LIRA NEWSLETTER

Michaelmas Term 2025

Dear LIRA member,

We are delighted to reach out to you with the latest edition of the LIRA Newsletter.

The interdisciplinary nature of research cuts across Departments, Schools and Faculties and the role of horizontal structures such as Centres and Institutes is to be a forum that fosters collaboration, initiatives and exchanges. The domain of LIRA is the area of intelligent, robotic and autonomous systems. Research interests and activities of many LIRA members cover multiple topics and domains (LIRA brings together members from over a dozen Departments) spanning from health and environment to management and psychology.

The ambition of LIRA (and its Newsletter will reflect this) will cover the intersection of interests and activities which fall within the area of intelligent, robotic and autonomous systems.

It is very important to have active two-way communication that serves our members and therefore, we would encourage all of you to reach out directly to the Newsletter Editor (Ashwin Sasikumar, e-mail: a.sasikumar@lancaster.ac.uk) and/or to your Theme Leads with potential news items and information of interest. Alternatively, you can submit the information straight to the shared file : Information for LIRA newsletter

We hope you will find the Newsletter content useful and, again, ***let us co-design and co-create it*.**

Plamen Angelov, Director, LIRA

David Cheneler, Associate Director, LIRA

LIRA website link

Flagship Project Grants

LIRA Theme Lead awarded £1.5M to Develop First Ever Tool to Diagnose Musculoskeletal Conditions in the Community

A team led by Dr Jemma Kerns from Lancaster Medical School, co-lead of LIRA's Biomedical Theme has been awarded £1.5M by the EPSRC to develop a tool to predict and diagnose bone disorders for the first time.

The novel tool will measure bone chemistry using lasers, providing a safe and effective way to predict and diagnose bone disorders so that they can be treated early, improving long-term outcomes. No such technology currently exists.

Dr Kerns said*: "Preventing disease progression will maximise the longer-term health benefits for people and ease pressure on the NHS, reducing the need to visit hospitals. Early diagnosis can also reduce the cost of treatment or surgery. Establishing this new portable technology will be a game changer for musculoskeletal management and will pave the way for other conditions, such as bone and breast cancers to be more readily diagnosed and treated."*

More details can be found here:

https://www.ukri.org/news/new-tools-aim-to-improve-early-diagnosis-and-ease-nhs-pressure/

https://www.lancaster.ac.uk/lms/about-us/news/15m-to-develop-first-ever-tool-to-diagnose-musculoskeletal-conditions-in-the-community

Details about two PDRA jobs offered on this project can be found in the section, Doctoral and Post-Doctoral Research: Opportunities and Funding, of this Newsletter.

SATURN CDT Studentships awarded to LIRA members

PhD studentships part-funded by the SATURN CDT (https://www.lancaster.ac.uk/engineering/research/saturn-cdt/) and matched by the NDA PhD Bursary scheme (https://ndaphdbursary.co.uk/) were awarded to LIRA members Dr Stephen Monk and Dr David Cheneler respectively, as well as other academics at Lancaster University. Their students, Alfie Allanach (project: Remotely Deployed Sensor Network to Characterise 50 Mm Pipework) and Blake Halliday (project: Automated Beta-emitting Radioisotope Identification and Monitoring in Boreholes) both started in October and are currently based in Manchester on the taught element of the CDT and will return in January for further training and starting their research formally.

SATURN, the EPSRC Centre for Doctoral Training in Skills and Training Underpinning a Renaissance in Nuclear, aims to train the next generation of researchers to lead in nuclear fission, supporting the UK's energy and net-zero goals. More details can be found here: https://www.saturn-nuclear-cdt.manchester.ac.uk/.

Professional Accomplishments

DSTL visits Lancaster University and meets with LIRA members

Lancaster University was visited by the Robotics & Autonomous Systems team from DSTL on 29th October 2025. The visit, organised by Prof. James Taylor, and supported by several other LIRA members and members of the Research and Enterprise Services team, and supplemented by separate meetings with the interim PVCR, sought to learn more about the facilities and expertise available in the area of robotics and autonomous systems at Lancaster University. Potential future funding calls were also discussed, the details of which will be circulated once finalised and released. This visit has been followed up by our sending of supplementary information regarding the capabilities that can be found within LIRA, and the RES team have also reached out to our broader HEI partnership team for a more general follow up discussion.

