



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

ANNUAL REPORT

2022 - 2023

TrinityHaus

The Michael McNamara
Research Centre for
Construction, Innovation
and Sustainability

TrinityHaus
www.tcd.ie/trinityhaus

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JOHN GALLAGHER

Director of Trinity Haus, Trinity Research Centre



Welcome to the 2022/23 Annual Report for TrinityHaus. The report aims to highlight all the key activities and achievements of the Principal Investigators (PIs), postdoctoral researchers, students and staff associated with the Centre.

We are amidst a phase of change and expansion as we welcome new PIs to the TrinityHaus that bolster our expertise in the centre's four research pillars, and I expect this to create significant momentum for us in strengthening our focus and direction.

The total in research funding obtained by TrinityHaus exceeded €5 million in the past year, from a range of National and European funding agencies. We continue to build on this success and the unique value provided by TrinityHaus as a centre that focuses on the role and impact of the built environment creating low-carbon, resilient, healthy, and inclusive communities.

We celebrated a new cohort of MAI and MSc students graduating from our Engineering degree programmes and also saw a number of PhD students complete their PhD programmes.

Our advancements in research are down to those at the heart of TrinityHaus, the researchers on the ground and the PIs as research leaders. I sincerely thank them for their commitment to TrinityHaus and the vision we have for our role in the future of a more sustainable, inclusive and healthy built environment.



1. INTRODUCTION

1.1 TrinityHaus

The built environment greatly affects sustainability, climate change, well-being, health, and inclusion. These matters are deeply embedded and connected within our buildings, neighbourhoods, towns, and cities, and they require integrated and people-centred research and design solutions.

TrinityHaus, established in 2008, responds to these challenges through transdisciplinary research and co-creation across multiple sectors and spatial scales. From housing to health care settings and from building material innovations to urban design, our projects focus on the role and impact of the built environment in creating low-carbon, resilient, healthy, and inclusive communities (Figure 1.1).

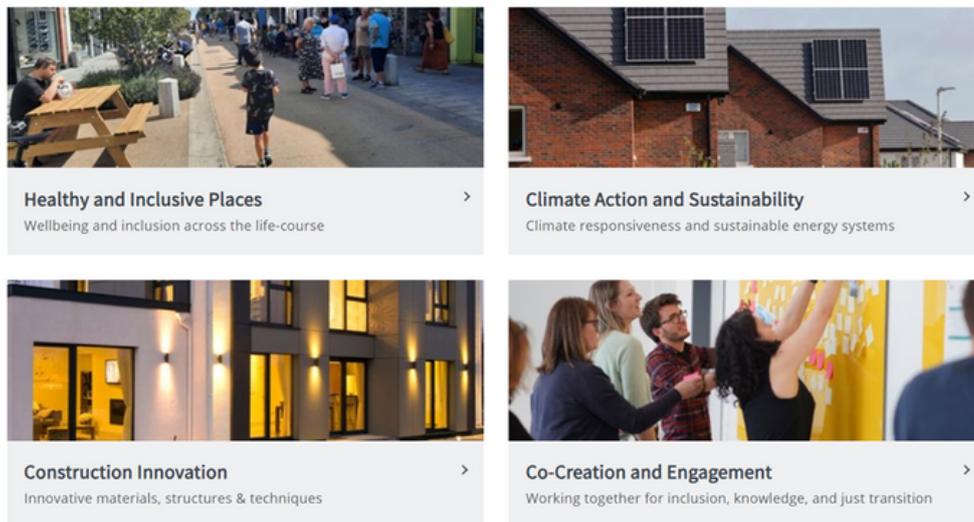


Figure 1.1. Overview of TrinityHaus and its structure as a research centre.

To achieve these objectives, the staff and students who work in TrinityHaus uniquely inculcate and embody the collaboration, interdisciplinary and supportive environment which the projects themselves espouse. The sharing of knowledge and skills in an open non-judgemental environment creates an ideas space from which all who participate benefit.

TrinityHaus aims to be a vibrant and inclusive Research Centre within Trinity, that brings together disciplinary experts from across College, and actively collaborate with external public and private sector organisations to deliver real-world impact.

History of TrinityHaus

TrinityHaus, established in 2008, responds to these challenges through transdisciplinary research and co-creation across multiple sectors and spatial scales. TrinityHaus was originally set up through a very generous benefaction by Bernard McNamara which provided seed funding for the research centre, including the institution of the Michael McNamara Chair of Construction Innovation and Sustainability, named in honour of Bernard's father. Prof Mark Dyer was the initial Chair and Director from 2008-2019, with Prof Brian Broderick (2019-2022), and most recently Prof Roger West (2022-2023), have taken on the role of Director of TrinityHaus in recent years. Dr John Gallagher, Assistant Professor in Environmental Systems Modelling from the Department of Civil, Structural Environmental Engineering, is due to be appointed as the new Director of TrinityHaus from 2024.

Current and Future Direction

The incoming Director, Dr Gallagher, Assistant Professor in the Civil Engineering Department, will take on this role in early 2024. His academic expertise and research interests lie in delivering a sustainable urban future, spanning life cycle and circular solutions that support a low-carbon, resilient and healthy built environment. He plans to leverage his extensive international academic and professional network, to strengthen the complementary research pillars that has shaped TrinityHaus, and position it's direction for the future.

In Ireland, some of the ongoing research undertaken in TrinityHaus is strongly associated with the recent launching of ConstructInnovate, the Construction Innovation Technology Centre (CITC) based in the University of Galway, of which Trinity College is a full and founding member. This is complemented by the breadth of research activity being led by Principal Investigators within TrinityHaus that are aligned with the four pillars.

1.2 Location and Space

TrinityHaus is located at 16 Westland Row, with the premises accommodating open office space, a meeting room, and an Ideas Lounge. Since 2021, TrinityHaus space was reduced to occupy only two floors of 16 Westland Row, limiting its capacity to accommodate only 12 postgraduates/postdoctoral researchers and provide office space for just three research staff. This means that researchers associated with the Centre are scattered across the University campus, which inhibits the ability to provide a collegiate and peer-learning environment within TrinityHaus.

TrinityHaus continues to house the Ideas Lounge in which dedicated multidisciplinary staff and postgraduates share their research ideas. The core collegiate working environment promotes creativity and inclusiveness, led by academics as Principal Investigators from three Schools in Trinity, supported by a strong core of Research Fellows and Assistants. As part of this ethos, regular talks are given by postgraduates to their peers over coffee so that an awareness of the breadth of the research undertaken in TrinityHaus can be shared and nurtured.

1.3 Governance

As part of the new Director's remit in 2024, a governance panel of internal and external stakeholders will be created, and a new Board put in place to provide guidance and input into TrinityHaus's future.

1.4 Website

The TrinityHaus website (Figure 1.2) is active (www.tcd.ie/trinityhaus) and allows researchers to share their work and to connect with other research institutions and industry representatives. The website is updated regularly by TrinityHaus staff.

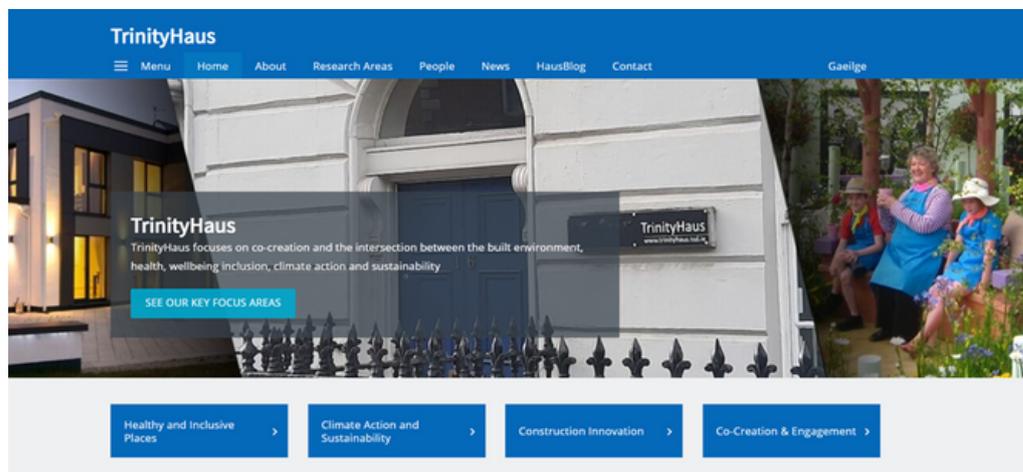


Figure 1.2. TrinityHaus website (<https://www.tcd.ie/trinityhaus>).

