

## PERSONAL INFORMATION



## Emanuela Mastronardo

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Sex Female | Date of birth 13/02/1986 | Nationality Italian

## WORK EXPERIENCE

8 March 2021 - Current

## Senior Researcher

Engineering Department, University of Messina, Italy

2018-2020

## Post-doctoral Researcher

Institute of Catalysis and Petrochemistry, Spanish National Research Council, Spain

2017-2019

## Visiting Post-doctoral Researcher

Materials Science and Engineering Department, Northwestern University, US (Chicago)

2017-2018

## Researcher

IMDEA Energy Institute

2016-2017

## Post-doctoral Researcher

Engineering Department, University of Messina, Italy

2014-2014

## Visiting Doctoral Researcher

Laboratory for Advanced Nuclear Energy, Tokyo Institute of Technology, Japan

## EDUCATION AND TRAINING

14 April 2016

## Ph.D. in Materials Engineering and Chemistry

Engineering Department, University of Messina, Italy

7 November 2012

## Master of Science in Materials Engineering

Engineering Department, University of Messina, Italy

30 March 2010

## Bachelor in Industrial Engineering

Engineering Department, University of Messina, Italy

## PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1

Spanish

A1

A1

A1

A1

A1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages

## ADDITIONAL INFORMATION

### Publications

- E. Mastronardo, E. La Mazza, D. Palamara, E. Piperopoulos, D. Iannazzo, E. Proverbio, C. Milone, Organic Salt Hydrate as a Novel Paradigm for Thermal Energy Storage, *Energies* 2022, 15(12), 4339.
- Calabrese, L., Palamara, D., Piperopoulos, E., ...Milone, C., Proverbio, E., Deviceful LiCl salt hydrate confinement into a macroporous silicone foam for low-temperature heat storage application, *Journal of Science: Advanced Materials and Devices*, 2022, 7(3), 100463.
- Carrillo, A.J., Bayon, A., Coronado, J.M., Mastronardo, E., Editorial: Recent Advances in Solar-Driven Thermochemical Fuel Production and Thermal Energy Storage. *Frontiers in Energy Research*, 2022, 10, 885894.
- Qian, X., Davenport, T.C., Mastronardo, E., Haile, S.M., Experimental Protocols for The Assessment of Redox Thermodynamics of Nonstoichiometric Oxides: A Case Study of  $\text{YMnO}_{3-\delta}$ . *Journal of the American Ceramic Society*, 2022, in press.
- Mastronardo E., Piperopoulos E., Palamara D., Frazzica A., Calabrese L., Morphological Observation of LiCl Deliquescence in PDMS-Based Composite Foams. *Applied Sciences (Switzerland)*, 2022, 12(3), 1510. 10.3390/app12031510 – 2022
- Mastronardo, E., Qian, X., Coronado, J.M., Haile, S.M., Impact of La doping on the thermochemical heat storage properties of  $\text{CaMnO}_{3-\delta}$ . *Journal of Energy Storage*, 2021, 40, 102793. 10.1016/j.est.2021.102793 – 2021
- Piperopoulos E, Fazio M, Mastronardo E, Lanza M, Milone C. Tuning  $\text{Mg}(\text{OH})_2$  structural, physical, and morphological characteristics for its optimal behavior in a thermochemical heat-storage application. *Materials*, 2021, 14(5), pp. 1–19, 1091
- Qian X, He J, Mastronardo E, Baldassarri B, Wolverton C, Haile S. Outstanding Properties and Performance of  $\text{CaTi}_{0.5}\text{Mn}_{0.5}\text{O}_{3-\delta}$  for Solar-Driven Thermochemical Hydrogen Production. *Matter*, 2021, 4(2), pp. 688–708.
- Qian X, He J, Mastronardo E, Baldassarri B, Wolverton C, Haile S. Favorable Redox Thermodynamics of  $\text{SrTi}_{0.5}\text{Mn}_{0.5}\text{O}_{3-\delta}$  in Thermochemical Water Splitting. *Chemistry of Materials*, 2020 (in press). doi: 10.1021/acs.chemmater.0c03278
- Mastronardo E, Coronado JM. High temperature chemical reactions for TES in *Encyclopedia of Energy Storage*, Elsevier, 2020
- Piperopoulos E, Calabrese L, Mastronardo E, Proverbio E, Milone C. Carbon Nanotubes-Filled Siloxane Composite Foams for Oil Recovery Application: Compression Properties. *Fibers* 2020, 8, 45. doi: 10.3390/fib8070045
- Piperopoulos E, Calabrese L, Mastronardo E, Proverbio E, Milone C. Sustainable Reuse of Char Waste for Oil Spill Recovery Foams. *Water, Air, and Soil Pollution* 2020, 231, 293. doi:10.1007/s11270-020-04671-2
- Mastronardo E, Qian X, Coronado JM, Haile SM. The favourable thermodynamic properties of Fe-doped  $\text{CaMnO}_3$  for thermochemical heat storage. *2020 Journal of Materials Chemistry A*, 2020, 8, 8503–8517. doi: 10.1039/D0TA02031A
- Mastronardo E, Qian X, Coronado JM, Haile S. Fe-doped  $\text{CaMnO}_3$  for thermochemical heat storage application. *AIP Conference Proceedings* 2019; 2126: 210005. doi:10.1063/1.5117754. 2
- Piperopoulos E, Calabrese L, Mastronardo E, Abdul Rahim SH, Proverbio E, Milone C. Assessment of sorption kinetics of carbon nanotube-based composite foams for oil recovery application. *J Appl Polym Sci* 2019;136: 1–14. doi:10.1002/app.47374.
- Piperopoulos E, Fazio M, Mastronardo E. Synthesis of Me doped  $\text{Mg}(\text{OH})_2$  materials for thermochemical heat storage. *Nanomaterials* 2018; 8:573. doi:10.3390/nano8080573.
- Piperopoulos E, Calabrese L, Mastronardo E, Proverbio E, Milone C. Synthesis of reusable silicone foam containing carbon nanotubes for oil spill remediation. *J Appl Polym Sci* 2018; 135. doi:10.1002/app.46067.
- Piperopoulos E, Mastronardo E, Fazio M, Lanza M, Galvagno S, Milone C. Enhancing the volumetric heat storage capacity of  $\text{Mg}(\text{OH})_2$  by the addition of a cationic surfactant during its synthesis. *Appl Energy* 2018; 215: 512-522. doi:10.1016/j.apenergy.2018.02.047
- Gorrasi G, Bugatti V, Milone C, Mastronardo E, Piperopoulos E, Iemmo L, Di Bartolomeo A. Effect of temperature and morphology on the electrical properties of PET/conductive nanofillers composites. *Compos Part B Eng* 2018;135. doi:10.1016/j.compositesb.2017.10.020.
- Milone C, Kato Y, Mastronardo E. (2019) Thermal Energy Storage with Chemical Reactions.

