

Education

- 06/09/2013 – 09/09/2016 **PhD. in Bio-Molecular Nanotechnology**, Dipartimento di Matematica e Fisica, Università del Salento, Lecce, Italy. Thesis: *Third generation photovoltaics evolution: from DSCs to Perovskite Solar Cells*; supervised by Dr. Michele Manca, Dr. Silvia Colella, Dr. Aurora Rizzo, Prof. Giuseppe Gigli.
- 02/11/2006 – 21/03/2011 **MSc. in Materials Science**, Università di Milano-Bicocca, Milano, Italy. Thesis: *Study of photovoltaic devices based on organic dyes*; supervised by Dr. Norberto Manfredi, Prof. Maurizio Acciarri, Prof. Alessandro Abbotto.
- 01/10/2003 – 26/10/2006 **BSc. in Materials Science**, Università di Torino, Torino, Italy. Thesis performed at ST Microelectronics: *Study of the morphology of floating gate in NOR flash memories of the 65nm node*; supervised by Dr. Marcello Mariani, Prof. Ettore Vittone.

Research employment

- 01/01/2018 – present **Research fellow** for cooperation in research activities, A2-type Senior, at the Materials Science Department of University of Milan Bicocca, supervised by Prof Simona Binetti; research is conducted on the topic *Development of growth processes for inorganic solar cells based on chalcogenides and related tandem cells*.
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- 01/01/2017 – 01/12/2017 **Research fellow** at the Solar Energy MIB-SOLAR Centre (Milano-Bicocca University), under the scientific responsibility of Prof Simona Binetti, on the study *Growth and characterization of Cu₂ZnSnS₄ films for photovoltaic applications*, part of the **Project ID 2016-ATESP-0582** and **2016-CONT-0640**.
- 01/10/2016 – 01/12/2016 **Researcher** at the Materials Science Department of University of Milan Bicocca supervised by Prof Alessandro Abbotto; research was conducted on the topic *Monolithic perovskite/silicon tandem solar cells*.
- 01/07/2013 – 15/11/2015 **Research fellow** at the Research Centre for Bio-Molecular Nanotechnology of IIT @ UNILE (supervisor: Dr Michele Manca) on the study: *Design and manufacture of multi colored semi-transparent photoelectrode for photovoltachromic devices*, on the project: **Molecular NANotechnology for HeAlth and EnvironmenT (MAAT)**.
- 01/02/2013 – 30/06/2013 **Research fellow** at U.O.S. NNL Institute – Lecce, (supervisor: Dr Daniele Sanvitto), on the project: **ERC POLAFLOW “POLARITON CONDENSATES”**.
- 01/02/2012 – 31/01/2013 **Research fellow** at the Solar Energy MIB-SOLAR Centre (Milano-Bicocca University) for ENI S.p.A. (supervisors Prof Abbotto and Prof Maurizio Acciarri), on the project: *Photosensitizers for organic dye-sensitized solar cells - DSC*.
- 01/10/2011 – 31/01/2012 **Contract research work** at the Materials Science and Inorganic Chemistry Departments of University of Milan Bicocca, (supervisors Prof Abbotto and Prof Roberto), on **Project Cariplo 2010**, *Organic solar cells with high efficiency based on surface nanostructuring of innovative hybrid materials for light confinement*.
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- 02/05/2011 – 30/09/2011 **Contract research work** at the Materials Science Department of University of Milan Bicocca, (supervisors Prof. Abbotto and Prof Roberto); topic: *Preparation and characterization of solar cells*.

Other employment

02/2006 – 09/2006	<i>Internship</i> at <u>ST Microelectronics</u> , Agrate Brianza (Milano) in R&D division, under the supervision of Dr Marcello Mariani (STMicroelectronics) and Prof Ettore Vittone (Università degli studi di Torino).
01/2002 – 08/2003	<i>Insurance secretary</i> at Garrisi (Lecce).
01/2002 – 12/2002	<i>Web Manager</i> at <u>W&G s.n.c.</u> (Lecce), self-employment in business created in participation with one journalist and a graphic designer, with the support of the Comune di Lecce and Regione Puglia.
09/2001 – 12/2001	<i>Product Manager</i> in Netsystems at <u>VET s.r.l.</u> , Bari, as support for telecommunication products.
05/2001 – 08/2001	<i>Internship</i> at <u>Trade Italy</u> in the Recruitment Division.

