

Project Extension

CPE were recently granted additional funding from the Welsh European Funding Office (WEFO) to enable the project to further extend its current operations until the end of December 2022!

We are delighted with the news and are excited to continue working alongside numerous West Wales and Valleys-based enterprises towards developing their products and processes throughout 2022.



Professor Caroline Gray, OBE



CPE and OpTIC Technology Centre Director, Professor Caroline Gray, has been awarded an OBE as part of the Queen's Birthday Honours.

Caroline, who is also Professor of Enterprise and Engagement at Wrexham Glyndŵr University, will receive the prestigious honour for her contribution to the Optics industry in Wales during a career spanning 35 years.

The recognition for Caroline has been made all the more special, as it coincides with the year of the Queen's Platinum Jubilee.

To read more about Caroline's achievement, visit the link below:

[Professor Caroline Gray OBE](#)

Thin-Film Coating Plant VIP Open Day – 30th March 2022

On Wednesday 30th March, CPE hosted an official VIP Open Day for the newly-launched High Vacuum Thin-Film Coating (HVTFC) R&D Facility at the OpTIC Technology Centre in St Asaph.

The £1.2million facility represents a unique new contribution to world-leading, advanced research and business opportunity in Wales and the wider UK.

Across both morning and afternoon sessions, the event included an address from Vaughan Gething MS, Minister for the Welsh Economy, along with presentations from guest industry speakers, guided tours of the facility, various exhibition stands, and networking opportunities.

Attendees included representatives from Welsh Government, UK funding agencies, and the wider photonics industry.



Welsh Business Show and Wales Construction Show

Back in April, CPE attended both the Welsh Business Show and the Welsh Construction Show. Both shows were held at the Cardiff City Stadium and were very well attended, with everyone clearly enjoying the opportunity to get back out networking.

CPE hosted a stand at the Welsh Business Show and networked at the Welsh Construction Show. There was plenty of interest in both the achievements of the CPE project so far and the possibility of getting involved. Across both events, we were able to make a variety of valuable connections and enjoyed some interesting discussions with a number of individuals. We are now working to bring some of those contacts into the CPE project as soon as possible.



Final Call!

The CPE project has now entered the final season of collaborative projects under the current funding model. We do hope that CPE will continue further into the future, but if you wish to work with us soon, then this is your final call to do so.



Funded by the European Regional Development Fund (ERDF), The Centre for Photonics Expertise (CPE) is an industry collaborative programme led by four Welsh Universities that works together with companies in Wales to improve or develop new products and processes to benefit their business. CPE is designed to provide easy access to academic resource and facilities at no cash cost to your company. Our pan-Wales team is comprised of academic experts from Wrexham Glyndŵr University, Aberystwyth University, Bangor University and the University of South Wales.

In short, eligible businesses will have an address within the West Wales and the Valleys region and have any product or process issues that we can help you to explore further through photonics / light-based solutions.

With over 75 successful projects already completed with 60 partners and more projects still taking place, we know that these projects are hugely beneficial to all involved. So please get in touch and let us discuss your challenge or problem – we really do not want any eligible Welsh businesses to miss out.

For further information, please contact Anita Davies (CPE Business Development Manager) on 07552 249972 who will guide you through the process.

CPE and Willows Holistic Therapies – Mind, Body, Soul... and Light?

The Willows Holistic Therapies is an established business at the OpTIC Centre in St Asaph, providing a range of holistic therapies such as reiki, aromatherapy massage and reflexology, all aimed at improving human wellness and wellbeing from a spiritual as well a physical perspective. When CPE met Willows in late 2021 an opportunity arose to investigate the extent to which light-based therapies could be adopted within the practice to augment and expand upon the existing range of holistic therapies; it is increasingly recognized nowadays that light plays an important role in human wellness and wellbeing.



The Willows Therapies



A scoping study by CPE and Willows was undertaken, looking at light-based therapies that can be identified as lying within three distinct but overlapping sectors defined as: medical, neurological and holistic. The investigative work determined that there was potential for the practice to adopt therapies from all three sectors as might become appropriate to the business development. In terms of holistic light therapies, there is presently great interest in an area known as chromatherapy wherein specific colours of light are selected and applied to influence wellbeing by for example promoting feelings of calm and relaxation; other colours may stimulate creativity and alertness. The types of light source involved range from handheld colour spheres of light to whole-of-room light treatments. The next steps of the project will seek to implement one or more of the light therapies within the business at St Asaph, a project which seems highly synergistic given the strong emphasis upon the use of light and optical technology at this location.

