

## ALESSANDRA MONTANINI – CURRICULUM VITAE



### **PERSONAL DATA**

Born in Parma (Italy)

Nationality: Italian

Affiliation: Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parco Area delle Scienze 157A, 43126 Parma, Italy

E-Mail: [alessandra.montanini@unipr.it](mailto:alessandra.montanini@unipr.it)

### **EDUCATION**

1987 Graduated cum laude in Geological Sciences, University of Parma, Italy

1992 PhD in Earth Sciences, University of Bologna, Italy, Thesis: “Petrology and Geochemistry of the Monte Arci (Sardinia) volcanic complex”

### **POSITIONS**

since 1994: Assistant Professor of Petrology at the Earth Sciences Department (University of Parma)

2013: National Academic Qualification as Associate Professor

since 2019: Associate Professor at the Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma

## **TEACHING:**

Petrography (Natural and Environmental Sciences, University of Parma - Bachelor Degree)

Petrogenesis and Geodynamics (Earth Sciences, University of Parma - Master Degree)

Previous teaching 1996-2017: Optical Mineralogy and Petrography, Introduction to Geology, Metamorphic Petrology

## **TRAINING**

- Supervisor of Master and PhD Thesis in Earth Sciences

- 2018-2022: supervisor of Post-doc projects at the University of Parma (“A novel approach to reveal mantle heterogeneity: combined Pb-Os analyses of oceanic peridotites”; “Origin and fate of refractory and ultra-refractory domains in the oceanic mantle: new constraints from the Iberia-Newfoundland, Hess Deep and IBM drilled peridotites”

## **RESEARCH INTERESTS**

- Anorogenic and post-collisional volcanism in the Mediterranean area
- Petrogenesis and tectono-metamorphic evolution of deep continental crust rocks
- Study of the metamorphic basement of the northern Apennines
- Petrogenesis of fossil ophiolitic sequences formed in different geodynamic settings (ocean-continent transition, slow-spreading ridge, subduction zones)
- Evolution of the lithosphere in relation to extensional processes
- Geochemical heterogeneity of the mantle
- Redox conditions and formation of elemental carbon in the mantle
- Origin of refractory domains in the mantle through geochemical study of samples from present-day oceans (W Iberia Margin, Newfoundland, Izu-Bonin Mariana)

## **RESEARCH ACTIVITY**

The scientific activity is mostly focused on the petrology and geochemistry of ophiolites and mantle peridotites. The research includes: (1) study of lithological and geochemical heterogeneities in the mantle, mainly represented by pyroxenites, and processes of crustal recycling. The research on mantle pyroxenites is carried out using different geochemical approaches based both on lithophile and highly siderophile (HSE) elements and radiogenic isotopes (Nd, Hf, Os, Pb). The peridotite/pyroxenite associations occurring in exhumed mantle sequences from the Northern Apennine ophiolites (Italy) are investigated as proxies to understand the characteristics, origin and evolution of the heterogeneities present in the sources of the oceanic basalts. (2) field-based studies of fossil oceanic lithosphere formed at different geodynamic settings (ocean-continent transition, slow-ultraslow spreading ridges, supra-subduction zones). In particular, these studies aim to elucidate the processes of partial melting and melt-rock reaction/refertilization affecting the mantle sections of ophiolitic sequences from the Northern Apennines, Western Alps and New Caledonia. Different isotope systematics (Sr-Nd-Pb-Hf-Os) are employed to trace the heterogeneity of the depleted peridotites. This research line has been also devoted to the petrogenesis of magmatic rocks formed in the nascent island arcs. The scientific activity has been also addressed to investigate petrology, geochemistry and tectono-metamorphic evolution of continental lower crustal rocks and petrology and geochemistry of postcollisional and anorogenic Cenozoic magmatism in the Mediterranean area.

Researchgate profile: [https://www.researchgate.net/profile/Alessandra\\_Montanini](https://www.researchgate.net/profile/Alessandra_Montanini)

Scopus Author ID: 6602991195

<https://www.scopus.com/authid/detail.uri?authorId=6602991195>

Google Scholar

<https://scholar.google.it/citations?user=kBCAQTsAAAAJ&hl=it>

## **SCIENTIFIC AND INSTITUTIONAL ACTIVITIES**

2004-2019: Coordinator of the Working Group on Mediterranean Ophiolites (GLOM)

Co-Organizer of International workshop and field meetings on ophiolites and oceanic lithosphere: "Peridotite Workshop" 2005, Lanzo (TO) Italy - Corsica Field trip, 2007 - Alpine Ophiolites and Modern Analogues Workshop, Parma, 2009.