Outreach

30/09/2017	<i>MEETmeTONIGHT</i> (Milan): posters, video and brochure realization, exhibition stand setting up and hostess.
09/2016	Author of the article <i>Luce e Fotovoltaico</i> (Light and Photovoltaics) in the departmental scientific journal: Ithaca, Viaggio nella Scienza (Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento). This journal is intended for consumption by school students and early stage undergraduates to enthuse them about some interesting areas of scientific research.
10/2014	<i>Photovoltaics Workshop: new frontiers and applications</i> (Lecce): assistant event planner for this public showcase of photovoltaic technology.
11/2011	<i>PVTECH - Enersolar 2011</i> (Milan): Produced a video and brochure, set up the exhibition stand and acted as hostess.

Supervising, mentoring and teaching activities

05/06/2017	The applicant gave a lecture addressed to senior researchers about <i>Solution Processable Photovoltaics</i> , at Department of Materials and Environmental Technology of Tallinn University of Technology.
28/04/2017	Under the project CHEETAH WEBINAR , the applicant presented a seminar with title: <i>Hybrid Halide Perovskite for Photovoltaic Applications</i> (https://www.cheetah-exchange.eu/webinars.asp?i=21)
2013 - 2016	<i>Delivered annual seminars</i> to students and researchers, on photovoltaic devices and materials (Research Centre for Bio-Molecular Nanotechnology of IIT, Italy).
2011 - present	<i>Supervision</i> of various undergraduate students and, <i>training of four doctoral students</i> at the start of their studies. She currently leads a research activity that is supported by one <i>doctoral student</i> in Chemistry, one <i>master student</i> in Materials Science, one <i>master student</i> in Chemistry and one <i>bachelor student</i> in Chemistry.
2011 - present	<i>Private tutoring</i> for physics undergraduates.
1999 - 2003	<i>Kung fu coach</i> to beginners of all ages at Chang Dsu Yao Kung fu School.

Participation in industrial innovation

01/02/2012 – 31/01/2013	<i>Researcher</i> for ENI S.p.A. at the Solar Energy MIB-SOLAR Centre (Milano-Bicocca University). Provided data and technical reports regarding screening of proprietary organic sensitizers and their processing.
01/02/2012 – 31/01/2013	Assisting in the <i>planning, preparation and launch</i> of the Solar Energy MIB-SOLAR Centre (Milano-Bicocca University), funded by an ENI S.p.A. project. The applicant had to liaise with academic and industrial partners to ensure the new lab was delivered

- to the highest quality and on time.
- 01/02/2006 – 30/09/2006 *Research trainee* at **ST Microelectronics**, R&D Division, Agrate Brianza (Milan). Development of physical/chemical deposition procedures of floating gate in 65nm logic.
- 02/01/2002 – 31/12/2002 *Web Manager* and *company co-director* **W&G s.n.c.** (Lecce, Italy). Our company was one of the first in Puglia to move local trade online. My role was to do market analysis and coordinate the design and interface of the website.
- 01/09/2001 – 31/12/2001 *Product manager* Netsystem at **VET s.r.l.**, Modugno (Bari). Worked on a project developing internet television.

Research funding and scholarships

2018 - *Winner Marie-Curie Individual Fellowship* (€ 183,454.80) Grant Agreement number: 798271 — HYPER THERM

2016 - *ERASMUS+ scholarship* at the School of Engineering and Materials Science of Queen Mary University of London, under the supervision of Dr. Oliver Fenwick, studying the charge transport properties of perovskite films (2 months).

Areas of scientific expertise

Solid state physics and chemistry; semiconductor physics; physics and technology of semiconductor devices; organic materials for photovoltaic devices; thin-film technology; dye-sensitized solar cells; scanning electron microscopy; hybrid halide perovskites; kesterite solar cells; solution processable photovoltaics.

