Confocal Microscopy (Physics Departement – CGS)

· Atomic Force Microscopy (Physics Departement – CGS)

· Electric Measurements (Physics Departement – CGS)

· Quantum Efficiency (CREATE-AUSI)

http://www.dsf.unica.it/~fotonica/index.html