

Curriculum Vitae

Personal information

First name / Surname Stefania Farinon
address
telephone
e-mail
nationality italian
date of birth
gender female

Work experience

position held from Nov. 1996 to Jan. 2001 Scientist at INFN (National Institute for Nuclear Physics)

Position held since Feb. 2001 Senior scientist at INFN

main research project and scientific collaboration

since 2019 Position: deputy project leader, project leader since June 2021
Design and construction supervision of a single aperture demonstrator of a Nb₃Sn high field dipole

since 2019 Position: design engineer
Design and construction of two prototype of high temperature superconductive CCT dipoles for the INFN experiment BISCOTTO

2015-2019 Position: responsible for INFN WP5 activities
Design of a Nb₃Sn 16 T superconducting dipole for the Future Circular Collider at CERN for the European experiment EuroCircol.

since 2014 Position: deputy project leader, project leader since June 2021
Design and construction supervision of a model, a prototype and the six magnet series of the superconducting dipole D2 for the High Luminosity upgrade of the Large Hadron Collider at CERN

2014-2016 Position: design engineer
Design and construction of a vacuum calorimeter to measure with high accuracy the heat generated by a 100kCi ¹⁴⁴Ce-¹⁴⁴Pr antineutrino generator for the SOX (Short distance neutrino Oscillations with BoreXino) experiment.

2014-2015 Position: design engineer
Design and construction of the first prototype out of 27 modules of the Transport Solenoid for the Mu2e experiment at Fermilab

since 2013 Position: design engineer
Participation to the upgrade study of the gravitational wave detector Virgo (analysis of the electromagnetic and Newtonian noise)

2013-2015 Position: design engineer
Design of a superconducting toroidal magnet for astroparticle shielding in interplanetary manned missions for the European experiment SR2S (Space Radiation Superconductive Shield).

2011-2013 Position: design engineer
Design, construction and test of a model superconducting quadrupole for the interaction region of SuperB factory.

2005-2010 Position: design engineer and responsible of the mechanical design
Design and construction of a fast ramped bent superconducting dipole for the FAIR SIS300 synchrotron.

1995-2005 Position: responsible for the quality assurance and design engineer
Design and construction of the CMS superconducting solenoid at CERN LHC.

2005-2007 Position: responsible for INFN-Genoa activities
Development of a high performance Nb₃Sn conductor for the European NED project

- 2003-2004 Position: responsible for INFN-Genoa activities
Design of the superconducting solenoid for the cyclotron SCENT (Superconducting Cyclotron for Exotic Nuclei and Therapy) at the LNS Laboratory of INFN.
- 2001-2003 Position: design engineer
Design of a heavy ion gantry for oncologic radiotherapy at the CNAO center.
- 1994-1996 Position: design engineer
Design and construction of the BABAR superconducting solenoid for the SLAC facility at Stanford.

Editorial tasks

- since 2005 Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the Applied Superconductivity Conference and the Magnet Technology Conference.
- 2005 Chief Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 19th Magnet Technology Conference.
- 2007 Chief Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 20th Magnet Technology Conference.
- 2009 Lead Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 21st Magnet Technology Conference
- 2010 Chief Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 2010 Applied Superconductivity Conference.
- 2011 Chief Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 22nd Magnet Technology Conference.
- 2012 Lead Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 2012 Applied Superconductivity Conference.
- 2013 Chief Editor of the journal "IEEE Transaction on Applied Superconductivity" for the issues containing the proceeding of the 23rd Magnet Technology Conference.
- 2013 Chief Editor of "Journal of Physics: Conference Series" for 2013 European Conference on Applied Superconductivity
- since 2019 Editor of the regular issues of the journal "IEEE Transaction on Applied Superconductivity"

Scientific committees

- 2013 Member of the Scientific Program Committee of the 23rd Magnet Technology Conference.
- 2013 Member of the Scientific Program Committee of the 2013 European Conference on Applied Superconductivity.
- 2014-2018 Elected member of Applied Superconductivity Conference Board Committee.
- 2014 Member of the Scientific Program Committee of the 2014 Applied Superconductivity Conference
- 2016 Member of the Scientific Program Committee of the 2016 Applied Superconductivity Conference
- 2018 Member of the Scientific Program Committee of the 2018 Applied Superconductivity Conference
- 2019 Member of the Scientific Program Committee of the 2019 European Conference on Applied Superconductivity.

