

- Scientist with a wide experimental solid-state physics / optoelectronics / chemistry / nanotechnology background. Expert in low-dimensional systems, light-matter interaction, and CO₂ capture
- Experienced in team management and international collaborations with top-level universities
- Skilled in teaching, proposal writing, and public speech

Work experience

<i>From</i> 09/2025	Associate Editor Nature Springer, Nature Communications – Applied Physics [Milano, Italy]. <i>Editorial handling of Device and Solid-State Physics Articles submitted to Nature Communications</i> Select high quality manuscripts, oversee the peer-review process, make editorial decisions on publication. Identify emerging research trends and engage with the scientific community to ensure the journal publishes impactful and rigorous work in applied physics.
<i>10/2023</i> <i>to</i> 08/2025	Senior Researcher LEAP @Politecnico di Milano [Piacenza, Italy]. IIT Affiliate <i>Scientific Research – Development of Materials and Technologies for Energy & Environment</i> Development and management of Horizon Europe projects aimed at sustainable energy production and CO ₂ capture, utilization, and storage (CCUS). Principal Investigator of the European Space Agency Project “A new device concept for lightweight, compact and highly sensitive X- and Γ -ray detection in Space”. Supervisor of a study on excitonic properties in low-dimensional metallorganic systems. Supervision of 1 Postdoc, 1 PhD, and 2 Master’s students.
<i>02/2022</i> <i>to</i> 09/2023	Assistant Professor University of Bologna – Department of Physics and Astronomy [Bologna, Italy] <i>Scientific Research – Hybrid Perovskites Optoelectronics</i> Development and testing of metal halide perovskites (MHP) solar cells. Studies of electronic localized states and ionic diffusion in MHP. Supervision of 1 PhD, and 9 Master’s students.
<i>06/2021</i> <i>to</i> 01/2022	Research Fellow University of Bologna – Department of Physics and Astronomy [Bologna, Italy] <i>Scientific Research – High-Energy Photon Detection with Hybrid Materials</i> Study and implementation of X- and gamma-ray photodetectors for medical applications based on low-dimensional metal-halides perovskites materials. Mentoring and supervising Master’s and PhD students (5 people total) on microfabrication of photodetectors and electrical investigation of perovskite defects.
<i>12/2018</i> <i>to</i> 05/2021	Researcher IIT – Center for Nano Science and Technology [Milan, Italy] <i>Scientific Research – Organic and Hybrid Opto-Electronics</i> Materials synthesis, fabrication, and optimization of Metal-Organic Chalcogenides devices for optoelectronic applications: ranging from UV and X-ray photodetectors to thermoelectric materials. In addition to basic science research on strong light-matter interaction in hybrid metallorganic materials for studying many-body physics phenomena. Coordinator of the MOCHA project (Seal of Excellence 2017 and 2018) that involved the collaboration of 4 PhD students.
<i>01/2017</i> <i>to</i> 11/2018	Postdoctoral Fellow LBNL – The Molecular Foundry, Nanofabrication Facility [Berkeley, CA, USA] <i>Scientific Research – Nanofabrication / Opto-Electronics</i> <i>De facto</i> coordination of large interdisciplinary project involving new materials synthesis, theoretical calculations, devices fabrication, and ultrafast spectroscopy of 2D materials and metal-organic chalcogenides (5 PIs, 10 Postdocs). Study of excitons dynamics in such quantum-confined systems as a phenomenon of fundamental interest for light-emitting applications. Supervision of a Master’s student for the design of nanostructures for plasmonic compression and pulsed electron emission. Users’ facility supports and training on ultrafast spectroscopy.
<i>01/2015</i> <i>to</i> 12/2016	Postdoctoral Fellow LBNL – The Molecular Foundry, Organic and Macromolecular Synthesis Facility [Berkeley, CA, USA] <i>Scientific Research – Metal-Organic Chemistry Synthesis</i>

Synthesis of new metal-organic frameworks (MOFs) and their application in mixed matrix membranes for CO₂/N₂ separation. Characterization of the crystallinity, porosity, and micro-morphology of the compounds. Organic synthesis of Polymers of Intrinsic Microporosity (PIMs). Engineering of membranes for aqueous sulphur batteries. Supervision of 1 PhD student.

04/2014 **Research Fellow**
to
12/2014 **Istituto Italiano di Tecnologia, Nanochemistry Department** [Genoa, Italy]
Scientific Research – Nanotechnology
Thermoelectric measurements on semiconducting nanocrystal films for plasmonic applications. Study the lattice deformation under an external electric field using X-ray diffraction on organometallic perovskite materials for solar cells.

