

Massimo De Vittorio is Director of the Center for Biomolecular Nanotechnologies of the Istituto Italiano di Tecnologia in Lecce – Italy and Full Professor at Università del Salento. His research activity deals with the development of science and technology applied to nanophotonics, nanoelectronics and nano and micro electromechanical systems (NEMS/MEMS) for applications in the fields of life-science, energy and ICT. He is currently focusing his research towards implantable probes for manipulating and recording brain activity and on wearable and tattooable sensors for IoMT (Internet of Medical Things) for monitoring and controlling health and wellness in real time.

During his career he has designed and coordinated micro and nanofabrication facilities with both backend and frontend technologies, with full prototyping and small/medium scale production capabilities. He has been consultant of high-tech corporations and founder/advisor of 5 startup companies. He has extensive managerial skills, having coordinated several national and EU projects. He has a strong national and international network and has served on several boards and committees. Author of about 300 manuscripts on international journals, 90 proceedings of international conferences, 14 international patents, 10 book chapters and more than 60 invited/keynote talks to international conferences, he is also senior editor of the Journal IEEE Transactions on Nanotechnology, board member of the international micro and nanoengineering society (iMNEs).

**WORK EXPERIENCE**

- 2016 - to date **Full Professor**  
 Università del Salento, Dip. Ingegneria dell’Innovazione (www.unisalento.it)  
 ▪ Lecturer of “Electronics for Biomedical Devices” and “Nanotechnologies for Electronics”.
- 2014 - to date **Director**  
 Center for Biomolecular nanotechnologies – Istituto Italiano di Tecnologia (Arnesano, LE – ITALY)
- 2014 - to date **Principal Investigator**  
 Istituto Italiano di Tecnologia - Research line “Nanotechnologies for humans and biosystems”
- 2010 –2016 **Associate Professor**  
 Università del Salento, Dip. Ingegneria dell’Innovazione.
- 2006 –2010 **Associate Professor and Deputy Director Nanoscience Dept.**  
 Istituto Superiore di Formazione Interdisciplinare (ISUFI).
- 2001 - 2006 **Assistant Professor.**  
 Engineer Faculty of the University degli Studi di Lecce (Italy).
- 1996-2000 **Technologist**  
 Istituto Nazionale per la Fisica della Materia (INFN).

**EDUCATION AND TRAINING**

- 1995-1996 **Post-doc fellow** *EQF Level: 8*  
 Istituto Nazionale per la Fisica della Materia (INFN)  
 ▪ study and fabrication of quantum semiconductor nanostructures for photonic applications
- 1992-1995 **Master (PhD equiv.)** *EQF Level: 8*  
 Optel InP & Università degli Studi di Lecce  
 ▪ Topic: Semiconductor technologies for optoelectronics  
 ▪ 1993: visiting student at the microfabrication facilities at the CNR–Lamel in Bologna (IT).
- 1986-1992 **M.Sc. degree in Electronic Engineering** *EQF Level: 7*  
 University of Pavia (Italy)

**WORK ACTIVITIES**

- Honors/Awards**
  - 2018-2021: Awardee of an NIH US Brain Initiative Grant on new implantable probes for fiber photometry
  - 2015-2018: Awardee of an NIH US Grant on Brain probes for optogenetics
  - 2013: Invited Professor at Laboratoire Kastler Brossel - UPMC - University Pierre and Marie CURIE – (Paris – France).
  - 2000: Invited scientist at Japanese Key Technology Center & ATR Laboratories (Kyoto – Japan)

Founder of the “Salento Biomedical District”.

Member of the steering committee MNE conference (2016-2018) and founding board member of the international Micro and Nano Engineering Society (iMNEs) (2018)

Chair of several international conferences (MNE2010, MNE2021, founder of the Optogen Series, PLMCN9, TNT2018)

Member of the IEEE EDS Nanotechnology committee

#### Editorial activity

Senior Editor of IEEE Transactions on Nanotechnology

Member of the Editorial Board of Elsevier - Microelectronic Engineering

#### Grants (last 10 years)

**Project Coordinator, H2020 RIA European project DEEPER** (2021-2025 - Budget: **1.24 M€**), Deep Brain Photonic Tools for Cell-type specific targeting of neural diseases (10 countries, 17 PIs).

