LIV.DATA NEWS

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AI, Healthcare and Innovation

Our recent workshop on Data Science in Healthcare showed the incredible potential of AI to transform patient care and drive real-world impact. The energy and engagement at this event reinforced that real impact comes from sustained, interdisciplinary collaboration.

LIV.INNO is committed to building on this momentum, and to working closely with our established and new partners. We see a pressing need for training even more innovators at the intersection of AI, physics, and health technologies.

I hope you will enjoy this LIV.DATA news.

Prof Carsten P. Welsch
LIV.INNO Director

Understanding the Universe's Hidden Energy: New Insights from String Theory

A study published in The European Physical Journal C, co-authored by LIV.INNO student Luke Detraux, has shed new light on the complex world of string theory, specifically focusing on the elusive concept of vacuum energy. The authors have delved into a complex area of theoretical physics with potential implications for our understanding of the universe.

The study explores the vacuum energy present in certain configurations of string theory. String theory, a framework aiming to unify all fundamental forces of nature, proposes that elementary particles are actually tiny vibrating strings. "Vacua" in this context refer to the possible states of these strings, and "vacuum energy" is the energy inherent in these states.

A significant aspect of this research is its focus on models that do not rely on supersymmetry. Supersymmetry, a theoretical symmetry, predicts that every known particle has a supersymmetric partner. By exploring non-supersymmetric models, researchers are expanding the scope of string theory and potentially opening new avenues for understanding the universe.

The aim is to develop models that closely align

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with the observed physical phenomena in our universe. This "quasi-realistic" approach is essential for bridging the gap between theoretical physics and experimental observations.

"Moduli" are parameters that define the shape and size of the extra dimensions in string theory. By "fixing" these moduli, researchers are simplifying the complex calculations and focusing on specific configurations.

Understanding vacuum energy is critical for addressing some of the most pressing questions in cosmology, such as the nature of the cosmological constant and the accelerating expansion of the universe. Also, the stability of the universe itself is something that the vacuum energy calculations help to understand.

This research represents a significant step forward in the ongoing quest to unify the fundamental forces of nature. By meticulously analysing these complex string theory configurations, the team have gained valuable insights into the underlying structure of the universe. The results of this study could have implications for our understanding of cosmology and particle physics.

More information:

'Vacuum energy in non-supersymmetric quasi-realistic heterotic-string vacua with fixed moduli'

Eman Basaad, Luke A. Detraux, Alonzo R. Diaz Avalos, Alon E. Faraggi, and Benjamin Percival

Eur. Phys. J. C **85**, 209 (2025) https://doi.org/10.1140/epjc/s10052-024-13733-2

New Method Improves Beam Analysis in Plasma Accelerators

A recent paper published in Physical Review Accelerators and Beams, led by former LIV.DAT student Monika Yadav, details a novel approach to enhance the analysis of high-energy electron beams within plasma wakefield accelerators. This research could significantly impact the future of particle physics experiments, including those at facilities like SLAC National Accelerator Laboratory's FACET-II.

In plasma wakefield acceleration, high-energy electron beams interact with plasma, generating betatron radiation. This radiation provides valuable information about the beam's behaviour and characteristics. However, accurately extracting this information from the radiation spectra is challenging.

The paper focuses on improving the reconstruction of beam parameters, such as spot size, energy, and emittance, from the measured betatron radiation. The authors explore and compare two advanced techniques: maximum likelihood estimation (MLE) and machine learning.

MLE is a statistical method used to estimate the parameters of a probability distribution based on observed data. In this context, researchers use MLE to determine the beam parameters that are most likely to have produced the measured radiation spectra.
The study also employs machine learning algorithms to analyse the complex relationship between the radiation spectra and the underlying beam properties. By training these algorithms on simulated data, researchers can improve the accuracy and efficiency of beam parameter reconstruction.

The paper demonstrates that both MLE and machine learning can effectively reconstruct beam parameters from betatron radiation spectra. The authors highlight that these methods can achieve high accuracy, even for very small beam sizes (less than 10 μm). This capability is crucial for understanding and optimizing beam propagation in plasma wakefield accelerators.

The improved accuracy in beam analysis offered by these techniques has significant implications for future research in particle physics. It could lead to more precise control and manipulation of electron beams in advanced accelerators, potentially paving the way for new discoveries.
The research also emphasizes the importance of advanced Compton spectrometers in accurately measuring betatron radiation. These spectrometers play a vital role in providing the data necessary for the reconstruction methods to succeed.

