

Personal Information Valeria Giliberti

PROFESSIONAL EXPERIENCES

Jan 2022 - today

Researcher

Center for Life NanoScience CLNS@Sapienza of the Italian Institute of Technology (IIT), Rome, Italy (3-year contract). **In charge of the Nano-Infrared laboratory at CLNS@SAPIENZA and head of research unit for CLNS@SAPIENZA in one regional project and one European project.**

My current activities are mainly devoted to surpassing the spatial resolution limits that plague **infrared** (IR) and **terahertz** (THz) **spectroscopy**, preventing their application to modern problems in nanotechnology, condensed matter and molecular biology. In the Nano-Infrared lab of CLNS@SAPIENZA I have installed and I am running one of the most advanced scanning-probe-assisted (AFM-assisted) instruments for infrared nanoimaging and nanospectroscopy, contributing to advancements in near-field spectroscopy, plasmonics and quantum cascade laser-based spectroscopy.

In the last few years, by combining AFM-assisted IR nanospectroscopy with plasmonic-based strategies, I have started studies of **protein conformations at the nanoscale**, thus posing the base for an independent research career. The main goal of this activity is to efficiently translate at the nanoscale, i.e. deeply beyond the diffraction limit, the well-known capabilities of IR vibrational spectroscopy in terms of label-free chemical identification and ultrasensitive detection of structural signatures of biomolecules.

Beyond fundamental research, I am working on technology applications taking advantage of the expertise in the field of semiconductor-based and THz devices, mainly gained during the PhD. With this aim, I have been involved as responsible of unit/sub-unit in diverse collaborative projects.

Apr 2016 – Dec 2021 **Post-doc**

CLNS@SAPIENZA (Center for Life NanoScience of the Italian Institute of Technology) Rome, Italy (2+3 year contract). Member of the Nano-Infrared laboratory.

After this 5-year position as post-doc I have been promoted to Researcher in charge of the same laboratory.

Maternity leave (2020-2021, 8 months).

Sept 2014 - Apr 2016 **Post-doc**

Department of Physics of Sapienza University of Rome, as team member of the European project FP7 FET-Open "GEMINI: germanium for mid-infrared plasmonics".

My activity mainly concerned the spectroscopic investigation of the as-grown heavily-doped epitaxial germanium samples, a necessary step for the design of the plasmonic devices. In April 2015 I have been in charge of the presentation of the entire work of the Sapienza Unit in the review meeting of the European project FP7 GEMINI project in Bruxelles.

In the framework of the GEMINI project, I spent a **visiting period at the Molecular Foundry of Lawrence Berkeley National Laboratory in Berkeley (United States) as leading research scientist with authorized access to the clean room (2014, 3 months)**. I have demonstrated the possibility of using a highly n-doped Ge-on-Si material for fabrication of **novel resonant scanning probe tips for near-field IR nanospectroscopy**.

Feb 2012 - Aug 2014 **Research fellowship**

Institute for Photonics and Nanotechnologies of National Research Council (IFN-CNR) in Rome.

EDUCATION

Nov 2011 - Oct 2014

PhD in Material Sciences

Sapienza University of Rome, Rome (Italy). Thesis title: "*Nonlinearity of Terahertz Plasmons in a Two-Dimensional Electron Gas*".

The research activity during the three years of PhD was carried out at IFN-CNR, where I could benefit of a fully equipped clean-room for micro- and nano-fabrication. The topic of my main research activity was the study of nonlinearity of plasmons at sub-terahertz frequencies (0.1-1 THz) in two-dimensional electron gases (2DEGs). The work included the design and the fabrication process of the devices by means of micro- and nano-fabrication in a clean-room, and the setup of a THz spectroscopy system. My work led to the **demonstration of an intrinsic plasmon-induced nonlinearity due to the hydrodynamic behaviour of the 2DEGs**, observed by probing the down-conversion by unscreened THz resonant plasmons in 2DEG field-effect transistors.

Sept 2009 - Oct 2011

Master (Italian Laurea Magistrale degree) in Physics

Department of Physics, Sapienza University of Rome, Rome, Italy. Thesis: "*Study of the electromagnetic response from terahertz to infrared frequencies of innovative metamaterials*".

