

**PAOLO CRISTOFANELLI****Scopus ID:** 55663790800**ORCID:** [orcid.org/0000-0001-5666-9131](http://orcid.org/0000-0001-5666-9131)**Nationality:** Italian**Date of Birth:** 27 December 1974**Personal web page:** <http://www.isac.cnr.it/en/users/paolo-cristofanelli>

Last update: 2020, December

**Total publications:** 101 documents (Scopus)**H-Index (Scopus):** 28**RESEARCH INTEREST AND ACTIVITIES:**

- Study of atmospheric composition variability (from long-term to shorter time scales) by means of in-situ observations at permanent observatories and field campaigns
- Investigation of natural and anthropogenic processes (e.g. STE, mineral dust transport, biomass burning, polluted air masses transport) and assessment of their influence on trace gas and aerosol variability in remote regions and urban areas
- In-situ measurement techniques for measurements of reactive and greenhouse gases
- Quality assurance for atmospheric and climatic observations

**EDUCATION:**

1999 Master Degree, Department of Physics, University of Bologna, Italy

2003 PhD, Environmental Science, University of Urbino, Italy

**CURRENT POSITION:***2020 – present* Senior Scientist, Institute of Atmospheric Science and Climate (ISAC), National Research Council of Italy (CNR), Bologna**Participation to scientific projects:***2021 – current* ATMO – ACCESS H2020. **Role:** Facility PI. **Task:** To coordinate Trans-National Access to the Mt. Cimone – Po Valley facility.*2016 – current* ICOS – Integrated Carbon Observing System. **Role:** station PI. **Task:** Station leader for CO, CH<sub>4</sub> and CO<sub>2</sub> observations at the Mt. Cimone class-2 ICOS station, data analysis and process investigation*2020 – 2021* Copernicus C3S\_511 “Quality Assessment of ECV Products”. **Role:** WP leader. **Task:** to contribute to evaluation of upper air atmospheric ECV datasets provided by Copernicus C3S throughout the Climate Data Store (CDS).*2018 – 2021* Copernicus C3S\_512 “Quality Assurance for the Climate Data Store”. **Role:** member of the Evaluation Team. **Task:** to contribute to evaluation and quality control activities for the in-situ datasets (focus on trace gases) provided by Copernicus C3S throughout the Climate Data Store (CDS).*2014 – 2019* ACTRIS 2- Aerosols, Clouds, and Trace gases Research Infrastructure Network (EU Project). **Role:** scientist. **Task:** Measurement leader of the NO<sub>x</sub> observation programme at the Mt. Cimone global GAW/WMO station, data and process analysis.*2012 – 2015* I-AMICA - Infrastruttura di Alta tecnologia per il Monitoraggio Integrato Climatico-Ambientale (PONa3\_00363). **Role:** leader of WP1.1 “Implementation of a Climate-Environmental Observatory network”. **Task:** coordination of the activities for setting-up 4 new WMO/GAW Observatories for the observation of trace gases and aerosol properties in the southern Italy. This activities included the commissioning of the atmospheric observatories and the integration of standardized procedures for measurement execution and QA/QC processes following WMO/GAW guidelines.*2012 – 2015* National Project of Interest “Nextdata”. **Role:** Scientific leader sub-project 1 “Integrated observation system for environmental and climate monitoring”; scientific leader WP1.1 “High-altitude climate observation system”; scientist WP1.2 “GAW-WMO climate observatories”. **Task:** The leaded Sub-project was aimed to create an integrated observation system and was divided into five different Work Packages (WP) participated by 5 research Institutes. They were associated with diverse requirements of research, and of climate, environmental, experimental, instrumental and technological applications. The WP 1.1 was aimed to support the research system at

high altitudes and in remote areas, providing Italy's specialized scientific and technological contribution. The central goal of the WP 1.1 monitoring system was to implement meteorological stations, both fixed and mobile, at key high-altitude sites for the study of climate change in the Mediterranean basin, Himalayas, Karakorum.

