



Preface: The 39th International Manufacturing Conference (IMC39) of the Irish Manufacturing Council

McFadden, S., McGowan, P., & Kerr, E. (2024). Preface: The 39th International Manufacturing Conference (IMC39) of the Irish Manufacturing Council. In *Proceedings of the 39th International Manufacturing Conference* (1 ed., Vol. 65, pp. 1-4). (Engineering Proceedings). MDPI. Advance online publication. <https://doi.org/10.3390/engproc2024065016>

[Link to publication record in Ulster University Research Portal](#)

Published in:
Proceedings of the 39th International Manufacturing Conference

Publication Status:
Published online: 27/05/2024

DOI:
[10.3390/engproc2024065016](https://doi.org/10.3390/engproc2024065016)

Document Version
Publisher's PDF, also known as Version of record

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Editorial

Preface: The 39th International Manufacturing Conference (IMC39) of the Irish Manufacturing Council

Shaun McFadden ^{1,*}, Paddy McGowan ² and Emmett Kerr ^{1,3}

¹ School of Computing, Engineering, and Intelligent Systems, Ulster University, Londonderry BT48 7JL, UK

² Bishopstown Campus, Munster Technological University, T12 P928 Cork, Ireland

³ Department of Mechanical and Electronic Engineering, Atlantic Technological University Donegal, F92 FC93 Letterkenny, Ireland

* Correspondence: s.mcfadden2@ulster.ac.uk

1. Introduction

Ulster University, on behalf of the Irish Manufacturing Council, hosted the 39th International Manufacturing Conference (IMC39) at the Derry~Londonderry campus on the 24th and 25th of August 2023. The Irish Manufacturing Council, founded in 1984, is a grouping of academics based on the island of Ireland representing academic institutions across two jurisdictions: Northern Ireland and the Republic of Ireland. The council is engaged with the promotion and dissemination of activities related to the manufacturing discipline. The council promotes both ground-breaking research and educational developments that inform continuous professional development and outreach activities within the discipline.

The theme of the conference was “Smart Manufacturing: The Next Generation”, selected to reflect novel research directions and training requirements for the manufacturing discipline into the future. Hence, the conference had two distinct tracks within the submission process: a research track and an education track.

Conference attendees enjoyed five oral presentation sessions and one poster session. The five oral sessions consisted of an opening plenary session with six speakers; three research track sessions with twelve original contributions; and an education track with four original contributions. Plenary speakers were selected to reflect the theme of the conference across both tracks.

2. Scopes and Topics

2.1. Technological Innovation for Manufacturing Track

- Sustainable and Energy Efficient Manufacturing
- Additive Manufacturing Processes
- Subtractive Manufacturing Processes and Surface Engineering.
- Forming and Joining Processes
- Industry 4.0 and Digital Manufacturing
- Machine Tool, Automation and Manufacturing System Design
- Manufacturing and Engineering Management

2.2. Education Track

- Contemporary Issues for Engineering Education
- Industrial Training and Professional Development
- Curriculum Design for Engineering Education
- Education for Design Thinking, Problem Solving and Engineering Decision Making
- Public Engagement and Outreach projects
- Industry and Academia Collaborations (Undergrad, Postgrad Placements and Research Projects)



Citation: McFadden, S.; McGowan, P.; Kerr, E. Preface: The 39th International Manufacturing Conference (IMC39) of the Irish Manufacturing Council. *Eng. Proc.* **2024**, *65*, 16. <https://doi.org/10.3390/engproc2024065016>

Published: 27 May 2024



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- Engineering Education for Sustainable Development

3. Program and Schedule

Important Dates for this Event are shown below (Table 1).

Table 1. Important dates for IMC39.

Event	Date
Submission open for extended abstracts and posters	Thursday, 1 June
Submission deadline for extended abstracts and posters	Friday, 30 June
Notification of feedback and decision	Monday, 31 July
Submission of camera-ready abstract and posters for official proceedings	Monday, 7 August
Early bird registration deadline	Monday, 7 August
Final Registration	Monday, 21 August
Conference preliminary session, networking, Mayor's Reception and dinner	Thursday, 24 August
Conference Plenary and technical sessions	Friday, 25 August

4. Committee Members

4.1. Organizing Committee (Ulster University)

- Shaun McFadden—conference chair and editor
- Emmett Kerr—conference co-chair and editor
- Paddy McGowan—editor
- Sagar Nikam—reviewer
- Cormac McGarrigle—reviewer
- Ryan Harkin—reviewer
- John Wade—reviewer
- Philip Vance—reviewer
- Marinus Toman—reviewer
- Atefeh Golbang—reviewer
- Joanna Ward—reviewer
- Margaret Morgan—reviewer

4.2. Irish Manufacturing Council Committee Members

- David Mulligan, Atlantic Technological University—chair
- Guangbo Hao, University College Cork—secretary
- Joe Butterfield, Queens University Belfast
- Matt Cotterell, Munster Technological University
- Ger Kelly, Munster Technological University
- Garret O'Donnell, Trinity College Dublin
- Patrick Delassus, Atlantic Technological University
- John Geraghty, Dublin City University
- Paul Young, Dublin City University
- Graham Gavin, Technological University of Dublin
- Liam Costelloe, Technological University of Dublin
- Paul Hermon, Queens University Belfast
- Kevin Kelly, Trinity College Dublin
- Bill Wright, University College Cork
- Alan Ryan, University of Limerick
- Rocco Lupoi, Trinity College Dublin
- Una Parsons, Atlantic Technological University
- Peter Tiernan, University of Limerick
- Morgan Margaret, Ulster University

