

## PERSONAL INFORMATION **Marcello Romagnoli**



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**Sex Male | Date of birth 18/03/1963 | Nationality Italian**

Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input checked="" type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
<input type="checkbox"/> Mid-Management Level	<input type="checkbox"/> Associate Professor	<input type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

## WORK EXPERIENCE

- 1992-1994 • Responsible for the private chemical laboratory Ispral, Sassuolo (Italy)
- 1994-2002 • Technician at Università di Modena (Italy)
- 2002-2021 • Associate professor in Material Science at Università di Modena e Reggio Emilia (Italy)
- 2021- • Full professor in Material Science at Università di Modena e Reggio Emilia (Italy)

## EDUCATION AND TRAINING

- December 20, 1991 • Master's Degree in Chemistry, with the thesis entitled: "Effect of oxides on the devitrification of glassy systems."
- July 19, 1982 • High school diploma in "Industrial Chemistry" obtained at I.T.I. "E.Fermi" of Modena on 07/19/1982

## PERSONAL SKILLS

- Mother tongue(s) Italian
- Other language(s) English

## ADDITIONAL INFORMATION

## Publications

- Luca Spinelli, Fabrizio Roncaglia, Roberto Biagi, Alessandro di Bona, Marcello Romagnoli, Adele Mucci, Graphite/epoxy composite for building Bipolar Plates, E3S Web Conf. 334 04010 (2022), DOI: 10.1051/e3sconf/202233404010
- Paolo E. Santangelo, Marcello Romagnoli, Marco Puglia, An experimental approach to evaluate drying kinetics and foam formation in inks for inkjet printing of fuel-cell layers, *Experimental Thermal and Fluid Science*, Volume 135, 2022, 110631, ISSN 0894-1777, <https://doi.org/10.1016/j.expthermflusci.2022.110631>.
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- Cannio, M., Righi, S., Santangelo, P.E., Romagnoli, M., Pedicini, R., Carbone, A., Gatto, I., Smart catalyst deposition by 3D printing for Polymer Electrolyte Membrane Fuel Cell manufacturing, *Renewable Energy*, 163, pp. 414-422, (2021).
- Boschetti, C., Leonelli, C., Rosa, R., Romagnoli, M., Tévar, M.Á.V., Schibille, N., Preliminary thermal investigations of calcium antimonate opacified white glass tesserae, *Heritage*, 3 (2), pp. 549-560, (2020).
- Santangelo, Paolo Emilio; Cannio, Maria; Romagnoli, Marcello, Review of catalyst-deposition techniques for PEMFC electrodes, *Tecnica Italiana*, 63 (1), pp. 65-72, (2019).
- Rissanen, J., Ohenoja, K., Kinnunen, P., Romagnoli, M., Illikainen, M., Milling of peat-wood fly ash: Effect on water demand of mortar and rheology of cement paste, *Construction and Building Materials*, 180, pp. 143-153, (2018).
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- Cristina Leonelli e Marcello Romagnoli, *Geopolimeri Polimeri inorganici chimicamente attivati* Seconda Edizione, Icers editore, ISBN 9781291781816 (2014) (<https://www.lulu.com/it/it/shop/icers-icers/geopolimeri-polimeri-inorganici-chimicamente-attivati-seconda-edizione/paperback/product-1e8n2yer.html?page=1&pageSize=4>)
- Cristina Leonelli e Marcello Romagnoli, *Geopolymers: The route to eliminate waste and emissions in ceramic and cement manufacturing*, ECI Conference, Schloss Hernstein Austria, Icers editore (<https://www.lulu.com/en/au/shop/icers-icers/geopolymers-the-route-to-eliminate-waste-and-emissions-in-ceramic-and-cement-manufacturing/paperback/product-1z4knvr9.html?page=1&pageSize=4>)

#### CHAPTERS, ARTICLES AND INTRODUCTION TO BOOKS.

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Legend: \* Conference speaker

#### INVITED LECTURES

- Marcello Romagnoli\*, ANN- Artificial neural networks and conventional mathematical approach (MLR) applied to the investigation of chemical stability of pyroclastic deposits-based AAMs, Virtual 45th International Conference and Expo on Advanced Ceramics and Composites 2021, February 8–12, 2021 (<https://ceramics.org/wp-content/uploads/2018/09/ICACC-Speaker-Schedule-by-Day.pdf>)
- Marcello Romagnoli\*, Geopolymer materials: Opportunities and difficulties, 2nd Conference of The Serbian Ceramic Society, Belgrade, Serbia, plenary lecturer, dal 05-06-2013 al 07-06-2013, [http://www.vin.bg.ac.rs/dkms/?page\\_id=51](http://www.vin.bg.ac.rs/dkms/?page_id=51)
- G.Bonifazi, S.Ramponi, M.Romagnoli\*, "Classical and New Possible Optical-digital Control Quality Systems for mixers and Blenders", 25th Powders & Bulk Solids, Conference. Rosemont, (Chicago) USA, 1-158 (2000). Presentazione lunga divisa tra i tre autori. Workshop leader.

