



## Francesco Corvaro

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### ● ABOUT ME

I am the Special Envoy for Climate Change of the Italian Government and an Italian University Professor with 20+ years of experience in Thermodynamics, Renewable Energy, Net-Zero, Energy Transition, Sustainable Mobility, Sustainability, Environmental Impact Evaluation (Assessment?), Resilience Models, Smart City Models and Life Cycle Assessment. I am responsible for initiating and maintaining several international collaborations with academia and the industry, such as: Architect of the Capitol (Washington DC), Naval Research Laboratory (Washington DC), Arup Group, Tiber International Group, Inc., National Gallery of Washington DC, Catholic University of America, University of Tennessee, Maryland University, and Georgetown University. I am the referent for the double degree program between the Catholic University of America and the Università Politecnica delle Marche. I believe that an integrated technical and political approach to the energy transition will be fundamental to combat Climate Change.

### ● WORK EXPERIENCE

08/03/2023 – CURRENT Rome, Italy

**SPECIAL ENVOY FOR CLIMATE CHANGE OF ITALY** MINISTRY ENVIRONMENT AND ENERGY SECURITY - MINISTRY OF FOREIGN AFFAIRS INTERNATIONAL COOPERATION

The Special Envoy for Climate Change of the Italian Ministry of Foreign Affairs and International Cooperation and the Italian Ministry of Environment and Energy Security is the reference point of Italian administrations with regard to the external dimension of climate change policies. The Envoy ensures the liaison between the two competent Ministries, and his appointment confirms Italy's commitment to the fight against climate change and its desire to confirm its leadership in one of the decisive issues for the survival of our planet.

Since assuming this role on August 3, 2023, I have had the opportunity to participate in the African Climate Week in Nairobi in September 2023, where I engaged with other special envoys, including John Kerry, the special envoy of the United States. During the week, I had a bilateral meeting with Achim Steiner, the chief of UNDP. Following that, I attended the UN General Assembly (UNGA) week in New York, where I conducted several bilateral meetings, including one with senior advisor David Thorne (former US Ambassador to Italy), Mafalda Duarte, the head of the Green Climate Fund, and many others. From October 8 to 12, I participated in the MENA Week in Riyadh, Saudi Arabia, during which I had a private meeting with Simon Stiell (the newly appointed UNFCCC Executive Secretary). From October 23 to 27, 2023, I was in Panama for the Latin America and the Caribbean Climate Week 2023, and from there, I traveled to Abu Dhabi to participate, along with the Minister of Environment and Energy Security, in the Pre-COP 2023. From November 28 to December 14, 2023, I participated in COP28 in Dubai, where, in the absence of the Minister of Environment and Energy Security and the Vice Minister, I assumed the role of head of delegation for Italy.

I represented the Italian Government in multiple meetings and, specifically, on behalf of Italy, I delivered a speech during the closing assembly of COP28. During COP28, I also conducted numerous bilateral meetings, including those with representatives from Goldman Sachs, John Denton of the International Chamber of Commerce, Achim Steiner (Chief, UNDP), Francesco La Camera (IRENA), the Minister of Energy of the Federal Republic of Germany, Dr. Conrad Rein, Director of Policy Outreach at the Innovation Commission Development Innovation Lab, Ambassador Fowler, Special Envoy for Food Security of the USA, the Maltese delegation, and Graham Stuart, the Minister for Energy Security of the United Kingdom. During COP28, alongside the Italian chief negotiator, Dr. Federica Fricano, I actively participated in and supervised the different negotiation phases on behalf of the Italian Government. In 2024, with the upcoming Italian presidency of the G7, I will actively participate in the working groups on climate, environment, and energy, as well as in groups directly coordinated by the Ministry of Foreign Affairs and International Cooperation (DGCS, DGMO).

