

## CV-Carlo Cardellini

Prof. Carlo Cardellini, was born in Perugia (Italy) on 12 April 1973.

### Education

1997: Degree in Geology at Perugia University

2003: PhD in Earth Sciences at Perugia University, on “Carbon dioxide diffuse degassing from active volcanoes and non-volcanic areas: methods and applications to southern Italy and Greece”.

2003-06: Post-doc at Perugia University

### Employment history

Since 2015: Associate Professor of Geochemistry and Volcanology at Perugia University

2008-2015: Permanent Researcher in Geochemistry and Volcanology at Perugia University.

1988-2006: Contracts of scientific collaboration at INGV-Naples Osservatorio Vesuviano.

2010-2016: Associate Researcher at INGV-Naples, Osservatorio Vesuviano.

### Teaching

Applied Geochemistry, Geothermics and Volcanic Risk courses at Perugia University

Member of the Board of Professors of the School of the Doctoral Programme in Science and Technologies for Physics and Geology of Perugia University.

### Teaching, Institutional Responsibilities and Community service

- Since 2008 I have taught **Applied Geochemistry, Hydro-geochemistry, Volcanic Risk** for the Degree course in Geology, the Master Degree in Geological Science and Technology and Master Degree in Petroleum Geology, at University of Perugia. In this period I was supervisor and co-supervisor of B.S. (5), M.S. (14) and four PostDoc fellowship, and co-supervisor of 1 PhD student. I am currently supervising 1 B.S. and 4 M.S..

In 2013 taught in the Advanced Training course entitled "Research geophysics and volcanology monitoring of natural hazards and environmental issues and for the protection and use of land resources", within the Project VULCAMED (PONA3\_00278 / F) at INGV of Naples.

From 2008 to 2013 I was member of the board of professor of PhD school in Earth Science and Geotechnology at University of Perugia. I was elected representative of Senior Researchers (Ricercatori) in the Faculty of Science (2010-2013). From 2008 to the present I have been member of the commission to judge PhD theses in Italy (University of Perugia - 2 PhD, University of Palermo-10 PhD) and at University of Azores (Azores, Portugal) – 1 PhD.

### Supervision of laboratories

I am the supervisor of the “Laboratory of Fluids Geochemistry” at the Department Physics and Geology at the University of Perugia where I set-up prototypes of the equipment for the measurement of CO<sub>2</sub> and CH<sub>4</sub>.

### Funding ID:

#### a. International and National projects

- 2012 **Principal Investigator** in the two years project INGV-DPC V2 “precursor of eruptions”. Funded by INGV-DPC
- 2013. **Principal Investigator** of the DCO Grant “Improvement of web interface and of interoperability of database for volcanic/non volcanic CO<sub>2</sub> emissions in the mediterranean area, MaGa-database”
- 2014 Project Investigator in “DECADE - Deep Carbon Degassing from Two Active Volcanic Systems in Patagonia (Argentina): Copahue and Planchon-Peteroa” DCO ID 11121/8438-3853-1032-6594-CC. Funded by DCO
- 2014. Project Investigator in “DECADE - Terciera Island, Azores Archipelago”, DCO ID 11121/9803-7461-8292-8244-CC. Funded by DCO
- 2012. Project Investigator in “DECADE - MaGa: A Database for Volcanic/Non-volcanic CO<sub>2</sub> Emissions in the Mediterranean Area”. DCO ID 11121/9073-6244-8954-1381-CC. Funded by DCO.
- 2012. I was funded by Deep Carbon Observatory (DCO) to study the degassing process of Karimsky Volcano (Kamchatka, Russia) in collaboration with Russian Academy of Sciences (Institute of Volcanology and Seismology) and Russian Geophysical Survey (Kamchaktan Branch).
- 2010. Researcher in the two year project PRIN-2008S89Y8R\_001 "Study of Earth degassing in Italy and geochemical modelling of the process. (P.I. F. Frondini). Funded by MIUR.

- 2008. Researcher in the two year project INGV-DPC V1 “Unrest” (P.I. G. Chiodini) Funded by INGV-Department of Civil Defence.
- 2007. I was funded by the Yellowstone Volcano Observatory, USGS, Yellowstone National Park, Wyoming for a **short-term scholar programme** for the “Geochemical study of Yellowstone volcano”.
- 2005 Researcher in the two year project INGV-DPC V5, “Diffuse degassing in Italy”. (P.I. G. Chiodini) Funded by INGV-Department of Civil Defence. In this project I was the responsible of the setting up of the catalogue of the gas emissions ([www.googas.ingv.it](http://www.googas.ingv.it))
- 2005 Researcher in the two year project PRIN- 2004048813\_011 “GEOBASI- Geochemical baseline of Italy” (P.I. G. Ottonello). Funded by MIUR
- 2000 researcher in the two year project PRIN-MM04118111\_002 “GEOCO2” (P.I. G. Ottonello). Funded by MIUR

#### **b. Local projects (peer reviewed)**

- 2010-2013. **Principal Investigator** of the research contract with ARPA-Umbria – Regional Environment Protection Agency “implementation of the new regional monitoring network monitoring groundwater”
- 2009 **Principal Investigator** of the research contract with Perugia Municipality “Mapping and quantification and geochemical-isotopic Characterization of CO<sub>2</sub> diffuse degassing form soil in the Cenerente area”
- 2009 Responsible of the Geochemistry Team in the project “Geothermal resources in the Tiber upper valley: integrated geological investigation and evaluation of geothermal potential”. Funded by Fondazione Cassa di risparmio di Perugia.