03/2010 **Business Analyst**
to
12/2010 **Accenture Management Consulting – Strategy Service Line** [Milan, Italy]
Management Consultancy
Strategic consulting, marketing, sales monitoring, and pricing are applied to the following industries: pharmaceutical, retail products, and appliances.

Education and trainings

01/2011 **PhD in Nanosciences**
to
04/2014 **Università degli Studi di Genova / Istituto Italiano di Tecnologia, Nanochemistry Department** [Genoa, Italy]
Thesis title: “Colloidal nanocrystal films for optoelectronic applications”
Deposition, chemical treatments, and full characterization for optoelectronic applications (solar cells, photodetectors, LEDs, and gas sensors). Collaboration with Nokia and the University of Cambridge (UK) for novel graphene / nanocrystal device design and fabrication.

05/2009 **Internship as Research Scholar**
to
12/2009 **UC Berkeley, Physics Department** [Berkeley, CA, USA]
Graphene production via CVD. Raman and SEM characterization, sample preparation for STM applications.

09/2007 **Master of Science in Physics Engineering for Nano-technology** - Final grade: 110/110
to
12/2009 **Politecnico di Milano** [Milan, Italy]
Thesis title: “Growth and characterization of large area free-standing monolayer graphene”
Solid State Physics, Low Dimensional Physics, Photonics, Nonlinear Dynamic Systems
International course of Nuclear Engineering and Plasma Physics in Madrid at UPM (Nov. 2008)

09/2004 **Bachelor in Physics Engineering** - Final grade: 99/110
to
07/2007 **Politecnico di Milano** [Milan, Italy]
Thesis title: "Magnetic Microscopy of BaFe₂O₃"
Quantum Physics, Photonics, Laser Applications, Telecommunications, Biomedical Optics.

Personal competences

<i>Mother tongue</i>	Italian									
	Understanding				Speaking				Writing	
	Listening		Reading		Interaction		Production			
English	C2	Proficient	C2	Proficient	C2	Proficient	C2	Proficient	C2	Proficient
French	C2	Proficient	B2	Independent	B2	Independent	B1	Independent	A1	Basic

* Common European Framework of Reference for Languages

Technical skills Spectroscopy techniques: time-resolved photoluminescence, transient-absorption, Raman, FTIR, and several adsorption/reflection measurements. Preparation and testing of nano/micro devices for optoelectronics. Skilled in cleanroom and glovebox work. CVD, ALD, SEM, TEM, AFM/EFM, STM, XRD, NMR, thermal evaporation and sputtering of metals and oxides, optical lithography, and electrical measurements. Gas sensing measurements. Metal-organic frameworks synthesis, porosimetry measurements. Polymer syntheses and membranes preparation and testing for batteries and gas separation. Development of perovskite solar cells, X-ray, and photodetectors.

Teaching Co-creator and appointed professor for the graduate course “Semiconductor, Nanostructure, and Advanced Functional Materials” for the Master Course in Energy Engineering – University of Bologna (2022-2023). Ad hoc lectures on exciton dynamics in quantum confined hybrids.

Conferences attended *Invited Speaker* at MRS Thailand (Bangkok, 2025); VISTEC 10 years Symposium, (Thailand, 2025); Chemistry Department, University of Trieste, 2022; CECAM 2021, Losanne; META 2020, Warsaw, 2021; SPIE 2018, San Diego 2018; NanoInnovation, Rome 2016. *Speaker* at MATSUS, Torremolinos, 2023; TeraMetaNano, Lecce, 2019; NanoteXnology, Thessaloniki, 2017; MOF, Long Beach, 2016; EFRC PI meeting, Washington D.C. 2015 – finalist in the Postdoctoral Researcher Competition; NaNaX6, Bad Hofgastein, 2014; E-MRS (Strasbourg 2013; Lille 2014); International school of solid-state physics “Materials for Renewable Energy”, Erice, 2012; European summer school on Nanoscience and Nanotech (ESONN) Grenoble, 2012; IEEE PV Specialists, Seattle, 2011.

Review Activity **Royal Society of Chemistry:** Nanoscale; Materials Advances, Chemical Communication; PCCP; Journal of Materials Chemistry C. **Nature Sringer:** Communications Chemistry; Nano-Micro Letters. **American Chemical Society:** JACS; ACS Energy Letters; ACS Nano; Nano Letters; ACS Applied Materials and Interfaces; Chemical Society Reviews; Dalton Transactions. **Wiley:** Advanced Materials; Advanced Optical Materials; Physica Status Solidi (a); Journal of Raman Spectroscopy. **Cell Press:** Matter. **MDPI:** Nanomaterials; Micromachines.
<https://www.webofscience.com/wos/author/record/1412966>

Private sector Since 2014, I have been a **technical consultant** for companies that require specialized assessment on physical processes applied to materials through the [“Find your Doc” platform](#).