AI and the Future of Marketing: Insights from our Expert Roundtable

As businesses and individuals increasingly turn to Artificial Intelligence, many assume it will save time and money—but how accurate is this assumption? In marketing, AI is reshaping everything from how brands communicate to how strategic decisions are made. Against this backdrop, Lancaster University Management School organised a thought-provoking Roundtable on 12th November 2025 to unpack these questions. The event featured an engaging discussion with an expert panel comprising Jack Daniel (Molson Coors), Darren Savage (Strategy Consultant), Professor Oguz Acar (King's College London), and Professor Adrian Friday (Lancaster University). The roundtable brought together leading voices from academia and industry, attracting an audience of more than 120 people both online and in person.

The conversation explored how to balance AI's creative potential with ethical responsibility, professional judgement, and long-term brand value. Key themes included personalisation, privacy and consumer trust, human–AI creative collaboration, and the role of predictive analytics in driving marketing ROI. The loss of creativity and talent as AI use spreads was a notable theme of discussion, as was the misconception that AI is free - the costs of power and water to run the data centres makes AI a very challenging tool for the planet and therefore for all of us.

Dr. Carolyn Downs, Lancaster University Management School, was the event lead.

You can view this event here: https://www.youtube.com/watch?v=odFZKji-ezU

LIRA Seminar run in conjunction with the 2025 IEEE/RSJ International Conference on Intelligent Robots and Systems

Dr. Ziwei Wang (co-leads in Additive Manufacturing and Fundamentals of LIRA) led a flagship workshop at IEEE/RSJ IROS 2025 in Hangzhou: "4th Sensorimotor-Augmented Teleoperation: Human-interaction-oriented Paradigm and Real-world Concerns." IROS is one of the world's premier robotics conferences, drawing over 7000 researchers, students and +160 industry partners to shape the future of intelligent robots and systems. Held on 20th October 2025, the event brought together experts from Lancaster, KAIST, Tsinghua, Tokyo University of Science, NYU, Liverpool and key industry partners to re-examine how humans and robots share control at a distance. Rather than treating teleoperation as a purely technical communication problem, the workshop foregrounds the human operator: their proprioception, cognitive load, trust and situational awareness. Sessions covered multimodal interfaces combining haptics and proprioception, AI-enabled exoskeletons and VR/AR control, plus new performance measures that reflect both task outcomes and human experience in demanding fields such as surgery, marine operations and nuclear decommissioning.

Now in its fourth edition, the series has evolved into a hub for the global teleoperation community, and this year's programme adds a strong mentoring and translational dimension. A dedicated Mentor-Mentee Network will connect early-career researchers and PhD students with senior academics and industrial partners, while live demonstrations, including haptic gloves and vision-based tactile sensing systems, will allow participants to experience next-generation interfaces first-hand. For LIRA, the workshop showcases Lancaster's leadership across multiple centre themes, from extreme environments and security & defence to biomedical and advanced manufacturing, and reinforces the university's role in shaping human-centred, sensorimotor-rich teleoperation for real-world deployment.

LIRA Director joins as Visiting Professor the European Space Agency's Pi School

LIRA Director, Prof. Plamen Angelov has been appointed a ***Visiting Professor at the European Space Agency's (ESA) Pi School***. As part of ESA's Collaborative Innovation Network (CIN), Professor Angelov will engage in lectures and research consultations with postdoctoral researchers—both in-person and remotely. The collaboration will associate Lancaster students and focus on applying Lancaster's advanced AI and machine learning expertise to the extensive Earth Observation data that ESA collects targeting floods and other natural disasters.

