

PERSONAL INFORMATION

MASSIMO MESSORI



 Politecnico di Torino
Department of Applied Science and Technology



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Sex Male | Date of birth | Nationality Italy

WORK EXPERIENCE

2021 - **Full Professor of Materials Science and Technology**

Politecnico di Torino
Department of Applied Science and Technology

- Teaching in the field of materials science and technology
- Research activity in the field of preparation, modification and characterization of polymers and polymer-based composites

2019 **Co-founder of Agromateriae s.r.l.s.**

Co-founder of Agromateriae s.r.l.s.. Agromateriae is an university startup company for the valorization of agricultural wastes and their use as additives for plastics.

2017 - 2021 **Full Professor of Materials Science and Technology**

University of Modena and Reggio Emilia
Department of Engineering 'Enzo Ferrari'

- Teaching in the field of polymer science and technology
- Research activity in the field of preparation, modification and characterization of polymers and polymer-based composites

2017 **Co-founder of MAT3D s.r.l.**

Co-founder of MAT3D srl (www.mat3d.it). MAT3D is an inter-university spinoff company for the design, development, production and commercialization of innovative polymer-based materials for additive manufacturing (stereolithography, digital light processing, fused deposition modelling).

2002 - 2017 **Associate Professor of Materials Science and Technology**

University of Modena and Reggio Emilia
Department of Engineering 'Enzo Ferrari'

- Teaching in the field of polymer science and technology
- Research activity in the field of preparation, modification and characterization of polymers and polymer-based composites

1999 - 2002 **Assistant Professor of Chemistry**

University of Bologna
Department of Applied Chemistry and Materials Science

- Teaching in the field of chemistry for engineers
- Research activity in the field of preparation, modification and characterization of polymers

EDUCATION AND TRAINING

1997-1999

Postdoc grant

Grant sponsored by General Electric Co. (USA)

- Research field: Innovative catalysts for the synthesis of aromatic polyesters

1996

PhD in Industrial Chemistry

University of Bologna

Faculty of Engineering

Department of Applied Chemistry and Materials Science

- PhD thesis title: Perfluoropolyether-based block copolymers: synthesis, characterization and applications

1992

Degree in Industrial Chemistry (summa cum laude)

University of Bologna

Faculty of Industrial Chemistry

- Experimental thesis title: Synthesis of phthalic anhydride and maleic anhydride through hydrocarbons oxidation with catalysts based on mixed vanadium oxides

RESEARCH ACTIVITY**Research areas**

General research activity in the field of science and technology of polymers.

Specific areas of interest are:

- chemical-physical and mechanical characterization of polymers (thermoplastic and thermoset materials) and polymer matrix composite materials;
- design and development of innovative formulations of plastics (filled polymers and polymer blends);
- design and synthesis/modification of macromolecular structures for special applications.

The expertise and skills have been developed and differentiated over the years in order to cover different aspects in the polymeric materials science. In the past, the main research themes were:

- synthesis and characterization of block copolymers containing perfluoropolyether segments and their use as surface modifiers for plastic matrices;
- study of innovative catalysts for synthesis of polyesters;
- preparation and characterization of organic-inorganic hybrid coatings for the protection and modification of several substrates (plastic, glass, metal);
- preparation and characterization of shape memory polymers;
- mechanical and functional properties modification through the in situ generation of fillers within the polymer matrix.

Nowadays, the main research interests are focused on the following areas:

- design and development of photo-curable resins for additive manufacturing (stereolithography and digital light processing);
- design and development of bio-polymers.

In addition to the above-mentioned scientific research activities, several collaborations of applied research have been carried out R&D divisions of companies active in the field of plastic processing for the development of new formulations and new materials and for the production processes optimization.

