

# Carla Tiraboschi

## Curriculum Vitae

Born: September 30<sup>th</sup>, 1985 in Milan (Italy)  
Office Address: Department of Physics and Geology, University of Perugia (Italy)  
Piazza dell'Università, 06123 Perugia (Italy)  
Phone: +39 075 585 2607  
Email: carla.tiraboschi@unipg.it

### RESEARCH INTERESTS

- Deep carbon cycle
- Synthesis and analysis of high-pressure carbon-bearing aqueous fluids
- Solubility of mantle minerals in high-pressure fluids and melts
- Redox state and iron transfer in subduction zones

### EDUCATION

November 2011 – February 2015

**Ph.D. in Earth Sciences**, University of Milan (Italy)

Thesis: *COH fluids at upper mantle conditions: an experimental study on volatile speciation and mineral solubility in the MS + COH system*

Supervisor: Dr. S. Tumati (University of Milan), Co-supervisor: Prof. P. Ulmer (ETH Zürich)

January 2013 – June 2013: Erasmus+ scholarship, ETH Zürich (Switzerland)

November 2008 – April 2011

**M.Sc. in Geology**, *Cum Laude*, University of Milan (Italy)

Thesis: *Melting of carbonated phlogopite lherzolite at fluid-saturated conditions: experimental constraints*

Supervisors: Dr. S. Tumati, Prof. S. Poli

September 2009 – February 2010: Erasmus scholarship, ETH Zürich (Switzerland)

October 2004 – November 2008

**B.Sc. in Geology**, University of Milan (Italy)

Final project: *Calibration of salt-pyrex pressure cells and synthesis of carbonated lherzolites*

Supervisors: Prof. S. Poli, Dr. S. Tumati

September 2005 – July 2006: Erasmus scholarship, Complutense University of Madrid (Spain)

### PROFESSIONAL APPOINTMENTS

September 2024 – present

**Assistant Professor** (RTD-b), Department of Physics and Geology, University of Perugia (Italy)

June 2021 – August 2024

**Researcher**, Institute for Mineralogy, University of Münster (Germany)

*Scientific referee*: Prof. C. Sanchez-Valle

January 2021 – May 2021

**WiRE Fellow**, Institute for Mineralogy, University of Münster (Germany)

*Scientific referee*: Prof. C. Sanchez-Valle

November 2018 – December 2020

**Post-doctoral researcher**, Institute for Mineralogy, University of Münster (Germany)

*Scientific referee*: Prof. C. Sanchez-Valle

**Parental leave** from August 2019 to July 2020

June 2018 – October 2018

**Research assistant**, Department of Earth Sciences, University of Milan (Italy)

*Scientific referee*: Prof. S. Poli

January 2016 – December 2017

**Post-doctoral researcher**, Department of Earth and Environmental Sciences, University of Milan Bicocca (Italy)

*Scientific referee*: Prof. M.L. Frezzotti

June 2011 – November 2011

**Undergraduate research assistant**, Department of Earth Sciences, University of Milan (Italy)

## TEACHING EXPERIENCE

Academic year 2025/2026

**Lecturer**, University of Perugia (Italy)

Introduction to Planetology (48 hours), M.Sc. in Geosciences for Risks and Environment Management

Planetology (48 hours), M.Sc. in Geosciences for Risks and Environment Management

Academic years 2024/2025

**Lecturer**, University of Perugia (Italy)

Interdisciplinary exercises on field (12 hours), B.Sc. Geology

Academic years 2016/2017

**Lecturer**, University of Milan Bicocca (Italy)

Laboratory of Petrography (Igneous and Metamorphic Thin Sections, 48 hours), B.Sc. Geology

