

Student Name

Project Title

- Profile of project
- Updates? What have you done so far? What are you finding difficult?
- Anything else you want to tell us about your project

About you

- Favorite dish
- Favorite animal
- Favorite place visited
- Fun fact about you

Collins Innocent Akor

Project Title: Extraction of biofuels from lignocellulosic biomass through anaerobic digestion (Valorisation of biomass)

About you

- Updates?
 - I have been able to determine percentage lignin content from the solid and liquid digestate sample by wet chemical analysis.
 - I have been able to establish that digestate from AD Plant contain aromatic bio-polymer that can be valorise to biofuels/chemicals.
 - I am currently characterising precious used catalyst with the possibility of investigating stabilisers that can enhance catalyst reaction longevity, hence complete depolymerisation of the lignin to biofuels/chemicals.
 - I am working on the re-wiring of the Autoclave reactor and newly purchased PLC controller that will be use for the Hydrogenolysis reaction.
- Challenges/Difficulties?
 - One of the major challenges I am facing is making the Autoclave reactor (Rig) to work. This is because it has not be used for the past 2-3 years and there is some electrical and mechanical work to be done. I am currently re-wiring and troubleshooting/testing the reactor. I am making progress but there is delays in ordering some equipment parts which is normal. Also, not yet working to the full capacity which is also expected since its not been in use for some time now.

- Its fun when I have the opportunity to discuss my project with colleagues. This create an opportunity to learn ways to carry out my research in a very productive way as we brainstorm about related topics.
- Its fun for me when I have the opportunity to spend some time during some weekend off with families and as well spend time in church in God's Presence. Also, fun to socialise with colleagues in ways that is in line with my life's principles.



Marian Borucki

Lithium ion battery degradation study using spectroscopic techniques

- Research project with aim of developing an external *in situ, in operando* method through which will be available degradation monitoring inside battery cell
- As it is the start of the project literature study as well as project plan development was needed. Study under changes in redox centres structure on cathode surface during battery operation has been undertaken.
- Studies are interdisciplinary taking into consideration both chemistry as well as mechanical changes occurring inside the battery.



About you

- Hot Pot if it could be considered that way
- Generally snakes, precisely *Atheris Squamigera*
- China
- I was metalhead, still am deep inside my soul

Heidi Schjøll Brede



Numerical Analysis of Floating Offshore

Wind Turbines (FOWTs)

- The long term aim is to improve the accuracy of response calculations for FOWTs in extreme weather
- So far I have been working on the hydrodynamic side of things. I have run CFD (computational fluid dynamics) simulations using a Fortran code, and am looking to run the same simulations with two different software for comparison. Learning to use new software and format input correctly is definitely the biggest challenge at this point.

About you

- Favourite dish: Sushi and any kind of creamy pasta
- Favourite animal: Horses (or preferably unicorns)
- Favourite place visited: Angkor Wat, Cambodia
- Fun fact about you: I have visited 36 countries and lived in 4

Nuala Carr

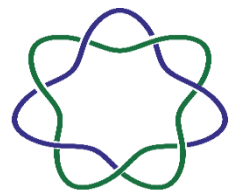


Transitioning towards social acceptability of MRE in Ireland

- Ireland's extensive marine area, a rich natural energy resource, has the potential to assist in the decarbonisation of our energy sector, if the Marine Renewable Energy (MRE) is harnessed sustainably. The experience of the onshore renewable energy sector highlights the fact that enhancing the social acceptability of MRE will play a major role in realising this potential. Social acceptability is understood as: community acceptance; market acceptance; and socio-political acceptance. Using the emerging field of energy transition studies, this project will examine the factors that impact on the acceptability of MRE in Ireland and, working with industry and government, the project will develop and test transition pathways which will enhance the acceptability of MRE.
- To date I have familiarised myself with the literature, industry and government policies in order to define my research question. There are so many interesting aspects to focus on, I found it difficult to narrow down my research to a specific area.
- The Bryden Centre Studentship gave me a fantastic opportunity to study a very topical subject, one that I am very passionate about, and enabled me to work with experts in the field, in top-class institutions.

