

PERSONAL INFORMATION

PATRIZIA FUMAGALLI

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Università degli Studi di Milano

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WORK EXPERIENCE

2010 - present

Associate Professor (GEO-07)Università degli Studi di Milano - www.unimi.it

■ Teaching and research

[Academia](#)

2002 - 2010

Researcher (GEO-07)Università degli Studi di Milano - www.unimi.it

■ Research and teaching

[Academia](#)

2001

Post-doc research Fellow

University of Michigan

■ Research

[Academia](#)

EDUCATION AND TRAINING

2001

PhD in Earth Science

Università degli Studi di Milano

1997

Graduated in Geological Science (cum laude)

Università degli Studi di Milano

PERSONAL SKILLS

Communication skills

communication skills gained through ongoing teaching experience and ongoing presentations and seminars at national and international workshops and conferences

Organisational / managerial skills

The different roles in organization activities in scientific projects, as supervisor and co-supervisor of undergraduates and PhD students, in public engagement programs, and in institutional/academic committee provide mature and robust organizational and managerial skills.

- Professional skills** The main scientific interests of Prof. Patrizia Fumagalli focus on deep geological processes, investigated by high pressure experimental petrology. Particular emphasys has been so far given to:
- Petrological processes at divergent margins and implications for the evolution of oceanic lithosphere; progressive subsolidus mineral chemical variations in response to the spinel-to plagioclase-facies transition; the role of pyroxenite components on partial melting of rising “veined” mantle; origin of the olivine rich troctolites; melt-rock interactions and dissolution/precipitation processes); experimental data are combined with field-based microstructural and geochemical studies of mantle-crust sections expose in ophiolite areas;
 - Petrological processes at convergent margins (transport and release of fluids - H₂O and COH, within the slab and to the mantle wedge, interactions between alkali rich fluids and ultramafics, COH fluids speciation and dissolution);
 - Stability, crystal chemistry and phase relations of hydrates such as chlorite, phlogopite, amphibole, Dense Hydrated Magnesium Silicates;
 - Different methodologies, belonging to different disciplines, i.e. mineralogy, geophysics and first principles calculations, have been combined together with the petrology of subduction zones in order to define the thermodynamics and crystal chemistry of high pressure minerals
 - High pressure techniques (Diamond anvil cell, piston cylinder, multianvil) and analytical techniques (X ray diffractometry, Raman spectroscopy, electron microprobe, electron scanning microscope) have been used to applied studies both in the field of material science and gemmology
 - The research activity takes advantage of both national and international collaborations.

ADDITIONAL INFORMATION

Publications

- Borghini G., Francomme J.E. Fumagalli P. (2018) Melt-Dunite interactions at 0.5 and 0.7 GPa: experimental constraints on the origin of olivine-rich troctolites. *Lithos Special Issue* <https://doi.org/10.1016/j.lithos.2018.09.022>
- Borghini G. and Fumagalli P. (2018) Subsolidus phase relations in a mantle pyroxenite: an experimental study from 0.7 to 1.5 GPa. *European Journal of Mineralogy. European Journal of Mineralogy*, published online, DOI: 10.1127/ejm/2018/0030-2735
- Borghini G., Fumagalli P., Rampone E. (2017) Partial melting of secondary pyroxenite at 1 and 1.5 GPa and its role in upwelling heterogeneous mantle. *Contributions to Mineralogy and Petrology* 172(8):70
- Fumagalli P., Borghini G., Rampone E., Poli S. (2017) Experimental calibration of Forsterite-Anorthite-Ca-Tschermak (FACE) geobarometer for mantle peridotites. *Contributions to Mineralogy and Petrology* 172(6):38
- Gemmi M., Merlini M., Palatinus L., Fumagalli P., Hanfland M (2016) Electron Diffraction determination of 11.5A and HySo structures: candidate water carriers to Upper Mantle. *American Mineralogist* 101:2645-2654
- Rampone E., Borghini G., Godard M., Ildefonse B., Crispini L., Fumagalli P. (2016) Melt/rock reaction at oceanic peridotite/gabbro transition as revealed by trace element chemistry of olivine. *Geochemica et Cosmochemica Acta*, 190:309-331
- Gatta G.D., Brundu A., Cappelletti P., Cerri G., De Gennaro B., Farina M., Fumagalli P., Guaschino L., Lotti P., Mercurio M. (2016) New insights on pressure, temperature, and chemical stability of CsAlSi₅O₁₂, a potential Host for nuclear waste. *Physics and Chemistry of Minerals* 43:639-647

