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Surrey Fesitival: Winnie-the-Pooh, refugee histories and music-making machines and more...

23 October 2026



How did a Surrey town help people fleeing the Nazis? What can Winnie-the-Pooh's woodland tell us all about belonging? And what does a mechanical piano teach us about music in the age of AI?

The University of Surrey is inviting the public to explore these questions through ten free events during the Being Human Festival, running from 5 to 14 November 2026. Held across Guildford, Dorking and Compton, its programme brings archives, performances and hands-on activities together under this year's theme, 'Crossroads'.

At Refugee Voices from World War II, visitors will discover how ordinary people in Dorking helped those escaping the Nazi regime. A pop-up exhibition at Dorking Museum on 7 November, 10am–4pm, draws on the Dorking Refugee Committee's archive from 1938–1949, documenting both the difficulties refugees faced and the support they received. Visitors can explore a new website developed by Surrey academics and speak with historians, curators and teachers about this local history of solidarity.

On 8 November, 11am–4pm, Into the Hundred Acre Wood: Queering Space in Children's Literature offers a different perspective on some of Britain's best-loved fictional landscapes. At the University's Library, Dr Amy Louise Morgan will explore how children's literary spaces open up possibilities for imagination and transformation through queer theory. Visitors will receive guided access to archive materials relating to E. H. Shepard, illustrator of Winnie-the-Pooh and The Wind in the Willows, before creating their own literary worlds in a workshop with award-winning author Ally Sherrick. The event is for ages 16 and over.

The relationship between human creativity and machines takes centre stage at The Evolution of Musical Creativity, at the Guildford Institute on 11 November, 7pm–8pm. Composer and music technologist Milton Mermikides will trace a history stretching from ninth-century programmable machines in Baghdad to today's AI-driven music. Historical demonstrations and musical examples will explore how technology has repeatedly changed the way people compose, perform and listen.

Dr Lucy Ella Rose, Lecturer in Victorian Literature and event lead at the University of Surrey said:

"These events show how stories from the past speak directly to questions we face today: how we welcome people seeking refuge, who feels a sense of belonging and what happens when machines become part of the creative process.

"We're inviting people to get close to the archives, meet the researchers and try things for themselves. Whether you come for Winnie-the-Pooh, wartime history or a live performance, there's an opportunity to discover something unexpected about Surrey and the wider world."

Elsewhere, families can explore Lewis Carroll's Surrey connections through immersive Alice in Wonderland storytelling, performance and 'imagination stations' at the Guildford Institute on 7 November. Dorking Museum will also host refugee-history zine-making workshops that day.

Music events include a live pianola concert with Rex Lawson on 5 November, an online player-piano exhibition throughout the festival and an interactive schools' session on 9 November.

Another event, Older LGBT+ Housing and Care at a Crossroads and Beyonde, explores how housing and care can better support LGBTQ+ people in later life. Taking place at the International Longevity Centre in London on 5 November, 5pm–7pm, the event combines a short animation, conversation and an interactive theatre workshop inspired by Surrey's Life House Project. Open to anyone aged 16 and over, no theatre experience is needed.

Creative writers can explore Turner's life and art at Watts Gallery on 13 November, while a family concert celebrating composer Richard Stoker at Guildford United Reformed Church on 14 November will bring together opera, literary song settings and music from Pirates of the Caribbean.

Explore the full programme and booking details. Advance booking is required for most events.

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Jim Al-Khalili to delve into the mysteries of time at Guildford Book Festival

23 October 2026



Acclaimed physicist and broadcaster, Professor Jim Al-Khalili, will join fellow University of Surrey astrophysicist, Dr Noelia Noël, at the Guildford Book Festival for a conversation exploring one of science's greatest mysteries: the nature of time.

Taking place on Tuesday evening, 13 October, at Guildford Baptist Church, the event will centre on Professor Al-Khalili's new book, On Time: The Physics That Makes the Universe Tick.

The book explores questions that have puzzled philosophers and scientists for thousands of years, including whether time had a beginning and if it will have an end, why it appears to flow towards the future rather than the past, whether it can be stretched, squeezed or even reversed – and, at the deepest level, whether time itself is real.

In a conversation with host Dr Noël, Professor Al-Khalili will take audiences on a journey through physics, philosophy and cosmology, unpacking what modern science can tell us about something that governs every moment of our lives yet remains mysterious.

Professor Al-Khalili said:

"Time is something we all experience, but the deeper you look, the stranger it becomes. Quantum mechanics, relativity and thermodynamics all give us different ways of understanding what time is and how it works. That's what makes it such a fascinating mystery – we live our whole lives by it, yet there is still so much we don't understand."

Professor Al-Khalili is Distinguished Professor Emeritus of Physics at Surrey, a Fellow of the Royal Society and one of the UK's best-known science communicators. He has written numerous popular science books, presented television documentaries and is best known for his long-running BBC Radio 4 programme The Life Scientific.

Dr Noelia Noël is a Senior Lecturer in Astrophysics at the University of Surrey's School of Mathematics and Physics. She has received multiple awards and recognition for her work, including a prestigious 2026 Leadership Fellowship in Public Engagement from the Science and Technology Facilities Council (STFC), recognising her contributions to astrophysics and sustainable space research, as well as her commitment to creating more inclusive pathways into science.

Dr Noël said:

"Jim has a wonderful ability to make some of the biggest questions in physics accessible, exciting and relevant to everyone. Time is something we all think we understand because we experience it every day, yet in physics it quickly becomes wonderfully strange. I'm really looking forward to exploring those ideas with Jim and sharing the conversation with audiences here in Guildford."

The ticketed event, Jim Al-Khalili in conversation with Dr Noelia Noel – On Time, is dedicated to the memory of Patricia Grayburn, in recognition of her strong and lasting connection with the University of Surrey.

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Surrey Uni to probe Moon dust for rocket fuel

23 October 2026



Could magnesium found in Moon dust help future spacecraft travel further into deep space? A new European Space Agency (ESA)-funded project led by the University of Surrey aims to find out.

