

# From the Cosmos to Commerce: University of Surrey Leads the Way

12 January 2026



The University of Surrey has been showcasing a remarkable breadth of achievement in recent weeks, with major advances announced across fundamental science, international collaboration, digital trade policy and lifetime academic excellence.

From unlocking the origins of the universe's rarest elements, to shaping the future of UK trade infrastructure and celebrating world-leading research careers, the University's latest announcements underline its growing national and international impact.

## Unlocking the universe's rarest elements

Surrey scientists are leading a new £215,100 international research project that aims to transform understanding of how chemical elements are formed during extreme cosmic events such as supernovae, neutron-star collisions and X-ray bursts.

Funded by the Royal Society's International Science Partnership Fund, the three-year project brings together researchers from Surrey, Kyushu University and Japan's world-leading RIKEN laboratory. The team will develop and deploy cutting-edge instruments capable of measuring some of the rarest and most unstable atomic nuclei ever studied.

These exotic isotopes do not exist naturally on Earth and can only be created briefly in advanced physics laboratories. By measuring their mass and decay rates for the first time, researchers hope to refine theoretical models of nuclear structure and gain new insight into how the heaviest elements in the universe are formed.

Experiments will take place at RIKEN's Rare-Radioactive Isotope Ring, a unique facility that allows repeated observation of these short-lived nuclei. Surrey researchers will play a central role, leading the design and testing of advanced detector and data-acquisition systems in the UK ahead of the experimental programme in Japan.

The collaboration is also expected to strengthen scientific ties between the UK and Japan and reinforce the UK's position at the forefront of nuclear physics research.

## Warning over UK digital trade and border fragmentation

In a very different field, new research from Surrey Business School and the Centre for the Decentralised Digital Economy has issued a stark warning that the UK risks falling behind global competitors in digital trade unless urgent action is taken.

The study argues that the UK's digital border initiatives are fragmented, with no single organisation responsible for coordinating legislation, technology platforms and end-to-end border processes. As a result, businesses face repeated data requests, delays and uncertainty, increasing costs rather than reducing friction.

Researchers examined UK trade and border policies since 2017, including the 2025 UK Border Strategy, recent digital trade legislation and multiple government pilot projects. Drawing on international case studies and academic research, the team proposes a collaborative governance framework to guide reform.

The report calls for the government to give one body a clear mandate to orchestrate policy, digital platforms and data standards across departments. It argues that, with the right leadership, the UK has a window of opportunity to create a new digital "silk road" for trade, enabling trusted data sharing that benefits smaller firms as well as multinationals.

## Lifetime achievement recognised in materials science

Surrey's excellence in research was further highlighted by the announcement that Professor Joseph Keddie, Professor of Soft Matter Physics, has been awarded the 2026 Sir Eric Rideal Award for lifetime achievement in colloid and interface science.

Jointly awarded by the Royal Society of Chemistry and the Society of Chemical Industry, the prestigious honour recognises sustained and distinguished contributions to the field. Professor Keddie is internationally known for pioneering work on polymer colloids, sustainable materials and so-called "living materials", with applications ranging from coatings and adhesives to wastewater treatment and bioremediation.

Over a career spanning more than three decades, he has authored more than 150 academic publications, holds multiple patents and co-authored the influential book *Fundamentals of Latex Film Formation*. His work at Surrey has previously been recognised by major awards from both the Institute of Physics and the Royal Society of Chemistry.

Professor Keddie will deliver the Rideal Lecture, titled *More than Watching Paint Dry*, on 8 April 2026, presenting highlights from his research including self-layering coatings and carbon-storing "living paints".

## A university with global reach

Taken together, the announcements paint a picture of a university operating at the cutting edge across disciplines: advancing fundamental science on a global stage, influencing national policy debates, and nurturing research careers with lasting international impact.

For Surrey residents, the achievements reinforce the University of Surrey's role not only as a local institution, but as a centre of innovation and expertise with reach far beyond Guildford.

Sam Jones - Reporter



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# Epsom Christmas carols of two colleges and a council

12 January 2026



In the first and a unique festive venture for the Borough of Epsom Ewell a special carol service was held in the Chapel of St Luke, Epsom College this evening. Organised on the joint initiatives of Julie Kapsalis (CEO NESCOLT), Jackie King (CEO Epsom and Ewell Borough Council) and Mark Lascelles (Head of Epsom College).

The event brought local choirs together including NESCOLT's own choir, singers from Epsom College and the local Ukrainian choir Renaissance.

Solos were sung by Evie Kingsley, Sienna-Leigh Campbell, Benedict Raper and Caleb Mangatal-Francis.

Julie Kapsalis read from the Gospel of St Matthew 2: 1-12 and Jackie King recited her own reading "The Heart of Christmas", reprinted below.

