Annalisa Di Bernardino
Curriculum Vitae

Rome
30/09/2024

Part I – General Information

Full Name	Annalisa Di Bernardino
Date of Birth	
Place of Birth	
Citizenship	
Permanent Address	
Mobile Phone Number	
E-mail	
Spoken Languages	

Part II – Education

Part IIa – Accademic education

Type	Year	Institution	Notes
Bachelor university graduation	2008-2010	Sapienza University of Rome	**Bachelor's degree in Environmental Engineering** Final mark: 110/110 *cum laude* Thesis title: "Analisi della contaminazione da arsenico nelle acque della Provincia di Viterbo e proposte di trattamento" ("Analysis of arsenic contamination in springs water of the Province of Viterbo with proposal treatments") Supervisor: Prof. Agostina Chiavola Skills: Environmental Engineering, Physics, Chemistry, Structural Mechanics, Hydraulic, Geology, Hydrogeology, Technical Hydrology, Remediation Technologies, Dynamics of pollutants, Supplying Water Treatment plants, Wastewater Treatment plants, Urban Planning, Applied Ecology
Master University graduation	2010-2012	Sapienza University of Rome	**Master's degree in Engineering for Construction and Environmental Systems** Final mark: 110/110 *cum laude* Thesis title: "Analisi del potenziale eolico nella zona del centro Italia con l'utilizzo di modelli meteorologici ad area limitata per lo sfruttamento del microeolico" ("Analysis of wind potential in the area of central Italy using limited area meteorological models for the exploitation of micro Eolic") Supervisor: Prof. Paolo Monti Skills: Urban Climatology, Hydraulic Engineering, Environmental Hydraulics, Geological Risk, Soil Mechanics and Foundations, Structural Engineering, Environmental and urban planning, Urban Planning Design complements,

			Photogrammetry and digital Cartography, 3D Modeling, Complements of architectural design, Technical, Environmental Hygiene, Technical Architecture and Environmental Sustainability, Wastewater Treatment plants, Technologies for the Remediation of Soil and Groundwater
Qualification for the profession of engineering	2013	Professional Order of Engineers of the Province of Rome	**Member of the Professional Order of Engineers of the Province of Rome**, no. 34582 sector A
Licensed for prevention and protection service manager	2013	Sapienza University of Rome	**Professional qualification of RSPP** - Prevention and Protection Service Manager
PhD	2012-2015 (defended on 12 July 2016)	Sapienza University of Rome	**Ph.D. in Environmental and Hydraulic Engineering - XXVIII Cycle** Final mark: Excellent Thesis title: "Water-channel study of flow and turbulence in urban canopies" Supervisor: Prof. Paolo Monti Skills: Experimental research activity aimed at the laboratory-scale reproduction of urban boundary layer (in conditions of neutral atmospheric stability) and urban canopies with complex geometry. The objective of the study is to investigate the turbulent parameters and the dispersion of passive tracers, comparable to air pollutants, within and above street canyons. The results have also been used as input for three-dimensional Lagrangian numerical models.

Part IIb – Training Courses

Year	Course
2014	IAHR 2014 Gerhard Jirka Summer School on Environmental Fluid Mechanics: Modelling and its role in sustainable development (Hong Kong)
2019	Short course on WRF Modelling for wind energy applications (Cagliari, Italy)
2023	Summer School Solar Radiation Based Established Techniques for Atmospheric Observations (SORBETTO) (Rome, Italy)

Part III – Appointments

Part IIIa – Academic Appointments

Start	End	Institution	Position
11/2012	10/2015	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Member of the Department of Civil, Constructional and Environmental Engineering Council** (Consiglio di Dipartimento) as Ph.D. representative
10/2015	09/2016	Polytechnic University of Bari, Department of Civil, Environmental, Land, Building Engineering and Chemistry	**Post-doctoral fellowship (Assegno di Ricerca) - 1 year** Supervisor: Prof. Michele Mossa Skills and research topics: Field campaigns and numerical simulations of the meteorological, wave, and sea circulation fields in the Mar Piccolo (Italy) region. Mesoscale meteorological fields

			were simulated through the CALMET diagnostic model.
02/2017	03/2017	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Senior research scholarship (Borsa di Ricerca Senior) - 2 months** Supervisor: Prof. Paolo Monti Skills and research topics: Experimental analysis of momentum and mass fluxes through image analysis techniques, such as Feature Tracking and Particle Image Velocimetry on two-dimensional urban canopies.
10/2017	05/2019	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Post-doctoral fellowship (Assegno di Ricerca) - 19 months** Supervisor: Prof. Paolo Monti Skills and research topics: Design and management of in situ measurement campaigns for the study of turbulence and particulate dispersion in the urban context; installation and management of anemological and micrometeorological instruments for the study of outdoor and indoor environments; analysis of meteorological data on micro and mesoscale; laboratory activity aimed at investigating the turbulence field and dispersion of passive tracers in urban environments; creation of scale models of two- and three-dimensional urban canopies with different geometric configurations for the experimental activity; numerical simulations using CFD codes for the reconstruction of the outdoor and indoor turbulence field.
06/2019	05/2024	Sapienza University of Rome, Physics Department	**Non–tenure Assistant Professor (RTDa)** Supervisors: Prof. Marco Cacciani (06/2019-01/2022), Prof. Anna Maria Siani (02/2022-05/2024) Skills and research topics: Work package leader and contact person for the BAQUNIN (Boundary-layer Air Quality-analysis Using Network of Instruments) project, for the calibration and validation of atmospheric satellite products using remote sensing instruments installed at the Atmospheric Physics Laboratory of the Physics department; scientific responsibility of the Atmospheric Physics Laboratory; data analysis from in-situ observations, columnar and vertical profiles of thermodynamic, meteorological and air quality variables; design and management of atmospheric measurement campaigns; data collection and data analysis; study of climate and air quality in urban environments through remote sensed observations; analysis of extreme climate events in the Mediterranean region; atmospheric characterization in a remote arctic environment.
06/2019	Present	Sapienza University of Rome and University of L'Aquila	**Member of the Didactic Area Council (CAD)** in Atmospheric Science and Technology for Meteorology & Climate
10/2022	Present	Ministry for Universities and Research (MUR)	**Italian National Scientific Qualification for associate professor for the sector 02/C1**:

			Astronomy, Astrophysics, Physics of the Earth and Planets
11/2022	10/2023	Sapienza University of Rome, Physics Department	**Supervisor of research fellowship (Assegno di Ricerca) - 1 year** Research topic: design, assembly and management via tailored software of a prototype LIDAR system for the measurement of vertical profiles of aerosol optical properties, water vapor and carbon dioxide in the atmosphere.
02/2024	05/2024	Sapienza University of Rome, Physics Department	**Supervisor of research fellowship (Assegno di Ricerca) - 18 month** Research topic: study of the interaction between urban heat island and urban pollution island in Rome and in its rural surrounding area.
06/2024	Present	Sapienza University of Rome, Physics Department	**Post-doctoral fellowship (Assegno di Ricerca) - 12 months** Supervisor: Prof. Anna Maria Siani Skills and research topics: study of the atmospheric boundary layer through ground-based active and passive remote sensing techniques for the investigation of the physical phenomena characterizing the atmosphere in an urban environment

