

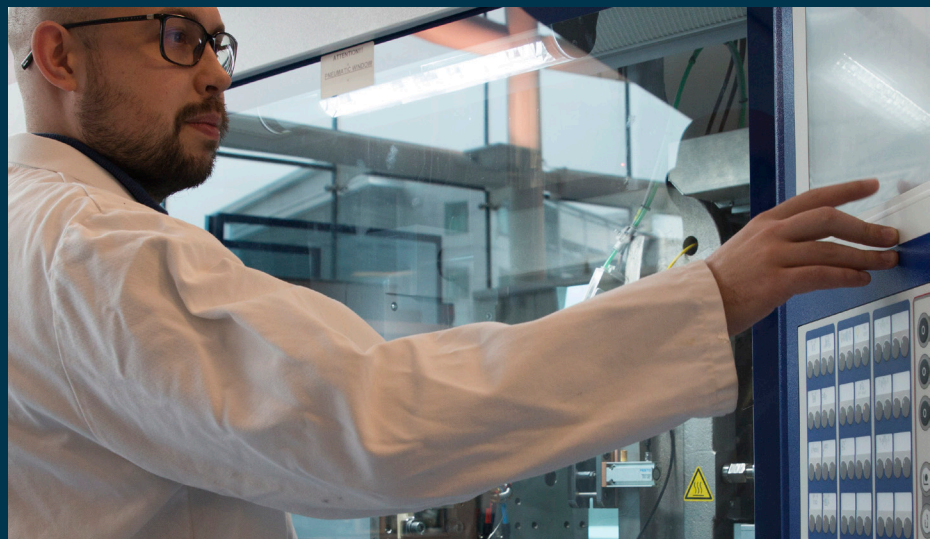


UNIVERSITY of
BRADFORD

Faculty of Engineering
& Informatics

Faculty of Engineering and Informatics Newsletter

October 2021



Welcome from the Dean

The Bradford Science Festival returned this October. The University of Bradford was a key sponsor and offered a range of activities and sessions including engineering a greener future, how surgery has evolved from the first human dissections, the Science of Sound which shapes our lives, and much more. The event was delivered by the National Science and Media Museum, the eight-day festival hosted events around four themes: Science Saving the World, Brad Lab, STEM City and Science of Sound.

- Our KTP Associate, Neha Sharma, exhibited her Miniature Acoustic Space Demo and talked about her research on sound and sustainable materials.

- Prof. Ashraf Ashour showed how our research contributes to building a more sustainable future. Ashraf delved into the environmental troubles of cement, its staggering contribution to CO2 emissions, and presented his team award-winning solution. More about this research [here>>](#)

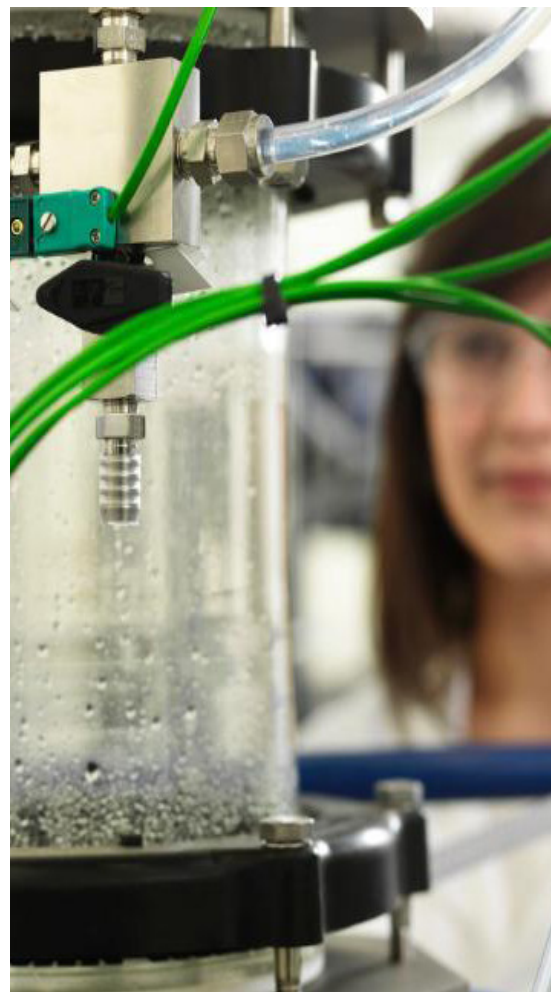
- Zero Waste Bradford- Little Changes Challenge was another festival topic - each day of the festival a basic tip was publicised on how to move towards zero waste, these tips were shared on social media and people were invited to submit their examples.