Academic years 2011/2012; 2012/2013; 2013/2014

**Teaching assistant**, University of Milan (Italy)

Igneous and Metamorphic Rocks Laboratory (Hand samples, 12 hours), B.Sc. Geology

Geological Field Mapping Course (5 days), Mt. Adamello (Italy), B.Sc. Geology

Laboratory of Petrography (Hand samples, 18 hours), B.Sc. Natural Sciences

Yearly seminar “Volatiles in the upper mantle”, M.Sc. Geology

## FELLOWSHIP AND GRANTS

- 2025 Re.connect Fellowship from the University of Münster (Germany)
- 2024 Individual Research Grant from the German Research Foundation (DFG), transferred to Prof. Sanchez-Valle
- 2023 Italian Scientific Habilitation to function as Associate Professor (sector 04/A1)
- 2021 Individual Research Grant from the German Research Foundation (DFG)
- 2020 WiRE (Women in Research) Fellowship from the University of Münster (Germany)
- 2018 Mobility grant award from the Italian Society of Mineralogy and Petrology (SIMP)
- 2018 Grant to participate at the “Gordon Research Conference: Deep Carbon in the Context of Geologic Time” at Bryant University, Smithfield (USA) from the Deep Carbon Observatory (DCO)
- 2017 Grant to participate at the “Deep Earth Water Workshop” at Johns Hopkins University, Baltimore (USA) from the Deep Carbon Observatory (DCO)
- 2016 Grant to participate at the “EMC conference” in Rimini (Italy) from the Italian Society of Mineralogy and Petrology (SIMP)
- 2015 Grant to participate at the “SIMP–AIV–SOGEL–SGI conference” in Florence (Italy) from the Italian Society of Mineralogy and Petrology (SIMP)
- 2015 Grant to participate at the “DCO workshop: carbon from the mantle to the surface” in Berkeley (USA) from the Sloan Foundation (with a contribution from the CIDER NSF grant)
- 2013 Grant to participate at the “Goldschmidt Conference” in Florence (Italy) from the Italian Society of Mineralogy and Petrology (SIMP)
- 2013 Lifelong Learning Programme/Erasmus+ student placement scholarship, spring semester, ETH Zürich (Switzerland)
- 2012 Grant to participate at the “14<sup>th</sup> EMPG” in Kiel (Germany) from the organizing committee
- 2009 Erasmus scholarship, fall semester, ETH Zürich (Switzerland)
- 2005 Erasmus scholarship, full academic year, Complutense University of Madrid (Spain)

## AWARDS

- 2016 Award for the best PhD thesis from the Italian Society of Mineralogy and Petrology (SIMP)

- 2013 “G. Schiavinato” award for best Italian mineralogical-petrological master thesis from Accademia dei Lincei, Rome (Italy)

#### FUNDED RESEARCH PROJECT AS PRINCIPAL INVESTIGATOR

- 2024 Individual Research Grant from the German Research Foundation (DFG)  
Project: “Carbon mobility in subduction zones: in-situ experimental constraints on organic and inorganic carbon transfer at oxidizing conditions”  
Amount: 276.330 €
- 2021 Individual Research Grant from the German Research Foundation (DFG)  
Project: “Mantle metasomatism by graphite-saturated COH fluids: an experimental study of solutes generation at high-pressure conditions in subduction zones”  
Amount: 259.007 €
- 2018 Mobility Grant from the Italian Society of Mineralogy and Petrology (SIMP)  
Project: “Assessing redox conditions in hydrothermal diamond anvil cells: an experimental approach to investigate COH fluids”  
Amount: 5.000 €

#### CONFERENCES

- 2026 EGU General Assembly, Vienna (Austria) **Convener**
- 2025 Goldschmidt Conference, Prague (Czech Republic) **Convener**
- 2025 19<sup>th</sup> EMPG, Orléans (France)
- 2025 EGU General Assembly, Vienna (Austria) **Convener**
- 2024 EGU General Assembly, Vienna (Austria) **Convener**
- 2023 Goldschmidt Conference, Lyon (France)\* **Keynote and invited speaker**
- 2023 18<sup>th</sup> EMPG, Milan (Italy) **Convener**
- 2022 EGU General Assembly, Vienna (Austria)\* **Invited**
- 2021 European Mineralogical Conference, Online **Convener**
- 2021 Goldschmidt Conference, Online\*
- 2021 17<sup>th</sup> EMPG, Online\*
- 2020 EGU2020: Sharing geoscience online **Convener**
- 2019 Geomünster, Münster (Germany) **Convener**
- 2018 EGU Galileo Conference “Exploring new frontiers in fluids processes in subduction zones”, Leibnitz (Austria)\* **Invited**
- 2018 Gordon Research Conference “Deep Carbon in the Context of Geologic Time”, Smithfield (USA)
- 2017 Congresso SIMP–AIV–SOGEI–SGI, Pisa (Italy)
- 2016 European Mineralogical Conference, Rimini (Italy)\*
- 2016 15<sup>th</sup> EMPG Conference, Zürich (Switzerland)\*
- 2015 Congresso SIMP–AIV–SOGEI–SGI, Florence (Italy)\*
- 2015 DCO workshop “Carbon from the mantle to the surface”, Berkeley (USA)\*
- 2014 90° Congresso Società Italiana Mineralogia e Petrologia, Milan (Italy)\*
- 2014 EGU General Assembly, Vienna (Austria)\*
- 2013 Goldschmidt Conference, Florence (Italy)
- 2012 14<sup>th</sup> EMPG Conference, Kiel (Germany)\*
- 2011 Geolitalia, VIII Forum Italiano di Scienze della Terra, Torino (Italy)\*
- \*talk