Researcher identifiers

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PUBLICATIONS

Articles

2022

Degli Esposti, M., Bisi, F., Righi, V., Fabbri, P., Bondioli, F., Messori, M., Morselli, D. Epoxy resin/TiO₂ nanocomposites prepared by the Reactive Suspension Method: Dynamic-mechanical properties and their prediction by theoretical models (2022) *Materials Today Communications*, 31, art. no. 103347

Nanni, A., Colonna, M., Messori, M. Fabrication and characterization of new eco-friendly composites obtained by the complete recycling of exhausted coffee capsules (2022) *Composites Science and Technology*, 222, art. no. 109358

2021

Nuvoli, D., Montevecchi, G., Lovato, F., Masino, F., Van Der Borgh, M., Messori, M., Antonelli, A. Protein films from black soldier fly (*Hermetia illucens*, Diptera: Stratiomyidae) prepupae: effect of protein solubility and mild crosslinking (2021) *Journal of the Science of Food and Agriculture*, 101 (11), pp. 4506-4513.

Sciancalepore, C., Bondioli, F., Messori, M., Milanese, D. Printing and characterization of three-dimensional high-loaded nanocomposites structures (2021) *Material Design and Processing Communications*, 3 (4), art. no. e256.

Nanni, A., Parisi, M., Colonna, M., Messori, M. Thermo - mechanical and morphological properties of polymer composites reinforced by natural fibers derived from wet blue leather wastes: A comparative study (2021) *Polymers*, 13 (11), art. no. 1837.

Cosola, A., Sangermano, M., Terenziani, D., Conti, R., Messori, M., Grützmacher, H., Pirri, C.F., Chiappone, A. DLP 3D – printing of shape memory polymers stabilized by thermoreversible hydrogen bonding interactions (2021) *Applied Materials Today*, 23, art. no. 101060.

Bouazza, A., Bassaid, S., Daho, B., Messori, M., Dehbi, A. Synthesis and characterization of a composite organic semiconductor (curcumin-paracetamol/TiO₂) (2021) *Polymers and Polymer Composites*, 29 (5), pp. 417-426.

Nanni, A., Cancelli, U., Montevecchi, G., Masino, F., Messori, M., Antonelli, A. Functionalization and use of grape stalks as poly(butylene succinate) (PBS) reinforcing fillers (2021) *Waste Management*, 126, pp. 538-548.

Giubilini, A., Bondioli, F., Messori, M., Nyström, G., Siqueira, G. Advantages of additive manufacturing for biomedical applications of polyhydroxyalkanoates (2021) *Bioengineering*, 8 (2), art. no. 29, pp. 1-31.

Nanni, A., Messori, M. Effect of the wine wastes on the thermal stability, mechanical properties, and biodegradation's rate of poly(3-hydroxybutyrate) (2021) *Journal of Applied Polymer Science*, 138 (3), art. no. 49713.

Giubilini, A., Sciancalepore, C., Messori, M., Bondioli, F. Valorization of oat hull fiber from agri-food industrial waste as filler for poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (2021) *Journal of Material Cycles and Waste Management*, 23 (1), pp. 402-408.

2020

Nanni, A., Ricci, A., Versari, A., Messori, M. Wine derived additives as poly(butylene succinate) (PBS) natural stabilizers for different degradative environments (2020) *Polymer Degradation and Stability*, 182, art. no. 109381.

Moroni, F., Musiari, F., Sciancalepore, C., Messori, M. Influence of atmospheric pressure plasma process parameters on the mechanical behavior of thermoplastic joints (2020) *International Journal of Adhesion and Adhesives*, 102, art. no. 102650.

Giubilini, A., Sciancalepore, C., Messori, M., Bondioli, F. New biocomposite obtained using poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (PHBH) and microfibrillated cellulose (2020) *Journal of Applied Polymer Science*, 137 (32), art. no. 48953.

Nanni, A., Messori, M. Effect of the wine lees wastes as cost-advantage and natural fillers on the thermal and mechanical properties of poly(3-hydroxybutyrate-co-hydroxyhexanoate) (PHBH) and poly(3-hydroxybutyrate-co-hydroxyvalerate) (PHBV) (2020) *Journal of Applied Polymer Science*, 137 (28), art. no. 48869.

Giubilini, A., Siqueira, G., Clemens, F.J., Sciancalepore, C., Messori, M., Nyström, G., Bondioli, F. 3D-Printing Nanocellulose-Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) Biodegradable Composites by Fused Deposition Modeling (2020) *ACS Sustainable Chemistry and Engineering*, 8 (27), pp. 10292-10302.

