europass Curriculum Vitae

Ilaria Rago

WORK EXPERIENCE

STARTING FROM SEPTEMB 2018-PRESENT

PostDoc Research Associate at Sapienza University

Serving at Department of Physics - "Sapienza" University of Rome

Title of the project "Carbon nanotubes as anisotropic targets"

Skills: CVD synthesis of Highly aligned CNTs on crystalline / amorphous surfaces. CNTs characterization via microscopic (SEM, TEM) and spectroscopic techniques. Ionic bombardment of CNTs in ultra-high vacuum (UHV) conditions to cause controlled damage. CNT analysis and characterization of induced defects. Control of channeling effects. Advanced mechanical design for nuclear physics research by using the most advanced software tools for the mechanical design (CAD and CAE solutions through software such as Autodesk Inventor and COMSOL Multiphysics). Additive Manufacturing studies, operative both in pure nuclear physics mechanical task and in applied research collaborative activities with private industries in the INFN HAMMER (Hub for Additive Manufacturing Materials Engineering and Research) facility, a diffused pole between Rome and Gran Sasso sites.

STARTING FROM NOVEM 2017-MAY 2018

PostDoc Research Associate at Elettra Synchrotron Light Source in Basovizza, Trieste

Serving at ELETTRA Synchrotron Light Source in Basovizza, Trieste
Title of the project "BioMec (Application of biomechanical technologies for supplementing the conventional methods in the hospital context)"

Skills: Development of substrates and protocols for the standardization of biomechanical measurements of tumor tissue bioptic slices via Atomic Force Microscopy (AFM). Data normalization strategies to compare healthy and diseased tissues on an absolute scale in order to develop an integrative approach allowing to correlate biomechanical properties of bioptic tissues with the degree of malignancy of the tumor, in the context of breast cancer.

EDUCATION AND TRAINING

STARTING FROM NOVEM 2014-NOVEM 2017

PhD in Nanotechnology

University of Trieste, research conducted at ELETTRA Synchrotron Light Source in Basovizza, Trieste

Title of the thesis: *"Tuning cellular functionality and mechanobiology via carbon nanotubes based scaffolds"*

Skills: deep knowledge of CNTs synthesis by CVD and ability to control the route in a nano-micro-fabrication context. CNTs characterization via electron microscopy (SEM and TEM) and spectroscopy studies (Raman and XPS), development and optimisation of complex 2D patterns or 3D CNTs architectures via lithographic techniques or by decorating porous iron-based materials (e.g. sintered iron foam) with CNTs, for cardiac applications (self-standing CNTs films to permit restoration of cellular conduction in the heart) and neuroscience (growth of 2D/3D cellular networks on CNTs based frameworks). Good knowledges of the main micro- and nano-fabrication techniques and protocols, such as:

- Lithography: UV lithography, Electron Beam lithography.
- Deposition: spin coating, thermal evaporation, e-beam evaporation and magnetron sputtering.
- Etching: dry etching in ICP-RIE of silicon, silicon nitride and silicon oxide; RIE based plasma treatment, dry etching and pattern transfer on substrates; wet etching processes.
- Characterization: AFM, SEM, EDS, profilometry.

STARTING FROM JULY 2013-OCTOBER 2014

Research fellow

University of Rome "Sapienza"

Title of the project: "Data collection and processing for biochemical tests on graphene and ZnO nanostructures"

Skills: Synthesis and characterization of graphene- and ZnO-based nanomaterials; bacterial viability tests to evaluate the antibacterial properties of these nanostructures on both Gram-positive and Gram-negative bacteria; in vivo toxicity studies of both GNPs- and ZnO- based suspensions by using the mini host infection model C. elegans.

2012-2013

Master's degree in Engineering of Industrial Nanotechnology

University of Rome "Sapienza", faculty of Civil and Industrial Engineering

Title of the thesis: "Antibacterial properties of graphene and ZnO-based nanostructures".

Vote: 110 /110 Cum Laude

Skills: learning of basic concepts of micro-nanotechnology to deal with materials and processes to engineer micro- and nano-devices; capacity to simulate micro- and nano-device using computational methods at the atomistic level for specific and multifunctional applications; theoretical knowledge of nano-lithographic fabrication procedures and self-assembled nanostructures, surface engineering, large scale production techniques of micro- and nano-particles, technique of multifunctional MEMS and sensing characterizations down to the nanoscale; methods of analysis and design of new multifunctional and smart materials; implementation of mechanical, electrical, electromagnetic and hybrid micro- and nano-device.