Part IIIb – Participation in Ph.D. activities

Start	End	Institution	Role
01/2019	10/2022	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Member of the Advisory Committee** of the Ph.D. student Alejandro Testa, Ph.D. in Information and Communications Technologies (ICT) of Sapienza University of Rome, Radar and Remote Sensing curriculum, XXXV cycle.
11/2020	10/2024	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Supervisor of Ph.D. student** Mattia Pecci. Ph.D. in Information and Communications Technologies (ICT), curriculum Radar and Remote Sensing, XXXVI cycle. The research activity of the Ph.D. student concerned the integrated use of satellite products and in-situ measurements for the study of CO_2 flows at the sea/atmosphere interface in the central Mediterranean.
11/2021	present	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Supervisor of Ph.D. student** Annachiara Bellini. Ph.D. in Information and Communications Technologies (ICT), curriculum Radar and Remote Sensing, XXXVII cycle. The research activity of the Ph.D. student concerns the study of the retrieval of aerosol properties from Automated Lidar-Ceilometers (ALC) and the evaluation of potential synergies with other active and passive remote sensing measurements and modeling tools to maximize the exploitation of ALC data.
11/2021	present	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Member of the Advisory Committee** of the Ph.D. student Marianna Angrisani. Ph.D. in Information and Communications Technologies (ICT) of Sapienza University of

			Rome, Radar and Remote Sensing curriculum, XXXVII cycle.
07/2021	11/2021	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Member of the Commission for access to the PhD in Information and Communications Technologies (ICT)** of Sapienza University of Rome, XXXVII cycle.
11/2022	present	Sapienza University of Rome, Department of Information Engineering, Electronics and Telecommunications	**Member of the Advisory Committee** of the Ph.D. student Francesco Romeo. Ph.D. in Information and Communications Technologies (ICT) of Sapienza University of Rome, Radar and Remote Sensing curriculum, XXXVIII cycle.
01/2023	05/2023	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Member of the final exam Commission** for the Doctorate in Environmental and Hydraulic Engineering of Sapienza University of Rome, XXXV cycle, in cooperation with Ecole Centrale de Lyon.

Part IIIc – Third mission activities

Start	End	Institution	Role
03/2022	present	Sapienza University of Rome, Physics Department	**Collaboration in the organization of World Meteorological Day (GMM)**
01/2024	present	Sapienza University of Rome, Physics Department	**Co-tutor of the activities of the Path for Transversal Skills and Orientation (PCTO)** with the involvement of about 40 students. Project: Non perdiamo il "Tempo": adotta una serie storica di dati meteorologici di Roma (Let's not waste "Time": adopt a historical series of meteorological data from Rome)

Part IV – Teaching experience

Period	Institution	Lecture/Course
11/2014 - present	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Supervisor of Master's thesis** for 15 students in Civil and Environmental Engineering **Supervisor of Bachelor's thesis** for 10 students in Civil and Environmental Engineering
02/2017 – 05/2019	Sapienza University of Rome, Department of Civil, Constructional and Environmental Engineering	**Tutor** of the experimental activities for the course **Urban Climatology**. Lecturer: Prof. Paolo Monti Master's Degree program in Civil and Environmental Engineering
06/2019 – 01/2021	Sapienza University of Rome, Physics Department	**Co-lecturer** for the course **Laboratory of Atmospheric Physics (4 CFU)** Co-lecturer: Prof. Marco Cacciani Master's Degree program in Atmospheric Science and Technology for Meteorology & Climate
06/2019 – 01/2022	Sapienza University of Rome, Physics Department	**Co-lecturer** for the course **Introduction to Atmospheric Physics (2 CFU)** Co-lecturer: Prof. Marco Cacciani Bachelor's Degree program in Physics
06/2019 - present	Sapienza University of Rome, Physics Department	**Supervisor of Master's thesis** for 1 student in Physics **Supervisor of Bachelor's thesis** for 13 students in Physics

06/2019 - present	Sapienza University of Rome, Physics Department	**Member of 7 Master's degree commissions** in Physics and Astronomy and Astrophysics **Member of 3 Bachelor's degree commissions** in Physics
02/2021 – 05/2024	Sapienza University of Rome, Physics Department	**Lecturer** for the course **Laboratory of Atmospheric Physics (6 CFU)** Master's Degree program in Atmospheric Science and Technology for Meteorology & Climate
05/2023 – 05/2024	Sapienza University of Rome, Physics Department	**Co-lecturer** for the course **Observational and modeling techniques for the study of the atmosphere and climate** of the Bachelor's Excellence Program in Physics Co-lecturers: Prof. Anna Maria Siani, Dr. Monica Campanelli, Dr. Serena Falasca
01/2024 – 04/2024	University of Salento, Department of Biological and Environmental Sciences and Technologies	**Supervisor of Level II Master's thesis** in "Meteorology and physical oceanography" for 1 student

Part V – Scientific Society memberships

Year	Title
2021 - present	Associate member of the Italian Association of Atmospheric Sciences and Meteorology (AISAM)
2022 - present	Member of the Coast Action CA21119 - International network for harmonization of atmospheric aerosol retrievals from ground based photometers (Harmonia)
2023 - present	Associate member of the Italian Physical Society (SIF)
2024 - present	Associate member of the European Geosciences Union (EGU)

Part VI - Funding Information

Part VIa - Funding Information: Grants as PI

Year	Title/Research Program	Program/Provider	Grant value
2014	**Experimental analysis of concentration fields within two-dimensional and three-dimensional urban canopies** The objective of the project is the laboratory-scale investigation of dispersion fields within and above two- and three-dimensional urban canopies under neutral atmospheric conditions.	Research Start-up Projects - Sapienza Research Calls	
2019	**Seagull Borne Atmospheric Measurements (SBAM)** The objective of the project is the development of low-cost sensors transportable by free-flying birds, such as seagulls and pigeons, for real-time measurement of air temperature, relative humidity, atmospheric pressure, and CO_2 concentration in the atmosphere.	Medium Research Project - Sapienza Research Calls	
2023	The collaboration aims at the experimental and numerical simulation of the current state and future scenarios, selected based on emission scenarios defined by the Intergovernmental Panel on Climate Change, for the assessment of geo-hydrological risk on railway infrastructures for specific geographical areas. Co-PI with Dr. Serena Falasca	Enser Srl	
2023	**uRban hEat and pollution iSlands inTerAction in Rome and possible miTigation strategies**	PRIN2022 - Ministry for Universities and	(for Sapienza

	(RESTART) The objective of the project is the study of the connection between Urban Heat Island and Urban Pollution Island in Rome (Italy), offering a series of mitigation strategies, including nature-based solutions and ready-to-use guidelines for improving well-being and liveability in urban environments.	Research	Research Unit)

Part VIb - Funding Information: Grants as Responsible of Local Research Unit

Year	Title/Research Program	Program/Provider	Grant value
2019	**Clouds and radiation in the Arctic and Antarctica (CLARA2**) The project intends to investigate and quantify the role of clouds on the surface radiation balance, giving particular emphasis to measurements of atmospheric vertical structure and the role of liquid clouds in the Arctic environment.	PNRA2018 - Ministry for Universities and Research	(for Sapienza Research Unit)
2020	**Effects of Changing Albedo and Precipitation on the Arctic Climate (ECAPAC)** The project aims to evaluate how the variability of precipitation and the consequent effects on snow and ice cover trigger the complex feedback mechanisms that link surface albedo to atmospheric and surface temperature, leading to sudden changes in the Arctic climate.	PRA2019 - Ministry for Universities and Research and Ministry of Economic Development	(for Sapienza Research Unit)
2021	**Compact Raman Lidar for measuring thermodynamic profiles and CO2 in the atmosphere (CONCERNING)** The project aims to develop a compact and transportable Raman LIDAR prototype system for the measurement of atmospheric vertical profiles of the optical properties of aerosols, water vapor and CO_2.	FISR2019 - Ministry for Universities and Research	(for Sapienza Research Unit)
2022	**Boundary layer Air Quality-analysis Using Network of Instruments (BAQUNIN)** The project aims to support the activities of the BAQUNIN observatory for the monitoring of meteorological parameters and air pollutants through active and passive ground-based remote sensing instruments.	European Space Agency (ESA) and European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)	
2022	**Quality Assurance for Earth Observation (QA4EO)** WP 2186: On-site maintenance and operations of sky cameras for CMIX. WP 2320: On-site hosting, maintenance and operations of PREDE-POM at APL site. WP 2364: Improved AOD@440nm - APL Instrument hosting and maintenance. WP 2382: Data provision for testing the cloud algorithm: CIMEL and Pandora from La Sapienza, Rome. The project concerns the calibration and validation of satellite data through ground-based remote sensing measurements.	European Space Agency (ESA)	