11/22/2021 – 07/31/2023 Rome

**ENERGY AND ENVIRONMENTAL CONSULTANT FOR PRESIDENCY OF THE COUNCIL OF MINISTERS** PRESIDENZA DEL CONSIGLIO - STRUTTURA COMMISSARIO STRAORDINARIO SISMA 2016

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Member, as energy expert, of the 2016 Earthquake Extraordinary Commissioner Structure (Governative structure under the control of the Italian Government).

In particular under this aspect I am involved in three main activities:

1) Line of Action A, "Safe, sustainable and connected cities and towns", for the definition of the interventions to be carried out under action A2 "Energy communities, recovery and refurbishment of buildings public and energy / heat production from renewable sources";

2) Line of Action A.1, "digitisation" of earthquake area in Central Italy;

3) Line of Action A 4.2 Hydrogen Project for the creation of on-site hydrogen production points from renewable sources (Green Hydrogen), for the upgrade of Sulmona - L'Aquila - Rieti - Terni railway line.

Team leader in the technical group created to support the first Italian public competition to develop CER.

Member of the team that wrote the first Italian public announcement to support the creation of CER.

Expert in energy management and planning, development of new technologies related to fourth generation nuclear power, applications related to hydrogen; experience gained in collaboration with US entities while living in Washington DC.

01/01/2022 – CURRENT

**MEMBER OF ADVISORY COMMITTEE FOR ENERGY POLICIES IN MARCHE REGION** MARCHE REGION

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08/27/2021 – CURRENT

**VIRGIN GALACTIC**

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Virgin Galactic Holdings, Inc. ("Virgin Galactic") asked my in-person attendance in New Mexico, USA to prepare for Virgin Galactic's upcoming Unity 23 mission with the Italian Air Force (Aeronautica Militare). My attendance is required at our operational headquarters at Spaceport America and at our corporate offices in Las Cruces, New Mexico from Sept. 23rd, 2021 until the completion of the mission which is currently scheduled for late September.

Specifically, Virgin Galactic is requesting my in-person attendance for Unity 23 because I am integral for mission support.

10/25/2022 – 07/31/2023

**RESPONSIBLE FOR SPACE ACTIVITIES** UNIVERSITÀ POLITECNICA DELLE MARCHE

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I am the responsible for the Space Activities at the Università Politecnica delle Marche

10/31/2015 – CURRENT Ancona, Italy

**ASSOCIATE PROFESSOR (SSD: ING-IND/10), WITH THE NATIONAL SCIENTIFIC QUALIFICATION FOR FULL PROFESSOR (SSD: ING-IND/10)** UNIVERSITÀ POLITECNICA DELLE MARCHE

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My research activity has been focused on **issues related to heat transfer applied to natural convection in cavities with both experimental and numerical simulation**. The experimental analysis has been carried out by **holographic interferometry**, for the determination of thermal fields, and by the **Particle Image Velocimetry (PIV)** for the study of dynamic magnitudes. The numerical simulation has been performed by using the code Fluent; the developed models were validated by experimental tests.

A further research field concerned the study of the **flow fields** that trigger natural convection in cavities **in two-dimensional geometry using a non-invasive technique for measuring the speed called PIV (Particle Image Velocimetry)**. This methodology is based on the use of a pulsed laser light to obtain digital image to be processed by computer in order to evaluate flow fields, velocity gradients and turbulence phenomena; more recently he addressed also the study of three-dimensional flows through the **Stereo-PIV**. This research has sprouted several publications in various scientific journals and national and international conferences.

He also carried out a number of numerical and experimental studies in the field of **lighting engineering**. In particular the behavior of three light pipes for the transport of natural light within confined environments in absence of artificial light, has been monitored.

To date several light tubes with different diameters and heights have been tested. All this he led to the collection of a large number of experimental data, allowing the publication of scientific articles in important international journals such as International Journal of Solar Energy.

He has also been active in the field of **renewable energy sources**, with particular attention to photovoltaic and solar thermal systems coming to draft guidelines for regional, provincial and municipal territory currently in force.

He has acted as consultant in the field of health and safety at the workplace at the "Interdepartmental Centre for Services for the Protection of Health and Safety in the Workplace"

Another field of research is related to the **study of innovative fluids in refrigeration and biofuels**.