2. KEY PEOPLE

2.1 Principal Investigators, Research and Post-doctoral Staff

The research reported on within this document was led by the Principal Investigators, research staff from three Schools in College, as listed in Table 2.1.

Table 2.1. Principal Investigators, Research and Post-doctoral Staff 2022-2023

Role	Name and Specialisation
Incoming Director of TrinityHaus (2024)	Asst Prof John Gallagher, Life Cycle & Circular Engineering
Outgoing Director of TrinityHaus (2023)	Adj Prof Roger West, Structural/Materials Engineering
PI and Deputy Director of TrinityHaus	Assoc Prof Liwen Xiao, Environmental Engineering
Principal Investigator	Prof Alan O'Connor, Bridge Engineering
Principal Investigator	Prof Brian Broderick, Structural Dynamics, and Air Quality Engineer
Principal Investigator	Prof Sarah McCormack, Energy Engineering
Principal Investigator	Prof Breiffni Fitzgerald, Structural Engineering
Principal Investigator	Prof Desmond O'Neill, Medic in Aging
Principal Investigator, Research Fellow	Tom Grey, Architecture and Urban Design
Principal Investigator	Asst Prof Julie Clarke, Resilience Engineering
Principal Investigator	Asst Prof John Hickey, Structural Engineering
Principal Investigator, Research Fellow	Dimitra Xidou, People-Centred Design of the Built Environment; Co-Production; Stakeholder Engagement; Arts-Based Approaches
Research Assistant	Jennifer O'Donoghue
Research Assistant	Mehak Puntambekar
Post-Doctoral Staff	Dr Saviour Okeke

2.2 Staff and Students Based Onsite in TrinityHaus

Staff and students involved with the many research activities are based on site in TrinityHaus over the 2022-2023 period, as listed in Table 2.2. However, not all staff and students are based in TrinityHaus and are otherwise spread across the campus.

Table 2.2. Staff and Students Onsite in TrinityHaus 2022-2023.

Role	Name and Specialisation
Principal Investigator, Research Fellow	Tom Grey, architecture and urban design
Research Fellow	Dimitra Xidou
Research Assistant	Jennifer O'Donoghue
Research Assistant	Mehak Puntambekar
Post-Doctoral Staff	Dr Saviour Okeke
PhD Student	Dervilla Niall (Supervised by Assoc Prof Roger P. West)
PhD Student	Zihan Zhang (Supervised by Assoc Prof Liwen Xiao)
PhD Student	Peiyin Kang (Supervised by Assoc Prof Liwen Xiao)
PhD Student	Yanqi Shi (Supervised by Assoc Prof Liwen Xiao)
PhD Student	Manish Kanoija (Supervised by Prof Biswajit Basu)
PhD Student	Conor O'Reilly (Supervised by Prof Biswajit Basu)

3. RESEARCH PROJECTS

3.1 Research Pillars

Research projects affiliated with TrinityHaus fall under one (or more) of the four research areas or pillars (Figure 3.1), namely (i) Health and Inclusive Places; (ii) Climate Action and Sustainability; (iii) Construction Innovation; (iv) Co-creation and Engagement.



Figure 3.1. TrinityHaus and its four research pillars: (i) Health and Inclusive Places; (ii) Climate Action and Sustainability; (iii) Construction Innovation; (iv) Co-creation and Engagement.

The specific topics associated with these pillars are outlined as follows:

- 1. Healthy and Inclusive Environments:** Inclusive, healthy, age-attuned, and people-centred built environment; soil, water, air (including external and internal air quality) and healthy materials.
 - GoGreenRoutes-Go Green: Resilient Optimal Urban natural, Technological and Environmental Solutions (2020-2024)
 - STATION-AIR-Investigating the impacts of urban railway STATION hubs on AIR quality in its environs (2022-2025)
 - Luminescent light shelves for daylight enhancement in building for improved circadian rhythm (2022-2026)

2. Climate Action and Sustainability: Low-carbon energy solutions and renewable energy systems, sustainable materials and buildings, and the circular economy.

- TRACE-Transforming Rural water communities As positive Climate and Energy districts (2023-2025)
- HY4RES: Hybrid solutions for renewable energy systems: achieving net-zero Atlantic area energy consumers & communities (2023-2026)
- CLIMECO: Methodologies for Financing and Costing of Climate Impacts and Future Adaptation Actions: Transport Networks in Ireland (2023-2025)

3. Construction Innovation: To enhance the sustainability of the construction industry through innovation

- ASHA: Achieving Sustainable Housing Affordably (2024-2027)
- Construct Innovate: Design for Manufacture and Assembly with Design for Reuse (ended 2023)
- Resilient Buildings: National Risk Index for Buildings in Ireland due to Climate Change Impacts (2023-2025)

4. Co-creation and Engagement: To bring the voice, needs and preferences of the community to the heart of the process

- Key issues, challenges, and opportunities for engaging older persons in co-creation of standards and guidelines for the built environment:
 - o Planning and design for Quality of Life and Resilience in RLTC settings for older people in Ireland: Research and Universal Design Guidelines for new-build, adaption and retrofit (2022-2024)
 - o RLTC & COVID-19: Role of the Built Environment in Balancing Infection Control and Quality of Life (2020-2022)
- Community engagement:
 - o UGPplus: Enhancing Urban Greening Plans to Mainstream Biodiversity in Society (2024-2026)

The research conducted by TrinityHaus and its focus on the built environment is inspired by and supports a range of key global, European, and Irish national frameworks and policies. Examples of these at a global level include the UN Sustainable Development Goals (SDGs), or HABITAT III-The New Urban Agenda. At a European level it includes the European Green Deal or the New European Bauhaus. At a national level the work aligns with, and responds to, key policies such as the Climate Action Plan 2023, Project Ireland 2040-National Planning Framework, or Housing for All-a New Housing Plan for Ireland.

3.2 Funding and Sponsoring Agencies

A full list of the currently active and recently completed projects and the level of funding attributed to the TrinityHaus PIs is given in Appendix A. Recognising again that it is not possible for all these projects to be managed within TrinityHaus, the very high level of research engagement by the TrinityHaus PIs is well represented by this list, amounting to over €5 million in value to Trinity College. As may be observed, this funding is sourced from a diverse range of agencies in Europe and nationally.

4. EVENTS

The following research events/seminars were organised and held by researchers at TrinityHaus. These activities help to disseminate research findings, publicise the centre's activities and provide networking opportunities in relation to future research and funding proposals.

Table 4.1. Events held 2022-2023.

Date	Event	Award/Organiser
May 2023	Research Symposium: Ageing and Dementia in Healthcare Settings: Design, Evaluation and Beyond	HaPAI / organisers T. Grey, D. Xidou, J. O'Donoghue
May 2023	Joint Technical Seminar (1-hour CPD): Advanced Concrete Technology Lecture: Calcined Clay as a Secondary Cementitious Material	Prof. Roger P. West, in association with the Irish Concrete Society and the Institute of Concrete Technology
April 2023	Workshop: Recycled Concrete Aggregates: Use in Concrete Structures, Road Pavements and Mortar	Prof. Roger P. West, in association with the Irish Concrete Society
April 2023	Online information session/briefing: NSAI Standard on Universal Design of Dwellings	NSAI Technical Committee "Universal Design Standards Consultative Committee", T. Grey (member)
March-May 2023	'Climate Action & Sustainability' Webinar Series	Prof John Gallagher
December 2022	MOOC Information Session: Dementia Inclusive Hospitals from a UD approach	EIT Health, T. Grey
May 2022	Research findings and recommendations launch: RLTC and COVID-19: The Role of the Built Environment in Balancing Infection Control and Quality of Life	Science Foundation Ireland, D. O'Neill, T. Grey, D. Xidou & J. O'Donoghue J. O'Donoghue
March 2022	Launch of Research Report and Guidelines with CEUD: Universal Design for Improving Quality of Life and Enhancing COVID-19 Infection Control in Existing Residential Care Settings for Older People	Centre for Excellence in Universal Design / organisers T. Grey, D. Xidou, J. O'Donoghue
March 2022	Webinar: Emerging opportunities in design standards for our built environment: well-being, inclusion, and UD	NSAI, T. Grey (member)
September 2022	2 nd International Workshop on Wind Farm Aerodynamics and Control, Dublin	Prof Breiffni Fitzgerald
July 2022	14 th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP14), TCD	Prof Breiffni Fitzgerald
August 2022	Civil Engineering Research in Ireland Conference 2022, Eds. N Holmes, C de Paor, RP West, TU Dublin and TCD	Prof Roger P. West

5. PUBLICATIONS

Throughout the wide array of research projects undertaken and completed by TrinityHaus affiliated research staff, there is a strong culture of information dissemination and publication. This includes both peer-reviewed journal publications and presentations at seminars or conferences as listed herein in Appendices B and C respectively. In total 103 journal papers and 67 seminar and conference citations are listed across 12 PIs and 3 research staff. Examples of other key publications are shown in **Figure 5.1**.