This research represents a significant step forward in the field of beam diagnostics. By providing more accurate and reliable methods for analyzing beam parameters, it contributes to the advancement of plasma wakefield accelerator technology and its potential applications in particle physics.

More information:

‘Reconstruction of beam parameters and betatron radiation spectra measured with a Compton spectrometer’

M. Yadav, M. H. Oruganti, B. Naranjo, S. Zhang, G. Andonian, Y. Zhuang, Ö. Apsimon, C. P. Welsch, and J. B. Rosenzweig, Phys. Rev. Accel. Beams **28**, 042802 – Published 23 April, (2025)

https://doi.org/10.1103/PhysRevAccelBeams.28.042802

Training the Next Generation of AI-Driven Accelerator Scientists

We are delighted to announce a new article in Europhysics News: “Artificial Intelligence for Advancing Particle Accelerators”, which explores how AI is transforming the design and operation of accelerators across the globe.

As these powerful machines become increasingly vital for applications ranging from fundamental physics to advanced medical therapies, the demands on beam performance, precision, and reliability grow exponentially.

This article underscores how leveraging machine learning algorithms for tasks such as data-driven optimization and predictive maintenance can drastically improve accelerator performance while minimizing downtime.

“AI has rapidly emerged as a game-changer in accelerator research,” says LIV.INNO Director Professor Carsten P Welsch. “It empowers our students and researchers to tackle real-world challenges, expand the frontiers of beam physics, and make a meaningful impact in global scientific and industrial endeavours.”

The LIV.INNO CDT trains the next generation of scientists and engineers, positioning them at the forefront of research in fields like data science, AI, and beam physics. Through interdisciplinary training and hands-on experience, doctoral candidates gain the unique skill set required to shape the future of science and innovation, including in the area of particle accelerators. They help make complex facilities more efficient, reliable, and capable of supporting new breakthroughs.

Discover more by reading the full article: Artificial Intelligence for Advancing Particle Accelerators

Best Young Researcher Poster at MaLAPA'25

Qiyuan Xu, a second-year PhD student at the University of Liverpool's Department of Physics, affiliated with the QUASAR Group and the LIV.INNO CDT, was awarded the "Best Young Researcher Poster" at the Machine Learning Applications for Particle Accelerators (MaLAPA'25) workshop held last week at CERN.

Qiyuan's research, titled "Developing Radiation-Tolerant Transverse Beam Imaging Using Synthetic Data and Multimode Fiber," focuses on developing a radiation-tolerant imaging system for accelerator beam diagnostics. The idea of his approach is to transmit a 2D light signal, generated when a particle beam interacts with a scintillating screen, through a multimode fiber to a low-radiation area. At this safer location, a standard camera would capture the fiber's output, and a machine learning model trained exclusively on synthetic data would reconstruct the original beam image. Current experimental results, obtained using real beam transverse distribution images displayed via a laser-illuminated Digital Micromirror Device (DMD) and relayed with the proposed system, demonstrate the method's accuracy and generalization capabilities for reconstruction.

The award was presented during the "5th ICFA Beam Dynamics Mini-Workshop" held at CERN's Globe of Science and Innovation from April 8 to 11, 2025. The event attracted more than 100 participants from international institutes and featured over 40 talks and 60 poster presentations. Reflecting on the event, Qiyuan remarked, "It was very inspiring to see such diverse and meaningful applications of machine learning in accelerator science. Researchers presented work dealing with different types of data, from images to time series, and used various AI techniques ranging from reinforcement learning for control systems to machine learning models solving complex optimization problems. The workshop was also a great opportunity to connect with others and learn more about their exciting research."

Qiyuan Xu holding his award.

Two More LIV.DAT Students Complete their PhDs

Two students of the LIV.DAT CDT have successfully defended their theses and passed their PhDs.

Luana Parsons Franca completed her PhD on “Secondary Emission Monitor (SEM) optimisation at the CERN fixed target beamlines” as part of the final cohort of LIV.DAT students. Luana spent two years at CERN as in order to complete this PhD. She was supervised by Professor Carsten Welsch, Dr Hao Zhang and Dr Federico Roncarolo (CERN).

Luana’s examiners were Professor Oliver Kester from TRIUMF, a recognized expert in radioactive ion beam facilities, and Professor Rodi Herzberg, a nuclear physicist from Liverpool who is well aware of the challenges linked to instrumentation and associated simulation studies.

Cristian Bontoiu was an associate student on the LIV.DAT program, thereby benefitting from the training available as part of this program while being funded from elsewhere. He had his PhD viva recently on his thesis about ‘Electron Acceleration in Carbon Nanotubes’ and passed successfully.

