

# Benedetta Carlotti

Department of Chemistry, Biology and Biotechnology  
University of Perugia  
via elce di sotto, n.8  
06123 Perugia, Italy

## CURRICULUM VITAE



## EDUCATION:

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- JULY 1999: **General Certificate of Education;**  
Liceo Scientifico "R. Casimiri" in Gualdo Tadino (PG), Italy  
Valuation 100/100.
- JULY 2004: **Laurea Master Degree in Chemistry** at the University of Perugia, Italy.  
Valuation: 110/110 cum laude.  
Thesis Title: "Synthesis and photophysical properties of semiconductor nanocrystals".  
Thesis Advisors: Prof. Fausto Elisei and Dr. Loredana Latterini.  
Winner of the Cultural **Prize "Luigi Casati" for young graduates** awarded by the Accademia dei Lincei.
- DECEMBER 2004: **State Abilitation** to the profession of chemist.
- FEBRUARY 2008: **PhD in Chemistry** (XX cycle) at the University of Perugia, Italy.  
Thesis Title: "Ultrafast and space resolved techniques for the investigation of simple and complex systems".  
Thesis Advisors: Prof. Fausto Elisei and Dr. Loredana Latterini.
- OCTOBER 2005–JANUARY 2007:  
**Visiting Research Scholar** in the group of Prof. Lawrence A. Bottomley, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta GA USA.

## PROFESSIONAL EXPERIENCE:

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- DECEMBER 2007–JUNE 2014: **Post–Doc** at the Department of Chemistry, University of Perugia, Italy.
- JUNE 2014–JUNE 2018: **Assistant Professor** of Physical Chemistry (Ricercatore a Tempo Determinato di tipo A) at the Department of Chemistry, Biology and Biotechnology of the University of Perugia, Italy. **Principal Investigator** of the project "Two–photon absorbing quadrupolar molecular systems" financed by the Italian Ministry for University and Research (MIUR) in the framework of the program "Futuro in Ricerca–FIRB 2013".
- FEBRUARY 2015: **Visiting Researcher** at the University of Geneva, Switzerland.
- OCTOBER 2015: **Visiting Professor** at the University of Coimbra, Portugal (within the Erasmus "Staff mobility for teaching" program).
- NOVEMBER 2016: **Visiting Professor** at the Aarhus University, Denmark (within the Erasmus "Staff mobility for teaching" program).

FEBRUARY 2017–SEPTEMBER 2018; FEBRUARY 2019; JULY 2019: **Visiting Researcher** at the University of Michigan, Ann Arbor MI, USA.

APRIL 2017: Italian National **Habilitation as Associate Professor** of Physical Chemistry.

AUGUST 2018–JULY 2021: **Tenure Track Assistant Professor** of Physical Chemistry (Ricercatore a Tempo Determinato di tipo B) at the Department of Chemistry, Biology and Biotechnology of the University of Perugia, Italy.

SEPTEMBER 2019: **Visiting Professor** at the University of Bordeaux, France (within the Erasmus “Staff mobility for teaching” program).

AUGUST 2021–PRESENT: **Associate Professor** of Physical Chemistry at the Department of Chemistry, Biology and Biotechnology of the University of Perugia, Italy.

## **RESEARCH INTERESTS:**

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Photophysics and photochemistry of organic materials in solution and in film by employing steady state and time resolved (nanosecond and femtosecond resolved) spectroscopic techniques. Push–pull organic flexible molecules (showing positive or negative solvatochromism) interesting for applications as new low–cost materials in Non–Linear Optics, organic compounds able to efficiently function after light absorption as electron donor/electron acceptor for the design of organic photovoltaic solar cells, singlet fission materials, highly emissive organic materials for organic light emitting diodes (OLEDs), aromatic systems usable as selective colorimetric and fluorescent sensors for anions and cations, drugs and their complexes with biologically relevant metal ions and DNA, megamolecules composed of fluorescent proteins.

## **RESEARCH PROJECTS:**

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✓ Participation (since 2004) to the project “Photophysical and photochemical characterization of organic chromophores in nanostructured systems and their applications” financed by the Ministero dell’Istruzione, dell’Università e della Ricerca (MIUR) in the framework of the “Centro di Eccellenza sui Materiali Innovativi Nanostrutturati per applicazioni chimiche, fisiche e biologiche (CEMIN)” of the University of Perugia.

