Silvia Marola

Birth date: [redacted]

Address: Politecnico di Milano, Campus Bovisa / B22 Building,
Via Giuseppe La Masa, 1 - 20156 Milan, Italy

Email: silvia.marola@polimi.it

Phone number: +39 02 23998679

PERSONAL INFORMATION

Silvia Marola graduated in Materials Science in 2016 from the Chemistry Department of the University of Turin. In 2020, at the same university, she obtained her Ph.D. in Chemical and Materials Sciences with a thesis entitled "Aluminum alloys for Additive Manufacturing: alloys microstructure, rapid solidification processes, testing of products". In 2020 she was the holder of a research grant at the Chemistry Department of the University of Turin and focused her research activity on the analysis of the residual stresses developing in Al-Si alloys during Powder Bed Additive Manufacturing processes. From November 2020 to August 2022, she worked as a postdoc researcher at the Italian Institute of Technology Center for Sustainable Future Technologies (IIT CSFT@Polito) located in Turin with the task of implementing the research activity related to the identification 3D printing processes suitable for the production of ceramic, polymeric, and metal components and subsystems for RF/microwave applications in the space sector in the frame of a commercial contract funded by the European Space Agency (ESA). Since September 2022, she has been working as a researcher (full time fixed-term researcher law 240/2010) at the Department of Mechanical Engineering, Materials for Mechanical Applications Section of the Milan Polytechnic developing metal alloys for innovative processes.

CURRENT POSITION

Full time fixed-term researcher law 240/2010 at the Department of Mechanical Engineering, POLIMI from September 2022.

DIDACTIC ACTIVITIES

- Laboratory assistant for the Metallic Materials course within the Bachelor's program in Materials Science and Technology at the University of Turin during the 2017–2018 academic year.
- Lecturer in a seminar for the Applied Metallurgy course within the Master's Degree program in Mechanical Engineering at Politecnico di Milano during the 2021–2022 academic year.
- Lecturer in metallographic preparation at the competence center COMPETENCE INDUSTRY MANUFACTURING 4.0 S.C.AR.L (CIM 4.0) for a total of 15 hours, February 2022.
- From the academic year 2023/2024, Dr. Marola is lecturer of the course Materials for Energy in the Master's Degree in Materials Engineering and Nanotechnology and offers

teaching support for the course Materials and Simulation Tools for Sustainable Processes in the Master's Degree in Mechanical Engineering at Politecnico di Milano.
- She has supervised several Master's theses as either co-supervisor or main supervisor, and has served as second reviewer for six Master's theses.

RESEARCH ACTIVITIES

Dr. Marola has carried out research activities mainly in the field of the development and characterization of advanced materials, focusing in particular on the design of aluminum alloys, ferrous alloys, and multi-material components produced via additive manufacturing or, more generally, through rapid solidification processes.
She is actively involved in European projects (M-TES, PoSAddive), also serving as a Work Package (WP) leader, in addition to participating in various industrial research contracts.
Her research activity includes close collaboration with the Politecnico di Torino, focused on the development of an aluminum alloy for high-temperature applications produced via additive manufacturing. In parallel, she collaborates with Trinity College Dublin on advanced studies related to the design, production, and characterization of both single-material and multi-material metallic components, created through an innovative additive manufacturing process developed in Ireland.
She occasionally serves as a reviewer for high-impact indexed journals in the field of materials and additive manufacturing.
She has authored 18 publications indexed in Scopus, with an H-index of 7 and a total of 339 citations.

RELEVANT PROJECTS

Project Title STAMP "Sviluppo Tecnologico dell'Additive Manufacturing in Piemonte"
Funding source Regione Piemonte
Period 01-10-2016 to 30-09-2019

Project Title ESA GSTP AO/1-9376/19/NL/HK "Evaluation and Consolidation of Additive Manufacturing Processes and Materials for the Manufacturing of RF Hardware"
Funding source ESA
Period 01-10-2019 to 31-08-2022

Project Title PoSAddive. Powder Sheet Additive Manufacturing
Funding source eit Raw Materials
Period 01-01-2023 to 31-12-2025

Project Title M-TES - Metallic phase change material-composites for Thermal Energy management
Funding source HORIZON-EIC-2022-PATHFINDERCHALLENGES-01
Period 01-10-2023 to 30-09-2026

