

PI name & contact details:	Professor John Donegan jdonegan@tcd.ie
School:	School of Physics
<i>Has project been agreed with head (or nominee) of proposed registration school?</i>	Yes
Research Centre / group affiliation:	CRANN- Nanoscience Research Centre
Research group / centre website:	Photonics Research Group
PI website / link to CV:	http://www.tcd.ie/Physics/photonics/ http://www.tcd.ie/Physics/photonics/people/john.donegan.php
Brief summary of PI research / research group / centre activity (2 or 3 lines max): Our Photonics group carries out research in two areas (i) nanophotonics where we deal with the coupling of light within cavities to plasmonic structures and (ii) optical communications where we deal with lasers, modulators and coherent receivers for high speed network applications.	
Title & brief description of PhD project (suitable for publication on web): Narrow linewidth lasers for communications: In optical communications systems, there is a need to continually increase the data rates in the network. One important way is to use lasers that have a controllable and narrow linewidth, less than 1MHz. In this project, we will investigate how such lasers are formed and how the narrow linewidth influences the data throughput from the laser source all the way through the network to the coherent receiver. The work will feature modelling of semiconductor lasers and receivers and in addition, laboratory work to measure how the linewidth changes with the structure of the laser itself.	
Unique selling points of PhD project in TCD: <i>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.</i> 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 offer 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:	
Please indicate the graduates of which disciplines that should apply: Physics, Materials Science, Electronic Engineering	
Ciências em 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	<input type="checkbox"/>
Pure and Natural Sciences (e.g. mathematics, physics, chemistry)	<input type="checkbox"/>

Health and Biomedical Sciences	
Information and Communication Technologies (ICTs)	X
Aerospace	
Pharmaceuticals	
Oil, Gas and Coal	
Renewable Energy	
Minerals	
Biotechnology	
Nanotechnology and New Materials	
Technology of prevention and remediation of natural disasters	
Biodiversity and Bioprospection	
Marine Sciences	
Creative Industry	
New technologies in constructive engineering	