2018-2021: Member of the management board of the Italian Society of Mineralogy and Petrology (SIMP)

A. Montanini has presented more than 100 contributions in national and international conferences.

Seminars and invited talks in various Italian and international meetings and schools. Most recent were held at the International Winter School "Melting and fluid/melt-rock reactions in the mantle", Pavia 13-17 February 2017 ("Recycled crust in the mantle: evidence from natural samples and implications for the heterogeneities in the OIB-MORB sources"), Geosciences Montpellier in 2018 ("From crustal protoliths to mantle pyroxenites: a highly siderophile elements and Os isotope perspective from the Ligurian mantle section (N Apennine, Italy)" and Université de la Nouvelle Calédonie in 2019 ("Origin and evolution of the New Caledonia ophiolite: a reappraisal based on recent geochemical and Sr, Nd, Pb investigations")

2018: Co-organizer of pre-conference field trip "Rifting-related structures in the mantle section from the External Ligurian Ophiolites (Bobbio, Northern Apennine)", EMAW, European Mantle Workshop, Pavia 25-30 giugno 2018, <http://emaw2018iggpavia.unipv.it/?q=node/4>

2019: Main organizer of the National Meeting "Congresso nazionale SIMP-SGI (Società Italiana di Mineralogia e Società Geologica Italiana, SIMP-SGI)", Parma 16-19 settembre 2019

2021: Co-organizer of the International School MEREMA 2nd Edition -International School on Mantle Dynamics (24 - 29 October 2021, Sestri Levante (Italy)

2022: visiting professor at the School of Earth Sciences, University of Western Australia

2023- Co-convener of the session "Ophiolite: A witness of Earth's evolution", Goldschmidt Conference, Lyon, France, 9-14 July 2023.

2023: Participation to ECORD Magellan Workshops MAREXKUS: "Mantle Remelting and hydrothermal chemical Exchange at Knipovich Ultraslow Spreading ridge" 1-3 March 2023, Rome;

“Accessing the Circus-Iberian mantle archive of Wilson Cycle processes through Land-to-Sea drilling” 3-6 July 2023, Plymouth, UK

## **SCIENTIFIC COLLABORATIONS**

- Geoscience Montpellier, Université Montpellier, France
- Steinmann Institute, University of Bonn, Germany
- Chemistry and Physics of Earth Materials, GeoForschungsZentrum, Potsdam, Germany
- Geological Survey of Western Australia, Dept. of Mines and Petroleum, Australia
- School of Earth Sciences, University College Dublin,
- institut für Geologische Wissenschaften, Freie Universität Berlin, Berlin, Germany
- Institut des Sciences Exactes et Appliquées, Université de la Nouvelle-Calédonie, Nouméa, New Caledonia
- Institut. Univ. Européen de la Mer, Brest, France
- Departamento de Mineralogía y Petrología, Universidad de Granada

## **EDITORIAL ACTIVITY**

Guest Editor of a Lithos Special issue "Alpine Ophiolites and Modern Analogues" (Montanini, A., Tribuzio, R., Piccardo, G.B., Dick, H. (2011) - Alpine ophiolites and modern analogues, Lithos, 124 (3-4), doi:10.1016/j.lithos.2011.03.012 and other Special Issues of Ofioliti Journal (2006, 2008, 2021)

Associate Editor of Ofioliti journal from 2014 to 2019

Executive Editor of Ofioliti journal starting from 2019

Manuscript reviewer for Chemical Geology, Contributions to Mineralogy and Petrology, European Journal of Mineralogy, Geochimica et Cosmochimica Acta, Geochemical Journal, International Journal of Earth Sciences, Lithos, Mineralogy and Petrology, Nature Geosciences, Ofioliti, Tectonophysics, Journal of Geophysical Research