RELEVANT PUBLICATIONS

- S. Marola, D. Manfredi, G. Fiore, M.G. Poletti, M. Lombardi, P. Fino, L. Battezzati "A comparison of Rapid Solidification and Selective Laser Melting (SLM) of Al-Si alloys", *Journal of Alloys and Compounds,* **2018**, 742, 271-279. DOI: 10.1016/j.jallcom.2018.01.309
- A. Aversa, F. Bosio, S. Marola, M. Lorusso, D. Manfredi, L. Battezzati, P. Fino, M. Lombardi, "Laser Single Scan Tracks Of New Aluminium Alloys Compositions", Euro PM2018 Proceedings, EPMA, Shewsbury, U.K. 2018. ISBN: 978-1-899072-50-7
- F. Bosio, A. Aversa, M. Lorusso, S. Marola, D. Gianoglio, L. Battezzati, P. Fino, D. Manfredi, M. Lombardi, "A time-saving and cost-effective method to process alloys by Laser Powder Bed Fusion", *Materials & Design*, **2019**, 181, 107949. DOI: 10.1016/j.matdes.2019.107949
- S. Marola, D. Gianoglio, F. Bosio, A. Aversa, M. Lorusso, D. Manfredi, M. Lombardi, L. Battezzati "Alloying AlSi10Mg and Cu powders in Laser Single Scan Tracks, Melt Spinning and, Laser Powder Bed Fusion", *Journal of Alloys and Compounds,* **2019**, 821, 153538. DOI: 10.1016/j.jallcom.2019.153538
- D. Gianoglio, S. Marola, L. Battezzati, A. Aversa, F. Bosio, M. Lombardi, D. Manfredi, M. Lorusso "Banded microstructures in rapidly solidified Al-3 wt% Er", *Intermetallics*, **2020**, 119, 106724. DOI: 10.1016/j.intermet.2020.106724
- S. Marola, S. Bosia, A. Veltro, G. Fiore, D. Manfredi, M. Lombardi, G. Amato, M. Baricco, L. Battezzati, "Residual stresses in additively manufactured AlSi10Mg: Raman spectroscopy and X-Ray diffraction analysis", *Materials & Design*, **2021**, 202, 109550. DOI: 10.1016/j.matdes.2021.109550
- F. Calignano, D. Manfredi, S. Marola, M. Lombardi, L. Iuliano, "Production of Dense Cu-10Sn Part by Laser Powder Bed Fusion with Low Surface Roughness and High Dimensional Accuracy", *Materials*, **2022**, 15, 3352. DOI: 10.3390/ma15093352
- S. Marola, G. Fiore, L. Battezzati, "Effect of modifiers on the microstructure of rapidly solidified AlSi10Mg alloy", *Metallurgical and Materials Transaction A*, **2022**. DOI: 10.1007/s11661-022-06907-8
- F. Larini, R. Casati, S. Marola, M. Vedani, "Microstructural Evolution of a High-Strength Zr-Ti-Modified 2139 Aluminum Alloy for Laser Powder Bed Fusion", *Metals*, **2023**, 13(5), 924. DOI: 10.3390/met13050924
- W. Zhang, S. Marola, S. McConnell, Z. Cai, J.M. Dugenio, M. Li, W.M. Abbott, A. Coban, A. Sasnauskas, S. Yin, Shuo, R. Padamati Babu, W. Mirihanage, R. Casati, R. Lupoi, "Demonstration and benchmarking of a novel powder sheet additive manufacturing approach with austenitic steel". *Materials & Design*, **2024**, 245, 113301. DOI: 10.1016/j.matdes.2024.113301
- F. Larini, R. Casati, S. Marola, C. Andrianopoli, P. Bajaj, M. Vedani. "Effect of combined additions of Sc, Zr and Ti on hot-cracking resistance and precipitation behaviour in Al-Mg alloy by L-PBF", *Materialia*, **2024**, 35, 102127, DOI: 10.1016/j.mtla.2024.102127
- S. Marola, O.A. Peverini, M. Lumia, G. Addamo, F. Calignano, D. Manfredi, "Effect of thermal treatments on the surface electrical conductivity of AlSi7Mg produced by laser powder bed fusion", *Materials Today Communications*, **2024**, 39, 109339, DOI: 10.1016/j.mtcomm.2024.109339
- W.Y. Zhang, A. Sasnauskas, A. Coban, S. Marola, R. Casati, S. Yin, R.P. Babu, R. Lupoi, "Powder sheets additive manufacturing: Principles and capabilities for multi-material

printing", *Additive Manufacturing Letters*, **2024**, 8, 100187, DOI: 10.1016/j.addlet.2023.100187

- S. Marola, M. Vedani "Demonstrating In Situ Formation of Globular Microstructure for Thixotropic Printing of EN AW-4043 Aluminum Alloy", *Metals*, **2025**, 15(7), 804. DOI: 10.3390/met15070804
- P. Guo, J. Volpp, H. Naesstroem, S. Marola, W. Zhang, J. Mouzon, R. Casati, M. Gibbons, R. Lupoi, A. F. H. Kaplan, "In-situ monitoring and metallographic observations of mass transfer and defect formation during AlSi10Mg additive manufacturing using powder sheets", *Optics and Laser Technology*, **2025**, 192, 113495. DOI: 10.1016/j.optlastec.2025.113495
- D. Manfredi, V. Mercurio, F. Calignano, N. Arcieri, S. Marola, R. Lupoi, L. Iuliano, "Feasibility study for reusing AlSi10Mg powder from the PBF-LB/M process in MAPS process", *Results in Engineering*, **2025**, 28, 108055. DOI: 10.1016/j.rineng.2025.108055
- F. Larini, R. Casati, S. Marola, M. Vedani, "Exploration of interface microstructures in additively manufactured multimaterial based on Ni, and Cu alloys through a cost-effective strategy", *Materials and Design*, **2025**, 260, 114919. DOI: 10.1016/j.matdes.2025.114919
- N. Arcieri, S. Marola, M. Actis Grande, D. Manfredi, "Al-Fe-Ce alloy processed by laser powder bed fusion: microstructure and mechanical characterization", *Materials Science and Engineering A*, **2025**, 947, 149252. DOI: 10.1016/j.msea.2025.149252

RELEVANT DISSEMINATION EVENTS

- September 17–22, 2017
  EUROMAT 2017 International Conference, Thessaloniki, Greece
  Presentation: "Additive Manufacturing (AM) as a rapid solidification process: a study on Al-Si alloys"
  In collaboration with Diego Manfredi, Gianluca Fiore, Marco Gabriele Poletti, Mariangela Lombardi, Paolo Fino, and Livio Battezzati.