In: Frazzica A, Cabeza L. (eds) Recent Advancements in Materials and Systems for Thermal Energy Storage. Green Energy and Technology. Springer. ISBN 978-3-319-96640-3  
doi:10.1007/978-3-319-96640-3\_3

- Mastronardo E, Kato Y, Bonaccorsi L, Piperopoulos E, Milone C. Thermochemical storage of middle temperature wasted heat by functionalized C/Mg(OH)<sub>2</sub> hybrid materials. *Energies* 2017;10:70. doi:10.3390/en10010070.
- Mastronardo E, Bonaccorsi L, Kato Y, Piperopoulos E, Lanza M, Milone C. Strategies for the enhancement of heat storage materials performances for MgO/ H<sub>2</sub>O/Mg(OH)<sub>2</sub> thermochemical storage system. *Appl Therm Eng* 2017;120: 626-634. doi:10.1016/j.applthermaleng.2017.04.004.
- Rosace G, Trovato V, Colleoni C, Caldara M, Re V, Brucale M, Piperopoulos E, Mastronardo E, Milone C, De Luca G, Plutin MR. Structural and morphological characterizations of MWCNTs hybrid coating onto cotton fabric as potential humidity and temperature wearable sensor. *Sensors Actuators, B Chem* 2017;252:428–39. doi:10.1016/j.snb.2017.05.175.
- Mastronardo E, Bonaccorsi L, Kato Y, Piperopoulos E, Lanza M, Milone C. Thermochemical performance of carbon nanotubes based hybrid materials for MgO/H<sub>2</sub>O/Mg(OH)<sub>2</sub> chemical heat pumps. *Appl Energy* 2016;181: 232-243. doi:10.1016/j.apenergy.2016.08.041.
- Mastronardo E, Bonaccorsi L, Kato Y, Piperopoulos E, Milone C. Efficiency improvement of heat storage materials for MgO/ H<sub>2</sub>O/Mg(OH)<sub>2</sub> chemical heat pumps. *Appl Energy* 2016;162: 31-39 doi:10.1016/j.apenergy.2015.10.066.

