



PERSONAL INFORMATION

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CURRENT WORKING LEVEL

EPR: Level III Researcher

WORK EXPERIENCE

jul 2019 – present

Level III Researcher**Consiglio Nazionale delle Ricerche, Istituto Nazionale di Ottica CNR-INO**

jul 2018 – jun 2019

Assegnista di ricerca**European Laboratory for Non-Linear Spectroscopy (Laboratorio Europeo di Spettroscopie non Lineari - LENS), Università di Firenze**

Human Brain Project, Specific Grant Agreement 2 (HBP-SGA2).

nov 2016 – jun 2018

Tecnologo di I livello, categoria EP**European Laboratory for Non-Linear Spectroscopy (Laboratorio Europeo di Spettroscopie non Lineari - LENS), Università di Firenze**

Project: Human Brain Project (HBP-SGA1)

Profile: Big data software engineer / machine learning developer

apr 2015 – nov 2016

Assegnista di ricerca**Consiglio Nazionale delle Ricerche, Istituto Nazionale di Ottica CNR-INO**

Project GRANCASSA ("Grafene ed effetto Casimir per Sensoristica Avanzata")

apr 2012 – mar 2015

Assegnista di ricerca**European Laboratory for Non-Linear Spectroscopy (Laboratorio Europeo di Spettroscopie non Lineari - LENS), Università di Firenze**

Project MALICIA (Light-Matter Interfaces in Absence of Cavities), single-photon quantum emitters based on organic Dibenzoterrylene (DBT) molecules in anthracene crystals.

EDUCATION AND TRAINING

apr 2012 – nov 2015

International Doctorate in Atomic and Molecular Photonics**European Laboratory for Non-Linear Spectroscopy (Laboratorio Europeo di Spettroscopie non Lineari - LENS), Università di Firenze**

Tesi: Single Organic Molecules and Light Transport in Thin Films (SSD: FIS/03)

Final examination: excellent

2009 – dec 2011

Master of Science in Physics and Astrophysics**Università degli Studi di Firenze** Final examination: 110/110 *cum laude*

2004 – dec 2008

Bachelor of Science in Physics**Università degli Studi di Firenze** Final examination: 110/110

SELECTED PROJECTS

01/09/2023 – present	(co-PI for the LENS unit) BRAIN CONNECTS: Mapping Connectivity of the Human Brainstem in a Nuclear Coordinate System, US National Institutes of Health (NIH), Grant n. U01NS132181
01/11/2023 – present	(co-PI) NEUROCIG: A systematic analysis of neuronal activity alterations during chronic cigarette smoke and e-cigarette vapor exposure and withdrawal in the mouse. PRIN 2022SCK8MW
01/11/2022 – present	Responsabile di unità CNR-INO EBRAINS-Italy: Infrastruttura di Ricerca IR00011 PNRR
01/10/2020 – 31/12/2021	(PI) BIGBRAIN – Gestione dei big data per la mappatura ad alta risoluzione dell'intero cervello, Fondazione CR Firenze
22/08/2018 – 31/5/2023	(co-PI for the LENS unit) Imaging and analysis techniques to construct a cell-census atlas of the human brain, BRAIN Initiative Cell Census Network, US National Institutes of Health (NIH), Grant n. 1U01MH117023-01
01/10/2020 – present	REPAIR – Restoring Cardiac Mechanical Function by Polymeric Artificial Muscular Tissue, Grant Agreement n. 952166 European Commission
01/04/2020 – 30-09-2023	Human Brain Project SGA3. Grant agreement n. 945539 European Commission
01/04/2018 – 31/03/2020	Human Brain Project SGA2. Grant agreement n. 785907 European Commission
14/11/2016 – 31/03/2018	Human Brain Project SGA1. Grant agreement n. 720270 European Commission
01/01/2018 – 31/12/2018	Member of the Joint Technical Committee 1 of the International Organization for Standardization (ISO) SC29, "Coding of Audio, Picture, Multimedia and Hypermedia Information" and UNINFO (Ente Italiano federato all'UNI per le tecnologie informatiche e loro applicazioni)