**Principal Investigator, US NIH project Brain Initiative** (2018-2021 - Budget: **329 k€**), Controlling the spatial extent of light-based monitoring and manipulation of neural activity in vivo

**Project Coordinator, PON project ITEM** (2011-2015 - Budget: **9.37 M€**), “Infrastructure for MEMS technologies”.

**Partner coordinator, Regional project BENEFIT** (2018-2021 - Budget: **175 k€**), “Wearable technologies for Nutritional and Physical Wellbeing”

**co-Principal Investigator, ERC AdG European project BrainBIT** (2016-2022 - Budget: **233 k€**), All-optical brain-to-brain behaviour and information transfer

**Principal Investigator, H2020 FET Open European project NanoBRIGHT** (2019-2023 - Budget: **1.64 M€**), Low- invasiveness devices able to exploit unconventional combinations between optics and photonics to interact with the brain tissue.

**Principal Investigator, ERC PoC European project IN DEPTH** (2021-2023 - Budget: **150 k€**), INtroDucing axial rEsolution in oPtoelectronic implantable devices for tHe brain

**Partner coordinator, PON project SE4I** (2018-2022 - Budget: **455 k€**), Smart Energy Efficiency & Environment for Industry

**Partner coordinator, PON project PON FishRise** (2021-2023 - Budget: **254 k€**), piezoelectric energy harvesters for “Remote, Intelligent & Sustainable aquaculturE system for Fish”.

**Partner coordinator, PON project REM** (2018-2021 - Budget: 509 k€), Recupero di energia meccanica da fluidi per internet delle cose e sensori remoti

**Project Coordinator, ESA European project European Space Agency** (2020-2022 - Budget: 90 k€), Piezoelectric skin smart patches for monitoring vital parameters and sleep of astronauts

## ADDITIONAL INFORMATION

#### Mentorship

MDV has been supervisor of about 20 postdocs and 42 PhD students. Among his former students Giuseppe Maruccio is currently Full Professor at Università del Salento, Egidio De Benedetto is Associate Professor at University of Naples, Ferruccio Pisanello is tenured Principal Investigator at Istituto Italiano di Tecnologia, Vincenzo Mastronardi is Assistant Professor at University of Salento, Marco Grande is Assistant Professor at Politecnico di Bari, M.Teresa Todaro is Researcher at CNR. Antonio Qualtieri, Tiziana Stomeo, and Francesco Rizzi are currently staff members and senior technicians at Istituto Italiano di Tecnologia. Several of his former students have prominent positions in multinational companies.

#### Publications

SCOPUS (August 06 2022)

Total n. of publications: 396; H-Index: 35; total number of citations: 5229 (last 5 years H-index: 20)

GOOGLE SCHOLAR (August 06 2022)

H-Index: 43; total number of citations: 7028

#### **10 selected publications (last 5 years)**

- Spagnolo, B., Balena, A., Peixoto, R. T., Pisanello, M., Sileo, L., Bianco, M., Rizzo, A., Pisano, F., Qualtieri, A., Lofrumento, D. D., de Nuccio, F., Assad, J. A., Sabatini, B. L., **De Vittorio, M. (co-last author)**, & Pisanello, F. (2022). Tapered fiberoles for optoelectrical neural interfacing in small brain volumes with reduced artefacts. **Nature Materials**, 21(7), 826–835. <https://doi.org/10.1038/s41563-022-01272-8> (I.F. 46.863).
- Mariello M., Fachechi L., Guido F., **De Vittorio M.**, Conformal, *Ultra-thin Skin-Contact-Actuated Hybrid Piezo/Triboelectric Wearable Sensor Based on AlN and Parylene-Encapsulated Elastomeric Blend*, **Advanced Functional Materials**, vol. 31, (no. 27), 2021, 10.1002/adfm.202101047, (I.F. 19,924).
- de Marzo, G., Mastronardi, V. M., Algieri, L., Vergari, F., Pisano, F., Fachechi, L., Marras, S., Natta, L., Spagnolo, B., Brunetti, V., Rizzi, F., Pisanello, F., & **De Vittorio, M. (2022)**. *Sustainable, Flexible, and Biocompatible Enhanced Piezoelectric Chitosan Thin Film for Compliant Piezosensors for Human Health*. **Advanced Electronic Materials**, 2200069, [10.1002/aelm.202200069](https://doi.org/10.1002/aelm.202200069) (I.F. 7.663).

