



# Maurizio Vedani

**Date of birth:** 21/09/1963 | **Nationality:** Italian | **Sex:** Male | **Phone:**  
| **Email:** [maurizio.vedani@polimi.it](mailto:maurizio.vedani@polimi.it) | **Website:**

[https://www4.ceda.polimi.it/manifesti/manifesti/controller/ricerche/RicercaPerDocentiPublic.do?evn\\_didattica=evento&k\\_doc=168599&\\_pj0=0&\\_pj1=2ee3a3d4fb399702a5703a9b0c3de32d](https://www4.ceda.polimi.it/manifesti/manifesti/controller/ricerche/RicercaPerDocentiPublic.do?evn_didattica=evento&k_doc=168599&_pj0=0&_pj1=2ee3a3d4fb399702a5703a9b0c3de32d)

**Address:** Via Giuseppe La Masa, 1, 20156, Milano, Italy (Work)

## WORK EXPERIENCE

2003 – CURRENT Milano, Italy

**FULL PROFESSOR** POLITECNICO DI MILANO, DEPARTMENT OF MECHANICAL ENGINEERING

1998 – 2003 Milano, Italy

**ASSOCIATE PROFESSOR** POLITECNICO DI MILANO, DEPARTMENT OF MECHANICAL ENGINEERING

1994 – 1998 Milano, Italy

**ASSISTANT PROFESSOR** POLITECNICO DI MILANO, DEPARTMENT OF MECHANICAL ENGINEERING

2013 – 2017 Quebec City, Canada

**AGGREGATE PROFESSOR** LAVAL UNIVERSITY, DEPARTMENT OF MINING, METALLURGICAL AND MATERIALS ENGINEERING.

## EDUCATION AND TRAINING

01/11/1990 – 26/09/1994 Torino, Italy

**PHD** Politecnico di Torino

**Website** <https://www.polito.it/> | **Field of study** Metallurgical Engineering | **Thesis** Aluminium-based metal matrix composites

1989 – 1991 Varese, Italy

**POST-MASTER SPECIALIZATION. GRANT FUNDED BY THE EUROPEAN COMMISSION** JRC Ispra - Institute of Advanced Materials.

**Website** [https://joint-research-centre.ec.europa.eu/jrc-sites-across-europe/jrc-ispra-italy\\_en](https://joint-research-centre.ec.europa.eu/jrc-sites-across-europe/jrc-ispra-italy_en)

## LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
<b>ENGLISH</b>	C2	C2	C1	C2	C2
<b>GERMAN</b>	B1	B1	A1	A1	A1
<b>FRENCH</b>	B1	B1	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

## PUBLICATIONS

**Scientific publications**

A total of 280+ scientific papers have been published since 1989 in journals, books, and international conference proceedings.  
The current track of records according to Scopus database (updated September 2024) reports a total of 6600+ citations by 230 documents and a H-index of 39.

A selection of five relevant papers is listed below

2024

### **Metal additive manufacturing for particle accelerator applications**

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Romano T, Pikurs G, Ratkus A, López E, Vedani M. Phys. Rev. Accel. and Beams, 2024, 27(5), 054801

2023

### **An investigation on the fatigue behavior of additively manufactured laser shock peened AlSi7Mg alloy surfaces**

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Hamidi Nasab M, Vedani M, Logé RE, et al. . Mater. Charact., 2023, 200, 112907

2014

### **Metal matrix composites reinforced by Nano-Particles - A review**

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Casati R, Vedani M. Metals, 2014, 4(1), pp. 65–83

2018

### **Zinc-based alloys for degradable vascular stent applications**

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Mostaed E, Sikora-Jasinska M, Drelich JW, Vedani M. Acta Biomaterialia, 2018, 71, pp. 1–23

2014

### **Microstructure, texture evolution, mechanical properties and corrosion behavior of ECAP processed ZK60 magnesium alloy for biodegradable applications**

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Mostaed E, Fabrizi A, Bonollo F, Vedani M. J Mech. Behavior Biomed. Mater., 2014, 37, pp. 307–322

## ● **PROJECTS**

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### **research projects**

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Responsible of industrial and fundamental research projects funded by Italian public institutions, by the European Union, by national and international private companies

Among the main and most recent research projects, the following can be listed:

- Synthesis and properties of ultrafine silver and silver alloys obtained by severe plastic deformation and by rapid solidification (2008-2009). PRIN national project funded by the Italian Ministry for Education, University and Research, national coordinator.
- Development of biodegradable hybrid Magnesium stents with polymeric coatings for biomedical applications (2012-2014). Funded by Ca.Ri.TRO Foundation, national coordinator.
- Development of high-performance barrels with innovative gradient coatings – DEBACOAT (2013-2014). EU funded project (res. for SMEs, grant n. 315417), scientific coordinator.
- Metalli nano-strutturati degradabili per applicazioni pediatriche / Métaux nano-structurés dégradables pour applications pédiatriques (2013-2015). Research project for the mobility of researchers funded by the ministries of foreign affairs of Italy and of Canada (Quebec), joint scientific responsible together with Prof. Diego Mantovani
- TISPHERO - Manufacturing of spherical powders from scraps for special applications (2017-2020). EIT Raw Materials, Upscaling project (2016). Responsible as research partner.
- SPACEMAN - Sustainable powders for additive manufacturing. EIT Raw Materials, Upscaling project (2018-2021). Project coordinator.
- Lighthouse2.0 – Materials for lightweight design how to treat them right 2.0. EIT Raw Materials, Learning & Education - Lifelong Learning (2019-2020). Responsible as research partner.
- CUSTODIAN - Customized photonic devices for defectless laser based manufacturing (2018-2020). EU project call: H2020-ICT-2018-2020. Responsible as project partner.
- I.FAST - Innovation Fostering in Accelerator Science and Technology (2021-2025). EU project call: H2020 INFRA-2020-2. Responsible as project partner

## ● **MANAGEMENT & LEADERSHIP SKILLS**

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### **Management and organisation**

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Involved in various academic activities, he has been appointed Deputy Director of the Department of Mechanical Engineering (more than 120 faculty members), from 2013 to 2017 .

From 2009 to 2011 and since 2017 he is serving as chief of the Materials Section in the same Department and responsible of the Advanced Materials research group.

From 2017 to 2019 he has been coordinator of the Scientific Board and member of the PhD Board of the Department of Mechanical Engineering.

From 2008 to 2012 he served as President of the "Physical metallurgy and materials science" Technical Committee of the Italian Association for Metallurgy. From 2013 to 2018 he was President of the "Light Metals" Committee in the same association.

In the period 2008-2012 he operated as elected Italian member in the Executive Committee of FEMS (the Federation of the European Materials Societies)

From 2023 he has been appointed by the Italian Ministry as member of the "Consultation Group for the Coordinated Plan for advanced materials".

## ● RESEARCH TOPICS

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1990 – CURRENT

### Main research activities

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The main subjects of his scientific activity concern research on microstructure and mechanical behaviour during manufacturing and service of several metals and metallic alloys, ranging from structural steels (microalloyed steels, spring steels, stainless steels) to non-ferrous alloys such as aluminium alloys, metal matrix composites, titanium and magnesium alloys.

Steels have been thoroughly investigated over years in their microstructural aspects, especially considering endogenous inclusion formation during steelmaking operations and precipitate stability during thermomechanical processing of HSLA steel grades. Cold and hot rolling, skin pass rolling, pack annealing, thermal fatigue are further topics that have been faced in the frame of various industrial research activities.

The subject of metal matrix composites is another field of wide activity, covering a large number of papers since 1989. On these materials several properties have been investigated, initially related to the fundamental properties and in a second stage, following the natural process of development, concerned with manufacturing of products (welding, plastic deformation, casting).

Significant research activities were also dedicated during years to light alloys. Aluminium alloys were investigated in many circumstances, either for comparison purpose to the corresponding aluminium matrix composites or as a free-standing subject, considering aging behaviour, mechanical properties and weldability. Magnesium alloys were also considered, either as cast and wrought products, and investigated for their microstructural and high-temperature behaviour. More recently, the use of Mg alloys as biodegradable materials for biomedical devices has been deeply investigated, considering alloy selection, corrosion behaviour and manufacturing processes required to optimize expected properties.

Ultrafine-grained alloys produced by severe plastic deformation techniques are one of the most significant research subject in recent years. Aluminium, titanium and magnesium alloys were successfully refined by Equal Channel Angular Pressing (ECAP) and other severe plastic deformation techniques down to the submicrometer grain-size scale and investigated in their physical and mechanical properties.

Of relevance is also the recent subject of additive manufacturing of metallic alloys by Laser powder bed fusion and binder jetting, facing issues about new alloy development, and the synthesis of multimaterials and of 3D lattices. Prof. Vedani is currently responsible of AddMe.Lab, a laboratory set up in 2014 at Department of Mechanical Engineering of Politecnico di Milano and dedicated to additive manufacturing of metals by several commercial machines and self-designed equipment. The lab is a joint initiative launched among several research groups and a team of five industrial partners aimed at developing multidisciplinary knowledge about additive manufacturing technologies for metals.