Mark: **110/110 cum laude**.

Sept 2006 - Oct 2009

Bachelor (Italian Laurea degree) in Physics

Department of Physics, Sapienza University of Rome, Rome, Italy.

Mark: **110/110 cum laude**.

SUPERVISION OF PERSONNEL

2023-today

Research supervisor of 1 post-doc and 1 fellowship student

Tommaso Venanzi, post-doc at CLNS@SAPIENZA and team member of the European project NEHO.

Federica Verde postgraduate fellowship student at CLNS@SAPIENZA.

2021-today

External thesis advisor of 2 PhD students

Maria Eleonora Temperini (PhD in Mathematical models for engineering, electromagnetism and nanoscience, Sapienza University) at CLNS@SAPIENZA.

Antonia Intze (PhD in Life Science, Sapienza University) at CLNS@SAPIENZA.

2021-2024

External thesis advisor of 4 master's degree students

Giorgio Gregori, Luna Iacobini, Alessandro Fulli and Federica Verde (Master degree in Physics) at CLNS@SAPIENZA.

2021-2023

External research supervisor of 1 post-doc

Raffaella Polito (post-doc Physics Department, Sapienza University) at CLNS@SAPIENZA.

2018-2021 External thesis advisor of 1 PhD student

Raffaella Polito (PhD Mathematical models for engineering, electromagnetism and nanoscience, Sapienza University) at CLNS@SAPIENZA. Thesis title: "*Plasmonic and photonic strategies to measure conformational changes of transmembrane proteins at the nanoscale*".

FUNDING

Jan 2023-today Scientist in charge of sub-unit (CLNS@SAPIENZA) for a Horizon EIC 2021 Pathfinder Open project

NEHO: Neuromorphic computing Enabled by Heavily doped semiconductor Optics. Partners: IIT - both CBN@Lecce and CLNS@Sapienza - (Italy), CNRS (France), CNR (Italy), Ghent University (Belgium), LMU University (Germany).

Nov 2023-today Scientist in charge of research unit (CLNS@SAPIENZA) for a regional project (call identifier: POR FESR LAZIO 2021-2027 Ambito ASAM "Aerospazio, Sicurezza e Automotive e Mobilità Sostenibile").

NARCISSUS: Monitoraggio del Rischio Idrogeologico da Satellite tramite misura Spettroscopica dell'Umidità del Suolo. Partner: Nhazca S.R.L.

Oct 2020-Oct 2022 Scientist in charge of research unit (CLNS@SAPIENZA) for a regional project (call identifier: POR FESR LAZIO 2014-2020, LIFE 2020).

MICOLET: Optical cavity microscope for the diagnosis of deep skin lesions at terahertz frequencies. Partners: Crisel Instruments S.R.L, Physics Department of Sapienza University of Rome.

Jan 2018-Jul 2019 Scientist in charge of research unit (CLNS@SAPIENZA) for a regional project (call identifier: POR FESR LAZIO 2014-2020, LIFE 2020).

MICOTED: THz confocal microscope for the diagnosis of skin cancer. Partner: Crisel Instruments S.R.L.

TEACHING ACTIVITIES

2020 Monographic lesson

Monographic lesson in a Microscopy Course for PhD students in Physics, Molecular Biology and Life Science at Sapienza University of Rome at CLNS@SAPIENZA. Title of the seminar: "*Infrared spectroscopy and imaging beyond the diffraction limit*" (4 hours)

2019 Monographic lesson

Monographic lesson for students of the Master's degree in Physics. Sapienza University (4 hours) at CLNS@SAPIENZA. Title of the lesson: "*Infrared and terahertz imaging*" (4 hours).

