

TU RISE Master by Research Scholarship

Project Title: Sustainable Dairy Spray Drying Processing through Digitalisation
Faculty of Engineering and Science / Department of Process, Energy and Transport Engineering

About the Project

We invite applications for a fully funded 2-year master's by research project as a full-time programme of study. This Master's project (*"Sustainable Dairy Spray Drying Processing through Digitalisation"*) is funded by MTU and supported by TU RISE funding.

This research aims to advance digitalisation in spray drying through predictive modelling to enhance process efficiency, sustainability, and food safety in the dairy sector. With Ireland's food exports reaching €17 billion in 2024/25, optimising spray drying is a critical unit operation for producing stable powdered dairy ingredients, essential for improving product quality while minimising environmental impact. This study seeks to establish mechanistic models that characterise spray drying parameters, enabling precise process control beyond conventional empirical approaches. A multidisciplinary framework that integrates experimental analysis with modelling will be utilised to quantify the complex interactions between the properties of spray solutions, drying kinetics and the final characteristics of powders. Key objectives include characterising liquid feedstocks and powders, determining the critical process parameters that influence mass and heat transfer and developing computational models to predict product behaviour under varying drying conditions. This is an exciting opportunity to work within a multidisciplinary capacity that combines research excellence and expertise spanning engineering (chemical/food) and computing science. More information on the research undertaken by the Process Innovation Engineering Research Group (PiERG), Dept of Process, Energy and Transport Engineering is available on the following link: <https://pet.mtu.ie/pierg>

Requirements:

Applicants must possess an Honours Bachelor's Degree (Level 8) with a performance equivalent to at least a second-class honours in a relevant field of study (Disciplines such as Chemical, Mechanical, Civil Engineering or Physics will be considered) from a recognised degree-awarding institution or university.

The successful candidate should be self-motivated and enthusiastic about developing technical skills in chemical and food engineering, spray drying process and mathematical modelling. They should also have an interest in and an aptitude for laboratory-based research and mathematical modelling.

For applicants whose first language is not English, the English language requirements accepted by MTU for entry into postgraduate studies are:

- IELTS Academic 6.0 (No less than a 5.5 in any one band)
- PTE Academic 51 (Minimum 45 in each component)
- TOEFL IBT 80 min (score of 18 in each component)
- Duolingo score Min of 100

Please refer to: <https://www.mtu.ie/international/eu-applicants/>

General terms and conditions of this Master by Research scholarship award

Start date & location: This master's by research program must start in **September 2025**. The student will be based primarily at MTU Cork campus (*Department of Process, Energy and Transport Engineering*). The student will be registered at MTU, working under the supervision of Dr Alexander Krok & Dr Sandra Lenihan (MTU). The Master Scholar is required to spend **at least 12 weeks on placement with an enterprise partner** within the 24-month term of their master by research program. The project supervisor (in conjunction with the Master Scholar) is responsible for arranging the student placement with a suitable enterprise partner.

Funding: The scholarship funding is tax-free and includes payment of University (Master by Research fees) (EU or non-EU) and a student stipend at a flat rate of €25,000 per annum, tenable for 24 months.

To Apply:

Please send a **single PDF file** consisting of the following to pierg@mtu.ie with 'TU RISE Master by Research Application' in the subject heading:

1. Resume/Curriculum Vitae (CV), including:
 - Education History
 - Relevant skills
 - Research projects/publications (if appropriate – not essential)
2. A cover letter (2 pages max) including a description of the applicant's research interests and reasons for applying for the position. The Cover letter must clearly indicate how the applicant's profile and skills fit the requirements of this Master's position.
3. Scanned copies of relevant academic transcripts and English language certificates.
4. Contact information for two referees.

For further information or queries, please e-mail (alexander.krok@mtu.ie)

Closing date for applications: 15/06/2025

Interviews (online) anticipated to be held on 30/06/2025

Master commencement date: September 2025

Funding Acknowledgement

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Rialtas na hÉireann
Government of Ireland



Arna chomhchistiú ag
an Aontas Eorpach
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an Deiscirt
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