#### Teachings:

- Hydrogen and Fuel Cell in Electric (Master Degree Course: Advanced Automotive Engineering).
- Fuel cells (Master Degree Course: Engineering for Environmental Sustainability);
- Applied Materials Chemistry (Degree Course: Civil and Environmental Engineering)

At the Università di San Marino (SM):

- Chemistry applied to materials, environment and recycling (Degree Course: Civil Engineering)

From the beginning of his career, he tutored or co-tutored, the research activity of:

- more than 60 thesis;
- 2 PhD students;
- 3 post-doc.

The scientific activity of prof. Marcello Romagnoli is carried out mainly in the fields of ceramic materials and fuel cells. He began his career studying the rheology of suspensions. At the same time, he also studied: refractory materials and geopolymers for industrial use; techniques for non-destructive characterization of ceramic artefacts. In recent years, it used the knowledge acquired in the field of the production of fuel cells type PEM with additive manufacturing techniques. In his studies, he has often used the statistical approach of the Design Of Experiment (DOE) and Artificial Neural Network (ANN) which permit to analyse in a systematic way the combined effect of the various parameters and to define mathematical models capable of predicting and optimising the behaviour of the systems.

At the same time, prof. Marcello Romagnoli carried out an action for the dissemination of the results of his research activity, which resulted in the publication of articles in scientific journals; presentations at conferences, seminars and study days. He was the promoter and organiser of the 1st School of Ceramic Rheology (2008), under the patronage of the Italian Society of Rheology and the Italian Ceramic Society

As regards the rheological behaviour of aqueous suspensions of raw materials to produce ceramic materials, he investigated the influence of chemical additives on the viscosity and time-dependence of these systems. The study employed techniques of measurement and data analysis used in advanced ceramic systems where the rheological investigation has a higher degree of evolution. Using mixtures, he has deepened the possibility of obtaining rheological behaviour compatible with the industrial process, with a cost/efficiency ratio better than the individual additives. It introduced for the first time the concept of "rheological behaviour engineering" by means of DOE, demonstrating its effective industrial applicability. In the field of ceramic pigments, prof. Marcello Romagnoli introduced the concept of "Color Matching" and the possibility of using the algorithm of Kubelka-Munk in the colouring of glazes used in the production of ceramic tiles. The "Color Matching" allows rationalisation of the use of pigments with different advantages: reduction of the number of pigments needed to obtain the range of colours used in production; reduction of the production inventories; the possibility of colour correction.

He has also developed several rheological and geopolymer formulation studies. Geopolymer are inorganic binders with remarkable resistance properties even at high temperatures. Also in this case, it addressed the effect of different parameters with the aforementioned methodologies of DOE and ANN. In particular, he also addressed the production of porous geopolymers with insulating functions in high temperature conditions.

Prof. Marcello Romagnoli dealt with the possibility of using the technique of Ultrasonic Pulse Velocity (U.P.V.), to determine the integrity of ceramic materials such as tiles and ceramic refractories. The principle has shown the ability to detect the presence into the refractory of defects that reduce their thermal shock resistance. Tests at industrial level have demonstrated the possibility to detect statistically, with this technique, failure events in advance due to rapid thermal cycles to which they are subjected. In recent years, it has transferred the knowledge acquired in other fields in fuel cell production, with particular attention to PEM. In particular, he has developed methods of production of MEA membranes and bipolar plates through known technologies such as: inkjet and 3d microextrusion regarding the deposition of electrodes; pressing about the production of bipolar plates. In addition, it has operated to build a network of companies to build a production district on fuel cells that includes both producers of the cells themselves and end users. In 2010 he won the Innovation Award of Ansaldo Energia for the study of suspension formulations for tape casting to produce molten carbonate fuel cells.

Since 2022 he is director of the "Centro Interdipartimentale di Ricerca e per i Servizi nel settore della produzione, stoccaggio ed utilizzo dell'Idrogeno" ("Interdepartmental Centre for Research and Services in the field of production, storage and use of Hydrogen")

Participation in national and international scientific committees:

- Member of scientific committees in the X Convegno Nazionale di Reologia Ravenna dal 18-05-2008 al 21-05-2008
  - Member of scientific committees in the International Advisory Board del 2nd INTERNATIONAL CONGRESS ON CERAMICS VERONA June 29 - July 4, 2008, dal 29-06-2008 al 04-07-2008
  - Member of scientific committees in the XI Convegno Nazionale di Reologia, Trieste from 23-05-2010 to 26-05-2010 (Link visited 04/04/2018) [http://www.sir-reologia.com/eventi\\_ita.asp?idevento=144](http://www.sir-reologia.com/eventi_ita.asp?idevento=144)
  - Member of scientific committee in the del International Congress Piero Lunghi Conference EFC17 Technology & Application - Naples 12-15 December 2017
  - Member of scientific committee in the International Congress Piero Lunghi Conference EFC19 Technology & Application - Naples 9-11 December 2019 (Link visited 25/01/2021) <https://www.europeanfuelcell.it/committee.php?id=5>
- Currently he represents UNIMORE in H2IT (Italian Association of Hydrogen and Fuel Cells – <https://www.h2it.it/>) and in Hydrogen Europe Research (<https://hydrogeneurope.eu/research>).