✓ Participation to the project “Spectroscopy and dynamics of organic compounds: effect of the structure and medium on the properties of the electronic excited states” financed by the MIUR in the framework of the program “Programmi di Ricerca Scientifica di Rilevante Interesse Nazionale–PRIN 2008”.

✓ Participation to the **university spin–off “Enzyme & Cell Biosolutions (E&CB)”** willing to produce and commercialize enzymes and microorganisms for a variety of applications in the agri–food and chemical industries, in the energetic and environmental fields, in the textile and paper industries, in the field of informatics and constructions. The E&CB spin–off proposal has won the 2012 edition of the Start Cup Umbria, a competition among business ideas generated from university research.

✓ **Principal Investigator** of the project “Two–photon absorbing quadrupolar molecular systems” financed by the MIUR in the framework of the program “**Futuro in Ricerca–FIRB 2013**”.

## PUBLICATIONS:

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**Total number of publications** in international journals: **70**

(22 as first author; 17 as corresponding author)

**h-index:** **25** (according to Google Scholar), **24** (according to Scopus)

**Total citations:** **1442** (according to Google Scholar), **1314** (according to Scopus)

- 1) L. Latterini, C. Roscini, **B. Carlotti**, G. G. Aloisi, and F. Elisei; "Synthesis and characterization of perylene nanoparticles"; *Phys. Stat. Sol. (a)* 2006, **203** (6), 1470–1475.
- 2) F. Elisei, A. Barbafina, **B. Carlotti** and L. Latterini; "Kinetic and spectroscopic investigation by ultrafast absorption and emission techniques"; *AIP Conference Proceedings* 2007, **963**, 615–618.
- 3) A. Barbafina, L. Latterini, **B. Carlotti** and F. Elisei "Characterization of Excited States of Quinones and Identification of Their Deactivation Pathways"; *J. Phys. Chem. A*, 2010, **114** (19), 5980–5984.
- 4) T. Del Giacco, **B. Carlotti**, S. De Solis, A. Barbafina, and F. Elisei "Photophysics of Aromatic Thiourea Derivatives and their Complexes with Anions. Fast and Ultrafast Spectroscopic Investigations"; *Phys. Chem. Chem. Phys.*, 2010, **12**, 8062–8070.
- 5) **B. Carlotti**, D. Fuoco and F. Elisei "Fast and Ultrafast Spectroscopic Investigation of Tetracycline Derivatives in Organic and Aqueous Media"; *Phys. Chem. Chem. Phys.*, 2010, **12**, 15580–15591.
- 6) T. Del Giacco, **B. Carlotti**, S. De Solis, A. Barbafina and F. Elisei "Steady-state and time-resolved investigations of a crown thioether conjugated with methylacridinium and its complexes with metal ions"; *Phys. Chem. Chem. Phys.*, 2011, **13**, 2188–2195.
- 7) **B. Carlotti**, A. Spalletti, M. Šindler-Kulyk and F. Elisei "Ultrafast photoinduced intramolecular charge transfer in push-pull distyryl furan and benzofuran: solvent and molecular structure effect"; *Phys. Chem. Chem. Phys.*, 2011, **13**, 4519–4528.
- 8) S. Ciorba, **B. Carlotti**, I. Škorić, M. Šindler-Kulyk and A. Spalletti "Spectral properties and photobehaviour of 2,5-distyrylfuran derivatives"; *J. Photochem. Photobiol. A: Chemistry* 2011, **219**, 1–9.
- 9) A. Mazzoli, **B. Carlotti**, C. G. Fortuna and A. Spalletti "Photobehaviour and DNA interaction of styrylquinolinium salts bearing thiophene substituents", *Photochem. Photobiol. Sci.*, 2011, **10**, 973–979.
- 10) R. Flamini, I. Tomasi, A. Marrocchi, **B. Carlotti** and A. Spalletti "Synthesis and photobehaviour of donor- $\pi$ -acceptor conjugated arylacetylenes" *J. Photochem. Photobiol. A: Chemistry*, 2011, **223**, 140–148.
- 11) A. Mazzoli, **B. Carlotti**, C. Bonaccorso, C. G. Fortuna, U. Mazzucato, G. Miolo and A. Spalletti "Photochemistry and DNA-affinity of some pyrimidine-substituted styryl-azinium iodides", *Photochem. Photobiol. Sci.*, 2011, **10**, 1830–1836.
- 12) **B. Carlotti**, F. Elisei and A. Spalletti "A peculiar dependence of intersystem crossing of *p*-nitro-2,5-distyrylfuran on the dielectric properties of the solvent" *Phys. Chem. Chem. Phys.*, 2011, **13**, 20787–20793.