Finally I am studying the possibility to apply **Thermography and Laser Vibration technologies** to preserve artworks and frescos.

Finally I am a **reviewer for international Journals:**

International Journal of Heat and Mass Transfer; Applied Thermal Engineering; Experimental Thermal and Fluid Science; CEAS Aeronautical Journal; Open Journal of Fluid Dynamics; ASME Journal: Journal of Heat Transfer; WSEAS Heat and Mass Transfer; International Journal of Thermal Sciences; Journal of Applied Physics; Journal of Food Engineering; British Journal of Applied Science & Technology.

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**Business or Sector** Professional, scientific and technical activities |

**Department** Dipartimento di Ingegneria Industriale e Scienze Matematiche |

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**Website** <https://www.diism.univpm.it>

06/29/2019 – CURRENT

**PERMANENT ADJUNCT PROFESSOR** CATHOLIC UNIVERSITY OF AMERICA

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Responsible for the development of educational and research programs in the fields of Climate Change, Renewable Energy, Environmental Protection and Environmental Impact Analysis.

07/31/2018 – 07/30/2019

**VISITING PROFESSOR** CATHOLIC UNIVERSITY OF AMERICA

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During this period I taught 9 different classes among heat transfer, energy application, energy and buildings, thermodynamics, green building design and iOS Developer app. I was also involved in different projects about applied acoustic.

07/31/2019 – CURRENT

**ENGINEERING LECTURER** UNIVERSITÀ DEGLI STUDI ECAMPUS

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As lecturer I am the instructor of these classes:

- 1) Réfrigération technique (6 CFU)
- 2) APP 1 (6 CFU)
- 3) APP 2 (6 CFU)

05/31/2019 – 12/30/2019

**CO-PI OF THE PROJECT: EVALUATION OF THE STATE OF CONSERVATION OF THE PRESIDENT'S ROOM CEILING AT THE US CAPITOL** ARCHITECT OF THE CAPITOL

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A critical step in carrying out a proper conservation restoration process is the identification of faults that threaten the integrity of the work. Scientists, engineers, and conservators have pursued for years a quantitative method for the identification process.

Several work and studies have been done to assess the conditions of the President's room ceiling.

The results of the previous studies do not seem always consistent with each other and with the current conditions even if there are some useful information in all of them.

The Advisory board that meet on April 2017 reached the conclusion that additional documentation and study must be prepared in a way that will enable systematic tracking of the ceiling's state of conservation and its monitoring over time.

One of the techniques that was used in the 2004 study was Laser Doppler vibrometry (SLDV). The basic idea behind SLDV technique is to substitute human senses with measurement instruments: surfaces are vibrated by sound waves emitted by loudspeakers, while a laser Doppler vibrometer scans the surface of the object measuring its velocity. As a result, we obtain 2D or 3D digital maps of surface mobility. Where a defect occurs, the velocity is higher than neighboring areas, thus defects can be easily located. A scanning laser vibrometer also identifies structural resonance frequencies leading to a complete characterization of defects.

The international team that is presenting this proposal has almost 20 years of experience in nondestructive testing of artworks by different means including the use of SLDV systems, thermal camera and lidar system.

From the 2004 measurement campaign, the technology behind the systems has improved allowing more reliable, accurate e fast measurements; moreover, the additional information that have been acquired by the advisory panel in 2017 will help in the interpretation of the vibrational and thermal images and in the definition of a map reproducing the state of conservation of the ceiling with a suitable resolution. A database of results will be created to be used to track changes in the ceiling system into the future.

The maps obtained by the combined use of SLDV, Thermography and Lidar will provide the following information:

- plaster delamination location and size (SLDV, Termography);
- cracks locations and size (SLDV, Termography);
- delamination depth (Termography)
- a 3D image of the topography of the plaster surface (Lidar).

