NICOLA POMPEO - CURRICULUM VITAE

Researcher on Experimental Physics
Università Roma Tre
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Personal data: Born in Maisières, Belgium, August 7th, 1973. Nationality: Italian.

Positions:
2017–present: **Researcher** (RTD-a then -b, L.240/2010), Experimental Physics, University Roma Tre.
2015–2017: High school tenure teacher.
2011–2015: **Researcher**, Experimental Physics, University Roma Tre.
2006–2010: **post Doc positions** - University Roma Tre.
2006: **Ph. D.** in **Physics**, University Roma Tre, Italy.
1999–2002: Military service up to 2000; System Engineer, MBDA Italia.
1998: **M. Sci. ("Laurea"), Engineering,** Università "La Sapienza", Italy.

Affiliations: IEEE, Senior Member (Council on Superconductivity);
GMEE (Associazione Gruppo Nazionale di Misure Elettriche ed Elettroniche).

Teaching: *Physics; thermodynamics; electromagnetism. Teaching assistant in Applied Superconductivity, Matter Physics.*

Other: Electrodynamics of Matter Laboratory (Univ. Roma Tre).
Participant of 4 Research Projects.
Referee for several journals; among them: *IEEE Trans. Appl. Supercond*., *Adv. Funct. Mater., New J. Phys., IEEE Trans. Microw. Theory Techn., Meas. Sci. Technol., Measurement, J. Phys. Chem. Solids, Physica C*
Collaborations with >6 research groups in Italy, Belgium, USA, France.

Main research (present):

• *Microwave studies to optimize the performances of (nanostructured) superconductors for applications* – The measurements demonstrated the strong reduction of the dissipation in a magnetic field in $YBa_2Cu3_3O_{7-x}$ with artificial nanodefects in the high frequency regime. Coupled with d.c. studies, it was possible to correlate the pinning properties on different dynamic, contributing to assess the feasibility of $YBa_2Cu_3O_{7-x}$ – based magnets in view of the DEMO fusion reactor as well as opening scenarios for microwave circuits based on engineered superconductors. Other materials under investigation are iron-based superconductors (FeSeTe) and MgB_2.

• *Fundamental and vortex properties of superconductor/ferromagnet heterostructures* – Microwave measurements of Nb/ferromagnet heterostructures allowed to determine the interplay of the superconducting and ferromagnetic properties both in terms of the fundamental state and in the vortex state. The latter showed significant effects of the ferromagnet on vortex losses and pinning. Studies on pure Nb lead to a reconsideration of otherwise "standard" vortex phenomenology.

• *Theory on electrodynamics measurements and models for vortex dynamics* – Study of the measurement process of surface impedance in layered complex structures, highlighting through simulations and measurements the complex contributions of different substrate materials. Comprehensive study of the high frequency vortex dynamics models, in order to correctly extract the physical properties of vortices (viscosity, pinning constant, pinning energy) and estimating their confidence intervals. Extension of the models to enable the study of anisotropic superconductors.

• *Design and realization of systems for the measurement of the microwave surface impedance of (super)conductors* – including high sensitivity dielectric resonators, mono and multi-tonal, operated both in reflection and in transmission, with operating frequencies from 6 to 50 GHz; rectangular resonators for the high frequency studies of material anisotropy; Corbino disk cell, for wide band (1-30 GHz) measurements.

Research products: ~55 papers in refereed international journals;
2 book chapters; ~20 Conference Proceedings papers;
~30 presentations at Conferences and Workshops (4 invited);
Citations: ~610; h-index = 14 (Scopus, June 2019).

Rome, Italy, June 2019