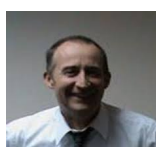
The service was officiated with humour and aplomb by The Reverend Canon Andrew Haviland.

Epsom Racecourse supported the service.

And no less a figure than the Worshipful Mayor of Epsom and Ewell, Cllr Robert Leach (RA Nonsuch) accompanied the congregation on the magnificent Chapel organ and played the processional at the end J.S. Bach's Prelude and Fugue in F from his book of 8 preludes and fugues.

The carol service was an uplifting beginning for many to the festive season and promises have been made to make it a regular feature in the Borough in future years.

Lionel Blackman



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## The Heart of Christmas

There are so many ways to tell the story of Christmas.  
Some begin with angels, some with gifts, some with the hush of falling snow.  
But however the story starts, it always finds its way to one place-  
the warmth we share when we come together.

Christmas is found in the quiet moments:  
in the smell of something baking,  
the sound of wrapping paper being carefully - or not so carefully - torn,  
in the giggles of children who can't quite sleep,

and in the gentle nod of someone who's seen many Christmases before.

It's in the messages sent to far-off friends,  
the unexpected kindness from a neighbour,  
the extra chair pulled up to the table,  
and the thought that maybe - just maybe -  
there is more that connects us than divides us.

And in this season of gathering and giving,  
we also pause for a moment to hold in our hearts  
those who are not with us tonight-  
loved ones we remember with tenderness,  
and friends or family who are far away.

We think of Christmases past -  
of laughter spilling across the table,  
carols sung a little off-key,  
hands held during snowy walks,  
stories told beside the glow of the tree.  
Those moments, though now memories,  
are treasures we carry with us -  
poignant reminders of love shared,  
and joyful times that shaped who we are.  
Their voices may have quietened,  
but their light has not dimmed.  
It lives in our hearts,  
woven into every song, every smile, every candle we light.

Distance and time may keep us apart,  
and for some, separation comes through hardship or conflict.  
Tonight, we think of them too -  
those far from home,  
those seeking safety,  
those waiting for peace.  
May they feel the warmth of the world's compassion  
and know that they are not forgotten.

For love is wonderfully stubborn;  
it travels in our thoughts, in our stories,  
and in the quiet spaces where we still feel their presence.  
Each memory, each name whispered with a smile,  
becomes part of the light that surrounds us now.

For some, Christmas means faith.  
For others, it means family, friendship, or the turning of the year.  
But for all of us, it can mean light-  
the light we share when we care,  
when we welcome,  
when we choose to hope.

So tonight, as the music rises and the candles glow,  
may we remember what truly makes this season shine:  
not the decorations or the presents,  
but the people-  
those beside us,  
those we miss,  
and those we have yet to meet.

Because the heart of Christmas is not found under a tree -  
it's found in us,  
in every act of kindness,  
every hand extended,  
every loving thought that crosses the miles or the years.

For when we give, include, and love-  
we keep the heart of Christmas alive.

Jackie King



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# Neurodiversity good for business Surrey study shows

12 January 2026



Businesses and policymakers risk missing out on workforce potential by misunderstanding neurodiverse conditions and the biological differences that shape entrepreneurial strengths, according to new research led by the University of Surrey. Instead of considering ADHD, dyslexia and bipolar conditions only as static clinical challenges, researchers build on the existing entrepreneurship literature to argue that these conditions can equip people with unique abilities that drive entrepreneurial action, innovation, and business growth.

In a study, published in *Neurodiversity in Entrepreneurship*, researchers carried out a systematic review of scientific evidence published between 2011 and 2023, mapping 139 papers and 28 core studies across business and management. Importantly, they focused on using organisational neuroscience evidence, spanning from brain activations to genetic mechanisms linked to ADHD, dyslexia and bipolar conditions.

Researchers found evidence that entrepreneurs with ADHD often show high entrepreneurial alertness and strong performance in innovation and risk taking. Dyslexic entrepreneurs may instead compensate for reading and writing challenges by developing advanced delegation strategies to accelerate business growth. Meanwhile, traits linked to bipolar conditions correlate with creativity, idea generation and willingness to pursue bold ventures.

Dr Sebastiano Massaro, co-author of the study and Associate Professor (Reader) of Organisational Neuroscience at the University of Surrey, said:

*“We often behave as if neurodiversity automatically means a deficit. The biological evidence shows something completely different. These conditions span a continuum and there is strong evidence that in entrepreneurial contexts they bring valuable strengths. Simply put, we need to stop treating them as problems to be fixed.”*

The research advocate for a shift in how businesses support programmes and employers view neurodiversity. It argues for business environments that value difference rather than seeking to normalise it and calls for practical organisational strategies that actively harness neurodiverse strengths. The study also highlights policy implications, noting that entrepreneurial settings can provide pathways to work and equality for people who are often miscategorised as unemployable.