The external examiner Dr Rasmus Ischebeck (PSI, Switzerland) and internal examiner Prof Christos Touramanis were impressed by the quality work of Cristian.

We congratulate Luana and Cristian on these fantastic achievements!

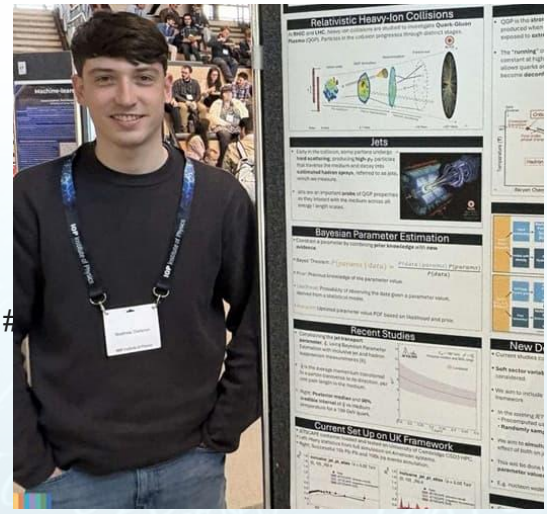
Dr Cristian Bontoiu (right) with his examiner Dr Rasmus Ischebeck.

LIV.INNO Students Attend Spring Conferences

The spring conference season has now passed and several of our LIV.INNO students have attended these conferences recently to present their work on a wide range of LIV.INNO topics.

The Institute of Physics' Astroparticle Physics (APP), High Energy Physics (HEP) and Nuclear Physics conferences always attract several of our students and this year was no different.

This year the IoP Nuclear Physics conference was held at the University of Manchester and LIV.INNO students Tom Wonderley and Matthew Ockleton attended. This meeting featured invited talks from national and international speakers, as well as extensive opportunities for contributed talks. A poster session took place to showcase other contributions.



Matthew Ockleton presenting his poster at the IoP Nuclear Physics conference

Matthew presented 'Bayesian Analyses of Key Quark-Gluon Plasma Parameters Using JETSCAPE'. This poster focussed on constraining parameters associated with the Quark-Gluon Plasma (QGP); the state produced by strongly interacting matter at high energy densities in heavy-ion collisions.

The IoP joint APP and HEP conference was held at the University of Cambridge. Former LIV.DAT student Adam Tarrant who is now continuing his research as a post-doc at the University of Liverpool presented 'BUTTON and Beyond: Integrating Novel Technologies in RAT-PAC for Precision Neutrino Detection' which is a continuation of the research he undertook for his PhD.

Adam Tarrant presenting his poster at the IoP APP and HEP conference.

Current LIV.INNO student Katie Ferraby presented 'Measurement of the muon electric dipole moment at the Fermi- lab g-2 experiment'. This was a summary of the analysis of the measurement of the electric dipole moment of the muon at the fermilab g-2experiment, which was done using 25% of the total dataset. The sensitivity of the future measurement, using the full statistics, and an optimal weighting method, was shown.

Stephen Randles presented ‘Measurement of the Higgs to invisible branching fraction at the FCC-ee’. The FCC-ee is the proposed first phase of a next generation particle collider the Future Circular Collider with the first phase having electrons and positrons collided.

The 5th ICFA Beam Dynamics Mini-Workshop on Machine Learning for Particle Accelerators was held at CERN with LIV.INNO students Qiyuan Xu and Alex Jury in attendance. The goal of this workshop was to bring together the world-wide community of researchers applying machine learning techniques to particle accelerators.

Qiyuan presented ‘Developing Radiation-Tolerant Transverse Beam Imaging Using Synthetic Data and Multimode Fiber’ and Alex presented ‘Simulation package for the Beam Synchrotron Radiation Longitudinal density monitor (BSRL)’. As previously reported, Qiyuan won the best poster prize at this workshop.

Delegates at the 5th ICFA Beam Dynamics Mini-Workshop on Machine Learning for Particle Accelerators (credit: ICFA)

African Students Explore Global Research Pathways with Prof Carsten Welsch

In a landmark African School of Physics (ASP) Online Seminar on 25 February 2025, over 200 live attendees from across Africa and beyond joined Professor Carsten P. Welsch, LIV.INNO Director and Head of the QUASAR Group at the University of Liverpool, for a dynamic and practical discussion on international research funding and career development for early-career scientists. With more than 500 registered participants, the event highlighted the growing demand for structured, accessible training routes that support African researchers in science and engineering.