I am delighted to announce that Dr Therese Sheehan, Department Civil & Structural Engineering, and Dr Kavian Cooke, Department of Mechanical & Energy Systems Engineering, have both been promoted to Associate Professor. I also welcome the arrival of Dr Amna Qureshi to the academic staff of the Department of Computer Science and note, with sadness but understanding, the retirement of Professor Marian Gheorghe from that Department. Marian and I both started as 50th Anniversary Chairs on the same day in February 2015 and I am pleased that he will stay involved in Computer Science research at Bradford in an emeritus capacity.



Newsletter summary:

1. Academic in profile
2. RKT News (grants applications, open calls, presentations and awards)
3. Staff and Students' news



Bradford down to last eight in City of Culture 2025 bid

Bradford has made it through to the next stage of the City of Culture 2025 competition after securing one of eight places on the longlist. The news was described as a major milestone for the city by Bradford2025, who are spearheading the bid, after a record 20 entries this year.

Professor Shirley Congdon, Vice-Chancellor of the University of Bradford, said: "Bradford has shown what it is capable of when we work together, and the bonds we have made must now be strengthened around a new goal. The aim is the same - to capitalise on Bradford's unique make-up and cultural diversity and support everyone who lives here to achieve their full potential. The energy that went into bidding generated a huge amount of excitement for our city's future and the next chapter starts now."

More [here>>](#)

Academic in profile:

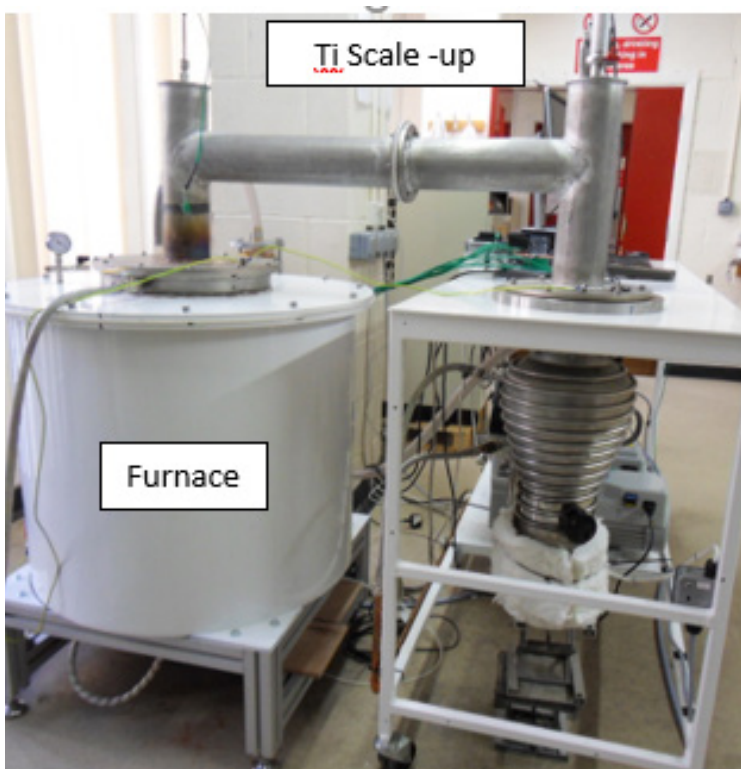
Prof Raj Patel



Prof Raj Patel is a Professor of Chemical Engineering in the Department of Chemical Engineering. He graduated from the University of Bradford in Chemical Engineering and obtained a PhD on The Fluid Mechanics of Gravure Roll Coating. After completing his PhD, Raj worked on seven major EPSRC sponsored research projects mainly on coating flows and processing of polymers, e.g. EPSRC Processing of polymer nanocomposites.