**2012 – 2014** ABLCLIMAT - The Arctic and Antarctic: the influence of the Atmospheric Boundary Layer on Climate (PNRA Project). **Role:** WP leader of the Research Unit focused on the investigation of surface ozone variability in the Antarctic PBL by in-situ observation at Dome C.

**2010 – 2012** SHARE PAPRIKA **Role:** WP leader. **Task:** the leaded WP was aimed to obtain a quantitative assessment of the current state of the atmospheric properties and circulation in Karakorum; aerosol load, deposition and chemical properties. The observational part of PAPRIKA-Karakorum was focused to high-altitude areas of the Karakorum in Pakistan, with a specific focus on the region of Baltoro glacier and the upper Indus basin.

**2011 – 2013** ACTRIS - Aerosols, Clouds, and Trace gases Research Infrastructure Network (EU Project). **Role:** scientist. **Task:** Data validation and analysis, atmospheric processes interpretation and investigation.

**2012** PEGASOS - Pan-European Gas-AeroSol-climate interaction Study. **Role:** Field campaign station leader. **Task:** coordination of the intensive field campaign activities carried out at the Mt. Cimone GAW/WMO Global Station during June – July 2012 (four external research groups involved).

**2008 – 2013** SHARE (Station at High Altitude for Research on the Environment). **Role:** scientist. **Task:** Leader for ozone and meteorological observations within GAW-WMO and UNEP-ABC project at the Nepal Climate Observatory – Pyramid WMO/GAW Global Station. Three-dimensional air mass back-trajectory analysis. Study of the transport processes affecting ozone and aerosol variability in Himalayas.

**2008 – 2012** SHARE-Tech (Station at High Altitude for Research on the Environment - Advanced Technological Research and Development). **Role:** scientist. **Task:** Data analysis supporting the implementation and development of innovative transportable and unmanned measurement systems to be used in remote regions.

**2006 – 2011:** EUSAAR - European Supersites for Atmospheric Aerosol Research (EU Project). **Role:** scientist. **Task:** Data validation and analysis, atmospheric processes interpretation and investigation.

#### **PREVIOUS POSITIONS**

**2000 – 2002:** research fellows, at the Institute of Atmospheric and Oceanic Sciences (ISAO), National Research Council of Italy (CNR), Bologna

**2002 – 2008:** research fellows, at the Institute of Atmosphere Sciences and Climate (ISAC), National Research Council of Italy (CNR), Bologna

**2009 – 2018:** staff scientist, at the Institute of Atmosphere Sciences and Climate (ISAC), National Research Council of Italy (CNR), Bologna

#### **SIGNIFICANT ROLES:**

**2021 – present** Chair of the ICOS Atmospheric Monitoring Station Assembly (MSA)

**2019 – 2021** Co-chair of the ICOS Atmospheric Monitoring Station Assembly (MSA)

**2021 – present** Member of the working group on Carbon Cycle of DTA – CNR

**2018 – present** Member of CNR-ISAC Steering Committee (Consiglio di Istituto)

**2016 – 2018** Head of the CNR "O. Vittori" Observatory, part of the Monte Cimone WMO/GAW Global Station

**2012 – 2017** Responsible of the Research Agreement between ISAC-CNR and ECMWF concerning the near-real time provision of atmospheric composition data by Mt. Cimone Observatory to MACC-2 EU Project

**2012 – 2017** Technical point of contact of the MoU between ISAC-CNR and NOAA/ERL-GLOBAL MONITORING DIVISION concerning the execution of CO, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub> measurements at the Mt. Cimone WMO/GAW Global Station

**2012 – 2017** Responsible for the MoU between ISAC-CNR and Barcelona Supercomputer Center about the near-real time provision of aerosol data by Mt. Cimone WMO/GAW station to WMO SDS-WAS programme

**2012 – present** Principal Investigator for the O<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub> and meteorological observation at the Mt. Cimone WMO/GAW Global Station (GAW ID: CMN)

**2014 – present** Principal Investigator for the O<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub> and meteorological observation at the Capo Granitola WMO/GAW Regional Station (GAW ID: CGR)