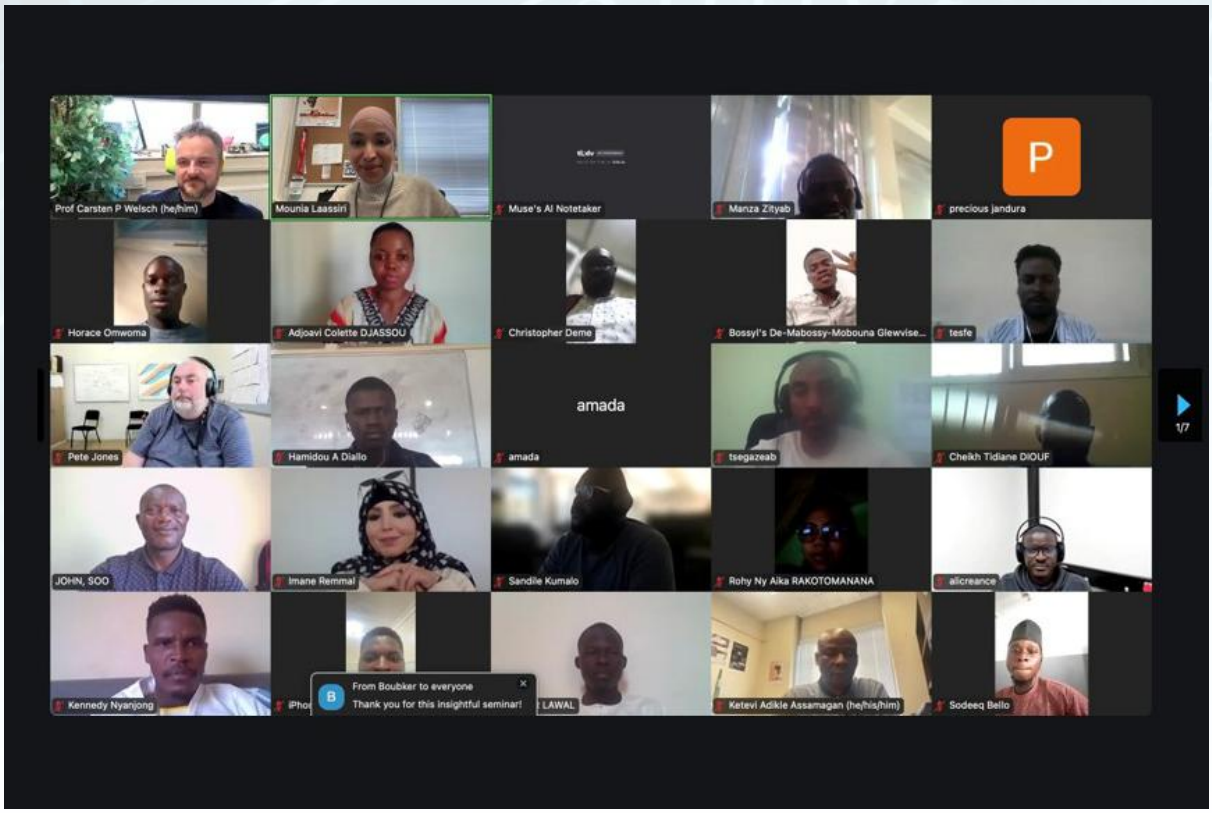
Professor Welsch, an expert in accelerator physics and former Head of the University of Liverpool's Physics Department, brought decades of experience coordinating large EU research networks to the session. His message was clear: "International collaboration, early exposure to interdisciplinary environments, and proactive networking are key to building a successful research career."

The seminar focused on the critical role of structured training programmes in empowering researchers to thrive in both academia and industry. Referencing very successful models such as the European Union's Marie Skłodowska-Curie Actions (MSCA) and the UK's Science and Technology Facilities Council (STFC) Centres for Doctoral Training such as LIV.INNO, Professor Welsch emphasized cohort-based training, cross-sectoral exposure, and international mobility as essential elements of modern scientific education.

He showcased a series of doctoral networks, including AVA (antimatter research), OMA (accelerators for cancer therapy), and EuPRAXIA-DN (plasma accelerator R&D), that offer African students fully funded PhD opportunities, hands-on lab experience, and strong industry links. "These programs aren't just about research," he said. "They equip you with the diverse skill set needed to lead in science, whether in the lab, in startups, or in policy."

The seminar was highly interactive, with participants raising questions about scholarships, postdoctoral opportunities, and the challenges of gaining international exposure. Professor Welsch provided practical strategies, from crafting compelling application letters to finding positions via trusted platforms such as EURAXESS, which offers thousands of research vacancies and guidance for mobility across Europe.

