

CURRICULUM VITAE

Personal Data

Name: *Francesco Paolo Orsitto* D.o.B.

Nationality: *Italian*

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Position: director of research (dirigente di ricerca) **retired november 2014**

Job : Advisor of the Director of Fusion Department for the scientific activities of DEMO and Broader Approach

Institution: ENEA Fusion and Nuclear Safety Department , v E Fermi 45 , 00044 Frascati (Italy)

Academic and Research Career Information

Physics Degree Univ Pisa(1973) and Fellow Scuola Normale Superiore Pisa(Italy)(1974-75)

1975-1978: ENEA C R Casaccia Lab Environmental Radioactivity

1978- 1999 and 2005-2014 : ENEA CR Frascati Unita' Tecnica Fusione

1999-2004 : EFDA(European Fusion Development Agreement) -JET Culham Science Centre

2014 - Retirement (november).

2015-2019- Collaboration with CREATE Consortium Universita di Napoli Federico II, Napoli and ENEA Fusion and Nuclear Safety Department.Frascati(Italy)

1987-1999 Group Leader Optical Diagnostic FTU (Thomson Scattering , active spectroscopy)

1990-1998 Collaboration with JET on Collective Thomson Scattering Experiment

1994-1996 Responsible of Project Proposal of FTAB/ HBFT (High Beta Frascati Tokamak) : a new tokamak device. proposed for ENEA Frascati .

1999-2004 EFDA JET Management Unit Resp Officer for Task Force Diagnostics and Deputy Task Force Leader Diagnostics (the largest Task Force at JET 200 scientists /year), and coordination JET-EP and EP-2 diagnostics enhancements. and developments

2006-2009 Programme of Development of ITER Relevant diagnostics on FTU

2005-2010 ENEA Responsible Scientific Contact Person at JET

2005-2010 FT3 and FAST tokamaks projects: responsible for coordination of the Diagnostics projects..

1995-2009 Nominated European Member of ITPA(International Tokamak Physics Activity) TG(Topical Group) Diagnostics for design and development ITER diagnostics.

2010-2013 European Member of Physics Unit JT-60SA: Responsible coordination at European level of Diagnostics.

2013-14 Coordinator of Eurofusion project PPP&T WP13-DAS 04 –DEMO Diagnostics and Instrumentation Systems.

November 2014 retired from ENEA.

2015-2021 -CREATE Consortium and ENEA Frascati Fusion Department Collaboration on EUROFUSION activities and organization of ICFDT and FUNFI conferences. Organization of

International Conference on Diagnostics for Fusion Reactors Varenna September 2021. (see conference section) .

2022-Activities :Organization of The Conference Frontiers in Diagnostics Technologies, ENEA Frascati , october 2022 . Studies on Fusion-Fission Reactors design (participation to IAEA FEC 2021 and IAEA Technical Meeting on Synergies between Fusion and Fission (june 2022) ; Design of Thomson Scattering Diagnostics for DTT(Divertor Test Tokamak) ; participation to EURO-Fusion activities on experiments for high beta (exp RT22-08) and analysis of difference of the electron temperature measurements between Thomson scattering and ECE (Electron Cyclotron Emission) Diagnostics in Deuterium Tritium Campaign; participation to HTPD (High Temperature Plasma Diagnostics , Rochester , NY 2022) and European Plasma Physics Conference 2022.

2023-2024 –Activities :

- 1.Organization as chairman of The Conference Frontiers in Diagnostics Technologies, ENEA Frascati , october 2024 .
- 2.Studies on Fusion-Fission Reactors design (participation to IAEA FEC 2023 London) presentation of a paper ;
- 3.DTT Diagnostics : Design of the collection system of the Thomson Scattering Diagnostics for the pedestal plasma in DTT(Divertor Test Tokamak) , and start of design activity of a Phase Contrast Imaging .
4. EURO-Fusion activities on analysis of experiments for high beta (exp RT22-08) in preparation of JT-60SA and analysis of difference of the electron temperature measurements between Thomson scattering and ECE (Electron Cyclotron Emission) Diagnostics in second and third JET Deuterium Tritium Campaigns; presentation of contributed papers at European Plasma Physics(EPS) Conference 2023Bordeaux France and EPS2024 Salamanca , Spain.
- 5.Organization of the ITPA (International Tokamak Physics Activity) Working Group on ‘High Temperature Measurements ‘ in the context of the ITPA Topical Group Diagnostics.

Teaching Experience

Vice –Director of Master Course In ‘Fusion Energy –science and engineering’ organized by ENEA and Univ Rome II Tor Vergata..