Researchers at the prestigious Surrey Space Centre are working with UK propulsion company Eos Space Technology Ltd to investigate whether the metal magnesium can be extracted from lunar regolith (the loose rock and dust covering the Moon) and used as a solid propellant for electric propulsion.

Electric propulsion systems can use gases such as xenon and krypton, but they would need to be transported from Earth. Producing propellant from materials already available on the Moon could reduce this reliance and potentially support future deep space exploration and cislunar commercial activity.

However, using metals such as magnesium in conventional Hall-effect thrusters (a type of electric propulsion system that uses electrically charged particles to generate thrust) presents several challenges, including condensation, unstable plasma and erosion of the channel through which the plasma travels.

The nine-month MAGPIE project (MAGnesium Propulsion from In-Situ Extraction on the Moon) aims to tackle these barriers by testing a novel Hall thruster design and assessing, from extraction through to propulsion, whether lunar-sourced magnesium could become a viable propellant for future spacecraft.

Dr Sungwoo Lim, Principal Investigator of MAGPIE, and Senior Lecturer in Space Applications, Exploration and Instrumentation at the Surrey Space Centre, University of Surrey, said:

“The exciting question behind MAGPIE is whether spacecraft could one day use a resource that is already available on the Moon instead of having to carry all of their propellant from Earth.

“We are proposing to melt the regolith and dust to see if it is possible to extract usable magnesium on the Moon’s surface. Using the specialist facilities here at Surrey Space Centre, we will confirm the effect of changes on how thrusters perform and will develop a way of feeding in magnesium.”

The research team will assess how much magnesium could be obtained from different types of lunar regolith, test ways of extracting it and develop a system for feeding the metal into an electric thruster. They will then test how the thruster performs with different propellants and how tolerant it is to impurities in the magnesium.

Dr Szymon Dworski, CEO and Co-Founder at Eos Space, said:

“We will provide the first dataset grounded in actual experimentation which links lunar extraction pathways to a functional thruster architecture. We hope to define the feasibility envelope for metallic-propellant electric propulsion, which will enable future lunar mobility and orbital logistics concepts that do not rely on propellants that are launched from Earth.”

Running from September 2026 to May 2027, the MAGPIE project is backed by £112,795 in funding through the European Space Agency’s Open Space Innovation Platform (OSIP), which supports novel ideas for new space technologies and applications.

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Dorking’s wartime refugee committee records go online for the first time

23 October 2026



Rich historical records of how the small town of Dorking sheltered people fleeing Nazi persecution during World War Two are now fully searchable and publicly accessible online, thanks to a partnership between the University of Surrey and Dorking Museum.

Formally launched today (24 September), dorkingrefugeearchive.org digitises the papers of the Dorking and District Refugee Committee – a group of volunteers who were able to find housing, work and medical care for refugees arriving in the Surrey town between 1938 and 1949. Until now, the records, which are frequently requested by researchers, have only existed in paper form at the Dorking Museum.

The website organises the committee’s work into five themes – solidarity, caring for refugees, children, the post-war years and the people involved.

In collaboration with the history department at Dorking’s Ashcombe School, the project has also produced teaching resources, which are freely available to other schools, researchers and community groups.

Professor Constance Bantman, co-project lead and Head of Literature and Languages at the University of Surrey, said:

“Making this archive accessible means the stories held in these records, of both the refugees and the people of Dorking who supported them, can finally reach the audience they deserve. It is a resource for researchers, but just as importantly, it’s a resource for the town itself.”

Surrey first announced the project in May 2026, sharing individual stories held within the collection, including that of Sir Erich Reich, who arrived in Britain on a Kindertransport in 1939. Ralph Vaughan Williams (the composer) personally brought the four-year-old to safety in Dorking.

Dr Beth Palmer, co-project lead from the University of Surrey, said:

“These remarkable papers hold enormous detail, individual cases, letters, decisions that changed lives. Dorking’s history as a place of welcome and support is genuinely remarkable, and until now, only a small number of people knew about it. Putting the archive online, alongside resources for schools, means this chapter of Surrey’s history can be taught, studied and understood well beyond the archive’s four walls.”

Kathy Atherton, Chairman of the Dorking Museum, said:

“The Refugee Committee papers are among the archive’s most frequently requested resources. Digitisation not only opens them up to a far wider audience but also protects the physical fabric of the collection from over-handling by researchers.”

Surrey University

Related reports

- Dorking’s role as a refuge from Nazi oppression — the town’s organised support for people fleeing Nazi persecution from 1938. epsomandewelltimes.com
- Ugandan Asian refugees in Surrey 50 years on — recalls Surrey’s response to the 1972 expulsion from Uganda. epsomandewelltimes.com
- Flight of refugees: history repeating? — connects earlier refugee experiences with the work of the Epsom and Ewell Refugee Network. epsomandewelltimes.com
- Ukrainian refugees made welcome by King’s rep. — Surrey’s Vice Lord Lieutenant welcomes Ukrainians who found refuge in the county. epsomandewelltimes.com
- Epsom and Ewell Borough of Sanctuary — recognition of the borough’s continuing welcome to refugees of all nationalities. Epsom & Ewell Times

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Does Epsom and Ewell have the geo-thermal energy to solve our pothole problems?

23 October 2026



Could geothermal roads help prevent potholes before they form? Surrey trial aims to find out.

The UK’s pothole problem could one day be tackled from beneath the road surface, as researchers at the University of Surrey launch a pioneering trial that uses heat stored underground to keep roads cooler in summer, warmer in winter and less prone to damage.

The Thermo-active Roads for Heat Harvesting and Pavement Temperature Regulation project will test whether a ground-source heating and cooling system can regulate road temperatures throughout the year – helping roads better withstand increasingly extreme weather while reducing the carbon footprint of highway maintenance, improving safety and reducing the inconvenience of roadworks.

