

Maria Eleonora Temperini

WORK EXPERIENCE

[20/11/2019 – 19/11/2020] **Research Fellowship**
Institute for Complex System (ISC), CNR

EDUCATION AND TRAINING

[01/11/2020 – 31/10/2021] **PhD in Materials Science**
Sapienza University of Rome and Istituto Italiano di Tecnologia-Center for Life Nano-&Neuro-science

[01/10/2017 – 24/10/2019] **Master Degree in Physics**
Sapienza University of Rome
Field(s) of study: Condensed Matter Physics

[01/10/2014 – 19/10/2017] **Bachelor Degree in Physics**
Sapienza University of Rome

LANGUAGE SKILLS

Mother tongue(s): Italian **Other language(s):** English

DIGITAL SKILLS

My Digital Skills

Microsoft Office | Python Language - Basic knowledge | LaTeX (very good) | Bruker OPUS | Igor Pro

PROJECTS

Nano-spettroscopia laser infrarossa per lo studio di proteine fotoattive

"Progetti per Avvio alla Ricerca - Tipo 1", 2021

Sapienza University of Rome

PUBLICATIONS

on Peer-Reviewed Journals

- Venanzi, T., Giliberti, V., **Temperini, M. E.**, Sotgiu, S., Polito, R., Mattioli, F. et al. Mid-infrared photocurrent nano-spectroscopy exploiting the thermoelectric effect in graphene. *Applied Physics Letters*, 123(15), 2023.
- Gastiasoro, M. N., **Temperini, M. E.**, Barone, P., & Lorenzana, J. Generalized Rashba electron-phonon coupling and superconductivity in strontium titanate. *Physical Review Research*, 5(2), 023177, 2023.
- Intze, A., **Temperini, M. E.**, Baldassarre, L., Giliberti, V., Ortolani, M., & Polito, R. Time-resolved investigation of nanometric cell membrane patches with a mid-infrared laser microscope. *Frontiers in Photonics*, 4, 1175033, 2023.
- **Temperini, M. E.**, Polito, R., Intze, A., Gillibert, R., Berkmann, F., Baldassarre, L., Giliberti, V. and Ortolani, M. A mid-infrared laser microscope for the time-resolved study of light-induced protein conformational changes. *Review of Scientific Instruments*, 94(6), 2023.
- Venditti, G., **Temperini, M. E.**, Barone, P., Lorenzana, J., and Gastiasoro, M. N. . Anisotropic Rashba coupling to polar modes in KTaO₃. *Journal of Physics: Materials*, 6(1), 014007, 2023.

- **Temperini, M. E.**, Di Giacinto, F., Romanò, S., Di Santo, R., Augello, A., Polito, R., et al. . Antenna-enhanced mid-infrared detection of extracellular vesicles derived from human cancer cell cultures. *Journal of Nanobiotechnology*, 20(1), 1-20, 2022.
- Gastiasoro, M. N., **Temperini, M. E.**, Barone, P., and Lorenzana, J. Theory of superconductivity mediated by Rashba coupling in incipient ferroelectrics. *Physical Review B*, 105(22), 224503, 2022.
- Polito, R., **Temperini, M. E.**, Ritter, E., Puskar, L., Schade, U., Broser, M., Hegemann, P., Baldassarre, L., Ortolani, M. and Giliberti, V. Conformational changes of a membrane protein determined by infrared difference spectroscopy beyond the diffraction limit. *Physical Review Applied*, 16(1), 014048 , 2021.
- Galafassi, S., Sighicelli, M., Pusceddu, A., Bettinetti, R., Cau, A., **Temperini, M. E.**, et al. Microplastic pollution in perch (*Perca fluviatilis*, Linnaeus 1758) from Italian south-alpine lakes. *Environmental Pollution*, 288, 117782, 2021.
- Polito, R., Musto, M., **Temperini, M. E.**, Ballerini, L., Ortolani, M., Baldassarre, L., Casalis, L. and Giliberti, V. Infrared nanospectroscopy of individual extracellular microvesicles. *Molecules*, 26(4), 887, 2021.
- **Temperini, M. E.**, Giliberti, V., Polito, R., Baldassarre, L., and Ortolani, M. Infrared nanospectroscopy and nanoimaging of individual cell membranes and microvesicles exposed to air. *OSA Continuum*, 3(9), 2564-2572, 2020.

