

PI name & contact details:	Mauro Ferreira, School of Physics Trinity College Dublin Dublin 2 Ireland
School:	School of Physics
Has project been agreed with head (or nominee) of proposed registration school?	Yes
Research Centre / group affiliation:	School of Physics and CRANN
Research group / centre website:	http://www.tcd.ie/Physics/
PI website / link to CV:	http://goo.gl/UIVZh
Brief summary of PI research / research group / centre activity (2 or 3 lines max):	
<p>All members of my group have the natural enthusiasm for modelling the physical world in mathematical terms. Regarding the group's research interests, they can be classified in the general field of Condensed Matter Theory. More specifically, in electronic properties of low-dimensional systems, in particular, multilayers, nanotubes, graphite and graphene. Among the electronic properties of interest, transport and magnetic properties are the main focus of attention.</p>	
Title & brief description of PhD project (suitable for publication on web):	
<p>Title: Spin-orbit effects in graphene-based materials</p> <p>The field of spintronics, responsible for a number of exciting proposals for future electronic devices, is based on ingenious ways of controlling not only how the electron current flows across magnetic and nonmagnetic hybrid materials, but also how the electron spin propagates throughout this environment. The issue of magnetization dynamics in low-dimensional systems is currently one of the most studied in spintronics. In particular, controlling how quickly the energy of a precessing magnetic moment propagates through wires is motivated by the possibility of building miniaturized memory devices with fast magnetization switchings. This project aims at investigating the role played by spin-orbit effects in the magnetization dynamics in graphene, a material often hailed as the new silicon for the 21st century.</p>	
Unique selling points of PhD project in TCD:	
<p>projects should offer something that's not available in Brazil – specific equipment, multi-disciplinarity, aspects of structured programme, links with industry, placements, links with other research groups etc.</p> <p>The Trinity PhD is a structured PhD and students can access discipline-specific training, as well as generic and transferable skills. All PhD students are eligible to participate in the Innovation Academy which offers a Postgraduate Certificate in Innovation and Entrepreneurship to assist PhD students identify and exploit the value within their research.</p>	

Name & contact details for project queries, if different from PI named above:	
Please indicate the graduates of which disciplines that should apply: Physics, Mathematics	
Ciência sem Fronteiras / Science Without Borders Priority Area: Please indicate the specific programme priority area under which the proposed PhD project fits- choose only one (tick box):	
Engineering and other technological areas	
Pure and Natural Sciences (e.g. mathematics, physics, chemistry)	
Health and Biomedical Sciences	
Information and Communication Technologies (ICTs)	
Aerospace	
Pharmaceuticals	
Oil, Gas and Coal	
Renewable Energy	
Minerals	
Biotechnology	
Nanotechnology and New Materials	X
Technology of prevention and remediation of natural disasters	
Biodiversity and Bioprospection	
Marine Sciences	
Creative Industry	
New technologies in constructive engineering	