Figure 5.1. Examples of TrinityHaus publications.

6. EDUCATION & LEARNING

Throughout the wide array of research projects undertaken and completed by TrinityHaus affiliated research staff, there is a strong culture of information dissemination and publication. This includes both peer-reviewed journal publications and presentations at seminars or conferences as listed herein in Appendices B and C respectively. In total 103 journal papers and 67 seminar and conference citations are listed across 12 PIs and 3 research staff. Examples of other key publications are shown in Figure 5.1.

6.1 Postgraduate Students

TrinityHaus has affiliated postgraduate students completing PhD and both types of Masters (MAI and MSc.) degrees supervised across nine TrinityHaus PIs/Supervisors. Throughout the 2022-2023 reporting period, many postgraduate students (Masters and PhDs) began, continued, or completed their research, all supervised by TrinityHaus-affiliated PIs. Their names, supervisors, and details for the 31 PhD and 61 Masters associated with TrinityHaus are listed in Appendix D.

6.2 PhD Advisory Role

TrinityHaus research staff have also acted in an advisory role in the completion of PhD theses. For example, Research Fellows Tom Grey and Dimitra Xidou are currently acting as advisors to the PhD candidate Mark Ware who is student with the School of Engineering and informatics; University of Sussex). His research topic is titled 'Nature-based interior architecture-Taking nature to people' and involves an art-led approach to the research and creation of multisensory nature-based interior architecture and its design. This is a good example of the wide and multidisciplinary nature of some of the research projects run out of TrinityHaus.

7. OUTREACH & EXTERNAL ACTIVITIES

Members of TrinityHaus are involved in many various non-project related activities based on their expertise and the research work conducted within the research centre. These activities help disseminate research outputs, develop networks, and more importantly contribute research knowledge and experience towards solving important societal issues. They may be summarised, in brief, as follows:

Asst. Prof. John Gallagher

Committee Member/National Delegate for ISO/TC 323/WG1 (Member) and WG3 (Chair)

Committee Member/National Delegate for CEN/TC 350/SC1/TG2 (Member)
Communications Officer for the Environmental Sciences Association of Ireland

CPD Course Coordinator for Engineers Ireland-Environmental Essentials for Engineering Projects

Reviewer of papers for multiple journals

Adj. Prof. Roger West

Chair of the Irish Concrete Society

Committee member of the Concrete Consultative committee, NSAI

Chair of the Irish Concrete Durability committee

Reviewer of papers for multiple journals

Assoc Prof. Liwen Xiao

Chair of the Ireland Chinese Association of Environment, Resources & Energy

General Secretary of the Association of China-Ireland Academics

Member of CIRCULÉIRE's Circular Plastics Thematic Working Group Panel

Associate Editor-of Advances in Renewable Energy

Reviewer of papers for multiple Journals

Prof. Alan O'Connor

Member Joint Committee on Structural Safety
Member/National Delegate CEN/TC 250/SC10, CEN/TC 250/WG2 and CEN/TC 250/WG6 Board Member International Civil Engineering Risk and Reliability Association (CERRA) Federation of European Highway Research Laboratories (FEHRL)-Research Coordinator for Republic of Ireland
IABSE TG1.10 (Chair) Utilisation of Traffic Data in Research, Design and Assessment of Bridges
IABSE TG6.1 (Vice Chair) Effects of Climate Change on Infrastructure
IABSE TG1.3 Calibration of Partial Safety Factors for the Assessment of Existing Bridges-Member
Transportation Research Board (USA)-Committee on Bridge and Structures Management (AKT50)
Chair of 14th International Conference on Applications of Statistics and Probability in Civil Engineering, Dublin, 2023.
Editor in Chief-ICE Journal Infrastructure Asset Management
Editorial Board Member-Structural Safety
Associate Editor Bridge Engineering-Frontiers
CEN-CENELEC Project Team Leader (WG6.T2) for the Eurocode Phase 3 project team tasked with incorporating Robustness Rules in the Material Related Eurocode Parts.
CEN-CENELEC Project Team member (WG2.T2) for developing a Eurocode (prEN1990-2) for the Assessment and Retrofitting of Existing Structures
Reviewer of papers for multiple journals

Prof. Brian Broderick

Eurocode 8: Design of Structures for Earthquake Resistance, CEN Sub-Committee TC250/SC8
Irish National Technical Contact for Eurocode 8: Design of Structures for Earthquake Resistance, NSAI
Member of Structures Journal Editorial Board, IStructE
Reviewer of papers for multiple journals

Prof. Sarah McCormack

Management Committee Member of COST Action CA16235-
Performance and Reliability of Photovoltaic Systems: Evaluations of
Large-Scale Monitoring Data (PEARL-PV) 2017-2022
Management Committee Member of COST Action CA21103-
Implementation of Circular Economy in the Built Environment
(CircularB) 2022-2026
Reviewer of papers for multiple journals

Prof. Breiffni Fitzgerald

Committee member of Structures and Construction Division,
Engineers Ireland Committee member of Institution of Structural
Engineers, Ireland Branch Chartered Engineer Panellist, Engineers
Ireland
CPD Course developer for Engineers Ireland
Invited talks to the Control Group of the Irish Systems and Signals
conference, Offshore Wind at the 2nd National Climate Stakeholder
Forum, European Academy of Wind Energy (EAWE) on the wind
energy research and education activities
Reviewer of papers for multiple journals

Tom Grey

Chair of NSAI/TC 023/SC 01 "Accessibility in Built Environment" and
Co-Chair of NSAI/TC023/SC 06/WG 03 "Ageing Societies", NSAI:
·National mirror committee on the development of the new
European Standard EN 17210:2021: Accessibility and usability of the
built environment, and the update of ISO 21542-Building construction
— Accessibility and usability of the built environment (2021)
·National mirror committee contributing to the development of
ISO/DIS 23623
Ageing Societies- Framework for Dementia-inclusive communities
Housing conditions, housing adaptations, and new build housing,
Housing Agency Sub-group on housing for our ageing population
Co-convenor and committee member, ISO/AWI 25553— Smart
Multigenerational Neighbourhoods- Guidance and Requirements

Dimitra Xidou

Network nature: task force no. 6: [Here](#)

Athena Swan: [Here](#)

Jennifer O'Donoghue

Housing conditions, housing adaptations, and new build housing, Housing Agency Sub-group on housing for our ageing population

8. STAFF DEVELOPMENT & TRAINING

Ongoing development and upskilling of staff are essential in a research environment. In this context TrinityHaus research staff have completed a range of training during the Covid period, including:

Tom Grey

- Data protection: Trinity College Dublin Data Protection Office
- Research Integrity Training: Epigeum

Dimitra Xidous

- Data protection: Trinity College Dublin Data Protection Office
- Research Integrity Training: Epigeum

Jennifer O'Donoghue

- Data protection: Trinity College Dublin Data Protection Office
- Research Integrity Training: Epigeum
- Data Protection and Health Research: GDPR and Health Research

9. LOOKING FORWARD

In conclusion, TrinityHaus is largely research-driven by sustainability issues in society at large, with many external stakeholders playing an active part in the research projects-in that way TrinityHaus is truly outward facing.

The academics who are the PIs in TrinityHaus have multiple demands on their time, for teaching, research supervision, administration, management and in leading their funded research projects. Concentrating on the research activities, TrinityHaus has a highly invigorated research community who give of their time to provide a very rewarding and unique research journey for all those involved. Given the very significant successes in attracting funding in the recent past and the potential for future funding, especially that associated with the formation of the government sponsored ConstructInnovate, finance is not seen as the central issue for TrinityHaus, though it is vital to ongoing success. Inevitably there are impediments to growth, such as the space restrictions imposed on us, or the ability of new researchers to join us due to national accommodation shortages. However, there is no risk that the ethos of the supportive, inclusive, and diverse research environment which the research staff inculcate might be set aside in coping with the increasing demands which our fundamental roles as teachers, researchers and mentors impose.

TrinityHaus could not be better placed to provide the research environment to address the enormous sustainability challenges which humankind faces, as supported by our four research pillars: Healthy and inclusive places, climate action and sustainability, construction innovation and co-creation and engagement.