PUBLICATIONS

Response of windowless silicon avalanche photo-diodes to electrons in the 90–900 eV range

A. Apponi, G. Cavoto, M. Iannone, C. Mariani, F. Pandolfi, D. Paoloni, **I. Rago**, A. Ruocco, *Journal of Instrumentation*, 15, 2020

Carbon nanotubes as anisotropic target for dark matter

G. Cavoto, M. G. Betti, C. Mariani, F. Pandolfi1, A. D. Polosa, **I. Rago**, A. Ruocco, *J. Phys.: Conf. Ser.* ,1468, 012232, 2020.

Neutrino physics with the PTOLEMY project: Active neutrino properties and the light sterile case

M.G. Betti, (…) **I. Rago**, Y. Raitsess, M. Rajteriz, N. Rossie, I. Rucandioo, R. Santorellio, K. Schaeffnery, C.G. Tullyw, M. Vivianiv, F. Zhaow and K.M. Zurek, Journal of Cosmology and Astroparticle Physics, Volume 2019, 2019.

Transparent carbon nanotubes promote the outgrowth of enthorino-dentate projections in lesioned organ slice cultures

N. P. Pampaloni, **I. Rago**, I. Calaresu, L. Cozzarini, L. Casalis, A. Goldoni, L. Ballerini, D. Scaini, *Devel. Neurobiol.*, 2019.

Carbon Nanotubes Directly Grown on Supporting Surfaces Demonstrate to Improve Neuronal Activity in Hippocampal Neuronal Networks

I. Rago, R. Rauti, A. Pozzato, M. Cibinel, M. Dal Miglio, A. Goldoni, Denis Scaini, *Advanced Biosystems*, 3 (5), 1800286, 2019.

Interface phenomena between CdTe and ZnTe:Cu back contact

A. Bosio, R. Ciprian, A. Lamperti, **I. Rago**; B. Ressel, G. Rosa, M. Stupar, E. Weschke, *Solar Energy*, 2018.

Atomic Force Microscopy analysis of extracellular vesicles

P. Parisse, **I. Rago**, L. Ulloa Severino, F. Perissinotto, E. Ambrosetti, P. Paoletti, M. Ricci, A. P. Beltrami, D. Cesselli, L. Casalis, *European Biophysics Journal*, 2017.

Polyhydroxyalkanoate/carbon nanotube nanocomposites: Flexible electrically conducting elastomers for neural applications

C. Vallejo-Giraldo, E. Pugliese, A. Larrañaga, M. A Fernandez-Yague, J. J. Britton, A. Trotier, G. Tadayyon, A. Kelly, **I. Rago**, J.Ramon. Sarasua, E. Dowd, L.R Quinlan, A. Pandit, M.J.P. Biggs *Nanomedicine*, 11(19), (2016).

Graphene Oxide Nanosheets Reshape Synaptic Function in Cultured Brain Networks

R. Rauti, N. Lozano, V. León, D. Scaini, M. Musto, **I.Rago**, F. P. Ulloa Severino, A. Fabbro, L.Casalis, E. Vázquez, K. Kostarelos, M. Prato, L. Ballerini *ACS Nano*, 10(4), (2016).

Experimental setups for FEL-based four-wave mixing experiments at FERMI

M. Zangrando, (…), **I. Rago**, L. Raimondi, R. Sauro, M. Scarcia, P. Sigalotti, M. Zaccaria, C. Masciovecchio, *Journal of Synchrotron Radiation*, 23(1), (2016).

Antimicrobial activity of graphene nanoplatelets against *Staphylococcus aureus*

A.Bregnocchi, E.Zanni, **I.Rago**, L.Paliotta, G.De Bellis, D. Uccelletti, M.S. Sarto Conference Paper, GraphIta 2015, Bologna, Italy.

Antimicrobial activity of graphene nanoplatelets against *Streptococcus mutans*

I. Rago, A. Bregnocchi, E. Zanni, A.G. D'Aloia, F. De Angelis, M. Bossu,G. De Bellis, A. Polimeni, D. Uccelletti, M.S. Sarto Conference Paper, IEEE 15th International Conference on Nanotechnology (IEEE NANO), 2015, Rome, Italy

Zinc Oxide Microrods and Nanorods: Differential Antibacterial Activity and their Mode of Action against Gram-positive Bacteria

I.Rago, C. Chandraiahgari, M. P. Bracciale, G.De Bellis, E. Zanni, M. C. Guidi, D. Sali, A. Broggi, C. Palleschi, M. S. Sarto, D. Uccelletti, *RSC Adv.*, 4, (2014).