

CV of Principal Investigator (max 4.000 characters including spaces) Giovanni Bongiovanni

Full professor, Condensed Matter Physics (SC: 02/B1)

RECENT EXECUTIVE POSITIONS at the Università di Cagliari, Italy:

- Coordinator of PhD curriculum in Condensed Matter Physics (2009)
- Director of the Physics PhD School (2010-2012)
- Member of the Senato Accademico (2012-2015; 2018-)
- Director of CESAR (Centro Servizi d'Ateneo per la Ricerca) (2014-2015)
- Director of the Physics Department (2015-)

RESEARCH

HYBRID ORGANIC-INORGANIC NANOMATERIALS. CdS/CdSe core/shell nanocrystals; NIR-nanocrystals: PbS, PbSe, (2008-); Non-toxic nanocrystals: Bi₂S₃, Cu₂S and Fe₂S (2012-). Hybrid organic-inorganic perovskites (from 2014). Investigated: excited-state properties, multi-exciton states, charged-states, Auger processes, light emission, optical gain and light amplification, photocurrent and photovoltaic response.

ORGANIC SEMICONDUCTORS AND NANOSTRUCTURES. Host-guest crystals; molecular semiconductors (oligothiophenes, oligophenylenes and organolanthanides); Self-assembled nanofibers (oligothiophenes and oligophenylenes) (1995-). Investigated: excited-state properties, excited-state relaxation, inter-molecular interaction, energy transfer, NIR-light emission, optical gain, light amplification and random lasing.

LOW DIMENSIONAL INORGANIC SEMICONDUCTOR NANOSTRUCTURES. GaAs/GaAlAs Quantum wells and semiconductor microcavities (1986-2002). Investigated: optical nonlinearities near the optical gap: optical gain, band gap renormalization, four-wave-mixing and coherent exciton-photon dynamics.

PUBLICATIONS

Co-author of more than 180 papers in peer reviewed International Journals. H-index=34; citations: 3654 (best of Scopus, WOS, Google Scholar)

CONFERENCE ORGANIZATION

- “XI International School on Hybrid and Organic Photovoltaics and IV School on Advanced Materials for Photonics, Electronics and Bioelectronics (ISOPHOS e MAPHEBIO)” 3 - 7 Sept. 2017 | Villaggio Telis Arbatax (Tortolì) - Italy dal 03-09-2017 al 07-09-2017
- National school and workshop on "Scuola Nazionale sui Materiali Molecolari per Fotonica ed Elettronica", held in Sardinia, 2001,2006,2009
- International school "Molecules in Nanochannels, Synthesis, Spectroscopy, and Application" held in Cagliari, 2003 -
- International school "European Spring School 2010 Supramolecular Organized Nanostructured Materials for Optoelectronic Applications " Alghero, June 2010

LEADERSHIP IN SCIENTIFIC PROJECTS

- Efficient light emission from hybrid organic-inorganic perovskites". Fondazione di Sardegna; L.R. 7/2007 annualità 2016.
- Perovskite-based Solar cells: towards high Efficiency and long-term stability. 2015-MIUR-PRIN dal 05-02-2017 a oggi
- Nanomateriali eco-compatibili per celle fotovoltaiche a stato solido di nuova generazione (2013-2016) - Promozione della ricerca scientifica e dell'innovazione tecnologica in Sardegna
- Centro servizi di Ateneo per la ricerca (CESAR), Comitato Interministeriale per la Programmazione Economica (CIPE) & Promozione della ricerca scientifica e dell'innovazione tecnologica in Sardegna-2013 (Funds:8 M€)
- Design di nanomateriali ibridi organici/inorganici per l'energia fotovoltaica (2010-2012), Promozione della ricerca scientifica e dell'innovazione tecnologica in Sardegna
- Supramolecular nanostructured organic/inorganic hybrid systems, FP6 Marie Curie Research Training Network 2007-2010
- Molecular organic semiconductors for blue lasers, MIUR-Italy-Austria bilateral project, 2004
- Synthesis of novel organic materials and supramolecular architectures for high efficiency optoelectronic and photonics systems, MIUR-FIRB project (2006-2009)
- Laboratorio di misure spettroscopiche, di trasporto e magnetiche in materiali sottoposti a pressioni estreme, 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, Programma Operativo Nazionale (PON), 2003
- Molecules in Nanochannels, Synthesis, Spectroscopy, and Application, EU Human Potential and Mobility of Researchers Programme 2002
- New light emitters for telecommunications based on organic complexes of lanthanides, MIUR-PRIN project (2002)