“Doing this CPE collaboration was fantastic. I would never have looked at this as a modality for my business until I did this project and with Neil’s expertise it really opened up my eyes to the world of colour and light. I am really excited to take this to the next phase and to see where this could go as I believe this will be one of the most sought-after modalities in the future.”

Sarah Maitland-Price – Owner, Willows Holistic Therapies.



5 Minutes With... Dr John Duffy

Name: Dr John Duffy
Job Role: Managing Director and Founder
Company: Smart Storm Ltd - <https://smartstormgroup.com>
Location: Caernarfon and Halifax



How and where does the story of Smart Storm begin?

It all started in 1994 when I decided that after 9 years as a lecturer at Bradford University, leading a research group in medical sensing technology I wanted an entrepreneurial challenge. As I had invented a new type of ultrasonic sensor, I saw this as a means of starting a business. Rather than the obvious, setting up a medical company (another story) I saw an opportunity to set up a flow and level instrumentation business in the wastewater sector which was dominated by German and French companies with the UK not having a manufacturer of this type of technology. So along with two of my recent graduates I established my first company.

What has the journey been like from the beginning of Smart Storm to where you are now?

It's been a roller coaster as I started the company in a recession and have been through the 2008 recession and then the Pandemic of the last two years.

My biggest challenge was turning what I believed was a very clever product from a university laboratory to working in a hostile industrial environment. As an academic we are great at developing new ideas but turning them into products that work in the real world at temperature extremes, high humidity, rain and snow, heavy handed operators kicking them around etc is something we were not trained to do. So, I learned the hard way and now know that a clever idea does not guarantee a successful product. However, after many burnt fingers we eventually got there and produced a very successful product range.

Smart Storm is my second company and in 2019 following an investment from the Development Bank of Wales and Sunnybarn investments we moved our headquarters, R&D and instrumentation manufacture from Yorkshire to North Wales whilst still retaining the heavy engineering part of the company in Halifax. I did my first degree and Doctorate at Bangor University, and it was always my dream to return to the area where I had some of the best years of my life.

The company has now greatly expanded its product range and have successfully moved into all areas of water and wastewater instrumentation, growing the business both at home and overseas, particularly in Asia, Middle East and Africa.

Tell us about the exciting projects you are working on now.

There are too many to discuss here but of mention would be a new innovative product for the construction

industry that uses CO2 rather than dangerous chemicals to pH balance concrete wash outs and secondly the improvement of one of our products that removes fats, oils and grease from industrial waste streams to prevent fatbergs in the sewer network. The latter project has been undertaken with the support of CPE and Bangor university and using laser technology has improved the efficacy of our product by 40%.

Do you have any advice for micro or SMEs looking to invest time in research, development, and innovation?

A successful technology needs two things: excellent research and development and good marketing. You must know your markets and customer base before developing new products as what you might regard as a clever idea may have little or no customer base. But you must always have a continuous R&D programme. Product lifetimes in the 90's when I started could be as much as 10 years but now technology is advancing so fast product lifetimes can be as little as 2-3 years so you can never stand still - always look ahead.

I also think innovation is misunderstood. It is not always about developing something entirely new. Some of the best businesses I have seen have produced innovative products by using old or state-of-the-art technology but in a new marketplace or packaged or utilised in an entirely different way. Innovation is about thinking outside the box rather than in the box.

What are you most proud of?

Growing the business on my own and in particular when I see my products and technologies used in the real world. I get a buzz when I visit a factory and see one of Smart Storm products in use.

However, having 3 wonderful children and 2 Briard dogs tops everything.

Tell us something others would be surprised to know about you or Smart Storm.

30 years ago, I would spend part of my week in a hospital theatre supporting reconstructive surgeons in the use of my university developed technology. Now I am an MD of a company spending my time dealing with water and wastewater projects but both I guess have a human element.

