Hamilton Institute

Post Ref: 036563

Maynooth University
National University of Ireland Maynooth

Ollscoil Mhá Nuad
Maynooth University

Hamilton Institute & Department of Computer Science
Post-Doctoral Researcher
(Specified Purpose)

The Role

Maynooth University is committed to a strategy in which the primary University goals of excellent research and scholarship, as well as outstanding education, are interlinked and equally valued.

We are seeking a Postdoctoral Researcher to work on the project Thermally-regulated Renewable and Automated DNA Computing Devices (TRAD), funded by Research Ireland. The position is under the direct supervision of Dr. Abeer Eshra and co-supervised by Prof. Damien Woods. It will be based at the Hamilton Institute with a possible co-appointment in the Department of Computer Science. The project combines theoretical and experimental approaches to develop renewable DNA computing devices that perform multiple computations in a single tube. The primary purpose is to regenerate automatically through temperature cycling and use DNA as a low-energy, sustainable medium for molecular computation and data storage.

The successful candidate will lead the design and modelling of thermally regulated DNA motifs and contribute to the development of an automated and renewable DNA computing prototype. The role encompasses both wet-lab and in silico work, including sequence design, data analysis, experimental planning, and writing publications. The postdoc will work closely with the PI and a PhD student.

An ideal candidate must hold, or be on the verge of holding, a PhD in a relevant field, such as DNA nanotechnology, computer science, bioengineering, synthetic biology, molecular self-assembly, physics, biology, or chemistry. You should demonstrate strong experimental skills or a background in modelling and analysis of molecular computation. Prior experience with DNA strand design or molecular computing is desirable.

You should be able to plan and execute your own research, engage in scientific discussions, and work as part of a collaborative team. You will publish high-quality research, mentor students, and contribute to future grant applications. We are seeking an individual who takes initiative, explores new ideas, and is eager to push the boundaries of renewable molecular computing.

Principal Duties

- Model thermally regulated DNA structures and design DNA inputs
- Conduct experimental testing of DNA circuits using fluorescence-based assays
- Lead and contribute to all work packages of the TRAD project
- Publish and present research in peer-reviewed venues

Taighde Éireann Research Ireland

Athena Swan Ireland

Athena SWAN Bronze Award

HR EXCELLENCE IN RESEARCH

- Collaborate within the research group and contribute to mentoring junior researchers
- Support lab setup, protocol development, and wet-lab automation

Administrative and other duties:

This will include:

- Assisting with data management, reporting, and dissemination
- Participating in project meetings and workshops
- Contributing to grant reporting and future funding applications
- Supporting the PI in supervision and training activities

The ideal candidate will have:

Essential

- A PhD in DNA computing, DNA nanotechnology, bioengineering, molecular self-assembly, and/or theoretical computer science, computer engineering; candidates with other backgrounds are welcome but should articulate clearly how their PhD and prior research are of relevance to the job description
- Ability to carry out both experimental and computational research independently
- A record of peer-reviewed publications appropriate to career stage
- For applicants with an experimental focus, the ability to plan and troubleshoot lab work, set up and optimise protocols, manage lab equipment, and willingness to learn theoretical approaches
- For applicants with a theoretical focus, a strong background in modelling, algorithms, or formal methods relevant to molecular computing, and a willingness to learn experimental approaches
- Clear articulation, in the application materials, of how their background and expertise match the project and job description
- Strong interest in interdisciplinary research and ability to learn and work across experimental and theoretical domains in a collaborative setting

Desirable

- Experience with fluorescence-based readout methods and thermocycling protocols
- Familiarity with DNA sequence design tools such as NUPACK or ViennaRNA
- Skills in Python or similar languages for lab automation or data analysis
- Knowledge of kinetic and/or thermodynamic modelling of nucleic acids
- Experience designing or optimising lab protocols and experimental workflows
- Clear ideas or a vision for advancing the field of molecular computing
- Experience developing custom code libraries to automate or control lab equipment
- Any other qualifications or experience that support the aims of the project will be considered
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Faculty and Research Institutes

The Hamilton Institute is Maynooth University's pillar of interdisciplinary research, bridging mathematics, computation, and their applications in ICT, biology, and other scientific domains. Founded in 2001 with support from Science Foundation Ireland, the Institute has gained international recognition for its work in communication networks, mathematical biology, and fundamental mathematics.