Principal publications of the Principal Investigator (max 15)

1. Sarritzu, Valerio, Sestu, Nicola, Marongiu, Daniela, Chang, Xueqing, Wang, Qingqian, Loi, Maria Antonietta, Quochi, Francesco, Saba, Michele, Mura, A, Bongiovanni, Giovanni (2018). Perovskite Excitonics: Primary Exciton Creation and Crossover from Free Carriers to a Secondary Exciton Phase. ADVANCED OPTICAL

2. Sarritzu, Valerio, Sestu, Nicola, Marongiu, Daniela, Chang, Xueqing, Wang, Qingqian, Masi, Sofia, Colella, Silvia, Rizzo, Aurora, Gocalinska, Agnieszka, Pelucchi, Emanuele, Mercuri, Maria Laura, Quochi, Francesco, Saba, Michele, Mura, A, Bongiovanni, Giovanni (2018). Direct or indirect bandgap in hybrid lead halide perovskites?. *ADVANCED OPTICAL MATERIALS*, vol. 6, ISSN: 2195-1071, doi: 10.1002/adom.201701254
3. Marongiu, Daniela, Chang, Xueqing, Sarritzu, Valerio, Sestu, Nicola, Pau, Riccardo, Geddo Lehmann, Alessandra, A. Mattoni, Quochi, Francesco, Saba, Michele, Mura, Antonio Andrea, Bongiovanni, Giovanni Luigi Carlo (2017). Self-Assembled Lead Halide Perovskite Nanocrystals in a Perovskite Matrix. *ACS ENERGY LETTERS*, vol. 2, p. 769-775, ISSN: 2380-8195, doi: 10.1021/acenergylett.7b00046
4. Sarritzu Valerio, Sestu Nicola, Marongiu Daniela, Chang Xueqing, Masi Sofia, Rizzo Aurora, Colella Silvia, Quochi Francesco, Saba Michele, A Mura, Bongiovanni Giovanni (2017). Optical determination of Shockley-Read-Hall and interface recombination currents in hybrid perovskites. *SCIENTIFIC REPORTS*, vol. 7, ISSN: 2045-2322, doi: 10.1038/srep44629
5. Saba Michele, Quochi Francesco, Mura Andrea, Bongiovanni Giovanni (2015). Excited State Properties of Hybrid Perovskites. *ACCOUNTS OF CHEMICAL RESEARCH*, ISSN: 0001-4842, doi: 10.1021/acs.accounts.5b00445
6. Sestu N, Cadelano M, Sarritzu V, Chen F, Marongiu D, Piras R, Mainas M, Quochi F, Saba M, Mura A, Bongiovanni G (2015). Absorption F-Sum Rule for the Exciton Binding Energy in Methylammonium Lead Halide Perovskites. *THE JOURNAL OF PHYSICAL CHEMISTRY LETTERS*, vol. 6, p. 4566-72-4572, ISSN: 1948-7185, doi: 10.1021/acs.jpcclett.5b02099
7. Cadelano M., Sarritzu V., Sestu N., Marongiu D., Chen F., Piras R., Corpino R., Carbonaro C.M., Quochi F., Saba M., Mura A., Bongiovanni G. (2015). Can Trihalide Lead Perovskites Support Continuous Wave Lasing?. *ADVANCED OPTICAL MATERIALS*, p. n/a, ISSN: 2195-1071, doi: 10.1002/adom.201500229 - Articolo in rivista