Daniele, V., Macera, L., Taglieri, G., Di Giambattista, A., Spagnoli, G., Massaria, A., Messori, M., Quagliarini, E., Chiappini, G., Campanella, V., Mummolo, S., Marchetti, E., Marzo, G., Quinzi, V. Thermoplastic disks used for commercial orthodontic aligners: Complete physicochemical and mechanical characterization (2020) *Materials*, 13 (10), art. no. 2386.

Giovanardi, R., Bononi, M., Messori, M., Bargellini, A., Paduano, S., Borella, P., Marchesi, I. Corrosion resistance of commonly used plumbing materials for water distribution systems exposed to disinfection treatments (2020) *Corrosion Engineering Science and Technology*, 55 (3), pp. 224-231.

Nanni, A., Messori, M. Thermo-mechanical properties and creep modelling of wine lees filled Polyamide 11 (PA11) and Polybutylene succinate (PBS) bio-composites (2020) *Composites Science and Technology*, 188, art. no. 107974.

Signorini, C., Nobili, A., Sola, A., Messori, M. Designing epoxy viscosity for optimal mechanical performance of coated Glass Textile Reinforced Mortar (GTRM) composites (2020) *Construction and Building Materials*, 233, art. no. 117325.

Signorini, C., Nobili, A., Sola, A., Messori, M. Optimal epoxy dilution for epoxy-coated textile reinforced mortar (Trm): An experimental perspective (2020) *Lecture Notes in Mechanical Engineering*, pp. 499-511.

2019

Bouabdallah Daho, Fontanesi, C., Messori, M., Dehbi, A., Belfedal, A. Synthesis and Characterization of Semiconductor Polymer Doped with FeCl₃ and I₂ (2019) *Semiconductors*, 53 (12), pp. 1656-1664

Messori, M., Nobili, A., Signorini, C., Sola, A. Effect of high temperature exposure on epoxy-coated glass textile reinforced mortar (GTRM) composites (2019) *Construction and Building Materials*, 212, pp. 765-774.

Nanni, A., Battezzore, D., Frache, A., Messori, M. Thermal and UV aging of polypropylene stabilized by wine seeds wastes and their extracts (2019) *Polymer Degradation and Stability*, 165, pp. 49-59.

Barrera, G., Tiberto, P., Sciancalepore, C., Messori, M., Bondioli, F., Allia, P. Verwey transition temperature distribution in magnetic nanocomposites containing polydisperse magnetite nanoparticles (2019) *Journal of Materials Science*, 54 (11), pp. 8346-8360.

Molavi, F.K., Ghasemi, I., Messori, M., Esfandeh, M. Design and Characterization of Novel Potentially Biodegradable Triple-Shape Memory Polymers Based on Immiscible Poly(L-lactide)/Poly(ϵ -caprolactone) Blends (2019) *Journal of Polymers and the Environment*, 27 (3), pp. 632-642.

Oulmou, F., Benhamida, A., Dorigato, A., Sola, A., Messori, M., Pegoretti, A. Effect of expandable and expanded graphites on the thermo-mechanical properties of polyamide 11 (2019) *Journal of Elastomers and Plastics*, 51 (2), pp. 175-190.

Sola, A., Bertacchini, J., D'Avella, D., Anselmi, L., Maraldi, T., Marmioli, S., Messori, M. Development of solvent-casting particulate leaching (SCPL) polymer scaffolds as improved three-dimensional supports to mimic the bone marrow niche (2019) *Materials Science and Engineering C*, 96, pp. 153-165.

Benobeidallah, B., Benhamida, A., Dorigato, A., Sola, A., Messori, M., Pegoretti, A. Structure and properties of polyamide 11 nanocomposites filled with fibrous palygorskite clay (2019) *Journal of Renewable Materials*, 7 (1), pp. 89-102.

