

MARIO GUAGLIANO

CURRICULUM VITAE



PERSONAL INFORMATION

Mario Guagliano

Position: Full Professor of Machine Design and Strength of Materials

Organization: Politecnico di Milano, Department of Mechanical Engineering

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EDUCATION AND EMPLOYMENT

- 1988: Laurea (MSc) in Mechanical Engineering, Politecnico di Milano
- 1989-1991: Research Associate, Department of Mechanical Engineering, Politecnico di Milano
- 1991-1993: Technical Assistant, Department of Mechanical Engineering, Politecnico di Milano
- 1993-2001: Assistant Professor, Department of Mechanical Engineering, Politecnico di Milano
- 2001-2016: Associate Professor, Department of Mechanical Engineering, Politecnico di Milano
- 2016-today: Full Professor, Department of Mechanical Engineering, Politecnico di Milano

HONORS

- 2018: Doctor Honoris Causa, University of Zilina, SK.
- 2019-2021 Associate Editor of the International Journal of Mechanics and Materials in Design (Springer)

ACADEMIC APPOINTMENTS

- 2017-2019, Rector's Delegate for International Relations with Middle East countries.
- 2016-2020, Delegate for Double Degree Programs for Mechanical Engineering at the School of Industrial and Information Engineering, Politecnico di Milano.
- 2012-today, Member of the PhD Faculty in Mechanical Engineering, Politecnico di Milano
- 2006-2016, Delegate for International Relationships and Student Exchange Mobility Programs for Mechanical Engineering at the School of Industrial and Information Engineering, Politecnico di Milano.
- 2006-today Responsible of the study plan "Advanced Mechanical Design", MSc degree in Mechanical Engineering.

RESEARCH AND PROFESSIONAL ACTIVITIES

My scientific and research activity has been developed in several research areas and carried out both with experimental and analytical/numerical approaches. The main focus is on surface modification techniques aimed at obtaining superior properties and on the development of experimental and numerical methodologies for determining the fracture and damage parameters.

My research has been developed within Italian and International research project programmes and in cooperation with public and private companies and with universities, with a special focus on the research of solutions suitable for implementation in practical applications.

Publications:

Co-Author of 2 books, Co-Editor of 1 book, author/co-author more than 200 papers published in peer-reviewed journals with Impact Factor, co-author of 5 book chapters, co-editor of one book, co-author of 150 papers published in international and national conference proceedings, co-author of 1 patent.

Bibliometric data (Google Scholar Database, 25/04/2023)

Citations: 8847

h-index: 50

Coordination of research projects and research funding (last ten years)

The research activities described above have led to the development of several European, National and Regional projects, of which I am a project manager/coordinator and/or head of research units, listed below:

- Coordinator of the HORIZON–MSCA–2022– DN project “REFURBISHMENT AND ADDITIVE MANUFACTURING ACCOMPLISHED BY KINETIC DEPOSITION” (RE-MAKE), funded in the Horizon Europe Program, Grant Agreement n. 101119988. (2023-2026).
- Coordinator of the research project “Advanced Design of High Entropy Based Materials for space Propulsion (ATLAS), funded in the H2020 program (call H2020-SPACE-2020), Grant Agreement n. 101004172. (2021-2023).
- Local responsible for Politecnico di Milano and Member of the Management Committee of the COST Action CA18203 “Optimizing Design for Inspection”, funded by the European Cooperation in Science and Technology, 2019-2023.
- Local responsible for the Mechanical Engineering Department of the project “Sistema di alimentazione elettrica supplementare per veicoli elettrici” (Supplementary Energy Supply System for Electric Vehicles) (SATELLITI), funded by Regione Lombardia (2017-2019).
- Coordinator of the research project “Cold Spray Radical Solutions for Aeronautic Improved Repairs” (CORSAIR, www.corsair-project.eu), funded in the EU FP7 program (call FP7-AAT-2013-RTD-1), contract number n. 605207 (2013-2016).
- Responsible of the Politecnico di Milano Unit of the Research Project “Bioactive Coating for Accelerated Bone Regeneration: A Pathway to Enhance Implant Fixation Nonlinear Piezoelectric Energy Harvesting” funded in the MIT-POLIMI Progetto Rocca Project, Seed Funds, Coordinators: MIT: Ming Dao - Polimi: Mario Guagliano, 2015-2016.
- Responsible of the Politecnico di Milano Unit of the Research Project “Exploring and Modelling Interacting Cracks: Toward a Crack Network Model,” funded in the MIT-POLIMI Progetto Rocca Project, Seed Funds, Coordinators: MIT: Ken Kamrin - Polimi: Mario Guagliano, 2015-2016.