Academic assignments

- Since A.A. 2021-2022 Lecturer for the Master in Physics: " Physics and Technology of Superconducting Magnets" (24 hours)
- A.A: 2005-2006 and 2006-2007 Lecturer for the Master in Physics: "Finite Element Computation for Applications in Physics Problems" (24 hours theory, 25 hours lab)
- Since A.A. 2018-2019 Lecturer in the course of the PhD School in Physics: "Design of superconducting magnets" (20 hours)

Education and training

- 1990-1994 Degree in Physics from University of Genoa
Thesis about the theoretical and experimental study of the spectral response of superconducting materials exposed to varying magnetic field

Personal skills and competences

- Languages Good English, in speaking and writing, poor knowledge of French
- Technical skills and competences in-depth knowledge of design using finite element tools

CURRICULUM VITAE of LAURA SAVOLDI

First name	<i>Laura</i>
Surname	<i>Savoldi</i>
Current job title	<i>Full Professor</i>

Highest education level (BSc, MSc, PhD):

PhD in “Energetics”, Dissertation on “Tests and Thermal-Hydraulic Modeling of Superconducting Magnets for Fusion Applications”, Dipartimento Energia “Galileo Ferraris” (former Dipartimento di Energetica), Politecnico di Torino, 2001.

Research experience:

The main research interests of Prof. L. Savoldi fall in the field of energetics: heat transfer at cryogenic temperatures or for high heat flux components, and energy systems modeling

As far as the first point is concerned, L. Savoldi know-how is in the development, validation and application of models and numerical tools for advanced heat transfer problems.

In the decade 2000-2010 her main focus was the refrigeration of superconducting cables and magnets for fusion. Already since 1999, L.Savoldi has participated to several experimental campaigns for the ITER nuclear fusion reactor magnets, in both European and Japanese laboratories. In particular she collaborated to thermal-hydraulic tests for the ITER conductors at CEA Cadarache (F), she was a member of the Testing group of the Central Solenoid Model Coil and its Insert Coils at JAEA in Naka (J) in 2000, 2001, 2002, 2008, 2015, 2016, she was a member of the Testing group of the TF Model Coil in 1999 and 2000 at the Karlsruhe Institute of Technology (KIT) (D). She collaborates or has collaborated with many national and international institutions, among which: ENEA at Frascati, Italy, Japan Atomic Energy Research Agency (JAEA) at Naka, Japan, Karlsruhe Institute of Technology, Germany, Swiss Plasma Center (CRPP) at Villigen, Switzerland, Commissariat a l’Energie Atomique (CEA) at Cadarache, France, Fusion for Energy (F4E) in Barcelona (ES), ITER IO at Cadarache, France. Her work has been financially supported throughout the last 20 years by several contracts with EURATOM, Fusion for Energy, ITER, the Italian Ministry for University and Research and EUROfusion, where she is an active member of the team working for the Magnet System development since 2014.

Her most important achievement is the development, V&V and application of numerical tools for the thermal-hydraulic analysis of low-critical-temperature (LTS) SC magnets. During her PhD, she developed the **M&M code**, for quasi-3D analysis of thermal-hydraulic transients in superconducting coils. The application of the code allowed a detailed assessment of the performance of the ITER Model Coils, with significant implications on the re-design of the ITER conductors. She also developed the **M³** code for multi-solid multi-channel thermal-hydraulic analysis of cable-in-conduit conductors and was a major contributor to the development of the **THELMA** code for integrated electromagnetic-thermal-hydraulic modelling of superconductors. Based on the M&M code, she was the main developer of the **4C (Conductor, Coil and Cryogenic Circuit) code** for the thermal-hydraulic analysis of superconducting magnet systems, including the cryogenic distribution system. The 4C code was widely validated and applied to several different magnet systems (ITER, JT-60SA, EAST, KSTAR, DTT, EU-DEMO) in the last 10 years. As high-critical-temperature (HTS) tapes are also becoming an option for fusion SC cables, more recently she promoted the development of new numerical models, suitable to simulate the thermal-hydraulic transients in HTS cables.

She first applied machine-learning techniques to the thermal-hydraulic modelling of the superconducting coils, with the aim of developing and testing suitable control strategies to smooth the heat load from the magnets to the cryoplant.

Still active in the field of modelling the appropriate cooling for superconducting cables, L. Savoldi is currently tutoring 2 PhD students working on related topics.

