



Seminar@ISM

organized by
Communications Group



CNR
Istituto di Struttura
della Materia

When?

January 23, 2025
11:30AM (CET)

Where?

@ Meeting room
CNR-ISM -
Montelibretti branch
Ed. 15

@MS Teams
<https://tinyurl.com/24wchbfy>



Blue Sky Research



ICT & Security

23

January 2025

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Italy

Hybrid spintronics: from nanoscale to microwave devices and quantum sensing

The continuous drive for miniaturization and enhanced functionality defines the trajectory of modern applied research. Spintronics emerges as a key enabler in this evolution, leveraging the spin degree of freedom and novel magnetic materials to push the boundaries of both fundamental understanding and technological innovation.

This presentation will outline the research activities and achievements of the Omnicos group. Nano-spintronics investigations focus on multilayered and nano-devices, demonstrating spin filter effects and the interplay between spin-polarized and single-electron tunneling phenomena. Magnetoresistive transducers are being designed for integration into biosensors and lab-on-a-chip platforms, advancing diagnostics. Additionally, multiferroic materials like BiFeO₃ are studied for their potential in multifunctional devices. Efforts are also directed toward optimizing surface acoustic waves and microwave cavity resonators for coupling with magnetic systems. For instance, our work explores strong coupling (anticrossing) between microwave photonic modes in a three-dimensional cavity and the magnetostatic mode of a YIG sphere from a fundamental point of view and also for quantum sensing applications.

Info at
www.ism.cnr.it/seminar-ism

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