

PI name & contact details:	Michael Coey jcoey@tcd.ie
School:	Physics
<i>Has project been agreed with head (or nominee) of proposed registration school?</i>	
Research Centre / group affiliation:	Magnetism and Spin Electronics Group
Research group / centre website:	http://www.tcd.ie/Physics/Magnetism/
PI website / link to CV:	http://www.tcd.ie/Physics/Magnetism/Profiles/mike.php
Brief summary of PI research / research group / centre activity (2 or 3 lines max): Ours is the leading research group on magnetism in Ireland, with interests ranging from new magnetic materials to spin electronics and unexplained magnetic field effects in chemistry and biology. Michael Coey was the Irish Researcher of the Year in 2012	
Title & brief description of PhD project (suitable for publication on web): Magnetic Effects on Gas Nucleation Nucleation is the critical first step to growing a new phase – solid or gas – from solution. It is a great experimental challenge to follow how a nanoscale embryo appears spontaneously, and then grows, especially for gas. This project examines gas bubble formation at a microelectrode or a micronozzle, using environmental atomic force microscopy, high-speed photography and small-angle neutron scattering from nanopatterned arrays of tiny electrodes. By focusing on ill-understood magnetic field effects, we will gain new insight into the process, and devise some practical applications which could be in areas as diverse as fuel cells or beer.	
Unique selling points of PhD project in TCD: This is a chance to work in an internationally-reknown research group, with people from all over the world, and learn how to think scientifically to solve a facinating practical problem. The project is based in Trinity College, jointly supervised by Michael Coey and Matthias Mobius, but it involves leaning about magnetism, soft matter and nanoscale patterning. Some experiments will be carried out at a neutron beam reactor in France. 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.	
Name & contact details for project queries, if different from PI named above: Michael Coey (jcoey@tcd.ie) Matthias Möbius (mobiusm@tcd.ie)	
Please indicate the graduates of which disciplines that should apply: Physics, Chemical Physics, Electrochemistry	
Ciência sem Fronteiras / Science Without Borders Priority Area: <i>Please indicate the specific programme priority area under which the proposed PhD project fits- choose only one (tick box):</i>	
Engineering and other technological areas	
Pure and Natural Sciences (e.g. mathematics, physics, chemistry)	X
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	