2015 Teaching assistant

General Physics course for Engineering students, Faculty of Information Engineering, Informatics, and Statistics, Sapienza University of Rome (20 hours)

SCIENTIFIC ACHIEVEMENTS
AND RESEARCH
RESPONSABILITIES

- 2023-today **Abilitazione Scientifica Nazionale (ASN)**
Abilitazione Scientifica Nazionale alle funzioni di professore universitario di Seconda Fascia nel Settore Concorsuale 02/B1 - FISICA SPERIMENTALE DELLA MATERIA. (a decorrere dal 06/12/2023).
- 2023 **Award**
Young Scientist Award of the IRMMW-THz society. Motivation: "for important breakthroughs in the domain of biophysical research with infrared near-field techniques". The prize is instituted to recognize interdisciplinary, outstanding scientific work by a young scientist who has made innovative contributions and discoveries in the field of infrared, millimeter, and Terahertz waves. It is awarded after a rigorous evaluation by a peer committee that broadly represents the Infrared, Millimeter-Wave and Terahertz communities.
- 2023-today **Membership in the Scientific Selection Panel (SSP) for the large facility BESSY II of the Helmholtz-Zentrum Berlin (HZB).**
The membership is for the **Condensed Matter college** (Mat college) and it is for three years from 01/01/2023 to 31/12/2025. The members of the SSP are nominated by the Scientific Advisory Committee of HZB and appointed by the HZB Board of Directors.
- 2012-today **Bibliometric indexes**
Total number of publications: 97 (52 peer-review publications + 45 peer-review conference proceedings) (Scopus)
Total Citations: 1154 (Scopus), 1645 (Google Scholar)
Hirsch (H) index: 17 (Scopus), 21 (Google Scholar)

ORGANIZATION OF
CONFERENCES

- 2017
Co-organizer of the international NanoIR user workshop, CLNS@SAPIENZA, Italy. ~50 participants.
- 2014
Participation to the local organizing committee of the workshop "Plasmonica 2014". Physics Department, Sapienza University, Italy. ~100 participants.

PARTICIPATION TO
CONFERENCES

- **Invited oral presentation** at the 1st *European meeting on InfraRed Nanospectro-Imaging*, Paris, France, (March 2024).
- **Invited oral presentation** at the international conference *Sci-X - Federation of Analytical Chemistry and Spectroscopy Societies*, Sparks, Nevada (USA), (Oct 2023).

- **Invited keynote oral** at The 2023 48th International Conference on Infrared, Millimeter and Terahertz Waves (IRMMW-THz) that will be held next September in Montreal, Canada, (Sept 2023).
- **Invited oral presentation** at the International Conference on Advanced Vibrational Spectroscopy (ICAVS12), Krakow, Poland, (Aug 2023).
- Oral presentation at the 5th European Forum on Nanoscale IR Spectroscopy (EFNS 2022), Vienna (Austria), (Sept 2022).
- **Invited oral contribution** at the national congress of the Italian Physical Society (SIF) - session "Fisica della Materia", Milan (Italy), (Sept 2022).
- Oral presentation at *The 46th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz 2019)*, Chengdu, China, (Aug 2021). Remote-based online talks.
- Oral presentation at the workshop *CT4OPTO-Principles of light-induced charge transfer for optogenetics*, (June 2021). Virtual edition.
- **Invited oral presentation** at *Sci-X - Federation of Analytical Chemistry and Spectroscopy Societies*, Palm Springs, USA, (Oct 2019).
- **Keynote oral presentation** at *The 44th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz 2019)*, Paris, France, (Sept 2019) Proc.: 10.1109/IRMMW-THz.2019.8874519.
- Oral presentation at *S3IC (Single-Molecule Sensors and NanoSystems International Conference)*, Munich, Germany, (Apr 2019)
- **Invited oral presentation** at European Forum on Nanoscale IR Spectroscopy, London, UK, (Sept 2018)
- Oral presentation at *The 15th international conference of Near-field Optics and Nanophotonics (NFO-15)*. Troyes, France (Aug 2018).
- Oral presentation at *Plasmonica 2018*. Florence, Italy, (Jul 2018).
- Oral presentation at the *International Conference on Enhanced Spectroscopy (ICES2017)*. Munich, Germany, (Sept 2017).
- Oral presentation at SPIE Optics + Photonics 2017. San Diego, USA, (Aug 2017) Proc.: 10.1117/12.2273796.
- Oral presentation at *Plasmonica 2017*. Lecce, Italy, (Jul 2017).
- Oral presentation at *SPIE Photonics West 2017*. San Francisco, USA, (Feb 2017). Proc.: 10.1117/12.2253851.
- **Keynote oral presentation** at *The 41st International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz 2016)*. Copenhagen, Denmark, (Sept 2016). Proc.: 10.1109/IRMMW-THz.2016.7758341.
- Oral presentation at *The 14th International Conference of Near-Field Optics, Nanophotonics and Related Techniques (NFO-14)*. Hamamatsu, Japan, (Oct 2016).
- Oral presentation at the *International Conference on Enhanced Spectroscopy (ICES2015)*. Messina, Italy, (Oct 2015).
- Oral presentation at *Plasmonica 2015*. Padova, Italy, (Jul 2015).
- Oral presentation at *Plasmonica 2014*. Rome, Italy, (Jun 2014).
- Oral presentation at *The 4th EOS Topical Meeting on Terahertz Science and Technology (EOS-TST 2014)*. Camogli, Italy, (May 2014).