SOFTWARE DEVELOPMENT

C++ GUI	SPIMlab: a data acquisition and control software Ligh Sheet Microscopy. https://github.com/lens-biophotonics/SPIMlab
Python package	ZetaStitcher: a tool designed to stitch large volumetric images such as those produced by Light-Sheet Fluorescence Microscopes. https://github.com/lens-biophotonics/ZetaStitcher
C++ library	MCPlusPlus: A Monte Carlo C++ code for radiative transport. G. Mazzamuto, L. Pattelli. www.lens.unifi.it/quantum-nanophotonics/mcplusplus
CUDA	CUDA-accelerated Electromagnetic scattering for Large Ensembles of Spheres. https://github.com/disordered-photonics/celes

COMPETENCES

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C1	C1	C1
	TOEFL IBT, score 109/120, September 2013 (Test Of English as a Foreign Language)				
French	B2	C1	B1	B2	B2
	DELFI (Diplôme d'Études en Langue Française)				

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](https://www.european-council.europa.eu/media/40207/en/about/press/press_corner/0/2013061101.pdf)

Digital skills	Advanced knowledge of operating systems: Linux, UNIX, Mac OS, Windows. Advanced knowledge of the following programming languages and tools: C, C++, Qt framework, Python (Numpy, Scipy, Pandas, Dask, Jupyter), Bash scripting, Boost C++ Libraries, MATLAB, FFTW, GSL
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PUBLICATIONS

- [1] Xiangrui Zeng, Oula Puonti, Areej Sayeed, Rogeny Herisse, Jocelyn Mora, Kathryn Evancic, Divya Varadarajan, Yael Balbastre, Irene Costantini, Marina Scardigli, Josephine Ramazzotti, Danila DiMeo, **Giacomo Mazzamuto**, Luca Pesce, Niamh Brady, Franco Cheli, Francesco Saverio Pavone, Patrick R Hof, Robert Frost, Jean Augustinack, André Van Der Kouwe, Juan Eugenio Iglesias, and Bruce Fischl. "Segmentation of supragranular and infragranular layers in ultra-high-resolution 7T *ex vivo* MRI of the human cerebral cortex". In: *Cerebral Cortex* 34.9 (Sept. 3, 2024), bhae362. URL: <https://doi.org/10.1093/cercor/bhae362>.
- [2] Russell A. Poldrack et al. "The past, present, and future of the brain imaging data structure (BIDS)". In: *Imaging Neuroscience* 2 (Mar. 8, 2024), pp. 1–19. URL: https://doi.org/10.1162/imag_a_00103.
- [3] Ernesto Pini, **Giacomo Mazzamuto**, Francesco Riboli, Diederik S. Wiersma, and Lorenzo Pattelli. "Non-self-similar light transport in scattering media". In: *Physical Review Research* 6.3 (July 31, 2024), p. L032026. URL: <https://doi.org/10.1103/PhysRevResearch.6.L032026>.
- [4] Danila Di Meo, Josephine Ramazzotti, Marina Scardigli, Franco Cheli, Luca Pesce, Niamh Brady, **Giacomo Mazzamuto**, Irene Costantini, and Francesco S. Pavone. "Optical Clearing and Labeling for Light-sheet Fluorescence Microscopy in Large-scale Human Brain Imaging". In: *Journal of Visualized Experiments* 203 (Jan. 26, 2024), p. 65960. URL: <https://dx.doi.org/10.3791/65960>.
