# FROM MICRO TO NANO: SYNTHESIS, CHARACTERIZATION AND MODELING FOR FUTURE ELECTRONICS AND SENSING

| | timing | Monday 13th May 2024 | Tuesday 14th May 2024 | Wednesday 15th may 2024 | Thursday 16th may 2024 | Friday 17th may 2024 |
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| | | | **SYNTHESIS** | **CHARACTERIZATION** | **MODELLING** | |
| Fundamentals | 9:00 - 9:45 | | **P. Prete**, *Synthesis of epitaxial nanostructures (MOVPE, VLS, SAE)* | **F. Liscio**, *Surfaces, interfaces and nanostructures: structure and morphology probed by X-ray scattering technique* | **E. Paladino**, *Introduction to quantum technologies* | |
| | 9:45 - 10:30 | ARRIVALS | **R. Lo Nigro,** *Chemical vapour deposition techniques* (CVD, MOCVD and ALD): precursors, deposition mechanisms and microelectronic applications. | **G. Pellegrino**, *XPS Techniques: principles and potentialities for the surfacxe analys of functional materials* | **C. Degli Esposti Boschi**, *Lattice Model Hamiltonians to study the effect of strong correlations in many-body quantum systems* | |
| | 10:30 - 11: 00 | | *coffe break* | *coffe break* | *coffe break* | |
| | 11:00 - 11:45 | | **F. La Via**, *SiC fast growth rate epitaxy by chloride precursors* | **A. Lamperti**, *Fundamentals of Secondary Ions Mass Spectrometry (SIMS): probing chemistry with high sensitivity.* | **A. Debernardi**, *First principles spectroscopy for the study of innovative materials: from nanoelectronics to sensors* | |
| | 11:45 - 12:30 | | **F. Roccaforte**, *Wide band gap semiconductors SiC & GaN for energy efficient power devices: physics and technology* | **M.A. Signore, L. Velardi**, *Piezoresponse Force Microscopy (PFM): a non-destructive technique to investigate electromechanical responses at the nanometer* | **F. Della Sala**, *Computational nanoplasmonics* | |
| | | | *LUNCH TIME* | | | |
| | | | *APPLICATIONS 1: NEUROMORPHIC DEVICES AND NEUROSCIENCE* | *APPLICATIONS 3: ELECTRON MICROSCOPY* | *APPLICATIONS 5: SOLAR CELLS* | DEPARTURES |
| Applications | 15:30 - 16:15 | **WELCOME COCKTAIL** | **S. Brivio**, *Emerging memory devices based on migration of ions in solid electrolytes for neuromorphic applications* | **Andrea Parisini**, *From colors to number: applications of quantitative Energy Dispersive Spectroscopy (EDS) in STEM to ultra-shallow junctions, ultra-thin defects and nanoparticles* | **I. Deretzis**, *Bridging length scales in perovskites solar cells: density functional theory, atomistic kinetics and devices* | |
| | 16:15 - 17:00 | **WELCOME SESSION** presentation of the institute sites, facilities, projects; presentation of the school | **A. Convertino**, *Innovative Applications of Nanomaterials and Microelectronics in Neuroscience Research* | **A. Gradone**, *In-liquid transmission electron microscopy* | **S. Valastro**, *Perovskite Solar Cells from materials to devices* | |
| | 17:00 - 17:30 | | *coffe break* | *coffe break* | *coffe break* | |
| | | | *APPLICATIONS 2: TWO-DIMENSIONAL MATERIALS* | *APPLICATIONS 4: OPTICAL SENSING and PHOTONIC DEVICES* | *APPLICATIONS 6: ELECTRONIC DEVICES* | |
| | 17:30 - 18:15 | | **C. Martella**, *Two-dimensional materials beyond graphene* | **S. Lombardo,** *Single Photon Detectors: Technologies and Applications* | **A. La Magna**, *Technological design with atomistic simulations: how to make difficult things simple* | |
| | 18:15 - 19:00 | POSTER SESSION/FLASH TALKS | **A. Liscio**, *Graphene-Related Materials for Industrial Applications: from Standardization to Space and Environmental Applications* | **V. Mussi**, *Raman micro-spectroscopy: from high resolution micrometric thermography to nano-biosensing* | **A. Valletta**, *Numerical simulation of micro- and nano-electronic devices: TCAD and compact modelling* | |
| | 19:00 - 19:45 | | **A. Taurino**, *Electron microscopy as a tool to study morphology, structure and chemistry of materials and devices from micro to nano scale and beyond* | **M.G. Manera,** *Versatile plasmonic nanostructures as smart optical sensing platforms: from design to Point-of-Need diagnostic devices* | **W. Fuscaldo**, *Terahertz Leaky-Wave Antennas* | |
| | | *DINNER* | *DINNER* | ***SOCIAL DINNER*** | *DINNER* | |