The system works by embedding a network of heat exchange pipes beneath the road surface, running through both the asphalt and the layers below. During summer, water circulating through the pipes absorbs heat from the asphalt and transfers it to a 100-metre-deep borehole, where it is stored underground. In winter, that heat is circulated back through the pipes to warm the road surface, helping to prevent ice from forming and reducing the freeze-thaw cycles that contribute to potholes.

Installation has already begun in the Senate House car park on the University’s Stag Hill campus, with the first phase of the trial underway and the second phase starting in mid-August 2026. Once operational, researchers will monitor the system over a number of years using underground sensors to assess how effectively it regulates road temperatures.

Project lead, Dr Benyi Cao, who is a Senior Lecturer in Geotechnical Engineering at the University of Surrey and Royal Academy of Engineering Research Fellow, said:

“Rather than reacting to potholes after they’ve formed, we’re asking how we can prevent them in the first place. Potholes are more than an inconvenience – they are a safety hazard; they disrupt journeys and are costly to repair. Our project will explore whether geothermal technology can help prevent that damage from happening at scale.”

Unlike many emerging infrastructure technologies, Surrey’s project uses mature, readily available materials, including standard plastic pipework and water circulation pumps, making future deployment both practical and affordable.

Previous studies in Europe and the United States have explored similar concepts, but Surrey’s project will provide detailed real-world evidence of how the technology performs in UK conditions.

As well as monitoring the road itself, the team will measure air temperatures above the test section to investigate whether cooler pavements could also reduce surrounding air temperatures during periods of extreme heat.

Dr Nikolas Makasis, Lecturer in Civil Engineering at the University of Surrey and project co-investigator, said:

“This trial will give us real-world evidence of how geothermal road systems perform outside the laboratory. If the results are promising, road authorities will have the evidence they need to deploy this technology to create longer-lasting roads, reduce maintenance costs and make transport infrastructure more resilient to a changing climate.”

The project is funded through Dr Benyi Cao’s Royal Academy of Engineering Research Fellowship, with additional support from Surrey County Council’s Lane Rental Scheme.

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Image: Construction underway outside Senate House, University of Surrey. Image credit: University of Surrey.

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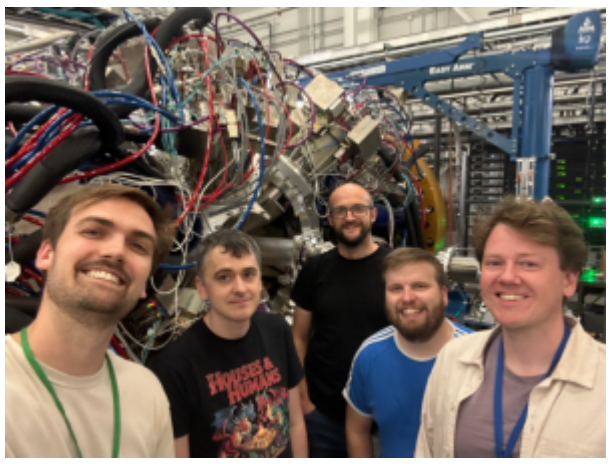
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Surrey leads first nuclear science experiment with world’s most advanced gamma-ray detector

23 October 2026



Nuclear physicists at the University of Surrey have become the first to carry out a scientific experiment using the world’s most advanced gamma-ray spectrometer – investigating a sudden change in the shape of the atomic nucleus that could challenge existing theories.

Nuclear physicists at the University of Surrey have become the first to carry out a scientific experiment using the world’s most advanced gamma-ray spectrometer – investigating a sudden change in the shape of the atomic nucleus that could challenge existing theories.

The experiment took place at the Facility for Rare Isotope Beams (FRIB) in Michigan, USA, using the newly delivered and characterised Gamma-Ray Energy Tracking Array (GRETA). Led by Lawrence Berkeley National Laboratory (LBNL) and delivered by a collaboration with Argonne National Laboratory, Oak Ridge National Laboratory and FRIB, GRETA is a $58 million detector designed to reveal the structure of atomic nuclei in unprecedented detail.

Working with collaborators from FRIB and Lawrence Berkeley National Laboratory, the Surrey team investigated a radioactive isotope of germanium to help answer a long-standing question about the shape of its atomic nucleus.

For many years, physicists predicted that the nucleus should resemble a rugby ball. However, more recent evidence has suggested it could instead be flattened like a disc – a result that would challenge current theories describing how protons and neutrons behave inside the nucleus.

Dr Jack Henderson, Co-Project Investigator, UKRI Future Leaders Fellow and Senior Lecturer at the University of Surrey’s School of Mathematics and Physics, said:

“Beam time at facilities like FRIB is exceptionally competitive, with proposals assessed by an international panel of experts. Being selected to lead the first scientific experiment using GRETA is an incredible achievement for us here at Surrey.

“Nuclear physicists deliberately study the most unusual atomic nuclei because they provide the toughest tests of our understanding. In this case, we wanted to investigate whether this isotope of germanium really does have an unexpected disc-like shape – a bit like chocolate Smarties.”

GRETA uses highly segmented high-purity germanium detectors to detect, localise and track gamma rays emitted by unstable atomic nuclei, allowing scientists to study their structure with unprecedented sensitivity and precision. Compared with the detector originally planned for the germanium experiment, GRETA is around five times more efficient, meaning measurements can be completed faster and with far greater precision.

Because access to rare isotope beam facilities is limited, GRETA’s efficiency enables scientists to study more exotic, short-lived isotopes within the available beam time.

Beyond Surrey’s experiment, GRETA opens up new opportunities to study how the elements are formed in explosive astrophysical events and deepen scientists’ understanding of how protons and neutrons interact within the atomic nucleus. Its exceptional sensitivity also allows researchers to detect tiny signals hidden within complex datasets and investigate increasingly rare isotopes that were previously beyond reach.

Paul Fallon, GRETA project director and interim director of Berkeley Lab’s Nuclear Science Division, said:

“The completion of GRETA and the first installation for physics experiments is a major milestone. This is the result of years of effort from a very big team.”

