

Annex A – Positions with specific topic

Ph.D. Course	NANOSCIENCES
Scholarship type	Financed by IIT - Istituto Italiano di Tecnologia
N.	3
Title	Synthesis of 2d quantum materials; Unveiling the electronic properties of twisted Van der Waals heterostructures; Developing novel low dimensional materials for biomedical applications;
Brief description of the research project	<p>1. Synthesis of 2d quantum materials. The candidate will focus on developing synthetic approaches for 2d quantum materials adopting classical as well as machine learning guided approaches. The synthesis will be performed with scalable techniques such as chemical vapor deposition and/or molecular beam epitaxy and the obtained materials will be investigated with a large number of microscopic and spectroscopic techniques which will allow to unveil the structural, chemical, optical and electronic properties of the targeted 2d quantum materials. Eligible candidates should have a MSc degree in physics, chemistry, materials science or related fields.</p> <p>2. Unveiling the electronic properties of twisted Van der Waals heterostructures; The candidate will develop approaches to obtain scalable vertical heterostructures with atomically sharp interfaces and twist-angle control, and adopt a combined angle resolved photoemission spectroscopy and scanning tunneling microscopy tool to investigate and correlate their structural and electronic properties. Eligible candidates should have a MSc degree in physics, chemistry, materials science or related fields;</p> <p>3. Developing novel low dimensional materials for biomedical applications. The candidate will carry on a multidisciplinary research devoted to the design, development, characterization and in-vitro/in- vivo application of low-dimensional materials for biomedical applications such as regenerative medicine, theranostics, or biosensing. Previous research experience is not requested. Creativity as well as marked enthusiasm for research are mandatory;</p>
Period of study and research to be carried out abroad	Each student is ordinarily expected to carry out periods of research and training activity, related to the research project, with highly qualified partners and/or institutions in Italy and abroad. The foreign and Italian destinations will be agreed with the students who will be holders of the scholarship, decided by supervisors and authorized by the Ph.D course board.