



**Applications are invited for the following a PhD studentship for the following project:**

### ***Nitride Nanomaterials for Energy Applications***

#### **Position**

- The PhD research project will develop high density arrays of novel III-Nitride nanorods, whose light absorption properties can be modified for harvesting and converting solar energy into hydrogen by means of photoelectrochemical water splitting.
- The PhD student will work under the direct supervision of Prof. Justin Holmes (School of Chemistry, University College Cork (UCC)) and Prof. Peter Parbrook (School of Engineering, UCC) and be part of the Materials for Energy platform within the Advanced Materials and Bioengineering Research (AMBER) Centre.
- The position will be based at UCC.

#### **Concept**

- Photoelectrochemical (PEC) water splitting, a process using light and the electrolysis of water to produce hydrogen gas, is one of the most desirable and promising ways of harvesting and storing solar energy. Nanopatterned III-V materials have been shown to significantly increase the efficiency of water splitting in comparison to a flat surface electrode.
- This project will focus on developing high density arrays of novel III-Nitride nanorods, and/or core-shell nanowires, as photoelectrodes for water splitting.
- Cheap and reliable growth, lithographic and etching steps will be developed to fabricate high density arrays of III-Nitride nanorods. The effect of nanorod dimensions and packing densities on photoelectrode efficiency will be studied.

#### **Key Duties and Responsibilities**

- The PhD candidate will conduct a specified programme of research under the supervision and direction of Prof. Holmes and Prof. Parbrook.
- The research will involve lab experiments and the advanced characterisation of III-Nitride nanomaterials to understand their fundamental properties, e.g. optical and photoelectrochemical.

#### **Criteria**

- Candidates should possess, or be expected to obtain shortly, a first class or upper second class BSc(Hons) degree in Chemistry, Materials Science or Physics. Candidates with basic chemistry and/or physics laboratory skills are sought, but applications will be considered favourably from any enthusiastic candidates with an undergraduate degree in any science or engineering.
- The researcher will work closely with other members of a multidisciplinary project team. Excellent written and oral communication skills are essential.
- Applicants whose first language is not English must show evidence of English proficiency, please check the minimum requirements at <https://www.ucc.ie/en/study/comparison/english/>.

#### **For informal enquiries on the post candidates should contact:**

- Name: Prof. Justin Holmes
- Email: [j.holmes@ucc.ie](mailto:j.holmes@ucc.ie)
- To Apply: Please send (1) your C.V. (including the names and addresses of three referees) and (2) a one-page letter outlining any relevant experience and your reasons for wanting to participate in the project, by email. Please quote "AMBER Nitride Nanomaterials" on the subject line of your application. The position will remain opened until filled, but the preferred start date is 1 September 2019. Only short-listed applications will be acknowledged.

This position is funded by the SFI-Research Centre AMBER. The AMBER research centre, as a community of researchers, welcomes its responsibility to provide equal opportunities for all. We are actively seeking diversity in our research teams and particularly encourage applications from underrepresented groups.