L. Savoldi, March 2023

CURRICULUM VITAE of LAURA SAVOLDI

In the decade 2010-2020, her activity included also the development of detailed (3D) and lumped models for the thermal-hydraulic analysis of water-cooled high heat flux components for nuclear fusion machines, for which she was the recipient of several contracts from F4E. In the past few years, she has been active in the analysis and optimization of cooling alternatives for resonators and collectors of the European gyrotrons. Under her guidance, the MUlti-physiCs tool for the integrated simulation of the CAvity (MUCCA) was developed in collaboration with KIT. The MUCCA tool has been widely applied for the evaluation of operating conditions / for the optimization of the resonator design for the Gyrotrons under development for ITER, the EU-DEMO, the TCV and W-7X. She devoted special attention to the multi-physics aspects of the modeling, and especially to the interaction between thermal-hydraulics and thermo-mechanics. Since 2015 she is also involved in the development, analysis and optimization of tubular receivers for Concentrated Solar Power applications, that share some of the peculiarities of the components for fusion: high heat fluxes and one-side heating. Since 2018 she is a member of the ASME V&V 20 committee for the Verification and Validation in Computational Fluid Dynamics and Heat Transfer, and she regularly serves as Expert for F4E. L. Savoldi is currently tutoring 3 PhD students working on topics related to heat transfer for High Heat Flux components, 2 of which together with Prof. Cammi, from Politecnico di Milano.

In the past 5 years, L. Savoldi started addressing the topic of macro-scale bottom-up modelling of energy systems. In this field, in the framework of OPENscience, she is carrying on the development of an Open-source tool for the modeling of future energy scenarios, in a technology-rich perfect foresight optimization framework. 4 PhD student and several research fellows are working on this project under her guidance.

L. Savoldi serves regularly as reviewer for Superconductor Science and Technology, Applied Energy, Energy, Solar Energy, Fusion Engineering and Design, Energies, Processes, IEEE Transaction on Applied Superconductivity, Nuclear Fusion, see also <https://publons.com/researcher/1965594/laura-savoldi/>.

Prof. Savoldi as today is author or co-author of 200+ papers published in the main International Journals of her sectors, with a h-index of 30 (data from [Google](https://scholar.google.com/) Scholar, Mar 17th, 2023)

MASSIMO SORBI si laurea in Fisica il 4/2/1994 presso l'Università degli Studi di Milano con tesi sperimentale sulla Superconduttività Applicata (Studio della propagazione del "Quench"). Votazione finale 110/110 con Lode.

Dal 1/5/1994 al 31/1/1996 usufruisce di borse di studio nell'ambito della collaborazione TERA per la progettazione di un ciclotrone superconduttivo da impiegarsi in **adroterapia**.

Dal 1/2/1996 al 31/1/2001 è assunto come Tecnologo presso l'Istituto Nazionale di Fisica Nucleare, Sez. di Milano, per la progettazione e costruzione delle bobine superconduttrici toroidali del rivelatore **ATLAS del CERN**. Le bobine verranno costruite in Italia e il magnete ATLAS è attualmente il magnete superconduttore più grande mai realizzato.

Dal 15/7/2002 al 31/12/2003 ha un contratto dall'Università degli Studi di Firenze per la progettazione di schermi **magnetici superconduttivi** da impiegarsi in missioni **spaziali**.

Dal 2/1/2004 al 30/11/2019 è Ricercatore Universitario presso Dipartimento di Fisica dell'Università degli Studi di Milano.

Dal 1/12/2019 è **Professore Associato** presso Dipartimento di Fisica dell'Università degli Studi di Milano. Ambito principale di attività: progettazione e costruzione di **magneti superconduttori per acceleratori di particelle**.

Dal 2016 è **Coordinatore del gruppo Magneti Superconduttori del LASA** (Laboratorio Acceleratori e Superconduttività Applicata - INFN Sez. di Milano & Università degli Studi di Milano) Principali progetti con responsabilità attualmente in corso:

- Progettazione e costruzione dei modelli di dipoli a alto campo (16 T) per il Future Circular Collider.
- Progettazione e costruzione dei magneti superconduttivi correttori "High Order" del programma HiLumi-LHC

Svolge attività didattica nella Laurea Triennale e Magistrale in Fisica di UNIMI.

E' coordinatore del percorso in Fisica degli Acceleratori della Laurea Magistrale in Fisica e tiene il corso di **Superconduttività Applicata**.

Ha assunto il ruolo di relatore di numerose tesi di laurea nell'ambito della superconduttività ed è tutor di Studenti di Dottorato.