

The University of Queensland - IIT Delhi Academy of Research Joint PhD Project

PROJECT TITLE	ORGANIC INORGANIC HYBRID PHOTODETECTORS
PROJECT CODE	UQIDAR 00206
PROJECT DESCRIPTION	<p>Photo-detectors convert light into electrical signals. They are used in electronic imaging applications in cameras, automobile sensors, medical imaging, and robotics. The global market for image sensors is estimated to reach \$15 billion/annum by 2020. The field of organic-inorganic hybrid photodiodes is emerging as the next frontier in optoelectronics. In particular, the ability to detect or transduce light has special significance in integrated sensing and control systems. We have a significant opportunity to make a big impact to this field because of our historical expertise in organic electronics at UQ and inorganic photo-detectors at IIT-D. This unique position in combining inorganic materials with organic materials creating a novel hybrid system. The overall aims of the project is to create novel hybrid photo-detectors using organic and inorganic semiconductors. Such photodetectors are highly attractive with remarkable features that are not shared with conventional inorganic or organic detectors. For example, organic photo-detectors can be tuned from the UV to near IR wavelengths by simple modification of the semiconducting chromophores. Furthermore, the compact size, low cost, and mechanical flexibility of organic semiconductors mean they can, in principle, be easily integrated into a wide range of products such as those used in telecommunications, as well as bio-medical and consumer devices.</p>
PROJECT OUTCOMES	<ul style="list-style-type: none"> - New class organic-inorganic hybrid photodetectors - New class of low cost and ultra-sensitive photo sensor with UV-Visible-Near IR detection capability; - New knowledge concerning the fundamental physics and chemistry of an organic - inorganic hybrid semiconductor; - A new cohort of multi-disciplinary research scientist trained across chemistry, physics and engineering at UQ and IIT-D, via supervision of PhD students. - Joint publication between UQ and IIT-D
ADVISORY TEAM	<p>Associate Professor Ebinazar B. Namdas Mathematics and Physics, UQ https://smp.uq.edu.au/profile/206/ebinazar-namdas</p> <p>Associate Professor Samaresh Das Applied Research in Electronics, IITD http://care.iitd.ac.in/People/Faculty/samaresh.html</p> <p>Additional advisors Associate Professor Shih-Chun Lo,</p>
TYPE OF STUDENT	Applications are open to i-students who meet eligibility criteria.
DISCIPLINE BACKGROUND OF STUDENT	Ideally, this project requires students with a background in: Physics and Engineering (EE or ECE)
IDEAL CANDIDATE	Essential Capabilities: 1st Class Honours or B. Tech or M.Sc. or M. Tech degree in physics or engineer with a high GPA

APPLICATION
PROCESS

Desirable Capabilities: strong background in condense physics, or electronics or electrical engineering

Expected qualifications (Courses/Degrees etc): BSC or B. Tech/BE with a 1st class, or M.Sc/MTech equivalent

Apply online by the due date: <https://www.uqidar.org/students/how-to-apply/>