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Alberto Diaspro

Senior Researcher - Principal Investigator
Department Director

Research Line

Nanoscopy & NIC@IIT (</research/lines/nanoscopy-nic-iit>)

Center

IIT Central Research Labs Genova

Contacts

[CONTACT ME](#)

About

Alberto Diaspro is Director of the Department of Nanophysics at the Istituto Italiano di Tecnologia (IIT), Deputy Director of IIT, Chair of the Nikon IMaging Center at IIT (www.nic.iit.it) (<http://www.nic.iit.it/>). AD is Professor of Applied Physics at the Department of Physics of University of Genova and supervisor for the Ph.D. Courses in the Bioengineering and Robotics and Physics programs of the University of Genova within the IIT program. He was President of OWLS (Optics with Life Sciences), EBSA (European Biophysical Societies Association), Appointed Vice President of ICO (International Commission of Optics). AD is a founder of the Nanoscale Biophysics Subgroup of the Biophysical Society (*). During the 90's he carried part of his research activity at Drexel University (PA, USA), Universidad Autonoma de Madrid (Spain) and Czech Academy of Sciences (Czech Republic). He also coordinated a research program (2004-2012) at IFOM-IEO Campus in Milano on Biomedical Research and is currently associated with the Institute of Biophysics of the National Research Council (CNR) (since 2006). He founded LAMBS (Laboratory for Advanced Microscopy, Bioimaging and Spectroscopy) in 2003 - www.lambs.it. AD realized a hybrid artificial "nanobiorobot" within EU and national Research Projects (2000-2005), and designed and realized the first Italian multiphoton microscope within a research grant of the National Institute of Physics of Matter (INFM) (2006). He directed the design and realization of the first Italian nanoscopy architecture at the Neuroscience and Brain Technologies Department of IIT (2008).

At present, Alberto Diaspro coordinates the Nanobiophotonics IIT research program (**). He is coordinator of several EU and national research programs, and published more than 100 international peer reviewed papers, 6000 citations, H=38 (source Google Scholar ***). He is Editor in Chief of the international Journal Microscopy Research and Technique and a member of international editorial boards and societies (SIOF, SIF, SISM, SIBPA, BS, EBSA, OWLS, IEEE, SPIE, OSA). AD is IEEE senior member and SPIE fellow (<http://spie.org/profile/Alberto.Diaspro-6137>) (<http://spie.org/profile/Alberto.Diaspro-6137>). AD He received the Emily M.Gray Award in 2011.

His specific research experience is related to the design, realization and utilization of optical and biophysical instrumentation as far-field super resolution optical microscopy and nanoscopy, conventional and confocal microscopy, two-photon fluorescence microscopy and spectroscopy architecture, differential scanning calorimetry, scanning probe microscopy (STM, SNOM, AFM), polarized light scattering, signal and image digital processing. His main interests are molecular oncology (chromatin, endocytosis and adhesion mechanisms), neuroscience (brain mapping and neuronal network signaling) and smart materials (intelligent drug delivery and nanocomposite materials).

(*) <http://www.biophysics.org/Membership/Subgroups/NanoscaleBiophysics/tabid/728/Default.aspx>
(**) (<http://www.biophysics.org/Membership/Subgroups/NanoscaleBiophysics/tabid/728/Default.aspx>) (https://www.iit.it/images/stories/scientific_plan/iit-strategic_plan_2015-2017)
(***) (/images/stories/scientific_plan/iit-strategic_plan_2015-2017.pdf) (<https://scholar.google.com/citations?user=FiRb-LIAAAAJ&hl=it>) (<https://scholar.google.com/citations?user=FiRb-LIAAAAJ&hl=it>) (<https://scholar.google.com/citations?user=FiRb-LIAAAAJ&hl=it>) (<http://www.biophysics.org/AwardsFunding/SocietyAwards/PastAwardees/tabid/5497/Default.aspx>) (<http://www.biophysics.org/AwardsFunding/SocietyAwards/PastAwardees/tabid/5497/Default.aspx>)

Microscopy skills

Super resolved fluorescence microscopy, Correlative Nanoscopy, Mueller matrix signature, Bioimaging.

Confocal and Multiphoton Microscopy, i.e., FRAP, FRET, SHG, lifetime imaging, spectral fingerprint, single molecule detection, colocalization, 3D/4D.

Live imaging down to molecular resolution, single molecule/particle tracking with 5-10 nm accuracy, 100-400 nm resolution, single molecule sensitivity, Nanoscopy - FCS, TIRF, STEC
IML-SPIM (Individual Molecule Localization - Selective Plane Illumination Microscopy).

4D (x, y, z, t) particle tracking, fast scanning modes - 100 fps, 512x512 pixel, photoactivatable fluo markers - paGFP, other fluo probes.

Active optical microscopy molecular 3D/4D uncaging and events follow up.

Deep imaging towards small animal live imaging, depth penetration, 0.5-1 mm.

Integration with electrophysiological data, multimodal platform for simultaneous imaging and data analysis.

Implementation of a deconvolution and image processing platform powermicroscope - friendly remote web access, correlative microscopy vs. TEM, SEM, AFM.

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Scientific Talks

2019

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Multi messenger multiphoton microscopy
SPIE Photonics West "Multiphoton Microscopy in the Biomedical Sciences XIX"

Diaspro A.ⁱⁱ

Multi-messenger Optical Microscopy
ISSUGE Seminar

Diaspro A.ⁱⁱ

Multi-messenger optical microscopy, a new paradigm in optical microscopy
Seminar Tech4Bio

2018

Diaspro A.ⁱⁱ

Cutting-edge Technology: Liquid Tunable Microscopy: a new paradigm in Optical Microscopy
Course "Fluorescence Microscopy"

Zanini G.ⁱⁱ, Deguchi T., Korobchevskaya K., Koike K., Kawagoe H., Oketani R., Smith N. I., Bianchini P.ⁱⁱ, Fujita K., Diaspro A.ⁱⁱ

Exploiting optical non-linearities in life sciences.
Women in Photonics

Diaspro A.ⁱⁱ

Exploring space and time at the nanoscale in the realm of light
SIB-ALPE ADRIA Meeting

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Fluorescence Optical Nanoscopy
Europtrode XIV

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La bellezza come sostanza e come forma: dal grafene alla superficie lunare le forme che si ripetono
La bellezza ci unisce

Diaspro A.ⁱⁱ

La Venere di Botticelli e le immagini liquide in Microscopia
Hypatia Festival

Diaspro A.ⁱⁱ

Liquid Tunable Microscopy
Quantitative Bioimaging Conference

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Dissemination Talks

2019

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Prego, si accomodi Mr.Feynman nel futuro immediato di Irene!
La Lanterna delle positività

Diaspro A.ⁱⁱ

Una 'nanoscala' per esplorare gli scaffali di quell'immensa libreria che è la cellula"
Biophysics Week Genova

2018

Diaspro A.ⁱⁱ

LIQUITOPY: painting living cells at the nanoscale
University of Urbino, March 29th