- Local responsible for the Mechanical Engineering Department of the project “Twin Engine Pack System” (TEPS), funded by Regione Lombardia and Fondazione Cariplo (2014-2016).
- Responsible of many research projects granted by private and public companies (2010-today), among them: Airbus, Brembo, Bosch, Cameron Valves Italy, Danieli Costruzioni Meccaniche, ENI, Ferrari Automotive, Peenservice Srl, Rolls Royce Germany, Tenaris Dalmine, HITACHI, WINOA.

Invited Plenary Talks

Plenary speaker at more than 15 International Conferences.

Positions held in foreign institutions

- Visiting Professor at the Brno University of Technology, October 2019, November 2022.

Editorial Boards

- Surface and Coatings Technology (Elsevier B.V. - ISSN: 0257-8972) (2018-present)
- Associate Editor of the International Journal of Mechanics and Materials in Design (Springer) (2019-2022).
- International Journal of Structural Integrity (Emerald Group Publishing Limited – ISSN: 1757-9864) (2017-present).
- Journal of Multiscale Modelling (World Scientific – ISSN: 1756-9737) (2016-present).
- Structural Damage and Health Monitoring (Tech Science Press – ISSN: 1930-2983) (2005-present).
- Materials Engineering (Materialove Inzinierstvo – ISSN: 1335-0803 (2011-present).
- Komunikacie (ISSN: 1335-4205) (2011-present)
- Il Progettista Industriale (Tecniche Nuove, in Italian, ISSN 0392-4823), Editor-in-chief (2008-present).
- Frattura e Integrità Strutturale (Fracture and Structural Integrity) (Gruppo Italiano Frattura – ISSN: 1971-8993 (2008-2014).
- Guest Editor of special issues of the journals: *Engineering Fracture Mechanics*, *Surface and Coatings Technology*, *International Journal of Fatigue*, *International Journal of Structural Integrity*.

Organization of Conferences

- Chairman of the 14th International Conference on Shot Peening (ICSP14), Milan, September 5th -7th, 2022.
- Co-Chairman of the 1st International Conference on Materials, Mimicking, Manufacturing from and for Bio Application (BioMM), Milano (Italy), 27th-29th June-1st, 2018.
- Chairman of the 30th International Conference on Surface Modification Technologies (SMT30), Milan, June 29-July 1, 2016.
- Co-Chairman of the 17th International Colloquium on Mechanical Fatigue of Metals, Verbania (Italy), 25-27 June 2014.
- Chairman of the 11th International Conference on the Mechanical Behaviour of Materials (ICM11), Como, 5-9 June 2011.
- Co-Chairman of the 2th International Conference on Fracture and Damage Mechanics, Milano, 18-20 September 2001.

Scientific committees:

- Member of the International Scientific Committee For Shot Peening (ISCSP) (2017-today. From 2022 President of ISCSP).
- Member of the International Scientific Committee of the Danubia Adria Symposium, DAS, (2015-today).

- Vice-president of the International Conference on the Mechanical Behavior of Materials (ICM), (2011-2015).
- Member of the Advisory Board of the project Promo-Air, co-funded by the European Commission Research area: AAT.2013.7-3. FP7-AAT-2013-RTD-1 (2012-2015).
- Member of the Board of Directors of the European Aeronautic Science Network (EASN) association as Treasurer (2010-present)
- Member of the International Scientific Committee of the Conference: Fracture and Damage of Materials (FDM) (1999-present)
- Member of the International Scientific Committee of the 16th Colloquium on the Mechanical Fatigue of Metals (ICMFM16) (2012)
- Member of the International Scientific Committee on Experimental Solid Mechanics and Dynamics (X-Mech 2012 and XMech 2014) (2012-2014).
- Member of the International Scientific Committee of the 10th International Conference on the Mechanical Behaviour of Materials (ICM10), (2007).
- Member of the International Scientific Committee of the 3rd International Conference on Engineering Against Failure (ICEAF3), (2013, 2015).
- Member of the Scientific Committee of the Italian Group of Fracture (IGF), (2007-2009).