A key takeaway was that quality matters more than quantity. "For postdoc applicants, strong, well-aligned publications and a clear research vision will take you further than just stacking your CV," Professor Welsch said. He also reassured older researchers and career changers that many fellowships, particularly within MSCA, have no age limit, prioritizing potential and relevance over age.



Participants at the ASP online seminar.

One inspiring example was that of Miha Červ, a former fellow in the AVA network, who leveraged connections made during his PhD to transition into the field of medical accelerator technology from his research in fundamental science; an illustration of how integrated training programs can set the stage for impactful careers.

With Africa's research ecosystem evolving rapidly, the seminar served as both a knowledge-sharing forum and a rallying call for collaboration. Professor Welsch's seminar did more than inform, it inspired. His final message was a call to action: "Use the tools, platforms, and programs available to you. The future of global science will be shaped by diverse voices, and yours needs to be one of them!"

As interest in international fellowships and training intensifies, initiatives like this ASP seminar play a crucial role in connecting talent with opportunity, and in ensuring that the next generation of researchers is equipped to solve global challenges – in collaboration.

For further information and to access the recording of the seminar, please visit: https://indico.cern.ch/event/1514388/

Sun Shines on Exciting Launch of “AI & EYES” Outreach Box

The future of medical technology was brought to life this weekend at the launch of the brand-new outreach box, AI & EYES, developed by the talented team at UK Unplugged and experts from the Liverpool Centre for Doctoral Training for Innovation in Data Intensive Science (LIV.INNO), an inclusive hub for training diverse cohorts of excellent students in data intensive science.

LIV.INNO student Joseph Hadley explaining AI to the participants.

The box is based on the research project conducted by LIV.INNO student Robert McNulty. Robert, together with several undergraduate students from different departments, played a key-role in shaping the idea.

Held under perfect sunny skies, the event welcomed over 40 enthusiastic attendees across vibrant morning and afternoon sessions. Families gathered to explore how artificial intelligence is revolutionising the way doctors diagnose diseases.

A child doing arts and crafts during the event.

Children and adults alike diving into fun outdoor games.

The AI & EYES box offers a dynamic, hands-on learning experience packed with educational games, creative crafts, and interactive activities designed to engage all ages. The day saw children and adults alike diving into fun outdoor games, creative challenges, and insightful talks, making it a truly unforgettable learning experience.

Dr Diana Powell taking to the participants.

Dr Diana Powell, CEO and founder of UK Unplugged said: “We really enjoyed collaborating with the team at LIV.INNO to find creative, fun and inclusive ways into what might seem like an intimidating topic of 'AI's use in medicine'! Key to our outreach was designing an event and box that catered to a wide age group and supported SEND families. Seeing young people and their parents and carers enjoying themselves at the event, asking questions and engaging in games like 'the confusion matrix' meant we had done it!“

The event was not only a celebration of innovation but also a testament to the power of community learning, leaving attendees inspired and eager to explore the possibilities of AI in healthcare.

"We're thrilled with the amazing turnout and the excitement around AI & EYES," said LIV.INNO Director Prof Carsten Welsch. "Our goal is to inspire curiosity and show how technology and medicine are coming together in powerful new ways.“

About UK Unplugged

Founded by Dr Diana Powell in 2019, UK Unplugged is a community-driven social enterprise based in the Wirral, UK, dedicated to helping families "create, explore and unplug." They design imaginative, screen-free activity boxes and host engaging events that promote creativity, sustainability, and mental well-being. Their mission is to foster curiosity and connection through hands-on learning experiences that bring families together.

UK Unplugged welcomes volunteers, sponsors, and partners who share their vision of fostering creativity and community. Whether you're interested in contributing your skills, sponsoring a box for a family in need, or collaborating on educational content, there are numerous ways to support their mission.

For more information or to get involved, visit their website at ukunplugged.org.

The AI & EYES box is packed with educational games and creative arts.

AI for Innovation 2025: Insights from Industry and Academia

The Liverpool Centre for Doctoral Training in Data Intensive Science (LIV.INNO) hosted the 'AI for Innovation' conference which was held online on Wednesday 7th May. The conference attracted over 100 delegates from across industry and academia who came together to discuss impact of AI on business and the opportunities for gain. These big questions challenge those tasked with innovation strategy and new product development across all industry sectors.

The conference was targeted at businesses interested in the potential benefits of AI to their products and internal processes but needed further information into how it may be safely implemented. Delegates were provided context for recent AI developments, offered insights from data scientists, and participated in discussions focussed on real-world industry experience from those who have started their journey.