LIST OF ALL PEER-REVIEW
PUBLICATIONS (without peer-
review conference proceedings)

- 1) Temperini, M. E., Polito, R., Venanzi, T., Baldassarre, L., Hu, H., Ciraci, C., ... & **Giliberti, V.** (2024). *An Infrared Nanospectroscopy Technique for the Study of Electric-Field-Induced Molecular Dynamics*. Nano Letters.
- 2) Intze, A., Temperini, M. E., Gregori, G., Verde, F., Ortolani, M., & **Giliberti, V.** (2024). *Effect of 0.6 THz Continuous-Wave Irradiation on Pathologically Relevant Protein Aggregates*. IEEE Transactions on Terahertz Science and Technology.
- 3) Cidonio, G., Dodhia, V. H., Iafrate, L., Kanczler, J. M., Rau, J. V., **Giliberti, V.**, ... & Kim, Y. H. (2024). *Clay nanofiller enhances and stabilises a new injectable human bone extracellular matrix scaffold for skeletal regeneration*. Materials Today Communications, 39, 109082.
- 4) Venanzi, T., Temperini, M. E., Baldassarre, L., Ortolani, M., & **Giliberti, V.** (2024). *Mid-infrared assisted transport at the nano-junction between graphene and a doped-diamond scanning probe*. Photonics and Nanostructures-Fundamentals and Applications, 58, 101243.
- 5) Polito, R., Sotgiu, S., Sohrabi, F., Ferrando, G., Berkmann, F., Temperini, M. E., **Giliberti, V.**, ... & Giordano, M. C. (2024). *Polarization-resolved surface-enhanced infrared spectra with nanosensors based on self-organized gold nanorods*. Journal of the European Optical Society-Rapid Publications, 20(1), 15.
- 6) Venanzi, T., **Giliberti, V.**, Temperini, M. E., Sotgiu, S., Polito, R., Mattioli, F., ... & Ortolani, M. (2023). *Mid-infrared photocurrent nano-spectroscopy exploiting the thermoelectric effect in graphene*. Applied Physics Letters, 123(15).
- 7) Temperini, M. E., Polito, R., Intze, A., Giliberti, R., Berkmann, F., Baldassarre, L., ... **Giliberti V.** and Ortolani, M. (2023). *A mid-infrared laser microscope for the time-resolved study of light-induced protein conformational changes*. Review of Scientific Instruments, 94(6).
- 8) Intze, A., Temperini, M. E., Baldassarre, L., **Giliberti, V.**, Ortolani, M., & Polito, R. (2023). *Time-resolved investigation of nanometric cell membrane patches with a mid-infrared laser microscope*. Frontiers in Photonics, 4, 1175033.
- 9) Temperini, M. E., Di Giacinto, F., Romanò, S., Di Santo, R., Augello, A., Polito, R., ... & Ciasca, G. (2022). *Antenna-enhanced mid-infrared detection of extracellular vesicles derived from human cancer cell cultures*. Journal of Nanobiotechnology, 20(1), 1-20.
- 10) Malerba, M., Sotgiu, S., Schirato, A., Baldassarre, L., Giliberti, R., **Giliberti, V.**, ... & Colombelli, R. (2022). *Detection of Strong Light–Matter Interaction in a Single Nanocavity with a Thermal Transducer*. ACS nano, 16(12), 20141-20150.
- 11) Polito, R., Temperini, M.E., Ritter, E., Puskar, L., Schade, U., Broser, M., Hegemann, P., Baldassarre, L., Ortolani, M., **Giliberti, V.** *Conformational changes of a membrane protein determined by infrared difference spectroscopy beyond the diffraction limit*. (2021) Physical Review Applied, 16 (1), art. no. 014048, .
- 12) Costanzo, G., Šponer, J. E., Šponer, J., Cirigliano, A., Benedetti, P., **Giliberti, V.**, Raffaella Polito and Di Mauro, E. *Sustainability and Chaos in the Abiotic Polymerization of 3', 5' Cyclic Guanosine Monophosphate: The Role of Aggregation*. (2021) ChemSystemsChem, 3(1), e2000011, .
- 13) Tanga, A., **Giliberti, V.**, Vitucci, F., Vitulano, D., Bruni, V., Rossetti, A., Messina, G., Daniele, M., Ruocco, G., Ortolani, M. *Terahertz scattering microscopy for dermatology diagnostics*.(2021) JPhys Photonics, 3 (3), art. no. 034007, .

