

Curriculum vitae

Dr. Marco Casazza

Marco Casazza

Born in Biella, Italy, 3rd October 1977.

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Academic achievements

1. **Degree in Physics** – Università degli Studi di Torino, Torino (Italy) (October 2001). Laurea Ciclo unico, antecedente riforma DM 509/99 (classe laurea: L-30). *The main subjects of study were: fluid dynamics; oceanography; environmental physics; theoretical physics (many-body theory); history of physics.* The subject of my degree dissertation was related to indoor fine particulate matter (PM_{2.5}) pollution in relation to close outdoor pollution levels.
2. **Specialization School in Health Physics, Environment address** – Università degli Studi di Torino, Torino (Italy) (July 2006). *Together with a strong formation in environmental and atmospheric physics and environmental impact assessment, I have followed a specific course in eco-physics (held by Prof. Luigi Sertorio, former researcher at Princeton University and Los Alamos National Laboratories), dealing with non-equilibrium thermodynamics and physics of ecosystems.* My final dissertation was about a portable personal protection device to be used in industrial environments.
3. **International course on Environmental Accounting and Management** – Beijing Normal University, Beijing (China) (July 2016).
4. **Academic Diploma in violin (Bachelor Degree)** – Conservatorio Statale di Musica 'G. Verdi', Torino (Italy) (March 2004). *The main subjects of study were: violin, chamber music, music composition.*
5. **Eligibility Certificate as Fixed Term Researcher** – University of Trento (Italy) (January 2017). *Sector 02/C1 (Astronomy, Astrophysics, Earth and Planetary Physics); Italian Scientific Disciplinary Sector FIS/06 (Physics of Earth System and*

List of professional activities

PERIOD	ACTIVITY
September 2003 – July 2006	<p>Trainee (environmental acoustics and industrial hygiene), Regional Environmental Protection Agency (ARPA Piemonte). <i>Ex D.D.G. 543 del 09.10.2003, signed by the General Director of ARPA Piemonte, Dr. Vincenzo Coccolo.</i></p> <p><i>I worked in two distinct fields: the road traffic noise impact on urban environments (measurements, GIS mapping, noise impact mapping); the impact of wood dust pollution on health and the development of portable personal protection devices in the wood industry.</i></p>
June 2004 – October 2004	<p>Research Collaboration contract. Italian National Research Council – Institute for Sciences of the Atmosphere and Climate (CNR-ISAC), Bologna (Italy), under the scientific responsibility of Dr. Franco Belosi (researcher of CNR-ISAC). <i>Opus: “Caratterizzazione dimensionale delle polveri di legno ai fini sanitari”, su capitolo di bilancio ISAC-SEDE 1.01.01.075.000.124. Dal 1 luglio 2004 al 31 ottobre 2004.</i></p> <p><i>I developed a reference wood dust sampler to be used in the wood industry for industrial hygiene purposes.</i></p>
September 2004 – February 2008	<p>Researcher, Italian National Research Council (CNR) spin-off (SME) firm Nubila S.A.S.</p> <p><i>I worked in the development, testing and operation of a X-band microwave raingauge disdrometer (named PLUDIX) for precipitation measurements. I have also worked at its adaptation as a volcanic ash fall measurer, that has been installed for monitoring the tephra fall generated by Mt.</i></p>

PERIOD	ACTIVITY
	<p><i>Etna Volcano (under a National Civil Protection Dept. contract). I have worked, as sub-contractor, for a European Space Agency (ESA) project to develop the optical and storage system for a measuring chamber for studying the conditions of aggregation of water vapour and aerosols under microgravity conditions. I managed a measuring network of PLUDIX for monitoring the precipitation and precipitation erosivity characteristics in semi-arid areas of Southern Italy. This has been done both for studying the soil depletion characteristics in relation to precipitation and the precipitable water availability for water conservation purposes, also collecting the informations about the Traditional Ecological Knowledge (TEK) on the regional primitive technologies for water storage. This has been done under the financial support of the Italian Ministry of University (MIUR) during the years 2004-2006. Finally, I have developed a calculation method to be applied to the PLUDIX data for studying and monitoring the adverse weather conditions for surface transports. This has been done under a European FP6 project (WEATHER project). I started here the research on the portable protection device, which has been the object developed for my specialization school degree, under a project (of which I was responsible) that won the first prize of Regione Emilia-Romagna for innovative research.</i></p>
<p>January 2005 – December 2006</p>	<p>Research Associate, Italian National Research Council – Institute for Sciences of the Atmosphere and Climate (CNR-ISAC), Bologna (Italy), under the scientific responsibility of Prof. Franco Prodi (Director of CNR-ISAC). <i>Protocols: (1) Comunicazione Prot. 1118/04/IR. Dal 01/01/2005 al 31/12/2005; (2) Comunicazione Prot. 1403/05/IR. Dal 01/01/2006 al</i></p>