- 13) **B. Carlotti**, A. Cesaretti and F. Elisei "Complexes of tetracyclines with divalent metal cations investigated by stationary and femtosecond-pulsed techniques" *Phys. Chem. Chem. Phys.*, 2012, **14**, 823–834.
- 14) **B. Carlotti**, R. Flamini, A. Spalletti and F. Elisei "Comprehensive photophysical behaviour of ethynyl-fluorenes and ethynyl-anthracenes investigated by fast and ultrafast time-resolved spectroscopy" *ChemPhysChem*, 2012, **13** (3), 724–735.
- 15) A. Amat, S. Fantacci, F. De Angelis, **B. Carlotti** and F. Elisei "DFT/TDDFT investigation of the stepwise deprotonation in tetracycline: pKa assignment and UV-vis spectroscopy", *Theor. Chem. Acc.*, 2012, **131** (5), 1218–1231.
- 16) I. Kikaš, **B. Carlotti**, I. Škorić, M. Šindler-Kulyk, U. Mazzucato and A. Spalletti "Synthesis, spectral properties and photobehaviour of push-pull distyrylbenzene nitro-derivatives", *J. Photochem. Photobiol. A*, 2012, **244**, 38–46.
- 17) G. Pizzoli, M. G. Lobello, **B. Carlotti**, F. Elisei, M. K. Nazeeruddin, G. Vitillaro and F. De Angelis "Acid-base properties of the N3 ruthenium (II) solar cell sensitizer: a combined experimental and computational analysis", *Dalton Trans.*, 2012, **41**, 11841–11848.
- 18) **B. Carlotti**, R. Flamini, I. Kikas, U. Mazzucato and A. Spalletti "Intramolecular charge transfer, solvatochromism and hyperpolarizability of compounds bearing ethenylene or ethynylene bridges", *Chem. Phys.*, 2012, **407**, 9–19.
- 19) **B. Carlotti**, T. Del Giacco and F. Elisei "Competition of C–H and C–O fragmentation in substituted p-methoxybenzyl ether radical cations generated by photosensitized oxidation" *Photochem. Photobiol. Sci.*, 2013, **12**, 489–499.
- 20) **B. Carlotti**, I. Kikaš, I. Škorić, A. Spalletti and F. Elisei "Photophysics of push-pull distyryl furans, thiophenes and pyridynes", *ChemPhysChem*, 2013, **14**, 970–981.
- 21) A. Cesaretti, **B. Carlotti**, C. Clementi, R. Germani and F. Elisei "Effect of micellar and sol-gel media on the spectral and kinetic properties of tetracycline and its complexes with Mg<sup>2+</sup>" *Photochem. Photobiol. Sci.*, 2014, **13**, 509–520.
- 22) A. Mazzoli, **B. Carlotti**, G. Consiglio, C. G. Fortuna, G. Miolo and A. Spalletti "Photobehaviour of methyl-pyridinium and quinolinium iodide derivatives, free and complexed with DNA. A case of bisintercalation" *Photochem. Photobiol. Sci.*, 2014, **13**, 939–950.
- 23) **B. Carlotti**, G. Consiglio, F. Elisei, C.G. Fortuna, U. Mazzucato and A. Spalletti "Intramolecular charge transfer of push-pull pyridinium salts in the singlet manifold" *J. Phys. Chem. A*, 2014, **118**, 3580–3592.
- 24) **B. Carlotti**, G. Consiglio, F. Elisei, C.G. Fortuna, U. Mazzucato and A. Spalletti "Intramolecular charge transfer of push-pull pyridinium salts in the triplet manifold" *J. Phys. Chem. A*, 2014, **118**, 7782–7787.
- 25) **B. Carlotti**, E. Benassi, A. Spalletti, C.G. Fortuna, F. Elisei and V. Barone "Photoinduced symmetry-breaking intramolecular charge transfer in a quadrupolar pyridinium derivative" *Phys. Chem. Chem. Phys.*, 2014, **16**, 13984–13994.
- 26) R. Flamini, **B. Carlotti**, A. Spalletti, and A. Marrocchi "Spectral properties and photophysics of arylacetylenes in thin films" *Organic Photonics and Photovoltaics*, 2014, **2**, 1–11.
- 27) A. Cesaretti, **B. Carlotti**, P. L. Gentili, C. Clementi, R. Germani and F. Elisei "Spectroscopic Investigation of the pH Controlled Inclusion of Doxycycline and Oxytetracycline Antibiotics in