- Publications
(continued)
- Merlini M, Sapelli F., Fumagalli P., et al (2016) High-temperature and high -pressure behaviour of carbonates in the ternary diagram CaCO₃-MgCO₃-FeCO₃. *American Mineralogist*, volume 101:1423-1430
- Kessel R, Fumagalli P, Pettke T (2015) The behaviour of incompatible elements during hydrous melting of metasomatized peridotite at 4-6 GPa, and 1000°C-1200°C. *Lithos*, Volume 236-237: 141-155
- Fumagalli P., Klemme S. (2015) Mineralogy of the Earth: Phase Transitions and Mineralogy of the Upper Mantle. In: Gerald Schubert (editor-in-chief) *Treatise on Geophysics*, 2nd edition, Oxford: Elsevier; 2015. pp. 7-31.
- Kessel R, Pettke T, Fumagalli P (2015) Melting of metasomatized peridotite at 4-6 GPa and up to 1200°C: an experimental approach. *Contributions to Mineralogy and Petrology* 169:37
- Fumagalli P., Poli S., Fischer J, Merlini M., Gemmi M. (2014) The high pressure stability of chlorite and other hydrates in subduction mélanges: experiments in the system Cr₂O₃-MgO-Al₂O₃-SiO₂-H₂O. *Contrib. Mineral. Petrol.* 167:979 DOI 10.1007/s00410-014-0979-5
- Tumiati S., Fumagalli P., Tiraboschi C., Poli S. (2013) An Experimental Study on COH-bearing Peridotite up to 3·2GPa and Implications for Crust-Mantle Recycling. *J. Petrol.* 54: 453-479
- Malaspina N., Langenhorst F., Fumagalli P., Tumiati S., Poli S. (2012) Fe³⁺ distribution between garnet and pyroxenes in mantle wedge carbonate-bearing garnet peridotites (Sulu, China) and implications for their oxidation state. *Lithos.* 146-147 pp. 11-17 IF: 3.779
- Gemmi M., Fischer J., Merlini M., Poli S., Fumagalli P., Mugnaioli E., Ute K. (2011) A new hydrous Al-bearing pyroxene as a water carrier in subduction zones. *Earth and Planetary Science Letters* 310:422-428 IF: 4.180
- Borghini G., Fumagalli P., Rampone E. (2011) The geobarometric significance of plagioclase in mantle peridotites: A link between nature and experiments. *Lithos*, 126:42-53 IF 3.246
- Comodi P., Nazzareni S., Fumagalli P., Capitani G.C. (2011) The peculiar crystal-chemistry of phlogopite from metasomatized peridotites: evidence from laboratory and nature. *Periodico di Mineralogia*, 80: 181-187
- Dvir O., Pettke T., Fumagalli P., Kessel R. (2011) Fluids in the peridotite-water system up to 6 GPa and new experimental constrains on dehydration reactions *Contrib Mineral Petrol* 161:829-844 IF: 3.441
- Poli S., Franzolin E., Fumagalli P., Crottini A. (2009) The transport of carbon and hydrogen in subducted oceanic crust: an experimental study to 5 GPa *Earth and Planetary Science Letters* 278 350-360
- Borghini G., Fumagalli P., Rampone E. (2010) The Stability of Plagioclase in the Upper Mantle: Subsolvus Experiments on Fertile and Depleted Lherzolite. *J. Petrol* 51:229-254 IF: 3.842
- Fumagalli P., Zanchetta S., Poli S. (2009) Alkali in phlogopite and amphibole and their effects on phase relations in metasomatized peridotites: a high-pressure study *Contrib Mineral Petrol* 158:723-737 IF: 3.497
- Malaspina N., Poli S., Fumagalli P. (2009) The oxidation state of metasomatized mantle wedge: insights from C-O-H- bearing garnet peridotite *J. Petrol* 50(8):1533-1552
- Orsingher L., Calicchio M., Carini G., Dal Maschio R., Fioretto D., Fontana A., Fumagalli P., Gilioli E., Mattarelli M., Moser E., Rossi F. (2008) Optical and spectroscopic characterisation of permanently densified GeO₂ glasses, *Philosophical Magazine*, 88 (33-35): 3907-3914 ISSN 1478-6435
- Fumagalli P. and Stixrude L. (2007) The 10Å phase at high pressure by first principles calculations and implications for the petrology of subduction zones. *Earth and Planetary Science Letters*, vol 260: 212-226