About you

- My favourite dish is freshly caught mackerel with home-grown spuds and salad
- I love all animals, but dogs, especially collies, because of their unconditional love and loyalty, top my list
- One of the most special places in the world for me is Narin/Portnoo, a beautiful coastal village in west Donegal
- I love life in the great outdoors!



THE
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ADVANCED MARINE AND BIO-ENERGY RESEARCH

Ashley Cathcart



Nutrient Management of digestate combined with energy recovery

- In October I will be commencing research into the separation of digestate – a by-product of anaerobic digestion commonly used as a fertiliser. I aim to characterise the nutrient content of the separated fractions with the aim of reducing phosphorous application to soils. I will also experiment with combustion of the solid fraction as a form of energy recovery. I am excited to get started!

About you

- Favourite dish - Steak and Chips
- Favourite animal - Cats
- Favourite place visited - Ljubljana
- Fun fact about you – I like football, fishing and the outdoors!



This project has been funded by the EU's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB)



Junhan Cheng



Distributed SOFC power and heat supply equipment

- Establishment of SOFC generator integration system
- Trying to design the whole system
- I'm doing what I could never do in China; something new and challenging for myself.

About you

- Roast duck
- Cats
- Venice
- Traveling

Morag Cooper

Optimisation of tidal energy devices

- I will be researching the enhancement of marine energy assets through validated numerical modelling and optimisation, and the adoption of building information modelling (BIM) for lifecycle management.
- Having just started, I am familiarising myself with my project, meeting with industry partners and planning my review of relevant literature and software.

About you



- Favourite dish - Haggis
- Favourite animal - Cat
- Favourite place visited - Cape Town
- Fun fact about you – Born and raised in South Africa, although I don't sound like I was

Melissa Costagliola-Ray

Project Title: Quantification of seabird use of tidal environments: Novel methods to address potential biases in vantage point survey data

- This project will investigate methods to address the limitations of vantage point surveys through developing:
 - data collection protocols
 - data analyses techniques
 - model simulations
- The PhD will improve the knowledge base available to industry and regulators, reduce consenting risk, and have the potential to reduce costs.
- I am currently immersed in the literature; working on the potential methods and scope of my project, with the aim of completing a literature review.



About me

- Favorite dish: Homemade lasagne
- Favorite animal(s): Razorbill and Common Guillemot
- Favorite place visited: Naples
- Fun fact about you: I have been Irish Dancing for 22 years.

Oisín de Priall



Performance Study and Validation of the Downdraft Biomass Gasification

- Gasification can use materials currently seen as a waste or with no value, to generate electricity and heat. It is ideal for localised, rural energy production and it can increase fuel security. The idea is to find local materials to generate energy.
- Just starting the PhD now. Daunting to think of the amount to do!
- Creating a model and validating it with real data will probably be the hardest part for me, I've no Matlab experience.

About you

- A good hearty stew.
- I've always been fascinated by crocodiles, no idea why.
- I lived in San Francisco for a summer, it was excellent.
- First job after my undergrad was in a chocolate factory.

Rowland Fraser



Multidisciplinary Design Optimisation

- Profile of project: To develop a Multi-Disciplinary Optimisation method for application to the Automotive, Energy and Environmental sectors.
- What have you done so far? Literature review started, understanding relevant maths, work with industry partner.
- What are you finding difficult? Putting theory into practice.
- Anything else you want to tell us about your project: MDO has huge potential to help solve complex design problems.

About you

- Favorite dish: Tom Yum soup
- Favorite animal: Stag
- Favorite place visited: Ecuador
- Fun fact about you: I'm almost (but not quite) the oldest PhD student!

