
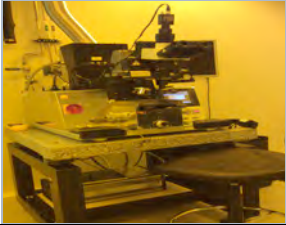

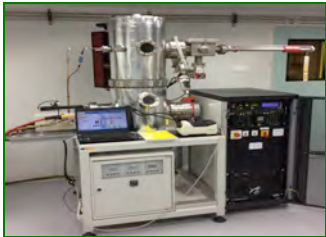
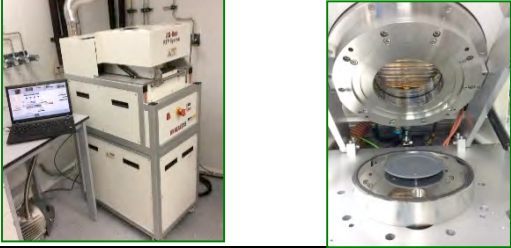

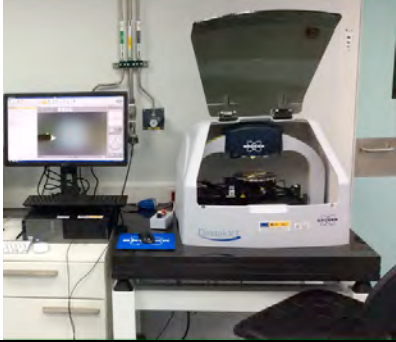





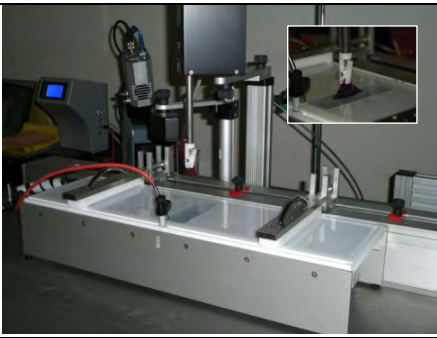

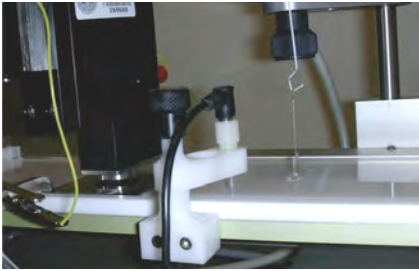
	<p style="text-align: center;">NANOMATERIAL AND THIN FILMS DEPOSITION</p>
<p>Description</p>	
<p>We investigate fundamental and applied aspects of quantum nanodevices based on new materials as graphene and 2D related materials, topological insulators and III-V semiconductor heterostructures. Our clean room includes state-of-the art nanolithography tools to process graphene and semiconductor based nanodevices down to sizes of 20 nm. Other deposition technologies such as Langmuir-Blodgett can be used to prepare thin films of new materials.</p>	
<p>Main Equipments</p>	
<p>Nanolithography and SEM Microscopy FE-SEM (Sigma Zeiss) + Raith Elphy plus (Resolution < 2nm)</p>	
<p>Deep-UV Lithography MJB4 –Karl Suss mask aligner (Resolution < 500 nm)</p>	
<p>Spin-Coating LabSpin6 Karl Suss Max speed: 6000 rpm</p>	
<p>E-Beam Metal thin –film Evaporator Au, Ti, Al, etc High Vacuum < 10⁻¹⁰ mbar ; Low Deposition rate <0,1 nm/s (resolution < 1 nm)</p>	

<p>Rapid Thermal Process (RTP) AS-ONE Up to 1500 °C Max ramp 200 °C/s High vacuum, air, O₂,N₂, He, Ar..</p>	
<p>Optical Microscope Leica DM8000 Objectives: 5x,10x,20x,50x,100x Resolution < 1 micron</p>	
<p>Stylus Profiler Dektak XT Brucker Line profile and 3D topographical maps Resolution < 1nm</p>	
<p>O₂ Plasma Cleaner Harrick Plasma Graphene and carbon nanomaterials etching and wafer cleaning</p>	
<p>Critical point Dryer Leica EM CPD030</p>	

<p style="text-align: center;">Chemical cabinet</p> <p>Wet- etching process with different acids: HF, HCl, H2SO4,BOE etc. Equipped with: Milli-Q for ultrapure water (Type 1, ISO 3696) Hot plate with magnetic stirrer Microbalance and Ultrasonic bath</p>	
<p style="text-align: center;">Reactive Ion Etching/Induced Coupled Plasma (RIE/ICP)</p> <p style="text-align: center;"><u>PlasmaPro System 100/1 Cobra 300</u> <u>Oxford Instruments</u></p> <p>Dry etching of many materials (semiconductors, metals, dielectrics) Gas lines (Cl₂, BCl₃, Ar, He, N₂, SF₆, C₄F₈, O₂, CH₄, H₂); Cyro-etching; Aspect ratio > 100 at 10 nm scale.</p>	 
<p style="text-align: center;">Micro Diamond Scriber</p> <p style="text-align: center;"><u>MR-100</u></p>	
<p style="text-align: center;">Semi-Automatic Wire Bonder</p> <p style="text-align: center;"><u>TPT HB10</u></p> <p>Top wire bonding of micro a nano electronic devices.</p>	

<p>Langmuir-Blodgett (KSV2000 System 2)</p> <p>To Fabricate and characterize monomolecular films with precise control of lateral packing density</p>	
<p>Brewster Angle Microscopy (Optrel BAM 3000)</p> <p>Visualization of Langmuir monolayers or adsorbate films at the air-water interface</p>	
<p>Kelvin probe (KSV SPOT1)</p> <p>It allows determining Composition, Dissociation degree, Orientation and Interaction in Langmuir monolayers</p>	
<p>Quartz Crystal Microbalance (Q-sense E1)</p> <p>Mass changes and interactions occurring at surfaces. Surface rheology of surface bound materials.</p>	