

PRESS RELEASE

DETECTED TRACES OF NEURAL ACTIVITY WITH A DIAMOND QUANTUM NANO-THERMOMETER

A group of INRiM researchers was able for the first time to measure, thanks to a quantum sensing technique (ODMR with NV centers), the temperature variation in a neuron induced by the increase of its "firing" activity. This result opens up various new possibilities for measurement and could lead to significant developments in the field of the neuroscience

■ **Turin, July 25th 2022** – The **quantum optics group of INRiM** (lead by Research Director Marco Genovese) has been able to observe the temperature raise in a neuron induced by the increase of its "firing" activity for the first time, exploiting a quantum sensor based on the spin properties of Nitrogen-Vacancy centers in nanodiamonds.

The results of the research "*Nanodiamond–quantum sensors reveal temperature variation associated to hippocampal neurons firing*", has been published in **Advanced Science** Journal (doi.org/10.1002/adv.202202014).

These quantum sensors, thanks to their nanoscale dimensions and their biocompatibility, are able to pass the cell membrane and probe the target quantities without damaging the cell itself or altering its functioning.

The experiment, realized in the context of **PATHOS** (Horizon 2020) and **QADeT** (EURAMET EMPIR) **projects**, has been carried in collaboration with the Drug Science and Technology Department and the Physics Department of University of Turin, Italian National Institute of Nuclear Physics and the Institute of Organic Chemistry and biochemistry of the Science Academy of Czech Republic.

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