PERIOD	ACTIVITY
	<p>31/12/2006.</p> <p><i>I worked for the characterisation of precipitations in the Venice Lagoon. I have also supported the research on rainfall erosivity in collaboration with Florence University and Ferrara University, installing and managing two measurement sites: one close to Florence (Montepaldi site) and one close to Torino (NW Italy - Bardonecchia Municipality).</i></p>
<p>February 2008 – February 2010</p>	<p>Post-doctoral research fellowship, Physics Department, Università degli Studi di Torino, under the scientific responsibility of Prof. Angelo Piano (Associate Professor of Environmental Physics Laboratory). Selection code no. A02.136/XI*, presso il Dipartimento di Fisica Generale “A. Avogadro”, Università degli Studi di Torino.</p> <p><i>I won a post-doctoral fellowship within the Physics Department of Torino University. Here I developed a theoretical and experimental approach to the environmental impact assessment of a High-Voltage Direct Current (HVDC) power line. In particular, I had to focus my attention on the physical factors (energetics; atmospheric pollution; noise pollution; EM fields). The project TIPE, under which my Post-Doc position was created, has been financed by Regione Piemonte government.</i></p>
<p>March 2010 – June 2010</p>	<p>Research collaboration contract, Department of Physics, Università degli Studi di Torino, under the scientific responsibility of Prof. Angelo Piano (Associate Professor of Environmental Physics Laboratory). Registration date: Corte dei Conti 04/05/2010 - registro 7 - foglio 109. Dal 18/05/2010 al 10/06/2010.</p>

PERIOD	ACTIVITY
	<i>I had to coordinate the management of the final outputs of the research project TIPE.</i>
May 2011 – December 2011	<p>Research scholarship, Department of Public Health and Microbiology, Università degli Studi di Torino, under the scientific responsibility of Prof. Giorgio Gilli (Full Professor of Hygiene).</p> <p><i>I won a scholarship to study the environmental and health impact of sub-micron atmospheric particles (PM₁) in the metropolitan area of Torino, in relation to the emission levels and the meteorological conditions.</i></p>
January 2012 – October 2016	<p>External Researcher, Department of Science and Technology, University 'Parthenope' of Naples, under the scientific responsibility of Prof. Sergio Ulgiati.</p> <p><i>Energetics of human-dominated systems</i></p>
January 2015 – May 2015	<p>External collaboration, ARENA Research, Graz (Austria)</p> <p><i>During this period, I gave support to ARENA Research in organizing the practical issues connected to the workshop BIWAES 2015 (Stockholm, Sweden, 4th-7th May 2015)</i></p>
March 2015 – May 2015	<p>Research scholarship, 'C.M. Lerici' Foundation – Energy Processes Group, Department of Chemical Engineering and Technology, KTH (Stockholm, Sweden), under the scientific responsibility of Prof. Jinyue Yan (Royal Institute of Technology (KTH), Sweden, Director of Future Energy Profile at Malardalen University (MDU), Sweden, Chief Editor of Applied Energy).</p> <p><i>I won a scholarship to study the energetic conditions related to the sustainability of the urban environments, with a special focus on food, aerosol emissions as a by-product of energy processes and pre-industrial communities as an example of low-carbon human</i></p>

PERIOD	ACTIVITY
	<i>settlements.</i>
March 2015 – May 2015	<p>External collaboration, Scientific Office, Embassy of Italy in Sweden, Italian Ministry of Foreign Affairs and International Cooperation under the responsibility of Dr. Piero Mazzinghi (former Director of the Italian Institute of Optics).</p> <p><i>During this period, I had to support the scientific office of the Italian Embassy in Sweden in the ongoing activities of the office, acting as connector between Italian and Swedish Scientist and with the scientific office of the Chinese Embassy in Sweden.</i></p>
June 2015 – October 2016	<p>Research consulting for Prof. Paolo De Vingo (Professor of Christian and Medieval Archaeology, University of Torino).</p> <p><i>During this period, I developed a research on pre-industrial Socio-Ecologic Systems, with a specific focus on: (1) energy accounting application to environmental archaeology; (2) study of the interplay between economy, regulation and the environment as potential causes of the partial collapse of the monastic communities of Bobbio (NW Italy) around 620 AD and Castelletto Cervo (XIII cent.)</i></p>
July 2016 – September 2016	<p>Research consulting for Beijing Normal University, Department of Environmental Sciences</p> <p><i>Support to common project writing and submission.</i></p>

Present position

I am PhD student for the Programme “Environment, Resources and Sustainable Development”, at University of Naples ‘Parthenope’, winning also the Minister for Research and Education (MIUR) scholarship for the position. My research project, supervised by prof. Sergio Ulgiati and by prof. Massimiliano Lega, is entitled “Urban atmospheric Particulate

Matter (PM) pollution. Monitoring and investigation about origin and improvement options". I am **Correspondent Academic of the Siena Academy of Science** (Physical Sciences class) since May 2016. I was previously invited as **observer** of the **Pontifical Academy of Sciences (PAS)** in year 2014 for a meeting focused on sustainability.