"Our environment, the world in which we live and work, is a mirror of our attitudes and expectations." – Earl Nightingale

A big thank you to John for taking the time to speak with us.

CPE and Space Republic: How UVC Lamps are Changing the Landscape of Working in Disinfected Office Spaces.

UVC disinfection lamps were designed to produce UVC radiation, which in-turn results in great disinfection and sterilization properties. In today's industries, UVC applications are the recommended standard for surface, air and water sterilization.

COVID-19 highlights the reason for UVC applications to reach popularity. The principle of operation for UVC lamps is the radiation. For example, if a known surface has been in contact with a user who had covid, the surface is then exposed with UVC light, the radiation wraps the structure of the genetic material of the virus and prevents the viral particles from making more copies of themselves.

Conwy-based Space Republic is a company that aims to tackle COVID-19 with their unique idea. Space Republic produce office pods for use in leisure and commercial centres, with a focus on providing high quality workspaces conducive to high productivity. As part of these pods, they provide dedicated ventilation systems (air purification system) which greatly improve air quality using technologies such as HEPA filters (particle absorbing filter) and UV-C sources. The CPE team at the University of South Wales held further discussions with the company to draw out a potential project.

It was determined that an air purification system for use with personal office pods aims to achieve sufficient intensity of ultraviolet light in order to have a meaningful impact on the destruction of airborne pathogens.

In order to confirm that this is practical in the design proposed by Space Republic, CPE began to provide their knowledge of the optical properties of materials and expertise in optical modelling while the enterprise provided their knowledge of the design constraints and practical considerations of the materials chosen to design the pod.

The CPE team is now at the experimenting stage of the project, where the team aims to optically model the air purification system to determine relationship between UV-C lamp power and time required to purify air passing through. The results of this experiment will then be highlighted to the company alongside the proposed and test alternative iterations of lamp positioning, purifier design, ducting dimensions and form factor to potentially improve rate of air purification. Furthermore, this will also allow Space Republic to be engaged in discussions relating to continued prospects of the collaboration and implementation of its findings.



Autodesk model of Space Republic office space (The Pod).



Components to be used by the CPE team for performing the experiments.



CPE Equipment Spotlight – Bangor University’s Thorlabs Picosecond Laser

Bangor University’s CPE team have recently invested in a picosecond laser as part of their micro/nano fabrication system. The Thorlabs QSL103A Q-Switched Picosecond Microchip Laser is a compact laser system designed to provide a turnkey, alignment-free solution for picosecond pulses at 1030 nm.



The laser provides a high-quality beam ($M^2 < 1.2$) with high pulse energies at a kHz repetition rate, making it ideal for material processing applications or harmonic generation. Most impressively, its compact size and reasonable price make it an excellent candidate for construction of customised laser systems. Currently, this laser is being used in a collaborative project with Diamond Centre Wales (DCW) to process micro/nano engraving on diamonds for traceability and identification.

For further details on the laser specifications, visit [Thorlabs Picosecond Laser](#)

CPE Staff Bio – Anita Davies, Business Development Manager

Anita joined the CPE team earlier this year taking over as the BDM (South and West Wales) following in the impressive footsteps of Hazel Hung. With over 20 years of experience working in Higher Education, Anita has been able to slot into the team quickly and effectively with the understanding of university processes and policies helping her to navigate the University demands well.

More recently, Anita was a busy entrepreneur running her own and her husband’s businesses around their young family. This unique blend of university and industry experience gives Anita a great insight into the needs of our partner businesses and the many challenges that they face. Anita looks forward to supporting CPE as we all work towards meeting the final targets of the project.



International Women’s Day 2022 – Interview with Hazel Hung



As part of International Women’s Day 2022, we caught up with Dr Hazel Hung, Programme Manager of CSConnected Strength in Places Fund Project (SIPF) based at Cardiff University, and former CPE Business Development Manager at the University of South Wales.

Hazel gives a fascinating insight into her career so far and how she first became involved with STEM.

Visit [IWD2022 - Interview with Hazel Hung](#) to read the full interview, and to learn more about the CSConnected Strength in Places Fund Project (SIPF), visit <https://csconnected.com/csconnectedsip/>

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