

## Italian Institute of Technology



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<http://www.iit.it/en/people/nanostructures/head/enzo-di-fabrizio.html>

***Enzo Di Fabrizio is,***

*Since 2009, Head of Nanostructures Department of Italian Institute of Technology in Genoa, head quarter ([www.iit.it](http://www.iit.it)) and full Professor of physics at the University of Magna Graecia in Catanzaro(<http://www.unicz.it/portale/index.php>) . Di Fabrizio conducts an interdisciplinary activity between physics and biology that includes basic and applied research in nanotechnology. His main interests concern: nanofabrication of semiconductor and magnetic materials, optical tweezers based microscopy (applied to biophysics and nanomedicine), Raman spectroscopy for single molecules detection, design and fabrication of nano-devices dedicated to drug delivery, proteomics and single molecule detection, and biophotonic (including photonic crystal and plasmonic based devices).*

Doctor in physics at University of Rome “La Sapienza” in 1987, Di Fabrizio's research in Nanoscience started more than 20 years ago. He spent several years as visiting and associate scientist at the centre of excellence for X-ray lithography (CxrL) at University of Madison-Wisconsin, US. In 1999 he became permanent senior scientist and research director (2001) at INFN, where he was responsible for advanced projects on micro and nanofabrication at TASC laboratory and ELETTRA synchrotron in Trieste; there he founded the Laboratory for interdisciplinary Lithography (LILIT) for which he designed and built two beamline labs for soft and hard X-ray lithography. In 2004 he became Full Professor of physics at the University of Magna Graecia in Catanzaro and since 2007 on, he his visiting Professor at IUSS in Pavia (<http://www.iusspavia.it>).

Di Fabrizio has published more than 250 papers on international journals, about 10 international patents and he coordinates and/or participates in different national and EU projects.

He is in the editorial board of different international scientific journal, Such as Journal of Optic A, European Journal of Physics, MEE member.

In 2011 he was appointed as a member of ANVUR (National Agency for the evaluation of the research)

**Recent short publication list:**

1. F. De Angelis, F. Gentile, F. Mecarini, G. Das, M. Moretti, P. Candeloro, M.L. Coluccio, G. Cojoc, A. Accardo, C. Liberale, R.P. Zaccaria, G. Perozziello, L. Tirinato, A. Toma, G. Cuda, R. Cingolani and E. Di Fabrizio, "Breaking the diffusion limit with super-hydrophobic delivery of molecules to plasmonic nanofocusing SERS structures",

*Nature Photonics*, 5, 682-687 (2011) DOI: 10.1038/NPHOTON.2011.222

2. F. De Angelis, G. Das, P. Candeloro, M. Patrini, M. Galli, A. Bek, M. Lazzarino, I. Maksymov, C. Liberale, L. C. Andreani, and. Di Fabrizio "Nanoscale chemical mapping using three-dimensional adiabatic compression of surface plasmon polaritons "

*Nature Nanotechnology*, 5 (2010) 67-72. DOI: 10.1038/NNANO.2009.348.

3. C. Liberale, P. Minzioni, F. Bragheri, F. De Angelis, E. Di Fabrizio, I. Cristiani "Miniaturized all-fibre probe for three dimensional optical trapping and manipulation;

*Nature Photonics* ; Volume: 1; pp.: 723-727; ISBN: 1749-4885, 2007

4. E. Di Fabrizio, F. Romanato, M. Gentili, S. Cabrini, J. Susini, R. Barrett "High efficiency multilevel Zone Plates for keV X-rays"

*Nature* Vol. 401, 28 October (1999).

5. F. De Angelis, M. Patrini, G. Das, I. Maksymov, M. Galli, L. Businaro, L. C. Andreani, E. Di Fabrizio "A Hybrid Plasmonic-Photonic Nanodevice for Label-Free Detection of a Few Molecules"

*Nano Lett.*, 8 (8), 2321-2327, 2008

6. A. Alexandrescu, D. Cojoc, and E. Di Fabrizio "Mechanism of Angular Momentum Exchange between Molecules and Laguerre-Gaussian Beams"

*Phys. Rev. Lett* ., vol. 96, pp. 243001-243004 ISSN: 1098-0121, (2006)

7. Andrey E. Nikolaenko,<sup>1</sup> Francesco De Angelis, Stuart A. Boden, Nikitas Papasimakis, Peter Ashburn, Enzo Di Fabrizio, Nikolay I. Zheludev “Carbon Nanotubes in a Photonic Metamaterial”,

*Phys. Rev Lett*, 104, 153902 (2010)

8. Accardo, A., Gentile, F., Mecarini, F., De Angelis, F., Burghammer, M., Di Fabrizio, E., Riekkel, C. ” In situ X-ray scattering studies of protein solution droplets drying on micro- and nanopatterned superhydrophobic PMMA surfaces”

*Langmuir*, vol.26, issue 18, pp 15057-15064, 2010

9. G.Das, F. Mecarini, F. Gentile, F. De Angelis, M. Kumar HG, P. Candeloro, C. Liberale, G. Cuda, E. Di Fabrizio”Nano-patterned SERS substrate: Application for protein analysis vs. Temperature”

*Biosensors and Bioelectronics* doi:10.1016/j.bios.2008.08.050 ,(2008)

10. A. Amy Yu, T. Savas, S. Cabrini, E. Di Fabrizio, H. I. Smith, F. Stellacci “High Resolution Printing of DNA feature on Poly(methyl methacrylate) Substrates Using Supramolecular Nano-Stamping”

*J. Am. Chem. Soc.* 127, 16774, 2005

## **Recent International projects**

As director of Nanostructures Department leads and is involved in several European and National research projects:

- ■ SMD, Single Molecule Detection, EU project started on July 1th 2009.

Duration: 3 years.

Total Budget: about 3.5 MEuro.

- ■ Nanoantenna, EU project started on October 1th 2009

Duration: 3 years.

Total Budget: about 3.6 MEuro.

- ■ FOCUS, EU project started on 1st January 2011.

Duration: 3 years.

Total Budget: about 3.8 MEuro.

- ■ PON, “Novel nanotech strategies for development of drugs and diagnostics for targeting of circulating cancer cells”.

National project started on July 2011.

Duration: 3 years.

Total Budget: about 13 MEuro