- 14) Polito, R., Musto, M., Temperini, M.E., Ballerini, L., Ortolani, M., Baldassarre, L., Casalis, L., **Giliberti, V.** *Infrared nanospectroscopy of individual extracellular microvesicles.* (2021) *Molecules*, 26 (4), art. no. 887, .
- 15) Occhicone, A., Pea, M., Polito, R., **Giliberti, V.**, Sinibaldi, A., Mattioli, F., Cibella, S., Notargiacomo, A., Nucara, A., Biagioni, P., Michelotti, F., Ortolani, M., Baldassarre, L. *Spectral Characterization of Mid-Infrared Bloch Surface Waves Excited on a Truncated 1D Photonic Crystal.* (2021) *ACS Photonics*, 8 (1), pp. 350-359.
- 16) Temperini, M.E., **Giliberti, V.**, Polito, R., Baldassarre, L., Ortolani, M. *Infrared nanospectroscopy and nanoimaging of individual cell membranes and microvesicles exposed to air.* (2020) *OSA Continuum*, 3 (9), pp. 2564-2572.
- 17) Giliberti, R., Malerba, M., Spirito, D., **Giliberti, V.**, Li, L., Davies, A.G., Linfield, E.H., Baldassarre, L., Colombelli, R., Ortolani, M. *Nanospectroscopy of a single patch antenna strongly coupled to a mid-infrared intersubband transition in a quantum well.* (2020) *Applied Physics Letters*, 117 (10), art. no. 101104, .
- 18) Gallacher, K., Millar, R.W., Paul, D.J., Frigerio, J., Ballabio, A., Isella, G., Rusconi, F., Biagioni, P., **Giliberti, V.**, Sorgi, A., Baldassarre, L., Ortolani, M. *Characterization of integrated waveguides by atomic-force-microscopy-assisted mid-infrared imaging and spectroscopy.* (2020) *Optics Express*, 28 (15), pp. 22186-22199.
- 19) **Giliberti, V.**, Polito, R., Ritter, E., Broser, M., Hegemann, P., Puskar, L., Schade, U., Zanetti-Polzi, L., Daidone, I., Corni, S., Rusconi, F., Biagioni, P., Baldassarre, L., Ortolani, M. *Tip-Enhanced Infrared Difference-Nanospectroscopy of the Proton Pump Activity of Bacteriorhodopsin in Single Purple Membrane Patches.* (2019) *Nano Letters*, 19 (5), pp. 3104-3114.
- 20) Mancini, A., **Giliberti, V.**, Alabastri, A., Calandrini, E., De Angelis, F., Garoli, D., Ortolani, M. *Nanoscale thermal gradients activated by antenna-enhanced molecular absorption in the mid-infrared.* (2019) *Applied Physics Letters*, 114 (2), art. no. 023105, .
- 21) Pellegrini, G., Baldassarre, L., **Giliberti, V.**, Frigerio, J., Gallacher, K., Paul, D.J., Isella, G., Ortolani, M., Biagioni, P. *Benchmarking the Use of Heavily Doped Ge for Plasmonics and Sensing in the Mid-Infrared.* (2018) *ACS Photonics*, 5 (9), pp. 3601-3607.
- 22) Nardecchia, I., Torres, J., Lechelon, M., **Giliberti, V.**, Ortolani, M., Nouvel, P., Gori, M., Meriguet, Y., Donato, I., Preto, J., Varani, L., Sturgis, J., Pettini, M. *Out-of-Equilibrium Collective Oscillation as Phonon Condensation in a Model Protein.* (2018) *Physical Review X*, 8 (3), .
- 23) Ciano, C., Flammini, M., **Giliberti, V.**, Calvani, P., Delre, E., Talarico, F., Torre, M., Messori, M., Ortolani, M. *Confocal Imaging at 0.3 THz with Depth Resolution of a Painted Wood Artwork for the Identification of Buried Thin Metal Foils.* (2018) *IEEE Transactions on Terahertz Science and Technology*, 8 (4), pp. 390-396.
- 24) Mancini, A., **Giliberti, V.**, Alabastri, A., Calandrini, E., De Angelis, F., Garoli, D., Ortolani, M. *Thermoplasmonic Effect of Surface-Enhanced Infrared Absorption in Vertical Nanoantenna Arrays.* (2018) *Journal of Physical Chemistry C*, 122 (24), pp. 13072-13081.
- 25) Ciano, C., **Giliberti, V.**, Ortolani, M., Baldassarre, L. *Observation of phonon-polaritons in thin flakes of hexagonal boron nitride on gold.* (2018) *Applied Physics Letters*, 112 (15), art. no. 153101, .
- 26) **Giliberti, V.**, Badioli, M., Nucara, A., Calvani, P., Ritter, E., Puskar, L., Aziz, E.F., Hegemann, P., Schade, U., Ortolani, M., Baldassarre, L. *Heterogeneity of the Transmembrane Protein Conformation in Purple Membranes Identified by Infrared Nanospectroscopy.* (2017) *Small*, 13 (44), art. no. 1701181, .