- Cationic Micelles and Their Magnesium Driven Release" *J. Phys. Chem. B*, 2014, **118**, 8601–8613.
- 28) A. Cesaretti, **B. Carlotti**, P. L. Gentili, C. Clementi, R. Germani and F. Elisei "Doxycycline and oxytetracycline loading of a zwitterionic amphoteric surfactant–gel and their controlled release" *Phys. Chem. Chem. Phys.*, 2014, **16**, 23096–23107.
- 29) E. Benassi, C. Cappelli, **B. Carlotti** and V. Barone "An integrated computational tool to model the broadening of the absorption bands of flexible dyes in solution: cationic chromophores as test cases" *Phys. Chem. Chem. Phys.*, 2014, **16**, 26963–26973.
- 30) N. Basaric, C. Clementi, **B. Carlotti**, M. Aleskovic and F. Elisei, "Photophysics of cyanophenylpyrroles: Investigation of solvatochromic properties and charge transfer by ultrafast spectroscopy and DFT calculations" *J. Photochem. Photobiol. A: Chem.*, 2015, **299**, 94–102.
- 31) **B. Carlotti**, A. Cesaretti, C. G. Fortuna, A. Spalletti and F. Elisei, "Experimental evidence of dual emission in a negatively solvatochromic push–pull pyridinium derivative", *Phys. Chem. Chem. Phys.*, 2015, **17**, 1877–1882.
- 32) E. Benassi, **B. Carlotti**, C. G. Fortuna, V. Barone, F. Elisei and A. Spalletti, "Acid–base strength and acidochromism of some dimethylamino–azinium iodides. An integrated experimental and theoretical study", *J. Phys. Chem. A*, 2015, **119**, 323–333.
- 33) A. Mazzoli, A. Spalletti, **B. Carlotti**, C. Emiliani, C. G. Fortuna, L. Urbanelli, L. Tarpani, and R. Germani, "Spectroscopic Investigation of Interactions of New Potential Anticancer Drugs with DNA and Non–Ionic Micelles", *J. Phys. Chem. B*, 2015, **119** (4), 1483–1495.
- 34) **B. Carlotti**, E. Benassi, V. Barone, G. Consiglio, F. Elisei, A. Mazzoli and A. Spalletti, "Effect of the  $\pi$  Bridge and Acceptor on Intramolecular Charge Transfer in Push–Pull Cationic Chromophores: An Ultrafast Spectroscopic and TD–DFT Computational Study", *ChemPhysChem*, 2015, **16** (7), 1440–1450.
- 35) E. Benassi, **B. Carlotti**, M. Segado, A. Cesaretti, A. Spalletti, F. Elisei and V. Barone, "Presence of Two Emissive Minima in the Lowest Excited State of a Push–Pull Cationic Dye Unequivocally Proved by Femtosecond Up–Conversion Spectroscopy and Vibronic Quantum–Mechanical Computations", *J. Phys. Chem. B*, 2015, **119** (19), 6035–6040.
- 36) A. Cesaretti, **B. Carlotti**, G. Consiglio, T. Del Giacco, A. Spalletti and F. Elisei, "Inclusion of Two Push–Pull *N*–Methylpyridinium Salts in Anionic Surfactant Solutions: A Comprehensive Photophysical Investigation", *J. Phys. Chem. B*, 2015, **119** (22), 6658–6667.
- 37) A. Cesaretti, **B. Carlotti**, R. Germani, A. Spalletti and F. Elisei, "Inclusion of push–pull *N*–methylpyridinium salts within surfactant hydrogels: is their excited state intramolecular charge transfer mediated by twisting?", *Phys. Chem. Chem. Phys.*, 2015, **17**, 17214–17220.
- 38) **B. Carlotti**, F. Elisei, U. Mazzucato and A. Spalletti, "Unusual high fluorescence of two nitro–distyrylbenzene–like compounds induced by CT processes affecting the fluorescence/intersystem–crossing competition", *Phys. Chem. Chem. Phys.*, 2015, **17**, 14740–14749.
- 39) **B. Carlotti**, E. Benassi, A. Cesaretti, C. G. Fortuna, A. Spalletti, V. Barone and F. Elisei, "An Ultrafast Spectroscopic and Quantum Mechanical Investigation of Multiple Emissions in Push–Pull Pyridinium Derivatives Bearing Different Electron Donors", *Phys. Chem. Chem. Phys.*, 2015, **17**, 20981–20989.
- 40) G. Cacioppa, **B. Carlotti**, F. Elisei, P. L. Gentili, A. Marrocchi and A. Spalletti, "Unexpected multiple

activated steps in the excited state decay of some bis(phenylethynyl)-fluorenes and -anthracenes”, *Phys. Chem. Chem. Phys.*, 2015, **18**, 285–294.