Reviewer for the following international journals:

Acta Materialia	Frattura e Integrità Strutturale	Measurements
Applied Surface Science	International Journal of Fatigue	Mechanics Research Communications
Additive Manufacturing	International Journal of Structural Integrity	Scientific Reports
Advances in Engineering Software	Journal of Materials Processing Technology	Scripta Materialia
Composite Structures	Materialove Inzinierstvo	Structural Health and Damage Monitoring
Composite, Part B	Materials & Design	Surface and Coatings Technology
Engineering Failure Analysis	Materials & Engineering	Theoretical and Applied Fracture Mechanics
Engineering Fracture Mechanics	Materials Characterization	Tribology International
Fatigue & Fracture of Engineering Materials & Structures	Materials Science & Engineering A	Wear

Scientific evaluator and projects reviewer:

- Reviewer of projects of the Clean Sky 2 calls.
- Reviewer of the European Council Research – Advanced Grants.
- Member of the Committee for Evaluation of the Research and Professional Activities of the Institutes of the Czech Academy of Sciences (CAS).
- Reviewer of the European Council Research – Consolidator Grants.
- Reviewer of proposal presented in the “Research Projects of National Interest” program (PRIN), Italian Ministry of Education, University and Research (MIUR) – 2007-2010.

Professional appointments

- Appointed Technical Consultant for the Courts of Milano, Piacenza and Pavia in different legal actions.
- Appointed Technical Consultant for the Chamber of Commerce of Milano in different legal civil actions.

TEACHING AND SUPERVISING ACTIVITIES

Teaching

My teaching activities, from the beginning to date, has been focused on courses of the scientific area of Machine Design, Finite Elements Method and Strength of Materials, held at the School of Industrial and Information Engineering and at the School of Design, Politecnico di Milano, in the Degree programmes of Mechanical Engineering and Design & Engineering, since 2014 given in English.

My teaching has been developed at Politecnico di Milano since 2001, when I have got the Associate Professor position, as described here:

Supervisor of PhD students:

Supervisor of 14 PhD students. (2008-2023).

Supervisor of MSc students:

Supervisor of more than 140 MSc theses. (2003-2023)

Host supervisor for visitors from foreign Institutions

Supervisor of 39 PhD students, researchers and visiting professors from China, Algeria, Canada, China, Czech Republic, Iran, Slovakia, Spain. (2010-2023)

Invited member in Committees for PhD final defences in foreign Institutions.

Invited member for 18 PhD final defense in foreign countries.

Invited seminars in foreign Institutions

Invited for seminars in 19 international universities.

LIST OF PUBLICATIONS

Authored books

1. O. Bokuvka, G. Nicoletto, M. Guagliano, L. Kunz, P. Palcek, F. Novy, M. Chapulova (2014). *Fatigue of Materials at Low and High Frequency Loads*. Published by University of Zilina (SK). ISBN: 9788055408576.
2. P. Davoli, L. Vergani, S. Beretta, M. Guagliano, S. Baragetti (2007). *Costruzione di Macchine 1*. p. 1-280, MILANO:McGraw-Hill, ISBN: 8838663807.

Book Chapters

1. S. Bagherifard, M. Guagliano (2021). Post-Processing. In: *Fundamentals of Laser Powder Bed fusion of Materials*, Elsevier (Edited by: I. Yadroitsev, I. Yadroitsava, Anotn Du Plessis and Eric MacDonald). ISBN: 978-0-12-824090-8.
2. S. Bagherifard, I. Fernandez-Pariente, R. Ghelichi and M. Guagliano (2015) Severe Shot Peening to Obtain Nanostructured Surfaces: Process and Properties of the Treated Surfaces. In: *Handbook of Mechanical Nanostructuring*, Vol. 1 (Edited by M. Aliofkhazraei). Wiley & Sons, Inc., ISBN: 9783527335060. Chapter 13, pp. 29-323.
3. C. Morel, M. Guagliano (2015). Surface Nanostructuring through a Technique Derived from Shot-Peening: Recent Advances. In: *Handbook of Mechanical Nanostructuring*, Vol. 2 (Edited by M. Aliofkhazraei). Wiley & Sons, Inc., ISBN: 9783527335060. Chapter 30, pp. 701-715.
4. M. Guagliano (2012). Severe shot Peening to obtain nanostructured surfaces: processes, properties and applications. In: *SHOT PEENING - A Dynamic Application and Its Future (3rd Edition)* (Edited by S. Baker). MFN Publishing House. ISBN: 9783033035911, pp. 220-243.
5. M. Guagliano, L. Vergani (2010). Fracture Mechanics approach and Propagation of Cracks. In: N. Bachschmid, P. Pennacchi, E. Tanzi “Cracked Rotors- A Survey on Static and Dynamic Behaviour Including Modelling and Diagnosis”, Springer, Berlin. ISBN: 9783642014840.
6. M. Guagliano (2009). Application of shot peening in the automotive industry. In: *SHOT PEENING - A Dynamic Application and Its Future (2nd Edition)* (Edited by S. Baker). MFN Publishing House. ISBN: 9783033020269, pp. 220-239.