APPENDIX A-RESEARCH PROJECTS BY TRINITYHAUS PIS 2022-2023

Grant/Project Title	Granting Body	PI	Total Grant Value
HY4RES: Hybrid solutions for renewable energy systems: achieving net-zero Atlantic area energy consumers & communities	Interreg AA	Prof Aonghus McNabola (Co-I Asst Prof John Gallagher)	€3.2m to consortium (€110,000)
TRACE: Transforming Rural water communities as positive Climate and Energy districts	SFI	Asst Prof. John Gallagher	€250,000
STATION-AIR: Investigating the impacts of urban railway STATION hubs on AIR quality in its environs	EPA	Asst Prof John Gallagher & Prof Brian Broderick	€350,000
GoGreenRoutes: Resilient Optimal Urban natural, Technological and Environmental Solutions	Horizon 2020	Prof Brian Broderick & Asst Prof John Gallagher	€445,000
Enhancing Urban Greening Plans to Mainstream Biodiversity in Society (UGPplus)	Horizon Europe	Dimitra Xidou, linked to Centre for Social Innovation	€4.51m
Minority Report (Project no. 101147385)	Horizon Europe	Tom Grey (TCD PI)	€4.98m
Ageing population and universal access-Building Regulations compliance assessment of UD Homes	DoHLGH	Tom Grey	€39,000
Planning and design for Quality of Life and Resilience in RLTC settings for older people in Ireland: Research and Universal Design Guidelines for new-build, adaption and retrofit	HRB	Prof. Des O'Neill (PI) and Tom Grey	€369,740
Supporting Tallaght University Hospital's (TUH) Integrated Care for Older Persons: Testing an approach to identify the common housing hazards in housing affecting older people in South Dublin	Meath Foundation	Prof. Des O'Neill (PI) and Tom Grey	€50,000
RLTC & COVID-19: Role of the Built Environment in Balancing Infection Control and Quality of Life	SFI	Prof. Des O'Neill Co-PI Tom Grey	€161,455
Enhanced Prevention, Warning, Coordination and Emergency Management for Floods at Local Scales	AA Floods	Prof Alan O'Connor	€256,000
Universal Design for Improving Quality of Life and Enhancing COVID-19 Infection Control in Existing Residential Care Settings for Older People	Centre for Excellence in Universal Design	Tom Grey (PI) and Dimitra Xidou	€30,000
Supporting Equity of Older People by Redefining and Refining Assessment of Dementia Inclusive Design of Hospital Spaces	HAPAI	Prof. Des O'Neill (PI) and Tom Grey	€161,455
The aggregation, deposition, and transport of aged PU synthetic leathers related to MPs in the environments	CSC	Assoc. Prof. Liwen Xiao	€15,000
Bioremediation of microplastics in Irish Soils	Laidlaw Scholarship	Assoc. Prof. Liwen Xiao	€10,000
Microbial Fuel Cells based system for pollutants removal, resources recovery and disinfection	EI	Assoc Prof Liwen Xiao	€520,000
Degradation of biodegradable plastics and their environmental impacts	CSC	Assoc. Prof. Liwen Xiao	€64,000
Removal of microplastics from wetland	CSC	Assoc. Prof. Liwen Xiao	€32,000
Assessment and Mitigation of microplastics (MPs) in the Dairy Foods	Teagasc	Assoc. Prof. Liwen Xiao	€150,000
National Standards Authority of Ireland (NSAI) and Accessibility of the Built Environment	NSAI	Tom Grey	N/A
National Construction Technology Centre	EI	Jamie Goggins	€5m in



('Construct Innovate')		(University of Galway)	consortium (estimated €1,000,000)
Controlling the Wind-Induced Vibration Response of Modular High-Rise Buildings	IRC	Prof Brian Broderick	€168,000
TORCH-Transforming Open Responsible Research and Innovation through CHARM	Horizon 2020	Prof Brian Broderick	€427,645
Design for Manufacture and Assembly with Design for Reuse	ConstructInnovate	Prof Brian Broderick	€32,000
FOREST	Kinsella Award	Prof Sarah McCormack	€500,000 to consortium (€110,000)
Novogrid Opportunities	EI	Prof Sarah McCormack	€5,000
Luminescent light shelves for daylight enhancement in building for improved circadian rhythm	Velux Stiftung-Daylight research platform	Prof Sarah McCormack	€400,000 to consortium (€150,000)
IDEAS: Novel building integration designs for increased efficiencies in advanced climatically tunable renewable energy systems	Horizon 2020	Prof Sarah McCormack	€3,999,084 to consortium (€680,134)
ASHA-Achieving Sustainable Housing Affordably	TCD	PI-Rachel Walsh Co-PI Sarah McCormack	€500,000
RevRenew	SEAI	Prof Sarah McCormack	€419,000
Smart Materials for Energy Efficient Windows (Energy Innovation)	SFI	PI-Igor Shvets Sarah McCormack (co-PI)	€250,000
EVOLUTE	ERC	Prof Sarah McCormack	€150,000
Development of damping parameters for Irish Offshore Wind Farms	SEAI	Prof Breiffni Fitzgerald	€348,950 to consortium (€104,000)
A comprehensive decision support tool for end-of-life wind turbines of Ireland; Lifetime Extension, Decommissioning, Repowering, Repurposing [WindLEDeRR]	SEAI	Prof Breiffni Fitzgerald	€550,000 to consortium (€97,875)
Data Driven Digital Twin of Wind Farm (TwinFarm)	SEAI	Prof Breiffni Fitzgerald	€198,750 to consortium (€99,375)
Remote-Wind	SEAI	Prof Breiffni Fitzgerald	€650,000 to consortium (€164,284)
Next Generation Energy Systems (NexSys)	SFI	Prof. Breiffni Fitzgerald (funded investigator)	€1.06m
Machine Learning for Wind Farm Aerodynamics and Control	SFI	Prof Breiffni Fitzgerald	€520,632
Enhanced Controllers to Improve Wind Farm Efficiency	SEAI	Prof Breiffni Fitzgerald	€324,788
NBS EduWorld	Horizon Europe	G Donnelly-Cox (CSI) [TrinityHaus Dimitra]	€530,000
CLIMECO: Methodologies for Financing and Costing of Climate Impacts and Future Adaptation Actions: Transport Networks in Ireland	EPA	Asst Prof Julie Clarke	€286,425
Resilient Buildings: National Risk Index for Buildings in Ireland due to Climate Change Impacts	SFI	Asst Prof Julie Clarke	€249,332
inDyCORE (INnovation in DYnamic Cables for Offshore Renewable Energy)	SEAI	Prof. Basu (Co-PI Asst Prof John Hickey)	€600,000



APPENDIX B-RELEVANT JOURNAL PEER-REVIEWED PUBLICATIONS 2022-2023

Prof. J. Gallagher

1. Merida Garcia, A., Gallagher, J., Crespo Chacon, M. & McNabola, A. (2023) An economic and environmental optimization model for sizing a hybrid renewable energy and battery storage system in off-grid farms, *Applied Energy*, 224, 119588.
2. Pereira Barboza, E., Montana, F., Cirach, M., Iungman, T., Khomenko, S., Gallagher, J., Thondoo, M., Mueller, N., Keune, H., MacIntyre, T., & Nieuwenhuijsen, M. (2023) Environmental health impacts and inequalities in green space and air pollution in six medium-sized European cities. *Environmental Research*, 116891.
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97. Lim, S.T., Murphy, S.J., Murphy, S.M., Coughlan, T., O'Neill, D., Tierney, S., Egan, B., Collins, D.R., McCarthy, A.J., Lim, S.Y. & Smith, D.R. (2022). Assessment of on-treatment platelet reactivity at high and low shear stress and platelet activation status after the addition of dipyridamole to aspirin in the early and late phases after TIA and ischaemic stroke, *Journal of the Neurological Sciences*, 120334.

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100. Hölischer, K ... Xidous, D (2023). Strategies for mainstreaming nature-based solutions in urban governance capacities in ten European cities. *Urban Sustainability*, 3, 54.

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Dr. Saviour Okeke

101. Li, D., Sun, Y., Shi, Y., Wang, Z. Okeke, S.I.; Yang, L.; Zhang, W.; Xiao, L, 2023, Structure evolution of air cathodes and their application in electrochemical sensor development and wastewater treatment, *Science of The Total Environment*, 869, 161689.

102. Sun, Y., Li, D., Shi, Y., Wang, Z., Okeke, S.I., Yang, L., Zhang, W., Zhang, Z., Shi, Y. and Xiao, L., 2023. Application of 3D Printing Technology in Sensor Development for Water Quality Monitoring., *Sensors*, 23(5), p.2366.

103. Wang, Z.; Li, D.; Shi, Y.; Sun, Y.; Okeke, S.I.; Yang, L.; Zhang, W.; Zhang, Z.; Shi, Y.; Xiao, L., 2023, Recent Implementations of Hydrogel-Based Microbial Electrochemical Technologies (METs) in Sensing Applications, *Sensors*, 23(2), 641.