The Institute's ethos is the application of mathematics to solve real-world problems. It maintains strong industry links and active collaborations with national and international partners, including IBM, Medimmune, AstraZeneca, Unilever, CERN, and MIT. Its projects are supported by funders such as SFI, IRC, the HEA, the EU's research programmes, Research Ireland, and Enterprise Ireland.

Research at the Institute currently focuses on areas including computational sciences, DNA and molecular computing, DNA nanotechnology, machine learning, optimisation, statistics, and the mathematics of networks. The Hamilton Institute is also home to a vibrant international visitor and workshop program, consistently earning high ratings in external reviews.

The University

Maynooth University is a distinctive university, a collegial institution focused on science, engineering, humanities, and social sciences, and equally committed to research, teaching, and community engagement. Located in Ireland's only university town, its distinctive features and character owe much to its unique history and heritage. It provides a high-quality educational experience to over 15,000 students on a campus with 18th-century roots and 21st-century dynamism.

The strategic trajectory and accomplishments of Maynooth University, spanning the 25 years since its establishment as an autonomous public university, are exceptional and a source of great pride to the university community, staff, students, and alumni. Maynooth University was ranked in the top 90 in the 2024 Times Higher Education (THE) Young University rankings, placing 86th globally. Maynooth University's growing global reputation is based on the originality, quality, importance, and impact of its research and scholarship, as well as its commitment to teaching and learning, the quality of its academic programmes, and its leadership in widening participation in higher education. The sources of success are the dedication of its staff and the energy and engagement of its students.

Maynooth University is a place of lively contrasts – a modern institution that is dynamic, rapidly growing, research-led, and engaged, yet grounded in historic academic strengths and scholarly traditions. With over 15,000 students, Maynooth offers a range of programmes at undergraduate, postgraduate, and doctoral levels in the humanities, science, engineering, and social sciences, including business, law, and education. The University also offers a range of international programmes and partnerships.

Maynooth's unique collegial culture fosters an interdisciplinary research approach, which its world-class academics bring to bear in tackling some of the most fundamental challenges facing society today. The University's research institutes and centres consolidate and deliver this impact as vibrant communities of learning, discovery and creation. Research at Maynooth is also very much central to its teaching, and the University prides itself on placing equal value on its research and teaching missions.

Maynooth University's Values

Our values define who we are, what we believe in and how we act as a community. They underpin our future success and guide our expectations of ourselves and each other. Our values apply to everyone in the University community:

- Integrity
- Collegiality
- Responsibility
- Freedom of expression
- Ambition

Maynooth University Strategic Plan 2023 – 2028

The University's Strategic Plan 2023-2028 builds on our rich academic history and strong foundations to outline an ambitious and forward-looking path for the future of our university. This roadmap underscores our commitment to adapt to a changing world while staying true to our values. Our vision is to be a university of excellence, opportunity and impact, having a significant stake in all three.

For more information about Maynooth University's future direction, please visit: https://strategy.maynoothuniversity.ie/

Plean Straitéiseach Ollscoil Mhá Nuad 2023 - 2028

Tógann Plean Straitéiseach na hOllscoile 2023 - 2028 ar ár stair acadúil shaibhir agus ar ár mbunchlocha láidre chun conair uaillmhianach agus cheannródaíoch a leagadh amach do thodhchaí ár nOllscoile. Soiléiríonn an treochlár seo ár dtiomantas do dhul i dtaithí ar dhomhan atá ag síorathrú agus ár ngníomhaíochtaí a chur in oiriúint dó, agus san am céanna a bheith dílis dár luachanna Ollscoile. Is í an fhís atá againn a bheith mar ollscoil feabhais, deiseanna agus tionchair, agus lámh láidir a bheith againn i ngach ceann de na trí ghné seo.

Taighde Éireann Research Ireland

Athena Swan Ireland Chairt Chomhionannais

Athena SWAN Bronze Award Gender Charter

HR EXCELLENCE IN RESEARCH

Léigh anseo le haghaidh breis eolais faoi thodhchaí Ollscoil Mhá Nuad: https://strategy.maynoothuniversity.ie/?lang=ga

Selection and Appointment

- Only shortlisted candidates will be invited to attend the interview.
- Candidates invited for interview will be required to make a brief presentation.
- The President will approve appointments based on the report of the selection board.
- Interviews are expected to be held in August 2025.
- The appointment is expected to take effect on September 1, 2025.