On his joining as the Visiting Professor, Professor Angelov said: "Joining the Collaborative Innovation Network of the European Space Agency's Φ-lab and its Pi School whose motto is "Machine Intelligence meets human creativity" is a great opportunity to contribute to, collaborate and interact with top researchers whose goal it is to make best use of the rich and ever-growing data sets and streams resulting from Earth Observation under the Copernicus Programme and its Sentinel missions. It is a privilege to help inform decision makers and the public about the adverse climate events such as flooding, and to get the opportunity to make a tangible difference to communities in this way. Φ-lab's and my personal interests

are primarily around the research and use of explainable and continual deep learning form of AI, and I look forward to working with them closer in the coming years."

https://cin.philab.esa.int/databases/researchers-db/plamen-angelov

Selected Recent Publications (and code)

Recursive SNE: Fast Prototype-Based t-SNE for Large-Scale and Online Data

LIRA member and a PhD student, Agil Aghasanli published a paper in the prestigious peer reviewed journal, ***Transactions on Machine Learning Research*** **(TMLR)**, 10/2025, entitled "Recursive SNE: Fast Prototype-Based t-SNE for Large-Scale and Online Data".

https://openreview.net/pdf?id=7wCPAFMDWM

It offers a significantly faster (factor of 5 or more) algorithms for visualisation in comparison to the current state of the art (t-SNE, Barnes-Hut t-SNE). Such visualisations are nowadays used widely to represent the results of AI and machine learning tasks in 2D or 3D, but they require a lot of computational resources, time and thus burn CO_2. The code is also available in both, Python https://github.com/Aghasanli-Angelov/RSNE

and Matlab

https://github.com/ashwin0306/Angelov-Aghasanli-Ashwin

There are ongoing discussions with Mathworks to implement this method as part of MATLAB toolboxes.

ProtoMedX: Towards Explainable Multi-Modal Prototype Learning for Bone Health Classification

Alvaro Lopez Pellicer, (PhD student and LIRA member), Andre Mariucci (Lancaster University graduate), Plamen Angelov (LIRA Director), Marwan Bukhari (NHS) and Jemma Kerns (LIRA Theme co-lead) co-authored a paper, "ProtoMedX: Towards Explainable Multi-Modal Prototype Learning for Bone Health Classification", presented at the top-tier **International Conference on Computer Vision (ICCV-2025)** in Hawaii in October 2025.

This article proposes ProtoMedX, a multi-modal (multimodal) model that uses both DEXA scans of the lumbar spine and patient records. ProtoMedX's prototype-based architecture is explainable by design, which is crucial for medical applications, especially in the context of the upcoming EU AI Act, as it allows explicit analysis of model decisions, including incorrect ones. ProtoMedX demonstrates state-of-the-art performance in bone health classification while also providing explanations that can be visually understood by clinicians. Using a dataset of 4,160 real NHS patients, the proposed ProtoMedX

achieves 87.58% accuracy in vision-only tasks and 89.8% in its multi-modal variant, both surpassing existing published methods.

ProtoMedX: Towards Explainable Multi-Modal Prototype Learning for Bone Health Classification

Invited Talks

Rethinking Interpretability and Adaptivity of Deep Learning

Prof. Plamen Angelov delivered a Guest lecture entitled ***Rethinking Interpretability and Adaptivity of Deep Learning***, at the Finish Centre for AI, Helsinki on 24th October 2025.

This lecture critically re-examined the deep learning pipeline and drew some parallels with the brain and the human decision-making processes.

Details of the lecture can be found here:

https://fcai.fi/calendar/2025/10/24/rethinking-interpretability-and-adaptivity-of-deep-learning

Funding Opportunities

N8 ERC Lunch time Webinar Series – December 2025

Are you an academic considering the European Research Council (ERC) as a potential funder for your next major research idea? Would you like to know more about how to write a competitive proposal and hear hints and tips from ERC award holders or reviewers in your broad research area? Would you like the opportunity to ask a question to a current ERC award holder at a similar career stage as you? If so, please join the **N8 ERC Lunch time Webinar Series.**