He was instrumental in the design and re-launch of the Chemical Engineering programmes in September 2010 and was Head of Department till April 2020. The programmes have been very successful with high levels of student satisfaction and increasing student numbers. He teaches at all levels (4 to 7) and includes in his courses as much practical elements as possible in order to reinforce theory and to increase positive attitudes towards the subject.

More recently Raj has developed a novel technology for the production of Titanium metal. This new process is far less energy intensive and much greener than the current complicated Kroll Process. Scale-up trials are on-going. Initial trials have also shown that this new technology is also able to produce other transition metals such as tantalum, niobium, hafnium, etc. There are multiple benefits that should arise from this project; from an economic perspective both titanium and titanium component producers should see reduced costs with resulting cost savings also reflected in the price of the final goods. Multiple sectors which do not use titanium in their products, e.g. the automotive industry, will be in a position to utilise the economically viable powder from this process. Significantly the UK economy should gain the most as this project will result in the development of a process that gives the UK a strategic edge in the production of high value titanium powder and create jobs and enhance business.



Current research interests:

- Desalination Using Reverse Osmosis
- Reaction Kinetics of Biodiesel Production
- Production of Transition and Rare Earth Metals
- Optimisation of Fluid Catalytic Cracking Units
- Seeded Granulation

Research projects:

- James Mae GroupKTP
- Process for Synthesis of Biodiesel from Used Cooking Oil: Feasibility and Experimental Studies
- Modelling, Simulation and Sensitivity Analysis of Naphtha Catalytic Reforming Reactions
- Optimal Reverse Osmosis Network Configuration for the Rejection of Dimethylphenol from Wastewater

Research and Innovation

Projects submitted:

- Energy-Efficient and AI-Empowered Smart Walls for Future Healthcare, Raed Abd-Alhameed
- Resource Recovery Framework for Concrete Demolition Waste towards circular economy, Ashraf Ashour
- Novel Method of Modifying Microstructure during Friction Stir Weld, Kavian Cooke
- Coordinated Control of Offshore Wind Turbines, Geev Mokryani
- Formal Validation of Artificial Intelligence Applications – the case of Spiking Neural P Systems, Marian Gheorghe
- Hydrodynamic Weakening Mechanism and Siltation Promotion Effect of Neutral Lattice Covered on Local Scour around Pile, Yakun Guo



University of Bradford celebrates Black History Month 2021

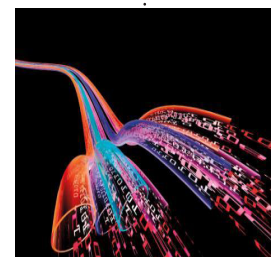
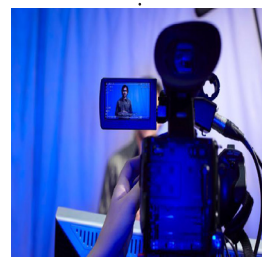
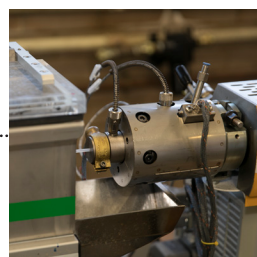
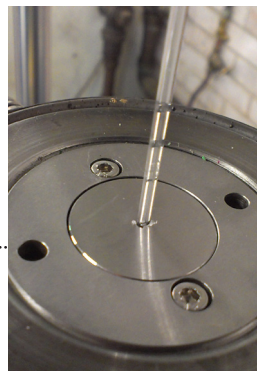
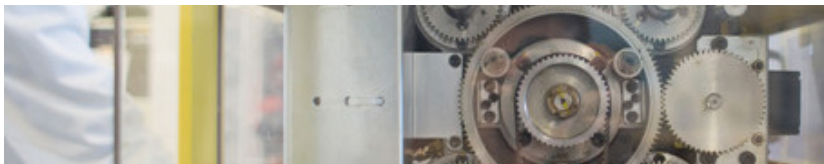
Running from 12th October to the end of the month, the University of Bradford has been celebrating Black History Month 2021.