Part VIc - Funding Information: Grants as Member

Year	Title/Research Program	Program/Provider	Grant value

2017	Integrated Evaluation of Indoor Particulate Exposure (VIEPI)	INAIL	(for Sapienza Research Unit)
2022	Highly resolved characterization of the urban boundary layer by means of numerical simulations and observations (GREENBELT)	Sapienza Research Calls - Small Research Project	
2023	Sapienza NanoOptical Microscopy (SNOM)	Sapienza Research Calls - Large Equipment Project	
2023	Challenges and opportunities to monitor climate change impacts in the Rome urban area: a multi-scale approach.	Sapienza Research Calls - Large Research Project	

Part VII – Research Activities, Scientific Responsibilities and Collaborations, Editorial Activity

Part VIIa – Main Research Activities

Topic	Activity
Ground-based remote sensing observations	In recent years, my research activity has focused on the use of ground-based observations to study atmospheric physical-chemical processes. I achieved an in-depth knowledge of active and passive remote sensing instruments for atmospheric monitoring (such as LIDAR, SODAR, ceilometers, sun/moon/sky photometers, spectrometers, weather and air quality stations, pyranometers, radiometers, etc) mainly thanks to the involvement in the activities of the Boundary layer Air Quality-analysis Using Network of Instruments (BAQUNIN) observatory. BAQUNIN is an atmospheric super-site with three locations, chosen according to the level of urbanization in downtown Rome and in its semi-rural and rural surroundings. The Physics Department of Sapienza hosts most of the supersite's instrumentation, collecting surface and columnar observations of meteorological variables, optical properties of aerosols, clouds and trace gases since 2017. Since 02/2022 I have been the contact person and the scientific manager on the Sapienza side of BAQUNIN. In this project, I am directly involved in the software development for SODARs and wind profilers, in the design and execution of measurement campaigns with national and international partners, and in the development and test of LIDARs. Moreover, I synergistically exploit data collected by different instruments to study the physical-chemical processes characterizing the urban atmosphere. Furthermore, the availability of data collected in the urban, semi-urban and rural sites allows us to compare meteorological (e.g., ventilation, temperature, humidity) and air quality (e.g., surface and columnar measurements of aerosols, NO, NO_2, C_6H_6, CO_2) characteristics in areas with different anthropogenic footprint. Among the various topics, ground-based observations have been used to investigate the effect of the sea breeze regime on the optical properties of aerosols and trace gases, the interaction of the sea breeze with the urban area of Rome, the impact of synoptic meteorological conditions on air quality in Rome, the effect of the lockdown on the atmospheric composition, the spatial-temporal variation of trace gases also comparing ground-based observations and satellite products, and the evaluation of different calibration procedures for specific instruments. As demonstrated by 10+ scientific articles published in international journals, atmospheric observations guarantee a fundamental ground truth, also for the calibration of satellite atmospheric products and for the validation of numerical

	outputs.
Urban climatology	Urban areas represent nowadays only 1.2% of land surfaces but they host about 55% of the global population, with a percentage of inhabitants expected to constantly increase. Therefore, the study of urban atmospheric conditions or, more generally, urban climatology, is a topic of primary importance, as it directly impacts on society, the population, and the environment. In fact, the presence of built areas alters energy budget, moisture, ventilation, and pollutants dispersion. Furthermore, the Urban Heat Island (UHI) and the Urban Pollution Island (UPI) are among the phenomena mostly affecting urban areas. The former describes the higher atmospheric warming in densely populated areas compared to rural surroundings, primarily due to the large extent of built-up surfaces, like concrete and asphalt, with greater heat capacity and lower evapotranspiration rates compared to natural surfaces. The latter defines the higher concentration of harmful atmospheric substances in the city compared to its rural surroundings. The interconnection between UHI and UPI is now accepted by the scientific community, but the cause-effect relationships are not clear and there is no univocal procedure for their determination. Therefore, these aspects require further investigation. In this line of research, my contribution has mainly concerned the relationship between sea/land breeze regime and characteristics of air pollutants both from an observational and numerical point of view, the influence of regional and synoptic atmospheric circulation patterns on urban ground-level pollution, and the temporal characterization of UPI through in-situ measurements of particulate matters and trace gases, also focusing on the interaction between UPI and UHI.
Extreme temperature events	In the context of the ongoing climate change, extreme weather events are becoming increasingly frequent, intense, and long-lasting. This does not happen homogeneously throughout the world but is more evident in areas recognized as climate change *hot-spots*, such as the Mediterranean Basin and, therefore, Italy. In this context, my research focuses on the study of extreme temperature events (such as heat waves, winter warm spells, and cold waves), being among the extreme meteorological phenomena most impacting on dwellers, outdoor well-being, and the economy and which, therefore, require specific regional studies. The objective evaluation of extreme temperature events is carried out by applying climate indices provided by the international scientific community, focusing on the Italian Peninsula and the Mediterranean Basin, and investigating the atmospheric circulation patterns that determine the onset of such events. The studies, based on the analysis of historical series of meteorological observations, allow us to assess the intensity of climate change and, therefore, support the stakeholders and the scientific community for designing tailor strategies for adaptation and mitigation of climate change.
Laboratory-scale turbulence and dispersion	During my first period of research at the Department of Civil, Construction and Environmental Engineering of Sapienza, my activity focused on the laboratory-scale reproduction of neutral atmospheric boundary layer. Under these conditions, replicated ensuring dynamic and geometric similarity with reality, the main parameters of turbulence and passive dispersion in correspondence with two-dimensional and three-dimensional urban canopies with different geometric configurations were investigated. The experiments were conducted using cutting-edge procedures, involving high resolution synchronized cameras (500 Hz), and image analysis techniques (e.g., Feature Tracking, Particle Tracking Velocimetry and Particle Image Velocimetry). My contribution concerned the formal definition of research objectives and of the optimal methodologies to achieve the set purposes, the design of laboratory-scale measurement campaigns, the creation of models of idealized and realistic urban canopies (e.g., reproducing the Campus of Sapienza University of Rome and various districts of Bologna), directly carrying out the experiments, the creation of codes for data analysis, the analysis of the datasets, and writing scientific

	articles. The activities I conducted made it possible to obtain high spatial resolution results, fundamental inputs for numerical dispersion models. The outcomes achieved in this line of research, demonstrated by more than 10 articles in leading international journals, include: detailed reconstruction of the turbulence (e.g., momentum flux, terms of the turbulent kinetic energy balance equation, Lagrangian and Eulerian time and spatial scales of turbulence) and dispersion (average and fluctuating components of concentration, mass fluxes, Schmidt number) fields.

