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£1.1 m boost for Surrey Uni’s solar thermal research

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Solar-thermal devices that have the potential to transform how we heat our homes and generate power on a larger scale are being developed by a team led by the University of Surrey. This exciting project has received a £1.1 million grant from the Engineering and Physical Sciences Research Council (EPSRC).

The main goal of this research is to create new designs for surfaces that can selectively absorb sunlight while also efficiently emitting heat in the form of near-infrared radiation. These devices are different from solar cells, which typically convert sunlight into electricity; solar-thermal devices use sunlight to generate heat, which can then be used for driving mechanical engines or converted into electricity.

The research project is led by Surrey, in collaboration with the University of Bristol and Northumbria University and combines their expertise in photonics, advanced materials, applied electromagnetics, and world-class nanofabrication facilities.

Professor Marian Florescu, Principal Investigator from the University of Surrey, said:

“Our project is not just about innovating; it’s about responding to a global necessity. The sun showers us with a tremendous amount of energy every day, far more than we currently capture. By developing these advanced solar-absorbing surfaces, we are opening up new, efficient ways to harness this abundant solar energy. Our goal is to transform how we use sunlight, making it a powerhouse for clean and sustainable energy that meets our growing needs without harming the planet.”

The project has several aims:

- To develop solar absorbers that can work well even at very high temperatures.
- Improve the efficiency of the team’s special solar-absorbing structures. The team plans to build prototype models to demonstrate how well they work.
- To better understand and ultimately improve how these devices handle and perform with the heat they generate from sunlight.

Professor Marin Cryan, Co-Principal Investigator from the University of Bristol, said:

“The University of Bristol has been developing thermionic solar cell technology for a number of years. These use concentrated sunlight to heat materials to the point where thermionic emission of electrons occurs, which can form the basis of high-efficiency, low-cost solar cells. This exciting project will develop very efficient solar selective absorbers, which will be an important component of the overall cell design.”

Dr Daniel Ho, Co-Principal Investigator from Northumbria University, said:

“Northumbria University is at the forefront of thermophotovoltaic research, utilising a specialised microscope heating stage alongside an in-house built Fourier imaging spectroscopy system. This advanced thermal analysis technique enables comprehensive and angle-resolved scattering analysis across both visible and infrared spectrums, even under vacuum conditions and at temperatures as high as 1000°C.

“We are excited to work with our partners to help achieve pioneering developments in renewable energy research.”

Surrey’s vulnerable without expert legal advice

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Surrey has become a ‘legal aid desert’, marked by a critical shortage of support services, leaving vulnerable individuals without expert advice on key issues such as, community care, education, and immigration.

The Access to Justice Report, by South West London Law Centres (SWLLC), was launched at the University of Surrey’s School of Law Access to Justice Clinic on Wednesday, 20 March, by His Honour Sir Robin Knowles CBE, Chair of the Commercial Bar Association of England & Wales. Sir Robin is a member of the Civil Justice Council and chairs its Standing Committee on access to justice for those without means.

The report highlights the need for accessible legal aid and representation and raises awareness of the challenges faced by vulnerable people in Surrey.

It catalogues the gaps in legal aid within Surrey; it highlights cases where people have had to rely on non-legal advice services instead of specialist legal services. The lack of specialist legal advice is particularly acute in employment, education and immigration.

The report shows that most social welfare advice is provided by voluntary or not-for-profit agencies, with Citizens Advice taking the leading role; however, there is a lack of specialist legal services.

People were left without expert legal advice on areas such as:

- School admissions and appeals
- School transport
- Special Education Needs
- Community care packages and complaints
- Immigration advice.

Stacey Edgar, Deputy CEO, South West London Law Centres, said:

“At the South West London Law Centres, we have directly observed the significant difficulties faced by individuals and families lacking proper guidance on matters such as immigration and education.

“Our findings now confirm that Surrey has limited mechanisms for accessing justice, signalling the urgency of leveraging insights from this new research to implement a strategy that addresses community needs.