Awards and qualifications **Winner** of the “Nanoinnovation’s Got Talent” award, Rome, 2016. **Seals of Excellence** of the European Commission – Marie Skłodowska-Curie Actions (MSCA), Individual Fellowships 2017 and 2018 (IIT grant 124 k€). Qualification to **Associate Professorship** in Italy (ASN 02/B1 Fisica Sperimentale della Materia), 2021. **Winner** of ESA Discovery Programme Grant (180 k€) by the European Space Agency, 2022. **Invited Visiting Professor** at VISTEC, Thailand 2025.

List of Publications

Researcher unique identifiers: [ORCID 0000-0002-9938-8935](https://orcid.org/0000-0002-9938-8935); [Web of Science ResearcherID Q-9147-2016](https://pubs.acs.org/doi/10.1021/acs.nano.4c18493)

Total citations >2340; h-index: 20 (source: [Google Scholar](https://scholar.google.com/))

Total number of publications: 25; First or last author publications: 10; Publications as corresponding author: 7.

- 25 Watcharaphol Paritmongkol, Zhifu Feng, Sivan Refaely-Abramson, William A. Tisdale, Christoph Kastl, [Lorenzo Maserati*](#), “Layered Metal–Organic Chalcogenides: 2D Optoelectronics in 3D Self-Assembled Semiconductors” *ACS Nano*, 04/2025, 19 (13), 12467–12477.
<https://pubs.acs.org/doi/10.1021/acs.nano.4c18493>
- 24 Andrea Ciavatti*, Vito Foderà, Giovanni Armaroli, [Lorenzo Maserati](#), Elisabetta Colantoni, Beatrice Fraboni, Daniela Cavalcoli, “Radiation Hardness and Defects Activity in PEA₂PbBr₄ Single Crystals” *Adv. Funct. Mater.*, 09/2024, 2405291.
<https://onlinelibrary.wiley.com/doi/full/10.1002/adfm.202405291>
- 23 Ilaria Fratelli*, [Lorenzo Maserati](#), Laura Basirico, Alessandro Galeazzi, Bianca Passarella, Andrea Ciavatti, Mario Caironi, Beatrice Fraboni, “Layered metal-organic chalcogenide thin films for flexible and large area X-ray direct detection” *Frontiers in Physics*, 11/ 2023, 11:1325164.
<https://www.frontiersin.org/articles/10.3389/fphy.2023.1325164/full>
- 22 Giovanni Armaroli†, [Lorenzo Maserati*](#), Andrea Ciavatti, Pierpaolo Vecchi, Alberto Piccioni, Martina Foschi, Valentina Van der Meer, Chiara Cortese, Matias Feldman, Vito Foderà, Thibault Lemercier, Julien Zaccaro, Javier Mayén Guillén, Eric Gros-Daillon, Beatrice Fraboni, Daniela Cavalcoli “Photoinduced Current Transient Spectroscopy on Metal Halide Perovskites: Electron Trapping and Ion Drift” *ACS Energy Lett.* 09/2023, 8 (10), 4371–4379.
<https://pubs.acs.org/doi/full/10.1021/acsenerylett.3c01429>
- 21 Christoph Kastl*, Pietro Bonfà, [Lorenzo Maserati*](#), “Anharmonic Exciton-Phonon Coupling in Metal–Organic Chalcogenides Hybrid Quantum Wells” *Adv. Opt. Mater.*, 01/2023, 11, 2202213.
<https://onlinelibrary.wiley.com/doi/full/10.1002/adom.202202213>
- 20 Christoph Kastl*, Adam M. Schwartzberg*, [Lorenzo Maserati*](#), “Picoseconds-Limited Exciton Recombination in Metal–Organic Chalcogenides Hybrid Quantum Wells” *ACS Nano*, 02/2022, 16 (3).
<https://doi.org/10.1021/acsnano.1c07281>
- 19 Stefano Pecorario, Alberto D. Scaccabarozzi, Daniele Fazzi, Edgar Gutiérrez-Fernández, Vito Vurro, [Lorenzo Maserati](#), Mengting Jiang, Tommaso Losi, Bozheng Sun, Rik R. Tykwinski, Carlo S. Casari, Mario Caironi*, “Stable and Solution-Processable Cumulenyl Sp-Carbon Wires: A New Paradigm for Organic Electronics” *Advanced Materials*, 02/2022, 2110468.
<https://doi.org/10.1002/adma.202110468>
- 18 Rajeshkumar Mupparapu, Joao Cunha, Francesco Tantussi, Andrea Jacassi, Leopold Summerer, Maddalena Patrini, Andrea Giugni, [Lorenzo Maserati](#), Alessandro Alabastri, Denis Garoli, Remo Proietti Zaccaria*, “High-Frequency Light Rectification by Nanoscale Plasmonic Conical Antenna in Point-Contact-Insulator-Metal Architecture” *Advanced Energy Materials*, 02/2022, 2103785.
<https://doi.org/10.1002/aenm.202103785>
- 17 [Lorenzo Maserati*](#), Mirko Prato, Stefano Pecorario, Bianca Passarella, Andrea Perinot, Anupa Anna Thomas, Filippo Melloni, Dario Natali, Mario Caironi*, “Photo-electrical properties of 2D quantum confined metal–organic chalcogenide nanocrystal films” *Nanoscale*, 01/2021, 13 (1).
<https://pubs.rsc.org/en/content/articlehtml/2021/nr/d0nr07409h>
- 16 [Lorenzo Maserati*](#), Sivan Refaely-Abramson*, Christoph Kastl, Christopher T Chen, Nicholas Borys, Carissa N Eisler, Mary S Collins, Tess E Smidt, Edward S Barnard, Brian Shevitski, Kaiyuan Yao, Elyse A. Schriber, J. Nathan Hohman, P. James Schuck, Shaul Aloni, Jeffrey B. Neaton*, Adam M. Schwartzberg*, “Anisotropic 2D excitons unveiled in organic–inorganic quantum wells” *Materials Horizons*, 01/2021, 8(1).
<https://pubs.rsc.org/en/content/articlehtml/2020/mh/c9mb01917k>
- 15 [Lorenzo Maserati*](#), Stefano Pecorario, Mirko Prato, Mario Caironi*, “Understanding the Synthetic Pathway to Large-Area, High-Quality [AgSePh]_∞ Nanocrystal Films” *The Journal of Physical Chemistry C*, 10/2020, 124(41).
<https://pubs.acs.org/doi/abs/10.1021/acs.jpcc.0c07330>