- [5] Michele Sorelli, Irene Costantini, Leonardo Bocchi, Markus Axer, Francesco Saverio Pavone, and **Giacomo Mazzamuto**. "Fiber enhancement and 3D orientation analysis in label-free two-photon fluorescence microscopy". In: *Scientific Reports* 13.1 (Mar. 13, 2023), p. 4160. URL: <https://doi.org/10.1038/s41598-023-30953-w>.
- [6] Lorenzo Pattelli and **Giacomo Mazzamuto**. "Experimental imaging and Monte Carlo modeling of ultrafast pulse propagation in thin scattering slabs". In: *Journal of Biomedical Optics* 27.8 (June 2, 2022). URL: <https://doi.org/10.1117/1.JBO.27.8.083020>.
- [7] Marie-Hélène Bourget, Lee Kamentsky, Satrajit S. Ghosh, **Giacomo Mazzamuto**, Alberto Lazari, Christopher J. Markiewicz, Robert Oostenveld, Guiomar Niso, Yaroslav O. Halchenko, Ilona Lipp, Sylvain Takerkart, Paule-Joanne Toussaint, Ali R. Khan, Gustav Nilsson, Filippo Maria Castelli, The BIDS Maintainers, and Julien Cohen-Adad. "Microscopy-BIDS: An Extension to the Brain Imaging Data Structure for Microscopy Data". In: *Frontiers in Neuroscience* 16 (2022), p. 871228. URL: <https://doi.org/10.3389/fnins.2022.871228>.
- [8] Luca Pesce, Marina Scardigli, Vladislav Gavryusev, Annunziata Laurino, **Giacomo Mazzamuto**, Niamh Brady, Giuseppe Sancataldo, Ludovico Silvestri, Christophe Destrieux, Patrick R. Hof, Irene Costantini, and Francesco S. Pavone. "3D molecular phenotyping of cleared human brain tissues with light-sheet fluorescence microscopy". In: *Communications Biology* 5.1 (2022), p. 447. URL: <https://doi.org/10.1038/s42003-022-03390-0>.
- [9] Claudia Capitini, Luca Pesce, Giulia Fani, **Giacomo Mazzamuto**, Massimo Genovese, Alessandra Franceschini, Paolo Paoli, Giuseppe Pieraccini, Michael Zasloff, Fabrizio Chiti, Francesco S. Pavone, and Martino Calamai. "Studying the trafficking of labeled trodusquemine and its application as nerve marker for light-sheet and expansion microscopy". In: *The FASEB Journal* 36.12 (Dec. 2022). URL: <https://doi.org/10.1096/fj.202201276R>.
- [10] Marina Scardigli, Luca Pesce, Niamh Brady, **Giacomo Mazzamuto**, Vladislav Gavryusev, Ludovico Silvestri, Patrick R. Hof, Christophe Destrieux, Irene Costantini, and Francesco S. Pavone. "Comparison of Different Tissue Clearing Methods for Three-Dimensional Reconstruction of Human Brain Cellular Anatomy Using Advanced Imaging Techniques". In: *Frontiers in Neuroanatomy* 15 (2021), p. 90. URL: <https://doi.org/10.3389/fnana.2021.752234>.
- [11] L Silvestri, MC Müllenbroich, I Costantini, AP Di Giovanna, **G Mazzamuto**, A Franceschini, D Kutra, A Kreshuk, C Checcucci, LO Toresano, P Frasconi, L Sacconi, and FS Pavone. "Universal autofocus for quantitative volumetric microscopy of whole mouse brains". In: *Nature Methods* 18.8 (2021), pp. 953–958. URL: <https://doi.org/10.1038/s41592-021-01208-1>.