#### Projects

##### 2021-Current

- NAUSICA - 'NAvi efficienti tramite l'Utilizzo di Soluzioni tecnologiche Innovative e low Carbon. ARS01\_00334, (M.I.U.R. – PON 2014/2020). Role: Participant

##### 2021-Current

- THALASSA - Technology And materials for safe Low consumption And low life cycle cost vessels And crafts. Italian National Operational Program (PON) "Research and Innovation" 2014-2020. Role: Participant

##### 2021-Current

- DAS PHANTOMSHIFFE - Development of innovative systems and processes for highly advanced technologies in the production of eco-friendly boats with low magnetic signature and high electromagnetic shielding. Role: Participant

##### 2021-Current

- SMART-ART - Development of advanced methods of restoration, diagnostics and remote control for the conservation of the artistic and architectural heritage. Sicily Region Operational Program (PO-FESR) 2014-2020

##### 2017-2020

- SESPer – Solar Energy Storage Perovskites. Marie Skłodowska Curie Individual Global Fellowship, European Union's Horizon 2020 research and innovation programme, grant agreement N° 74616.

## Conferences and Seminars

- Solar World Congress of the International Solar Energy Society, October 2021, (held online). Contribution title: "Lab-scale Reactor Tests on Fe-Doped  $\text{CaMnO}_3$  for Thermochemical Heat Storage Application" by E. Mastronardo\*, M. Sanchez, J. González-Aguilar, S. Haile, J.M. Coronado.
- Enerstock 2021, June 2021, Ljubljana, Slovenia (held online). Contribution title: "Impact of Fe- and La-doping on the thermochemical heat storage capacity of  $\text{CaMnO}_3$ " by E. Mastronardo\*, X. Qian, J.M. Coronado, S. Haile
- FYREE - 1st Forum of Young Researchers in Energy & Environment – Thermal Storage & Fuels Production, November 2020, Messina, Italy (held online). Contribution title: "Doped  $\text{CaMnO}_3$  for Thermochemical Heat Storage from Concentrated Solar Power Plants (SESPer Project)" by E. Mastronardo\*, X. Qian, M. Sánchez, J. González-Aguilar, J.M. Coronado, S. Haile
- 26th International Conference on Solar Power and Chemical Energy Systems, SolarPACES2020, October 2020, Albuquerque, New Mexico (US) (held online). Contribution title: "Thermochemical heat storage for concentrated solar power plants through  $(\text{La}_{1-x}\text{Fe}_x\text{Mn}_{1-y})\text{O}_3$  oxides" (short oral+poster) by E. Mastronardo\*, X. Qian, J.M. Coronado, S. Haile
- 5th International Symposium on Innovative Materials and Processes in Energy Systems, IMPRES2019, October 2019, Kanazawa, Japan. Contribution title: " $\text{CaMn}_{1-x}\text{Fe}_x\text{O}_{3-\delta}$  ( $x=0.1, 0.3$ ) for thermochemical heat storage" by E. Mastronardo\* (Keynote Speaker), X. Qian, J.M. Coronado, S. Haile
- 24th International Conference on Solar Power and Chemical Energy Systems, SolarPACES2018, October 2018, Casablanca, Morocco. Contribution title: "Fe-doped  $\text{CaMnO}_3$  for thermochemical heat storage application" by E. Mastronardo\*, X. Qian, J.M. Coronado, S. Haile
- 4th International Symposium on Innovative Materials for Processes in Energy Systems, IMPRES2016, October 2016, Taormina, Italy. Contribution title: "Strategies for the enhancement of heat storage materials performances for  $\text{MgO}/\text{H}_2\text{O}/\text{Mg}(\text{OH})_2$  chemical heat pump" by E. Mastronardo\*, L. Bonaccorsi, Y. Kato, E. Piperopoulos, M. Lanza, C. Milone.
- 4th International Conference on Multifunctional, Hybrid and Nanomaterials, March 2015, Sitges, Spain. Contribution title: "Development of carbon nanotubes based nanohybrid materials for chemical heat storage" by E. Mastronardo\*, L. Bonaccorsi, Y. Kato, E. Piperopoulos, C. Milone.

