ASU Biodesign Institute
Arizona State University

DCU Ollscoil Chathair Bhaile Átha Cliath Dublin City University

Biodesign Europe

Arizona State University & Dublin City University Collaborative Doctoral Funding Program 2024

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Introduction

Arizona State University (ASU) and Dublin City University (DCU) have been international partners since 2006, aiming to advance education and research in both North America and Ireland. Their collaboration is based on shared values of innovation, entrepreneurship, technology-enhanced learning, and research and discovery. In 2013, the two institutions formally established a comprehensive Transatlantic Higher Education Partnership, leading to several initiatives focused on fostering a global research and innovation environment that will have a positive impact on both communities in Arizona and Ireland.

One significant outcome of this partnership was the establishment of Biodesign Europe at DCU***. Biodesign Europe*** aims to harness and consolidate the substantial research infrastructure, capacity, and expertise of ASU **Biodesign Institute'**s 17 research centres and DCU's research centres and institutes within the faculties of Science & Health and Engineering & Computing. The *core objective is to translate nature- inspired laboratory discoveries into tangible technologies that can positively impact urgent global issues relating to human health, sustainability, and security.* To accomplish this, Biodesign Europe and the Biodesign Institute bring together international experts from diverse fields, including engineering, biotechnology, chemistry, computing, and biology and provide the necessary framework and support to enable a holistic and transdisciplinary research approach.

In support of these objectives, ASU and DCU are implementing a joint funding call that will support **collaborative research projects** that address significant scientific challenges in the areas of **Healthcare Technologies and Sustainable Materials and Manufacturing.** The collaborative funding program will support teams comprising of an investigator from each institution and two PhD researchers, one based in ASU and one based in DCU. The team will work collaboratively to tackle a complex research problem that would be difficult for individual researchers to address alone. Funded projects are expected to produce promising preliminary data or pilot work. This work will lay the groundwork for the research team to competitively apply for larger, external funding to sustain the collaboration beyond the duration of the PhD projects.

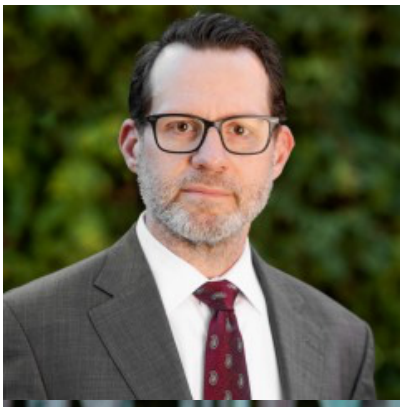
Forewords

Professor John Doyle
Vice-President for Research
Dublin City University

On behalf of Dublin City University, I am delighted to introduce this collaborative research program with the Biodesign Institute at Arizona State University, focused on tackling critical challenges in Healthcare Technology and Sustainable Materials and Manufacturing. This partnership highlights the transformative impact of international cooperation in addressing some of the most urgent global issues of our time.

At DCU, our mission is to drive research excellence that has a tangible impact on society. We believe that by working together with international partners such as *ASU*, we can leverage our collective expertise and resources to innovate and develop solutions that not only advance academic knowledge but also provide practical benefits to communities worldwide. This collaboration aligns seamlessly with our strategic commitment to fostering interdisciplinary research that addresses the complex issues facing our planet, from health disparities to environmental sustainability.

By uniting the strengths of DCU and ASU, we aim to push the boundaries of what is possible in healthcare technology and sustainable materials. This program is a testament to our shared vision of creating a better future through scientific discovery and technological innovation. We are excited about the potential breakthroughs that will emerge from this partnership and look forward to the positive impact it will have on both our institutions and the global community.



Professor Matt Hulver

Vice-President for Knowledge Enterprise Initiatives
Arizona State University

Professor Lara Ferry

Vice-President for Research
Arizona State University

It is with great enthusiasm that we announce the launch of this collaborative program between ASU and DCU. This initiative represents a significant step forward in our shared commitment to addressing some of the most pressing global challenges of our time. By combining our expertise, resources, and innovative spirit, ASU and DCU are poised to deliver cutting-edge advancements in healthcare technologies and sustainable materials and manufacturing.

The partnership between our two institutions is founded on the recognition of our complementary strengths. This collaboration not only enhances our individual capabilities through meaningful knowledge exchange but also amplifies our collective impact on a global scale. Together, we are committed to fostering an environment where bold ideas can flourish, and where the boundaries of knowledge and innovation are continuously expanded.