Courses on Plasma Diagnostics at University of Pisa and Univ Roma II Tor Vergata

Tutor of PhD Thesis at Univ Roma II Tor Vergata

Organization of International Conferences

Chairman of International Conference ‘Burning Plasma Diagnostics’ Varenna(Italy) 2007

Chairman of International Conference ‘Fusion Reactor Diagnostics’ Varenna(Italy) 2013

Chairman of International Conference ‘Frontiers in Diagnostics Technologies’ Frascati(Italy) 1st edition 2009 , 2nd edition 2011 and 3rd edition 2013., 4th edition 2016 , 5th edition 2018.

Organization and Scientific Secretary of Conference FUNFI (Fusion Neutrons for Fission):
 Organization of the 2nd (Frascati 2016) and 3rd edition (Hefei China,2018) of the FUNFI
 conference dedicated to the Fusion-Fission reactors design and technology .
 Chairman of the International Conference 'Diagnostics for Fusion Reactors ' Varenna (Italy)
 september 2021.
 Chairman of International Conference Frontiers in Diagnostics Technologies , Frascati October
 2022 and **2024** .

Topics of Research

Plasma Physics, Plasma Diagnostics , Fusion reactor Scenario evaluation . Thomson Scattering,
 plasma polarimetry, active spectroscopy. tokamak diagnostics , Tokamak Fusion Reactor Design
 and projects of diagnostics and controls, Fusion-Fission reactor projects . Fusion neutron sources
 projects..

Publication record

Author of about 100 papers published on peer-reviewed journals. Editor of four Conference
 proceedings books.

Some key publications

1. Title of publication: **Analysis of Faraday rotation in JET polarimetric measurements**
 Journal : Plasma Physics and Controlled Fusion, 53 (2011)
2. Title of publication: **Investigating the possibility of a monitoring fast ion diagnostic for ITER**
 Journal : Rev Sci Instr 79(2008)
3. Title of publication: **Requirements for fast particle measurements on ITER and candidate measurement techniques**
 Journal : 2007 Nucl. Fusion 47 1311
4. Title of publication : **Thomson-Scattering Diagnostics on the Frascati tokamak Upgrade**
 Journal : Applied Optics 34(1995)2712 and Rev Sci Instr 66(1995)1167
5. Title of publication : **JET experimental programme and related diagnostics development**
 Journal : Rev Sci Instr 74(2003) 2084
6. Title of publication : **Characterization and preliminary results of the collective Thomson Scattering system on FTU tokamak**
 Journal : Rev Sci Instr 70(1999) 1158
7. Title of publication : **Test of ITER Plasma Facing Mirror on JET**
 Publisher : American Physical Society, 44th Annual Meeting of the Division of Plasma , #LP1.036

8. Title of publication: **Optical characterization of plasma facing mirrors for a Thomson scattering system of a burning plasma experiment**
Journal : Rev Sci Instr 2001

9. Title of publication : **Diagnostics and control for steady state and pulsed tokamak DEMO**
Journal : Nuclear Fusion 2016

10. Title of Publication : **On similarity Scaling of tokamak fusion plasmas with different aspect ratio**
Journal : Plasma Physics Controlled Fusion 2021

11. Title of publication : **Tritium production in a Fusion-Fission hybrid reactor based on a spherical tokamak neutron source** paper CN 316/1708 , uploaded on the IAEA FEC23 INDICO

12. Title of publication: **Study on Differences of ECE and High Resolution Thomson Scattering temperature measurements in DT(Deuterium-Tritium) plasmas on JET**

Journal : EUROFUSION report WPJET1-CP(23)34231

Key Invited Talk :

New Tokamak physics and next step devices versus present limits of diagnostics – Invited Talk at High Temperature Plasma Diagnostics Conference 1998.

Diagnostics for Fusion-Fission reactors - 2nd edition FUNFI Conference Frascati (Italy)

Neutron sources for Fusion-Fission reactors - 3rd edition FUNFI Conference 2018, Hefei (China).

Fusion-Fission Hybrid reactors based on High Field Tokamak Neutron Source – IAEA Technical Meeting on Synergy between Fusion and Fission , Vienna June 2022 .

Physical Basis of Differences of ECE (Electron Cyclotron Emission) and Thomson Scattering plasma temperature measurements on JET and impact on design of electron temperature diagnostics for Fusion Reactors – ICFDT6 (6th International Conference Frontiers in Diagnostics Technologies , ENEA Frascati , October 2022)

Frascati 09 october 2024

Dr Francesco Paolo Orsitto