Publications in peer-reviewed scientific journals (Scopus)	Citations (Scopus)
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Documents: 19
 Total citations: 273
 Average citations per publication: 14.369
 H-index: 11
 Total impact factor: 89.801
 Average impact factor per publication: 4.726

1. Krustok, J.; Raadik, T.; Grossberg, M.; Kauk-Kuusik, M.; Trifiletti, V. ; Binetti, S. <i>Photoluminescence study of deep donor-deep acceptor pairs in Cu₂ZnSnS₄</i> . <i>Materials Science in Semiconductor Processing</i> 2018 , 80, 52-55. DOI: https://doi.org/10.1016/j.mssp.2018.02.025 .	
2. Trifiletti, V. ; Cannavale, A.; Listorti, A.; Rizzo, A.; Colella, S. <i>Sequential deposition of hybrid halide perovskite starting both from lead iodide and lead chloride on the most widely employed substrates</i> . <i>Thin Solid Films</i> 2018 , 657, 110-117. DOI: https://doi.org/10.1016/j.tsf.2018.05.022 .	
3. Manfredi, N.; Trifiletti, V. ; Melchiorre, F.; Giannotta, G.; Biagini, P.; Abbotto, A. <i>Performance enhancement of a dye-sensitized solar cell by peripheral aromatic and heteroaromatic functionalization in di-branched organic sensitizers</i> . <i>New Journal of Chemistry</i> 2018 . DOI: 10.1039/C7NJ05188C.	
4. Boldrini, C. L.; Manfredi, N.; Perna, F. M.; Trifiletti, V.; Capriati, V.; Abbotto, A. <i>Dye-Sensitized Solar Cells that use an Aqueous Choline Chloride-Based Deep Eutectic Solvent as Effective Electrolyte Solution</i> . <i>Energy Technology</i> 2017 , 5 (2), 345-353. DOI: 10.1002/ente.201600420.	7
5. Trifiletti, V. ; Manfredi, N.; Listorti, A.; Altamura, D.; Giannini, C.; Colella, S.; Gigli, G.; Rizzo, A. <i>Engineering TiO₂/Perovskite Planar Heterojunction for Hysteresis-Less Solar Cells</i> . <i>Advanced Materials Interfaces</i> 2016 , 3 (22), 1600493. DOI: 10.1002/admi.201600493.	7