- 41) **B. Carlotti**, E. Benassi, C. G. Fortuna, V. Barone, A. Spalletti and F. Elisei, “Efficient Excited-State Symmetry Breaking in a Cationic Quadrupolar System Bearing Diphenylamino Donors”, *ChemPhysChem*, 2015, **17**, 136–146.
- 42) C. Clementi, A. Cesaretti, **B. Carlotti** and F. Elisei, “The Role of pH in Modulating the Electronic State Properties of Minocycline Drug and Its Inclusion within Micellar Carriers”, *J. Phys. Chem. A*, 2016, **120**, 4994–5005.
- 43) A. Cesaretti, **B. Carlotti**, P. L. Gentili, R. Germani, A. Spalletti and F. Elisei, “Twisting in the excited state of an N-methylpyridinium fluorescent dye modulated by nano-heterogeneous micellar systems”, *Photochem. Photobiol. Sci.*, 2016, **15**(4), 525–535.
- 44) **B. Carlotti**, A. Cesaretti, P. L. Gentili, A. Marrocchi, F. Elisei and A. Spalletti, “A two excited state model to explain the peculiar photobehaviour of a flexible quadrupolar D- $\pi$ -D anthracene derivative”, *Phys. Chem. Chem. Phys.*, 2016, **18**, 23389–23399.
- 45) M. Aschi, V. Barone, **B. Carlotti**, I. Daidone, F. Elisei and A. Amadei, “Photoexcitation and relaxation kinetics of molecular systems in solution: towards a complete in silico model”, *Phys. Chem. Chem. Phys.*, 2016, **18**, 28919–28931.
- 46) F. Ricci, F. Elisei, P. Foggi, A. Marrocchi, A. Spalletti and **B. Carlotti**, “Photobehavior and Nonlinear Optical Properties of Push-Pull, Symmetrical, and Highly Fluorescent Benzothiadiazole Derivatives”, *J. Phys. Chem. C*, 2016, **120**, 23726–23739.
- 47) A. Cesaretti, **B. Carlotti**, F. Elisei, C.G. Fortuna, G. Consiglio and A. Spalletti, “A cationic naphthyl derivative defies the Non Equilibrated Excited Rotamers principle”, *Phys. Chem. Chem. Phys.*, 2017, **19**, 5262–5272.
- 48) F. Ricci, **B. Carlotti**, B. A. Keller, C. Bonaccorso, C. G. Fortuna, T. Goodson III, F. Elisei and A. Spalletti, “Two-Photon Absorption Enhancement Parallels Intramolecular Charge Transfer Efficiency in Quadrupolar Versus Dipolar Cationic Chromophores”, *J. Phys. Chem. C*, 2017, **121**, 3987–4001.
- 49) O. Cannelli, T. Giovannini, A. Baiardi, **B. Carlotti**, F. Elisei, and C. Cappelli, “Understanding the interplay between the solvent and nuclear rearrangements in the negative solvatochromism of a push-pull flexible quinolinium cation”, *Phys. Chem. Chem. Phys.*, 2017, **19**, 32544–32555.
- 50) A. Cesaretti, **B. Carlotti**, F. Elisei, C.G. Fortuna, G. Consiglio and A. Spalletti, “Photoinduced ICT vs Excited Rotamer Intercoversion in two quadrupolar polyaromatic N-methylpyridinium cations”, *Phys. Chem. Chem. Phys.*, 2018, **20**, 2851–2864.
- 51) **B. Carlotti**, A. Cesaretti, O. Cannelli, T. Giovannini, C. Cappelli, C. Bonaccorso, C. G. Fortuna, F. Elisei, and A. Spalletti, “Evaluation of Hyperpolarizability from the Solvatochromic Method: Thiophene Containing Push-Pull Cationic Dyes as a Case Study”, *J. Phys. Chem. C*, 2018, **122**, 2285–2296.
- 52) **B. Carlotti**, Z. Cai, H. Kim, V. Shaparov, I. K. Madu, D. Zhao, W. Chen, P. M. Zimmerman, L. Yu and T. Goodson III, “Charge Transfer and Aggregation Effects in the Performance of Planar vs. Twisted Perylene Diimide Isomers as Electron Acceptors in Organic Solar Cells.” *Chem. Mater.*, 2018, **30**, 4263–4276.

