CHALLENGES
Training School on real time nano characterization related technologies

September 21-22-23

The School will be held both REMOTELY and IN ATTENDANCE

Chairs: Daniele PASSERI, *Sapienza University of Rome* & Stefania MELANDRI*, Warrant Hub*

Co-organized with
CHALLENGES

The course is dedicated to PhD students and postdoc young scientists, from Italian and European Institutions, companies and industry.

The programme includes 2 days of frontal lessons and 1 day of training (i.e. lessons, visits and practical demonstrations) at the Laboratory for Nanotechnologies and Nanosciences of Sapienza (SNN-Lab) of the interdepartmental research center on nanotechnologies applied to engineering (CNIS) and at the ATOM (Open Infrastructure for Advanced Tomography and Microscopies) Research Center.

Time/date	21st September 2022 - Training	22nd September 2022 - Training	23rd September 2022 - Symposium
09:00-09:30	Arrival & Registration	Arrival	Arrival & Registration
09:30- 09:45	UNISAP – Welcome and introduction to day 1	Introduction to day 2	Introduction to day 3
09:45-10:30	*Strain in materials science and conventional characterization methods*	*Nanomaterials production in industrial environment*	9:30-9:50 **CHALLENGES project** UNISAP
09:45-10:30	**Welcome speech** *Marco Rossi (UNISAP)* **General introduction on strain in materials science** Paolo Postorino (UNISAP)	**Metrology for process control in semiconductor industry** *Delphine Le Cunff (ST_C)*	9:50-10:10 **Horizon Europe: new challenges and opportunities** Lorenza Carabba (WH) 10:10 – 11:00 **Speech from EMMC / EMCC clusters** Gerhard Goldbeck (Goldbeck Consulting) - EMMC Marco SEBASTIANI (Roma3) - EMCC
10:30 -11:15	**Introduction to strain characterization methods in Transmission Electron Microscopy** *Roberto Balboni (CNR)*	**Status and production process of crystalline Silicon solar cells and modules** *Ivan Gordon (IMEC)*	11:00-12:00 **PITCH SESSION - SISTERS PROJECTS** - NanoPAT https://cordis.europa.eu/project/id/862583 - NanoBat https://cordis.europa.eu/project/id/861962 - RealNano https://cordis.europa.eu/project/id/862442
11:15-11:30	*Coffee break*	*Coffee break*	*Coffee break (12:00-12:15)*
11:30-12:15	**Metrological raman spectroscopy for strain characterization** *Stefan WUNDRACK (PTB)*	**Process control measures and QC and GFET wafers** *Amaia ZURUTUZA (GRAPHENEA) - virtual* **Transmission Electron Microscopy for 2D materials characterization & standardization** *Vittorio MORANDI* (CNR-IMM)	12:15-13:00 **Round table and discussion**
12:15-13:00	**X-ray strain analysis** *Patrice Gergaud (CEA)*	*Simulation and modelling* **Multiscale simulation and modelling** *Matthias AUF DER MAUR (TIBERLAB)*	
13:00-14:00	*Lunch*	*13:00 – 14:30 Lunch*	*Closing*
	Innovative plasmonic techniques for strain characterization	*Hands- on sessions*	

14:00-14:45	Basics on plasmonic enhanced characterization techniques Aaron Lewis - NANONICS	14:30-17:00 Visit to Laboratories of CNIS (Center of Nanotenologies Applied to Engineering of Sapienza): Sapienza Nanotechnolieges and Nanosciences Lab Advances Tomographies and Microscopies Lab Main Campus of Sapienza - P.le A. Moro, 5 Buildings CU014 & CU016	
14:45-15:30	**Enhanced Optical Heating of Silicon Nano-Cones Under CW Illumination** *Sergey S. Kharintsev* (invited speaker) - *virtual*		
15:30-15:45	*Coffee break*	15:45 – 17:00 Visit to ATOM (Open Infrastructure for Advanced Tomography and Microscopies) Research Center	
15:45-16:30	Plasmonic enhanced optical spectroscopy - from the lab environment to the factory floors Aaron Lewis - NANONICS	Visit to ATOM (Open Infrastructure for Advanced Tomography and Microscopies) Research Center	
16:30-17:15	**AI and machine learning algorithms for fast optical material metrology tools** *Roy Pinhassi (NOVA)*		