## **RECENT FUNDED PROJECTS**

Responsible of the Parma Unit Research for PRIN 2015 Grant "Melt-rock reaction and melt migration in the MORB mantle through combined natural and experimental studies" (P.I. Elisabetta Rampone, Univ. of Genova <https://m-in-m-project.com>)

Participation to the project “Tracing subducted crust in the oceanic mantle with siderophile elements and transition metal stable isotopes and implications for the sources of basaltic volcanism” (P.I. Ambre Luguet, Bonn University)”, funded by DFG (Germany), <http://gepris.dfg.de/gepris/projekt/277251666>

Responsible of a Cariparma Foundation project (2023-2025) "Exploration of natural hydrogen emissions associated to ophiolitic bodies of the Parma province"

## MAIN PEER REVIEWED SCIENTIFIC PUBLICATIONS

Secchiari, A., Montanini, A., Cluzel, D. (2022) – Hydrous mafic-ultramafic intrusives at the roots of a proto-arc: implications for crust building and mantle source heterogeneity in young forearc regions *Contrib. Mineral. Petrol.*, 177, 50, doi: 10.1007/s00410-022-01912-x.

Secchiari, A., Montanini, A., Cluzel, D. (2022) -Temperatures and cooling rates recorded by the New Caledonia ophiolite: implications for cooling mechanisms in young forearc sequences. *Geochemistry, Geophysics, Geosystems*, 23, e2021GC009859.  
<https://doi.org/10.1029/2021GC009859>

Ferrari, E., Montanini, A., Tribuzio, R. (2022) - Rifting evolution of the lithospheric subcontinental mantle: new insights from the External Ligurian ophiolites. *Lithos* 410–411, 106571,  
<https://doi.org/10.1016/j.lithos.2021.106571>

Eslami, A., Borghini, G., Montanini, A., Grieco, G., Marchesi, C. (2021) - Petrological constraints on the origin of pyroxenite dykes in the lithospheric mantle of the Cheshmeh-Bid Ophiolitic Massif, Southern Iran. *Ophioliti*, in press. <https://doi.org/10.4454/ofioliti.v46i1.538>

A. Eslami, B. Malvoisin, G. Grieco, L. E. Aradic, C. Marchesi, A. Cavallo, A. Montanini, G. Borghini, R. Mathur, K. Ikehata, D. W. Davis, C. Li, C. Szabo (2020). Native copper formation associated with serpentinization in the Cheshmeh-Bid ophiolite massif (Southern Iran). *Lithos*, 382-383, 105953, <https://doi.org/10.1016/j.lithos.2020.105953>

P. Maurizot, D. Cluzel, M. Patriat, J. Collot, M. Iseppi, S. Le Simple, A. Secchiari, D. Bosch, A. Montanini, P. Macera, H. L. Davies (2020). Chapter 5, The Eocene Subduction–Obduction Complex of New Caledonia. In: “Geology and Mineral Resources of New Caledonia” Memoir of the Geological Society of London. Ed N. Mortimer- Geological Society, London, Memoirs, 51, 93-130, 2020, <https://doi.org/10.1144/M51-2018-70>

Salvioli-Mariani, E., Boschetti, T., Toscani, L., Montanini, A., Petriglieri, J.R., Bersani, D. (2020) - Multi-stage rodingitization of ophiolitic bodies from Northern Apennines (Italy): Constraints from petrography, geochemistry and thermodynamic modelling. *Geosci. Frontiers*, in press.  
<https://doi.org/10.1016/j.gsf.2020.04.017>

Secchiari, A., Montanini, A., Bosch, D., Macera, P., Cluzel, D. (2020) - Sr, Nd, Pb and trace element systematics of the New Caledonia harzburgites: tracking source depletion and contamination processes in a SSZ setting. *Geoscience Frontiers*, 11, 37-55,  
<https://doi.org/10.1016/j.gsf.2019.04.004>

Secchiari, A., Gleissner, Ph., Li, C., Goncharov, A., Becker, H., Bosch, D., Montanini, A. (2020) - Highly siderophile and chalcophile element behaviour in abyssal-type and supra-subduction zone mantle: new insights from the New Caledonia ophiolite. *Lithos*, 354-355,  
<https://doi.org/10.1016/j.lithos.2019.105338>

