



## *James Sweeney*

Statistics

University of Limerick

Associate Professor in Dept of Mathematics & Statistics

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### Expertise

- Spatio-temporal statistical modelling
- Statistical models for disease spread
- Design of experiments in field trials and animal studies
- Bayesian statistics
- Applied statistical modelling including non-parametric modelling

### Research focus in VistaMilk

Contribute to development of spatial statistical models for geo-referenced data including soil, water, fertiliser. Disease modelling, particularly the spread of bovine tuberculosis amongst cattle herds

### Research outcomes

- Lead investigator on SFI Challenges project GREEN-GRID. The project is focused on the development of spatio-temporal maps for wind and solar resources nationwide with a view to expediting the move to 100% electricity generation from renewables
- Lead investigator on SFI New Frontiers project 3-EX. The project is focused on the development of the next generation of respiratory disease spread models to ensure preparedness for future pandemics
- Contributor to World Health Organisation (WHO) proof-of-concept project on COVID-19 integrated epidemiological-economic modelling.

# Michael Murphy

Energy

Munster Technological University

Lecturer, Sustainable Energy Engineering

E-mail: MichaelD.Murphy@mtu.ie



## Expertise

- On-farm energy optimisation
- Integration of renewable energy systems
- Calculation of carbon dioxide emissions offsets
- Open-source tools for farmers and researchers
- Grass measurement optimisation

## Research focus in VistaMilk

Contribute to on-farm energy optimisation, integration of renewable energy systems and the development of open-source tools to aid farmers, researchers and policy makers in decision making

## Research outcomes

- Investigator on several agri-engineering projects. Secured €2.5m in research funding
- Investigator on national project which developed the on-line farm energy optimisation tool which is currently being used by farmers and researchers ([messo.shinyapps.io/Farm\\_Energy](https://messo.shinyapps.io/Farm_Energy))
- Extensive industry-based research through several commercially co-funded projects
- Developed several open-source tools in agriculture and energy domains such as: GMOT, DRAF & elmada



## ***Pádraig Lyons***

Renewable Energy

Tyndall National Institute, UCC

Head of Group, International Energy  
Research Centre

E-mail: [padraig.lyons@tyndall.ie](mailto:padraig.lyons@tyndall.ie)

### **Expertise**

- Renewable energy
- Energy storage (electrical/thermal)
- Real-time digital simulation
- Energy policy
- Energy systems integration

### **Research focus in VistaMilk**

Renewable energy and energy efficiency in agriculture, agri-photovoltaics, energy data analytics, electrification of farming, energy system integration in agriculture, electrical infrastructure utilisation and smart grids

### **Research outcomes**

- Development of a research programme that informed the development of system services for Transmission System Operators that support the integration of renewables on the electrical power system. The approach utilised co-simulation using laboratory based energy storage to emulate grid-scale storage in collaboration with real-time digital simulation known as Power Hardware in the Loop
- Led research that led to unique data set that provided insights into the real world operation of heat pumps in retrofitted Irish homes
- Led research as part of Energy Policy Insights for Climate Action (EPICA) programme that was funded by the Department for Energy Climate and Communications that has influenced the development of the Irish Government's Climate Action Plan and other government policy



## ***Ben Lahart***

Methane Measurement

Teagasc

Research Officer

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Phone: +353 (0)25 42511

### **Expertise**

- Methane measurement using GreenFeed technology
- Nutritional factors influencing methane output
- Grazing management
- Feed additives
- Animal phenotyping

### **Research focus in VistaMilk**

Development of improved prediction models for methane output of grazing dairy cows as well as the development of strategies to reduce methane output in grazing dairy systems - specifically focusing on the evaluation of pasture type and management as well as feed additives and genetics

### **Research outcomes**

- Generation of country specific emission factors for pasture-based dairy cows for use in greenhouse gas models
- Contribution of genetic and nutritional strategies to reduce methane output from dairy systems within the Teagasc marginal abatement cost curve
- Three Invention Disclosure Forms

# Lizy Abraham

Wireless Sensor Networks

Walton Institute, South East Technological University

Researcher

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## Expertise

- Wireless sensor networks
- Artificial intelligence and machine learning
- Computer vision
- Internet of Things
- Edge computing

## Research focus in VistaMilk

Assessing the heterogeneity of farms in real-time with a focus on anomaly detection using edge computing

## Research outcomes

Onsite monitoring of machine health of dairy equipment for condition monitoring and predictive maintenance



## ***Deirdre Hennessy***

Grassland

University College Cork

Lecturer

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### **Expertise**

- Grassland management
- Grassland agronomy including grass and clover growth
- White clover
- Nitrogen fertiliser management
- Grassland phenotyping

### **Research focus in VistaMilk**

Contribute to pasture research - rapid phenotyping - image analysis to predict herbage mass, sward composition, herbage quality; quantifying biological nitrogen fixation in grass white clover swards; quantifying nitrogen mineralisation in grassland swards; development of nutrient sensors

### **Research outcomes**

- Led white cover research programme at Teagasc for 10+ years
- Secured Department of Agriculture, Food and Marine Research Stimulus Funding that ultimately led to development of the MoSt grass growth model
- Lead the research team working on using image analysis for grassland phenotyping in VistaMilk
- 3 Invention Disclosure Forms



## ***Michael O'Donovan***

Grazing Systems

Teagasc

Professor, Head of Grassland Science in Teagasc

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Phone: +353 (0)25 42395

### **Expertise**

- Grass production/nutrient use efficiency/grassland management
- Grass/clover - plant animal interactions
- PastureBase Ireland - national grassland database
- Pasture Profit Index
- Grass intake measurement/modelling

### **Research focus in VistaMilk**

Precision nitrogen management, linking nitrogen inputs to nitrogen mineralisation, nitrogen fixation and grassland output

### **Research outcomes**

- Creation of PastureBase Ireland
- Pasture Profit Index to rank grass varieties on expected profit
- Understanding effects of herbage mass on methane emissions of dairy cows
- New traits for grass variety selection indices

# Elodie Ruelle

Systems Modelling

Teagasc

Research Officer

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Phone: +353 (0)25 42686



## Expertise

- Mechanistic modelling
- Dairy grazing systems
- Nitrogen use efficiency, nitrogen leaching
- Grass growth forecasting
- Climate adaptation

## Research focus in VistaMilk

Improving the grass growth prediction program to incorporate new grass species, improve the soil component and be part of the system of system development

## Research outcomes

- Live grass growth prediction on 84 commercial farms disseminated every Sunday on national television
- Model develop enabling the prediction of the impact of different farm management on nitrogen leaching used for the nitrate derogation
- Prediction of the impact of climate change on Irish grasslands





## ***William Burchill***

Sustainable Agriculture

University College Cork

FBD Lecturer in Sustainable Agriculture

E-mail: [WBurchill@ucc.ie](mailto:WBurchill@ucc.ie)

### **Expertise**

- Nitrogen use efficiency
- Biological nitrogen fixation
- Nitrous oxide emissions
- Manure management
- Ammonia emissions

### **Research focus in VistaMilk**

Quantifying strategies to reduce greenhouse gas and ammonia emissions from the manure management chain within Irish pasture based systems. Identifying alternative drought tolerance forage legume to develop more sustainable and resilient swards for Irish pasture based systems

### **Research outcomes**

- Development of the marginal abatement cost curve for ammonia emissions from Irish agriculture
- Contributed to the revised Teagasc Greenbook - a guide for nutrient management planning in Ireland
- Developed a nitrogen use efficiency calculator which has been incorporated into Pasturebase Ireland
- Research has led to the refinement of Ireland's national ammonia emissions reporting to the EU