Honours and awards 2017	<ul style="list-style-type: none"> <li>Seal of Excellence by European Union's Horizon 2020 research and innovation programme.</li> </ul>
2017	<ul style="list-style-type: none"> <li>AICIng Award for Young Researchers by the Italian Association of Chemistry for Engineering (AICIng).</li> </ul>
Teaching activities 2021-Current	<ul style="list-style-type: none"> <li>Professor – Materials Science and Technology, Engineering Department, University of Messina, Italy.</li> </ul>
Institutional responsibilities 2021-Current	<ul style="list-style-type: none"> <li>Member of the Quality Assurance Committee; Engineering Department, University of Messina, Italy.</li> </ul>
2021-Current	<ul style="list-style-type: none"> <li>Member of the Board of Industrial Engineering Course; Engineering Department, University of Messina, Italy.</li> </ul>
Memberships of scientific societies 2021-Current	<ul style="list-style-type: none"> <li>Member, Research Network "Italian Association of Materials Engineering (AIMAT)", Italy.</li> </ul>
2018-Current	<ul style="list-style-type: none"> <li>Expert Member, SolarPACES Task III.</li> </ul>
2016-2018	<ul style="list-style-type: none"> <li>Member, Research Network "National Interuniversity Consortium for Materials Science and Technology (INSTM)", Italy.</li> </ul>
2016-2018	<ul style="list-style-type: none"> <li>Member, Research Network "Italian Association of Chemistry for Engineering", Italy.</li> </ul>
2016-Current	<ul style="list-style-type: none"> <li>Expert Member, International Energy Agency Solar Heating and Cooling (IEA/SHC)/Energy Conservation and Energy Storage (ECES) Joint Programme Task 58/Annex 33 "Material and Component Development for Thermal Energy Storage".</li> </ul>
Major collaborations	<ul style="list-style-type: none"> <li>Juan M. Coronado, Materials for Energy Storage, Institute of Catalysis and Petrochemistry, Spanish National Research Council, Spain.</li> <li>Sossina M. Haile, Materials for Thermochemical Water Splitting and Energy Storage, Materials Science and Engineering Department, Northwestern University, US (Chicago).</li> <li>Yukitaka Kato, Materials for Energy Storage, Laboratory for Advanced Nuclear Energy, Tokyo Institute of Technology, Japan.</li> <li>José Gonzales Aguilar, Systems for Energy Storage, IMDEA Energy Institute, Spain.</li> </ul>

## Reviewing activities

2021-Current

- Evaluator of Marie Skłodowska-Curie Postdoctoral Fellowships, Research Executive Agency, European Commission.

2021-Current

- Reviewer Editor for "Frontiers in Thermal Engineering", Frontiers.

2020-Current

- Topic Editor for "Frontiers in Energy Research" (IF 4.008), Frontiers.

2020-Current

- Topic Editor for "Crystals" (IF 2.589), MDPI.

2020

- Member of the Scientific Committee of the of the SolarPACES Conference 2020.

2020

- Member of the Scientific Committee of the of the SolarPACES Conference 2018.

2015-Current

- Reviewer for Advanced Energy Materials, Applied Energy, Journal of Energy Storage, ACS Omega, Crystals, Energies, J. of Nanoparticle Research, Energy Technology, Processes.

## Thesis co-supervised/Supervised students

- June-August 2018, Summer Research Experience for Undergraduates, Northwestern University, Materials Science and Engineering Department, Project title: "Nonstoichiometric behavior of  $\text{YBa}_{1-x}\text{Ca}_x\text{Mn}_2\text{O}_{5+\delta}$ ", student: Kenneth Crossley.
- January-May 2017, "School-work alternation" Project of the Italian Ministry of Education, University and Research, University of Messina, Engineering Department, Project title: "Materials for Energy Storage", Students: high school students.
- March 2015. Bachelor thesis in Industrial Engineering, University of Messina, Engineering Department, Thesis title: "Synthesis and characterization of hybrid materials for energy storage", Student: Federico Parisi.
- October 2013. Bachelor thesis in Industrial Engineering, University of Messina, Engineering Department, Thesis title: "Preparation and characterization of graphene oxide", Student: Elisa Siclari

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Messina, 14/06/2022

*Emanuela Mastronardo*