2018

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Borsacchi, S., Sudhakaran, U.P., Calucci, L., Martini, F., Carignani, E., Messori, M., Geppi, M. Rubber-filler interactions in polyisoprene filled with in situ generated silica: A solid state NMR study (2018) *Polymers*, 10 (8), art. no. 822. DOI: 10.3390/polym10080822

Taormina, G., Sciancalpore, C., Messori, M., Bondioli, F. Advanced resins for stereolithography: In situ generation of silver nanoparticles (2018) *AIP Conference Proceedings*, 1981, art. no. 020065. DOI: 10.1063/1.5045927

Taormina, G., Sciancalepore, C., Messori, M., Bondioli, F. 3D printing processes for photocurable polymeric materials: technologies, materials, and future trends (2018) *Journal of Applied Biomaterials and Functional Materials*, 16 (3), pp. 151-160. DOI: 10.1177/2280800018764770

Nanni, A., Messori, M. A comparative study of different winemaking by-products derived additives on oxidation stability, mechanical and thermal properties of polypropylene (2018) *Polymer Degradation and Stability*, 149, pp. 9-18. DOI: 10.1016/j.polymdegradstab.2018.01.012

Sciancalepore, C., Gualtieri, A.F., Scardi, P., Flor, A., Allia, P., Tiberto, P., Barrera, G., Messori, M., Bondioli, F. Structural characterization and functional correlation of Fe₃O₄ nanocrystals obtained using 2-ethyl-1,3-hexanediol as innovative reactive solvent in non-hydrolytic sol-gel synthesis (2018) *Materials Chemistry and Physics*, 207, pp. 337-349. DOI: 10.1016/j.matchemphys.2017.12.089

Taormina, G., Sciancalepore, C., Bondioli, F., Messori, M. Special resins for stereolithography: In situ generation of silver nanoparticles (2018) *Polymers*, 10 (2), art. no. 212. DOI: 10.3390/polym10020212

Checchi, M., Bertacchini, J., Grisendi, G., Smargiassi, A., Sola, A., Messori, M., Palumbo, C. Proposal of a novel natural biomaterial, the scleral ossicle, for the development of vascularized bone tissue in vitro (2018) *Biomedicines*, 6 (1), art. no. 3. DOI: 10.3390/biomedicines6010003

Barbi, S., Messori, M., Manfredini, T., Pini, M., Montorsi, M. Rational design and characterization of bioplastics from *Hermetia illucens* prepupae proteins (2018) *Biopolymers*, art. no. e23250. DOI: 10.1002/bip.23250

Oulmou, F., Benhamida, A., Dorigato, A., Sola, A., Messori, M., Pegoretti, A. Effect of expandable and expanded graphites on the thermo-mechanical properties of polyamide 11 (2018) *Journal of Elastomers and Plastics*. DOI: 10.1177/0095244318781956

2017

Sciancalepore, C., Moroni, F., Messori, M., Bondioli, F. Acrylate-based silver nanocomposite by simultaneous polymerization–reduction approach via 3D stereolithography (2017) *Composites Communications*, 6, pp. 11-16. DOI: 10.1016/j.coco.2017.07.006

Gullo, M., Sola, A., Zanichelli, G., Montorsi, M., Messori, M., Giudici, P. Increased production of bacterial cellulose as starting point for scaled-up applications (2017) *Applied Microbiology and Biotechnology*, 101 (22), pp. 8115-8127. DOI: 10.1007/s00253-017-8539-3

Khademeh Molavi, F., Ghasemi, I., Messori, M., Esfandeh, M. Nanocomposites based on poly(L-lactide)/poly(ϵ -caprolactone) blends with triple-shape memory behavior: Effect of the incorporation of graphene nanoplatelets (GNPs) (2017) *Composites Science and Technology*, 151, pp. 219-227. DOI: 10.1016/j.compscitech.2017.08.021

Barrera, G., Sciancalepore, C., Messori, M., Allia, P., Tiberto, P., Bondioli, F. Magnetite-epoxy nanocomposites obtained by the reactive suspension method: Microstructural, thermo-mechanical and magnetic properties (2017) *European Polymer Journal*, 94, pp. 354-365. DOI:

10.1016/j.eurpolymj.2017.07.022

Pandini, S., Agnelli, S., Merlettini, A., Chiellini, F., Gualandi, C., Paderni, K., Focarete, M.L., Messori, M., Toselli, M. Multifunctional Electrospun Nonwoven Mats with Two-Way Shape Memory Behavior Prepared from Sol–Gel Crosslinked Poly(ϵ -Caprolactone) (2017) *Macromolecular Materials and Engineering*, 302 (8), art. no. 1600519 DOI: 10.1002/mame.201600519

Boumezgane, O., Messori, M. Poly(ethylene glycol)-based shape-memory polymers (2017) *International Journal of Polymer Analysis and Characterization*, 22 (5), pp. 463-471. DOI: 10.1080/1023666X.2017.1324589

Spinella, A., Bondioli, F., Nasillo, G., Renda, V., Caponetti, E., Messori, M., Morselli, D. Organic-inorganic nanocomposites prepared by reactive suspension method: investigation on filler/matrix interactions and their effect on the nanoparticles dispersion (2017) *Colloid and Polymer Science*, 295 (4), pp. 695-701. DOI: 10.1007/s00396-017-4036-6

Tana, F., Messori, M., Contini, D., Cigada, A., Valente, T., Variola, F., De Nardo, L., Bondioli, F. Synthesis and characterization of scratch-resistant hybrid coatings based on non-hydrolytic sol-gel ZrO₂ nanoparticles (2017) *Progress in Organic Coatings*, 103, pp. 60-68. DOI: 10.1016/j.porgcoat.2016.11.022

Sciancalepore, C., Bondioli, F., Messori, M. Non-hydrolytic sol–gel synthesis and reactive suspension method: an innovative approach to obtain magnetite–epoxy nanocomposite materials (2017) *Journal of Sol-Gel Science and Technology*, 81 (1), pp. 69-83. DOI: 10.1007/s10971-016-4095-z

Marziano, M., Tonello, S., Serzanti, M., Borghetti, M., Lopomo, N.F., Serpelloni, M., Pandini, S., Merlettini, A., Gualandi, C., Focarete, M.L., Messori, M., Toselli, M., Uberti, D., Memo, M., Dell’Era, P., Sardini, E. Carbon on poly(ϵ -caprolactone) (PCL) ink-jet printed sensor for monitoring cell cultures of myoblasts (2017) *IFMBE Proceedings*, 65, pp. 783-786. DOI: 10.1007/978-981-10-5122-7_196

2016

Fabbri, P., Messori, M. Surface Modification of Polymers: Chemical, Physical, and Biological Routes (2016) *Modification of Polymer Properties*, pp. 109-130. DOI: 10.1016/B978-0-323-44353-1.00005-1

Pandini, S., Dioni, D., Paderni, K., Messori, M., Toselli, M., Bontempi, E., Riccò, T. The two-way shape memory behaviour of crosslinked poly(ϵ -caprolactone) systems with largely varied network density (2016) *Journal of Intelligent Material Systems and Structures*, 27 (10), pp. 1388-1403. DOI: 10.1177/1045389X15591384

Yahyaee, H., Mohseni, M., Ghanbari, H., Messori, M. Synthesis and characterization of polyhedral oligomeric titanized silsesquioxane: A new biocompatible cage like molecule for biomedical application (2016) *Materials Science and Engineering C*, 61, pp. 293-300. DOI: 10.1016/j.msec.2015.12.048

Lashgari, S., Karrabi, M., Ghasemi, I., Azizi, H., Messori, M., Paderni, K. Shape memory nanocomposite of poly(L-lactic acid)/graphene nanoplatelets triggered by infrared light and thermal heating (2016) *Express Polymer Letters*, 10 (4), pp. 349-359. DOI: 10.3144/expresspolymlett.2016.32

Lashgari, S., Karrabi, M., Ghasemi, I., Azizi, H., Messori, M. Graphene nanoplatelets dispersion in poly(L-lactic acid): preparation method and its influence on electrical, crystallinity and thermomechanical properties (2016) *Iranian Polymer Journal (English Edition)*, 25 (2), pp. 193-202. DOI: 10.1007/s13726-015-0413-5

