

# PhD Studentship

## Faculty of Science, Agriculture and Engineering

### Title:

PhD studentship in Photoelectrocatalytic CO<sub>2</sub> reduction to chemicals and fuels

### Value of award:

The studentship covers full UK/EU fees (eligibility criteria applies to EU students) and an annual living allowance of £14,777 (at the 2018/19 UKRI rate). Also significant additional funding to cover research costs and local, national and international travel (conferences and exchanges).

### Number of awards:

1

### Start date and duration:

September 2019 for 4 years

### Application closing date:

Friday 8 March 2019

### Overview:

[The EPSRC Centre for Doctoral Training \(CDT\) in Renewable Energy Northeast Universities \(ReNU\)](#) is a collaborative doctoral training programme run by the Universities of Northumbria, Newcastle and Durham. In addition to undertaking an individual scientific research project described below at one of the three partner Universities, doctoral candidates will engage with added value training opportunities for example in business, innovation and internationalisation through a 4-year training programme that has been designed to maximise the benefits of a cohort approach to doctoral training.

This project will address Challenges of renewable energy storage and waste CO<sub>2</sub> valorisation, through the development of a CO<sub>2</sub> conversion system.

The aim of the project is to develop a commercially viable “solar fuel” technology with a robust, high efficiency system. Initially, a solar cell will be integrated into an electrochemical reactor which contains an established oxygen evolving catalyst (e.g. CoPi) deposited on the anode and a CO<sub>2</sub> reduction catalyst (e.g. cobalt porphyrin, metal oxides) at the cathode. A gas diffusion electrode (GDE) will be assembled as the cathode to minimise CO<sub>2</sub> mass transport limitation. Secondly, the interface between the cathode and the electrolyte will be modified, to incorporate pigments to drive photoelectrocatalytic CO<sub>2</sub> reduction to C1 product (CO and formate) and, then, to incorporate novel catalysts to produce longer chain products with the synergy from photo and electrochemical activity. Results will be disseminated through presentations at UK and international conferences and publications in leading scientific journals.

### Sponsor:

[Engineering and Physical Sciences Research Council \(EPSRC\)](#)

### Name of supervisor(s):

Newcastle University: Dr Eileen Yu (School of Engineering), Dr Elizabeth Gibson (School of Natural and Environmental Science)

Northumbria University: Dr Neil Beatie (Mathematics, Physics and Electrical Engineering)

## Eligibility Criteria:

The applicant is expected to have a 1st class honours degree in Chemistry, Chemical Engineering, Materials Science or a related subject. The award is available to UK/EU applicants only. Depending on how you meet the [EPSRC's eligibility criteria](#), you may be entitled to a full or a partial award.

## How to apply:

You must apply through the University's online postgraduate application system by creating an account. To do this please select '[How to Apply](#)' and choose the 'Apply now' button.

All relevant fields should be completed, but fields marked with a red asterisk must to be completed. The following information will help us to process your application. You will need to:

- click on **programme of study**
- insert **8030F** in the **programme code** section and click search
- **select** Programme name '**PhD Chemical Engineering (full time) - Chemical Engineering**
- insert **renu196** in the **studentship/partnership reference field**
- **attach** a covering letter and CV. The covering letter must state the title of the studentship, quote reference code **renu196** and state how your interests and experience relate to the project
- attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications.

## Contact

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