APPENDIX C-Seminars and Conferences 2022-2023

Prof J. Gallagher

1. Gallagher, J. STATION-AIR-Investigating the impacts of urban railway STATION hubs on AIR quality in its environs. National Air Event, Kilkenny, Ireland, 15 March 2023.
2. Jin, M., Gallagher, J., Apsunde, K., & Peng, Z.R. Evaluating and Enhancing the Impact of Urban Parks on Local Air Quality Conditions. 32nd Irish Environmental Researchers Colloquium (Environ 2022), "Unlocking Sustainability", Ulster University, Belfast. 20-22 June 2022.
3. Jin, M., Zhang, L., He, H., & Peng, Z.R. & Gallagher, J. Analysing the Impact of Passive Control Methods on Air Pollutant Dispersion in Urban Street Canyon. Transport Research Board 102nd Annual Meeting. Washington D.C., 8-12 January 2023.

Prof. Roger P. West

4. Kuang, S., Hore, A.V., Hassan, A., McAuley, B. and West, R.P., Public sector BIM adoption: Development and evaluation of government policy interventions: A systematic literature review, 30th EG-ICE International Conference on Intelligent Computing, UCL, London, 2023, 531-538.
5. Hore, A.V., McAuley, B. and West, R.P. eds, BIM Gathering 2023-Accelerating BIM Adoption, Athlone, 18-20 September 2023, CitA Ltd, 2023, 1-211.
6. Hore, A., West, R.P. and McAuley, B., Accelerating BIM adoption in Ireland: A ten-year review of CitA BIM Gathering proceedings, CitA 6th BIM Gathering 2023-Accelerating BIM adoption, Athlone, September 2023, 10-22.
7. West, R.P., To teach is human, ICON BITS 2023-international conference on best innovative teaching strategies, Pilani, Rajasthan, India, Feb 2023.
8. West, R.P. and Alawais, A., Truly sustainable concrete, UKIERI Concrete Congress-Sustainable Concrete Infrastructure, Jalandhar, India, March 2023.
9. Murphy, O., West, R.P., and Saini, N. (2022) 'Understanding mould growth causes and solutions for A-rated homes' edited by Holmes, N., de Paor, C., West, R.P. Civil Engineering Research in Ireland (CERI2022), Dublin, edited by Holmes, N., de Paor, C., West, R.P., 2022, 210-215.
10. Markey, E., West, R.P., Kelly, E. and Saini, N. (2022) 'Optimising heating costs in low- occupancy office', edited by Holmes, N., de Paor, C., West, R.P. Civil Engineering Research in Ireland (CERI2022), Dublin, edited by Holmes, N., de Paor, C., West, R.P., 2022, 573-578.
11. Saini, N., West, R.P., Shiel, P., Kerrigan, R., Filho, R. and Pyburn, Ian. (2022) 'Modelling human influences on the indoor environment in homes', Civil Engineering Research in Ireland (CERI2022), Dublin, edited by Holmes, N., de Paor, C., West, R.P., 2022, 497-502.
12. West, R.P., O'Loughlin, D., Pakdel, A., Grimes, M. and Hunt, S. (2022) 'Delivering materials laboratory sessions to large classes during the pandemic', Civil Engineering Research in Ireland (CERI2022), Dublin, edited by Holmes, N., de Paor, C., West, R.P., 2022, 549-554.
13. West, R.P. and Richardson, M. (2022) 'Concrete Matter-25 years of Concrete Research in Ireland conferences', edited by Holmes, N., de Paor, C., West, R.P., 2022, 2-10.
14. West, R.P. and West, S. (2022) 'Shrinking sports socks and cracking concrete', edited by Holmes, N., de Paor, C., West, R.P., 2022, 544-548.
15. Childs, M. and West, R.P. (2022) 'A solution to bamboo reinforced concrete's bond problem, edited by Holmes, N., de Paor, C., West, R.P., 2022, 22-27.
16. Holmes, N., de Paor, C. and West, R.P. (2022) Civil Engineering Research in Ireland 2022, Dublin, 25-26 August 2022, 622.

Assoc Prof. Liwen Xiao

17. Sun, Y., Wang, Z., Li, D., Shi, Y., Yang, L. and Xiao, L., (2022) 3D-printed air-cathodes for microbial



fuel cells. In: Environ 2022, Belfast, Ireland 20-22 June 2022.

18. Yang, L., Li, D., Shi, Y., Wang, J.J., Xiao, L., Boland, J., (2022) Sampling, identification, and characterization of microplastics released from daily used plastic products In: Environ 2022, Belfast, Ireland 20-22 June 2022.

Prof. Brian Broderick

19. Moore, H., Broderick, B., Fitzgerald, B., Barrett, V. and Linehan, S. (2022). Model Validation for the Wind Response of Modular High-Rise Buildings through Full Scale Monitoring, Civil Engineering Research in Ireland.

20. Moore, H., Broderick, B. and Fitzgerald, B. (2022). Experimental and computational evaluation of modal identification techniques for structural damping estimation, International Conference on Civil and Environment Engineering.

21. Broderick, B.M. and Ryan, T. (2022). Dynamic buckling of steel braces in concentrically braced frames, SeismiCON22, 3rd Intl Conf on Seismic Design and Analysis of Structures, 12-21.

Prof. Breiffni Fitzgerald

Moore, H., Fitzgerald, B., Hickey, J. and Broderick, B. (2023). The Effects of Acceleration Signal Length on the Outputs from Modal Identification Methods, In 2023 34th Irish Signals and Systems Conference (ISSC) (1-6). IEEE. (2023).

22. Hickey, J., Moore, H., Broderick, B. and Fitzgerald, B. (2023). Damping Ratio Estimation for a Slender Modular Building from Full Scale Ambient Response Monitoring, International Conference on Experimental Vibration Analysis for Civil Engineering Structures. Cham: Springer Nature Switzerland, 2023.

Moore, H., Broderick, B., Fitzgerald, B., Barrett, V. and Linehan, S. (2022). Model Validation for the Wind Response of Modular High-Rise Buildings through Full Scale Monitoring, Civil Engineering Research in Ireland 2022, Dublin, Ireland, 25-26 August 2022.

23. Moore, H., Broderick, B. and Fitzgerald, B. (2022). Experimental and computational evaluation of model identification techniques for structural damping estimation, 4th International Conference on Civil and Environmental Engineering 2022, Bali, Indonesia, 4-5 August 2022.

24. Baisthakur, S. and Fitzgerald, B. (2022). A study of wind-wave misalignment for the Irish coastline and its effect on the wind turbine response, Civil Engineering Research in Ireland, Dublin, Ireland, 25-26 August 2022.

Asst Prof. John Hickey

25. Hickey J, Langley R; "A method for Probabilistic Analysis in Structural Dynamics Based on Separation of Aleatory and Epistemic Uncertainties," 14th International Conference on Applications of Statistics and Probability in Civil Engineering, Dublin, Ireland, 2023

Hickey J, Moore H, Broderick B and Fitzgerald B; "Damping Ratio Estimation for a Slender Modular Building from Full Scale Ambient Response Monitoring," Experimental Vibration Analysis for Civil Engineering Structures, 2023

Moore H, Fitzgerald B, Hickey J and Broderick B, "Validation of Acceleration Response Modelling for Modular High-Rise Structures through Full Scale Monitoring," Eurodyn2023 XII International Conference on Structural Dynamics, Delft, Netherlands, 2023

Moore H, Fitzgerald B, Hickey J and Broderick B, "The Effect of Acceleration Signal Length on the Outputs from Modal Identification Methods," 34th Irish Signals and Systems Conference (ISSC), Dublin, Ireland, 2023.

26. Hickey J, Butlin T, Langley R, Onozato N; "An Equivalent Linearization Method for Predicting the



Vibration Response of Nonlinear Oscillators Under Combined Harmonic and Random Excitation”, ISMA-2022 Conference on Noise and Vibration Engineering, Leuven, Belgium, 2022.