8. Aresti M, Saba M, Piras R, Marongiu D, Mula G, Quochi F, Mura A, Cannas C, Mureddu M, Ardu A, Ennas G, Calzia V, Mattoni A, Musinu A, Bongiovanni G (2014). Colloidal Bi₂S₃ nanocrystals: Quantum size effects and midgap states. *ADVANCED FUNCTIONAL MATERIALS*, vol. 24, p. 3341-3350, ISSN: 1616-301X, doi: 10.1002/adfm.201303879
9. M. Saba, M. Cadelano, D. Marongiu, F. Chen, V. Sarritzu, N. Sestu, C Figus, M Aresti, R Piras, A. G. Lehmann, C. Cannas, A. Musinu, F Quochi, Mura A, G. Bongiovanni. (2014). Correlated electron-hole plasma in organometal perovskites. *NATURE COMMUNICATIONS*, vol. 5, 5049, ISSN: 2041-1723, doi: 10.1038/ncomms6049 - Articolo in rivista
10. Saba M, Aresti M, Quochi F, Marceddu M, Loi M.A, Huang J, Talapin D, Mura A, Bongiovanni G (2013). Light-induced charged and trap states in colloidal nanocrystals detected by variable pulse rate photoluminescence spectroscopy. *ACS NANO*, vol. 7, p. 229-238, ISSN: 1936-0851, doi: 10.1021/nn305031k
11. Gocalinska A, Saba M, Quochi F, Marceddu M, Szendrei K, Jia Gao, Loi MA, Yarema M, Seyrkammer R, Heiss W, Mura A, Bongiovanni G (2010). Size-Dependent Electron Transfer from Colloidal PbS Nanocrystals to Fullerene. *THE JOURNAL OF PHYSICAL CHEMISTRY LETTERS*, vol. 1, p. 1149-1154, ISSN: 1948-7185, doi: 10.1021/jz100116t
12. Simbrunner C, Quochi F, Hernandez-Sosa G, Oehzelt M, Resel R, Hesser G, Arndt M, Saba M, Mura A, Bongiovanni G, Sitter H (2010). Organic–Organic heteroepitaxy of Red-, Green-, and Blue-emitting nanofibers. *ACS NANO*, vol. 4, p. 6244-6250, ISSN: 1936-0851, doi: 10.1021/nn1018889
13. Saba M., Minniberger S., Quochi F, Roither J., Marceddu M., Gocalinska A., Kovalenko M.V., Talapin D.V., Heiss W., Mura A., Bongiovanni G. (2009). Exciton-Exciton Interaction and Optical Gain in Colloidal CdSe/CdS Dot/Rod Nanocrystals. *ADVANCED MATERIALS*, vol. 21, p. 4942-4946, ISSN: 0935-9648, doi: 10.1002/adma.200901482
14. Szendrei K, Cordella F, Kovalenko MV, Boberl M, Hesser G, Yarema M, Jarzab D, Mikhnenko OV, Gocalinska A, Saba M, Quochi F, Mura A, Bongiovanni G, Blom PWM, Heiss WG, Loi MA (2009). Solution-Processable Near-IR Photodetectors Based on Electron Transfer from PbS Nanocrystals to Fullerene Derivatives. *ADVANCED MATERIALS*, vol. 21, p. 683-687, ISSN: 1521-4095, doi: 10.1002/adma.200801752
15. Saba M, Ciuti C, Bloch J, Thierry-Mieg V, Andre R, Dang LS, Kundermann S, Mura A, Bongiovanni G, Staehli JL, Deveaud B (2001). High-temperature ultrafast polariton parametric amplification in semiconductor microcavities. *NATURE*, vol. 414, p. 731-735, ISSN: 0028-0836, doi: 10.1038/414731a