- ***Wednesday 10th December 2025 - Starter ERC Award – Physical Sciences - 12:10 – 12:50pm***
  Presenters - Dr Rostislav Mikhaylovskiy (Lancaster University) and Dr Dominic Bowman (Newcastle University)
  Please use the link below to join the event: Join the meeting now 12:10pm, 10th December 2025; Meeting ID:315 256 395 349 0 ; Passcode: oq3HG94p
- ***Tuesday 16th December 2025 - Starter ERC Award – Social Sciences - 12:10 – 12:50pm***
  Presenters - Professor Robbie Williams (University of Leeds) and Dr Mark Griffiths (Newcastle University)
  Please use the link below to join the event: Join the meeting now 12:10pm, 16th December 2025; Meeting ID:336 871 031 716; Passcode: Lm7Kn2YA

UK-Japan Partnership Funds AI and Robotics for Nuclear Decommissioning

Engineering and Physical Sciences Research Council (EPSRC), UK and Japan Atomic Energy Agency (JAEA) have announced new funding under joint ***UK-Japan Civil Nuclear Research Programme 2025.*** This long-standing collaborative research programme supports pioneering research to address challenges of decommissioning the Sellafield nuclear power plant in the UK and the Fukushima Daiichi nuclear power plant in Japan. EPSRC has awarded £950,000 to two innovative projects led by the UK universities focusing on four major challenges: Radioactive waste treatment, packaging, and storage; Robotic, and autonomous systems for decommissioning; Fuel debris and material; and Decommissioning technology.

The first project, led by Dr Alex Scrimshire at Sheffield Hallam University, will focus on scaling up the vitrification of secondary waste forms. This process aims to create stable waste products suitable for safe, long-term storage or disposal. The second project, led by Professor Christopher Pain at Imperial College London, will use AI-driven modelling to optimise the transport and handling of fuel debris and radioactive sludge, enhancing both operational safety and efficiency.

Leverhulme Trust Funded Research Grants

There is a call for Leverhulme Research Project Grants (up to £500k over 5 years). Outline invitations to this open call remain open until 27th February 2026.

The weblink to the scheme is: https://www.leverhulme.ac.uk/research-project-grants

Sandpit: Reservoir Computing for National Security and Defence

Applications are invited to attend a four-day interactive interdisciplinary sandpit to develop projects on reservoir computing for national security and defence applications. Participants selected to attend must do so for all online and in-person days.

- You must be based at a UK research organisation eligible for Engineering and Physical Sciences Research Council (EPSRC) funding.
- You must complete an expression of interest to apply.

Total fund: £1,375,000

Opening date: 18 November 2025

Closing date: 16 December 2025

Attendance at the sandpit does not guarantee UK Research and Innovation (UKRI) or Defence Science and Technology Laboratory (Dstl) funding.

For more details : https://www.ukri.org/opportunity/sandpit-reservoir-computing-for-national-security-and-defence/?utm_medium=email&utm_source=govdelivery

The Hamlyn Symposium on Medical Robotics 2026: Proposals Invited for Full-day Workshops

18th Hamlyn Symposium on Medical Robotics will be held from 23rd - 26th June 2026.

This year's theme — *Medical Robotics: the Complex Journey from Ideation to Value Creation* — invites the global community of researchers, clinicians, engineers, entrepreneurs, and policymakers to explore how transformative ideas in medical robotics evolve into technologies that deliver measurable impact and value in healthcare.

Proposals for full-day workshops for the 2026 Hamlyn Symposium on Medical Robotics are now invited. Workshops will take place on Friday 26 June 2026. Proposers must submit: A brief outline of the workshop theme and structure; The intended learning outcomes; A provisional list of national and international speakers you plan to invite; and A budget outlining the proposed running costs. Workshop proposals must be led by an academic institution, though industry partners are welcome.

Submission Deadline: 12 noon (GMT) 23rd January 2026.

https://www.hamlynsymposium.org/call-for-workshop-proposals/

Turing Global Fellowship call

https://www.ukri.org/opportunity/turing-ai-global-fellowships/?utm_medium=email&utm_source=govdelivery

Isambard -AI and Dawn-AIRR Supercomputers opportunity

https://www.ukri.org/opportunity/isambard-ai-and-dawn-airr-supercomputers-innovator-route/?utm_medium=email&utm_source=govdelivery