The experiment was led by Dr Jacob Heery, a postdoctoral research assistant at the University of Surrey, whose proposal secured the highly sought-after beam time after being selected by an international panel of experts.

Jacob Heery said: “Securing the first scientific experiment using GRETA is a huge achievement within the nuclear physics community. The detector gives us a level of sensitivity we’ve never had before, allowing us to investigate extremely rare isotopes that were previously beyond reach. We’re only just beginning to explore what’s possible, and I hope this will be the first of many collaborations between Surrey, FRIB and the GRETA team.”

Analysis of the experiment is now underway. The work formed part of the JANUS (Joint Arrays for Nuclear Structure) collaboration between FRIB, Lawrence Berkeley National Laboratory and the University of Surrey. It also builds on Surrey’s leadership of the £3.1 million FAUST project, which is developing a next-generation detector system that will

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operate alongside GRETA in future experiments.

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Photo: Credit University of Surrey. Caption: From left to right: Chris Cousins (Surrey), Stephen Gillespie (FRIB), Jack Henderson (Surrey), Tom Parry (FRIB – Surrey PhD), Daniel Doherty (Surrey).

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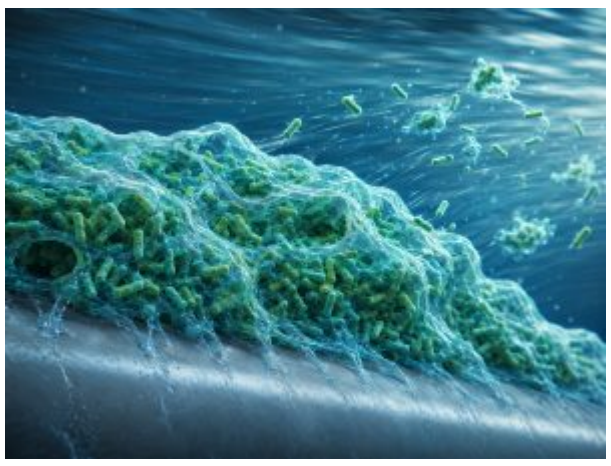
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Surrey University leads research against anti-biotic resistance

23 October 2026



Faster and more effective ways to treat *pseudomonas aeruginosa*, a bacterium identified by the World Health Organization (WHO) as one of the most life-threatening pathogens, could be on the cards thanks to a first-of-its-kind 3D computer model developed by the University of Surrey.

The model has shown how *pseudomonas aeruginosa* grows and reshapes its protective layer and spreads to new surfaces. The WHO estimates that bacterial antimicrobial resistance – where antibiotics are no longer effective – was directly responsible for 1.27 million deaths worldwide in 2019 alone.

In a study published in npj Biofilms and Microbiomes, researchers used BioDynaMo, an open-source simulation platform developed as part of an international collaboration involving the University of Surrey and partners worldwide, to create a three-dimensional agent-based model (ABM) that recreates how *pseudomonas aeruginosa* forms biofilms.

Biofilms are communities of bacteria encased in a protective sticky layer made up of sugars, proteins and DNA that allows them to cling to surfaces and resist antibiotics. For Pseudomonas aeruginosa, these biofilms commonly form in flowing environments such as catheters and plumbing systems.

Unlike previous computer models, the Surrey-developed ABM captures how biofilms grow under constant fluid flow – similar to real-world conditions – and how the bacteria naturally break away from them to spread and colonise new surfaces. The team validated the simulation against laboratory experiments, demonstrating that it accurately reproduces the growth, structure and detachment patterns seen in real bacterial biofilms.

Ryan Bournes, postgraduate researcher at the University of Surrey and lead author of the study, said:

“Biofilms are incredibly difficult to study because many of the important interactions happen at a microscopic level. Our model allows us to simulate these processes in a virtual environment, making it much easier to test new ideas and understand how these bacteria spread without solely relying on costly and time-consuming laboratory experiments.”

As well as helping scientists study *pseudomonas aeruginosa*, the modelling framework could be adapted to investigate other biofilm-forming bacteria and predict how factors such as fluid flow, surface design and bacterial behaviour influence the spread of infection.

Dr Roman Bauer, Senior Lecturer at the University of Surrey’s Computer Science Research Centre and BioDynaMo spokesperson, said:

“Antimicrobial resistance is steadily rising due to the overuse and misuse of antibiotics, so finding faster and smarter ways to understand the behaviour of pathogens is essential.

“Using BioDynaMo, we’ve been able to recreate for the first time how Pseudomonas aeruginosa biofilms grow, change shape and spread under flowing conditions – biological processes that would be extremely difficult, expensive or even impossible to observe directly. This gives researchers a powerful new tool for virtual testing before moving into the

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laboratory."

The research could help researchers optimise experiments, reduce laboratory costs and support the development of safer medical devices, hospital plumbing systems and other environments where harmful biofilms can form.

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Image: Artist's impression of Pseudomonas aeruginosa bacteria encased within a protective biofilm under flowing conditions.

Surrey astrophysicists explore ultra-black satellite coating to protect night sky

23 October 2026



A satellite coating made from one of the world's darkest materials could help tackle a growing threat to astronomy, according to new research led by astrophysicists at the University of Surrey.

With as many as 60,000 satellites projected to orbit Earth by 2030, scientists are seeking ways to reduce their brightness in the night sky.

In a new study published in the *Monthly Notices of the Royal Astronomical Society*, researchers demonstrate how Vantablack® 310 – an ultra-black coating developed by University of Surrey spinout Surrey NanoSystems, which co-authored the paper – could help reduce light pollution from satellites in low Earth orbit.

The growing number of satellites already in orbit has raised concerns among scientists and stargazers. Reflected sunlight from spacecraft can create bright streaks and flares that interfere with telescope observations and large-scale surveys of the night sky.

This can make it more difficult to detect faint objects, including asteroids, distant galaxies and other important astronomical phenomena.

