UNIVERSIDAD DE GRANADA

CITIC

Conferencia: Quantum – and Nanophotonics and for Nanoscale Sensing and for Future emerging...

04/12/2024

Conferencia



- **Title:**



Quantum – a
Nanoscale Se
integrated ph
- **Speaker:** Jan
- **Date and tim**
2024, 11:30 a
- **Location:** Mu
- **Organised by:** Centre for Research in Information and Communication Technologies of the University of Granada (CITIC-UGR).
- **Contact:** Francisco Gámiz.

Biografy:

Dr. Jana Nieder is an experimental physicist and Research Group Leader of the Ultrafast Bio- and Nanophotonics Group (UBNP) at INL. Since joining INL in 2014, she has held key roles, including Head of the Nanophotonics Department (2016–2020) and leadership positions in INL's research clusters, contributing to strategic initiatives in Advanced Materials, Health Tech, and Digital Nanosystems.

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Before INL, she was a postdoctoral fellow at IGC (Portugal) and ICFO (Spain), specializing in super-resolution microscopy and ultrafast single-molecule spectroscopy. She earned her PhD in Physics in 2011 with summa cum laude from Freie Universität Berlin, focusing on single-molecule spectroscopy of pigment-protein complexes.

Abstract:
This talk highlights advances in nanophotonics and quantum sensing for nanoscale metrology, emphasizing non-invasive methods to measure distances, temperature, and magnetic fields with unprecedented precision. By leveraging fluorescence lifetime measurements and near-field effects, nanoscale resolutions below the diffraction limit are achieved. A fluorescence lifetime and peak-shifting nanothermometer, compatible with biological cells, has been developed for non-invasive temperature measurement. Advances in quantum sensing using nitrogen vacancy centers in diamond address the challenge of measuring magnetic fields in nanoscale magnetic materials, with applications in medicine, such as cancer therapies. The integration of nanoscale sensors with light sources into photonic platforms opens new possibilities for biosensing and neuromorphic computing. Key enablers include 2D and 3D waveguide fabrication via two-photon polymerization. This work underscores the pioneering efforts of Nieder's Ultrafast Nano- and Biophotonics Group at INL in advancing integrated photonic technologies.

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