Dr Sebastiano Massaro continued:

*“To the best of our knowledge, we are presenting the first grounded explanation of why neurodiversity matters in business by drawing a direct connection between neural mechanisms and entrepreneurial behaviour. If universities, industry and governments overlook how these biological foundations impact entrepreneurship, they might miss valuable capability hidden in plain sight.”*

Surrey University



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## Epsom celebrity visits his old college

12 January 2026



**Joe Wicks** MBE, widely known as The Body Coach, recently visited his former college, Nescot (North East Surrey College of Technology), the place where his journey into fitness and education began. His visit to Nescot was filled with inspiration, energy and memorable moments.

Joe was warmly welcomed by Nescot Principal and CEO, Julie Kapsalis, students and staff to the college. He toured the Nescot Fitness centre where Julie proudly presented him with a commemorative plaque, 'Joe's Gym' in his honour. He also signed copies of his bestselling cookbooks for staff and the college's Learning Resources Centre and was delighted to receive his original college lanyard and a thoughtful gift from the college.

Students from our Sport, Public Services and Foundation Learning courses joined Joe in the sports hall for an unforgettable workout session. Joe led the students in a fun and energetic routine, sharing his passion for fitness and wellbeing.

Sports students, Patrick and Nathan shared their thoughts on meeting Joe. Patrick said, "It's been a huge honour meeting Joe who's done so much for fitness, inspiring young kids at an early age and even raising money for charity. A good day for Nescot too." Nathan added, "It's incredible to meet Joe who's a household name and who's been to the same college as me!"

Joe's visit continued in the college theatre, where he took part in a packed Q&A session hosted by Julie Kapsalis. Staff and students gathered to hear about Joe's incredible journey and his time at Nescot.

Joe Wicks, who completed a National Diploma in Sport at Nescot in 2002, spoke warmly about his time at the college, "Nescot started me on my journey to education. The college helped me to grow and mature, and to be more independent as a learner." Speaking candidly to the students, he encouraged them to persevere, "Always try your hardest and put your heart into what you do. It won't always be easy, but never give up - give it your all."

Nescot Principal and CEO, Julie Kapsalis, said, "It has been a privilege to welcome Joe Wicks, The Body Coach, back to his hold college. His visit was particularly meaningful as his journey began here at Nescot, and we are so proud that his time here laid the foundation for a thriving career in fitness, exercise and nutrition. A huge thank you to Joe for taking the time to inspire our community with his message to stay 'Fitter, Happier and Healthier'. We look forward to welcoming him back again in the future."

At the end of the Q&A session, Julie Kapsalis presented Joe Wicks with a Nescot Honorary Fellowship, the highest accolade that the college can bestow, in recognition of his outstanding contributions to fitness, wellbeing and nutrition education, and his mission to improve the nation's health.

Nescot's NVQ Catering and Hospitality students also presented Joe with a cheque for £300 in support of his charity, The Body Coach Foundation. They fundraised by preparing and selling meals inspired by his recipes. The visit concluded with excited students lining up for a group selfie and reflecting on how Joe's message of resilience and ambition left a lasting impression.

To learn more about Joe Wicks' journey and his time at Nescot, visit our alumni feature on our website

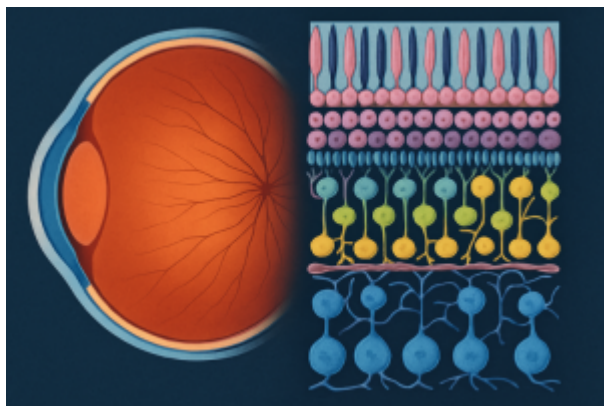
NESCOT



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## **Surrey Uni study may show way to reverse vision loss**

12 January 2026



New computer modelling could help scientists better understand how the retina regenerates, opening the door to new treatments for vision loss, according to a study from the University of Surrey.

The first-of-its-kind model is capable of detailing how the retina - the light-sensitive layer at the back of the eye - can build its complex structure from just one type of stem cell, deepening our understanding of how sight develops and how its development could inform studies of injury or disease.

Using advanced agent-based modelling, the research team have simulated key stages of retinogenesis - the process by which identical progenitor cells diversify into the six types of neurons that make up the retina.