To tackle the problem, the research team measured how Vantablack® 310 reflects light under a range of illumination and viewing conditions. They then used those laboratory measurements to simulate how a coated satellite surface would appear from the ground.

The simulations showed that the coating could make satellite surfaces significantly fainter, bringing their brightness close to the limit recommended by the International Astronomical Union for protecting astronomical observations.

The findings suggest that ultra-black coatings could provide a practical way to reduce the impact of future satellites on astronomy and the night sky.

Astha Chaturvedi, lead author of the study and a postgraduate researcher at the University of Surrey, said: "The night sky is one of humanity's oldest windows into the universe, but it is becoming increasingly difficult to see things.

"Our results show that relatively simple material choices could make a meaningful difference to how satellites affect astronomical observations without requiring major changes to mission design."

Vantablack® 310 reflects only around two per cent of incoming light. The small amount of light it does reflect is distributed more diffusely, reducing the bright flashes commonly produced by reflective satellite surfaces.

Dr Noelia Noël, co-author of the study and Senior Lecturer in Astrophysics at the University of Surrey, said: "Space is becoming increasingly crowded, creating challenges not only for astronomers but for everyone who values an unspoilt night sky.

"What is encouraging about this research is that it moves us beyond simply identifying the problem and towards developing practical, evidence-based solutions.

"As an astrophysicist at Surrey, I am particularly proud that a potential solution to this astronomical challenge has

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emerged from pioneering materials research at our own University. Vantablack® technology grew from work involving my colleague Professor Ravi Silva and was developed and commercialised by Surrey NanoSystems, demonstrating what can be achieved when astrophysics, engineering and industry work together."

James Whitfield, Applications Scientist at Surrey NanoSystems and co-author of the study, said: "Satellite constellations offer enormous benefits, but their growing brightness presents a challenge for ground-based astronomy.

"Vantablack® 310 combines ultra-black performance across a wide range of viewing angles with the durability needed for low Earth orbit. We are proud to work with the University of Surrey to help protect the night sky while supporting innovation in satellite technology."

The team is now preparing for an in-orbit demonstration aboard the Jovian-1 CubeSat mission, a student-led satellite programme involving the universities of Surrey, Portsmouth and Southampton.

The demonstration will test both the coating's performance in the space environment and whether the resulting change in brightness can be measured from the ground.

The wider Light Pollution and Sustainable Space initiative, led by Dr Noël, was named Best Sustainable Project at the University of Surrey's 2026 Sustainability Awards, recognising its systematic approach to reducing satellite brightness through material design.

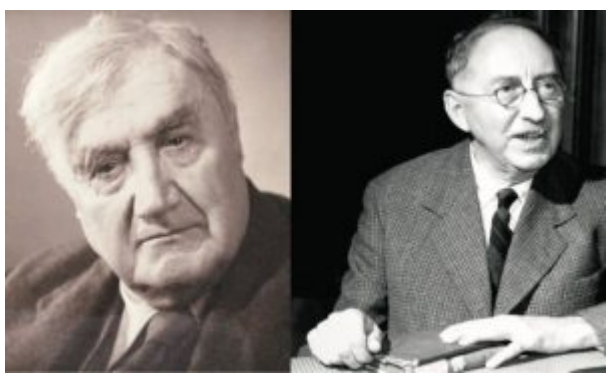
The work has also reached the international stage, with lead author Astha Chaturvedi invited to present the research at the United Nations Workshop on Dark and Quiet Skies in Vienna. Dr Noël has also highlighted the wider challenge of satellite light pollution and the need to protect the night sky through her TEDx talk.

Two identical bronze casts – one has been coated with Vantablack® 310 (Credit: Surrey NanoSystems)

Surrey University

Dorking's role as a refuge from Nazi oppression

23 October 2026



Papers documenting how novelist E.M. Forster and composer Ralph Vaughan Williams helped refugees fleeing Nazi persecution find shelter in the Surrey town of Dorking are to be made fully accessible online for the first time, through a new project led by the University of Surrey and Dorking Museum.

The Dorking and District Refugee Committee was established in 1938 to support people escaping Nazi oppression in central Europe. Operating throughout the Second World War, the committee found housing, work and medical care for refugees, and later helped Dorking's German and Czech nationals apply to Home Office tribunals to avoid internment as enemy aliens. Its records – held by Dorking Museum – are of national and international significance, containing individual stories of displacement, solidarity and community response during one of the darkest periods in modern history.

The project, Accessing Refugee History in Surrey, is funded by the Community Foundation for Surrey and led by Professor Constance Bantman and Dr Beth Palmer from the University of Surrey's School of Arts, Humanities and Creative Industries. It will create a new web-based archive, making the committee's records fully searchable and publicly available, alongside teaching and support resources for schools, researchers and community groups. A launch event and other activities to publicise this significant resource will take place later in 2026.

Among the stories contained in the records is that of Sir Erich Reich, who arrived in Britain on a Kindertransport in 1939, aged four. With his older brothers sent elsewhere, Vaughan Williams personally brought the young boy to Burchett House in Dorking – a hostel provided rent-free by the Duke of Newcastle – where refugees received support from the committee. Reich went on to become a successful entrepreneur and philanthropist, and credited Dorking with saving his life.

The committee's work extended beyond housing. When war was declared in 1939, Dorking's German nationals faced internment. The committee intervened on behalf of individuals, including Erika Schmidt-Landry, a former journalist whose husband had been interned on the Isle of Man, and who faced the prospect of placing her three children in an orphanage. Forster and Vaughan Williams took up her case directly.

Professor Constance Bantman, Head of Literature and Languages and Professor of French History at the University of Surrey, said

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“These records tell the stories of people who were forced to leave everything behind, and of a community that chose to help them. Making this archive accessible means those stories – of both the refugees and the people of Dorking who supported them – can be understood and learned from by a much wider audience. At a time when questions about refuge and displacement remain urgent, this history has a great deal to teach us.”