#### **Service as reviewer**

Reviews for Journal of Geophysical Research, Geophysical Research letters, Earth and Planetary Science Letters, Geothermics, Bulletin of Volcanology, Journal of Volcanology and Geothermal Research, Chemical Geology, G<sup>3</sup>, Journal of Geochemical Exploration, Tectonophysics, Environmental Geology, Geological Society, Fuel, Italian Journal of Geosciences, Annals of Geophysics. In 2013 I served as remote reviewer for the Ministero dell’Istruzione, dell’Università e della Ricerca, ANVUR for evaluating research projects in the funding program “Futuro in Ricerca”.

#### **Membership of scientific society and international research initiative**

I am a member of American Geophysical Union (AGU), European Geosciences Union (EGU), International Association of Volcanology and Chemistry of the Earth’s Interior (IAVCEI) and of the Commission on the Chemistry of Volcanic Gases (CCVG-IAVCEI). Since 2013 I am a member of the DCO (Deep Carbon Observatory) DECADE (Deep Earth Carbon Degassing) research initiative involving more than two dozen researchers from 11 countries, finalized to the aimed to “sharpen global estimates of carbon fluxes out of volcanoes”.

#### **Collaboration with other institutions**

My research activity was carried out in collaboration with colleagues from both Italian Universities and Research Institutions and International. The main collaboration are with the INGV of Naples, Bologna and Palermo; INAF, National Institute for Astrophysics of Rome; University of Palermo, Firenze and Genova, Centro de Vulcanologia e Avaliação de Riscos Geológicos–CVARG, Azores, Portugal; Centre de Datation Radiocarbone, Université laude Bernard Lyon 1, France; Institut des Sciences de la Terre-ISTERRE, Université de Savoie, France; University of Durham, UK; Institute of Geophysics, Universidad Nacional Autónoma de Mexico, Mexico; US Geological Survey, Menlo Park and Yellowstone.

In particular, since 2013 I am collaborating with the IEDA, Lamont-Doherty Earth Observatory (Columbia University) and the Smithsonian’s Global Volcanism Program (Smithsonian Institution) to the development of the interoperability between their databases (EarthChem and VOTW) and MaGa (Mapping Gas Emission) database that I am developing.

#### **Recognition and diffusion of research activity**

My publications demonstrates the recognition and diffusion of my research activity, constituted by more than 50 papers published mostly (~80% of total papers) in ISI high-Impact-Factor international journals. I have a total H-index of 22 (source: ISI Web of Science). I have also presented my research results at many international conferences (over 70 presentations).

#### **Research interests**

The research activity of Carlo Cardellini is focused on the investigation of the Earth degassing process at various scale and in different geologic environments:

1) EARTH DEGASSING AT REGIONAL SCALE. The research was focused on the geochemical-isotopic study of groundwater from regional aquifers in central and southern Italy for the definition and quantification of the sources of the carbon dissolved in to groundwater, through the carbon balance approach. This approach allowed to quantify CO<sub>2</sub> Earth degassing affecting a large area of Italy, to produce the first map in the world of deeply derived CO<sub>2</sub> flux at regional scale and to highlight the correlations between CO<sub>2</sub> Earth degassing, seismicity, heat flow and geodynamic setting of the region.

2) DEGASSING FOM ACTIVE VOLCANOES. He contributed to the study of the degassing process from active volcanoes mainly investigating the soil diffuse degassing of CO<sub>2</sub> and CH<sub>4</sub>, by developing techniques for the measurement of gas fluxes, methodologies for the mapping and estimation of gas release, and methods for the characterization of sources feeding soil degassing. These methods were applied to the investigations of soil degassing from various volcanoes and volcanic-hydrothermal systems, for the comprehension of the degassing process and for the monitoring of volcanic activity (e.g., Solfatara of Pozzuoli, Vesuvio, Ischia, Nisyros (Greece), Las Furnas (Azores), Copahue (Argentina) and Karimsky (Russia)).

3) DEGASSING FROM GAS MANIFESTATIONS IN NON-VOLCANIC REGIONS. The study of soil diffuse degassing was integrated with the study of chemical and isotopic composition of the released gases especially, in central and southern Italy, for the definition of a conceptual model for the origin, migration and storage of deep fluids.

4) DATABASE OF "GAS EMISSIONS" In 2007, he contributed, to realize the on-line catalogue of gas emissions in Italy (Googas, <http://googas.ov.ingv.it/>), afterwards he coordinated to the development of gas emission database with the development of MaGa ([www.magadb.net](http://www.magadb.net)) a global database of gas emissions and gas fluxes from volcanic and non-volcanic areas. The MaGa database was developed also with the support of DCO in the frame of the DECADE initiative.

Number of publications: 46 (Scopus), 44 (Web of Science) 'h-index': 22 (Scopus) 21 (Web of Science)