- 27) Sakat, E., **Giliberti, V.**, Bollani, M., Notargiacomo, A., Pea, M., Finazzi, M., Pellegrini, G., Hugonin, J.-P., Weber-Bargioni, A., Melli, M., Sassolini, S., Cabrini, S., Biagioni, P., Ortolani, M., Baldassarre, L. *Near-Field Imaging of Free Carriers in ZnO Nanowires with a Scanning Probe Tip Made of Heavily Doped Germanium*. (2017) Physical Review Applied, 8 (5), art. no. 054042, .
- 28) Flammini, M., Pontecorvo, E., **Giliberti, V.**, Rizza, C., Ciattoni, A., Ortolani, M., DelRe, E. *Evanescent-Wave Filtering in Images Using Remote Terahertz Structured Illumination*. (2017) Physical Review Applied, 8 (5), art. no. 054019, .
- 29) **Giliberti, V.**, Panaro, S., Toma, A., Ortolani, M. *Loading the Antenna Gap with Two-Dimensional Electron Gas Transistors: A Versatile Approach for the Rectification of Free-Space Radiation*. (2017) ACS Photonics, 4 (4), pp. 837-845.
- 30) Flammini, M., Bonsi, C., Ciano, C., **Giliberti, V.**, Pontecorvo, E., Italia, P., DelRe, E., Ortolani, M. *Confocal Terahertz Imaging of Ancient Manuscripts*. (2017) Journal of Infrared, Millimeter, and Terahertz Waves, 38 (4), pp. 435-442.
- 31) **Giliberti, V.**, Sakat, E., Bollani, M., Altoe, M.V., Melli, M., Weber-Bargioni, A., Baldassarre, L., Celebrano, M., Frigerio, J., Isella, G., Cabrini, S., Ortolani, M. *Functionalization of Scanning Probe Tips with Epitaxial Semiconductor Layers*. (2017) Small Methods, 1 (3), art. no. 1600033, .
- 32) **Giliberti, V.**, Baldassarre, L., Rosa, A., De Turre, V., Ortolani, M., Calvani, P., Nucara, A. *Protein clustering in chemically stressed HeLa cells studied by infrared nanospectroscopy*. (2016) Nanoscale, 8 (40), pp. 17560-17567.
- 33) Calandrini, E., Venanzi, T., Appugliese, F., Badioli, M., **Giliberti, V.**, Baldassarre, L., Biagioni, P., De Angelis, F., Klesse, W.M., Scappucci, G., Ortolani, M. *Mapping the electromagnetic field confinement in the gap of germanium nanoantennas with plasma wavelength of 4.5 micrometers*. (2016) Applied Physics Letters, 109 (12), art. no. 121104, .
- 34) Frigerio, J., Ballabio, A., Isella, G., Sakat, E., Pellegrini, G., Biagioni, P., Bollani, M., Napolitani, E., Manganelli, C., Virgilio, M., Grupp, A., Fischer, M.P., Brida, D., Gallacher, K., Paul, D.J., Baldassarre, L., Calvani, P., **Giliberti, V.**, Nucara, A., Ortolani, M. *Tunability of the dielectric function of heavily doped germanium thin films for mid-infrared plasmonics*. (2016) Physical Review B, 94 (8), art. no. 085202, .
- 35) Bollani, M., **Giliberti, V.**, Sakat, E., Baldassarre, L., Celebrano, M., Frigerio, J., Isella, G., Finazzi, M., Melli, M., Weber-Bargioni, A., Cabrini, S., Biagioni, P., Ortolani, M. *Photoluminescence emission from a nanofabricated scanning probe tip made of epitaxial germanium*. (2016) Microelectronic Engineering, 159, pp. 164-168.
- 36) Baldassarre, L., **Giliberti, V.**, Rosa, A., Ortolani, M., Bonamore, A., Baiocco, P., Kjoller, K., Calvani, P., Nucara, A. *Mapping the amide I absorption in single bacteria and mammalian cells with resonant infrared nanospectroscopy*. (2016) Nanotechnology, 27 (7), art. no. 075101, .
- 37) Gallacher, K., Baldassarre, L., Samarelli, A., Millar, R.W., Ballabio, A., Frigerio, J., Isella, G., Bashir, A., Maclaren, I., **Giliberti, V.**, Pellegrini, G., Biagioni, P., Ortolani, M., Paul, D.J. *Ge-on-Si Photonics for Mid-infrared Sensing Applications*. (2016) MRS Advances, 1 (48), pp. 3269-3279.
- 38) Baldassarre, L., Sakat, E., Frigerio, J., Frigerio, J.B.J., Samarelli, A., **Giliberti, V.**, Pellegrini, G., Gallacher, K., Fischer, M., Brida, D., Isella, G., Biagioni, P., Paul, D.J., Ortolani, M. *Mid-infrared sensing using heavily doped germanium plasmonics on silicon substrates*. (2016) ECS Transactions, 75 (8), pp. 247-251.