In a world that is increasingly interconnected, the importance of international cooperation cannot be overstated. The challenges we face – ranging from healthcare disparities to environmental sustainability – are complex and multifaceted. They demand solutions that transcend national borders and disciplinary silos. Through this partnership, we are embracing this approach, recognizing that the most profound breakthroughs often emerge at the intersection of diverse perspectives and expertise.

Professor Nicholas Dunne

Executive Director, Biodesign Europe Dublin City University

As Executive Director of Biodesign Europe, I am delighted to introduce this landmark collaborative PhD research programme between Dublin City University and Arizona State University. This transatlantic initiative marks a significant milestone in our commitment to advancing impactful research and fostering interdisciplinary approaches to global challenges.

The importance of this programme extends beyond immediate research outcomes. By integrating knowledge across disciplines and international organisations, we are building networks that enable us to tackle critical research challenges holistically. The synergy between Dublin City University and Arizona State University will accelerate scientific advancements and ensure their translation into practical applications that enhance healthcare and promote sustainability.

A key aspect of this programme is broadening the experience of PhD researchers. Working in laboratories across different countries will expose students to diverse methodologies, cutting-edge technologies, and unique cultural perspectives. This international experience will enhance their technical skills, adaptability, and cultural competence – valuable assets in today's interconnected scientific community. Engaging in interdisciplinary projects will also foster innovative thinking and prepare students for the multifaceted challenges of modern research and industry

This partnership exemplifies the power of collaboration in translating scientific discoveries into societal benefits. By combining diverse expertise and perspectives, we can develop innovative solutions to global challenges more effectively. The programme embodies the spirit of cooperation and shared vision necessary to create a sustainable and healthy future for all.

Professor Joshua LaBaer

Executive Director
The Biodesign Institute
Arizona State University

As you know, the Biodesign Institute has been working together with our colleagues in Biodesign Europe, at our sister site in Dublin. I am thrilled to present this collaborative research program between the Biodesign Institute and Biodesign Europe. This initiative is deeply aligned with our core mission, which is to harness the power of interdisciplinary research to address critical global challenges and deliver real-world solutions.

The Biodesign Institute is committed to fostering innovation that transcends traditional boundaries and drives scientific breakthroughs. Our collaboration with DCU epitomizes this commitment, as it brings together leading experts from diverse fields to work on pioneering solutions that can transform health care and promote sustainability.

This program underscores the importance of international partnerships in advancing our shared goals. By leveraging the complementary strengths of the Biodesign Institute and Biodesign Europe, we can accelerate the translation of scientific discoveries into practical applications that improve lives and protect our environment. The integration of cutting-edge research in **health care technology** and **sustainable materials** is a testament to our collective dedication to creating a healthier and more sustainable future.

We believe that through this partnership, we will not only achieve significant research milestones but also build lasting networks that will continue to drive innovation and excellence. Together, we can make a profound impact on society, fulfilling the mission of the Biodesign Institute to lead through discovery and innovation.

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Arizona State University (ASU)

Arizona State University (ASU) is a world-leading, research-intensive institution which consistently ranks highly in national and international evaluations of research universities. It has been recognized for its research productivity, innovation, and impact, affirming its status as a premier research institution. ASU has been ranked #1 in innovation for several years, ahead of institutions like MIT and Stanford. It is also ranked among the top public research universities by the National Science Foundation. ASU's research extends beyond academia, aiming to create tangible benefits for society through initiatives like the Knowledge Enterprise, translating research findings into real-world solutions that address societal needs and contribute to economic development.

ASU places strong emphasis on interdisciplinary collaboration, transcending traditional academic boundaries to tackle complex global challenges. Research centers and institutes, such as the Biodesign Institute, integrate diverse fields, including engineering, life sciences, social sciences, and humanities.

The university is equipped with state-of-the-art research facilities and laboratories, featuring advanced technology. These resources enable both faculty and students to conduct pioneering research in areas such as renewable energy, biomedical engineering, and artificial intelligence, among others.

Dublin City University (DCU)

Dublin City University (DCU) is Ireland's fastest-growing university. Since its establishment in 1980, DCU has gained global recognition for its commitment to academic excellence, groundbreaking research, and active community involvement. DCU is home to several centers of research excellence that drive innovative solutions for global challenges. Major research areas include health technologies, digital innovation and sustainable development.

DCU collaborates actively with industry, government, and international partners, converting research into real-world applications and contributing to economic growth and societal well-being. DCU has cutting-edge facilities, including the state-of-the-art DCU Alpha Innovation Campus, which supports start-ups and research-driven enterprises. The university also houses advanced health and human performance research facilities, featuring specialized laboratories supporting academic research and community health initiatives.