Dallán Friel



Project Title: Modelling the dynamic responses of floating photovoltaic solar arrays to develop the basis for sustainable design.

Progress:

Currently in the early stages of the project, developing my knowledge of the research area including terminologies, physics, physical principles of the technology related to aerodynamics, hydrodynamics and structure.

That knowledge should facilitate my understanding, interests and aid the development of a suitable research question by the 3 month milestone.

About me:

I'm a 23 year old male from Letterkenny, Co. Donegal. My undergraduate was in Mechanical Engineering here in Letterkenny Institute of Technology. I'm probably the only Dallán you have ever met.

I have a keen interest in advancing technologies, engineering, electronics, mathematics and computers. Generally, I'm interested in how everything works and operates.

Nicholas Horne



Project Title: Animal use of high-flow tidal environments and the potential for spatial and temporal overlap with marine renewable energy devices

- I am aiming to advance understanding of collision risk of harbour seals with tidal energy devices.
- Progress is being made on modelling collision risk via computer simulations

About you

- Favorite dish: Anything Italian
- Favorite animal: Orca
- Favorite place visited: Bolivia
- Fun fact about you: I am colourblind

Natalie Isaksson



Use of tidal flow areas by seabirds and the potential interactions with tidal stream renewable energy

- Use existing GPS tracking data to determine broadly how seabirds utilise tidal flow areas. In conjunction, gather and use new data on how specific key species (i.e. tysties) interact with tidal turbines at fine-scale resolution
- Working on literature review and considering various methods for implementation of the project

About me

- Favorite dish: pasta with a tasty sauce
- Favorite animal: killer whale, closely followed by razorbill
- Favorite place visited: Gotland, Sweden
- Big Iron Maiden fan

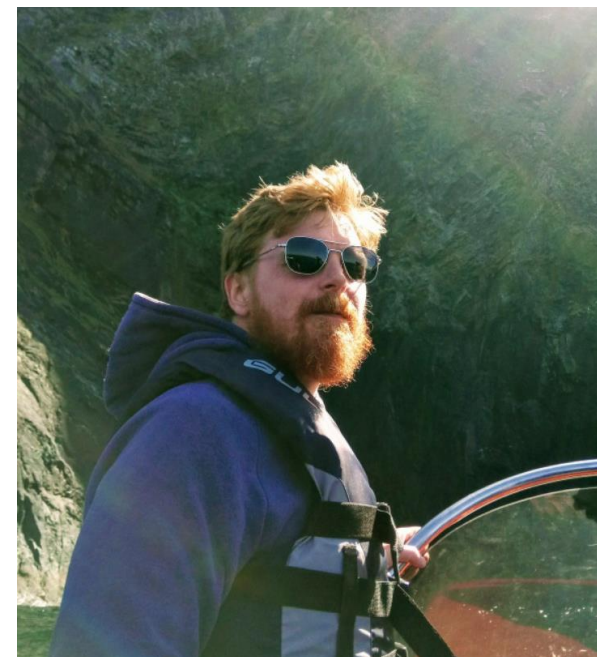
Barry Johnston

Optimal integration of joint energy and power services to determine true strike price of offshore wind

- Energy generated from offshore wind farms should ideally be readily incorporated into the supporting power systems operations. In order to do this the full economic viability needs to be understood
- To date I have been primarily reading to develop a better understanding of the topic

About you

- Burritos
- Dogs & Seals
- Sumatra, Indonesia
- I love travelling and being outdoors



John Keogh



Adding Value to Waste Glycerol to Produce Renewable Fuels and Chemicals

- A major problem with biodiesel is the production of a waste product glycerol. It is important for the viability of the biodiesel industry to find ways to add value to this waste product and therefore improve the economic viability of the industry.
- So far I have investigated the use of some low cost protic ionic liquids in catalysing the esterification of glycerol with acetic acid to produce oxygenated fuel additives.