The conference opened with a welcome from LIV.INNO director Professor Carsten P Welsch, and was followed by talks from industry leaders Andy Walker, Head of Commercial for Deep Tech at TTP, and Ben Scowen, Vice President and UK&I Cloud Practice Lead at Kyndryl. Andy provided an excellent overview of innovation in and with AI, while Ben discussed the exciting launch of Kyndryl's AI Innovation Lab in the historic Liver Building, and the opportunities for businesses to benefit from the wealth of talent developed the city's universities.
Delegates were next invited to join a series of small group discussions focussed on an area of AI which was most relevant to them. These were AI for product development, AI for improving processes, AI for agent development and AI in highly regulated and safety critical environments. Expert speakers introduced the topic for each group before a facilitated discussion took place between the speakers and the audience for each group.

The conference wrapped up with talks from Sana Khareghani, a Professor of Practice in AI at Kings College London and Robert Cooper, Professor Emeritus at the McMaster University's DeGroote School of Business in Canada. Sana provided a UK-wide perspective of AI opportunities for growth and innovation in the context of the UK's AI Opportunities Action Plan, while Robert highlighted the disparity between countries in AI adoption and the upside for businesses in applying AI to various components of their operations.

LIV.INNO Director Carsten P Welsch said: "The excellent discussion throughout the event highlighted just how essential and timely this conversation is. It was inspiring to see so many leaders from academia and industry actively engaging with the opportunities AI presents. The questions raised and insights shared reflect a growing readiness to turn curiosity into action. I am confident that the collaborations sparked today will accelerate real, measurable innovation across sectors."

The talks from the plenary sessions of this conference can be viewed on YouTube!

Data Science in Healthcare workshop attracts audience from Industry, Academia and beyond

Delegates at the LIV.INNO Data Science in Healthcare and Health Technologies workshop. (Credit: QUASAR Group)

The LIV.INNO CDT has hosted a workshop on Data Science in Healthcare and Health Technologies. Taking place in Liverpool's Spine building, over 40 people from across industry, academia and the NHS to accepted invitations to attend and contribute to a day of seminars and fruitful discussions. LIV.INNO were happy to welcome current partners, as well as many new organisations.

LIV.INNO Director Prof Welsch welcoming the participants. (Credit: QUASAR Group)

The workshop commenced with a welcome and introduction from Prof Carsten Welsch, Director of the LIV.INNO CDT. Katherine Robertson and Phil Carvil then introduced the North West Health Cluster, and outlined the STFC facilities and funding available to support research in this area. Nicolas Nunn next discussed how the University's Enterprise Team help researchers achieve research impact. Closing the opening session, LIV.INNO Data Science Fellow Alex Hill outlined LIV.INNO's existing partnerships. He focused on the current collaboration with Adaptix Ltd, which includes joint-funded PhD studentships and recently celebrated a £400k STFC late-stage commercialisation grant.

Later in the morning, Yalda Ashraf Kharaz from Health Data Research UK talked about NHS data access, and opportunities

Data Science Fellow Alex Hill outlining LIV.INNO's existing partnerships. (Credit: QUASAR Group)

in its use to improve outcomes for patients. Alder Hey's Head of Data Science, Olufemi Olajide, next spoke about the large number of issues within the NHS, which can be improved greatly using data science as a tool. This was further emphasised by neurosurgeon Deepti Bhargava of the Walton Centre, who explained how data science can enhance techniques used in neurorestoration, a process that helps recover neurological function in patients with both overactive and underactive neurological conditions. Finally, Jane Shortall of the University of Manchester spoke about the application of Gaussian Processes to augment incomplete datasets to improve early detection of recurrent prostate cancer.

Delegates at the event. (Credit: QUASAR Group)

Attendees had the opportunity to discuss key data science challenges and opportunities in healthcare. Groups were formed with a mix of backgrounds to ensure engaging conversations and the identification of opportunities for collaboration.

The topics were:

- trustworthy and explainable AI for clinical decision support
- patient-specific digital twins
- physics informed Machine Learning
- synthetic data generation and validation standards

A summary of each can be found on the workshop's Indico site.