The model shows how simple genetic rules and subtle randomness work together to form the retina's precise layered architecture, a structure essential for how we see.

The paper was presented at IWWBIO 2025 and published in Lecture Notes in Computer Science (LNCS).

Cayla Harris, lead researcher from the University of Surrey's Nature Inspired Computing and Engineering Group, said:

*"The beauty of biology is that complex structures can emerge from simple rules. Our simulations show how genetically identical cells can, through intrinsic bias and chance, self-organise into the retina's highly ordered layers - a pattern that underpins how we see the world."*

Using the BioDynaMo software platform, the team modelled virtual "cells" that grow, divide and make fate decisions based on internal gene-regulation logic, mimicking biological behaviour. They tested different network designs for how genes might interact when cells decide what kind of neuron to become.

Two particular designs - called the Reentry and Multidirectional models - reproduced real biological data most accurately, suggesting that retinal cells may make their fate decisions through overlapping and flexible genetic pathways, rather than a fixed sequence.

This approach could help researchers better understand not only healthy eye development but also what happens in retinal diseases and in regenerative research exploring how stem cells might rebuild tissue.

Dr Roman Bauer, senior author on the study from the University of Surrey, added:

*"Computational modelling gives us a powerful way to explore biological processes we can't easily observe in real time. By simulating every cell's decision and interaction, we can test hypotheses about how tissues like the retina form - and how to restore them when damaged."*

This research is supported by the Engineering and Physical Sciences Research Council (EPSRC).

Cayla Harris added:

*"We think that our research is a step forward in linking genetics, computation and developmental biology to understand one of the body's most complex neural structures."*

Surrey University



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## Is Epsom and Ewell ideal for remote working?

12 January 2026



When remote work is supported well, it can raise job satisfaction, reduce commuting stress and give people meaningful control over their work life balance. However, the recent drive by some organisations to bring staff back into offices risks reversing these gains and widening the gap between regions, according to a new study that University of Surrey researchers contributed to as part of the R-Map project.

A new study, published in Nature's Scientific Data, details how access to reliable internet, local services, green space and community facilities can determine whether remote work improves quality of life or deepens inequalities. The research is based on a survey of more than 20,000 workers from across Europe and explores how remote work is influencing relocation patterns, wellbeing, job satisfaction, productivity, travel behaviour and the pull between urban and rural living.

The study gathered responses from people living and working remotely in Europe through a large, structured survey. Participants were asked about their preferences, experiences and the practical realities of working away from a traditional office. The survey was distributed across multiple languages and included workers in both rural and urban environments.

The study highlighted that remote work, either fully or partly i.e. hybrid work, is often associated with higher job satisfaction and a stronger sense of personal autonomy, particularly because people can choose where and when they work. This can support better work life balance, reduce commuting stress and create more space for family time or personal priorities.

However, where remote work is discouraged or unsupported workers may lose these benefits. Returning to a daily commute or living far from their workplace can limit choice, increase strain and reduce the positive local impact remote work can bring to smaller towns and rural communities.

Dr Nikolas Thomopoulos, Principal Investigator of the study from the University of Surrey, said:

"Remote work is changing how our towns and cities function and who gets access to good and rewarding jobs. When remote work is supported properly it can reconnect residents and tourists with their communities and boost local economies. When it is not, it risks deepening divides. We are hopeful that this research will provide policymakers with the clear evidence needed to shape a fairer and more sustainable future of work."

Dr Tracy Xu, Co-Director of the Future of Work Research Centre at the University of Surrey, said:

"Our research shows that remote work can genuinely improve quality of life by giving people more choice in where and how they live. Without strong digital access and supportive environments, remote workers can feel isolated and overlooked. This study gives us the detail needed to understand where remote work thrives and where it needs to be improved."

The R-Map findings suggest that remote work can revitalise some rural or suburban areas, especially when people are able to move away from expensive city centres in search of more space, affordability or proximity to nature.

However, the benefits are not shared equally. The study shows that access to everyday amenities such as green spaces, grocery shops, healthcare and public transport within a short walking distance plays a key role in whether remote work feels sustainable and supportive of wellbeing. Where these amenities are lacking, and where digital connectivity is weak, remote workers were more likely to report feelings of isolation and difficulty maintaining work life balance. In contrast, participants with reliable internet and access to local services reported greater satisfaction with remote work and stronger ties to their communities.

Surrey University



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## Nescot students' artwork brightens Ewell East Station

12 January 2026



Artwork by Nescot's Level 3 Art and Digital Design students is now on display at Ewell East Station as part of

Art@theStation, a national initiative bringing young artists' work into public transport spaces.

