

# Piergiorgio Sonato

Professor of electrical Science at the University of Padova.



## CONTACT INFORMATION

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**Phone:** +393357879306  
**Date of birth:** 28 Jun, 1958  
**Nationality:** Italian

## EXPERIENCE

### Padova

2011 - Present

### Full Professor of electrical Science

University of Padova

### Padova

2001 – 2011

### Associate Professor of Electrical Science

University of Padova

### Cagliari

1998 – 2001

### Associate Professor of Electrical Science

University of Cagliari

### Padova

1986 – 1998

### Researcher

Istituto Gas Ionizzati of the National Research Council (C.N.R.)

### Padova

1984 – 1986

### Temporary contracts in the team for the design and construction of the RFX experiment

Istituto Gas Ionizzati of the National Research Council (C.N.R.).

## EDUCATION

### Padova

academic 1982 – 1983

Post-graduate course on “*Plasma Engineering and Controlled Thermonuclear Fusion*” final diploma with full marks and honours  
University of Padova

### Padova

academic 1981 – 1982

Doctor in Electrical Engineering in the Faculty of Engineering with full marks and honours (110/110 and “lode”)  
University of Padova

## LANGUAGES

### English

Advanced certified B2

### French

Advanced

### Italian

Native

## SKILLS

Piergiorgio Sonato has more than thirty-eight years of experience in thermonuclear fusion research, resulting in:

wide competence in modelling, design, construction, installation, commissioning, exploitation and project management of components and systems;

deep involvement in international collaboration with the tokamak community: ITER, JET, Tore Supra, Asdex UG.

He has a significant experience in the management of complex projects from the conceptual design up to the operation of the systems. This implied leading a team, involving a significant number of researchers and technicians.

He has a wide experience in the management of contracts in an international environment for design, manufacturing of mechanical and electromechanical components, first wall components, Neutral Beam Injector system for ITER and Ion Cyclotron Heating antennas for ITER, JET, Tore Supra, realization of vacuum, gas injection and remote handling systems; manufacturing of electromagnetic, thermal and mechanical transducer systems to be mainly installed and operated under UHV conditions or on the mechanical structures of fusion devices.

He has also a good competence in conceptual design proposals, exploitation and data analysis of experimental campaigns mainly in RFX, but also in Tokamak devices (JET, Asdex UG, Tore Supra).

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## PROJECTS

He started working in 1983 for the design and construction of RFX. In this phase he was a member of the "Plasma System" group, involved in: first wall, vacuum vessel, stabilizing shell, and in-vessel remote handling system. He had direct responsibility for the design and construction of the following components: vacuum and gas injection system, and magnetic and thermal transducers.

From 1992 up to 2001, after the start of RFX operation, he assumed the role of "Plasma Engineering" Group Leader. The group included 6 to 9 researchers plus some PhD students. In this role, besides coordinating all scientific and technological activities of the group members he has promoted new developments and upgrades of RFX and scientific experimental campaigns.

In addition, in 1993-94 he collaborated with the Plasma Wall Interaction group coordinated by Dr. André Grosman for the exploitation of the ergodic divertor of Tore Supra (F).

From 1999 to 2003, under the EFDA-JET Task Force M activities (EU), he has been responsible of the activity for the application of Neural Network techniques in the prediction of the plasma disruptive events.

In 2000 he was responsible of the electromechanical calculations of the blanket modules of ITER (F). In the same year he collaborated to the tests on the flexible electrical contacts of the blanket modules under a collaboration between ENEA-Frascati and Consorzio RFX.

In 2000 he was responsible of the electromechanical calculations of the Ion Cyclotron and Lower Hybrid Antenna for ITER (F).

In 2001 he has been appointed Project Leader for the design and construction of the RFX-mod load assembly, including the new first wall, thin stabilizing shell, mechanical structure, saddle coils, electromagnetic and thermal transducers. He was also appointed member of the Programme Coordination Group of the Consorzio RFX.

From 2003 to 2007 has been Project Leader for design, construction and installation of the system of probes for the study of the "Halo Currents" in JET (JET-EP-DIA-HCS) (EU). The system has been in full operation and produced ITER-relevant information regarding the non-axisymmetric mechanical loads on the vacuum vessel during anomalous events like disruptions and vertical displacement events.

In 2004 he had a collaboration with IPP-Garching (G) to study the application of new techniques for the prediction of the disruption events and other abnormal phenomena in Asdex UG.

From 2004 to 2006 he has been responsible of three annual contracts under EFDA (EU) for the electromechanical and thermomechanical design of the antenna for the Ion Cyclotron Radiation Heating for ITER.