- 39) **Giliberti, V.**, Sakat, E., Baldassarre, L., Di Gaspare, A., Notargiacomo, A., Giovine, E., Frigerio, J., Isella, G., Melli, M., Weber-Bargioni, A., Aloni, S., Sassolini, S., Cabrini, S., Biagioni, P., Ortolani, M., Bollani, M. *Three-dimensional fabrication of free-standing epitaxial semiconductor nanostructures obtained by focused ion beam*. (2015) *Microelectronic Engineering*, 141, pp. 168-172.
- 40) **Giliberti, V.**, Di Gaspare, A., Giovine, E., Ortolani, M., Sorba, L., Biasiol, G., Popov, V.V., Fateev, D.V., Evangelisti, F. *Downconversion of terahertz radiation due to intrinsic hydrodynamic nonlinearity of a two-dimensional electron plasma*. (2015) *Physical Review B - Condensed Matter and Materials Physics*, 91 (16), art. no. 165313, .
- 41) Autore, M., D'Apuzzo, F., Di Gaspare, A., **Giliberti, V.**, Limaj, O., Roy, P., Brahlek, M., Koirala, N., Oh, S., García de Abajo, F.J., Lupi, S. *Plasmon-Phonon Interactions in Topological Insulator Microrings*. (2015) *Advanced Optical Materials*, 3 (9), pp. 1257-1263.
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