Prof. Giuseppe Calabrò

Position Title: Full Professor of Nuclear Fusion and Electrical Sciences at the University of Tuscia (Viterbo, Italy)

Personal Statement

Prof. Giuseppe Calabrò is professor of Nuclear Fusion and Electrical Sciences with a long experience as researcher in several nuclear fusion laboratories in Europe and China. He has been researcher, for 14 years, at ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development, contributing to a number of experimental, technical physics and engineering areas including: plasma equilibrium configuration modelling, plasma tokamak scenario design, computational electromagnetics, multi-physics codes development and experimental data analysis. Current research interests include numerical computation of electromagnetic fields, with special reference to magneto-quasi-static fields. The fields of applications focus on thermonuclear fusion (mainly to plasma wall interactions studies and advanced magnetic configurations), but range also on electromagnetic non-destructive evaluation, electromagnetic compatibility, analysis of complex electromagnetic systems. He has scientific coordinator and responsible for experimental nuclear fusion experiments like JET (UK), EAST (China), TCV (Switzerland). Tore Supra (France) and ASDEX (Germany). He is co-author of several numerical codes and computational tools, widely used by the international scientific community in the field of fusion plasma modelling and computational electromagnetic (e.g. XSC tools or CREATE–NL code). He is Project Leader and Responsible Officer of several contracts, grants, notifications, task agreement, task orders with several international institutions in the field of fusion (JET, EFDA/EUROfusion, and Fusion for Energy), and invited lecturer for International Conferences and PhD Schools. More recently he has been working on developing innovative metamaterials, consisting on tungsten (W) lattice structures integrated on the plasma facing components for nuclear fusion devices to ensure the effective exhaust of the nominal thermal load during stationary operation.

Education/Training

2003 - 2008	Postdoctoral Fellow at ENEA – Fusion Energy Department, Frascati (Italy). Main research activities have been: fusion plasma engineering, tokamak operations and computational electromagnetics.
2003	Postdoctoral Fellow on Plasma Physics and Fusion Technology at D.I.M.E.T. Department of the University Mediterranea of Reggio Calabria (Italy).

1999 – 2003 PhD in Electronic Engineering (Thesis in Plasma Physics and Fusion Technology) at D.I.M.E.T. Department of the University Mediterranea of Reggio Calabria (Italy). Long-term visiting PhD student at JET (Joint European Torus) tokamak (UK), participating to various projects connected to the JET plasma current and shape control system, including the development and experimental test of CREATE-NL non-linear plasma evolution code (co-author).

1992 – 1999 Master Science (Laurea) degree in Electronic Engineering from the University Mediterranea of Reggio Calabria (Italy)

Positions, Scientific Appointments

- Rector's Delegate for Promotion of Relations with Enterprises and Fundraising, University of Tuscia [2019 – Present]
- President of University Integrated Center (CIA) research department at University of Tuscia [2024 – Present]
- Expert of the Italian Panel for the National Platform for Sustainable Nuclear (PNNS) – Ministry of Environment and Energy Security [2023 – present]
- Spoke Leader for Rome Technopole "Out-reach, public engagement, lifelong learning". "Rome Technopole" is PNRR-NextGenerationEU n. ECS 00000024 project, covering Mission 4 Education and Research, Component 2 From Research to Enterprise, Investment. 1.5 Creation and strengthening of "Innovation ecosystems for sustainability" [2022 – Present]
- European Deputy Project Leader at EUROfusion – Horizon 2020 Plasma Wall Interaction & Exhaust Workpackage [2021 – 2023]
- Rector's delegate at the General Assembly of FuseNet Network [2021 – present]
- Director of CINTEST (Center for Technological Innovation and Territorial Development) at University of Tuscia [2018 – Present]
- Dean of School of Engineering at University of Tuscia, Industrial and Mechanical Engineering programs [2017 – 2020]

Honors and Awards

- Materials Today Cover Competition 2019 (Impact Factor diMaterials Today: 26.416) https://www.materialstoday.com/materials-today-cover-competition-2019/, 2019
- Best Poster Prize at 30th Symposium of Fusion Technology SOFT2018, 2018

List of 5 peer-reviewed publications

1. V. Müller, A., Binder, M., Calabro, et al., *Tailored tungsten lattice structures for plasma-facing components in magnetic confinement fusion devices*, Materials Today 2020, doi: 10.1016/j.mattod.2020.08.015
2. Reimerdes, H., . . . , Calabro, G., et al., *Assessment of alternative divertor configurations as an exhaust solution for DEMO*, Nuclear Fusion, 60 (6) 2020, 066030, doi: 10.1088/1741-4326/ab8a6a
3. Glöggler, S., . . . , Calabrò, G., et al., *Characterisation of highly radiating neon seeded plasmas in JET-ILW*, Nuclear Fusion 59 (12), 2019, 126031, doi: 10.1088/1741-4326/ab3f7a
4. Ambrosino, R., Albanese, R., Calabrò, G., et al., *The DTT device: Poloidal field coil assessment for alternative plasma configuration*, Fusion Engineering and Design 122 (2017) 322-332, doi: 10.1088/1741-4326/aa82c2
5. Calabrò G., et al., *EAST alternative magnetic configurations: Modelling and first experiments*, Nuclear Fusion 55 (8) (2015) 083005, doi: 10.1088/0029-5515/55/8/083005

Teaching activities and mentorship

- Regular graduate courses from the DEIM Department – University of Tuscia: including Nuclear Fusion and Electrical Sciences (2017 - Present)
- Tutor of 15 PhD students and supervisor of more than 50 degree theses (2017 - Present)

Additional information

- Scientific Responsible and Rector's Delegate for University of Tuscia in Divertor Tokamak Test (DTT) SCARL and DTT General Assembly [2020 – present]
- Scientific Responsible of the Nuclear Fusion Research Group at University of Tuscia and Member of Nation Scientific Board of Italian Electrical Engineering Researchers Group [2017 – present]

- Scientific Responsible for University of Tuscia in EUROfusion program [2017 – present]
- Scientific responsible for the project on "Alternative magnetic configurations for EAST tokamak", funded by ASIPP (China) and the project on “Metallurgical and mechanical characterisation of joints for Fusion Energy purpose", funded by Walter Tosto SpA [2017 – 2020]
- Expert Evaluator for Marie Sklodowska-Curie, Horizon 2020, Horizon Europe, ERASMUS+, Rita Levi Montalcini programs [2017 – present]