In 2005-06, under the EFDA-JET Task Force FT activities (EU), he was responsible of the activity for the implementation of disruption identification and mitigation tools.

In 2005-06 he has been responsible of the electromagnetic and thermomechanical analysis for the design of the European Superconducting Dipole under an EFDA contract (EU).

From 2007 to 2013 is has been Project Manager of the international team for the design, construction and exploitation of the Neutral Beam Test Facility (NBTF) for the development of the Neutral Beam Injectors for ITER in Padova.

In 2014 it has been nominated Section Leader of the "R&D, Conceptual Design and Advanced Technologies" for the development of the Neutral Beam Injectors for DEMO under the activities covered by the Work Package HCD within the EUROfusion Programme (EU) FP8 (Horizon 2020).

In 2014 it has been nominated member of the EUROfusion STAC (Scientific Technical Advisory Committee) in support to the Program Manager and the General Assembly of EUROfusion the European Consortium for the management of the European research activities in the field of the fusion of Hydrogen. He has been renovated in this position in 2016 up to October 2017.

From October 2017 to March 2022 it has been nominated Director of "Consorzio RFX", a research institution with more than 170 employed and seconded staff members and, considering collaborators and personnel under training, in total at Consorzio RFX more than 210 persons are working.

In April 2022 he has been nominated President of the Consorzio RFX in Padova. Consorzio RFX shareholders are CNR, ENEA; INFN, Università degli Studi di Padova and Acciaierie Venete.

### ***Teaching activity***

From 1995 to 1998 he taught "Electrical Science" for the Diploma on Information Technology Engineering and Environmental Engineering in the Trento University.

From 1998 to 2004 he taught "Electrical Science", "Theory of electric networks" and "Automatic design of electric and magnetic devices" at the University of Cagliari.

From the academic year 2001/02 he teaches "Electrical Science" and "Industrial Plasma Technologies" at Padova University.

He has been tutor of many students for their final dissertation for the Graduation of Electrical Engineers, Mechanical Engineers, Electronic Engineers, Aerospace Engineers, Material Engineers and Chemical Engineers.

He has been supervisor of many PhD students both at University of Cagliari and at University of Padova.

From 1991 to 2003 he taught, "UHV technology applied to fusion experiments, first wall components, vacuum vessels and surface treatments" in the postgraduate course in Plasma Engineering and Controlled Thermonuclear Fusion.

From the academic year 2003/04 to 2007/08 he taught "UHV technology applied to fusion experiments and surface treatments" for the postgraduate Master in "Plasma Physics and Engineering".

He taught many cycle of lessons at different Doctoral Schools and Master Schools in "UHV technology applied to fusion experiments and surface treatments" and in "Neutral Beam Injectors".

#### **Academic roles**

Since 2016 he is advisor of the Vice Rector for International Relations for the activities in Africa region promoted by University of Padova.

He is delegate of the University of Padova for the Development Cooperation activities at CRUI (Conferenza dei Rettori delle Università Italiane).

He is delegate of the University of Padova at the Development Cooperation working group of the Coimbra Group of Universities.

He is delegate of the University of Padova at the CUCS (Coordinamento Universitario per la Cooperazione allo Sviluppo).

He is member of the Management Committee of "IHEA-Italian Higher Education with Africa", a foundation in which the members are: Polytechnic of Milan, University of Bologna, University of Florence, University of Rome "La Sapienza", University of Naples "Federico II" and University of Padua.

He is member of the Board of Trustees of the Ethiopian Catholic University-Higher Learning Institute, Addis Ababa (Ethiopia).

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## **ACHIEVEMENT**

He received many invitations for speeches at International Conferences, Workshops and international university and laboratories.

He is co-inventor of two patents in the field of heterogeneous mechanical joints and in the field of vacuum pumps based on Non Evaporable Getter materials:

- WO 2013182962 A1: Vacuum tight threaded junction, Publ. date Dec 12, 2013 (European Patent)
- WO 2015198235 A1: Getter pumping system, Publ. date Dec 30, 2015 (European Patent)

He has been member of the Academic Council of FUSENET the European Fusion Education Network from 2013 to 2018.

In the position of Director of Consorzio RFX he has been also member of the General Assembly of the Consortium EUROfusion from October 2017 to 03/2022.

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## **PUBLICATIONS**

He is author or co-author of more than 210, recorded on SCOPUS, scientific papers published on international journals or proceedings of international conferences, h-index 33, total citations: 5163.

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