Commissioned by The Arts Society Epsom and funded by Govia Thameslink Railway, this is the second collaboration with the college. Their first commission, exhibited in 2024, is still on show at Epsom Station.

### **"Sense of Place - Ewell"**

Students were asked to create portrait-format designs themed around *Sense of Place - Ewell*, using bold silhouettes and bright colours to reflect local landmarks. Four students - Jess, Emma, Cate and Sarah - were selected for display and each received a certificate and a £25 prize.

Sarah's design features Bourne Hall Museum. She said working collaboratively "just like in the art industry" had been one of the highlights, adding that the digital skills gained at college had been "invaluable". Cate's design, inspired by Bourne Hall Park and the Dog Gate entrance, left her "thrilled" when selected. She said researching the history behind her piece had been fascinating and that seeing her work displayed publicly was "a proud moment".

Jess and Emma, whose pieces depict well-known Ewell Village landmarks, said the project strengthened their digital design skills and that they enjoyed working as a team.

### **Building skills and confidence**

Tutor Demonstrator Miles Merritt said the project offered "a brilliant opportunity" for students to build confidence and professional experience. He praised the chance for learners to work to a live brief and deadline and to enhance their portfolios ahead of further study.

He added thanks to The Arts Society Epsom for providing a platform to showcase student creativity, saying the college looked forward to future collaborations.

### **Praise from The Arts Society Epsom**

Angie Child, Project Lead for Art@theStation, said she was "delighted" with the students' graphic designs, noting their use of vibrant colour to bring clarity and impact to familiar Ewell landmarks. She said each student showed a "mature approach to commercial design" and a clear passion for pursuing creative careers. She also commended Miles Merritt for supporting the students throughout the project.

### **Supporting young artists**

Art@theStation is part of a wider national initiative developed by The Arts Society, giving young artists the rare chance to exhibit work in waiting rooms, ticket halls and on platforms across Britain. The scheme aims both to improve the station environment and to give travellers an unexpected cultural experience.

**Photo:** (left to right): Tudor Evans, Ewell East Station Manager; Alistair McGeachey, Chair of The Arts Society Epsom; Nescot Level 3 students Jess, Emma, Sarah and Cate; and project lead Angie Child.

Sam Jones - Reporter



Related reports:

Ewell's Nescot student's work selected for Origins Creatives 2025

Ewell East underpass transformed by new community mural

Young Artists Brighten Up Tattenham Corner Station

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## **Surrey's Satellite bio-diversity project promoted at COP30 Brazil**

12 January 2026



Surrey's Space4Nature project, which uses satellite data and community science to protect biodiversity across the county, is currently being showcased by the UK Government at the COP30 UK Pavilion in Belém, Brazil (10–21 November 2025). The display forms part of the UK's official presentation of research and innovation tackling global climate and nature challenges.

Co-led by the University of Surrey's Centre for Environment and Sustainability (CES) in collaboration with Surrey Wildlife Trust, Buglife, and the Painshill Park Trust, Space4Nature brings together scientists, local communities and conservation groups to map and monitor key habitats across Surrey - from chalk grasslands to heathlands and acid grasslands that support some of the nation's rarest species.

Using advanced satellite imagery and artificial intelligence trained with data from local volunteers, the project can classify habitats to Level 4 of the UKHab system - producing one of the most detailed environmental maps of its kind. This allows conservation partners to pinpoint where biodiversity is under threat and focus restoration efforts, such as reconnecting fragmented chalk grasslands - often called the "rainforests of Europe" for their carbon storage and rich biodiversity.

Surrey Wildlife Trust plays a central role in Space4Nature, leading the project's citizen science programme, training volunteers and coordinating the collection of field data that makes its satellite and AI mapping possible. The Trust's on-the-ground expertise connects technology and conservation, turning local knowledge into invaluable data for protecting Surrey's landscapes.

Dr Ana Andries, Lecturer in Remote Sensing and GIS at the University of Surrey, and project lead, said:

"We're using satellite data and artificial intelligence in a way that directly supports conservation on the ground. Citizen scientists help train our machine learning models, thus turning local field data into high-resolution habitat maps that reveal where biodiversity is under threat. To see our work featured on a global stage at COP30 highlights how our region's innovation and collaboration can help shape the future of biodiversity monitoring."

Andrew Jamieson, Space4Nature Project Manager at Surrey Wildlife Trust, says:

"It's time for conservation organisations like ours to step outside traditional boundaries and focus not just on land management and individual species recovery, but also on delivering the tools and partnerships that will drive change on a landscape level. This project exemplifies that approach."

Space4Nature was among the first projects in the United Kingdom to receive Space for Climate Observatory (SCO) accreditation from the UK's Space4Climate network, recognising its excellence in using Earth observation data to tackle environmental challenges. This year, it has been selected as one of just 19 organisations featured in the UK Government's Pavilion at COP30, with a video and QR-linked display presented by government representatives throughout the conference.