I am interested in developing the axiomatization of human socio-ecological systems, in order to understand the impact of human activities on the ecosystem at different scales.

The majority of my work is focused on some of the occurring physical impacts related to the human activities, considering the need of a transition toward a lifestyle within the planetary boundaries. Within this field, I am developing the past researches of prof. Luigi Sertorio (former professor of ecophysics at Turin University; previously working at the Institute for Advanced Study - Princeton and at Los Alamos National Laboratory). I employ field measurements, grey-literature analyses and accounting methods with three special focus subjects: two of the atmospheric components (i.e.: aerosols, precipitations) and the energy cycles of human activities, also involving the development of technologies.

While maintaining my research lines about aerosol science, with a specific focus on particulate matter pollution impacts on human communities and on the ecosystem, my present major goal is to define the characteristics of a dynamically stable human Socio-Ecological System (SES). This research becomes opportune now to reduce the risk of societal collapse, which could be originated by several concurring factors, such as: the continuous and ever increasing depletion of natural resources and of the environment; the climate change; the human migrations and social instabilities; the present decline of EROI (i.e.: Energy Return Of Investment); the economic crisis...

I have a **collaboration with the School of Environment - Beijing Normal University (China)** both to deepen the knowledge about atmospheric aerosol pollution and to develop the related emission abatement strategies in the Jing-Jin-Ji area.

Teaching activities

My teaching experience is focused on atmospheric physics, environmental physics laboratory (mainly atmospheric pollutant measurements and meteorology) and teacher training (curriculum development focused on building, operating and analysing the data of simple measuring instruments for primary and secondary education classes).

From the Academic Year 2008/2009 to the Academic Year 2010/2011, I have been contract professor of:

1. **Environmental Physics Laboratory**, Master Degree in Science and Technologies

- for Cultural Heritage, University of Torino;
2. **Principles and Techniques of environmental control**, Bachelor Degree in Science and Technologies for Cultural Heritage, University of Torino;
 3. **Atmospheric Physics**, Master degree in Environmental Chemistry, University of Torino;
 4. **Didactic Experiences Preparation**, Master Degree in Primary Education Sciences, University of Torino.

Total: 208 hours of frontal lessons.

I have also held a **set of seminars in acoustics** for the Master Degree in Physics, University of Torino. Finally, I have been in charge, with a specific contract, for **75 hours of teaching support in statistics** for the Bachelor Degree in Science and Technologies for Cultural Heritage, University of Torino.

During the Academic Year 2010/2011, I have been **visiting lecturer of hydrology for the Master Degree in Meteorology, Dept. of Meteorology and Geophysics of Köln University (Germany) under the responsibility of Prof. Yaping Shao**. This 16-hours set of lessons has been financed under European Funds ERASMUS 'Teaching Staff).

During the Academic Year 2015/2016, I have been **visiting lecturer for the Master Degree in Environmental Sciences at Beijing Normal University (China), invited by Prof. Gengyuan Liu**. I have held a 15-hours set of lessons focused the physics and chemistry of Particulate Matter pollution.

Between years 2002 and 2014 I have **tutored 25 Physics Master Degree Thesis** candidates, **2 PhD theses** (one in metrology and one in atmospheric physics), supporting them in the environmental physics laboratory, under the supervision of Prof. Angelo Piano. I have also been **co-supervisor** of: **2 Bachelor Degree** candidates in Science for Cultural Heritage, **1 Bachelor Degree** candidate in Arts and Music Disciplines and **2 Master Degree** candidates (one in Physics and one in Science of Primary Education). Finally, I have been also **supervisor** of **2 Bachelor Degree** candidates (one in Science and Technologies for Cultural Heritage (Università degli Studi di Torino) and one in Mechanical Engineering (Politecnico di Torino)).

Editorial activity

Associate Editor: Frontiers in Environmental Informatics (a section of Frontiers in Environmental Science)

Guest Editor (managing Guest Editor): Energy Policy (Elsevier); Journal of Cleaner Production (Elsevier)

Referee: Articles referee: Journal of Arid Environments (Elsevier); Journal of Hydrology (Elsevier); Journal of Cleaner Production (Elsevier); Ecological Indicators (Elsevier); Journal of Environmental Accounting and Management (David Publishing). Book reviewer: Contemporary Physics (Taylor & Francis).