- Cathal Heavey, University of Limerick
- Seamus Gordon, University of Limerick
- Shaun Mc Fadden, Ulster University
- Ronan Dunbar, Technological University of the Shannon
- Nan Zhang, University College Dublin
- Jason Power, University of Limerick
- Sinead Mitchell, University of Galway
- Eoin Hinchy, University of Limerick
- Denis Dowling, University College Dublin
- Xavier Velay, Atlantic Technological University
- Eamonn Ahearne, University College Dublin
- Jufan Zhang, University College Dublin
- Emmett Kerr, Atlantic Technological University
- Paddy Mc Gowan, Munster Technological University

5. Keynote Speakers

The conference was officially opened by Professor Liam Maguire, Pro Vice Chancellor for Research at Ulster University, followed by opening remarks from David Mulligan, chair of the Irish Manufacturing Council.

Four keynote speakers from across industry, the civil service, and academia presented contributions:

- **Gavin Killeen MBE, DL, Managing Director Nuprint Technologies Ltd.**

Mr. Killeen delivered a presentation entitled: “Nuprint—labels that attract attention. The power of the North West”. The first part of the presentation related to highlighting industry needs in the labelling and packaging sector. The second part of the presentation reflected the training initiatives being promoted by local government and NGO organizations within Northern Ireland—all informed by Mr Killeen’s involvement in various business and training panels. Mr Killeen was awarded Member of the Order of the British Empire (MBE) in the New Year Honours List 2023 by His Majesty The King for services to Further Education in Northern Ireland.

- **Cormac McAteer, Senior Engineering Manager, Seagate Technology**

Mr. McAteer delivered a presentation entitled: “Value and Innovation in Smart Manufacturing”. This presentation focused on the research activity ongoing at Seagate Technology including involvement through the Smart Nano NI consortium, which is a strength in places funded project.

- **Emma Annett, Head of Youth Training Delivery & Performance, Northern Ireland Department for the Economy (DfE)**

Ms. Annett delivered a presentation entitled: “Inclusive Pathways into Advanced Manufacturing”. This presentation included details of government-supported internships for the entry of new apprentices to advanced manufacturing with demonstrative case studies included.

- **Philip Devlin, Product Design Centre Manager, North West Regional College (NWRC)**

Mr. Devlin presented on “Supporting businesses with smart skills and innovation” through the product design centre (within the Business Support Centre) of the North West Regional College (NWRC). NWRC is a further and higher education college in the Northwest region of Northern Ireland that meets industry training needs for the region.

6. Sponsors

The conference was supported by the School of Computing, Engineering, and Intelligent Systems and the School of Engineering both within Ulster University. The conference received support from Seagate Technology. Nonfinancial support was provided by Visit-

Derry and by the Mayor of Derry City & Strabane district council, Cllr Patricia Logue, who hosted a reception for delegates at the Guildhall in the city center.

7. Notable Achievements

With his closing remarks, Conference Chair, Dr McFadden announced the prizes (as judged by the IMC members in attendance).

- Winner of the best presentation, Babak Ziaie (ATU) for the presentation “Exploring the Mechanical Properties of Gyroid Sheet Network for Additive Manufacturing of Biomedical Structures: A Numerical Analysis Approach”. A presentation in the research track.
- Winner of the best poster, Natalia Lishchenko, Niklas Braun, John Kennedy and Garret E. O’Donnell (TCD) entitled “Examining the feasibility of Acoustic Resonance Testing (ART) for Quality Control in Manufacturing” (presented by Ms. Lishchenko).
- Noted as highly commended presentations (in no particular order):
- Courtney Gallagher (UU) for the presentation in the research track entitled: “Additive Manufacturing Powder Particle Size Distributions: Comparison of Histogram Binning Methods”
- Páidraig Herbert (MTU) for the education track presentation “Demystifying the Electrocardiogram—A Printed Circuit Board for use in a Biomedical Electronics Laboratory”.

8. Statement of Peer Review

In submitting conference proceedings to *Engineering Proceedings*, the volume editors of the proceedings certify to the publisher that all papers published in this volume have been subjected to peer review administered by the volume editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal.

- Type of peer review: single-blind peer review for full articles and posters to be considered as a conference contribution.
- Conference submission management system: Submissions were made to the conference chair for initial review who then made the first decision to proceed to peer review
- Number of submissions sent for review: 16 full articles and 5 posters. Only full articles were subject to further dissemination.
- Number of submissions accepted: 15 full articles and 4 posters
- Acceptance rate (number of submissions accepted/number of submissions received): 94% acceptance for full articles (19% accepted without change, 75% accepted after minor revision, 6% accepted after major revision). 80% acceptance for posters.
- Average number of reviews per paper: 1.75 reviewers per full article, 1 reviewer per poster.
- Total number of reviewers involved: 12 reviewers involved and 3 editors gave oversight.
- Peer review criteria and process: All full articles required at least one full peer review report was subject to overall editorial approval. Two reviewers were sought for each article and 12 articles received comments from 2 reviewers. Of the 12 reviewers, 9 were from the local organizing committee (Ulster University) and 3 were from the pool of the Irish Manufacturing Council committee (non-Ulster University). To avoid conflict of interest, no reviewer or editor from a particular institution was allowed to review an article affiliated with the same lead institution on the article. The editors confirmed that all requested changes had been made after peer review and before publication.

Conflicts of Interest: The authors declare no conflict of interest.

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