Part VIIb – Scientific Responsibilities

Period	Activity
02/2022-present	Responsible for teaching and research activities (RADL) in the Laboratory of Atmospheric Physics at the Physics Department of Sapienza University of Rome. The main research activities concern the development of active and passive ground-based remote sensing instruments, such as LIDAR and SODAR and the collection of chemical and thermodynamic data for the characterization of the atmospheric boundary layer and for calibration/validation of satellite products.
02/2022-present	Scientific responsibility for Sapienza University of Rome of the BAQUNIN (Boundary-layer Air Quality-analysis Using Network of Instruments, www.baquin.eu) super-site. The activities of the observatory are aimed at monitoring meteorological parameters and atmospheric pollutants through active and passive ground-based remote sensing instruments.

Part VIIc – Main National and International Collaborations

Period	Partner	Activity
10/2015-02/2020	Polytechnic University of Bari, CNR-ISMAR	Design of measurement campaigns and numerical simulations of meteorological, wave, and circulation fields in the Mar Piccolo (Taranto, Italy) region. I was involved in meteorological measurement campaigns and in numerical simulations of the mesoscale meteorological field through the CALMET diagnostic model.
06/2016-12/2021	INAIL, ISPRA, CNR-IIA	Study of the correlation between atmospheric particulate measurements and microclimatic conditions in indoor environments to understand the implications related to occupational exposures. Specifically, I was involved in micrometeorological measurement campaigns and in carrying out numerical simulations using fluid dynamics models with comparison with outdoor meteorological measurements to evaluate the wind field and thermodynamic conditions.
06/2019-present	CNR-IIA, CNR-ISAC, SERCO Italia	Study of the influence of synoptic meteorological conditions on the concentration and composition of atmospheric particulate matter measured by in-situ air quality monitoring stations in urban and rural contexts.
06/2019-present	INGV, ENEA, University of Firenze, NCAR	Study of the atmospheric characteristics in a polar environment, thanks to the measurements collected at the Thule High Arctic Atmospheric Observatory (THAAO) in Greenland.
06/2019-present	LuftBlick Earth Observation Technologies, University of Innsbruck, SERCO Italia	Development and test of remote sensing instruments for monitoring atmospheric constituents and greenhouse gases, such as NO_2, O_3, and water vapour. Specifically, instruments developed by LuftBlick and hosted by BAQUNIN in Rome allow for the assessment of atmospheric composition in sites with different urbanization levels.
11/2019-present	University of L'Aquila,	Numerical simulations of the daily evolution of thermodynamic quantities in complex terrain conditions using the Weather and

	CETEMPS, CIMA Fondation, Sapienza University of Rome, ENEA	Research Forecasting (WRF) model, varying the physical and thermal properties of urban materials. In particular, the collaboration concerns the analysis of the interaction between synoptic and mesoscale circulation in a coastal urban environment (Rome).
03/2020-present	NASA, ESA/ESRIN, SERCO Italia	Hosting at the BAQUNIN atmospheric observatory of all-sky cameras dedicated to the observation of the sky for the determination of cloud coverage and the clouds base/top altitudes.
09/2020-present	Universidad de Granada, Universidad de Málaga, CNR-IMAMOTER, School of Advanced Studies Sant'Anna	Study of soil erosivity in relation to severe meteorological events, with particular attention to the effects on agriculture, through numerical modeling and comparison with time series collected in experimental vineyards in northern Italy.
12/2020-present	University of Basilicata, CNR-IMAA, CNR-ISMAR	Development of a compact Raman LIDAR prototype system for the measurement of thermodynamic profiles and CO_2 in the atmosphere, focusing on the design and development of optical components, on the development of software for remote management of the system, and on the design and implementation of an automated scanning system for measurement in the atmosphere at different zenith and azimuthal angles.
02/2021-present	University of Leicester, SERCO Italia	Numerical simulation of LIDAR systems for the study of the atmospheric aerosols optical properties, in comparison with ground-based measurements.
02/2022-present	ESA/ESRIN, CNR-ISAC, CNR-IIA, SERCO Italia, ARPA Valle d'Aosta, Sardegna Clima Onlus	Management of the remote sensing instrumentation belonging to the BAQUNIN super-site installed at the Physics Department of Sapienza University of Rome and in the two sites located in semi-rural and rural environments near Rome. Development of advanced software for the study of the peculiarities of the atmosphere and the analysis of quality checked data, useful to the scientific community and stakeholders.
05/2023-present	Royal Belgian Institute for Space Aeronomy, ESA/ESRIN, SERCO Italia	Development and test of a prototype camera with high spatial-temporal resolution capable of reconstructing two-dimensional NO_2 fields.
11/2023-present	PMOD-WRC, Institute for Environmental Research & Sustainable Development, National Observatory of Athens, CNR-ISAC, SERCO Italia	Development of algorithms for the elimination of clouds from the datasets of the Davos, Rome, and Athens stations for the optimization of the calculation of trace gases and aerosols optical properties.
11/2023-present	University of Bologna, CNR-ISAC	Study of the interaction between urban heat island and urban pollution island in Rome (Italy) offering a series of mitigation strategies including nature-based solutions and ready-to-use guidelines for improvement of well-being and liveability in urban environments.
01/2024-present	Norwegian University of Science and Technology,	Study of key themes related to urban climate and microclimate (such as buildings and their interiors) in the Mediterranean Basin, i.e., a region very sensitive to climate change, choosing

	University of L'Aquila, ARPA Valle d'Aosta, CNR-ISAC	the metropolitan area of Rome as a case study.

Part VIId – Editorial Activity

Period	Role
2016-present	External reviewer for the following international journals: Science of the Total Environment, Urban Science, Monthly Weather Review, Quarterly Journal of the Royal Meteorological Society, Environmental Fluid Mechanics, Pure and Applied Geophysics, Advances in Meteorology, Bulletin of Atmospheric Science and Technology, Energies, Atmosphere, Remote Sensing, Toxics, Sensors, Applied Sciences, Fluids, Meteorological Application, Photonics, Sustainability, Agriculture, Healthcare, Photonics, Water, International Journal of Environmental Research and Public Health, Journal of Building Engineering, JGR: Atmospheres, Frontiers in Environment
2020-2021	Co-guest Editor of the Special Issue "Turbulent Flow Simulations" on the international journal Energies (ISSN: 1996-1073, Impact Factor: 3.0)
2021-present	Member of the Editorial Board of the international journal Frontiers in Environmental Engineering (Air Pollution Management section)
2022-2023	Co-guest Editor of the Special Issue "Challenges in Modeling and Observing Urban Environments: Recent Trends, Current Progress and Future Directions" on the international journal Atmosphere (ISSN: 2073-4433, Impact Factor: 2.5)
2024-present	Co-guest Editor of the Special Issue "Urban Air Quality and Microclimate: Observations and Measurements" on the international journal Atmosphere (ISSN: 2073-4433, Impact Factor: 2.5)

Part VIII – Conferences, Workshops and Seminars

Part VIIIa – Organization of national and international conferences

- **Member of the Scientific Committee** of the 4th National Congress of the Italian Association of Atmospheric Sciences and Meteorology (AISAM). 01/06/2021-19/02/2022, Milan, Italy.
- **Co-chair** of the session "PROCESSES: Physical and chemical processes in the atmosphere, from the synoptic scale to the micrometeorological scale" at the 4th AISAM National Congress 2022. 15-19/02/2022, Milan, Italy.
- **Member of the Organizational Committee** of the International Winter School SOlar Radiation Based Established Techniques for aTmospheric Observations (SORBETTO). 02/06/2023 - 02/10/2023, Rome Italy.
- **Member of the Judging Committee** for the awards as Best Oral Presentation and Best Poster at the 9th International Conference on Meteorology and Climatology of the Mediterranean METMED 2023. 22-24/05/2023, Genova, Italia.
- **Co-chair** of the session "Extreme Events: Observations and Modeling" at the EGU General Assembly 2024. 14-19/04/2024, Vienna, Austria.
- **Judge for the Outstanding Student and PhD candidate Presentation (OSPP) contest** at the EGU General Assembly 2024. 14-19/04/2024, Vienna, Austria.
- **Technical-scientific organization** of the annual Project Review Meetings within the BAQUNIN project. 02/2022-present, Rome, Italy.