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Merlettini, A., Pandini, S., Agnelli, S., Gualandi, C., Paderni, K., Messori, M., Toselli, M., Focarete, M.L. Facile fabrication of shape memory poly(ϵ -caprolactone) non-woven mat by combining electrospinning

and sol-gel reaction (2016) RSC Advances, 6 (50), pp. 43964-43974. DOI: 10.1039/c6ra05490k

2015

Acebo, C., Fernández-Francos, X., Santos, J.-I., Messori, M., Ramis, X., Serra, À. Hybrid epoxy networks from ethoxysilyl-modified hyperbranched poly(ethyleneimine) and inorganic reactive precursors (2015) European Polymer Journal, 70, pp. 18-27. DOI: 10.1016/j.eurpolymj.2015.06.029

Yari, H., Mohseni, M., Messori, M. Toughened acrylic/melamine thermosetting clear coats using POSS molecules: Mechanical and morphological studies (2015) Polymer (United Kingdom), 63, pp. 19-29. DOI: 10.1016/j.polymer.2015.02.040

Sciancalepore, C., Bondioli, F., Messori, M., Barrera, G., Tiberto, P., Allia, P. Epoxy nanocomposites functionalized with in situ generated magnetite nanocrystals: Microstructure, magnetic properties, interaction among magnetic particles (2015) Polymer (United Kingdom), 59, pp. 278-289. DOI: 10.1016/j.polymer.2014.12.047

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Morselli, D., Bondioli, F., Sangermano, M., Messori, M. Epoxy networks reinforced with TiO₂ generated by nonhydrolytic sol-gel process: A comparison between in situ and ex situ syntheses to obtain filled polymers (2015) Polymer Engineering and Science, 55 (7), pp. 1689-1697. DOI: 10.1002/pen.24007

Mokhothu, T.H., Luyt, A.S., Morselli, D., Bondioli, F., Messori, M. Influence of in situ-generated silica nanoparticles on EPDM morphology, thermal, thermomechanical, and mechanical properties (2015) Polymer Composites, 36 (5), pp. 825-833. DOI: 10.1002/pc.23002

2014

T.H. Mokhothu, A.S. Luyt, Messori, M. Preparation and characterization of EPDM/silica nanocomposites prepared through non-hydrolytic sol-gel method in the absence and presence of a coupling agent (2014) eXPRESS Polymer Letters, 8 (11), pp. 809-822.

Taurino, R., Fabbri, E., Pospiech, D., Synytska, A., Messori, M. Preparation of scratch resistant superhydrophobic hybrid coatings by sol-gel process (2014) Progress in Organic Coatings, . Article in Press.

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Valentini, L., Fabbri, P., Messori, M., Degli Esposti, M., Bittolo Bon, S. Multilayer films composed of conductive poly(3-hydroxybutyrate)/carbon nanotubes bionanocomposites and a photoresponsive conducting polymer (2014) Journal of Polymer Science, Part B: Polymer Physics, 52 (8), pp. 596-602.

Mokhothu, T.H., Luyt, A.S., Morselli, D., Bondioli, F., Messori, M. Influence of in situ-generated silica nanoparticles on EPDM morphology, thermal, thermomechanical, and mechanical properties (2014) Polymer Composites, . Article in Press.

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2013

Paderni, K., Morselli, D., Bondioli, F., Luyt, A.S., Mokhothu, T.H., Messori, M. EPDM rubber reinforced with titania generated by nonhydrolytic sol-gel process (2013) *Polymer Engineering and Science*, . Article in Press.

Sangermano, M., Naguib, M., Messori, M. Fracture toughness enhancement of UV-cured epoxy coatings containing Al₂O₃ nanoparticles (2013) *Macromolecular Materials and Engineering*, 298 (11), pp. 1184-1189.

Sangermano, M., Foix, D., Kortaberria, G., Messori, M. Multifunctional antistatic and scratch resistant UV-cured acrylic coatings (2013) *Progress in Organic Coatings*, 76 (9), pp. 1191-1196.

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2012

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