“We’re pushing to fill these gaps because access to justice shouldn’t depend on where you live or what you can afford.”

The report proposes new initiatives to improve legal support, including a Family Law Court Help Desk, an Education Rights Advice Project, and Immigration and Asylum Caseworkers in Surrey.

Currently, the research proposals are transforming into a project to create these mechanisms in Surrey, and SWLLC is welcoming donations, volunteers, and partners to be involved in expanding access to justice to meet the needs of impacted community members.

Liz Williams, Associate Professor and Director of Clinical Legal Education at the University of Surrey, said:

“The Access to Justice Clinic at the School of Law understands that social transformation and legal impact is only possible through a collaborative approach. The Clinic has been a flourishing initiative since its launch four years ago and plans to expand in partnership with South West London Law Centres, local charities and legal professionals on a broad range of collaborations to help solve the access to justice crisis in Surrey.”

Professor Veronica Rodriguez-Blanco from the School of Law added:

“The School of Law is committed to placing access to justice at the centre of legal education in developing social sensitivity among the future lawyers that we are educating.”

Surrey Uni taking lead on future network security

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A national effort is needed to train the next generation of the United Kingdom’s workforce in intelligent and resilient telecom networks, says a world-leading 5G and 6G expert from the University of Surrey.

The comment comes as the Engineering and Physical Sciences Research Council (EPSRC) announced that Surrey’s 5G/6G Innovation Centre will lead a new £8 million Centre for Doctoral Training in Future Open Secure Networks (FORT).

Over the next eight years, FORT will train more than 50 post-graduate researchers, who will become leaders with unique expertise in wireless communications, cybersecurity, networking, and artificial intelligence (AI). Surrey’s future cohort will influence the roadmaps of future open networking and security technologies and their applications.

In partnership with Queen’s University Belfast’s (QUB) Centre for Secure Information Technologies, FORT also enjoys support from more than 21 industry partners. These partners include: Amazon Web Services, Ampliphae, Angoka, AWTG, Catapult Satellite Applications, Codasip, Ericsson, Hewlett Packard Enterprises, HP, Intel, Interdigital, Keysight Technologies, Kyndryl, National Physical Laboratory, Nvidia, OpenWeb, Qualcomm, Rolls Royce, Virgin Media O2, and Viavi Solutions.

Regius Professor Rahim Tafazolli, FREng, Director of the 5G/6G Innovation Centre at the University of Surrey and Principal Investigator of FORT, said:

“I want to extend my heartfelt gratitude to EPSRC for backing the Future Open SecuRe NeTworks (FORT) initiative. I am equally thankful for the support of our 21 industry partners and look forward to working closely with colleagues from Queen’s University Belfast. This powerful team has a unique vision, expertise, and mission of making the UK a powerhouse for future telecommunications.

“In a world evolving at breakneck speed, our programme is designed with this dynamic future in mind. We’re committed to nurturing future visionaries and leaders with in-depth knowledge of advanced space and terrestrial networks, environmental considerations, and AI technology. The UK’s focus must now shift towards upskilling individuals capable of addressing the cyber security challenges posed by AI and take advantage of opportunities presented by societal shifts, environmental concerns, and industrial advancements.”

Along with providing a world-class education with access to industry, FORT will create an environment for students to research new and better ways to build communication networks that are safe, reliable, and ready for the future. FORT is committed to conducting responsible, ethical research in cybersecurity, AI technologies, and future networks, with a strong societal focus. This approach is designed to generate world-class academic contributions and establish a pipeline of talent for the future.

Dr Jesus Martinez del Rincon, Co-Director of FORT and Research Director of Secure Intelligence at CSIT at QUB, said:

“With the FORT programme, we aim to create a community of 50 PhDs who will become the future, industry-conscious thinkers and leaders on secure, trustworthy and autonomous future network communications.”

Along with Professor Tafazolli and Dr Martinez del Rincon, FORT will be led by: Dr Tim Brown from Surrey, who will serve as Director of FORT, and Professor Máire O’Neill from QUB, who is Co-Investigator of FORT.