Group discussions on key data science challenges. (Credit: QUASAR Group)

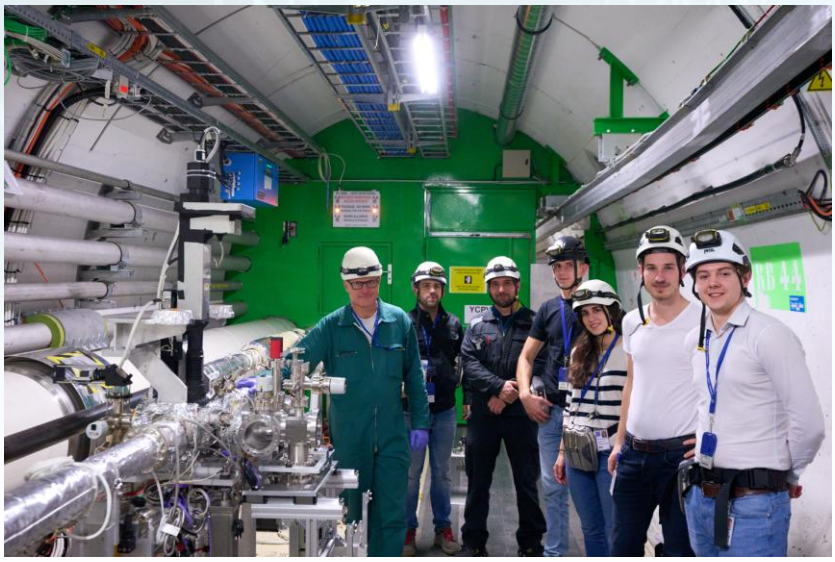
The workshop's closing session featured contributions from medtech innovators who have their roots in academia. CCI photonics CEO Carlos Meza detailed how AI can be used to speed up bacterial infection diagnosis, and therefore improve outcomes for patients. Head of Core Lab Operations at MyCardium, Chloe Bickerstaff, highlighted their use of AI in rapidly assessing cardiac scans. Finally, LYEONS CEO, Lucy Jung, introduced burgeoning work in the development of devices to predict and prevent panic attacks.

The workshop received lots of positive feedback from participants. Prof Carsten Welsch said "It was fantastic to see such an engaged group come together to tackle some of the most pressing challenges in healthcare. This workshop exemplifies the power of interdisciplinary collaboration, and I am excited to see how the new partnerships and ideas formed today will shape future innovation in LIV.INNO".

The presentations made at this workshop can be found on the workshop Indico site

Data Science Fellow Interview

In each edition of this newsletter, we will interview one of our Data Science Fellows from the LIV.DAT CDT, which recruited students from 2017 to 2020. In this edition, we speak to Ondrej Sedlacek who has been studying 'Beam Induced Fluorescence monitor for high-intensity beams' during his time at the University of Liverpool.



LIV.INNO student Ondrej Sedlacek (second from right) with colleagues from the University of Liverpool and collaborators from CERN standing next to the Beam Gas Curtain, installed on the LHC. (Image credit: CERN / Maximilien Brice)

Can you explain in a few words what your project was about and what you have achieved?

My work was focused on a 3rd generation prototype of a gas jet monitor. It is a transverse profile monitor for charged particle beams using fluorescence on injected gas jet. Basically, the monitor injects a gas and detects the beam particles' position by watching the light that comes from their interaction with the gas molecules. The most significant achievement was successfully installing the monitor on the LHC and obtaining the first successful measurements. This milestone was pivotal for the entire collaboration. Personally, it was incredibly fulfilling to contribute throughout the project—from assembling the prototype with colleagues to operating it at Cockcroft, at CERN setups, and ultimately at the LHC."

What has the CDT provided you professionally?