6. Miletić, T.; Pavoni, E.; **Trifiletti, V.**; Rizzo, A.; Listorti, A.; Colella, S.; Armaroli, N.; Bonifazi, D. *Covalently Functionalized SWCNTs as Tailored p-Type Dopants for Perovskite Solar Cells*. ACS Applied Materials & Interfaces **2016**, 8 (41), 27966-27973. 8
DOI: 10.1021/acsami.6b08398.
7. Magnano, G.; Marinotto, D.; Cipolla, M. P.; **Trifiletti, V.**; Listorti, A.; Mussini, P. R.; Di Carlo, G.; Tessore, F.; Manca, M.; Orbelli Biroli, A.; Pizzotti, M. *Influence of alkoxy chain envelopes on the interfacial photoinduced processes in tetraarylporphyrin-sensitized solar cells*. Phys Chem Chem Phys **2016**, 18 (14), 9577-85. 12
DOI: 10.1039/c6cp00129g.
8. Guerra, V. L. P.; Altamura, D.; **Trifiletti, V.**; Colella, S.; Listorti, A.; Giannuzzi, R.; Pellegrino, G.; Condorelli, G. G.; Giannini, C.; Gigli, G.; Rizzo, A. *Implications of TiO₂ surface functionalization on polycrystalline mixed halide perovskite films and photovoltaic devices*. J. Mater. Chem. A **2015**, 3 (41), 20811-20818. 13
DOI: 10.1039/c5ta05220c.
9. Orbelli Biroli, A.; Tessore, F.; Vece, V.; Di Carlo, G.; Mussini, P. R.; **Trifiletti, V.**; De Marco, L.; Giannuzzi, R.; Manca, M.; Pizzotti, M. *Highly improved performance of ZnII tetraarylporphyrinates in DSSCs by the presence of octyloxy chains in the aryl rings*. Journal of Materials Chemistry A **2015**, 3 (6), 2954-2959. 11
DOI: 10.1039/C4TA05233A.
10. **Trifiletti, V.**; Roiati, V.; Colella, S.; Giannuzzi, R.; De Marco, L.; Rizzo, A.; Manca, M.; Listorti, A.; Gigli, G. *NiO/MAPbI_{(3-x)Cl_x}*/PCBM: a model case for an improved understanding of inverted mesoscopic solar cells. ACS Appl Mater Interfaces **2015**, 7 (7), 4283-9. 28
DOI: 10.1021/am508678p.
11. Di Carlo, G.; Caramori, S.; **Trifiletti, V.**; Giannuzzi, R.; De Marco, L.; Pizzotti, M.; Orbelli Biroli, A.; Tessore, F.; Argazzi, R.; Bignozzi, C. A. *Influence of porphyrinic structure on electron transfer processes at the electrolyte/dye/TiO₂ interface in PSSCs: a comparison between meso push-pull and beta-pyrrolic architectures*. ACS Appl Mater Interfaces **2014**, 6 (18), 15841-52. 12
DOI: 10.1021/am503113x.
12. Di Carlo, G.; Orbelli Biroli, A.; Tessore, F.; Pizzotti, M.; Mussini, P. R.; Amat, A.; De Angelis, F.; Abboto, A.; **Trifiletti, V.**; Ruffo, R. *Physicochemical Investigation of the Panchromatic Effect on β -Substituted ZnIIPorphyrinates for DSSCs: The Role of the π Bridge between a Dithienylethylene Unit and the Porphyrinic Ring*. The Journal of Physical Chemistry C **2014**, 118 (14), 7307-7320. 14
DOI: 10.1021/jp412087f.
13. **Trifiletti, V.**; Ruffo, R.; Turrini, C.; Tasseti, D.; Brescia, R.; Di Fonzo, F.; Riccardi, C.; Abboto, A. *Dye-sensitized solar cells containing plasma jet deposited hierarchically nanostructured TiO₂ thin photoanodes*. Journal of Materials Chemistry A **2013**, 1 (38), 11665. 7
DOI: 10.1039/c3ta11485f.
14. Leandri, V.; Ruffo, R.; **Trifiletti, V.**; Abboto, A. *Asymmetric Tribranched Dyes: An Intramolecular Cosensitization Approach for Dye-Sensitized Solar Cells*. European Journal of Organic Chemistry **2013**, 2013 (30), 6793-6801. 18
DOI: 10.1002/ejoc.201300962.
15. Di Carlo, G.; Orbelli Biroli, A.; Pizzotti, M.; Tessore, F.; **Trifiletti, V.**; Ruffo, R.; Abboto, A.; Amat, A.; De Angelis, F.; Mussini, P. R. *Tetraaryl ZnII porphyrinates substituted at beta-pyrrolic positions as sensitizers in dye-sensitized solar cells: a comparison with meso-disubstituted push-pull Zn(II) porphyrinates*. Chemistry **2013**, 19 (32), 10723-40. 32
DOI: 10.1002/chem.201300219.
16. Dragonetti, C.; Valore, A.; Colombo, A.; Magni, M.; Mussini, P.; Roberto, D.; Ugo, R.; Valsecchi, A.; **Trifiletti, V.**; Manfredi, N.; Abboto, A. *Ruthenium oxyquinolate complexes for dye-sensitized solar cells*. Inorganica Chimica Acta **2013**, 405, 98-104. 15
DOI: 10.1016/j.ica.2013.05.006.
17. Abboto, A.; Coluccini, C.; Dell'Orto, E.; Manfredi, N.; **Trifiletti, V.**; Salamone, M. M.; Ruffo, R.; Acciarri, M.; Colombo, A.; Dragonetti, C.; Ordanini, S.; Roberto, D.; Valore, A. *Thiocyanate-free cyclometalated ruthenium sensitizers for solar cells based on heteroaromatic-substituted 2-arylpyridines*. Dalton Trans **2012**, 41 (38), 11731-8. 28

DOI: 10.1039/c2dt31551c.