- 14 Miranda J. Baran, Miles N. Braten, Swagat Sahu, Artem Baskin, Stephen M Meckler, Longjun Li, Lorenzo Maserati, Mark E Carrington, Yet-Ming Chiang, David Prendergast, Brett A. Helms* “Design Rules for Membranes from Polymers of Intrinsic Microporosity for Crossover-free Aqueous Electrochemical Devices” **Joule**, 10/2019; 3(1-18).
<https://www.sciencedirect.com/science/article/pii/S2542435119304283>
- 13 David A. Hanifi, Noah D. Bronstein, Brent A. Koscher, Zach Nett, Joseph K. Swabeck, Kaori Takano, Adam M. Schwartzberg, Lorenzo Maserati, Koen Vandewal, Yoeri van de Burgt, Alberto Salles*, A. Paul Alivisatos* “Redefining near-unity luminescence in quantum dots with photothermal threshold quantum yield” **Science**, 03/2019; 363(6432).
<https://www.science.org/doi/abs/10.1126/science.aat3803>
- 12 Liangang Xiao, Bo He, Qin Hu, Lorenzo Maserati, Yun Zhao, Bin Yang, Matthew A. Kolczakowski, Christopher A. Anderson, Nicholas J. Borys, Liana M. Klivansky, Teresa L. Chen, Adam M. Schwartzberg, Thomas P. Russell, Yong Cao, Xiaobin Peng, and Yi Liu* “Multiple Roles of a Non-fullerene Acceptor Contribute Synergistically for High-Efficiency Ternary Organic Photovoltaics. **Joule**, 08/2018; 2(9).
<https://www.sciencedirect.com/science/article/pii/S2542435118303829>
- 11 Jung-Hoon Lee, Rebecca L. Siegelman, Lorenzo Maserati, Tonatiuh Rangel Gordillo, Jeffrey R. Long, Brett A. Helms, and Jeffrey B. Neaton* “First-principles studies of the role of N,N'-dimethylethylenediamine (mmen) ligands in adsorption and mechanical properties of mmen-M₂(dobpdc) Metal–Organic Frameworks” **Chemical Science**, 05/2018, 9(23).
<https://pubs.rsc.org/en/content/articlehtml/2018/sc/c7sc05217k>
- 10 Changyi Li, Stephen M. Meckler, Jonathan E. Bachman, Zachary P. Smith, Lorenzo Maserati, Jeffrey R. Long and Brett A. Helms* “Engineered Transport in Microporous Materials and Membranes for Clean Energy Technology” **Advanced Materials**, 01/2018, 30, 1704953.
<https://onlinelibrary.wiley.com/doi/abs/10.1002/adma.201704953>
- 9 Lorenzo Maserati, Stephen M. Meckler, Jonathan E. Bachman, Jeffrey R. Long and Brett A. Helms* “Diamine-Appended Mg₂(dobpdc) Nanorods as Phase-Change Fillers in Mixed-Matrix Membranes for Efficient CO₂/N₂ Separations” **Nano Letters**, 10/2017; 17(11).
<https://pubs.acs.org/doi/abs/10.1021/acs.nanolett.7b03106>
- 8 Lorenzo Maserati, Stephen M. Meckler, Changyi Li and Brett A. Helms* “Minute-MOFs: Ultrafast Synthesis of M₂(dobpdc) Metal-Organic Frameworks from Divalent Metal Oxide Colloidal Nanocrystals” **Chemistry of Materials**, 02/2016; 28(5).