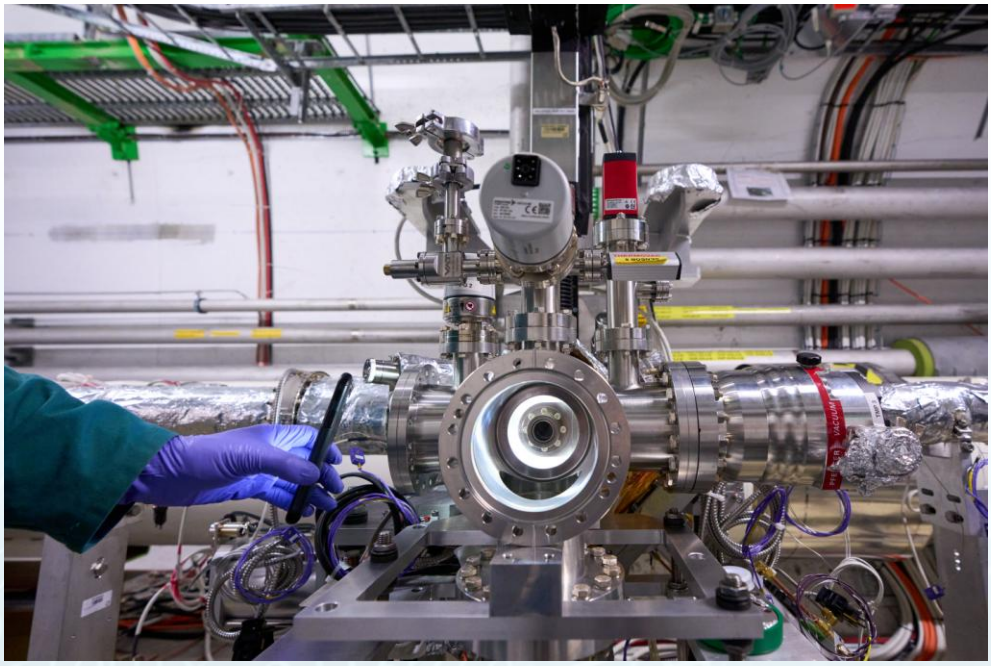
The CDT has been very useful in my professional development. It provided me with hands-on experience across a range of technologies, including vacuum systems, optics, data acquisition and processing, and statistical analysis, all of which are crucial in the R&D field. Additionally, it allowed me to gain insight into how large-scale research facilities like CERN and Cockcroft Institute operate, from team dynamics to organizational structures. This experience taught me how to adapt to these environments and effectively contribute to collaborative projects.

Can you say something about your next career move?

As part of my program, I completed a nine-month placement in the R&D department at Valeo, an automotive company, where I contributed to the development of LIDAR technology. This role allowed me to apply several skills I honed during my PhD, such as optics, data processing, and statistical analysis. The placement provided an excellent opportunity to experience how the industry operates. At the end of the placement, my manager offered me a position, and I've decided to pursue this opportunity. I really enjoyed the working environment, and I'm excited to continue my career in this direction.

What is your favourite memory from your time as part of the CDT?

It's hard to choose just one favourite memory because there were so many rewarding moments. Some of the most exciting times were when we overcame significant challenges, and suddenly, the measurements started making sense, pushing us closer to the next milestone. Those breakthroughs were incredibly fulfilling. I also really enjoyed the BGC collaboration meetings—the people were fantastic, full of enthusiasm and expertise. My main memories will likely be the countless hours spent in the laboratory tuning and operating the machine, reporting results, and working alongside such passionate and dedicated colleagues.



The installed Beam Gas Curtain on the LHC. (Image credit: CERN / Maximilien Brice)

Meet the LIV.INNO students

In each edition of this newsletter, we will introduce some of the students who are studying as part of LIV.INNO CDT

Qiyuan Xu (2nd year PhD student)

Project title

Reconstruction of Transverse Beam Distribution using

Machine Learning

Where are you from?

I'm from Guiyang, China

What degree did you study?

Before coming to Liverpool, I studied MSc Artificial Intelligence at the University of Edinburgh.

What do you do in your free time?

In my free time, I enjoy playing the guitar, playing badminton, and going hiking.

Rosie Bartlett (1st year PhD student)

Project title

Machine Learning methods to identify faint stellar streams

in Milky Way-type galaxies

Where are you from?

I'm from Ashford, England, UK

What degree did you study?

I studied BSc Astrophysics and MSc Data Intensive Astrophysics at Cardiff University.

What do you do in your free time?

In my free time I like to go to gigs, knit and sew.

Archie Hanlon (1st year PhD student)

Project title

Efficient and accurate Technology Computer-Aided Design simulations with machine learning and their application to develop monolithic CMOS sensors for physics experiments

Where are you from?

I'm from Leicester, England, UK.

What degree did you study?

I studied for an integrated Master's degree in Physics at the University of Birmingham, UK.

What do you do in your free time?

Outside of Physics, I spend most of my time doing sport, specifically basketball, athletics and cricket.

John Kerfoot (1st year PhD student)

Project title

Quantum computing innovation to simulate quantum systems

Where are you from?

I'm from Trelawnyd, North Wales, UK.

What degree did you study?

I studied an integrated Master's in mathematical physics at the University of Liverpool.

What do you do in your free time?

In my free time I like to go to music events and play computer games.

Notice Board

The Liverpool Virtual Seminar Series on Data Intensive Science will restart after the summer break!

The seminars in this series cover R&D outside of the LIV.INNO centre's core research areas and give an insight into cutting edge research data intensive science.

To register to attend these seminars please visit
https://indico.ph.liv.ac.uk/e/data_science_seminars

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