Equality and Diversity

Maynooth University actively works to ensure equality, celebrate the diversity of our community, and promote inclusion. To learn more about our commitment to Equality and Diversity, please read the Maynooth University Equality and Diversity Policy / Polasaí Comhionannais agus Éagsúlachta, our policy on the Employment of People with Disabilities, and our Gender Equality Action Plan 2023-2026. We aim to reflect the diversity of the community we serve and welcome applications from all individuals across our society.

Terms and Conditions

Tenure	This is a full-time, temporary post for a specified purpose, anticipated to be 2 2-year duration.
Location	The place of work is the campus of Maynooth University, Maynooth, Co. Kildare.
Salary	Post-Doctoral Researcher Salary Scale: € 45,847 per annum (with increment) Appointments will be made in accordance with public sector pay provisions.
Hours of work	A 37-hour working week is in operation in respect of full-time positions (pro-rated for part-time positions). This can be reviewed or adjusted periodically through national agreements.
Annual Leave	Annual leave and public holidays are outlined in the University's policy, available at: https://www.maynoothuniversity.ie/human-resources/policies/annual-leave-policy. Annual leave will be allocated on a pro-rata basis for part-time and temporary positions.
University policies and schemes	Employees of the University will be subject to the terms of the University policies and schemes, available on the University website at: https://www.maynoothuniversity.ie/university-policies https://www.maynoothuniversity.ie/human-resources/policies
Pension	This is a pensionable post. Employees of the University will be enrolled in a public sector pension scheme, and as such, applicants must ensure they are eligible to become a member of a public sector pension scheme for the duration of their appointment. Details of the public sector pension schemes are available at: https://www.maynoothuniversity.ie/human-resources/pension-information

Eligibility	Applicants should note that eligibility is determined by the Department of Enterprise, Trade and Employment. Further information regarding eligibility is available at: https://enterprise.gov.ie/en/what-we-do/workplace-and-skills/employment-permits/employment-permit-eligibility/ Non-EEA applicants are responsible for ensuring they can secure a visa to travel to Ireland. Any offer of employment is conditional on applicants securing the appropriate employment permissions. **Former Irish Public Service employees - Certain Restrictions on Eligibility** Eligibility of applicants formerly employed by an Irish Public Sector body, and who availed of an Irish Public Service Redundancy or Incentivised Retirement Scheme under the Schemes below, may be affected: • Collective Agreement: Redundancy Payments to Public Servants • Incentivised Scheme for Early Retirement (ISER) • Department of Health and Children Circular (7/2010) • Department of Environment, Community & Local Government (Circular Letter LG(P) 06/2013) Applicants should ensure that they are eligible to be re-engaged in the Irish Public Service under the terms of such Schemes. Applicants should address queries with their former Irish Public Sector employer.
Garda vetting	Garda vetting or clearance may be required by the University.
Medical	The University may require a medical examination as a condition of employment.

Data Protection Law

Applications to the University will be treated in accordance with the University Data Protection Policies. For information on the University's Data Protection Policies and Privacy Notice, please see our website: https://www.maynoothuniversity.ie/data-protection

Application Procedure

Closing Date:

23:30hrs (local Irish time) on **Monday the 4th August 2025**

Please note that all applications must be made via our **Online Recruitment Portal** at the following link:

https://www.maynoothuniversity.ie/human-resources/vacancies

Applicants must submit a comprehensive **CV**, a **research statement** of no more than four pages, and a **cover letter**. The research statement should describe the applicant's research vision, future plans, and how their background aligns with the project. The cover letter must address all role requirements listed in the job specification. The two documents may be combined, provided that all points are clearly addressed. Applications that are missing any of these documents or fail to address the role requirements will not be considered.

Applications must be submitted by the closing date and time specified above. Any applications still in progress at the closing time on the specified closing date will be automatically cancelled by the system.

Maynooth University is an equal opportunity employer.

The position is subject to the Statutes of the University.