Part VIIIb – Invited talks

- Environmental Meteorology Seminars at the University of Trento. 24/06/2021, Trento, Italy.
  Contribution: *"Laboratory study of Lagrangian and Eulerian time scales of the turbulence over flat terrain and urban canopies"*
- 109th Congress of the Italian Physics Society. 11-15/09/2023, Salerno, Italy.
  Contribution: "*The Boundary-layer Air Quality-analysis Using Network of Instruments (BAQUNIN) supersite for atmospheric research and satellite validation over Rome area*"

Part VIIIc – Contributions to national and international conferences

- 16th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes. 08-11/09/2014, Varna, Bulgaria.
  Contribution (poster): *"A laboratory investigation of flow and turbulence over a twodimensional urban canopy"*
- 2016 IEEE Workshop on Environmental, Energy, and Structural Monitoring Systems. 13-14/06/2016 Bari, Italia.
  Contribution (oral): *"Micrometeorological simulations over a coastal area using CALMET model"*
- 2016 IEEE Workshop on Environmental, Energy, and Structural Monitoring Systems. 13-14/06/2016 Bari, Italia.
  Contribution (oral): *"Semi enclosed basin monitoring and analysis of meteo, wave, tide and current data"*
- 18th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes. 09-12/10/2017, Bologna, Italia.
  Contribution (oral): *"Lagrangian time scales within a two-dimensional urban canyon"*
  Contribution (poster): *"Experimental investigation of turbulence and dispersion around an isolated cubic building"*
  Contribution (poster): *"Performances of parametric laws for computing the wind speed profile in the urban boundary layer. Comparison to three-dimensional building water channel experiment"*
- 15th International Conference on Atmospheric Sciences and Applications to Air Quality. 28-30/10/2019, Kuala Lumpur, Malesia.
  Contribution (oral): *"Numerical and experimental analysis of flow and particulate matter dispersion in indoor environment"*
- EGU General Assembly 2020. 04-08/05/2020, virtual.
  Contribution (poster): *"Effect of sea breeze regime on aerosol optical properties over the city of Rome, Italy"*
- 4th National Congress of the Italian Association of Atmospheric Sciences and Meteorology (AISAM). 15-19/02/2022, Milan, Italy.
  Contribution (poster): *"Monitoraggio atmosferico della CO_2 attraverso sensori wearable applicati a colombi in città"*
  Contribution (poster): *"Il super sito BAQUNIN (Boundary-layer Air Quality analysis Using Network of Instruments) per la ricerca atmosferica e la validazione dei dati satellitari sull'area di Roma"*
- International Radiation Symposium IRS 2022. 04-08/07/2022, Salonicco, Greece.
  Contribution (oral, co-author): *"The Boundary-layer Air Quality-analysis Using Network of INstruments Supersite for Atmospheric Research and Satellite Validation"*
  Contribution (oral, co-author): *"Arctic cloud properties retrievals from UV-VIS-NIR data at the THAAO observatory, Thule, Greenland"*
  Contribution (poster, co-author): *"Surface radiation budget at the Thule High Arctic Atmospheric Observatory, Greenland"*
  Contribution (poster, co-author): *"A new parametrizations of clear-sky downward longwave irradiance for the Artic environment"*
- EGU General Assembly 2023. 23-28/04/2023 Vienna, Austria.
  Contribution (oral, co-author): *"Performance Simulation and Preliminary Measurements of a Raman Lidar for the Retrieval of CO2 Atmospheric Profiles"*
  Contribution (poster, co-author): *"Several months of continuous operation of two thermodynamic Raman lidars in the frame of WaLiNeAs"*
- 9th International Conference on Meteorology and Climatology of the Mediterranean METMED 2023. 22-24/05/2023, Genova, Italia.
  Contribution (oral): *"Heatwaves in Rome (Italy) during summer 2022: interaction with sea breeze, urban heat island, and thermo-hygrometric comfort"*
  Contribution (poster): *"How have temperature and atmospheric constituents changed in the Rome area (Italy) during the last two decades?"*
  Contribution (poster): *"The Boundary-layer Air Quality-analysis Using Network of INstruments Supersite (BAQUNIN) for atmospheric research and satellite validation"*

Contribution (poster): *"CO_2 monitoring through pigeon-borne miniaturized sensors: the case study of Rome (Italy)"*
Contribution (poster, co-author): *"A new framework for the identification and characterization of thermo-hygrometric stress events"*

- 15th International Symposium on Particle Image Velocimetry – ISPIV 2023. 19-21/06/2023, San Diego, USA.
  Contribution (oral): *"Turbulence Parameters in Stably Strati/fied Flows Over Surface Roughness: a Laboratory Study"*
- National Conference APECS Italy. 08-09/09/2023, Venice, Italy.
  Contribution (oral, co-author): *"Da Thule a Pituffik: breve viaggio attraverso storia, attualità e prospettive di un luogo tutt'altro che mitico della Groenlandia contemporanea"*
- EC-ESA Joint Earth System Science Initiative 2023 Workshop. 22-24/11/2023, Rome, Italy.
  Contribution (oral, co-author): *"Surface radiation fluxes at the Thule High Arctic Atmospheric Observatory, Greenland, and comparison with CERES products"*
- Fourth Joint GSICS/IVOS Lunar Calibration Workshop. 04-08/12/2023, Darmstadt, Germany.
  Contribution (oral, co-author): *"The Skynet network for the retrieval of aerosol properties from the moon irradiance measurements"*
- EGU General Assembly 2024. 14-19/04/2024, Vienna, Austria.
  Contribution (oral): *"Spatial-temporal variation of winter warm spells in Italy over the period 1993-2022"*
  Contribution (oral, co-author): *"Connection among meteorological observations, columnar aerosol properties and urban heat island during nighttime extreme heat events in the framework of the uRban hEat and pollution iSlands inTerAction in Rome and possible miTigation strategies (RESTART) project"*
  Contribution (oral, co-author): *"Urban application of the AOTF-based NO2 camera"*
- 10th International Symposium on Environmental Hydraulics 2024. 25-27/06/2024, Aberdeen, Scotland.
  Contribution (oral, co-author): *"Measurements of turbulence parameters at a density interface"*
- ACTRIS Science Conference 2024. 13-16/05/2024, Rennes, France.
  Contribution (oral, co-author): *"The AOTF-based NO_2 camera: Urban applications"*
- 31st International Laser Radar Conference. 23-28/06/2024, Landshut, Germany.
  Contribution (poster, co-author): *"CO_2 profiles in the lower troposphere using the Raman lidar technique: preliminary results"*
- ATMOS2024. 01-05/07/2024, Bologna, Italy.
  Contribution (oral, co-author): *"The first year of COCCON EM27/SUN operation in Rome"*
- European Meteorological Society Annual Meeting 2024. 02-06/09/2024, Barcelona, Spain.
  Contribution (oral, co-author): *"Comparison of AERO-N/ET and Skynet retrievals under different anemological conditions in the urban site of Rome (Italy)"*
- 18th Plinius Conference on Mediterranean Risks. 30/09-03/10/2024, Chania, Creete.
  Contribution (poster, co-author): *"The uRban hEat and pollution iSlands inTerAction in Rome and possible miTigation strategies (RESTART) project"*
- MedCLIVAR-SISC 2024 Conference. 24-27/09/2024, Lecce, Italy.
  Contribution (poster, co-author): *"WRF simulations with Local Climate Zones to explore the thermo-hygrometric conditions during severe weather events in the urban area of Rome"*
- 4th APOLO Conference: Advancement of POLarimetric Observations: instruments, calibration, and improved aerosol and cloud retrievals. 18-21/11/2024, Kyoto, Japan.
  Contribution (oral, co-author): *"Effect of aerosol optical scattering and absorbing properties on the Urban heat island intensity during summertime in Rome, Italy"*

