

ANGELO MARIA MONGUZZI1. Personal Informations.

- FAMILY NAME, FIRST NAME: Monguzzi, Angelo Maria (birth 07/07/1981)
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2. Current Position.

From 2019, A.M. serves as **Associate Professor in Condensed Matter Physics** at Department of Materials Science. His research is focused on the development of **advanced hybrid functional nanomaterials for applications in molecular photonics, photon management and bio-imaging, in collaboration with several national and international universities and research institutes**. He started his research by working on hybrid organic/inorganic light NIR emitters based on lanthanides ions and photonic crystals for lighting and telecom, in the framework of several national and international project and networks. The topic of the current research is the design and study of advanced materials and nanostructured materials for multiexcitonic processes such as photon upconversion (UC) to fabricate efficient anti Stokes emitters for application in the solar and biomedical field. Specifically, **A.M is currently at the forefront on the research on UC materials based on triplet-triplet annihilation**. The research on TTA-UC has been developed so far to be considered one of the most promising recent advances in photon management processes for solar technologies. The experimental activity is centered on **CW and ultrafast TRPL photoluminescence spectroscopy**, transient absorption spectroscopy, confocal imaging, IR and FT-IR spectroscopy to tackle both fundamental and applicative aspects aimed at the development of real-world devices.

In 2009, A.M. has been awarded as Young Researcher by the Italian Society of Physics. During his career he has been involved in several national/international researches. From 2011, A.M. led a 3-years project funded by the holding Eni S.p.A. From 2016, He led a research 2-years project on UC founded by the Cariplo Foundation and Regione Lombardia. In 2020, he received funding for the European Community for FET project SPARTE (4 years) where he will work as unit coordinator for developing scintillators based on hybrid materials and emitters. His research activity has been also supported by the prestigious fellowships from the Japan Society for the Promotion of Science (JSPS) and by the Volta-Edison scholarship for young physicist dedicated to European projects.

A. M. is author of 72 scientific works (42 as first/corresponding author, 5 invited, average impact factor IF = 15). To date, his work received 2886 citations resulting a **Hirsch factor of 28 and a i10-index of 51** (Google Scholar).

3. Previous Positions.

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| • 2019 - present | Associate Professor | Univ. Milano Bicocca, ITALY |
| • 2016/2019 | Assistant Professor | Univ. Milano Bicocca, ITALY |
| • 2015 | Senior PostDoc | Univ. Milano Bicocca, ITALY |
| • 2014 | PostDoc JSPS Fellow | Univ. of Kyushu, Fukuoka, JAPAN |
| • 2008/2013 | PostDoc | Univ. Milano Bicocca, ITALY |
| • 2007 | Visiting PhD | Materia Nova Center, Mons-Hainaut, BELGIUM |
| • 2006/2008 | PhD Scholar | Univ. Milano Bicocca, ITALY |

4. Education

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|-------------|------------------------------|-----------------------------|
| • 2006/2008 | PhD - Materials Science | Univ. Milano-Bicocca, ITALY |
| • 2004/2005 | M. Sc. - Solid State Physics | |
| • 2001/2003 | B. Sc. - Physics | |

5. Commissions of Trust.

- **2007 Organizing Committee of the 4th International conference ECOER** (2007, Varenna – Italy).
- **A. M. works as Referee for several international journals** (*Phys. Rev. Lett.*, *Phys. Rev. B*, *J. Am. Chem. Soc.*, *J. Phys. Chem. Lett.*, *J. Phys. Chem. A*, *Chem. Phys. Lett.*, *Synth. Met.*, *J. Mater. Chem.*, *Laser Phys. Lett.*, *Phys. Chem. Chem. Phys.*, *ACS AMI*, *Advanced Materials*, *Acc. Chem. Res.*). **A. M. collaborates with l'Agence Nationale de la Recherche (ANR), and the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) and CINECA** for the evaluation of national/ international research projects.

6. Scholarships and Fellowships

- 2013 JSPS Fellowship (<https://www.jsps.go.jp/english/>).
- 2005 Italian Ministerial Scholarship for PhD students (3 years).

7. Granted Patents

In the framework of the project “*Photoactive Materials for Low Power Photon Up-conversion*” funded by Eni S.p.A., **A.M. is the inventor for European patent n° MI2014A001235**, acquired Eni S.p.A.