Dr Elaine Brown, AD EDI, said: “In line with this year’s theme, we are using this opportunity to highlight the history and achievements of black and brown people and to celebrate the intersecting identities they are proud of. We encourage everyone to get involved, join our celebrations and share details of the programme within their respective areas.”

More details of these events are available [here>>>](#)

Open calls for funding:

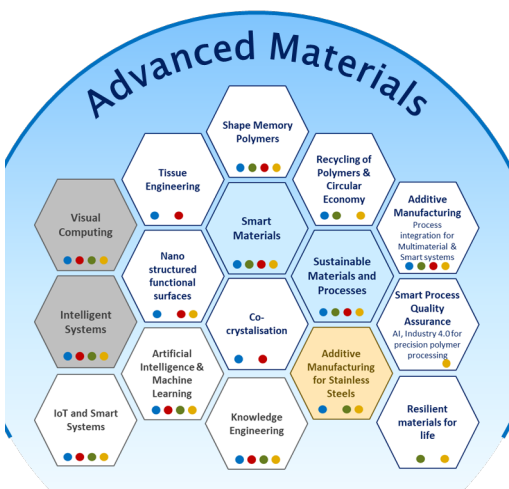
- Pre-announcement: High-risk speculative research ideas in engineering and ICT, Closing date: 25 January 2022 16:00 UK time
- Business and academia prosperity partnership: fifth round, Closing date: 11 January 2022 16:00 UK time
- Healthcare technologies for infectious disease resilience Closing date: 31 March 2022 16:00 UK time
- Manufacturing the future, Closing date: Open - no closing date



Faculty Research Strategy Proposal

A key objective of the RGAP 2021 analysis was to support the development of a better definition for the Faculty research themes, i.e. to identify key research strengths and important strategic directions for development under each of the 4 research impact themes – advanced materials, smart healthcare systems, sustainable environments and smart industrial systems. The analysis based on RGAPs’ and PRIPs’ return, screening current projects and proposed bids, has enabled to align the key research directions in each area with the four research impact themes.

The main outcome from this analysis is that an overall research picture for the Faculty Research Landscape has emerged as shown below. While this is still to be discussed with the broader research community in the Faculty, as it is driven by the evidence basis provided by the RGAPs and PRIPs, the main message is that the four research themes can provide a sustainable landscape and the basis for a research ecosystem in the faculty for the next period leading to the next REF. All the four areas have critical mass of researchers and research track record to support not just strong bidding, but also an environment conducive to innovation and leadership development.

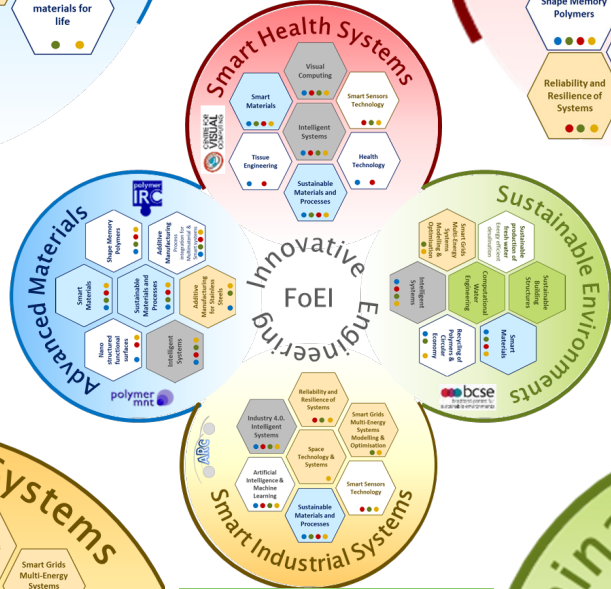


Advanced Materials: interdisciplinary collaboration underpinned by the strength of the IRC research base and track record. In particular, collaboration between Intelligent Systems and Visual Computing and materials and sustainable materials processing can lead to important