Moreover, he is member of the board of Greentech (<https://greentech.clust-er.it/>)

Collaborates and has collaborated with several foreign institutes and universities including:

- Alfred University, USA -Imperial College, UK
- Izmir Institute of Technology, Turkey
- University of Aveiro, Portugal -University of Belgrade, Serbia and Montenegro
- Kaunas University of Technology, Lithuania
- C.N.R.-Itae, Italy
- Ceram Research Ltd, UK

He is the author of 90 articles in international scientific journals and presentations in congress, 1734 citations, H-index 23.

He is Editorial Board Member of Ceramic MDPI and reviewer for several international scientific journals including:

- Applied Clay Sciences, Elsevier IF 2.467;
- Colloids & Surfaces A, Elsevier IF 2.752;
- Ultrasonic journal, Elsevier IF 1.942;
- Journal of the European Ceramic Society, Elsevier, IF 2.947;
- Thermochimica Acta, IF 2.184;
- Surface and Coatings Technology IF 4.158
- Ceramics International IF 4.527
- Construction and Building Materials IF 6.141
- Composites Part B: Engineering IF 9.078
- Journal of the European Ceramic Society IF 5.302
- Materials Letters IF 3.423
- Applied Sciences IF 2.679
- Materials IF 3.623
- Minerals IF 2.644

He has experiences in the use of techniques for the materials characterization:

- BET technique to measure the specific surface area of the materials;
- Hg porosimetry to measure pore size distribution;
- Rheological techniques to characterise the rheological behaviour of suspensions;
- Laser Diffraction to determine the particle size distributions of powders;
- Dynamic light scattering (DLS) for measuring the size and size distribution of particles typically in the submicron region;
- Image Analysis for measuring particle size and particle shape;
- Ultrasonic pulse velocity test, as in-situ, non-destructive test to check the massive characteristics of a material.
- Three point bending flexural test, for testing mechanical characteristic of materials
- Forming techniques as: tape casting, extrusion, pressing, slip casting, ink-jet, 3D microextrusion, etc.

He has been active in scientific divulgation, participation in seminars and workshops as speaker and organiser; writing articles and chapters of books. He is co-author of the books and courses:

- Geopolimeri Polimeri Inorganici Chimicamente Attivati - second edition, Editor Italian Ceramic society, primo libro sui geopolimeri in italiano;

([https://books.google.it/books/about/GEOPOLIMERI\\_POLIMERI\\_INORGANICI\\_CHIMICAM.html?id=PEqPBqAAQBAJ&redir\\_esc=y](https://books.google.it/books/about/GEOPOLIMERI_POLIMERI_INORGANICI_CHIMICAM.html?id=PEqPBqAAQBAJ&redir_esc=y));

- Rheology Applied to Ceramic (theory and applications), SALA editore

(<http://www.tiledizioni.it/eng/riviste/15921/Rheology-applied-to-ceramics.aspx>);

- Handbook of Alkali-activated Cements, Mortars and Concretes, Woodhead Publishing, in 2015, il quale è stato nella 7a posizione su Amazon top 100 best sold rank.

([https://books.google.it/books/about/Handbook\\_of\\_Alkali\\_Activated\\_Cements\\_Mor.html?id=KXQmBAAAQBAJ&redir\\_esc=y](https://books.google.it/books/about/Handbook_of_Alkali_Activated_Cements_Mor.html?id=KXQmBAAAQBAJ&redir_esc=y)).

- E-learning course on Ceramic Rheology, editore IIEA-SCHOOL, translated in three different languages: Italian, English, Turkish

(<http://www.iiea-school.it/corso.asp?id=4&idliv=262&codlingua= ENG>).

He participated in several European projects as unit coordinator or participant:

- FP5-SME- "Innovative gres porcellanato processing NOVELGRES", also as coordinator of Technical Committee ([https://www.cordis.europa.eu/project/rcn/69591\\_it.html](https://www.cordis.europa.eu/project/rcn/69591_it.html));
- FP6- 2004- SME-COLL: "Additive Optimisation for Improved Ceramics ADOPTIC" ([https://cordis.europa.eu/publication/rcn/11289\\_en.html](https://cordis.europa.eu/publication/rcn/11289_en.html));
- FP7- SME-2008-1: "Development of a Non-destructive Sensor to Determine Density Gradient of Ceramic Tiles During Pressing NOVAPRESS" ([https://cordis.europa.eu/project/rcn/92248\\_it.html](https://cordis.europa.eu/project/rcn/92248_it.html)).
- H2020: "Mass manufacture of MEAs using high speed deposition processes" (<http://www.fch.europa.eu/project/mass-manufacture-meas-using-high-speed-deposition-processes>). This last one, on 2020 winner of the FCH-JU Best Innovation award for its revolutionary approach to fuel cell membrane production
- HyMantovalley: hydrogen valley in the province of Mantova, among the first in Europe.
- HyAcademy: european academy on H2

The author of the patent: "A reflective paint and a method for its use" (W0200 20 2897S).

25 July 2024