Dr Beth Palmer, Associate Professor in English Literature at the University of Surrey, said:

“The Dorking Refugee Committee papers are a remarkable collection. They document not just the administrative work of the committee but the human detail – the individual cases, the letters, the decisions that changed lives. Our aim is to make all of this available to researchers, educators and the public, and to provide resources that help people engage with this important chapter of Surrey’s history.”

Kathy Atherton, Chair and exhibitions, Dorking Museum, said:

“The papers of the Dorking Refugee Committee are one of the most popularly requested by researchers in the archive. Covering the period from 1938 into the post-war period and immensely detailed, the papers are of national interest in documenting the refugee experience during these years.

“We are very pleased to be working with the team from the University of Surrey to bring these papers to a wider audience whilst at the same time protecting the originals from excessive handling.”

The project will also produce teaching resources designed to support engagement with the collection, making the archive a practical tool for education alongside its research value.

Surrey University

Image: R Vaugan-Williams and EM Forster

Surrey University designs new long-life battery

23 October 2026



A new battery design that could significantly extend the range of electric vehicles and the lifespan of portable electronics has been developed by researchers at the University of Surrey’s Advanced Technology Institute (ATI).

In a study published in ACS Applied Energy Materials, researchers introduce a novel lithium-ion battery anode that delivers some of the highest energy storage capacities reported for silicon–carbon nanotube systems, while maintaining stability over hundreds of charge cycles.

Lithium-ion batteries power much of modern technology – from smartphones and wearables to electric vehicles. Graphite, the most commonly used anode material, is stable but limited in the amount of energy it can store. Silicon, on the other hand, offers far greater capacity, but it expands during charging, causing it to crack and degrade over time.

To overcome this, the research team developed a new “Vertically Integrated Silicon–Carbon Nanotube” (VISiCNT) structure. The design grows dense forests of carbon nanotubes directly onto copper foil and coats them with a thin layer of silicon, creating a flexible, conductive scaffold that can absorb expansion while maintaining performance.

The resulting anode can store a very large amount of energy for its weight. In laboratory tests, it stored more than 3500 milliampere-hours per gram – close to the maximum possible for silicon and far higher than the graphite (370 mAh/g) used in today’s batteries. It also demonstrated improved stability and performance over repeated charge cycles.

Dr Muhammad Ahmad, Research Fellow at the University of Surrey’s ATI and lead author of the study, said:

“There’s been a growing push for battery innovation, as many of today’s technologies are limited by how much energy batteries can store. Our VISiCNT design offers a practical route to harness silicon’s huge storage capability without sacrificing cycle life.

“This is a much-needed breakthrough, delivering very high capacity, fast charging and long-term durability, while bringing us closer to batteries that can power electric vehicles and everyday devices for much longer on a single charge.”

A key advantage of the new approach is that the carbon nanotubes are grown directly onto copper – the material already

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used in commercial batteries – using a scalable manufacturing process. This could make it easier to integrate the technology into existing industrial production lines.

Professor Ravi Silva, Principal Investigator and Director of the ATI, said:

“This work is an important step towards bringing CNT-silicon anodes out of the lab and into real-world manufacturing. We can grow carbon nanotube structures directly onto copper foil at speed and tailor the silicon layer for stability, meaning this approach could be integrated into existing battery production lines with minimal disruption. The technology has clear potential not just for electric vehicles, but also for grid storage and smaller batteries used in microelectronics.

“We are very proud to present yet another CNT technology following our initial research in delivering the world’s darkest material, VANTA-Black via the university spin-out Surrey NanoSystems Ltd., which is showing real-world impact of fundamental research funded by UKRI.”

As demand for energy storage grows, batteries will need to store more energy, charge faster and last longer to support the UK’s transition to Net Zero. The VISiCNT design offers a promising route to meeting these challenges and could be key to powering next-generation electric vehicles and phones.

Surrey University

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Surrey battery leads

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Surrey Space Institute could lead UK missions to the stars

23 October 2026



UK-led and UK-enabled space missions within this decade should be the hard-coded goal of the country’s space industry at every level, says the Director of the newly launched Surrey Space Institute at the University of Surrey.

Professor Adam Amara, who is also on secondment to the UK Space Agency as Chief Scientist, is calling on the sector and government partners to “stop outsourcing ambition and have belief and pride in our capabilities to operate missions on a regular basis”.

Professor Amara said:

“There is a real opportunity for ‘middle powers’, as Mark Carney put it, to partner together and compete with the established global superpowers. But this does not mean the UK space industry or the UK public should water down its ambition for what we could accomplish. It is in our gift to establish regular UK-led and operated missions.

“Mega-constellations, mega-primes, mega-states – these are the gravitational forces we feel in the world today. But the extraordinary capabilities held by the UK and our allies can be mobilised, as an antidote to the inertia of giants. The Surrey Space Institute will be a focal point for convening the technologies, the researchers and the companies that will prevent middle-power ambitions being limited by fragmentation. This must become a sectoral, a national and a collaborative commitment to contribute to the promise of space.”

The Surrey Space Institute was set up precisely to help deliver that commitment. A key focus will be to help the UK grow the skills and capabilities in today’s workforce and for future generations. The Institute will also work with its partners to conceive and operate space missions – combining hardware, software, policy and operations to tackle problems on this planet as well as in deep space. Its research will focus on three areas: managing water and climate on Earth, strengthening space systems such as satellite communications and cybersecurity, and developing the engineering, physiological, legal and economic governance solutions needed to deliver deep space exploration, operation and even settlement.

The UK space sector has a proud heritage – and Surrey has been at the heart of it, helping to drive the small satellite

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revolution that proved space could be accessible, not just the preserve of superpowers. The Surrey Space Institute will take that further – forging industry partnerships, opening up space sector facilities to small businesses, and equipping the next generation with mission-ready skills through hands-on research opportunities and specialist Continuing Professional Development programmes.