#### INVITED SEMINARS

- 2023 “Investigating fluids in the upper mantle: an experimental perspective on element transfer and metasomatism” - Goethe University Frankfurt (Germany)
- 2023 “Fluids in the upper Mantle: an experimental perspective on volatiles, element transfer and metasomatism” - RSES 50<sup>th</sup> Anniversary Symposia, Australian National University (Australia)
- 2022 “COH fluids in subduction zones: investigating volatiles-bearing systems in the laboratory” - Ruhr University Bochum (Germany)
- 2021 “Volatiles in the upper-mantle: investigating fluid-bearing systems in the laboratory” - University of Bern (Switzerland)

2015 “Fluids at upper-mantle conditions: experimental results on volatile speciation and mineral solubility in COH-bearing systems” - University of Milan Bicocca (Italy)

## SERVICE

2024 – present Council member of European Association of Geochemistry (EAG)  
2024 PhD thesis reviewer - Srijita Ray “The solubility of monazite in carbonate melts at upper mantle and crustal conditions” Australian National University (Australia)  
2023 Panelist for the workshop “Hidden histories - Towards equity, diversity and inclusion in geosciences” – Goldschmidt conference, Lyon (France)  
2023 – present Member of the Diversity, Equity and Inclusion (DEI) Committee of the European Association of Geochemistry (EAG)  
2017 Co-advisor bachelor thesis - G. Lombardo, University of Milan Bicocca (Italy)  
2017 Organizing committee for the international school “Carbon forms paths and processes in the Earth” – Villa del Grumello, Como (Italy)  
2016 Organizing committee for the international school “Fluids in the Earth” – University of Naples Federico II (Italy)  
2006 – 2008 Student representative for the Earth Science department council and Faculty council

## LANGUAGES

Italian: native  
English: fluent  
Spanish: fluent  
German: basic

## OTHER ACTIVITIES

**Guest Associate Editor** Research topic “Advances in the Study of Fluids and Melts Under Extreme Conditions” Earth and Planetary Materials section of “Frontiers in Earth Sciences”  
**Reviewer** Earth and Planetary Science Letters, Lithos, Geochimica et Cosmochimica Acta, Contributions to Mineralogy and Petrology, European Journal of Mineralogy, Journal of Petrology, Chemical Geology  
**Memberships** European Association of Geochemistry (EAG); Italian Society of Mineralogy and Petrology (SIMP); European Geoscience Union (EGU)

## OUTREACH AND SCIENCE COMMUNICATION

[Best Outreach Award](#), “On the Rocks 2021” film festival  
Collaborations: [Experimenta](#) Science Center in Heilbronn (Germany), [“Frag Sophie”](#)  
Featured on: [National Geographic](#), WiRe [blog](#), high-school book [“Sistema Terra”](#)

## PUBLICATIONS

### Peer-reviewed publications

Citations: 465 h-index: 10 (via Google Scholar)

1. **Tiraboschi C.**, Sverjensky D., Sanchez-Valle C. (in review) The hidden role of Mg–Si–COH fluids on mantle wedge metasomatism. *Lithos*
2. Anzellini S., Louvel M., Miozzi F., Rosa A.D., **Tiraboschi C.** (2023) Advances in the study of fluids and melts under extreme conditions. *Frontiers in Earth Sciences* 11, 560. DOI 10.3389/feart.2023.1187340
3. **Tiraboschi C.**, McCammon C., Rohrbach A., Klemme S., Berndt J., Sanchez-Valle C. (2023) Preferential mobilisation of oxidised iron by slab-derived hydrous silicate melts. *Geochemical Perspective Letters* 24, 43-47. DOI10.7185/geochemlet.2304