About you

- Pizza
- The Pudu deer
- Berlin
- I can play the trombone and guitar.



Project title: Passive acoustic monitoring and automated detection of gadoid fish species in marine renewable development areas

My main goal is to conduct passive acoustic monitoring (PAM) of gadoid fish (cod is first on my list) in potential marine renewable development areas, as it is known that gadoid fish produce sounds during spawning. I also plan to develop automated detector for those sounds using python language. I want to show that by using PAM we can identify regions of high importance for fish, which may be useful while screening potential MRED development sites.

About you:

- Favorite dish – squid ☹️
- Favorite animal - bat
- Favorite place visited – Vilanova i la Geltru
- Fun fact about you - all my dreams come true :)

Ralph Lavery



Project Title

- Profile of project – Waste Heat Recovery from Refrigeration Cycles
- Updates? What have you done so far? What are you finding difficult? – I have spent most of my time researching around my topic as well as beginning to form the basic structure of the experiment
- Anything else you want to tell us about your project – Refrigeration is a great example of how small savings can have massive impacts due to how reliant we are on them for daily life.

About you

- Favorite dish – Pizza
- Favorite animal – Dogs
- Favorite place visited – Ephesus, Turkey
- Fun fact about you – I'm a member of the Ireland Touch Rugby National Coaching team as well as a European Touch rugby referee

Joe Livingstone



Renewable energy crops for reducing agricultural run-off and improving water quality

- Profile of project

The project is focused on improving water quality in Northern Ireland

- Updates? What have you done so far? I haven't started yet but looking forward to getting stuck in!

About you

- Favourite dish- Chilli chicken wraps
- Favourite animal- Cat
- Favourite place visited- Lake Bled
- Fun fact about you- My band once had a number 1 in the iTunes comedy chart.

Euan Mackenzie



Ecology and recovery potential of flame shells (*L.hians*) to disturbance

- Flame shells are a poorly studied bivalve species that are prevalent on the West coast of Scotland. Individuals bind small stones together to form nests that then overlap with others forming vast mats of hard substrates as their nests. These often span hundreds of kilometres and are regarded as a Priority Marine Feature (PMF) due to their associated increase in biodiversity. They are also suspected to form a key nursery habitat for commercially important fisheries species. These habitats however are very fragile and sensitive to disturbances.
- I aim to establish to what extent these flame shells can recover from various types of disturbance to better enable us to mitigate against damages to this important habitat across all industries but especially to better enable development of renewable energies. I hope to accomplish this through a combination of desktop review, aquarium studies and *in situ* practical observation of these benthic communities.

About you

- Favourite food: Anything spicy
- Favourite animal :Flame shells!
- Favourite place: Nosy Komba, Madagascar
- Fun fact: Obsessed with SCUBA diving and underwater photography

Viktor Malovs

H2GEN – Hydrogen for the Agricultural Sector

- The aim of the project is to assess the economics of the use of stranded or curtailed electricity to produce hydrogen and develop innovative solutions focussed on the reduction of cost of the electrolyzers.
- Even though that the project is just starting, I have already collected some information on hydrogen safety and gained an industrial experience on H2 electrolyzers and fuel cells.



About you

- Seafood
- Panda
- Switzerland/Russia/Brazil/Indonesia
- Crazy about extreme sports

Paul McKeever



Ensuring Biofuels Meet Future Emissions Standards

- I've worked closely with AFBi to collect data on gaseous and particulate matter emissions from wood burning boilers for various fuels. My rig is almost ready to begin catalyst testing soon and I have catalyst samples ready for testing.
- I intend to begin working with Agri AD to look at CHP emissions and relevant methane slip abatement methods

About you

- Favourite dish: Steak
- Favourite animal: Cats and dogs
- Favourite place visited: Prague, Czech Republic
- Fun fact about you: I was an extra for the new season of Game of Thrones.