- Publications
(continued)
- Stixrude L., Lithgow-Bertelloni C., Kiefer B. and Fumagalli P. (2007) Phase stability and shear softening in CaSiO₃ perovskite at high pressure, *Physical Review B*, 75:024108
- Comodi P., Fumagalli P., Nazzareni S. Zanazzi P.F. (2005) The 10Å phase: crystal structure from single-crystal X-ray data. *American Mineralogist*, 90:1012-1016
- Fumagalli P. and Poli S. (2005) - Experimentally determined phase relations in hydrous peridotites to 6.5 GPa and their consequences on the dynamics of subduction zone. *Journal of Petrology*, 46:555-578
- Fumagalli P. and Poli S. (2004) - Modelling metamorphic rocks in complex systems: present-day developments in high pressure experimental petrology, *Periodico di Mineralogia*, 73:197-208, Special Issue 2: A showcase of the Italian research in metamorphic petrology
- Comodi P., Fumagalli P., Montagnoli M., Zanazzi P.F. (2004) - A single crystal study on the pressure behavior of phlogopite and petrological implications, *American Mineralogist*, 89:647-653.
- Paleari A., Chiodini N., Di Martino D. Meinardi F, Fumagalli P. (2003) - Ultraviolet-excited radiative decay channels of defect states in high-density sixfold-coordinated SiO₂, *Physical Review B*, 68: 184107-4
- Pavese A., Levy D., Curetti N., Diella V., Fumagalli P., Sani A. (2003) - Equation of state and compressibility of phlogopite by in situ X-ray powder diffraction, *European Journal of Mineralogy*, 15 (3):455-463
- Poli S. and Fumagalli P., (2003) - Mineral assemblages in ultra-high pressure metamorphism: A review of experimentally determined phase diagrams, in Carswell D.A.; Compagnoni R. *Ultra-High Pressure Metamorphism*. vol. 5 Budapest: Eotvos University Press (Hungary). ISBN 9634636462
- Fumagalli P., Stixrude L., Poli S. and Snyder D. (2001) The 10Å phase - A high pressure expandable sheet silicate stable during subduction of hydrated lithosphere. *Earth and Planetary Science Letters*, 186(2):125-141
- Fumagalli P. and Poli S. (2001) Subsolidus phase relationships in hydrous peridotites to 7 GPa: an experimental study. In: Ogasawara Y., Maruyama S., Liou J.G. (eds), *Fluid/Slab/Mantle Interactions and ultrahigh-P minerals*. Waseda University, pp. 61-64
- Zanchi A., Poli S., Fumagalli P., Gaetani M. (2000). Mantle exhumation along the Tirich Mir Fault Zone, NW Pakistan: pre-mid Cretaceous accretion of the Karakoram terrane to the Eurasian margin. In: *Tectonics of the Nanga Parbat Syntaxis and the Western Himalaya*, Geological Society of London, Special Publication No. 170, eds. Khan M.A., Jan M.Q., Treloar P.J. and Searle M.P., 237-252.
- Artioli G., Fumagalli P., Poli S. (1999) The crystal structure of Mg₈(Al₂Mg₂)Al₈Si₁₂(O,OH)₅₆ pumpellyite and its relevance in ultramafic systems at high pressure. *American Mineralogist*, 84:1906-1914.
- Fumagalli P. and Poli S. (1999) Phase relationships in hydrous peridotites at high pressure: preliminary results of multi-anvil experiments. *Periodico di Mineralogia*, 68(3):275-286.