- Pisano F., Pisanello M., Lee S.J., Lee J., Maglie E., Balena A., Sileo L., Spagnolo B., Bianco M., Hyun M., Sabatini B.L., **De Vittorio M. (co-last author)**, Pisanello F., *Depth-resolved fiber photometry with a single tapered optical fiber implant*, **Nature Methods**, vol. 16, (no. 11), pp. 1185-1192, **2019**, 10.1038/s41592-019-0581-x, **(I.F. 47,990)**.
- Pisanello, F., Mandelbaum, G., Pisanello, M., Oldenburg, I.A., Sileo, L., Markowitz, J. E., Peterson, R. E., della Patria, A., Haynes, T. M., Emara, M. S., Spagnolo, B., Datta, S. R., De Vittorio, M., & Sabatini, B. L., *Dynamic illumination of spatially restricted or large brain volumes via a single tapered optical fiber*, **Nature Neuroscience**, vol. 20, (no. 8), pp. 1180-1188, **2017**, 10.1038/nn.4591 **(I.F. 28,771)**.
- Lamanna L., Rizzi F., Bhethanabotla V.R., De Vittorio M., Conformable surface acoustic wave biosensor for E-coli fabricated on PEN plastic film, **Biosensors and Bioelectronics**, vol. 163, **2020**, 10.1016/j.bios.2020.112164 **(I.F. 12,54)**.
- Natta L. et al., Guido F., Algieri L., Mastronardi V.M., Rizzi F., Scarpa E., Quattieri A., Todaro M.T., Sallustio V., De Vittorio M., *Conformable AIN Piezoelectric Sensors as a Non-invasive Approach for Swallowing Disorder Assessment*, **ACS Sensors**, vol. 6, (no. 5), pp. 1761-1769, **2021**, 10.1021/acssensors.0c02339, **(I.F. 8,57)**.
- Pisano F., Kashif M.F., Balena A., Pisanello M., De Angelis F., de la Prida L.M., Valiente M., D'Orazio A., De Vittorio M., Grande M., Pisanello F., Plasmonics on a Neural Implant: Engineering Light-Matter Interactions on the Nonplanar Surface of Tapered Optical Fibers, **Advanced Optical Materials**, **2021**, 10.1002/adom.202101649 **(I.F. 10,05)**
- Mariello M., Blad T.W.A., Mastronardi V.M., Madaro F., Guido F., Staufer U., Tolou N., De Vittorio M., Flexible piezoelectric AIN transducers buckled through package-induced preloading for mechanical energy harvesting, **Nano Energy**, vol. 85, **2021**, 10.1016/j.nanoen.2021.105986 **(I.F. 17,81)**.
- Mariello M., Fachechi L., Guido F., De Vittorio M., Multifunctional sub-100µm thickness flexible piezo/triboelectric hybrid water energy harvester based on biocompatible AIN and soft parylene C-PDMS-Ecoflex, **Nano Energy**, vol. 83, **2021**, 10.1016/j.nanoen.2021.105811 **(I.F. 17,81)**.

Complete list of publications:

<https://www.scopus.com/authid/detail.uri?authorId=23501214900>

Lecce, August 27 2022