18. Dragonetti, C.; Valore, A.; Colombo, A.; Roberto, D.; **Trifiletti, V.**; Manfredi, N.; Salamone, M. M.; Ruffo, R.; Abboto, A. *A new thiocyanate-free cyclometallated ruthenium complex for dye-sensitized solar cells: Beneficial effects of substitution on the cyclometallated ligand.* Journal of Organometallic Chemistry **2012**, 714, 88-93. 29
DOI: <https://doi.org/10.1016/j.jorgchem.2012.03.011>.
19. Dragonetti, C.; Valore, A.; Colombo, A.; Righetto, S.; **Trifiletti, V.** *Simple novel cyclometallated iridium complexes for potential application in dye-sensitized solar cells.* Inorganica Chimica Acta **2012**, 388, 163-167. 32
DOI: <https://doi.org/10.1016/j.ica.2012.03.028>.

Oral presentations at conferences

1st Enerchem School, Florence, Italy, **2018**.

1. *In situ gel formation of high quality kesterite thin films*

International Conference on Hybrid and Organic Photovoltaics (HOPV17), Lausanne, Switzerland, **2017**.

1. *Engineering Titania based Planar Heterojunction for Hysteresis-Less Perovskite Solar Cells*

Poster presentations at conferences

Centre for Plastic Electronics Annual Lecture & Symposium "Bioelectronics & Beyond", London, UK, **2016**.

1. *Engineering TiO₂/perovskite planar heterojunction for hysteresis-free solar cells*

1st International Conference on Perovskite Solar Cells and Optoelectronics (PSCO15), Lausanne, Switzerland, **2015**.

2. *Engineering CH₃NH₃PbI₃ film morphology for optoelectronic devices.*

7th International Conference on Hybrid and Organic Photovoltaics (HOPV15), Rome, Italy, **2015**.

3. *Alkoxy-substituted Zn^{II} tetra-aryl porphyrinates with improved power conversion efficiency in DSSCs.*

4. *NiO/MAPbI_{3-x}Cl_x/PCBM: A Model Case for an Improved Understanding of Inverted Mesoscopic Solar Cells.*

6th International Conference on Hybrid and Organic Photovoltaics (HOPV14), Lausanne, Switzerland, **2014**.

5. *Analysis at the Nanoscale of Perovskite/TiO₂ Interface as Useful Design Criteria for Mesostuctured Solar Cells with Optimized Performances.*

6. *β-substituted Zn^{II}-tetra-aryl porphyrinates: dyes with native shielding architecture for Porphyrin-Sensitized Solar Cells.*

Photovoltaics: new frontiers and applications, Lecce, Italy, **2014**.

7. *NiO/MAPbI_{3-x}Cl_x/PCBM: A Model Case for an Improved Understanding of Inverted Mesoscopic Solar Cells.*

8. *Influence of Porphyrinic Structure on Electron Transfer Processes at the Electrolyte/Dye/TiO₂ Interface in PSSCs: A Comparison between meso Push-Pull and β-Pyrrolic Architectures.*

5th International Conference on Hybrid and Organic Photovoltaics (HOPV13), Seville, Spain, **2013**.

9. *Asymmetric Tribranched Dyes: An Intramolecular Co-Sensitization Approach for Dye-sensitized Solar Cells.*

Second International Meeting on Organic Materials for a Better Future (FUTURMAT2), Brindisi, Italy **2012**.

10. *Dye-sensitized solar cells containing plasma jet deposited hierarchical nanostructured TiO₂ thin photoanodes.*

11. *Dye-Sensitized Solar Cells: Spectroscopic Evaluation of Dye Loading On TiO₂.*

Milan, 18th May 2018

Vincenzo Trifiletti