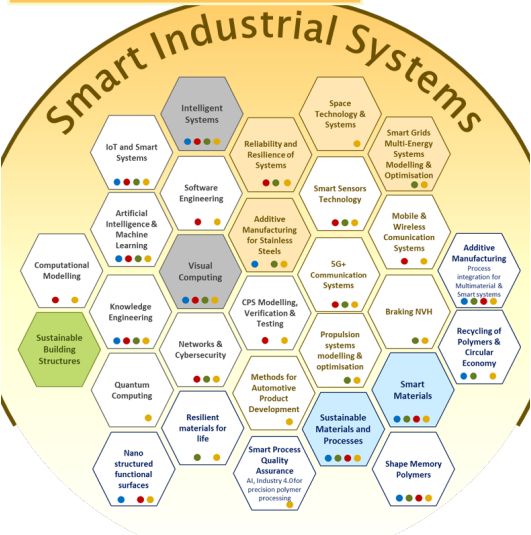


Smart Health Systems: multidisciplinary - area of application for advanced materials, smart materials, design and manufacturing of healthcare devices, drug delivery solutions, tissue engineering, intelligent systems (AI), visual computing, and smart sensors and communication technologies.

Smart Industrial Systems: multidisciplinary cohesion – in a research impact area that has not been previously considered in the Faculty. The key emerging strategic developments acting as catalyst for research in this area revolve around the launch of the Space AI centre, the Systems Reliability Engineering, and possibly the Industry 4.0



Sustainable Environments: broader and interdisciplinary landscape - smart materials for constructions structures; intelligent systems (CS) for sustainable built environments; technologies and processes for recycling and circular economy, multi-energy systems, circular economy and broader sustainable development.



Staff and Students' news

University Council visit to our Labs

On Thursday 14th October we had the pleasure to host the University Council at our University. The visitors accompanied by Stuart Mckinnon-Evans and Riley Power were invited to the Polymer IRC laboratories.

Phil, Tim, Bana, Ben, Michael and Max presented the facilities available in our laboratory and introduced a few projects run by the Polymer IRC team, e.g. face visors, microneedles and soft tissue fixation, etc. Phil spoke also about the very successful Science Bridges China and 3 joint labs resulting from this collaboration.

The Council members asked many questions, including several about engagement with students and they understood the strong interdisciplinary nature of our work, including the life sciences / med-tech areas.

Stuart Mckinnon-Evans, Chief Finance Officer said: "The deserved pride and enthusiasm of Phil and his team are always manifest. For a non-scientist like me, they have a great ability to explain what their work is, and why it's important. A marvellous showcase for the University."



Erasmus+ Students Success at 4th EDMA Workshop

Alexey Uglanov and Kirill Kartashev joined the Faculty in September 2020 as part of an Erasmus+ research student placement scheme. Originally from the Plekhanov Russian University of Economics, they worked with the research team in the Advanced Automotive Analytics (AAA) on data science methods for driver behaviour modelling. Following their 4-months research placement at Bradford which they thoroughly enjoyed and which they continue to reflect on enthusiastically, they are continuing to collaborate remotely with the AAA team to finalise their work and write up research papers.

After presenting two papers documenting their different modelling approaches and algorithms at the PGR Annual Innovative Engineering Research Conference in April 2021 – with Alexey getting a Best Paper award at the conference - they submitted enhanced versions of the research (authored jointly with the industrial collaborators) to the 4th Engineering Data- and Model-driven Applications EDMA Workshop, organised in conjunction with the 20th UK Workshop on Computational Intelligence. Alexey and Kirill presented the papers at the workshop, with Kirill receiving the Best Student Paper Award! This is an inspiring example of the developmental opportunities afforded by the Erasmus + programme

More about the event [here](#)>>

EDMA-2021



BEST STUDENT PAPER AWARD

Staff and Students' news

Interplas 2021

Interplas is the UK's largest and leading plastics industry event. It is the only one to cover all the manufacturing processes, technologies and services essential to the plastics sector. For over sixty years, Interplas has been the key show for more than 400 exhibitors to present solutions, products, machines and ideas to the UK manufacturing industry.

Our Faculty had a stand at the tradeshow where Dr Paul Spencer, Dr Brian Thomson and Dr Cristina Tuinea-Bobe made contact with visitors and exhibitors giving them an insight of the assistance our Faculty can give.

At the event, Prof Ben Whiteside gave a talk on Manufacturing Technologies in the post-pandemic world for the Advancing UK Plastic Stage.



