Naughton REU FSTEM Application 2023: OFFER OF TRAINING FORM SUMMER 2023

Proposer details:	
Title:	Assistant Professors
Name:	Dr Roderick Jones & Dr. Recep Kaan Dereli
Email:	roderick.jones@ucd.ie; recep.dereli@ucd.ie
Website:	https://www.ucd.ie/chembioeng/
If your grade does not allow you to supervise students, please supply the name of support PI:	N/A

Student required:	
Specify any previous training / experience the student should have:	
Familiar with reaction engineering and/or basic principles of bioprocessing	
Study level (3rd year, 4th year)	Either
Any other requirements:	

Traineeship offered:	
Brief job description: (please include (1) type of work, (2) what student should hope to achieve at end of the process, (3) who will supervise student on daily basis (post-doc etc.))	
Enhancing the performance of hydrogen to biomethane process by using engineered catalysts: Green hydrogen produced by using renewable energy is expected to play an important role in the decarbonization of the energy system. However, the features of hydrogen present technical problems with transport and storage that require high pressure (200-300 bar for storage and up to 800 bar for transport), low temperature and costly materials (high-quality steel). To address these, hydrogen can be converted to methane which is a more compatible gas with the existing infrastructure, e.g., natural gas grid. Methane (CH_4) is a relatively easier-to-handle energy vector which can be used to chemically store the curtailed electricity for long periods. Power to biomethane (P2bM) process employs the hydrogenotrophic archaea species to convert H_2 and CO_2 to CH_4. Hydrogenotrophic archaea utilise H_2 and/or formic acid as electron donors and reduce CO_2 to produce methane. The project will investigate enhancing the performance of this biological process by using chemically engineered catalysts. The student will be mainly responsible for operating and monitoring a laboratory-scale bioreactor.	
Link to research group or supervisor webpage:	https://people.ucd.ie/roderick.jones https://people.ucd.ie/recep.dereli
Location of lab:	UCD Belfield, Dublin

Working hours:	
Number of Weeks offered:	10-weeks
Hours per week:	TBC
Earliest Start Date possible:	Tuesday, 30 May
Latest End Date possible:	Friday, 04 August