- Presentations** Seminars and invited seminars in several national and international meetings and workshops.
Selected invited international seminars:
- 1999 Invited seminar at the GeoForschung Zentrum di Potsdam entitled "Phase relationships in the MASH system at high pressure: problems and perspectives"
 - 1999 Invited seminar at the Departement of Geological Sciences, University of Michigan (Ann Arbor, USA) entitled "Subsolidus phase relationships in hydrous peridotites at high pressure"
 - 2001 Invited seminar "Turner Lectures" at the Departement of Geological Sciences, University of Michigan (Ann Arbor, USA) entitled "Fluid fluxes in subduction zones: seeking hydrogen desperately"
 - 2004 Invited seminar at the International Seminars of Petrology (ISPET) Third Seminar "High and Ultrahigh Pressure Metamorphism: A Window on Subduction Processes" - Monte Ortone (Italy) entitled "Phase relations in mantle rocks"
 - 2004 invited seminar at the University of Utrecht entitled "Subsolidus phase relations in hydrous ultramafic systems: an experimental study up to 6.5 GPa"
 - 2008 invited seminars at the International School "HP-HT Mineral Physics: implications for geosciences" Bressanone entitled: "High pressure phase equilibria" e "High pressure experimental techniques"
 - 2008 invited seminar at the Bayerisches Geoinstitut, University of Bayreuth (D) entitled "Subsolidus phase relations in ultramafic compositions up to 6.0 GPa and their geodynamic implications"
 - 2009 Invited seminar at the Laboratoire Magmas et Volcans - Université Blaise Pascal di Clermont-Ferrand (F) entitled "Exploring the Earth's Mantle: subsolidus phase relations in ultramafic "dirty" systems up to 6.0 GPa"
 - 2009 Invited seminar entitled "Experimental constraints on mafic and ultramafic rocks" for the "EUROPEAN INTENSIVE SEMINARS ON PETROLOGY "High-pressure Metamorphism and Subduction Zones" - EURISPET GRANADA 2009
- Invited seminar entitled "Experimentally-derived Ca-Na partitioning between plagioclase and clinopyroxene: a new geobarometer for mantle rocks" al Workshop "ThermoDynaMix III: Thermodynamic-Geophysical Characterization of the Upper Mantle: The Next Step" Dublino
- Invited seminar entitled "Experimental simulation of subsolidus processes: the rules of the game" per il workshop internazionale "Colloquium on the build-up of petrological phase diagrams" Santa Margherita Ligure (Ge)
- Coordination of Projects**
- 2015-present Local PI (Unit of University of Milan) of MIUR-PRIN 2015 "Melt-rock reaction and melt migration in the MORB mantle through combined natural and experimental studies".
 - 2014-2018 Coordinator for the University of Milano in the European FP7- ITN Marie Curie - Initial Training Network: "Abyss - Training network on reactive geological systems from the mantle to the abyssal sub-seafloor".
 - 2006 Responsible for the project European High Pressure Facility at Bayerisches Geoinstitut - European Union FP6 "Research Infrastructures";

Participations to Projects

- 2006-2007 European Synchrotron Radiation Facility - Grenoble; GILDA BM08 Beam Line;
- 1999-2000 project funded by the Università degli Studi di Milano (progetto giovani - Es. Fin. 1998 - Nota n. 1707 del 22.7.1998)
- 2011-2013 MIUR-PRIN 2009 National Grant on “Fluid speciation and redox processes in ultramafic systems at subduction zones”
- 2008- 2010 MIUR-PRIN 2007 National Grant on “Phase relations and interaction with COH fluid in carbonate peridotites from subduction settings: from nature to experiments”
- 2006-2008 2006-2008 MIUR-PRIN 2005 National grant on “Stability of carbonates, hydrates, and C-O-H fluid speciation in mafic and ultramafic systems: an experimental study at high pressure”
- 2011-2013 MIUR-Regione Lombardia - National and regional grant on “sintering metal and ceramics based matrix” - FORSICOCER
- 2006-2010 2006- 2010 participant to the Marie Curie Research Training Network “Crust to Core : the fate of subducted material
- 2003- present participant to the first Spin-Off of the University of Milan (Petroceramics).

Honours and awards

- 2007 “A.Bianchi” award, Società Italiana Mineralogia Petrologia
- 2001 Reasearch Fellowship, University of Michigan, Dep of Geological Sciences, Ann Arbor (USA)
- 1999 paper award (Fumagalli et al., 1999 - Terra Nostra, 7, 27-28) at the Workshop “Processes and Consequences of deep subduction”