- September 12–14, 2018
  37th AIM National Conference, Bologna, Italy
  Presentation: " Solidificazione rapida di miscele di polveri AlSi10Mg + (Ag,Cu) mediante fusione laser di single trace e melt spinning: relazione con le microstrutture nelle tecnologie additive"
  In collaboration with Dario Gianoglio, Livio Battezzati, Massimo Lorusso, Diego Manfredi, Federico Bosio, Alberta Aversa, and Mariangela Lombardi.

- September 1–5, 2019
  EUROMAT 2019 International Conference, Stockholm, Sweden
  Presentation: "Designing new alloys tailored for Laser Powder Bed Fusion process using Melt Spinning and Laser Single Scan Tracks"

In collaboration with Dario Gianoglio, Federico Bosio, Alberta Aversa, Massimo Lorusso, Diego Manfredi, Mariangela Lombardi, and Livio Battezzati.

- November 27, 2020
  AIM FaReTra Webinar – New Developments in Materials for Additive Manufacturing
  Talk: " Caratterizzazione convenzionale e non-convenzionale degli stress residui presenti in campioni prodotti tramite manifattura additiva."

- January 18–26, 2021
  38th AIM National Conference – Virtual Edition, Naples (Online)
  Presentation: " Analisi degli stress residui presenti in campioni di AlSi10Mg prodotti tramite manifattura additiva attraverso XRD e spettroscopia Raman"
  In collaboration with Silvia Bosia, Alessandro Veltro, Gianluca Fiore, Diego Manfredi, Mariangela Lombardi, Giampiero Amato, Marcello Baricco, and Livio Battezzati.

- May 4, 2022
  AIM FaReTra Webinar – Additive Metallurgy Course
  Talk: " Solidificazione e microstrutture di non-equilibrio."

- September 21–23, 2022
  39th AIM National Conference, Padua, Italy
  Presentation: " Effetto di diversi modificatori sulla microstruttura di una lega AlSi10Mg rapidamente solidificata"
  In collaboration with Gianluca Fiore and Livio Battezzati.

- January 22–25, 2023
  30 Years of INSTM Conference: Past, Present and Future of the Consortium, Bressanone, Italy
  Presentation: "Effect of thermal treatments on the surface electrical conductivity of AlSi7Mg produced by Laser Powder Bed Fusion"
  In collaboration with Oscar Antonio Peverini, Giuseppe Addamo, Flaviana Calignano, Luca Iuliano, and Diego Manfredi.

- March 3–7, 2024
  TMS 2024 Annual Meeting & Exhibition, Orlando, Florida, USA
  Presentation: "Microstructure and mechanical properties of 304SS printed by Metal Additive Manufacturing using Powder Sheets (MAPS)"
  In collaboration with Wenyou Zhang, William Abbott, Asli Coban, Sean McConnell, Joerg Volpp, Ramesh Babu, Rocco Lupoi, and Riccardo Casati.

- September 11–13, 2024
  40th AIM National Conference, Naples, Italy
  Presentation: " Selezione del materiale, progettazione dell'ugello e primi test di stampa tixotropica di una lega di alluminio"
  In collaboration with Riccardo Casati and Maurizio Vedani.

- September 3–5, 2025
  AAMS 2025 Alloys for Additive Manufacturing Symposium, Neuchâtel, Switzerland
  Presentation: " Insights on Interface Features in 3D-Printed Multimaterials"
  In collaboration with Federico Larini, Maurizio Vedani, Riccardo Casati.

- September 14–18, 2025
  FEMS EUROMAT 2025, Granada, Spain
  Presentation: " Insights on Interface Features in 3D-Printed Multimaterials"
  In collaboration with Federico Larini, Maurizio Vedani, Riccardo Casati.

- September 14–18, 2025
  FEMS EUROMAT 2025, Granada, Spain
  Presentation: " Thermal Characterization of combined Al-Based and Sn-Based Alloys as Composite Phase Change Materials for Thermal Energy Management"
  In collaboration with Matteo Molteni, Paola Bassani, Elisabetta Gariboldi.

I authorize the processing of the personal data contained in my curriculum vitae in accordance with Article 13 of Legislative Decree 196/2003 and Article 13 of EU Regulation 2016/679 regarding the protection of individuals with regard to the processing of personal data for the purposes of recruitment and personnel selection.

Milano, 1 December 2025

Silvia Marola