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Image: Prof Amara (Surrey Uni) against imagined background of a rocket into space from UK

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Surrey's big brains on tiny matters recognised

23 October 2026



Surrey ranked world's leading university for nuclear isomer discovery, with three physicists in global top ten

A global database of nuclear physics discoveries spanning more than a century has ranked three University of Surrey physicists among the world's top 10 for discovering and characterising nuclear isomers – rare, long-lived excited states of atomic nuclei that provide a unique window into the structure of matter and underpin modern medical imaging.

(From left to right: Professors Philip Walker, Zsolt Podolyák and Patrick Regan.)

Professors Zsolt Podolyák, Philip Walker and Patrick Regan – ranked second, third and tenth respectively in a global list of more than 1,000 researchers – are the highest-ranking university-based academics. Their work has helped position Surrey as the world's leading university for nuclear isomer discovery, an exceptional distinction in a field typically dominated by large national laboratories.

Nuclear isomers occur when protons and neutrons inside an atomic nucleus rearrange into higher-energy configurations that live far longer than typical excited nuclear states, which usually last much less than a microsecond. Some isomers survive for microseconds, years, or in extreme cases, far longer than the age of the universe.

Alongside helping scientists understand how elements are formed in stellar explosions and neutron-star mergers – and how they decay to create the matter around us – isomers are most widely used in medicine. The world's most common diagnostic imaging isotope, Technetium-99m, used in around 20 million diagnostic procedures each year, is itself an isomer, and the same techniques used to study these states allow for accurate cancer diagnosis and safe radiation dosing.

The rankings come from a new international database compiled by Professor Michael Thoennessen of Michigan State University and published in Nuclear Physics News International. The findings will be presented at the NUSTAR Annual Meeting in Germany from 23-27 February.

Zsolt Podolyák, Professor at Surrey's School of Mathematics and Physics, said:

"Discovering and characterising nuclear isomers is technically extremely challenging. These states are rare and often hidden within enormous amounts of background data. What this recognition shows is the sustained strength of Surrey's nuclear physics research and our ability to lead major experiments at the world's most advanced accelerator facilities."

The discoveries were carried out at major international accelerator laboratories, including the GSI Helmholtz Centre for Heavy Ion Research in Darmstadt, Germany, a leading hub for nuclear structure research. While the new ranking database has named GSI the world's leading laboratory for isomer discoveries, Surrey is ranked number one in isomers

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discovered by external users.

Patrick Regan, NPL Professor of Nuclear Metrology at the University of Surrey, said:

“Research into nuclear isomers helps us address some of the most fundamental questions in science – including where we come from and how the atoms that make up our bodies were formed in stellar explosions. To have three researchers from one university ranked in the global top 10 is highly unusual and reflects decades of sustained leadership in a very demanding field.”

Professor Philip Walker, Emeritus Professor of Physics at the University of Surrey, who has previously been awarded the Institute of Physics’ Rutherford Medal and the European Physical Society’s Lise Meitner Prize for his contributions to nuclear structure physics, said:

“Nuclear isomers have played a central role in shaping our understanding of atomic nuclei since their discovery in 1921. They provide some of the most sensitive tests of how protons and neutrons arrange themselves inside the nucleus and have repeatedly challenged and refined our theoretical models. I am honoured to be counted among the world’s leading researchers in this field.”

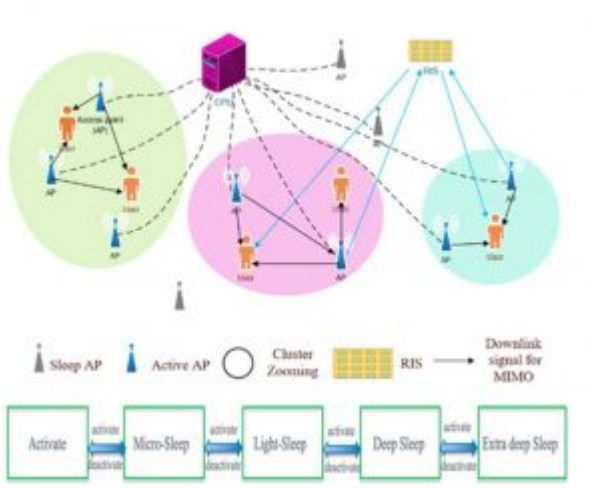
The NUSTAR (Nuclear Structure, Astrophysics and Reactions) Annual Meeting forms part of the FAIR (Facility for Antiproton and Ion Research) accelerator facility at the GSI site in Darmstadt, bringing together around 800 nuclear physicists worldwide. Surrey Professor Zsolt Podolyák serves as spokesperson for the international NUSTAR collaboration, helping to guide its scientific direction and coordinate research at one of the world’s most advanced accelerator facilities.

Photo: *From left to right: Professors Philip Walker, Zsolt Podolyák and Patrick Regan*

Surrey University

Surrey Uni finds energy-saving 5G features could cut carbon emissions

23 October 2026



An optimal combination of energy-efficient 5G network features – including AI systems that let mobile mast and antenna base stations go into sleep mode when usage is low, and phones that avoid unnecessary background network checks – could help cut indirect carbon emissions across the UK economy by around 25 million tonnes of CO2, suggests new research from the University of Surrey.

The study, published in Resources, Conservation and Recycling, challenges the assumption that 5G will inevitably increase the UK’s energy demand. Instead, researchers show that next-generation network technologies have the potential to reduce emissions across many industries that rely on the digital infrastructure that keeps them online – from finance and IT to transport and construction.

Using UK economic and emissions data, the team established an environmentally extended input–output (EEIO) model tailored specifically to the Information and Communication Technology (ICT) sector. This allowed them to trace how cutting energy use in 5G can send knock-on effects across 33 industries of the UK economy.

Working in collaboration with Professor Ming Xu from Tsinghua University, researchers looked at 10 emerging technologies – six targeting how base stations operate and four designed to make user devices more energy-efficient. These included AI-driven multi-level sleep modes, which let mobile masts switch off when demand is low, reconfigurable intelligent surfaces (RIS) such as smart panels that redirect radio waves using little power, “cluster-zooming” in cell-free MIMO networks that allow groups of small antennas to expand or shrink coverage so energy is not wasted, and smarter handset signalling.