Part VIIId – Workshops

- Final workshop of the VIEPI project, Indoor/Outdoor Atmospheric Particulate Pollution in Research and University Environments: Chemical, Physical, Biological, Micrometeorological Characterisation. 22/11/2019, Rome, Italy.
  Contribution (oral): *"Micrometeorological characterization in the vicinity of buildings for the determination of infiltrations in confined environments"*

- First European workshop Forecasting Urban Heat Island and Heat-Health related impacts in a climate changing environment and urban adaptation. 05-06/12/2019, Rome, Italy.
  Contribution (oral): *"Laboratory study of flow and pollutant dispersion in urban canopies"*

Part IX – Skills

Part IXa - Informatic skills

Sector	Knowledge
Coding languages	Phyton, Matlab, Fortran
Software	MS Office, AutoCAD, ANSYS Fluent, ENVIMET, CALMET, ArcGis
Graphic	Photoshop, Acrobat, Photomodeler, Surfer, Grapher, Tecplot
Certification	ECDL

Part IXb - Hard skills

Keyword	Brief description
Field campaigns	Design, coordination, management, and execution of measurement campaigns with national and international partners
Atmospheric monitoring instruments	In-depth knowledge of active and passive remote sensing instruments for atmospheric monitoring, working with the instruments of the BAQUNIN observatory (LIDAR, SODAR, ceilometers, sun/moon/sky photometers, spectrometers, weather and air quality station, pyranometers, radiometers, etc)
Data collection and data analysis	Synergistic use of atmospheric data from national and international agencies, creation of complex datasets, extraction of information about the chemical-physical processes characterizing the Earth's atmosphere focusing on atmospheric boundary layer, urban climatology, temporal trend analysis, climate indices, identification, and investigation of extreme climate events
Laboratory management	Management of teaching, research activities, and safety in laboratories through the know-how acquired with the scientific and technical responsibility of the Atmospheric Physics Laboratory at the Physics Department of Sapienza University of Rome
Writing	Draft scientific texts and technical reports thanks to many years of experience in writing scientific articles and project reports

Part IXc - Soft skills

Keyword	Brief description
Leadership	Coordination of research groups, carrying out leadership roles and scientific and technical responsibilities
Time management	Excellent time management, respecting deadlines thanks to the ability to plan work activities also under stressful conditions
Analytical thinking	Ability to process and break down complex information, identifying cause and effect relationships and finding the most appropriate and simple solutions
Problem solving	Self-starter and collaborative teammate, proactive in understanding the root of a problem and work with others to consider a wide range of solutions before deciding how to move forward

Part X – Summary of Scientific Achievements

Product type	Number	Database	Start	End
International papers	36	Scopus	2015	present
International conference proceedings	16	Scopus	2014	present
Book chapters	1	Scopus	2021	present

Period: last 10 years (2014-2024)

Index	Value	Database
Total Impact Factor (in relation to the year of publication)	**142.5**	Scimago Journal & Country Rank
Average Impact Factor	**4.0**	Scimago Journal & Country Rank
Total number of publications	**53**	Scopus
Number of publications on international journals	**36**	Scopus
Total Citations	**388**	Scopus
Average Citations per Product	**7.3**	Scopus
Hirsch (H) index	**11**	Scopus
Normalized H index*	**1.1**	Scopus

*****H index divided by the academic seniority (from the year of the first publication (2014) = 10 years)

Period: year of the first publication (2014) - 2024

Index	Value	Database
Total Impact Factor (in relation to the year of publication)	**142.5**	Scimago Journal & Country Rank
Average Impact Factor	**4.0**	Scimago Journal & Country Rank
Total number of publications	**53**	Scopus
Number of publications on international journals	**36**	Scopus
Total Citations	**388**	Scopus
Average Citations per Product	**7.3**	Scopus
Hirsch (H) index	**11**	Scopus
Normalized H index*	**1.1**	Scopus

*****H index divided by the academic seniority (from the year of the first publication (2014) = 10 years)

From 24/07/2018 to 24/12/2018 the research activity was interrupted due to mandatory maternity leave.
From 04/09/2024 to present the research activity was interrupted due to mandatory maternity leave.

Part XI– Selected Publications

1. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2018) "Pollutant fluxes in two-dimensional street canyons", *Urban Climate*, vol. 24, pp. 80-93. DOI: 10.1016/j.uclim.2018.02.002. Impact Factor (year 2018): 4.0.

My contribution concerned the design of the tailored laboratory setup for the estimation of pollutant fluxes, the creation of laboratory-scaled models of the urban canopies, the conduction of the experiments, the definition of algorithms for data analysis, formal analysis, data production, verification of the results, and writing of the original draft of the paper, with critical revision in collaboration with the co-authors.

2. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2020) "Turbulent Schmidt Number Measurements Over Three-Dimensional Cubic Arrays", *Boundary-Layer Meteorology*, vol. 174(2), pp. 231-250. DOI: 10.1007/s10546-019-00482-z. Impact Factor (year 2020): 2.8.

My contribution concerned the development and design of the methodology used for laboratory experiments, the creation of laboratory-scaled models of the urban canopies, the conduction of the experiments, the definition of algorithms for data analysis, formal analysis, data production and verification of the results obtained and writing of the original draft of the paper, with critical revision in collaboration with the co-authors.

3. **Di Bernardino A**., Monti P., Leuzzi G., Querzoli G. (2020) "Eulerian and Lagrangian time scales of the turbulence above staggered arrays of cubical obstacles", *Environmental Fluid Mechanics*, vol. 20(4), pp. 987-1005. DOI: 10.1007/s10652-020-09736-8. Impact Factor (year 2020): 2.6.

My contribution concerned the design of the tailored laboratory setup for the estimation of Eulerian and Lagrangian time scales of turbulence, the creation of laboratory-scaled models of the urban canopies, the conduction of the experiments, the definition of algorithms for data analysis, formal analysis, data production and verification of the results obtained and writing of the original draft of the paper, with revision in collaboration with the co-authors.

4. **Di Bernardino A.**, Iannarelli A.M., Casadio, S., Mevi G., Campanelli M., Casasanta G., Cede A., Tiefengraber M., Siani A.M., Spinei E., Cacciani M. (2021) "On the effect of sea breeze regime on aerosols and gases properties in the urban area of Rome, Italy", *Urban Climate*, vol. 37, n. 100842. DOI: 10.1016/j.uclim.2021.100842. Impact Factor (year 2021): 7.0.

My contribution concerned the formulation of the research objectives, defining the methodology for identifying the effect of the sea-breeze on the properties of atmospheric aerosols and gases in Rome. I collected and analysed the data, developing dedicated software and verifying the correctness of the results. I wrote the original draft of the paper, which I revised critically with the co-authors.