Secchiari, A., Montanini, A., Bosch, D., Macera, P., Cluzel, D. (2019) - Origin of the spinel-pyroxene symplectites in the harzburgites from the New Caledonia Peridotite. *Ophioliti* 44, 31-42

Secchiari, A., Montanini, A., Bosch, D., Macera, P., Cluzel, D. (2018) - The contrasting geochemical message from the New Caledonia gabbro-norites: insights on depletion and contamination processes of the sub-arc mantle in a nascent arc setting. *Contributions to Mineralogy and Petrology*, 173, 66-. DOI: 10.1007/s00410-018-1496-8

Lo Po', D., Braga, R., Massonne, H.J., Molli, G., Montanini, A., Bargossi, G. (2018) - High-pressure tectono-metamorphic evolution of mylonites from the Variscan basement of the Northern Apennines, Italy. *J. Metam. Geol.*, doi:10.1111/jmg.12281

Secchiari, A., Montanini, A., Bosch, D., Macera, P., Cluzel, D. (2016) - Melt extraction and enrichment processes in the New Caledonia lherzolites: evidence from geochemical and Sr-Nd isotope data. *Lithos* 260, 28-43, doi: 10.1016/j.lithos.2016.04.030

Lo Po, D., Braga, R., Massonne, H.C., Molli, G., Montanini, A., Theye, T. (2016) - Fluid-induced breakdown of monazite in medium-grade metasedimentary rocks of the Pontremoli basement (Northern Apennines, Italy)", *Journal of Metamorphic Geology*, 34: 63-84, doi: 10.1111/jmg.12171

Montanini, A., Tribuzio, R. (2015) - Evolution of recycled crust within the mantle: constraints from the garnet pyroxenites of the External Ligurian ophiolites, N Apennine, Italy. *Geology* 43: 911-914, doi: 10.1130/G36877.1

Beltrando, M., Zibra, I., Montanini, A., Tribuzio, R. (2013) - Crustal thinning and exhumation along a fossil magma-poor distal margin preserved in Corsica: a hot rift to drift transition? *Lithos* 168-169: 99-112, <https://doi.org/10.1016/j.lithos.2013.01.017>.

Montanini, A., Tribuzio, R., Thirlwall, M. (2012) - Garnet clinopyroxenite layers from the mantle sequences of the Northern Apennine ophiolites (Italy): evidence for recycling of crustal material. *Earth and Planetary Science Letters* 351-352: 171-181, <http://dx.doi.org/10.1016/j.epsl.2012.07.033>

Montanini A., Tribuzio R., Bersani D. (2010) - Insights into the origin of mantle graphite and sulphides in garnet pyroxenites from the External Liguride peridotites (Northern Apennine, Italy), in: (M. Coltorti, H. Downes, M. Gregoire, O' Reilly S.Y. eds.) "Petrological evolution of the European Lithospheric Mantle", *Geological Society of London Special Publication* 337, p.87- 105, <https://doi.org/10.1144/SP337.5>

Montanini A., Tribuzio R., Vernia L. (2008) - Petrogenesis of basalts and gabbros from an ancient continent-ocean transition (External Liguride ophiolites, Northern Italy). *Lithos* 101, 453- 479, <https://doi.org/10.1016/j.lithos.2007.09.007>

Montanini A., Tribuzio R., Anczkiewicz R. (2006) - Exhumation history of a garnet pyroxenite-bearing mantle section from a continent-ocean transition (Northern Apennine ophiolites, Italy). *Journal of Petrology* 47, 1943- 1971, <https://doi.org/10.1093/petrology/egl032>

Montanini A., Harlov D. (2006) - Petrology and mineralogy of granulite-facies mafic xenoliths (Sardinia, Italy): evidence for KCl metasomatism in the lower crust. *Lithos* 92, 588-608, <https://doi.org/10.1016/j.lithos.2006.03.053>.

Montanini A., Tribuzio, R. (2001) - Gabbro-derived and felsic granulites from the Northern Apennines (Italy): evidence for emplacement of tholeiitic basalts in the post-Variscan lower crust. *Journal of Petrology* 42, 2259- 2277, <https://doi.org/10.1093/petrology/42.12.2259>.