PhD success

PhD student Salem Al-Hassan, supervised by Dr Chakib Kara-Zaitri, has successfully defended his PhD thesis entitled 'A smart sound fingerprinting system for monitoring elderly people living alone using advanced Fast Fourier Transform and Machine Learning'.

Congratulations!



British Plastic Federation (BPF) Membership

Prof Phil Coates is the holder of a BPF membership that allows Faculty members to interact with companies, UK Government and the EU Commission and the media to influence legislation and public opinion.

The BPF provides an ever-expanding range of services that enable its members to maximise and develop their markets and profitability.

More information [here>>](#)

Staff and Students' news

Newton for Climate Newton Prize 2020 - Turkey

Newton for Climate Webinar is a series of talks, focusing on the excellent science and research projects funded under the Newton- Katip Celebi UK-TR Science and Innovation Fund which are challenging climate change with novel technologies and research.

They will be running ahead of the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow (31 October – 12 November 2021), demonstrating the impact of the successful joint research in Environmental Studies.

The first webinar in this series was hosted on 7th October 2021 by Prof. Ashraf Ashour from the University of Bradford and Prof. Mustafa Sahmaran from Hacettepe University and covered the findings of their award-winning project 'Lego construction system of green structural components for low-cost housing'.

More [here](#)>>

**WORLD TECHNOLOGY
UNIVERSITIES NETWORK**



Webinar series:

NEWTON FOR CLIMATE

Newton Prize Winner Project:

Lego Construction System of 'Green' Structural Components for Low-Cost Housing

Speakers:

Professor Mustafa Şahmaran
Department of Civil Engineering
Hacettepe University, Turkey



Professor Ashraf Ashour
Department of Civil and Structural Engineering
University of Bradford, UK



Moderator:



Nick Mellors
Regional Manager,
Eastern Mediterranean and Central & Eastern Europe
UK Science & Innovation Network
British Consulate-General Istanbul

The WTUN 2021 Congress

The World Technology Universities Network (WTUN) launched their annual Congress which took place on 18th – 21st October 2021 on Zoom. The event was free to attend.

The sessions were varied this year across our hosts and involved conversations on:

- Energy System Transformation for a Carbon Neutral Future
- Civically Engaged Institutions in a Global Landscape: The Great Balancing Act
- The UN Sustainable Development Goals – Less than 10 years to go
- Climate Action: A view from experts, HEI staff and university students
- International Student Collaborations for Community Involvement
- Practices and Strategies of University Social Responsibility.

More [here](#)>>

Staff and Students' news

MDPI publishes Dr Sefat work in the field of dentistry and regenerative medicine

The first paper is a review of the effect of nanostructures on the properties of glass ionomer in dental restoratives/cements. The conclusions were : (1) most of the nanostructures are likely to enhance the mechanical strength of GICs; (2) certain nanostructures improve the antibacterial activity of GICs against the cariogenic bacteria; (3) clinical translation of these promising outcomes are completely missing, and (4) the nanostructured modified GICs could perform better than their conventional counterparts in the load bearing posterior dentition.

View full text [here](#)>>

The second paper 'Regenerative Medicine of Liver: Promises, Advances and Challenges' aims to critically investigate different possible methods to tackle issues related with liver diseases/disorders mainly using regenerative medicine. In this work the various regenerative treatment options are discussed, for improving the prognosis of chronic liver disorders.

View full paper [here](#)>>

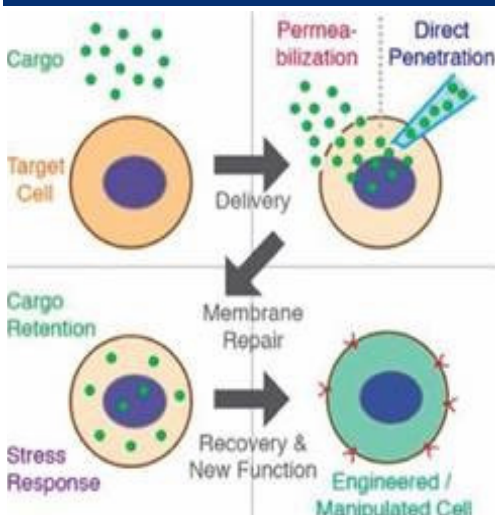


Dr Mansour Yousseff publication in IEEE

The paper covered a study looking at Cannabidiol Effect on MCF-7 with Low Voltage Pulse Electric Field and is the result of the collaboration with Huddersfield University and Tun Hussain Onn (UTHM) in Malaysia. This work is sponsored by the Malaysian Ministry of Higher Education and will continue via joint PhD supervision.