Prof. Sarah McCormack

27. Bacaoanu, A., Ortega, A. and McCormack, S. (2022). Phase Change for a Radiant Floor Coupled to a Heat Pump and a Geothermal Heat Exchanger, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
28. Chandra, S. and McCormack, S. (2022). Understanding the impact of environmental conditions on the Development & Application of LDS on Photovoltaics, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
29. Flynn, T., Chandra, S. and McCormack, S. (2022). Assessment of large-area luminescent solar concentrators as building integrated geodesic dome panels, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
30. Glenn, A., Chandra, S. and McCormack, S. (2022). Design, Fabrication, Optimization and LargeScale Preliminary Testing of Plasmonic Luminescent Solar Concentrator Devices, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
31. Madhi, S., Chandra, S. and McCormack, S. (2022). Phosphorescent Layers for Photovoltaic Efficiency Enhancement, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
32. Martzeli, P. and McCormack, S. (2022). Investigation of biomimetic designs and the use of phase change materials for improving efficiencies in solar thermal energy systems, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
33. Tham, W. Q., Chandra, S., Norton, B. and McCormack, S. (2022). Investigating Luminescent Materials for Circadian Rhythm Regulation using Daylight, World Renewable Energy Congress XXI, Perth, Australia, December 4-9th 2022.
34. Cass, B., Chandra, S., and McCormack, S. (2022). Development from a small to large scale luminescent downshifting layers, WCPEC-8-World Conference on Photovoltaic Energy Conversion, 26-30 September 2022, Milan, Italy.
35. Glenn, A., Chandra, S. and McCormack, S. (2022). Validation of Plasmonic Luminescent Solar Concentrator modelling software, WCPEC-8-World Conference on Photovoltaic Energy Conversion, 26-30 September 2022, Milan, Italy.
36. Glenn, A., Chandra, S., Cass, B., and McCormack, S.J. (2022). Implementation and Optimization of a Luminescent Down-Shifting Photovoltaic System for Use in a Compound Parabolic Concentrator, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds) Sustainable Energy Development and Innovation. Innovative Renewable Energy. Springer, Cham.
37. Huang, M.J., McCormack, S.J., Yao, J., Dai, Y. and Hewitt, N.J. (2022). Development of Innovative Technologies for Solar-Assisted Heat Pump for Residential Heat Supply, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds) Sustainable Energy Development and Innovation. Innovative Renewable Energy. Springer, Cham.
38. Cass, B., Chandra, S., Sethi, A. and McCormack, S.J. (2022). Characterisation of Luminescent Downshifting Layer Effects on Silicon Solar Cells, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds) Sustainable Energy Development and Innovation. Innovative Renewable Energy. Springer, Cham.
39. Saers, S., Ortega, A., Chandra, S., and McCormack, S.J. (2022). ‘Compound Parabolic Concentrator Design: Assessment of Performance Enhancement for Building-Integrated Photovoltaic Systems’, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds). Sustainable Energy Development and Innovation. Innovative Renewable Energy.



1.Springer, Cham.

40. Ayala Barragan, M.F., Chandra, S., Cass, B., and McCormack, S.J. (2022). Defining Critical Parameters in a Luminescent Downshifting Layer for PV Enhancement, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds) Sustainable Energy Development and Innovation. Innovative Renewable Energy. Springer, Cham.

41. Ortega, A., Chandra, S., and McCormack, S.J. (2022). Design and Characterization of a Roof- Mounted Compound Parabolic Concentrator, Proceedings of the World Renewable Energy Congress XX, 26-30 July 2020, Lisbon, Portugal. In: Sayigh, A. (eds) Sustainable Energy Development and Innovation. Innovative Renewable Energy. Springer, Cham.

Prof. Alan O'Connor

42. Teixeira, R., Martinez-Pastor, B., Nogal, M. and O'Connor, A., (2022), 'A Multi-Fidelity Framework for Operational Adaptation of Engineering Systems, ESREL 2022.

43. Al-Mhdawi, M., O'Connor, A., Brito, M., Qazi, A., and Rashid, H. (2022), Modeling the effects of Construction Risks on the Performance of Oil and Gas Projects in Developing Countries: Project Managers' Perspective, Civil Engineering Research in Ireland Conference, CERI 2022.

Prof. Des O'Neill

44. Fitzpatrick, N. and O'Neill, D. (2023). Exploring the success of older female directors: creativity and resilience of old age in the face of cultural barriers, Age and Ageing, Irish Gerontological Society, Galway, 22 September 2023, 52, Supplement_3, 2023, afad156.273.

45. O'Neill, D. (2023). Ageing through the lens of arts and humanities: a core element of gerontology, Societas Gerontologica Fennica, Helsinki, 27 April 2023.

46. Waldron, E., Wakefield, K. and O'Neill, D. (2023). Interdisciplinarity and joint working in cultural gerontology, Age and Ageing, Irish Gerontological Society, Galway, 22 Sept 2023, 52, Supplement_3, 2023, afad156.271.

47. Adams-Price, C. and O'Neill, D. (2022). On the threshold: creativity in mid-life, Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting, Indianapolis, USA, 2-6 November 2022, 6, Suppl 1, 2022, 211.

48. Baisthakur, S. and Fitzgerald, B. (2022). A study of wind-wave misalignment for the Irish coastline and its effect on the wind turbine response, Civil Engineering Research in Ireland, Dublin, Ireland, 25-26 August 2022.

49. de Medeiros, K. and O'Neill, D (2022). Narrative as a boundary concept in gerontology: the story behind the stories, Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting, Indianapolis, USA, 2-6 November 2022, 6, Suppl 1, 2022, 242.

50. O'Donnell, D., Romero-Ortuno, R., Kennelly, S., Lavan, A., Kenny, R.A., O'Neill, D., McElwaine, P., and Briggs R. (2022). The 'Bermuda Triangle' of Orthostatic Hypotension, Cognitive Impairment and Reduced Mobility: Prospective Associations with Falls and Fractures in Community-Dwelling Older People, European Geriatric Medicine, 18th European Geriatric Medicine Society Congress, London, 28-30 Sept, 13, Suppl 1, 2022, S262.

51. O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Interviews with experts in residential long-term care and the built environment: balancing quality of life and infection control, 19th Congress of the European Geriatric Medicine Society, 20-22 September 2023, Helsinki, Finland, 14, Eur Geriatr Med (2023) 14 (suppl 1): S1-S387.

52. O'Donoghue, J., Xidous, D., Grey, T., Nicol, S., Kennelly, S., Coveney, E. & O'Neill, D. (2023). Supporting Integrated Care for Older Persons: Testing an approach to identify common housing hazards affecting older people, 19th Congress of the European Geriatric Medicine Society, 20-22 September 2023, Helsinki, Finland, 14, Eur Geriatr Med (2023) 14 (suppl 1): S1-S387.



53. O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Testing an approach to identify common housing hazards affecting older people in Ireland & to support the integrated care for older persons programme, IGS 70th Annual and Scientific Meeting, 28-30 September 2023, Galway, Ireland.

54. O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Nursing home care in Ireland and the built environment: key emerging issues and insights, IGS 70th Annual and Scientific Meeting, 28-30 September 2023, Galway, Ireland.

55. O'Neill, D. (2022). Understanding ageing in the tales of Hans Christian Andersen, European Geriatric Medicine, 18th Congress of the European Geriatric Medicine Society, London, 28-30 September 2022, 13, Suppl 1, 2022, S224.

56. O'Neill, D. (2022). Exploring the narrative of aging through music, Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting, Indianapolis, USA, 2-6 November 2022, 6, Suppl 1, 2022, 242.

57. O'Neill, D. (2022). Midlife creativity among composers and novelists, Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting, Indianapolis, USA, 2-6 November 2022, 6, Suppl 1, 2022, 211.

58. O'Neill, D., Grey, T., Xidous, D., O'Donoghue, J. and Puntambekar, M. (2022). Rethinking nursing home architecture and design in the light of the COVID-19 pandemic, Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting, 2-6 November 2022, Indianapolis, USA, 6, (Suppl 1), 2022, 790-791.

59. O'Neill, D., Xidous, D., O'Donoghue, J., Puntambekar, M. and Grey, T. (2022). Residential long-term care, COVID-19 and architecture and design of the built environment, European Geriatric Medicine, 18th Congress of the European Geriatric Medicine Society, 28-30 September 2022, London, 13, (Suppl 1), 2355.

60. O'Donoghue, J., Xidous, D., Grey, T. and O'Neill, D. (2022). Interviews with Experts in the Area of Residential Long-Term Care: Built Environment, Quality of Life and Infection Control from a Universal Design Approach, Health Humanities Consortium, Spaces of/for Health Humanities, 25-27 March 2022, Hiram, Lehigh, USA (online), 26.

61. O'Neill, D. (2022). Profiling Medical and Health Humanities in Ireland, Health Humanities Consortium, Hiram College/Online, 25-27 March, 2022.

Tom Grey

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Interviews with experts in residential long-term care and the built environment: balancing quality of life and infection control, 19th Congress of the European Geriatric Medicine Society, 20-22 September 2023, Helsinki, Finland, 14, Eur Geriatr Med (2023) 14 (suppl 1): S1-S387.