- [12] I Costantini, **G Mazzamuto**, M Roffilli, A Laurino, FM Castelli, M Neri, G Lughi, A Simonetto, E Lazzeri, Luca Pesce, C Destrieux, L Silvestri, V Conti, R Guerrini, and Pavone FS. "Large-scale, cell-resolution volumetric mapping allows layer-specific investigation of human brain cytoarchitecture". In: *Biomedical Optics Express* 12.6 (2021). Publisher: Optical Society of America, pp. 3684–3699. URL: <https://doi.org/10.1364/B0E.415555>.
- [13] Irene Costantini, Enrico Baria, Michele Sorelli, Felix Matuschke, Francesco Giardini, Miriam Menzel, **Giacomo Mazzamuto**, Ludovico Silvestri, Riccardo Cicchi, Katrin Amunts, Markus Axer, and Francesco Saverio Pavone. "Autofluorescence enhancement for label-free imaging of myelinated fibers in mammalian brains". In: *Scientific Reports* 11.1 (2021), p. 8038. URL: <https://doi.org/10.1038/s41598-021-86092-7>.
- [14] Simone Zanolto, **Giacomo Mazzamuto**, Francesco Riboli, Giorgio Biasiol, Giuseppe C. La Rocca, Alessandro Tredicucci, and Alessandro Pitanti. "Photonic bands, superchirality, and inverse design of a chiral minimal metasurface". In: *Nanophotonics* (2019). Publisher: De Gruyter. URL: <https://doi.org/10.1515/nanoph-2019-0321>.
- [15] M Caroline Müllenbroich, Ludovico Silvestri, Antonino P Di Giovanna, **Giacomo Mazzamuto**, Irene Costantini, Leonardo Sacconi, and Francesco S Pavone. "High-Fidelity Imaging in Brain-Wide Structural Studies Using Light-Sheet Microscopy". In: *eNeuro* (2018). Publisher: Society for Neuroscience, ENEURO–0124. URL: <https://doi.org/10.1523/ENEURO.0124-18.2018>.
- [16] **G Mazzamuto**, I Costantini, M Neri, M Roffilli, L Silvestri, and FS Pavone. "Automatic Segmentation of Neurons in 3D Samples of Human Brain Cortex". In: *International Conference on the Applications of Evolutionary Computation*. Springer, 2018, pp. 78–85. URL: https://doi.org/10.1007/978-3-319-77538-8_6.
- [17] **Giacomo Mazzamuto**. "HEVC for high-resolution biomedical tomographies". In: *121st MPEG meeting, International Organization for Standardization (ISO)*. 2018, p. m42109.
- [18] P Lombardi, AP Ovvy, S Pazzagli, **G Mazzamuto**, G Kewes, O Neitzke, N Gruhler, O Benson, WHP Pernice, FS Cataliotti, and C Toninelli. "Photostable Molecules on Chip: Integrated Sources of Nonclassical Light". In: *ACS Photonics* 5.1 (2018), pp. 126–132. URL: <https://doi.org/10.1021/acsp Photonics.7b00521>.
- [19] Amos Egel, Lorenzo Pattelli, **Giacomo Mazzamuto**, Diederik S. Wiersma, and Uli Lemmer. "CELES: CUDA-accelerated simulation of electromagnetic scattering by large ensembles of spheres". In: *Journal of Quantitative Spectroscopy and Radiative Transfer* 199 (2017), pp. 103–110. URL: <https://doi.org/10.1016/j.jqsrt.2017.05.010>.
- [20] Lorenzo Pattelli, **Giacomo Mazzamuto**, Diederik S Wiersma, and Costanza Toninelli. "Diffusive light transport in semitransparent media". In: *Physical Review A* 94.4 (2016). Publisher: APS, p. 043846. URL: <https://doi.org/10.1103/PhysRevA.94.043846>.
- [21] Günter Kewes, Max Schoengen, Oliver Neitzke, Pietro Lombardi, Rolf-Simon Schönfeld, **Giacomo Mazzamuto**, Andreas W Schell, Jürgen Probst, Janik Wolters, Bernd Löchel, Costanza Toninelli, and Oliver Benson. "A realistic fabrication and design concept for quantum gates based on single emitters integrated in plasmonic-dielectric waveguide structures". In: *Scientific Reports* 6.28877 (2016). Publisher: Nature Publishing Group. URL: <https://doi.org/10.1038/srep28877>.
- [22] **Giacomo Mazzamuto**, Lorenzo Pattelli, Costanza Toninelli, and DS Wiersma. "Deducing effective light transport parameters in optically thin systems". In: *New Journal of Physics* 18.2 (2016). Publisher: IOP Publishing, p. 023036. URL: <https://doi.org/10.1088/1367-2630/18/2/023036>.
- [23] Fabrizio Sgrignuoli, **Giacomo Mazzamuto**, Niccolò Caselli, Francesca Intonti, Francesco Saverio Cataliotti, Massimo Gurioli, and Costanza Toninelli. "Necklace state hallmark in disordered 2D photonic systems". In: *ACS Photonics* 2.11 (2015), pp. 1636–1643. URL: <https://doi.org/10.1021/acsp Photonics.5b00422>.
- [24] **G Mazzamuto**, A Tabani, S Pazzagli, S Rizvi, A Reserbat-Plantey, K Schädler, G Navickaite, L Gaudreau, FS Cataliotti, F Koppens, and C Toninelli. "Single-molecule study for a graphene-based nano-position sensor". In: *New Journal of Physics* 16.11 (2014). Publisher: IOP Publishing, p. 113007. URL: <https://doi.org/10.1088/1367-2630/16/11/113007>.