5. **Di Bernardino A.**, Iannarelli A.M., Casadio S., Perrino C., Barnaba F., Tofful L., Campanelli M., Di Liberto L., Mevi G., Siani A.M., Cacciani M. (2021) "Impact of synoptic meteorological conditions on air quality in three different case studies in Rome, Italy", *Atmospheric Pollution Research*, vol. 12(4), pp. 76-88. DOI: 10.1016/j.apr.2021.02.019. Impact Factor (year 2021): 4.9.

My contribution concerned the formulation of the research objectives, defining the methodology for investigating the relation between synoptic meteorological conditions and air quality levels in selected cases. I collected and analysed the observations, developing dedicated software and validating the results. I wrote the original draft of the paper, which I revised critically with the co-authors.

6. Iannarelli A.M., **Di Bernardino A.**, Casadio S., Bassani C., Cacciani M., Campanelli M., Casasanta G., Cadau E., Diémoz H., Mevi G., Siani A.M., Cardaci M., Dehn A., Goryl P. (2022) "The Boundary-layer Air Quality-analysis Using Network of INstruments (BAQUNIN) supersite for Atmospheric Research and Satellite Validation over Rome area", *Bulletin of the American Meteorological Society*, vol. 103(2), pp. E599-E618. DOI: 10.1175/BAMS-D-21-0099.1. Impact Factor (year 2022): 4.9.

My contribution concerned the formulation of the research objectives, the development of the methodology to achieve the scientific purposes, data collection and analysis, development of algorithms for data analysis, graphing, and storage, and writing the original draft of the paper.

7. **Di Bernardino A.**, Mazzarella V., Pecci M., Casasanta G., Cacciani M., Ferretti R. (2022) "Interaction of the sea breeze with the urban area of Rome (Italy): WRF and WRF-LES simulations compared to ground-based observations", *Boundary Layer Meteorology*, vol. 185(3), pp. 333-363. DOI: 10.1007/s10546-022-00734-5. Impact Factor (year 2022): 4.6.

My contribution concerned the definition of the research objectives and the methodology to be applied, the collection of ground-based meteorological observations for the validation of the numerical outputs, and the writing of the original draft of the manuscript.

8. **Di Bernardino A.**, Iannarelli A.M., Diémoz H., Casadio S., Cacciani M., Siani A.M. (2022) "Analysis of two-decade meteorological and air quality trends in Rome (Italy)", *Theoretical and Applied Climatology*, vol. 149(1), pp. 291-307. DOI:10.1007/s00704-022-04047-y. Impact Factor (year 2022): 3.5.

My contribution concerned the identification of research goals, the formal analysis and the definition of the methodology, the collection of ground-based meteorological and air quality observations, the development of algorithms for data analysis, graphing, and storage, and writing the original draft of the paper.

9. **Di Bernardino A.**, Monti P., Leuzzi G., Querzoli G. (2022) "On the Lagrangian and Eulerian Time Scale of the Turbulence within a Two-Dimensional Array of Obstacles", *Boundary Layer Meteorology*, vol. 184(3), pp. 375-379. DOI: 10.1007/s10546-022-00717-6. Impact Factor (year 2022): 4.6.

My contribution concerned the development and design of the methodology used for laboratory experiments, the creation of laboratory-scaled models of the urban canopies, the conduction of the experiments, the definition of algorithms for data analysis, formal analysis, data production, and writing of the original draft of the paper, with critical revision in collaboration with the co-authors.

10. **Di Bernardino A.**, Falasca S., Iannarelli A.M., Casadio S., Siani A.M. (2023) "Effect of heatwaves on urban sea breeze, heat island intensity, and outdoor thermo-hygrometric comfort in Rome (Italy)", *Urban Climate*, vol. 52, n. 101735. DOI: 10.1016/j.uclim.2023.101735. Impact Factor (year 2023): 6.6.

My contribution concerned the formulation of research goals, the development and design of the methodology for identifying the heatwaves and their effect on sea breeze intensity, urban heat island, and

outdoor thermo-hygrometric stress. Furthermore, I was responsible for designing the algorithms for data analysis, analyzing the data, validating the results, and writing the original draft of the paper.

11. **Di Bernardino A.**, Iannarelli A.M., Casadio S., Pisacane G., Siani A.M. (2023) "Spatial-temporal assessment of air quality in Rome (Italy) based on anemological clustering", *Atmospheric Pollution Research*, vol. 14(2), n. 101670. DOI: 10.1016/J.Apr.2023.101670. Impact factor (year 2023): 4.4.

My contribution concerned the formulation of research goals, the development and design of the methodology for the anemological clustering procedure based on in-situ wind observations and the effect on air quality levels. Moreover, I was responsible for developing ad hoc software, collecting and analysing data, validating the results and writing the original draft of the paper.

12. **Di Bernardino A.**, Iannarelli A.M., Casadio S., Siani A.M. (2024) "Winter warm spells over Italy: Spatial–temporal variation and large-scale atmospheric circulation", *International Journal of Climatology*, vol. 44(4), pp. 1262-1275. DOI: 10.1002/joc.8388. Impact Factor (year 2024): 3.5.

My contribution concerned the identification of the winter warm spells events in Italy, defining the methodology to achieve the objectives of the research. I dealt with data collection and analysis, developing specific algorithms, and interpreting the results. Furthermore, I validated the results and I wrote the original version of the manuscript, revised with the co-authors.

Part XII – Full list of publications

Part XIIa - International papers

1. **Di Bernardino A.,** Monti P., Leuzzi, G., Querzoli, G. (2015) "Water Channel Study Of Flow And Turbulence Past A 2d Array Of Obstacles", *Boundary-Layer Meteorology*, vol. 155, pp. 73-85. DOI: 10.1007/s10546-014-9987-2
2. Amicarelli A., **Di Bernardino, A.**, Catalano, F., Leuzzi, G., Monti, P. (2015) "Analytical Solutions of the Balance Equation for the Scalar Variance in One-Dimensional Turbulent Flows under Stationary Conditions", *Advances In Mathematical Physics*, vol. 2015(1), n. 424827. DOI: 10.1155/2015/424827
3. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2015) "On the effect of the aspect ratio on flow and turbulence over a two-dimensional street canyon", *International Journal of Environment and Pollution*, vol. 58(1-2), pp. 27-38. DOI: 10.1504/IJEP.2015.076581
4. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2017) "Pollutant removal mechanism in two-dimensional street canyons: A laboratory study", *International Journal of Environment and Pollution*, vol. 62(2-4), pp. 291-304. DOI: 10.1504/IJEP.2017.089415
5. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2017) "Water-Channel Estimation of Eulerian and Lagrangian Time Scales of the Turbulence in Idealized Two-Dimensional Urban Canopies", *Boundary-Layer Meteorology*, vol. 165, pp. 251-276. DOI: 10.1007/s10546-017-0278-6
6. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2018) "Pollutant fluxes in two-dimensional street canyons", *Urban Climate*, vol. 24, pp. 80-93. DOI: 10.1016/j.uclim.2018.02.002
7. Nardecchia F., **Di Bernardino, A.**, Pagliaro, F., Monti, P., Leuzzi, G., Gugliermetti, L. (2018) "CFD Analysis of Urban Canopy Flows Employing the V2F Model: Impact of Different Aspect Ratios and Relative Heights", *Advances in Meteorology*, vol. 2018, n. 2189234. DOI: 10.1155/2018/2189234
8. **Di Bernardino A.**, Pelliccioni, A., Monti P., Leuzzi, G., Querzoli, G. (2018) "Evaluation of parametric laws for computing the wind speed profile in the urban boundary layer: Comparison to two-dimensional building water channel data", *International Journal of Environment and Pollution*, vol. 64(1-3), pp. 4-21. DOI: 10.1504/IJEP.2018.10020559
9. **Di Bernardino A.**, Monti P., Leuzzi, G., Querzoli, G. (2020) "Turbulent Schmidt Number Measurements Over Three-Dimensional Cubic Arrays", *Boundary-Layer Meteorology*, vol. 174(2), pp. 231-250. DOI: 10.1007/s10546-019-00482-z
10. De Serio F., Armenio E., Ben Meftah M., Capasso G., Corbelli V., De Padova D., De Pascalis F., **Di Bernardino A.**, Leuzzi G., Monti P., Mossa M., Pini A., Velardo R. (2020) "Detecting sensitive areas in confined shallow basins", *Environmental Modelling and Software*, vol. 126, n. 104659. DOI: 10.1016/j.envsoft.2020.104659
11. **Di Bernardino A**., Monti P., Leuzzi G., Querzoli G. (2020) "Eulerian and Lagrangian time scales of the turbulence above staggered arrays of cubical obstacles", *Environmental Fluid Mechanics*, vol. 20(4), pp. 987-1005. DOI: 10.1007/s10652-020-09736-8