Edited books

1. M. Guagliano, M.H. Aliabadi (Eds.) (2004) *Fracture and Damage of Composites*. Series: *Advances in Fracture Mechanics*, Vol. 8. WIT Press.

Papers published in Peer-Reviewed Journals and International Conferences

Mario Guagliano published more 200 papers on international journals. Here a selection of ten recent papers is reported.

1. Maleki, E., Bagheirfard, S., Guagliano, M. (2022) Correlation of residual stress, hardness and surface roughness with crack initiation and fatigue strength of surface treated additive manufactured AlSi10Mg: Experimental and machine learning approaches, *JOURNAL OF MATERIALS RESEARCH AND TECHNOLOGY*, Vol. 24, pp. 3265–3283.

2. Ardeshiri Lordejani, A., Vitali, L., Guagliano, M., Bagherifard, S. (2022) Estimating deposition efficiency and chemical composition variation along thickness for cold spraying of composite feedstocks, *SURFACE AND COATINGS TECHNOLOGY*, Vol. 436, Paper n. 128239.
3. Maleki, E., Bagherifard, S., Bandini, M., Guagliano, M. (2021) Surface post-treatments for metal additive manufacturing: Progress, challenges, and opportunities, *ADDITIVE MANUFACTURING*, Vol. 37, Paper n. 1016919.
4. Bagherifard, S., Kondas, J., Monti, S., Cizek, J., Perego, F., Kovarik, O., Lukac, F., Gaertner, F., Guagliano, M. (2021) Tailoring cold spray additive manufacturing of steel 316 L for static and cyclic load-bearing applications, *MATERIALS & DESIGN*, Vol. 203: 109575.
5. Maleki, E., Unal, O., Reza Kashyzadeh, K., Bagherifard, S., Guagliano, M. (2021) A systematic study of shot peening on a mild carbon steel: Microstructure, mechanical properties and axial fatigue strength of smooth and notched specimens, *Applied Surface Science Advances*, Vol. 4: 100071.
6. Maleki, E., Bagherifard, S., Unal, O., Bandini, M., Farrahi, G.H., Guagliano, M. (2021) Introducing gradient severe shot peening as a novel mechanical surface treatment, *SCIENTIFIC REPORTS*, Vol 11:22015.
7. Bagherifard, S., Guagliano, M. (2020) Fatigue performance of cold spray deposits: Coating, repair and additive manufacturing cases , *INTERNATIONAL JOURNAL OF FATIGUE*, Vol. 139, Article number 105744.
8. Heydari Astaraee A., Bagherifard S., Bradanini A., Duò P., Henze S., Taylor B., Guagliano M. (2020) Application of shot peening to case-hardened steel gears: the effect of gradient material properties and component geometry, *SURFACE & COATINGS TECHNOLOGY* 398 126084.
9. Bagherifard S., Heydari Astaraee A., Locati M., Nawaz A., Monti S., Kondás, Singh R., Guagliano (2020) Design and analysis of additive manufactured bimodal structures obtained by cold spray deposition. *ADDITIVE MANUFACTURING* 33 101131.
10. Bagherifard, S., Molla, M.F., Kajaneck, D., Hadzima, B., Guagliano, M. (2019) Accelerated biodegradation and improved mechanical performance of pure iron through surface grain refinement, *ACTA BIOMATERIALIA*, Vol. 98, pp. 88-102.

The complete list of publications by Mario Guagliano can be found at the web pages:

- <https://www.scopus.com/authid/detail.uri?authorId=6701706224> (SCOPUS)
- https://scholar.google.com/citations?hl=it&user=PEAKqrEAAAAJ&view_op=list_works&sortby=pub_date (GOOGLE SCHOLAR)

Patents

1. D'Errico, M. Guagliano, F. Micari "Nodo monolitico per la giunzione di elementi in acciaio, particolarmente per bicicletta" (Monolithic node for joining steel elements, in particular for bicycle), Patent n.: MI2006A 001131, Deposited on: June 13th 2006.
2. Guagliano Mario, Monti Stefano, Bonadonna Carlo, Paganelli Mauro, Bagherifard Sara, D'Antona Gabriele " Sistema per la deposizione di microparticelle" (System for micro particle deposition), Patent n. ME.19.119.A, Deposited on May 5th, 2020.

Milan, April 25th, 2023

Mario Guagliano