8. Prizes.

- 2016 – 2° Classified - **Talented Young Researchers Prize**, Univ. Milano Bicocca - Accademia dei Lincei.
- 2014 - **Young Researchers in Physics Award**, European Physical Society/Edison S.p.A Award.
- 2009 - **Young Researcher Special Mention Award - Solid State Physics**, Società Italiana di Fisica (SIF).

9. Research Funding.

The research activity has been strongly supported by several grants obtained from European, national, regional and private organizations, with an overall funding >4000 k€.

- 2020/2024 SPARTE, *Scintillating Porous Architectures for RadioacTivE gas detection* - FET Open RIA Horizon 2020, European Community (2900 k€)
- 2020/2022 (PI) X-PATH, *X-ray activated photodynamic therapy for targeted treatment of Alzheimer's disease - Scientific and Technological Cooperation ITALY-ISRAEL* (200k€)
- 2019/2021 NANOTRACK, *Multimodal nanotracking for exosome-based therapy in DMD* - RF 2016 Italian Ministry of Health (450 k€)
- 2018/2019 (PI) HUNTER, *Engineering Hybrid Photon UpcoNverters for Tracking the Breast CancER Treatment* - Università Milano Bicocca – Fondo di Ateneo Quota Competitiva (25 k€)
- 2016/2019 (PI) “*Materiali per Upconversion a bassa potenza con applicazione nel Solare e nella Bioteranostica Multimodale*”- Cariplo Foundation and regione Lombardia. (125 k€)
- 2016/2017 (PI) USB, *Low power Up-conversion Materials for Solar Applications and Multimodal Bio-theranostics* - Università Milano Bicocca – Fondo di Ateneo Quota Competitiva (25 k€)
- 2011/2014 (PI) *Photoactive Materials for Low Power Photon Upconversion* - Eni S.p.A. - Div. Corporate Centro Ric. Energie Non Convenzionali, Istituto Eni (365 k€)
- 2010/2012 LUMIPHOTO - *Luminescent Solar Concentrators for Building-Integrated Photovoltaics* - Cariplo Foundation
- 2008/2010 Progetti di Ricerca di Interesse Nazionale (PRIN) - *Organic Systems For Low power Photon Up-Conversion* – Italian Ministry of Instruction MIUR – (140 k€)
- 2007/2009 *Novel Metal Organic Complexes for WOLED* – Cariplo Foundation (130 k€)
- 2006/2008 FIRB RBNE03S7XZ SYNERGY - *SYNthEsis of novel oRganic materials and supramolecular architectures for high efficiency optoelectronic and photonic systems* - Italian Ministero dell'Istruzione MIUR
- 2005-2010 Supramolecular Chromophores Organization in Nanochannels - VII European Executive Program of Scientific Collaboration Italy-Belgium “

10. Research Activities and Collaborations.**Present Research and Collaborations**

- Prof. C. Larpent, Institut Lavoisier de Versaille, France.
- Prof. N. Kimizuka and Dr. N. Yanai, Department of Chemistry and Biochemistry at the University of Kyushu, Fukuoka, Japan.

- Prof. C. Weder, University of Fribourg, Director of the A. Merkl Institute, Fribourg, Switzerland.
- Prof. Y. Torrente, MD, Director of the STEM CELLS LABS, Department of Pathophysiology and Transplantation, Università degli Studi di Milano and hospital Ospedale Maggiore Policlinico di Milano.
- Prof. L. Manna, head of the Nanochemistry Department at the Italian Institute of Technology in Genova, Italy.

Past Research and Collaborations

- Prof. D. J. Norris, Director of the Optical Materials Engineering Laboratory in the Department of Mechanical and Process Engineering at ETH, Zürich, Switzerland.
- Prof. Gion Calzaferri Department of Chemistry and Biochemistry University of Berne, Berne, Switzerland.
- Prof. Chiara Castiglioni at the Dept. of Chemistry, Materials and Chemical Engineering of the Politecnico di Milano, Italy.
- Prof. G. A. Ozin, Department of Chemistry, University Of Toronto, Canada. (<http://nanowizardry.info>)
- Prof. G. Lanzani, Director of the Center for Nano Science and Technology at the Politecnico di Milano, Istituto Italiano di Tecnologia, Milano, Italy. (<http://cnst.iit.it>)-

11. Academics, Supervision and Teaching

- 2008/2020 - Supervisor of 8 Bc. S. and 9 M. Sc. students for the degree in Physics or Materials Science,
- 2019/2020 - Faculty of Science, Material Science B. Sc. Classes –Introduction to the Structure of Matter.
- 2018/2020 - Faculty of Science, Material Science M. Sc. Classes – Molecular Electronics and Photonics
- 2008/2017 - Assistant Professor in the Faculty of Science, for Material Science B. Sc. Classes.