- 53) **B. Carlotti**, A. Cesaretti, G. Cacioppa, F. Elisei, I. Kikas, I. Skoric and A. Spalletti, "Fluorosolvatochromism and hyperpolarizability of one-arm and two-arms nitro-compounds bearing heterocyclic rings.", *J. Photochem. Photobiol. A, Chem.*, 2019, **368**, 190–199.
- 54) E. L. Taylor, K. J. Metcalf, **B. Carlotti**, C. T. Lai, J. A. Modica, G. C. Schatz, M. Mrksich and T. Goodson III, "Long Range Energy Transfer in Protein Megamolecules", *J. Am. Chem. Soc.*, 2018, **140**, 15731–15743.
- 55) C. Clementi, **B. Carlotti**, C. Burattini, R. M. Pellegrino, A. Romani and F. Elisei, "Effect of hydrogen bonding interaction on the photophysics of  $\alpha$ - amino-orcein", *Spectrochim. Acta A*, 2019, **214**, 522–530.
- 56) N. Duran-Giner, **B. Carlotti**, C. Clementi, F. Elisei, S. Encinas Perea, and M. A Miranda, "Transient Absorption Spectroscopic Studies on 4-Nitroquinoline N- Oxide: from Femtoseconds to Microseconds Timescale", *Spectrochim. Acta A*, 2019, **216**, 265–272.
- 57) A. Cesaretti, **B. Carlotti**, F. Elisei and A. Spalletti, "Effect of the size of polycyclic aryl groups on the competition between adiabatic/diabatic photoisomerization mechanisms of cis-styrylarenes", *Photochem. Photobiol. Sci.*, 2019, **18**, 2125–2135.
- 58) M. Soderberg, B. Dereka, A. Marrocchi, **B. Carlotti** and E. Vauthey, "Ground State Structural Disorder and Excited State Symmetry Breaking in a Quadrupolar Molecule", *J. Phys. Chem. Lett.*, 2019, **10**, 2944–2948.
- 59) **B. Carlotti**, M. Poddar, F. Elisei, A. Spalletti and R. Misra, "Energy Transfer and Charge Transfer Dynamics in Highly Fluorescent Naphthalimide–BODIPY Dyads: Effect of BODIPY Orientation", *J. Phys. Chem. C*, 2019, **123**, 24362–24374.
- 60) A. Cesaretti, P. Foggi, C. G. Fortuna, F. Elisei, A. Spalletti and **B. Carlotti**, "Uncovering Structure–Property Relationships in Push–Pull Chromophores: A Promising Route to Large Hyperpolarizability and Two-Photon Absorption", *J. Phys. Chem. C*, 2020, **124**, 15739–15748.
- 61) M. Poddar, A. Cesaretti, E. Ferraguzzi, **B. Carlotti** and R. Misra, "Singlet and Triplet Excited-State Dynamics of 3,7-Bis(arylethynyl)phenothiazines: Intramolecular Charge Transfer and Reverse Intersystem Crossing", *J. Phys. Chem. C*, 2020, **124**, 17864–17878.
- 62) **B. Carlotti**, I. K. Madu, H. Kim, Z. Cai, H. Jiang, A. K. Muthike, L. Yu, P. M. Zimmerman and T. Goodson III, "Activating intramolecular singlet exciton fission by altering  $\pi$ -bridge flexibility in perylene diimide trimers for organic solar cells", *Chem. Sci.*, 2020, **11**, 8757–8770.
- 63) Y. Rout, A. Cesaretti, E. Ferraguzzi, **B. Carlotti**, R. Misra "Multiple Intramolecular Charge Transfers in Multimodular Donor-Acceptor Chromophores with large Two-Photon Absorption", *J. Phys. Chem. C*, 2020, **124**, 24631–24643.
- 64) L. Mencaroni, **B. Carlotti**, A. Cesaretti, F. Elisei, A. Grgičević, I. Škorić, A. Spalletti, "Competition between fluorescence and triplet production ruled by nitro groups in one-arm and two-arm styrylbenzene heteroanalogues", *Photochem. Photobiol. Sci.*, 2020, **19**, 1665–1676.
- 65) A. K. Muthike, **B. Carlotti**, I. K. Madu, H. Jiang, H. Kim, Q. Wu, L. Yu, P. M. Zimmerman, T. Goodson III, "The Role of the Core Attachment Positioning in Triggering Intramolecular Singlet Exciton Fission in Perylene Diimide Tetramers", *J. Phys. Chem. B*, 2021, **125**, 5114–5131.
- 66) Y. Rout, C. Montanari, E. Pasciucco, R. Misra, **B. Carlotti**, "Tuning the Fluorescence and the Intramolecular Charge Transfer of Phenothiazine Dipolar and Quadrupolar Derivatives by Oxygen Functionalization", *J. Am. Chem. Soc.*, 2021, **143** (26), 9933–9943.