<https://pubs.acs.org/doi/abs/10.1021/acs.chemmater.6b00494>
- 7 Luca De Trizio, Roberto Gaspari, Giovanni Bertoni, Ilka Kriegel, Luca Moretti, Francesco Scotognella, Lorenzo Maserati, Yang Zhang, Gabriele C. Messina, Mirko Prato, Sergio Marras, Andrea Cavalli, Liberato Manna* “Cu_{3-x}P Nanocrystals as a Material Platform for Near-Infrared Plasmonics and Cation Exchange Reactions”, **Chemistry of Materials**, 01/2015; 27(3).
<https://pubs.acs.org/doi/abs/10.1021/cm5044792>
- 6 Lorenzo Maserati, Iwan Moreels, Mirko Prato, Roman Krahne, Liberato Manna, Yang Zhang* “Oxygen sensitivity of atomically passivated CdS nanocrystal films”, **ACS Applied Materials & Interfaces**, 05/2014; 6(12).
<https://pubs.acs.org/doi/abs/10.1021/am501906y>
- 5 Enrico Dilella, Yi Xie, Rosaria Brescia, Mirko Prato, Lorenzo Maserati, Roman Krahne, Andrea Paoletta, Giovanni Bertoni, Mauro Povia, Iwan Moreels, Liberato Manna* “CuIn_xGa_{1-x}S₂ Nanocrystals with Tunable Composition and Band Gap Synthesized via a Phosphine-Free and Scalable Procedure”, **Chemistry of Materials**, 07/2013; 25(15).
<https://pubs.acs.org/doi/abs/10.1021/cm401563u>
- 4 Marco Zanella, Lorenzo Maserati, Manuel Pernia Leal, Mirko Prato, Romain Lavieville, Mauro Povia, Roman Krahne, Liberato Manna* “Atomic Ligand Passivation of Colloidal Nanocrystal Films via their Reaction with Propyltrichlorosilane”, **Chemistry of Materials**, 01/2013; 25(8).
<https://pubs.acs.org/doi/abs/10.1021/cm303022w>
- 3 Victor W. Brar, Decker, Hans-Michael Solowan, Yang Wang, Lorenzo Maserati, Kevin T. Chan, Hoonkyung Lee, O. Girit, Alex Zettl, Steven G. Louie, Marvin L. Cohen, Michael F. Crommie* “Gate-controlled ionization and screening of cobalt adatoms on a graphene surface”, **Nature Physics**, 10/2010; 7(1):43-47.
<https://www.nature.com/articles/nphys1807>

- 2 Benjamín Alemán, William Regan, Shaul Aloni, Virginia Altoe, Nasim Alem, Caglar Girit, Baisong Geng, Lorenzo Maserati, Michael Crommie, Feng Wang, Alex Zettl* “Transfer-Free Batch Fabrication of Large-Area Suspended Graphene Membranes”, *ACS Nano*, 08/2010; 4(8):4762-8. <https://pubs.acs.org/doi/abs/10.1021/nn100459u>
- 1 William Regan, Nasim Alem, Benjamín Alemán, Baisong Geng, Caglar Girit, Lorenzo Maserati, Feng Wang, Michael Crommie, A. Zettl* “A direct transfer of layer-area graphene”, *Applied Physics Letters*, 04/2010; 96(11-96):113102 - 113102-3. <https://aip.scitation.org/doi/abs/10.1063/1.3337091>