They found that AI-powered sleep control for base stations and improved control-channel signalling on user devices delivered the most impactful reductions.

Dr Lirong Liu, Associate Professor at Surrey’s Centre for Environment and Sustainability, said:

“Smarter base stations and devices don’t just cut electricity use in telecoms – they reduce indirect emissions in the whole supply chain. The modelling framework allowed us to quantify effects that are usually hidden, especially the indirect

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emissions linked to electricity use and wider supply chains. It also gave us a clear way to compare different 5G features side by side and identify which combinations deliver the strongest environmental benefits."

The analysis shows that sectors such as financial services, IT services and computer programming gain some of the largest indirect benefits, reflecting just how much modern industries depend on digital connectivity.

Professor Pei Xiao, Professor of Wireless Communications at Surrey's Institute for Communication Systems, said:

"Many of these energy-efficient features are already on the engineering roadmap. What this study provides is a clear system-level view of where the biggest carbon wins lie – and why regulators, operators and industry should prioritise them as part of the UK's net zero transition."

The research also suggests that to unlock these benefits, 5G policy must extend beyond coverage and speed targets and encourage the adoption of energy-efficient architectures. Measures could include building energy targets into spectrum licenses that mobile operators need to use 5G frequencies, incentives for low-power network design and making sure 5G research supports the UK's broader net zero goals.

Surrey University

The full paper can be found here: https://www.sciencedirect.com/science/article/abs/pii/S0921344925005774?via%3Dihub

Image from Resources, Conservation and Recycling

Surrey University installs Vice-Chancellor number six

23 October 2026



Guildford Cathedral played host as town and gown come together to see formal installation of Professor Stephen Jarvis as Surrey's sixth Vice-Chancellor

In a ceremony that fused a message about the dual research and teaching purpose of the University, the urgency of a rapidly changing world, and age-old academic pageantry, Professor Stephen Jarvis was formally installed as the University of Surrey's sixth President and Vice-Chancellor at Guildford Cathedral on 11 February.

The academic and civic occasion was attended by community representatives and leaders – including council leaders, current and former MPs and representatives from across the region's business and academic communities, alongside hundreds of staff and students from across the University community.

Professor Jarvis shared a message of a University with deep local roots – bringing together our community of academics, students and graduates with the wider community in Guildford, Surrey and beyond to contribute to social, economic and cultural wellbeing. He spoke of a University with a critical leadership role in combining entrepreneurship and purpose to find solutions to the challenges of the modern world, and in driving economic growth, social opportunity and the future skills agenda.

A computational scientist and former Royal Society Industry Fellow who helped establish The Alan Turing Institute, Professor Jarvis is internationally recognised for his academic leadership in high-performance computing, data science and applied artificial intelligence. On these foundations, he has established himself as an institutional and sector leader. At the University of Birmingham, where he served as Provost and Vice-Principal, he played a central role in shaping strategic vision, whilst at the University of Warwick he led industry-academic partnerships in big data as Deputy Pro-Vice-Chancellor (Research).

Professor Jarvis took up the role of President and Vice-Chancellor at the University of Surrey on 15 September 2025. In his address to a packed cathedral, he said:

"The University of Surrey is defined by a dual commitment to excellence in both education and research. Ours is also a university with a clear sense of purpose: to provide an education that equips graduates for the world of work, and to undertake research that addresses some of the most urgent challenges facing society.

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“Surrey aspires to be recognised among the very best universities in the UK, with a strong and growing global reputation, reach and influence. I firmly believe that the UK needs universities like ours to navigate the opportunities and challenges of technological change, respond to critical skills needs, and prepare students for the workplaces of the future.

“The University of Surrey is deeply rooted in its local community – not only a place of learning and discovery, but also an active contributor to the social, economic and cultural wellbeing of the communities we serve. The long-term success of a place is built through a shared endeavour: universities, colleges and schools that educate and inspire; public services that protect and enable; infrastructure that connects people to opportunity; and governance that provides stability, trust and direction. Aligned, we don’t just function, we flourish.”

The installation ceremony featured a traditional academic procession with full regalia, a specially commissioned fanfare, and music from the University Chamber Choir. The fanfare has been arranged for the installation by Dr Christopher Wiley, Head of Music and Media at the University, having been originally composed by the renowned composer of the day Dame Ethel Smyth. Dame Ethel lived in Surrey for most of her life and is commemorated at the University and with a statue in her home town of Woking. More information on the fanfare is included in the Notes to Editors, below.

Professor Jarvis joins Surrey as the University continues to deliver Vision 2041, its long-term strategy to become a globally recognised top 100 leader in research, innovation, education and civic engagement. The University has achieved its highest-ever global position of 219th in the Times Higher Education World University Rankings 2026 and remains within the UK top 15 for student satisfaction, with 85% of graduates progressing into highly skilled employment.

Surrey University

The specially commissioned fanfare was originally composed in the 1930s as one of eight Fanfares for the Musicians’ Benevolent Fund, each composed by one of the eight best-known British composers of the day, based on a traditional military bugle call. The ‘Men’s Meal (2nd call)’ bugle call, also known as ‘Hot Potatoes’ was composed as a fanfare by **Dame Ethel Smyth**, who lived in Surrey for most of her life and is commemorated at the University and with a statue in her home town of Woking. As well as producing an impressive canon of musical works, Dame Smyth was a much-published author and an influential suffragette. Her fanfare was first performed by the Royal Military School Bandsmen under Captain H.E. Adkins at a Musicians’ Benevolent Fund Annual Dinner held in London’s Savoy Hotel on 8 May 1930. It was recorded by the same ensemble and performed on other occasions, but the manuscript was lost, with Dr Wiley using the 1930s recording to bring the fanfare back to life for today’s installation.

Related report:

Surrey’s suffragette composer re-imagined in many ways

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