## 10 MOST RECENT PUBLICATION ON PEER-REVIEWED PAPERS

1. Aruffo, Eleonora; Di Carlo, Piero; Cristofanelli, Paolo; Bonasoni, Paolo; *Neural Network Model Analysis for Investigation of NO Origin in a High Mountain Site*, Atmosphere, 11, 2, 173, **2020**
2. Cristofanelli, P., Arduini, J., Calzolari, F.,...,Bonasoni, P., Maione, M.; *First evidences of methyl chloride (CH<sub>3</sub>Cl) transport from the Northern Italy boundary layer during summer 2017*. Atmosphere, 11(3), 238, **2020**
3. Brattich, E., Orza, J.A.G., Cristofanelli, P.,..., Marinoni, A., Tositti, L.; *Advection pathways at the Mt. Cimone WMO-GAW station: Seasonality, trends, and influence on atmospheric composition*. Atmospheric Environment, 234, 117513, **2020**
4. Ramonet, M., Ciais, P., Apadula, F.,..., Cristofanelli, P.,..., Yala, K., Yver Kwok, C.; *The fingerprint of the summer 2018 drought in Europe on ground-based atmospheric CO<sub>2</sub> measurements: Atmospheric CO<sub>2</sub> anomaly*. Philosophical Transactions of the Royal Society B: Biological Sciences, 375(1810), **2020**
5. J. M. Thornton, E. Palazzi, N. C. Pepin, P. Cristofanelli, R. Essery, S. Kotlarski, G. Giuliani, Y. Guigoz, A. Kulonen, D. Pritchard, X. Li, H. J. Fowler, C. F. Randin, M. Shahgedanova, M. Steinbacher, M. Zebisch, C. Adler. *Toward a definition of Essential Mountain Climate Variables*. One Earth, 4, 6, **2021**.
6. Yver-Kwok, C., Philippon, C., Bergamaschi, P., Biermann, T., Calzolari, F., Chen, H., Conil, S., Cristofanelli, P., Delmotte, M., Hatakka, J., Heliasz, M., Hermansen, O., Komínková, K., Kubistin, D., Kumpp, N., Laurent, O., Laurila, T., Lehner, I., Levula, J., Lindauer, M., Lopez, M., Mammarella, I., Manca, G., Marklund, P., Metzger, J.-M., Mölder, M., Platt, S. M., Ramonet, M., Rivier, L., Scheeren, B., Sha, M. K., Smith, P., Steinbacher, M., Vítková, G., and Wyss, S.: Evaluation and optimization of ICOS atmosphere station data as part of the labeling process, Atmos. Meas. Tech., 14, 89–116, <https://doi.org/10.5194/amt-14-89-2021>, **2021**
7. Begley, A., Cristofanelli, P., Bonasoni, P., Barlasina, M. E., & Sánchez, R. *The Increasing Surface Ozone and Tropospheric Ozone in Antarctica and Their Possible Drivers*. Environmental science & technology, 55(13), 8542–8553. <https://doi.org/10.1021/acs.est.0c08491>, **2021**
8. Cristofanelli, P., Arduni, J., Serva, F., Calzolari, F., Bonasoni, P., Busetto, M., Maione, M., Sprenger, M., Trisolino, P., and Putero, D. *Negative ozone anomalies at a high mountain site in northern Italy during 2020: a possible role of COVID-19 lockdowns?* Environ. Res. Lett. 16 074029, **2021**
9. Dallo, F., Zannoni, D., Gabrieli, J., Cristofanelli, P., Calzolari, F., de Blasi, F., Spolaor, A., Battistel, D., Lodi, R., Cairns, W. R. L., Fjærraa, A. M., Bonasoni, P., and Barbante, C. *Calibration and assessment of electrochemical low-cost sensors in remote alpine harsh environments*. Atmos. Meas. Tech., 14, 6005–6021, <https://doi.org/10.5194/amt-14-6005-2021>, **2021**.
10. Adame, J.A., Gutiérrez-Álvarez, I., Cristofanelli, P., ...Bolívar, J.P., Yela, M. *Surface ozone trends over a 21-year period at El Arenosillo observatory (Southwestern Europe)*. Atmospheric Research, 106048, **2022**.

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