O'Donoghue, J., Xidous, D., Grey, T., Nicol, S., Kennelly, S., Coveney, E. & O'Neill, D. (2023). Supporting Integrated Care for Older Persons: Testing an approach to identify common housing hazards affecting older people, 19th Congress of the European Geriatric Medicine Society, 20-22 September 2023, Helsinki, Finland, 14, Eur Geriatr Med (2023) 14 (suppl 1): S1-S387.

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Testing an approach to identify common housing hazards affecting older people in Ireland & to support the integrated care for older persons programme, IGS 70th Annual and Scientific Meeting, 28-30 September 2023, Galway, Ireland.

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Nursing home care in Ireland and the built environment: key emerging issues and insights, IGS 70th Annual and Scientific Meeting, 28-30 September 2023, Galway, Ireland.

62. Health Economics and Policy Analysis Centre (NUIG) and ESRI-Future of long-term residential care (LTRC) in Ireland-roundtable discussion: T. Grey was invited to attend a roundtable discussion focussing on the future of long-term residential care (LTRC) in Ireland organised by the



1. Health Economics and Policy Analysis Centre, University of Galway, along with the Economic and Social Research Institute. The discussion explored current issues and future challenges facing the LTRC sector in Ireland. The insights gained from this roundtable helped inform the design of a survey of the public to ascertain their attitudes towards and understanding of the LTRC sector.

63. SAGE Advocacy Seminar-FORTY SHADES OF GREY-Responding to the challenges and opportunities of an ageing society and economy-T. Grey as invited speaker to talk about the residential spectrum and older people including housing and long-term residential care.

O'Neill, D., Grey, T., Xidous, D., O'Donoghue, J. and Puntambekar, M. (2022). Rethinking nursing home architecture and design in the light of the COVID-19 pandemic, *Innovation in Aging, Gerontological Society of America 2022 Annual Scientific Meeting*, 2-6 November 2022, Indianapolis, USA, 6, (Suppl 1), 2022, 790-791.

O'Neill, D., Xidous, D., O'Donoghue, J., Puntambekar, M. and Grey, T. (2022). Residential long-term care, COVID-19 and architecture and design of the built environment, *European Geriatric Medicine*, 18th Congress of the European Geriatric Medicine Society, 28-30 September 2022, London, 13, (Suppl 1), 2355.

O'Donoghue, J., Xidous, D., Grey, T. and O'Neill, D. (2022). Interviews with Experts in the Area of Residential Long-Term Care: Built Environment, Quality of Life and Infection Control from a Universal Design Approach, *Health Humanities Consortium, Spaces of/for Health Humanities*, 25-27 March 2022, Hiram, Lehigh, USA (online), 26.

Dimitra Xidous

64. October 2023-Dimitra Xidous chaired the opening session of this season's Trinity College Dublin Trinity Long Room Hub Medical Humanities seminar: Writing Chronic Illness Just in Time with Kimberly Campanello-Professor of Poetry (University of Leeds). Prof. Campanello spoke on her experience of chronic illness and disability and discussed her writing process and approach with reference to key touchstones, including Dante's acedia, Proust's corked wall and ill objects, and Alison Kafer's 'crip time'.

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Interviews with experts in residential long-term care and the built environment: balancing quality of life and infection control, *19th Congress of the European Geriatric Medicine Society*, 20-22 September 2023, Helsinki, Finland, 14, *Eur Geriatr Med* (2023) 14 (suppl 1): S1-S387.

O'Donoghue, J., Xidous, D., Grey, T., Nicol, S., Kennelly, S., Coveney, E. & O'Neill, D. (2023). Supporting Integrated Care for Older Persons: Testing an approach to identify common housing hazards affecting older people, *19th Congress of the European Geriatric Medicine Society*, 20-22 September 2023, Helsinki, Finland, 14, *Eur Geriatr Med* (2023) 14 (suppl 1): S1-S387.

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Testing an approach to identify common housing hazards affecting older people in Ireland & to support the integrated care for older persons programme, *IGS 70th Annual and Scientific Meeting*, 28-30 September 2023, Galway, Ireland.

O'Donoghue, J., Xidous, D., Grey, T. & O'Neill, D. (2023). Nursing home care in Ireland and the built environment: key emerging issues and insights, *IGS 70th Annual and Scientific Meeting*, 28-30 September 2023, Galway, Ireland.

65. June 2023-Dimitra Xidous chaired the #EUGreenWeek Workshop: Enhancing NBS Education for a Sustainable Future!

66. January 2023-2023 ECOSOC Partnership Forum: Leveraging Interlinkages Among SDGs Through Inclusive Partnerships with Local Communities was held as an official 2023 ECOSOC Partnership Forum virtual event hosted by Stakeholder Forum on 31 January 2023. The session discusses recent innovated partnerships that are driving action on the UN Sustainable Development Goals (SDGs) at the local level and highlights the contributions that transnational multi-stakeholder partnerships can make in this regard, as well as the challenges involved. A key them was how



transnational partnerships such as these can leverage interlinkages between SDGs at local levels to empower communities to improve local SDG implementation. Dimitra Xidou represented TCD and presented on engaging local communities in nature-based solutions at the city level. Link: <https://stakeholderforum.org/2023/01/31/a-2023-ecosoc-partnership-forum-side-event-31-january-2023/>

O'Neill, D., Grey, T., Xidou, D., O'Donoghue, J. and Puntambekar, M. (2022). Rethinking nursing home architecture and design in the light of the COVID-19 pandemic, *Innovation in Aging*, Gerontological Society of America 2022 Annual Scientific Meeting, 2-6 November 2022, Indianapolis, USA, 6, (Suppl 1), 2022, 790-791.

O'Neill, D., Xidou, D., O'Donoghue, J., Puntambekar, M. and Grey, T. (2022). Residential long-term care, COVID-19 and architecture and design of the built environment, *European Geriatric Medicine*, 18th Congress of the European Geriatric Medicine Society, 28-30 September 2022, London, 13, (Suppl 1), 2355.

O'Donoghue, J., Xidou, D., Grey, T. and O'Neill, D. (2022). Interviews with Experts in the Area of Residential Long-Term Care: Built Environment, Quality of Life and Infection Control from a Universal Design Approach, *Health Humanities Consortium, Spaces of/for Health Humanities*, 25-27 March 2022, Hiram, Lehigh, USA (online), 26.

Jennifer O'Donoghue

O'Donoghue, J., Xidou, D., Grey, T. & O'Neill, D. (2023). Interviews with experts in residential long-term care and the built environment: balancing quality of life and infection control, 19th Congress of the European Geriatric Medicine Society, 20-22 September 2023, Helsinki, Finland, 14, *Eur Geriatr Med* (2023) 14 (suppl 1): S1-S387.

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Mehak Puntambekar

O'Neill, D., Grey, T., Xidou, D., O'Donoghue, J. and Puntambekar, M. (2022). Rethinking nursing home architecture and design in the light of the COVID-19 pandemic, *Innovation in Aging*,



1Gerontological Society of America 2022 Annual Scientific Meeting, 2-6 November 2022, Indianapolis, USA, 6, (Suppl 1), 2022, 790-791.

O'Neill, D., Xidous, D., O'Donoghue, J., Puntambekar, M. and Grey, T. (2022). Residential long-term care, COVID-19 and architecture and design of the built environment, European Geriatric Medicine, 18th Congress of the European Geriatric Medicine Society, 28-30 September 2022, London, 13, (Suppl 1), S355.

Dr. Saviour Okeke

67. Enterprise Ireland Commercialisation Fund Network-Onboarding, Dublin, Ireland, Thursday 30th June 2022.



APPENDIX D-Postgraduate Students in 2022-2023

No.	PhD Student	Award Dates	Supervisor (s)
1	Kiran Apsunde	2024	Asst Prof. John Gallagher & Prof Brian Broderick
2	Shanmuga Priyan R	2026	Asst Prof. John Gallagher & Prof Brian Broderick
3	Yuxuan Guo	2026	Secondary: Prof. John Gallagher
4	Xiaoyu Wang	2027	Prof. John Gallagher
5	Niti Saini	2022	Prof Roger P. West
6	Jingran Gao	2022	Prof Roger P. West
7	Dervilla Niall	2023	Prof Roger P. West
8	Ferguson Tobins	2025	Prof Roger P. West, co-supervisor
9	Luming Yang	2023	Assoc Prof Liwen Xiao
10	Yanqi Shi	2023	Assoc Prof Liwen Xiao
11	Peiyin Kang	2024	Assoc Prof Liwen Xiao
12	Yifan Sun	2024	Assoc Prof Liwen Xiao
13	Zeena Wang	2025	Assoc Prof Liwen Xiao
14	Zihan Zhang	2026	Assoc Prof Liwen Xiao
15	Mohammad Al-Mhawadi	2024	Prof Alan O'Connor
16	Kristopher Campbell	2024	Prof Alan O'Connor, co-supervisor QUB
17	Unnikrishnan Madhavan	2023	Prof Brian Broderick and Prof Biswajit Basu
18	Terence Ryan	2023	Prof Brian Broderick
19	Hollie Moore	2024	Prof Brian Broderick and Prof Breiffni Fitzgerald
20	Sudipta Lal Basu	2022	Prof Breiffni Fitzgerald
21	Shubham Baisthakur	2024	Prof Breiffni Fitzgerald
22	James McAuliffe	2025	Prof Breiffni Fitzgerald and Prof Brian Broderick
23	Adbulbaset Alazhare	2025	Prof Breiffni Fitzgerald
24	David Flanagan	2026	Prof Breiffni Fitzgerald
25	Anita Ortega	2023	Prof. Sarah McCormack
26	Bill Cass	2023	Prof. Sarah McCormack
27	Aaron Glenn	2025	Prof. Sarah McCormack
28	Kenny McGoldrick	2025	Prof. Sarah McCormack (TU Dublin)
29	Wai Qian Tham	2026	Prof. Sarah McCormack
30	Tianren Chen	2026	Prof. Sarah McCormack (UCC)
31	Roisin Gowen	2026	Prof. Sarah McCormack