Organization of scientific meetings

- 2018-present Scientific Committee of the EMU (European Mineralogical Union) School on “Melting and fluid/melt-rock reactions in the mantle - 2nd Edition (MEREMA) - 64 participants expected / to be held in Sestri Levante - Italy in march 2020
- 2018 Organization for the Dipartimento di Scienze della Terra “Ardito Desio” of the stand on Geotechnologies at European Event “Meet Me Tonight 2018 - H2020-MSCA-NIGHT-2018” Milan, ITALY
- 2018 Scientific Committee of the XVI International Symposium on Experimental Mineralogy, Petrology and Geochemistry (EMPG) Clermont-Ferrand - France
- 2017 Scientific Committee of the International Winter School on “Melting and fluid/melt-rock reactions in the mantle (MEREMA) - 64 participants / Pavia (Italy)
- 2016 Organization of the Short Course “Experimentation in Geology” for ERS and ER of the ITN European Project “ABYSS” FP7- PEOPLE-ITN - 14 participants / Milan (ITALY)
- 2016 Co-convenor of session at the 88° national conference of the Italian Geological Society “Controls on mantle depletion/enrichment on geological processes”
- 2016 Co-convenor of session “The mantle and core of Earth and other planet” - XV International Symposium of Experimental Mineralogy Petrology and Geochemistry (EMPG) Zurich - Swiss
- 2014 Organizing Committee of the Italian Conference SGI/SIMP “The future of Italian Geoscience” (Italian Geological Society/Italian Society of Mineralogy and Petrology) 2014 - approx 500 participants /Milan (ITALY)
- 2014 Co-Convenor of session “Rock-forming minerals and their bearing to petrogenetic processes” for the SGI-SIMP conference “The future of italian geosciences”

Reviewing activities

- 2018 Guest Editor for LITHOS (Elsevier Publication) - Special Issues "ABYSS"
- 2017-2018 Examiner for international 2 PhD Thesis (Dr. Juliette Maurice, Université Blaise-Pascal - Clermont-Ferrand, France; Dr. Shayne Lakey, Australian National University - Canberra, Australia)
- 2002-present Reviewer for several scientific journals and scientific panel for evaluation of reseach positions (Lithos, Contributions to Mineralogy and Petrology, American Mineralogist, Earth and Planetary Science Letters)

Teaching

Geology of Georesources, "Laurea Magistrale" Earth Sciences, Università degli Studi di Milano
 Petrography, "Laurea Triennale" Natural Sciences,Università degli Studi di Milano;
 Laboratory and Didactics of Earth Science, "Laurea Magistrale" BioGeoSciences Università degli Studi di Milano
 Laboratory of Petrography, Rocks classification and description, "Laurea Triennale" Earth Sciences, Università degli Studi di Milano;
 Petrology, "Laurea Magistrale" Earth Sciences Università degli Studi di Milano
 Laboratory of Petrography, "Laurea Triennale" Natural Sciences, Università degli Studi di Milano
 Laboratory and Didactics of Earth Science, for teachers of high school- SILSIS Università degli Studi di Milano
 Field activities for undergraduated (B.Sc. and M. Sc.) in Earth Sciences and Natural Science - Università degli Studi di Milano
 2002 - present supervisor and co supervisor of several Master students and PhD students

Institutional responsibilities

- 2017- present President of the Department Committee for the Promotion of Geosciences - outreach activities and public engagement
- 2017-present Organizer of Internal Seminar and Seminar fot High School Teachers and students
- 2015-2018 Member of Evaluation Committee for Researchers and Associate Professor at University of Milan, Trieste.
- 2006-present Faculty Member of Doctoral School of Earth Science, Università degli Studi di Milano/ Dipartimento di Scienze della Terra "Ardito Desio"/ Italy
- 2009-present Member of the Board of Directors of the National group of Petrography - Gruppo Nazionale di Petrografia (GNP) - Italy
- 2014-2017 Member of Department Council, Università degli Studi di Milano/ Dipartimento di Scienze della Terra "Ardito Desio"/ Italy
- 2014-2017 President of the Joint Committee Students-Faculty for Natural Sciences Courses
- 2002-2004 Member of the Erasmus-Socrates Committee for the Dipartimento di Scienze della Terra "Ardito Desio"
- 2009 Member of the Board of Directors of the Gruppo Nazionale di Petrografia (GNP) - Italy

Personal information

I authorize the handling of personal information in this curriculum, according to D.Lgs n. 196/03 and following modifications and Regulations EU 679/2016 (General Regulations concerning Data Protection or GRDP) and art. 7 of University Regulations concerning protection of personal information.

I authorize, according to D.lgs 14/03/2013 n. 33 concerning transparency, in case of conferment of the position and of the fellowship, the publication of this curriculum in the web site of Università degli Studi di Milano in the section "Amministrazione trasparente", "Consulenti e collaboratori".

Date

Signature

23-11-2018