Joanne Mitchell



Offshore wind turbine mechanical power electronic coupled fault diagnostic tool

- Marine renewable energy/Offshore wind power and diagnostics
- Start Date Oct 2018
- Previously undertook this project for my individual project within my Masters of Mechanical Engineering.

About you

- Favourite dish: Sweet chilli pork stir fry
- Favourite animal: Horses
- Favourite place visited: Salzburg, Austria
- Fun fact about you: Race engineer for RTR Projects a.s.

Abdolmajid Moghtadaei

FATIGUE ASSESSMENT OF OFFSHORE WIND TURBINE

- To investigate the fatigue of offshore wind turbine structures numerically, it is required to estimate the environmental condition as precise as possible. However, there are some limitations such as time, cost and technology. The main motivation of this research is how far we can push these limitations and have a more realistic results.
- Different aspects of numerical modeling will be considered in this research and an optimized Aero-Hydro-Servo-Elastic model will be developed.

About you



- My favourite food is Italian Pizza
- I love Koalas.
- The Marble Arch Caves in Enniskillen
- I talk a lot :D

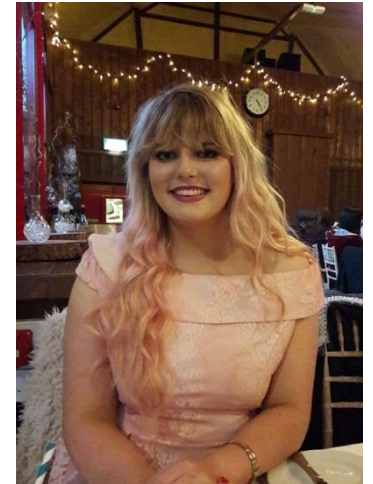
Clare Rice

My project – Investigating the coupling of photocatalytic technology with floating solar PV arrays for aquaculture water treatment

About this project:

Aquaculture is a prominent area of industry in for both Scotland and Northern Ireland. A major issue is the quick uptake of chemical contaminants by fish, which leads to a financial loss, so there is a significant challenge to ensure their rapid and efficient removal. Photocatalysis has become an attractive method for achieving environmental remediation due to its ambient operating conditions, minimal maintenance and running costs. The process is driven by the absorption of light which generates powerful radical species capable of pollutant removal. This project will involve integration of photocatalysis with floating PV panels or additional hybrid renewable energy, rapid removal of contaminants, versatile design for the deployment of the unit and removal of a range of pollutants.

- Favorite dish – Anything with cheese
- Favorite animal – Monkeys
- Favorite place visited – Sorrento, Italy
- Fun fact about me – I was 21 years old before I got my first pet



Julie Rostan



Marine Bio-Energy; what does third generation marine biofuels mean for society?

- Marine social science project
- I am currently trying to precise my topic by doing a literature review:
 - To find out more about the social issues related to marine energy projects in the past
 - Understanding the concerns about third generation biofuels (environmental, social, economic, legal...)
 - Trying to determine the ethical requirements for my research

About you

- Moussaka (but now I am vegetarian)
- All of them
- Tahiti
- I am French and I hate cheese

James Slingsby



Behavioural changes of top predators related to tidal-stream energy extraction – using Unmanned Aerial Vehicles (UAVs) to measure animal distribution

- As of October I am starting research into developing and demonstrating the viability of using UAVs as a technique to more precisely investigate top predator interactions with both tidal-stream sites and energy devices.
- I am currently getting myself familiarised with the relevant literature in order to present my own research proposal.
- The development of algorithms for automated animal detection will be challenging, but I am excited to undertake this aspect of the project.

About you

- A roast dinner with plenty of potatoes and gravy.
- Sperm whale
- In the UK it would have to be Cornwall, but further afield Morocco. I would love to visit Canada and Iceland.
- I enjoy surfing and look forward to the “world class” waves Thurso has to offer.