No.	Masters Student	Supervisor	Project Title
1	Riley Knight	John Gallagher	Spatial and temporal variations in environmental quality in urban settings: the role and impact of green infrastructure / nature-based solutions
2	James Collins Weinmann	John Gallagher	Evaluating the potential circular value of bio-products recovered from wastewater
3	Muireann Kearney	John Gallagher	An evaluation of air quality sources in the environs of Dublin's railway stations
4	Ruoqi Dong	John Gallagher	Application of Building Retrofit and Renewable Energy for Low Carbon Realization in Residential Sector of Rural Community: Life Cycle Assessment of Community Low Carbon Transition in Ireland
5	Richard Wadsworth	John Gallagher	Footprint of change: Quantifying the transition to sustainability of an island community.
6	Le Ying Zhang	John Gallagher	Modelling air quality in and around outdoor cafes and restaurants: rethinking ventilation assessments.
7	Mavri, Artemis	John Gallagher	The impact of urban green infrastructure on outdoor and indoor environmental quality.
8	Ó Maoldúin, Cormac	John Gallagher	Evaluating the potential circular value of bio-products recovered from wastewater.
9	Sinead Quinn	John Gallagher	Coffee and Air Pollution: Assessing Exposure and Defining Mitigation Measures to Pollution Exposure outside Coffee Shops
10	Aisling Cashell	John Gallagher	Developing an Urban Ventilation Index for the Built Environment
11	Arthur Odlum	John Gallagher	The Predictive Control of Thermal Comfort in a Domestic Home based on a Building's Energy Rating and Environmental Climate Data
12	Conor O Heocha	John Gallagher	Green Infrastructure/ Nature-Based Solutions and Air Pollution: Developing A Global Map of Research Activities
13	Meabh Childs	Roger West	The role of notches in the bond behaviour of sustainable bamboo reinforced concrete beams
14	Orlaith Murphy	Roger West	Defining the conditions for mould growth to occur in A rated home
15	Erica Markey	Roger West	Radiator controllers as a means of reducing heat waste
16	Donal Cotter	Roger West	Recycled concrete aggregate use in structural concrete
17	Mark Theunissen	Roger West	Optimising heating in infrequently used offices on campus
18	Ryan Campion	Roger West	Optimising anchorage of bamboo reinforcement in concrete beams
19	Sudhakar Deo Bhagat	Roger West	A comparison of concrete and epoxy bamboo waste composites.
20	Bhagat, Vasudha Rani	Roger West	Impact Resistance of Bamboo-Reinforced Epoxy Slabs.
21	Kenneth Hyland	Liwen Xiao	Development of biosensors for glucose detection.
22	Olivia Skwerski	Liwen Xiao	Degradation characteristics of biodegradable plastics.
23	Hyland, Kenneth	Liwen Xiao	Implementing the Circular Economy in Healthcare-A Review of Healthcare Waste Segregation Practices in Ireland.
24	Orla Kearney	Brian Broderick	Testing & Analysis of Steel-Timber Composite Structural Elements
25	Ben Broderick	Brian Broderick	Nonlinear Analysis of the Seismic Response of Steel Structures
26	Tom Sheehy	Brian Broderick	Modelling the Impact of Motor Vehicle Emissions on Ambient Air Quality
27	Prateek Grover	Brian Broderick	Testing and analysis of hybrid timber-steel structures
28	Stephen Foley	Brian Broderick	Nonlinear Analysis of the Seismic Response of Steel Structures
29	Duroonan Elangovan	Brian Broderick	Modelling the Dynamic Response of Timber Frame Buildings.
30	Anish Kapil	Julie Clarke	Vulnerability Assessment of Structures Along Ireland's Legacy Road Network to Climate Change Impacts.



31	Doireann Tarrant	Julie Clarke	Integrating sustainability into major transport infrastructure projects.
32	Kelly Augustt	Breiffni Fitzgerald	Fatigue Analysis of a 15MW Offshore Wind Turbine
33	Philip McDowell	Breiffni Fitzgerald	Development of data-driven models for wind speed forecasting
34	Conor Bryce	Breiffni Fitzgerald	Wind Farm Modelling and Control
35	Laura Murphy	Breiffni Fitzgerald	Vibration control of tall buildings
36	Thomas Shanahan	Breiffni Fitzgerald	A study of wind-wave misalignment for the Irish coastline and its effect on wind turbine dynamics
37	Daniel McCann	Breiffni Fitzgerald	Fatigue Analysis of a 15MW Offshore Wind Turbine
38	Emily Cullen	Breiffni Fitzgerald	Combined exploitation of offshore wind and wave energy in the Irish seas: a spatial planning approach
39	Maghnus Shaw	Breiffni Fitzgerald	Wind Farm Modelling and Control
40	Rory Cafferky	Breiffni Fitzgerald	Optimising the use of Wind Energy on the island of Ireland by focusing on the improvements in the approach to Constraining/Curtailing Wind.
41	Basu, Soumi	John Hickey	Comparative Assessment of Embodied Carbon in Steel and Concrete Structures in Ireland.
42	Yan, Mingming	John Hickey	Predicting the acceleration of tall buildings under wind excitation.
43	James Sutton	Sarah McCormack	Life cycle assessment of the building integration and intelligent control of renewable energy technologies.
44	Una O'Neill	Sarah McCormack	Optimisation of self-sufficiency in domestic solar photovoltaic installations in Ireland
45	Lizzie Collins	Sarah McCormack	Luminescent solar devices for building integrated components
46	Conor Gallagher	Sarah McCormack	Performance assessment of integrated sustainable energy technologies in buildings
47	Thomas Flynn	Sarah McCormack	Luminescent Solar Devices for Building Integrated Components.
48	Adrian Bacabonu	Sarah McCormack	Analysis of PCM for a radiant floor coupled with a geothermal heat exchanger.
49	Shaakirah Madhi	Sarah McCormack	Luminescent Downshifting Layers and Phosphorescent Reflecting Layers for Solar Efficiency Enhancement.
50	Nontyatyambo Manyisane	Sarah McCormack	Assessment of bifacial solar panels for solar farms in Ireland.
51	Polyxeni Martzeli	Sarah McCormack	Investigation of biomimetic designs for phase change materials in energy storage applications in buildings.
52	Cafferky, Rory	Sarah McCormack	The Role of Energy Storage in the Power system of the future.
53	Eeson, Martin Joseph	Sarah McCormack	Investigation of Ionic liquids as phase change materials for energy storage.
54	Fun, Pui Ying	Sarah McCormack	Investigating the potential of Photovoltaic (PV) and agriculture in Ireland.
55	Eanna O'Foighill	Alan O'Connor	Reliability Analysis of Timber Structures.
56	Matthew Conway	Alan O'Connor	Reliability based structural assessment
57	Alex Casey	Alan O'Connor	Developing Bayesian Networks to Assess Bridge Failure Risk Due to Scour
58	Leontina Schelling	Alan O'Connor	Your Own Project Idea
59	Oisín Dougan	Alan O'Connor	The Effect of Prestress Force Magnitude on the Vibration Properties of Post-Tensioned Concrete Beams with Varying Span/Depth Ratios
60	Gavin Taylor	Alan O'Connor	Value of Information Analysis in Structural Health Monitoring
61	Latuda, Arianna	Alan O'Connor	Investigating the correlation between resilience and sustainability in the context of critical infrastructure systems exposed to natural hazards



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