10/31/2008 – 10/30/2015

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## **RESEARCHER IN APPLIED PHYSICS (SSD: ING-IND/11) UNIVERSITÀ POLITECNICA DELLE MARCHE**

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My research activity has been focused on issues related to heat transfer applied to natural convection in cavities with both experimental and numerical simulation. The experimental analysis has been carried out by holographic interferometry, for the determination of thermal fields, and by the Particle Image Velocimetry (PIV) for the study of dynamic magnitudes. The numerical simulation has been performed by using the code Fluent; the developed models were validated by experimental tests.

A further research field concerned the study of the flow fields that trigger natural convection in cavities in two-dimensional geometry using a non-invasive technique for measuring the speed called PIV (Particle Image Velocimetry).

In 2011 I was the Team Leader for the project between UNIVPM (Università Politecnica delle Marche) and GSE (Gestore dei Servizi Energetici GSE S.p.A - Socio unico Ministero dell'Economia e delle Finanze) to evaluate the photovoltaic plants involved in the incentives "Conto Energia"; my team analysed more than 40.000 different plants.

Finally I was a member of the team that prepared the Energetic Plan of Marche Region.

## ● **EDUCATION AND TRAINING**

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05/31/2021 – CURRENT

### **ASN AS FULL PROFESSOR (09-C2; ING-IND/10) Ministero dell'Università e della Ricerca**

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09/30/2002 – 10/30/2005 Ancona, Italy

### **PHD IN "RELIABILITY, SAFETY, AND ENVIRONMENTAL SUSTAINABILITY IN THE OPERATION OF COMPLEX INDUSTRIAL PLANTS".** Università Politecnica delle Marche

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The PhD course focused on the assessment of the environmental impact of complex industrial plants specifically dedicated to the production of energy and/or energy carriers. The study was systematically approached using Life Cycle Assessment (LCA) techniques.

**Address** via Breccie Bianche 12, 60131, Ancona, Italy | **Field of study** Electricity and energy |

**Thesis** Energy, Reliability, Security and Environmental Sustainability in the exercise of industrial plants

10/31/1997 – 12/09/2002 Ancona, Italy

### **MASTER DEGREE IN MECHANICAL ENGINEERING** Univerisità degli studi di Ancona

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**Address** via breccie bianche 12, 60131, Ancona, Italy | **Website** [www.univpm.it](http://www.univpm.it) |

**Field of study** Electricity and energy , Environmental protection technology | **Final grade** 110/110 cum laude |

**Thesis** Evaluation of the life cycle of oil refinery products: the case of API Falconara refinery

## **FIRST CAMBRIDGE EXAMINATION**

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## **QUALIFIED ENGINEER FOR ENVIRONMENTAL ACOUSTICS**

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## QUALIFIED ENGINEER FOR FIRE PREVENTION CERTIFICATION

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11/02/2003 – CURRENT Macerata, Italy

**MEMBER OF ENGINEERS ASSOCIATION OF THE PROVINCE OF MACERATA** Engineers  
Association of the Province of Macerata

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### ● **ADDITIONAL INFORMATION**

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#### **HONOURS AND AWARDS**

06/01/2018

**Member of the Climate Change Committee and Center for the Care of the Earth – CUA, Washington DC** Member of the scientific committee that deals with the dissemination of issues related to climate change and the actions to be taken for their mitigation. In this context, international workshops are periodically organized in which leading figures from the political, business and scientific worlds come together to share best practices.

10/08/2023

**Member of the Expert Committee – Foundation Social Economic Development Enrico Mattei** The FSED constitutes the place to build policies related to the modernization of Enterprises and Public Administrations, aimed at promoting the local implementation of new European Strategies linked to territorial growth, including the resources from the Next Generation EU and the National Recovery and Resilience Plan (PNRR), with the aim of transforming territories into innovation and environmental sustainability laboratories.

The FSED is based on the principles of Enrico Mattei, whom we could define as a visionary madman who turned his "madness" into a method. He was guided by a North Star: intelligence and the enormous need for peace and redemption, and believed that these would generate development for his people. And this would not happen at the expense of other nations, but rather in shared collaboration with them.