Conference proceedings

- Intze, A., Polito, R., **Temperini, M.E.**, Giliberti, V., Ortolani, M. Infrared Nanospectroscopy and Terahertz Irradiation of Pathological Protein Aggregates. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2023.
- Venanzi, T., Giliberti, V., **Temperini, M.E.**, Sotgiu, S., Polito, R., Mattioli, F., Coletti, C., Roddaro, S., Baldassarre, L., Ortolani, M. Infrared photocurrent imaging and spectroscopy with an atomic-force-microscopy probe. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2023 .
- Intze, A., **Temperini, M.E.**, Polito, R., Ortolani, M., Giliberti, V. Mid-Infrared nanospectroscopy to probe protein conformation at the nanoscale. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2023.
- Ortolani, M., **Temperini, M.E.**, Polito, R., Intze, A., Ciano, C., Gillibert, R., Baldassarre, L., Giliberti, V. A Quantum Cascade Laser Microscope for Time-resolved Study of Membrane Proteins. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2022.
- **Temperini, M.E.**, Romanò, S., Di Giacinto, F., Baldassarre, L., Giliberti, V., De Spirito, M., Ciasca, G., Ortolani, M. Mid-infrared Exosome Detection with Plasmonic Nanoantenna Arrays. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2022.
- Intze, A., **Temperini, M.E.**, Polito, R., Zacco, E., Tartaglia, G. G., Pastore, A., Ortolani, M., Giliberti, V. Mid-infrared nanospectroscopy of individual DNA-binding protein oligomers. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2022.
- Polito, R., **Temperini, M. E.**, Puskar, L., Schade, U., Baldassarre, L., Ortolani, M., Giliberti, V. Tip-enhanced infrared nanospectroscopy of microvesicles. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2021.

- **Temperini, M. E.**, Polito, R., Intze, A., Baldassarre, L., Giliberti, V., Ortolani, M. Conformational changes of an oriented film of photosensitive proteins observed by polarized ATR infrared spectroscopy. International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2021.
- **Temperini, M. E.**, Polito, R., Intze, A., Schade, U., Puskar, L., Ritter, E., Baldassarre, L., Ortolani, M., Giliberti, V. Infrared nanospectroscopy study of the light-induced conformational changes of Channelrhodopsin. The European Physical Journal Conferences, 2021.
- Polito, R., Giliberti, V., **Temperini, M. E.**, Ritter, E., Broser, M., Hegemann, P., Puskar, L., Schade, U., Baldassarre, L., Ortolani, M. Light-induced conformational changes of two different Channelrhodopsin mutants probed by difference mid-Infrared microspectroscopy with Synchrotron radiation. . International Conference on Infrared, Millimeter, and Terahertz Waves, IRMMW-THz, 2020.

CONFERENCES AND SCHOOLS

Partecipazione in

- **SciX by The Federation of Analytical Chemistry and Spectroscopy Societies**, Reno (USA), 8-13 October 2023

Oral presentation: *Infrared nanospectroscopy of local electric-field dependent effects probed with atomic-force-microscopy in contact mode.*

- **Principles of light-induced charge transfer for optogenetics**, Modena, 3-5 July 2023

Oral presentation: *A new IR spectroscopy platform to study the effect of static electric fields on biomolecules.*

- **BIOCUBE meeting, workshop and winter school in biophotonics, bioelectronics and biomechanics**, Sestriere , 11-18 December 2022

Poster presentation : *Light-sensitive Protein Activity Probed by Mid-Infrared Spectroscopy at the Nanoscale.*

- **The 16th International Conference on Near-Field Optics, Nanophotonics and Related Techniques**, Victoria (Canada), 29 Agosto- 2 September 2022

Oral presentation: *Exosome detection using a double resonant nanoantenna device in the mid-infrared range.*

- **International workshop and school on Plasmonics**, Torino, 4-8 July 2022

Poster presentation: *Infrared nanospectroscopy study of light-sensitive proteins with a plasmonic probe.*

- **European Optical Society Annual Meeting 2021**, Roma, 13-17 September 2021

Oral presentation: *Infrared nanospectroscopy study of the light-induced conformational changes of Channelrhodopsin.*

- **The 46th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz 2021)**, Chengdu, China (Online Edition), 28 August-3 September 2021

Oral Presentation: *Conformational changes of an oriented film of photosensitive proteins observed by polarized ATR infrared spectroscopy.*

- **Principles of light-induced charge transfer for optogenetics**, Online edition, 14-16 June 2021

- **Temathic school: All-optical interrogation of neuronal networks in vivo**, Online edition, 25-28 May 2021

• **Plasmonica, national workshop of Plasmonics and Nano-optics**, Napoli, 19-21 June 2019

Poster presentation: *Nanoplastic detection in seawater samples with an infrared plasmonic nanoprobe.*