

# Quantum optics measurements: a new tool in the MTSD Unit of the Center for Sensors & Devices

November 12, 2025

**A new measuring instrument has been installed in the spectroscopy laboratories of the MTSD Unit at the FBK Center for Sensors & Devices, marking an important step forward in research and development activities in quantum optics and single-photon light sources.**

*“Thanks to this tool, researcher **Rossana Dell’Anna** explains, it will be possible to fully characterize the quantum nature of solid-state photon emitters produced by Center for Sensors & Devices through advanced ion implantation techniques.”*

The [Center for Sensors & Devices](#) (SD) has been active for several years in research on quantum technology platforms, supported by major national and international projects dedicated to the fabrication of quantum photon sources (color centers) in wide-bandgap semiconductors through ion implantation, as well as their optical characterization via photoluminescence spectroscopy.

The researchers involved in these activities are part of a multidisciplinary group that includes, in addition to Rossana Dell’Anna, **Damiano Giubertoni, Giorgio Speranza, Antonino Picciotto, Georg Pucker, Elena Missale, Elia Scattolo, Alessandro Cian, and Elena Nieto Hernandez**.

The new instrument **will enhance** the technological platform for quantum light sources by enabling measurements of the emission lifetimes of color centers and the experimental verification of their potential as single-photon sources. Single-photon sources exhibit a specific behavior known as antibunching, *which* the new instrument can detect using the Hanbury Brown–Twiss interferometry **effect**. The device was developed specifically for the Center through a collaboration with the *Scottish* company Edinburgh Instruments.

Funded through the **IPCEI ME/CT** strategic project, the instrument is the first in a long series of acquisitions that will strengthen the cleanrooms and laboratories of the FBK Center for Sensors & Devices in the coming years. Through the IPCEI ME/CT project, Europe aims to develop innovative solutions in advanced microelectronics and communication technologies to support a digital and sustainable European technological ecosystem.

At FBK, new technological platforms based on the integration of novel materials into research and development processes will lay the foundation for future efficient and intelligent devices capable of transforming sectors such as space, autonomous mobility, and, more broadly, enhancing the sustainability of future European technologies.

*Cover photo: Rossana Dell'Anna, Elena Missale, Elena Nieto Hernandez*

#### PERMALINK

<https://magazine.fbk.eu/en/news/quantum-optics-measurements-a-new-tool-in-the-mtsd-unit-of-the-center-for-sensors-devices/>

#### TAGS

- #antibunching
- #clean room
- #fotoni
- #Hanbury-Brown-Tiss
- #interferometria
- #IPCEI ME/CT
- #microelectronics
- #MTSD
- #photon
- #quantistics
- #semiconductors
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- #spectroscopy
- #sustainability

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