DCU supports entrepreneurship through incubator programs, mentoring, and funding access. DCU Invent promotes a thriving start-up ecosystem, inspiring researchers to turn innovative ideas into successful businesses. DCU has a strong network of global partnerships with top universities and research institutions, enriching academic exchange, collaborative research projects, and global learning opportunities. Additionally, DCU is involved in social innovation projects, tackling issues such as urban regeneration, social entrepreneurship, & inclusive education.

Scope of the Call & Objectives

The ASU-DCU Collaborative Doctoral Funding Program will fund research projects that align with one of the following thematic areas:

- **Healthcare Technologies**: Projects which enhance the quality, effectiveness and/or efficiency of healthcare delivery and/or patient care by fostering innovations that address current and/or emerging health challenges. Includes but is not limited to research areas such as: *biomedical engineering, precision medicine, diagnostics, drug development or delivery, biotechnology, regenerative medicine, robotics, prosthetics, tissue engineering, biomaterials, medical imaging, advanced analytics/AI in healthcare, human performance, cybersecurity.*
- **Sustainable Materials & Manufacturing:** Projects which advance the development of materials that are environmentally friendly, biodegradable or derived from renewable sources. Also includes the development of manufacturing processes that will reduce environmental impact, enhance resource efficiency and promote circular economy principles. Includes but is not limited to *circular economy, sustainable manufacturing, sustainable design, biomass engineering, marine, water quality, semiconductors, next generation materials and cybersecurity.*

It is expected that one project per thematic area will be funded, however, should the quality of applications in one thematic area be much higher than the other, the executive team may decide to fund two projects under the same theme.

Objectives of the ASU-DCU Collaborative Doctoral Funding Program

- Build translational research programs leveraging complementary strengths
- Advance world-class reputation for research innovation
- Expand global research networks
- Sustain research collaboration ambitions through external funding generation

Funded Teams will be expected to strongly engage with the Biodesign Europe Senior Research Development Lead to identify future research directions, external funding opportunities and partnering/stakeholder activities.

Eligibility Criteria

Eligible Applicant Teams must include:

- a member of academic staff from the DCU Faculty of Science & Health **or** the DCU Faculty of Engineering & Computing
- a member of academic staff affiliated with one of the Biodesign Institute Centers at ASU
- To ensure a timely and synchronized start to projects in Spring 2025, each investigator at each institution must also identify a prospective PhD researcher to join the project, at the time of submission. A CV for each prospective PhD researcher should be uploaded with the final application.

While additional collaborators outside of the above applicant team are welcome, the following categories are **not eligible** to be part of the core applicant team:

- Members of academic staff at DCU or ASU on temporary contracts which do not cover the full duration of the project (4-5 years, starting from mid-2025).

- Executive Directors of DCU Biodesign Europe (Prof Nicholas Dunne) and/or the ASU Biodesign Institute (Prof Joshua LaBaer). For transparency and fairness during the ranking process, Executive Directors should not be approached for input into proposals prior to submission.

- Academics in ASU or DCU who are not affiliated with the ASU Biodesign Institute or the DCU Faculties of Science & Health or Engineering & Computing. Other ASU and DCU staff are welcome to be involved as collaborators but may not be one of the core investigators on the projects.

- Additional external stakeholders or collaborators from academia, industry, public sector etc. are encouraged but should add a meaningful contribution to the project objectives and student training and development.

Funding Available & Start Dates

Each funded project will receive funding for two full-time fully funded PhD students, one to be based at DCU and one to be based at ASU. Each student will be funded in line with local funding levels for PhD researchers.

PhD students based at DCU will be funded in line with IRC Government of Ireland rates for four years as is customary in DCU.

Biodesign Europe will also offer additional travel support for the research team in DCU, where there are clear objectives for a research visit.

PhD students based at ASU will be funded for 5 years, as is customary in ASU and includes salary, tuition and ERE costs. The ASU funding package will also include a contribution towards foreign travel, housing, supplies and fees.

Evaluation Process & Criteria

Evaluation Process

Applications will be reviewed by a panel of academic peers from ASU and DCU who have expertise in the broader area of the application topic and who are not involved in any applications.

While a best effort will be made to match applications to reviewers in the same field, applicant teams should be aware that their applications may be reviewed by a peer who may not work directly on the research topic. As such, applicant teams are advised to develop their applications in a way that is accessible to a more generalist reviewer.