UKRI funding that may be relevant to LIRA members

https://www.ukri.org/opportunity/large-grant-outlines-february-2026/?utm_medium=email&utm_source=govdelivery

https://www.ukri.org/news/ambitious-new-uk-project-to-transform-human-disease-modelling/?utm_medium=email&utm_source=govdelivery

https://www.ukri.org/opportunity/drive35-scale-up-feasibility-studies-two/?utm_medium=email&utm_source=govdelivery

EPSRC Prosperity Partnership

https://www.ukri.org/opportunity/epsrc-prosperity-partnerships-2027/?utm_medium=email&utm_source=govdelivery

Doctoral and Post-Doctoral Research: Opportunities and Funding

Two Post-Doctoral Researchers positions available on the recently funded £1.5M EPSRC project led by Dr Jemma Kerns

Immunologist: https://hr-jobs.lancs.ac.uk/Vacancy.aspx?ref=0824-25

Data Analyst: https://hr-jobs.lancs.ac.uk/Vacancy.aspx?ref=0815-25

Fully Funded PhD Studentship in Robotics and Control

Lancaster University's School of Engineering, in collaboration with the **UK National Nuclear Laboratory (UKNNL)**, invites applications for a fully funded Doctoral Studentship in Robotics and Control. The research will focus on developing novel data-driven, robust, and adaptive control methods for human–robot interaction and teleoperation, with direct applications in nuclear robotics, hazardous environment manipulation, and related areas. It aims to design and experimentally validate a hybrid motion–force control framework that ensures precise end-effector positioning while maintaining robust and adaptive force regulation under real-world conditions.

Funding is for a duration of 4 years, covering UKRI minimum stipend, tuition fees for Home students, and a research training support grant.

Eligibility: Open to UK Home students only; Applicants should have (or expect to obtain) a First or Upper Second-Class degree (or equivalent) in Engineering, Control, Robotics, Computer Science, or a related discipline; Strong mathematical and programming skills (MATLAB, Python, or C++) are highly desirable.

To Apply: Submit a full CV, a one-page cover letter outlining motivation and suitability, and reference letters from two academics. Applications are considered on a rolling basis until the position is filled, with an expected start date of January 2026.

Enquiries: Please contact Dr Allahyar Montazeri (a.montazeri@lancaster.ac.uk).

PhD Studentships at Edinburgh's CDT in Dependable and Deployable AI for Robotics

Applications are invited for funded PhD places for September 2026 entry into Edinburgh's **UKRI AI Centre for Doctoral Training in Dependable and Deployable AI for Robotics** (CDT-D2AIR), a joint 4-year PhD training programme offered by Heriot-Watt University and the University of Edinburgh.

Students will specialise in topics related to the four research themes of CDT-D2AIR, gaining a deep understanding of the technical aspects and theoretical foundations of the intersection between AI and robotics: Trustworthy and Rigorous AI for Robotics; Robust Robot Design; Dependable AI for Human-Robot Interaction (HRI); AI for Deployable Robot Systems and Field Systems.

For more information about the CDT-D2AIR programme and to apply, please see: https://www.cdt-d2air.uk/#h.1mr7lp3cggdi

Leverhulme Trust's 2026 Doctoral Scholarships Competition

Summary

- For UK universities to fund up to 30 Leverhulme Doctoral Scholarships in an interdisciplinary priority research area for that institution (one per University only!).
- Additional scholarship places to support students from underrepresented groups in the UK to undertake a master's plus doctoral programme
- Doctoral scholarships for international students
- Dedicated funding to support research and training expenses and cohort-building activities
- Funding to support a limited number of postdoctoral level opportunities for LCDS programme graduates
- Funding to contribute to dedicated administrative assistance costs
- The option to apply as a consortium of up to two universities

Key dates

- Lancaster internal EOI process closes: 12noon (GMT) on Wednesday 26th November 2025
- Internal call outcome: w/c 15th December 2025
- Leverhulme full bid deadline: 12noon on Friday 6th March 2026
- Leverhulme decision expected in July 2026
- The online form and instructions for the supporting email can be accessed at Leverhulme Trust Doctoral Scholarships EoI form

If you have any questions about this form or the process, please contact the Senior Research Development Managers via researchdevelopment@lancaster.ac.uk.