12. Selected 10 Recent Publications.

- [P01] Perego, J.; Villa, I.; Pedrini, A.; Padovani, E. C.; Crapanzano, R.; Vedda, A.; Dujardin, C.; Bezuidenhout, C. X.; Bracco, S.; Sozzani, P. E.; Comotti, A.; Gironi, L.; Beretta, M.; Salomoni, M.; Kratochwil, N.; Gundacker, S.; Auffray, E.; Meinardi, F.; Monguzzi, A., *Composite fast scintillators based on high-Z fluorescent metal–organic framework nanocrystals*. **Nature Photonics** 1-8, 2021.
- [P02] Ronchi, A.; Capitani, C.; Pinchetti, V.; Gariano, G.; Zaffalon, M. L.; Meinardi, F.; Brovelli, S.; Monguzzi, A., *High Photon Upconversion Efficiency with Hybrid Triplet Sensitizers by Ultrafast Hole-Routing in Electronic-Doped Nanocrystals*. **Advanced Materials** 2020, 32 (37), 2002953.
- [P03] Ferreira, R. A. S.; Correia, S. F. H.; Monguzzi, A.; Liu, X.; Meinardi, F., *Spectral converters for photovoltaics – What’s ahead*. **Materials Today** 2020, 33, 105-121.
- [P04] Perego, J.; Pedrini, J.; Bezuidenhout, C. X.; Sozzani, P. E.; Meinardi, F.; Bracco, S.; Comotti, A.; Monguzzi, A., *Engineering Porous Emitting Framework Nanoparticles with Integrated Sensitizers for Low-Power Photon Upconversion by Triplet Fusion*. **Advanced Materials** 2019, 31 (40), 1903309.
- [P05] Villa, C.; Campione, M.; Santiago-González, B.; Alessandrini, F.; Erratico, S.; Zucca, I.; Bruzzone, M. G.; Forzenigo, L.; Malatesta, P.; Mauri, M.; Trombetta, E.; Brovelli, S.; Torrente, Y.; Meinardi, F.; Monguzzi, A., *Self-Assembled pH-Sensitive Fluoromagnetic Nanotubes as Archetype System for Multimodal Imaging of Brain Cancer*. **Advanced Functional Materials** 2018, 28 (19), 1707582.
- [P06] Monguzzi, A.; Ballabio, M.; Yanai, N.; Kimizuka, N.; Fazzi, D.; Campione, M.; Meinardi, F., *Highly Fluorescent Metal–Organic-Framework Nanocomposites for Photonic Applications*. **Nano Letters** 2018, 18 (1), 528-534.
- [P07] Vadrucci, R.; Monguzzi, A.; Saenz, F.; Wilts, B. D.; Simon, Y. C.; Weder, C., *Nanodroplet-Containing Polymers for Efficient Low-Power Light Upconversion*. **Advanced Materials** 2017, 29 (41), 1702992.
- [P08] Mattiello, S.; Monguzzi, A.; Pedrini, J.; Sassi, M.; Villa, C.; Torrente, Y.; Marotta, R.; Meinardi, F.; Beverina, L., *Self-Assembled Dual Dye-Doped Nanosized Micelles for High-Contrast Up-Conversion Bioimaging*. **Advanced Functional Materials** 2016, 26 (46), 8447-8454.
- [P09] Santiago-Gonzalez, B.; Monguzzi, A.; Azpiroz, J. M.; Prato, M.; Erratico, S.; Campione, M.; Lorenzi, R.; Pedrini, J.; Santambrogio, C.; Torrente, Y.; De Angelis, F.; Meinardi, F.; Brovelli, S., *Permanent excimer superstructures by supramolecular networking of metal quantum clusters*. **Science** 2016, 353 (6299), 571-575.
- [P10] Monguzzi, A.; Borisov, S. M.; Pedrini, J.; Klimant, I.; Salvalaggio, M.; Biagini, P.; Melchiorre, F.; Lelii, C.; Meinardi, F., *Efficient Broadband Triplet–Triplet Annihilation-Assisted Photon Upconversion at Subsolar Irradiance in Fully Organic Systems*. **Advanced Functional Materials** 2015, 25 (35), 5617-5624.

13. Presentations and Contributions

A. M. presented 29 oral contributions [7 invited], 11 poster at international conferences and 3 invited seminars.