

Dr. Roberta Fantoni

Role/Charge

Head, Technology Application for Security and Health Division (FSN-TECFIS) at ENEA since July 2015.

Professional career

Degree in Chemistry at Roma University "La Sapienza" in 1978 discussing a thesis on electron spectroscopy in the gas phase. After a period of fellowships, permanent position at ENEA in 1982 initially addressed to the participation to laser assisted uranium isotope enrichment project. At the end of the project she spent some periods of specialization abroad (Catholic University of Nijmegen - NL, ETH Ecole Polytechnique Zurich - CH). Due to her professional expertise on laser diagnostics and photochemistry, in 1998 she became the head of the Molecular Spectroscopy Laboratory of ENEA at Frascati (FIS-SPET), keeping the charge until 2010. In 2010 she was appointed as director of the large Technical Unit "Applications of radiations" (UTAPRAD) of ENEA at Frascati. Following the last structural changes in ENEA, since 2015 to now, she became head of Technology Application for Security and Health Division (FSN-TECFIS) of ENEA at Frascati.

Major scientific results

Scientific activity. From the beginning of her career Dr. R. Fantoni was involved in multidisciplinary research activities and projects implying knowledge relevant to both chemistry and physics (spectroscopy and material processing). Successively, within the field of radiation-matter interactions, she carried out researches on processes with a broader applicative range, from biology and medicine to cultural heritage. Her well consolidated scientific and technological background was time to time utilized and reshaped for specific tasks, such as: laser applications in physical chemistry, starting from researches relevant to the laser isotope enrichment project basically dealing with multi-photon and high resolution IR spectroscopy; laser spectroscopies and diagnostics, including infrared diode laser spectroscopy, laser Raman spectroscopy, emission spectroscopy in visible/ultraviolet range, multiphoton-ionization spectrometry, Laser Induced Fluorescence (LIF), Laser Induced Breakdown Spectroscopy (LIBS), Coherent AntiStokes Raman Scattering (CARS), Degenerate Four Wave Mixing (DFWM) e Laser Induced Grating Spectroscopy (LIGS); different multidisciplinary laser application relevant to microelectronics (thin film deposition), to material science (nano-structures synthesis), to the environment (laser decomposition of liquid and gaseous pollutants) and in situ and remote characterization of Cultural Heritage surfaces; Organization and participation to monitoring campaigns on sea waters and cultural heritage surfaces.

Major editorial activities

She is the co-author of about 167 peer reviewed scientific publications, we report only 5 significant recent titles:

(2013) R. Fantoni, S. Almaviva, L. Caneve, F. Colao, A. M. Popov, G. Maddaluno "Development of Calibration-Free Laser-Induced-Breakdown-Spectroscopy based techniques for deposited layers diagnostics on ITER-like tiles" *Spectrochim. Acta B* 87, 153-160.

(2013) L. Caneve, F. Colao, R. Fantoni, L. Fiorani "Scanning lidar fluorosensor for remote diagnostic of surfaces" *Nuclear Instruments and Methods in Physics Research A* 720, 164-167.

(2014) S. Almaviva, S. Botti, L. Cantarini, R. Fantoni, S. Lecci, A. Palucci, A. Puiu and A. Rufoloni "Ultrasensitive RDX detection with commercial SERS substrates" *J. Raman Spectrosc*, 45, 41-46.

(2014) V. Spizzichino, R. Fantoni "Laser Induced Breakdown Spectroscopy in Archeometry: a review of its application and future perspectives" *Spectrochim. Acta B* 99, 201-209.

(2018) V. Lazic, M. Vadrucchi, R. Fantoni, M. Chiari, A. Mazzinghi, A. Gorghinian, Applications of laser induced breakdown spectroscopy for cultural heritage: A comparison with XRF and PIXE techniques, *Spectrochim. Acta Part B* 149, 1-14.