Dr Zoe M Harris, Director of Surrey's Centre for Environment and Sustainability and Co-Director of the Institute for Sustainability, said:

"The Centre for Environment and Sustainability was founded on the idea that solving environmental challenges means bringing disciplines and people together. Space4Nature embodies that vision - combining engineering, data science and community insight to create practical tools for nature recovery. Seeing this work recognised at COP30 highlights Surrey's role as a global leader in sustainability research and innovation."

Surrey University



Image: Centre for Environment and Sustainability, University of Surrey

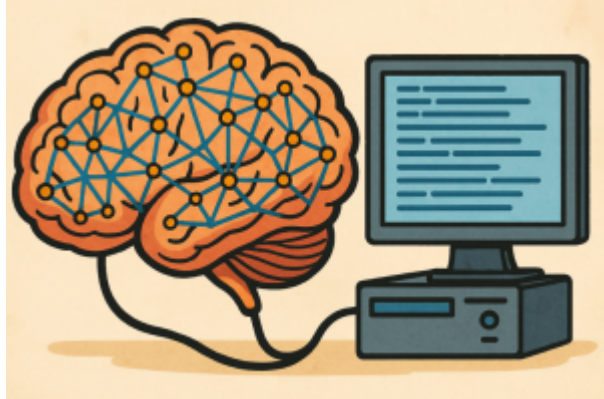
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Epsom and Ewell Times adds - the Surrey project is one of only twenty presented by the UK at the COP30 summit. See the full list [HERE](#).

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# Surrey Uni show AI systems based on the human brain's save energy

12 January 2026



Artificial intelligence (AI) could soon become more energy-efficient and faster, thanks to a new approach developed at the University of Surrey that takes direct inspiration from biological neural networks of the human brain.

In a study published in *Neurocomputing*, researchers from Surrey's Nature-Inspired Computation and Engineering (NICE) group have shown that mimicking the brain's sparse and structured neural wiring can significantly improve the performance of artificial neural networks (ANNs) - used in generative AI and other modern AI models such as ChatGPT - without sacrificing accuracy.

The method, called Topographical Sparse Mapping (TSM), rethinks how AI systems are wired at their most fundamental level. Unlike conventional deep-learning models - such as those used for image recognition and language processing - which connect every neuron in one layer to all neurons in the next, wasting energy, TSM connects each neuron only to nearby or related ones, much like how the brain's visual system organises information efficiently. Through this natural design, the model eliminates the need for vast numbers of unnecessary connections and computations.

An enhanced version, called Enhanced Topographical Sparse Mapping (ETSM), goes a step further by introducing a biologically inspired "pruning" process during training - similar to how the brain gradually refines its neural connections as it learns. Together, these approaches allow AI systems to achieve equal or even greater accuracy while using only a fraction of the parameters and energy required by conventional models.

Dr Roman Bauer, Senior Lecturer at the University of Surrey's School of Computer Science and Electronic Engineering, and project supervisor, said:

*"Training many of today's popular large AI models can consume over a million kilowatt-hours of electricity, which is equivalent to the annual use of more than a hundred US homes, and cost tens of millions of dollars. That simply isn't sustainable at the rate AI continues to grow. Our work shows that intelligent systems can be built far more efficiently, cutting energy demands without sacrificing performance."*

Surrey's enhanced model achieved up to 99% sparsity - meaning it could remove almost all of the usual neural connections - but still matched or exceeded the accuracy of standard networks on benchmark datasets. Because it avoids the constant fine-tuning and rewiring used by other approaches, it trains faster, uses less memory and consumes less than one per cent of the energy of a conventional AI system.

Mohsen Kamelian Rad, a PhD student at the University of Surrey and lead author of the study, said:

*"The brain achieves remarkable efficiency through its structure, with each neuron forming connections that are spatially well-organised. When we mirror this topographical design, we can train AI systems that learn faster, use less energy and perform just as accurately. It's a new way of thinking about neural networks, built on the same biological principles that make natural intelligence so effective"*

While the current framework applies the brain-inspired mapping to an AI model's input layer, extending it to deeper layers could make networks even leaner and more efficient. The research team is also exploring how the approach could be used in other applications, such as more realistic neuromorphic computers, where the efficiency gains could have an even greater impact.

Surrey University



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**Epsom and Ewell Times** asked ChatGPT to explain the above press release from Surrey University and this is what it wrote:

"Artificial intelligence models like ChatGPT rely on vast numbers of digital connections between "neurons", mimicking how the human brain works - but they use enormous amounts of electricity to do it. Researchers at the University of Surrey have developed a new way to wire these networks that could make them dramatically more efficient.