Yaoguang Song

Thermochemical Conversion of Biomass Lignin into Mesoporous Carbon Materials

- There is a global imperative towards replacing conventional fossile feedstocks with sustainable resources like biomass. As a typical recalcitrant component of biomass, lignin is a promising precursor for preparing mesoporous carbon materials aiming for industrial applications (e.g. energy storage, catalysis, biomedical devices). This project mainly focuses on efficiently utilising the biomass lignin to produce mesoporous carbons with specific pore structures. The successful scale-up/commercialization of the technology will create national/international economic benefits due to the fact that the products, mesoporous carbons, are valued at 10 times more than that of traditional bio-fuels. This multidisciplinary project will be carried out adopting multi-scale simulations and experimental validations.
- I have already searched for much information about commonly-used strategies to prepare mesoporous carbons, and also already done some experiments to make lignin-based mesoporous carbons using templating route in my Master period. The most challenging difficulties is to tailor the pore structures of mesoporous carbons using biomass lignin as carbon precursor as the molecular architecture of lignin is highly complicated. Another challenge lies in adopting multi-scale simulation to predict the pore structures of lignin-based mesoporous carbons.
- This project is very interesting and challenging as lignin is such a complicated natural polymer with a very broad range of molecular weight, indefinite molecule structures. The products, mesoporous carbons, have wide range applications. Besides, both the structures and properties of isolated lignin vary greatly based on different isolation methods.

About me

- Favorite dishes: steak, noodles
- Favorite animal: dog
- Favorite place visited: Qingdao Sculpture Park, located just off the seashore, a perfect place to contemplate or kill time.
- Fun fact about you: Organised a team of over 80 people to hike and camp in Qingdao Lao Mountain



Emma Whettall



Community Scale Tidal Power Generation: is it feasible in the INTERREG VA area?

- The coastal waters surrounding west Scotland, Northern Ireland and northern Republic of Ireland are poised to generate significant levels of electricity from their abundant tidal resources. There is increasing interest in small scale tidal energy projects to decarbonise energy supply of remote communities. But, what dictates a potential site's suitability? Marine environments are famously harsh, variable and highly complicated therefore, fully understanding their hydrodynamics is paramount if tidal energy is to be a success in the future. My PhD research will principally explore the nature of the tidal resource, characterising and investigating the small-scale flow structure and variability of contrasting candidate sites. Firstly, the development of a novel methodology – oblique photography – will be used to define the surface expression of coherent flow structures, track their evolution, and understand their physics. Secondly, through the review of engineering constraints of existing and future technologies, how these fine-scale hydrodynamics implicate a site's feasibility for development will be considered.
- Over the past few months I've been practicing with the oblique imagery technique, working through any unexpected issues and tweaking the methodology to best suit our needs. I've also been working hard on my literature review, compiling the current understanding in fine scale flow dynamics of tidally energetic sites and how these dynamics are typically observed and predicted.
- Next, I plan to complete a substantial desktop review in order to critically assess the potential sites within the INTERREG VA area. This will allow me to not only get a better handle on the size of the community scale tidal resource of the INTERREG VA area, but also short list sites to explore further with the oblique imagery technique.

About you

I am an oceanographer passionate about the world's transition to a sustainable energy supply, and interested in understanding the dynamics and impacts of finer scale flow structure and variability on the tidal energy resource. Being based at SAMS is the ideal location for me – climbing, hiking and mountain biking galore!

- Favourite food - Amok
- Favourite Animal - Platypus
- Favourite Place – Fiordland, New Zealand
- Interesting Fact – During a geological dig in the Carpathian Mountains (Romania) I helped excavate a dinosaur nest.

Inne Withouck



Optimisation of data for use in planning marine energy developments

I will be developing a spatial model to assist the energy sector in optimising the siting and design of marine energy developments

About you

As a lover of maps as well as the oceans, I love travelling, snorkelling and trying out gastronomy from around the world.