- 67) L. Mencaroni, C. Bonaccorso, V. Botti, **B. Carlotti**, G. Consiglio, F. Elisei, C. Fortuna, A. Spalletti, A. Cesaretti, “Nonlinear Optical Properties of a New Panchromatic Series of Water-Soluble Bicationic Push-Pull Fluorophores”, *Dyes and Pigments*, 2021, **194**, 109620, 1–12.
- 68) A. Cesaretti, A. Spalletti, F. Elisei, P. Foggi, R. Germani, C. Fortuna, **B. Carlotti**, “The Role of Twisting in Driving Excited State Symmetry Breaking and Enhanced Two-Photon Absorption in Quadrupolar Cationic Pyridinium Derivatives”, *Phys. Chem. Chem. Phys.*, 2021, **23**, 16739–16753.
- 69) G. Tassone, M. Paolino, C. Pozzi, A. Reale, L. Salvini, G. Giorgi, M. Orlandini, F. Galvagni, S. Mangani, X. Yang, **B. Carlotti**, F. Ortica, L. Latterini, M. Olivucci, and A. Cappelli, “Xanthopsin-like Systems via Site-Specific Click-Functionalization of a Retinoic Acid Binding Protein”, *ChemBioChem*, 2022, **23**, e202100449, 1–11.
- 70) W. Dai,<sup>#</sup> T. Bianconi,<sup>#</sup> E. Ferraguzzi, X. Wu, Y. Lei, J. Shi, B. Tong, **B. Carlotti**, Z. Cai, and Y. Dong, “Excited-State Modulation of Aggregation-Induced Emission Molecules for High Efficiency Triplet Exciton Generation”, *ACS Materials Lett.*, 2021, **3**, 12, 1767–1777.

#### Reviewer Activity:

Reviewer for the following international journals: *Nature Communications*, *Accounts of Chemical Research*, *Chemical Science*, *ACS Energy Letters*, *Chemistry of Materials*, *The Journal of Physical Chemistry Letters*, *Chemistry a European Journal*, *The Journal of Physical Chemistry*, *Physical Chemistry Chemical Physics*, *ACS Sustainable Chemistry & Engineering*, *RSC Advances*, *Chemical Physics Letters*, *ChemPhysChem*, *New Journal of Chemistry*, *Photochemical and Photobiological Science*, *Journal of Photochemistry and Photobiology*, *Journal of Luminescence*, *Material Chemistry and Physics*, *International Journal of Analytical Chemistry*, *Spectrochimica Acta*, *Environmental Pollution*.

#### Editor Activity:

Member of the Editorial Board of *Applied Sciences* (IF 2.474).

### **CONFERENCES:**

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#### Scientific/Organizing Committees:

- 1) Member of the Organizing Committee of the on-line **Winter School on Biotechnology 2021** (“Biotechnologies in the time of COVID-19” January 18–25, 2021) and **Winter School on Biotechnology 2022** (“Complexity in Biotechnology” January 17–22, 2022) at the University of Perugia, Italy.
- 2) Member of the Organizing Committee of the on-line **Workshop** “Metodi Chimico Fisici utilizzati per lo studio di fasi condensate: informazioni dall’interazione tra fotoni e materiali” (February 24, 2021) organized **by the Division of Physical Chemistry of the Italian Chemical Society**.