Instead of connecting every artificial neuron to every other, the Surrey team copied the brain's habit of linking only

nearby or related neurons. Their method, called **Topographical Sparse Mapping**, cuts out unnecessary connections, saving energy while maintaining accuracy. A refined version, **Enhanced Topographical Sparse Mapping**, even “prunes” the network during learning – like the brain trimming unused connections as it develops. The result is AI that can train faster, use less memory and consume less than one per cent of the energy of current systems.

If this approach proves scalable, it could mean greener, cheaper and quicker AI – taking inspiration not from bigger computers, but from the extraordinary efficiency of the human brain.”

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## Surrey solar study shows cheapest energy source

12 January 2026



Solar energy is now so cost-effective that, in some of the sunniest parts of the world, it costs as little as two pence to produce one unit of electricity – cheaper than power generated from coal, gas or wind. That is the finding of a new study by researchers at the University of Surrey’s Advanced Technology Institute (ATI), who say solar photovoltaic (PV) technology has become the key driver of the world’s shift to clean, renewable energy.

Publishing their work in *Energy and Environment Materials*, the Surrey team point out that the global capacity of installed solar power passed 1.5 terawatts in 2024 – double the figure in 2020 and now enough to supply hundreds of millions of homes.

Professor Ravi Silva, Director of the ATI and co-author of the study, said: “Even here in the UK, a country that sits 50 degrees north of the equator, solar is the cheapest option for large-scale energy generation. Simply put, this technology is no longer a moonshot prospect but a foundational part of the resilient, low-carbon energy future that we all want to bring to reality.”

The study notes that the price of lithium-ion batteries has fallen by almost 90 per cent since 2010, making combined solar-plus-storage systems as cost-effective as gas power plants. Such hybrid installations allow solar energy to be stored and released when required, turning an intermittent source into a dispatchable one that helps balance grid demand.

However, the researchers warn that the next major challenge lies in connecting vast amounts of solar generation to existing electricity networks. In regions such as California and China, high solar output has already caused congestion on power lines and wasted energy when supply outstrips demand. Co-author Dr Ehsan Rezaee said: “Connecting growing levels of solar power to electricity networks is now one of the biggest challenges. Smart grids, artificial-intelligence forecasting and stronger links between regions will be vital to keep power systems stable as renewable energy use rises.”

Professor Silva added that advances in materials such as perovskite solar cells could raise energy output by up to 50 per cent without using additional land. “With the integration of energy storage and smart grid technologies, solar is now capable of delivering reliable, affordable and clean power at scale,” he said. “But progress depends on consistent, long-term policy support. The US Inflation Reduction Act, the EU’s REPowerEU plan and India’s Production Linked Incentive scheme show how clear direction can drive investment and innovation. Sustained commitment and international collaboration will be essential if we are to accelerate the world’s transition to a clean and reliable energy system.”

Across the UK, renewable sources supplied just over half of all electricity in 2024 – the first time that clean generation surpassed fossil fuels. Wind power dominated with nearly 30 per cent of total generation, while solar contributed about 5 per cent, equivalent to one unit in every ten generated from renewables. Biomass, biogas and hydro made up most of the rest. When nuclear is included, low-carbon sources together delivered around two-thirds of the UK’s electricity.

Globally, renewables produced about 30 per cent of electricity in 2024, with wind and solar together accounting for roughly 15 per cent and expanding faster than any other energy source. The International Energy Agency expects global renewable capacity to rise by almost half again before 2030, with most new investment in solar.

While Britain’s relatively low sunshine hours limit its solar potential compared with southern Europe or Asia, domestic generation costs have plunged, making rooftop and community-scale arrays increasingly popular. Planning delays and grid connection backlogs remain obstacles, but the UK Government has set a target to increase installed solar capacity fivefold by 2035.

As Professor Silva observed, solar power has crossed the threshold from promise to practicality. The next test, he said, is building the smart, interconnected systems and political consensus needed to make affordable solar energy work everywhere – even in less sunny countries like the UK.

Sam Jones – Reporter



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## Surrey inequality report challenges 'leafy county' myth

12 January 2026



The idea that Surrey is all leafy lanes, golf courses and big houses is a myth, according to a new report. Despite being a prosperous area of the country, the county still has thousands of residents struggling with inequality, isolation and poverty.

The report, *Understanding Inequality in Surrey*, lays bare the scale of the challenge. It found that residents from Bangladeshi, Pakistani, Black African, Roma and Gypsy/Traveller communities are far more likely to live in poverty, overcrowded housing and poor health. Gypsy and Irish Traveller residents experience the worst health among working-age people, and Bangladeshi-origin residents experience the worst health among over-65s.