The paper shows that in various cancer types, plant extract has been found to be an important and useful preventive agent for chemotherapy. Cannabidiol is one of the interesting plants that has recently been identified as a possible anti-cancer agent. The pulse electric field range most widely used is 100-1000 V/cm. Cannabidiol inhibitory concentration (IC 50) for breast cancer cells were estimated in this study. The efficacy was determined by controlling cancer cell anti-proliferation. These approaches could be an effective way for cancer treatment with less side effects during chemotherapy.

More [here](#)>>



Staff and Students' news

New staff - Kathryn Rooney

Please welcome our new general apprentice Kathryn Rooney (k.rooney2@bradford.ac.uk) to the technical team.

Kathryn has come to us from Notre Dame Catholic Sixth Form College, where she studied a Level 3 BTEC National Diploma in Applied Science. Over the course of her apprenticeship, she will be working all round the different technical areas of the faculty, but her base is in Horton D2.21 (alongside our Kickstarter scheme staff Felix and Luke). Kathryn has two days at college, so will be on site Monday, Thursday, and Fridays.

Kathryn said: "I've had a lovely welcome to the team here and I am loving it so far."



Dr Nejat Rahmanian was the invited speaker to Shiraz University to talk on Climate Change

The main message of the talk was that by increasing the concentration of greenhouse gases (mainly CO₂), the effect on the balance of oxygen levels in the air will be detrimental to the health of human beings. The impact on air quality for millions of people will be unavoidable if no global decision is agreed. Carbon Capture and Storage (CCS) and Carbon Capture, Usage and Storage (CCUS) are possible options, and they are being slowly adopted by a few countries, albeit in spite of many opponents at different levels within society and politics.

Dr Rahmanian highlighted that a more legally binding agreement, from all nations, is required (other than what was agreed at the Paris CoP21 in 2015) to reduce greenhouse gas emissions, particularly those high Co₂ emitters like China, USA, UK, EU, India, else.

This talk is a precursor of the [CoP 26](#).



Climate Change: Challenges, Opportunities, and Engineering Solutions

Dr Nejat Rahmanian
Associate Professor in Chemical Engineering,

University of Bradford
21 September 2021



Nejat Rahmanian, PhD, University of Bradford



Staff and Students' news

Early Career Research Seminar (ECRF)

Dr Sohag Kabir presented his talk: 'From Traditional Safety Analysis to Dependability Assurance of AI-assisted Self Adaptive Systems'.

Dr Emma Brown, from Research and Innovation Services, introduced to the forum the essentials of embedding impact in UKRI Grant bids. Emma is happy to support any member of staff who needs help with impact in their funding applications. The presentation is available on SharePoint [here>>](#)

Our next meeting is on 18 November 2021, 12 noon.



Flying the flag for green spaces

The University of Bradford's grounds have been ranked among the best parks and green spaces in the country after being awarded a prestigious green flag award. The flag, which is placed next to the Horton A building represents the hard work and commitment of the University in providing green spaces for students, staff and the local community. It serves as a sign to everyone that the University grounds are maintained and managed to an excellent standard with first-class facilities.

Richard Hirst, Buildings Operation Manager at the University of Bradford said: "We are very proud to receive this external recognition of the quality of our grounds. The Main Campus is an asset to the city of Bradford and is valued by local people as well as our students and staff. The award reflects the hard work that our dedicated staff put in to maintaining the University grounds to the highest standard."

The Green Flag Award scheme, managed by environmental charity Keep Britain Tidy under licence from the Department for Levelling Up, Housing and Communities, recognises and rewards well-managed parks and green spaces, setting the benchmark standard for the management of green spaces across the United Kingdom and around the world.

More [here>>](#)