12. Pelliccioni A., Monti P., Cattani G., Bucconi F., Cacciani M., Canepari S., Capone P., Catrambone M., Cusano M., D'Ovidio M.C., De Santis A., **Di Bernardino A.**, Di Menno di Bucchianico A., Di Renzi S., Ferrante R., Gaeta A., Gaddi, R., Gherardi M., Giusto M., Gordiani A., Grandoni L., Leone G., Leuzzi G., L'Episcopo N., Marcovecchio F., Pini A., Sargolini T., Tombolini F., Tofful L., Perrino C. (2020) "Integrated evaluation of indoor particulate exposure: The VIEPI project", *Sustainability*, vol. 12(22), n. 9758. DOI: 10.3390/su12229758
13. Pelliccioni A., Grandoni, L., **Di Bernardino A.** (2021) "Evaluation of Profiles of Standard Deviation of Vertical Wind in the Urban Area of Rome: Performances of Monin–Obukhov Similarity Theory Using Different Scaling Variables", *Sustainability*, vol. 13(15), n. 8426. DOI: 10.3390/su13158426
14. **Di Bernardino A.**, Iannarelli A.M., Casadi, S., Mevi G., Campanelli M., Casasanta G., Cede A., Tiefengraber M., Siani A.M., Spinei E., Cacciani M. (2021) "On the effect of sea breeze regime on aerosols and gases properties in the urban area of Rome, Italy", *Urban Climate*, vol. 37, n. 100842. DOI: 10.1016/j.uclim.2021.100842
15. **Di Bernardino A.**, Iannarelli A.M., Casadio S., Perrino C., Barnaba F., Tofful L., Campanelli M., Di Liberto L., Mevi G., Siani A.M., Cacciani M. (2021) "Impact of synoptic meteorological conditions on air quality in three different case studies in Rome, Italy", *Atmospheric Pollution Research*, vol. 12(4), pp. 76-88. DOI: 10.1016/j.apr.2021.02.019
16. Salvadori L., Badas M.G., **Di Bernardino A.**, Querzoli G., Ferrari S. (2021) "A street graph-based morphometric characterization of two large urban areas", *Sustainability*, vol. 13(3), n. 1025. DOI: 10.3390/su13031025
17. Salvadori L., **Di Bernardino A.**, Querzoli G., Ferrari S. (2021) "A novel automatic method for the urban canyon parametrization needed by turbulence numerical simulations for wind energy potential assessment", *Energies*, vol. 14(16), n. 4969. DOI: 10.3390/en14164969
18. Campanelli M., Iannarelli A.M., Mevi G., Casadio S., Diémoz H., Finardi S., Dinoi A., Castelli E., di Sarra A.G., **Di Bernardino A.**, Casasanta G., Bassani C., Siani A.M., Cacciani M., Barnaba F., Di Liberto L., Argentini S. (2021) "A wide-ranging investigation of the COVID-19 lockdown effects on the atmospheric composition in various Italian urban sites (AER–LOCUS)", *Urban Climate*, vol. 39, n. 100954. DOI: 10.1016/j.uclim.2021.100954
19. Gaeta A., Leone G., Di Menno di Bucchianico A., Cusano M., Gaddi R., Pelliccioni A., Reatini M.A., **Di Bernardino A.**, Cattani G. (2021) "Spatio-temporal modeling of small-scale ultrafine particle variability using generalized additive models", *Sustainability*, vol. 14(1), n. 313. DOI: 10.3390/su14010313
20. Calì Quaglia F., Meloni D., Muscari G., Di Iorio T., Ciardini V., Pace G., Becagli S., **Di Bernardino A.**, Cacciani M., Hannigan J.W., Ortega I., di Sarra A.G. (2022) "On the Radiative Impact of Biomass-Burning Aerosols in the Arctic: The August 2017 Case Study", *Remote Sensing*, vol. 14(2), n. 313. DOI: 10.3390/rs14020313
21. Iannarelli A.M., **Di Bernardino A.**, Casadio S., Bassani C., Cacciani M., Campanelli M., Casasanta G., Cadau E., Diémoz H., Mevi G., Siani A.M., Cardaci M., Dehn A., Goryl P. (2022) "The Boundary-layer Air Quality-analysis Using Network of INstruments (BAQUNIN) supersite for Atmospheric Research and Satellite Validation over Rome area", *Bulletin of the American Meteorological Society*, vol. 103(2), pp. E599-E618. DOI: 10.1175/BAMS-D-21-0099.1
22. **Di Bernardino A.**, Iannarelli A.M., Casadio S., Pisacane G., Mevi G., Cacciani M. (2022) "Classification of synoptic and local-scale wind patterns using k-means clustering in a Tyrrhenian coastal area (Italy)", *Meteorology and Atmospheric Physics*, vol. 314(2), n. 30. DOI: 10.1007/s00703-022-00871-z
23. **Di Bernardino A.**, Iannarelli A.M., Diémoz H., Casadio S., Cacciani M., Siani A.M. (2022) "Analysis of two-decade meteorological and air quality trends in Rome (Italy)", *Theoretical and Applied Climatology*, vol. 149(1), pp. 291-307. DOI:10.1007/s00704-022-04047-y
24. **Di Bernardino A.**, Monti P., Leuzzi G., Querzoli G. (2022) "On the Lagrangian and Eulerian Time Scale of the Turbulence within a Two-Dimensional Array of Obstacles", *Boundary Layer Meteorology*, vol. 184(3), pp. 375-379. DOI: 10.1007/s10546-022-00717-6
25. **Di Bernardino A.**, Mazzarella V., Pecci M., Casasanta G., Cacciani M., Ferretti R. (2022) "Interaction of the sea breeze with the urban area of Rome (Italy): WRF and WRF-LES simulations compared to ground-based observations", *Boundary Layer Meteorology*, vol. 185(3), pp. 333-363. DOI: 10.1007/s10546-022-00734-5

26. **Di Bernardino A.**, Jennings V., Dell'Omo G. (2022) "Bird-borne samplers for monitoring CO2 and atmospheric physical parameters", *Remote Sensing*, vol. 14(19), n. 4876. DOI: 10.3390/rs14194876
27. Ferrari S., Rossi R., **Di Bernardino A.** (2022) "A review of laboratory and numerical techniques to simulate turbulent flows", *Energies*, vol. 15(20), n. 7580. DOI: 10.3390/En15207580
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