The study also found that, while unemployment is rising more generally, racial minority groups are more than twice as likely to be unemployed compared to White British residents. Even degree-holders from minority backgrounds are still less likely to get into senior jobs or management positions than their white counterparts.

Cllr Mark Nuti, Cabinet Member for Health and Wellbeing, said: "We're in a very changing world at the moment. There is a lot going on politically in our society and people are feeling quite fragile in places. Especially when we're looking at equality, diversity and inclusion, there are people out there who are feeling very alone at the moment. We do have people that are living on the poverty line, we do have from different races [and] different ethnicities that aren't feeling part of these communities who are feeling alone - as everywhere else in the country. The most urgent action we need to do as a council, and as individuals, is to make sure that we identify where those people are and we have wraparound support for people to make sure they aren't feeling alone or feeling scared in their own home. And they do know the majority of us respect and love them, and want them to be part of our community and our county."

The fresh report comes after a 2023 peer review which praised Surrey County Council for improving its culture but also found it lacked a real understanding of how inequality shows up in local communities, prompting this study.

Cllr Robert Hughes added: "I think the image of Surrey being a county of golf courses, wealthy people and pretty villages are a small part of what Surrey is in reality."

The county boasts around 120 golf clubs - many of which are world class - alongside million-pound mansions, outstanding private schools and leafy green countryside. Yet the report exposed how 20,000 children are growing up in poverty, disabled residents are far less likely to find work, and young people with additional needs and disabilities are four times as likely to have experienced mental ill health compared to the wider population. Women are also hit harder by the cost of living, with the gender pay gap in Surrey reaching a staggering 21 per cent, well above the national average, according to the study.

Officers told a Resources and Performance Select Committee on October 2 that the study will help to alert council departments to how these disadvantages are often linked to an exacerbated socio-economic disadvantage. The new Equality, Diversity and Inclusion framework aims to bring councils, charities and communities together to make sure support actually reaches the people who need it. It looks at everything from jobs and housing to health, education and digital access.

Local groups have already started using the data to apply for funding and shape projects - a sign, councillors say, that the work is already making a difference. The data will be used to make services easier to access, tackle inequality in schools and workplaces, and build stronger communities.

Council officers admit the financial squeeze is real, but argue investing now will save money long-term. The idea is that better support means fewer people reaching crisis point and more residents able to thrive. The next stage is running focus groups with young people, disabled residents and minority communities to make sure the priorities match lived experience.

Emily Dalton LDRS

Aerial view of one of Surrey's less well of wards - Tattenham and Preston Hawe

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## Defibrillators delivered by drone?

12 January 2026



A groundbreaking project testing how drones could be integrated into the UK's 999 emergency response system to deliver defibrillators to out-of-hospital cardiac arrest patients has been launched by the **University of Surrey**, **Air Ambulance Charity Kent Surrey Sussex**, and the **South East Coast Ambulance Service NHS Foundation Trust (SECamb)**.

Funded by the **National Institute for Health and Care Research (NIHR)**, the 16-month initiative will explore how drones can rapidly deliver Automated External Defibrillators (AEDs) to the scene of an emergency — potentially saving lives where every second counts.

The research will take place in two phases. The first will simulate 999 call handling, Air Traffic Control coordination, ambulance dispatch, and drone operations to develop and refine delivery procedures. The second will involve interviews with out-of-hospital cardiac arrest survivors, family members, emergency responders and members of the public to assess perceptions of drone technology, ease of use, and any concerns.

**Dr Scott Munro**, Lecturer in Paramedic Practice at the University of Surrey and project co-lead, said:

"This research is the first step towards integrating drone technology into our emergency response systems. Our ultimate goal is to develop and test the procedures needed to seamlessly introduce drone delivery of AEDs into the 999-emergency system."

**Professor Kevin Munro**, Director of the NIHR Research for Patient Benefit Programme, added:

"Using drones to deliver defibrillators could help emergency teams reach patients faster, improve survival after cardiac arrest, and bring cutting-edge technology directly to the NHS frontline."

**Dr Craig Mortimer**, Research Manager at SECamb, said:

"Rapid intervention is vital in managing out-of-hospital cardiac arrests. Integrating this technology into future healthcare systems represents real progress in strengthening the chain of survival and giving patients the best chance of a positive outcome."

With UK survival rates for out-of-hospital cardiac arrest currently below 10%, the research aims to tackle one of the biggest challenges in emergency care: getting a defibrillator to the patient in time.

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### About NIHR

The **National Institute for Health and Care Research (NIHR)** is the UK's largest funder of health and social care research. It invests in high-quality studies that benefit the NHS, public health and social care, supports researchers and facilities, and partners with patients and communities to improve outcomes both in the UK and globally.

Surrey University