Specific expertise

I have a specific expertise in:

1. Aerosol science and technology, in relation to air quality measurements (both indoor and outdoor);
2. Microphysics of precipitations, with a specific interest in field precipitation measurements;
3. Meteorological field measurements;
4. Energetics of ecosystems;
5. Environmental history, with a specific focus on the energetics pre-industrial communities.

I have previously supported some researches in the field of environmental and musical acoustics and history and philosophy of physics.

Additional skills

I have strong communication skills, which I also developed through three different collaboration, as a journalist, with: the free-press (both on-line and printed) 'La Voix du Val d'Aoste' (<http://www.lavoixduvaldaoste.it/>), writing articles about regional culture, energy and the environment; the on-line journal ArticoloTre (<http://www.articolotre.com>), developing and coordinating a section related to environmental issues (Territori-Ambiente). I have also developed skills in music and theatre. In particular, I hold a Bachelor Degree in music (violin) since year 2004 (Music Conservatory 'G. Verdi', Torino, Italy) and I have a parallel activity as a musician (I play chamber music with an organ player; I also play in a group of traditional music of Piemonte). I have worked as actor/musician/composer for theatre since 2011 (Torino Spettacoli, Torino, Italy; Civit'Arte 2011, Civita di Bagnoregio, Italy; Asti Teatro 33,

Asti, Italy). I am founder of an artistic collective named 'Siderei Pictores', whose purpose is developing an interdisciplinary research on arts and science and sustainability.

Management and leadership qualities

Since my Master Degree thesis in physics, I started to support the activities of the environmental physics laboratory inside the Physics Department of Torino University.

I participated to my first international congress, held in Rome University "La Sapienza" (International Conference on Atmospheric Research Progress and More dedicated to Professor Giorgio Fiocco on his 70th birthday) one month before my Degree, in September 2001. I started the collaboration with the 'History and Didactics of Physics', funded by Prof. Carlo Castagnoli in 1968 inside my Department. Between years 2002 and 2013 I have held 11 seminars on different subjects: environmental physics, history and philosophy of physics, eco-physics.

I assisted with the organization of two international conferences: **14th International Conference on Clouds and Precipitations (ICCP)** (Bologna, 19th-23th July 2004); **Euromediterranean Representative Basins (ERB) 2004** (Turin, 13th-17th October 2004); **International Union of Geodesy and Geophysics (IUGG) XXIV General Assembly: Earth, Our Changing Planet** (Perugia, 2nd-13th July 2007).

I have been the organizer of the 9th **Biennial International Workshop Advances in Energy Studies (BIWAES 2015): Energy and Urban Systems** (Stockholm, 4th-7th May 2015), endorsed by UNEP, the Club of Rome, IIASA, the Applied Energy Innovation Institute and KTH.

I have been involved in the organization of the **Global Cleaner Production Conference & Sustainable Consumption** (Sitges, Barcelona, Spain; 1st-4th November 2015), organized by ELSEVIER and supported by the Journal of Cleaner Production, in order to cooperate with Prof. Donald Huisingsh for the coordination of the Conference keynote speakers.

During my work in the spin-off firm 'Nubila S.A.S.' I won the **first prize for an innovative technological research** (on a portable personal protection device for the respiratory ways) in a tender of Regione Emilia-Romagna government (Italy).

Project management and project participation

During the years, I have been in charge for different responsibilities inside regional, national and international research projects:

Funded research projects (Responsible – PI)

Aria da Pioviggia, funded by Piemonte Regional government. About the impact of aerosol pollution on precipitation extreme events. Years 2008 – 2010. Amount: € 20,000.00

Funded research project (Project writer; co-PI and vicar coordinator)

T.I.P.E. (Transmission Infrastructure for Power Exchange) Funded by Piemonte Regional government (Call for industrial research and innovation, year 2006). About the environmental impact assessment of a HVDC power line. Years 2007 – 2010. Amount: € 735,300.00

Sub-contract (Responsible - PI)

ICAPS (Interactions in Cosmic and Atmospheric Particle Systems). Funded by European Space Agency. About the development of an optical measuring chamber. Years 2004-2005.
RIADE (Integrated Research for the application of technologies and innovative tools for combating the desertification), funded by the Italian Ministry of Research and University (MIUR). Years 2004-2006.

Funded research project (Project participant)

“Research on Emissions Collaborative Reduction Policy Tools Based on Industrial Metabolic Network of Urban Agglomeration ”. Funded by Chinese Academy of Sciences. Listed as participant with Beijing Normal University. Years 2017-2020.

European Projects (steering – scientific committee)

WEATHER (Wind Early Alarm system for Terrestrial transportation). Funded by European Union, FP6, CRAFT Project (Project Code: CT-2004-512862). Years 2004-2007.

Date, 26th March 2017

Signed Marco Casazza