#### Invited Talks:

- 1) **International Conference on Photochemistry 2021**  
Geneva, Switzerland (Virtual); July 19– 23, 2021  
“Activating Intramolecular Singlet Exciton Fission by Altering the  $\pi$ -Bridge Connection in Perylene Diimide Trimers and Tetramers for Organic Solar Cells”  
B. Carlotti, I.K. Madu, A.K. Muthike, H. Kim, Z. Cai, H. Jiang, L. Yu, P.M. Zimmerman, T. Goodson III



2) **Singlet Fission Workshop 2022**  
Estes Park, Colorado, USA; June 26–30, 2022

Title Yet To Be Defined

Oral Contributions: 18 at National and International Conferences

Posters: 31 at National and International Conferences

**TEACHING EXPERIENCE:**

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- Teaching Assistant for the “Physical Chemistry” class of the Pharmaceutical Chemistry and Technology degree of the University of Perugia (2007).
- Teaching of a course about “Innovation in textile fibres and yarns” within a project of professional formation in the textile sector (2008 and 2011).
- Teaching Assistant for the “Physical Chemistry Lab 2” of the degree in Chemistry of the University of Perugia (2010–2014).
- Teaching of a course of “Environmental Chemistry” for the “Attività di Protezione Civile” degree of the University of Perugia (2011 and 2012).
- Teaching of a course of “Femtochemistry” for the master degree in Chemistry of the University of Perugia (2015–2021).
- Teaching of a course of “Instrumental Analytical Chemistry Lab” for the degree in Chemistry of the University of Perugia (2019).
- Teaching of a course of “Physical Chemistry Lab 2” for the degree in Chemistry of the University of Perugia (2018 and 2021).
- Teaching of a course of “Biosensors and Biomaterials” for the degree in Biotechnology of the University of Perugia (2019–2021).
- Teaching of a course of “Femtobiology” for the PhD in Biotechnology of the University of Perugia (2020, 2021).
- Member of the jury for the title of “Docteur en Sciences Naturelles, mention chimie” (PhD in Natural Science, Chemistry) at the University of Geneva, Switzerland (April 2015).
- Visiting professor of “Photochemistry and Spectroscopy” at the University of Coimbra, Portugal (2015).
- Visiting professor of “Femtochemistry” at the Aarhus University, Denmark (2016).
- Visiting Professor of “Femtochemistry” at the University of Bordeaux, France (2019).
- Member of the Faculty Board for the “PhD in Biotechnology” of the University of Perugia (since March 2019).
- Research advisor of several bachelor and master students: Alessandra Mazzoli (Degree in Chemistry, 2008), Alessio Cesaretti (Degree in Chemistry, 2009), Laura Paparelli (Degree in Biotechnology, 2009), Domenico Fuoco (PhD in Chemistry, 2010), Francesco Lampredi (Degree in Biotechnology, 2010), Alessandra Mazzoli (Master Degree in Chemistry, 2010), Matteo Massini Rosati (Degree in Biotechnology, 2010), Giuliano Pizzoli (Master Degree in Chemistry, 2011), Alessio Cesaretti (Master Degree in Chemistry, 2011), Laura Paparelli (Master Degree in Biotechnology, 2012), Serena Vannucci (Master Degree in Chemistry, 2013), Giulia Cacioppa (Degree in Chemistry, 2013), Fiamma Galletti (Degree in Chemistry, 2014), Francesco Lampredi (Master Degree in Biotechnology, 2014), Federica Ricci (Degree in Chemistry, 2014), Simona Fontanella (Master Degree in Biotechnology, 2014), Serena Paoletti (Degree in Chemistry, 2015), Giulia Cacioppa (Master Degree in Chemistry, 2015), Davide Delli Campi (Degree in Chemistry,

- 2015), Maddalena Elia (Degree in Biotechnology, 2016), Leonardo Tarlati (Degree in Chemistry, 2016), Federica Ricci (Master Degree in Chemistry, 2016), Fiamma Galletti (Master Degree in Chemistry, 2017), Irene Golemno (Degree in Biotechnology, 2017), Davide Delli Campi (Master Degree in Chemistry, 2017), Letizia Mencaroni (Master Degree in Chemistry, 2019), Elena Ferraguzzi (Master Degree in Chemistry, 2020), Chiara Montanari (Degree in Chemistry, 2020), Erika Pasciucco (Degree in Chemistry, 2020), Martina Alebardi (Degree in Chemistry, 2020), Giulia Pantella (Degree in Biotechnology, 2020), Antonio Lattanzi (Degree in Biotechnology, 2020), Mariafrancesca Coccimiglio (Master Degree in Chemistry, 2021), Maria Aurora Mancuso (Master Degree in Chemistry, 2021), Alessandro Armadoro (Degree in Chemistry, 2021).
- Research advisor of PhD students: Tommaso Bianconi (PhD in Biotechnology, 2020-2023).

*January 2022*