Reviewers will evaluate applications based on the criteria and weightings listed below. Reviewers will provide qualitative and quantitative feedback. These rankings will be collated by Yvonne Smith (DCU) and provided to the Executive Directors and VPs at both institutions for final consideration at a consensus meeting. The Executive Directors and VPs will then make a funding recommendation based on the peer review feedback. Applicants will receive the collated peer feedback at the end of the review process.

Evaluation Criteria

The evaluation will be based on the following criteria:

1) Scientific excellence (40%)
2) Complementarity and synergy of the collaborative team (20%)
3) Future potential to secure external funding (20%)
4) Impact and Strategic Alignment with ASU, DCU, Biodesign Institute and Biodesign Europe priorities (15%)
5) Project Management and Implementation (5%)

Submission Process

Applications should be submitted via the ASU InfoReady application portal. This system accepts applications from ASU Staff and External Collaborators. External Collaborators to ASU may create an account on the site at the following link: https://asu.infoready4.com/

Applications should be submitted once on InfoReady by either the ASU or DCU Principal Investigator.

The deadline for applications is **1pm MST (Arizona)/ 8pm GMT (Ireland)** on Friday **November 29th 2024.** The InfoReady will not accept applications after this time. For fairness and transparency, applications submitted late or by email will not be accepted for evaluation.

Applications should be submitted following the proposal template detailed in Appendix I of this Call Document. Font size should be a minimum of size 11 in either Arial, Calibri or Times New Roman, with minimum margins of 1.5cm. Proposals exceeding the specified page limits will have the additional pages removed before being sent for peer review. Figures and Diagrams are permitted within the specified page limit.

For queries relating to the submission process or to seek support finding a collaborative partner, please email:

Yvonne Smith, Senior Research Development Lead for Biodesign Europe at DCU (yvonne.smith@dcu.ie)

Please note that as program manager for this call, she is not able to comment on the quality of applications or assist in the development of applications.

Appendix I: Overview of Application Form

Biodesign Europe - Collaborative Research Programme

Proposal Template

Administrative Details to be input onto ASU InfoReady System

DCU Principal Investigator

Name & Title	
Department	
Email Address	

ASU Principal Investigator

Name & Title	
Department	
Email Address	

Upload a brief CV (Max 2 pages) for each Principal Investigator

Upload CV (Max 2 pages) for each of the proposed students to be recruited

Research Priority Area

Select from:

1. Sustainable Materials and Manufacturing
2. Healthcare Technologies

Project Title	

Project Abstract (Max 500 words)

Upload Research Proposal (Max 10 pages using the following structure)

Section 1: Background, Aims and Objectives

1.1 Briefly describe the research question or challenge

- Emphasise its significance, the current state-of-the-art, and highlight the key challenges and opportunities in this area.

1.2 Describe the research aims and objectives of the proposed research.

- Include key performance indicators where relevant.

1.3 Describe the innovative aspects of the proposed research.

- Describe how the proposed research projects will advance the state-of-the-art.

1.4 Describe the research team and the expertise and how it is relevant to the research question.

- Highlight the synergy and potential impact of the interdisciplinary collaboration between ASU and DCU in addressing this challenge or research question**.**

Section 2: Research Plan

2.1 Describe the overarching interdisciplinary, research approach.

- Explain how the expertise from each PI will be integrated in pursuit of the wider project objectives.

2.2 Include a description for each PhD project* in the following table.

Host Institution	
Project Title	
Objectives	
Proposed Methodology	
Expected Results	

Host Institution	
Project Title	
Objectives	
Proposed Methodology	
Expected Results	

**It should be explained how each of the projects will be integrated into – and contribute to – the overall research aims and objectives. However, it is important that the progress of each project is not dependent on the progress of the other. PIs should take particular care to get this balance right*.

Section 3: Impact and Expected Outcomes

3.1 Describe how the project will generate new knowledge and insights, and the expected societal, economic, and technological impact.

3.2 Describe the human capital benefits of training PhD researchers in this area as well as the career development opportunities for both researchers, particularly focusing on the interdisciplinary and international aspects of the project.

3.3 Describe the potential for future work and include a plan for sustaining this collaboration beyond the scope of this proposal.

Section 4: Collaboration and Project Management Plan

4.1 Include a project management plan for the project which describes the structures the team will put in place to ensure efficient operation of the team and delivery of the main objectives.

4.2 Describe the mechanisms that will be put in place to ensure strong collaboration and engagement between the institutions.

References (Not subject to the 10-page limit but should not exceed 20 references)