4. Liu Z., Rohrbach A., **Tiraboschi C.**, Foley S., Berndt J., Klemme S. (2023) The effect of COH fluids on partial melting of eclogite and lherzolite under moderately oxidizing and reducing conditions. *Chemical Geology* 616, 121219. DOI 10.1016/j.chemgeo.2022.121219
5. Peng W., Tumiati S., Zhang L., **Tiraboschi C.**, Vitale Brovarone A., Toffolo L., Poli S. (2022) An experimental study on kinetics-controlled Ca-carbonate aqueous reduction into CH<sub>4</sub> (1 and 2 GPa, 550 °C): Implications for C mobility in subduction zones. *Journal of Petrology* egac070. DOI 10.1093/petrology/egac070
6. Flemetakis S., **Tiraboschi C.**, Rohrbach A., Berndt J., Klemme S. (2022) The stability of antigorite in subduction zones revisited: The effect of F on antigorite stability and its breakdown reactions at high pressures and high temperatures, with implications for the geochemical cycles of halogens. *Contributions to Mineralogy and Petrology* 177, 70 DOI 10.1007/s00410-022-01934-5
7. Tumiati S., Recchia S., Remusat L., **Tiraboschi C.**, Vitale Brovarone A., Sverjensky D., Manning C., Spanu D., Poli S. (2022) Oxidation of organic matter buffered by subducted marine carbonate rules the carbon isotopic signature of arc emissions. *Nature Communications* 13(1), 1-10. DOI 10.1038/s41467-022-30421-5
8. **Tiraboschi C.**, Miozzi F., Tumiati S. (2022) Carbon-saturated COH fluids in the upper mantle: a review of high-pressure and high-temperature ex situ experiments. *European Journal of Mineralogy* 34, 59-75. DOI 10.5194/ejm-34-59-2022
9. Tumiati S., **Tiraboschi C.**, Miozzi F., Vitale-Brovarone A., Manning C., Sverjensky D., Milani S., Poli S. (2020) Dissolution susceptibility of amorphous carbon versus crystalline graphite in high-pressure aqueous fluids. *Geochimica et Cosmochimica Acta* 273, 383-402. DOI 10.1016/j.gca.2020.01.030
10. **Tiraboschi C.**, Tumiati S., Sverjensky D., Pettke T., Ulmer P., Poli S. (2018) Experimental determination of magnesia and silica solubilities in graphite-saturated and redox-buffered high-pressure COH fluids in equilibrium with forsterite + enstatite and magnesite + enstatite. *Contributions to Mineralogy and Petrology* 173:2. DOI 10.1007/s00410-017-1427-0
11. Tumiati S., **Tiraboschi C.**, Sverjensky D., Pettke T., Recchia S., Ulmer P., Miozzi F., Poli S. (2017) Silicate dissolution boosts the CO<sub>2</sub> concentration in subduction fluids. *Nature Communications* 8(1), 1-11. DOI 10.1038/s41467-017-00562-z
12. Ogialoro E., Frezzotti M.L., Ferrando S., **Tiraboschi C.**, Principe C., Groppelli G., Villa I.M. (2017) Lithospheric magma dynamics beneath El Hierro, Canary Islands: a fluid inclusion study. *Bulletin of Volcanology* 79:70. DOI 10.1007/s00445-017-1152-6
13. **Tiraboschi C.**, Tumiati S., Recchia S., Miozzi F., Poli S. (2016) Quantitative analysis of COH fluids synthesized at HP–HT conditions: an optimized methodology to measure volatiles in experimental capsules. *Geofluids* 16, 841-855. DOI 10.1111/gfl.12191
14. Tumiati S., Fumagalli P., **Tiraboschi C.**, Poli S. (2013) An experimental study on COH-bearing peridotite up to 3.2 GPa and implications for crust-mantle recycling. *Journal of Petrology* 54, 453-479. DOI 10.1093/petrology/egs074

#### Other publications (not peer-reviewed)

1. **Tiraboschi C.** (2015) COH fluids at upper mantle conditions: an experimental study on volatile speciation and mineral solubility in the MS + COH system. *Plinius* 41.