

Faculty of Engineering and Technology

September 2022

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

(LOOM) €626,318.62 allocated to LJMU, Decarbonising the Shipping Industry and Cutting Emissions by at least 55% by 2030 through Retrofit, **Dr. Milad Armin** (PI),

Dr. Eddie Blanco Davis and **Prof. Jin Wang**. Horizon Europe, 2022-2025.

AWARDS/PRIZES/KEYNOTE ADDRESSES (AT RECOGNISED INTERNATIONAL CONFERENCES)

(LOOM) Dr. Danial Yazdani (supervisors **Prof. Trung Thanh Nguyen**, **Prof. Jin Wang** and Prof. Juergen Branke) has been awarded a prestigious IEEE CIS Outstanding PhD Dissertation Awards. This award, given to only one awardee each year, recognizes outstanding PhD dissertations that have contributed to the advancement of the theory and/or applications of computational intelligence.

Dr. Eddie Blanco Davis delivered an invited speech to the Marine and Ocean Division of the Europe-Korea Conference on Science and Technology (EKC2022), 19th-22nd July 2022, Marseille, France.

(PROTECT) **Dr. Hoshang Kolivand** delivered an invited Speech, 'Future Challenges of Wearable Devices', [Sustainable Energy; Blockchain and Cryptocurrency \(SEBC-2022\)](#), 1st-3rd August 2022, Chicago, USA.

RESEARCH IMPACT GENERATING ACTIVITIES

(LOOM) In collaboration with Sefton Council and Sefton high schools, **Prof. Trung Thanh Nguyen**, **Mrs. Diane Fitch** and **Dr. Ahmed Makki** have successfully installed indoor air quality sensors in two high schools in the region. The data provided the local authorities and schools with interesting insights regarding how the recent heatwaves have affected air quality inside classrooms, and what we can do to mitigate the impact. The research was supported by LJMU, Sefton Council, Birkdale High School and Greenbank High School.

As a part of the EPSRC-funded project 'Co-designing the 15-minute city' with the University of Liverpool, **Prof. Nguyen**, **Mrs. Fitch** and **Dr. Makki** have also provided Liverpool City Council with analyses on their traffic sensors. These analyses helped the council and

local residents to understand the impact of their infrastructure interventions in a major road in Liverpool. The council have commented that their data has been very useful to show residents how the infrastructure improvement has made the road safer and how the road has been used by road users. There is strong evidence that perceptions of residents on the infrastructure improvement have changed significantly, once they have provided more data, and once the residents have had more time to get used to the scheme. The analyses will help assist future decisions on infrastructure development.

(PROTECT) **Dr. Gabriela Czanner** and **Dr. Ivo Siekmann** are leading a pilot study with Royal Liverpool University Hospital and University of Brescia Italy, on automated detection of Keratoconus that needs

intervention. This research is expected to provide clinicians with insights regarding quality of

measurements from cornea in Keratoconus and contribute towards better diagnostic support.

IMPORTANT ITEMS FOR POSTGRADUATE RESEARCHERS INCLUDING PHD COMPLETIONS AND RESEARCH INITIATIVES AT FET

(FET) Faculty Research Day took place on Wednesday 29th June 2022 in the Adaptive Learning Zone, James Parsons Building. Photo and Posters presentations were displayed in the Construction Professional Skills and Knowledge Hub, 1.02 GERI Building for public viewing and the top 5 from each category were moved to the Adaptive Learning Zone for the live event. **Prof. Ian McCarthy** delivered the conference opening. Pitch Presentation Finalists presented their 3 minute pitch presentations in a live session chaired by Prof. Keith George, with **Mr. Paul Dickson** and **Prof. Andy Shaw** as members of the review panel. Following the conclusion of the Pitch Presentation Final, Prof. Tony Graham and Dr. Mamadou Diallo delivered their Keynote Speeches. The event was well attended with colleagues joining online via Microsoft Teams and in person to share in the experience. A Prize Giving Ceremony was held during the afternoon, where **Prof. Ndy Ekere** announced the award winners. The Faculty would like to offer their sincerest gratitude to all participants, attendees and presenters. Many congratulations are offered to all award winners. We look forward to seeing you in 2023 at the next event.

Paper Competition

- 1st Place **Hazha Mohammed** (BEST) “Bio-mineralisation to enhance the characteristics of polymer modified concrete for chloride environments”.
- 2nd place **Evangelia Georgantzia** (BEST) “Design of Aluminium Alloy Channel Sections Under Minor Axis Bending”.
- 3rd place **Conor Ransome** (ARI) “An H α survey of the environments of nearby type II supernovae”.

Photo Competition

- 1st Place **David Hitchmough** (LOOM) “Air Lubrication: AKA It’s All Air Under The Ship”.

- 2nd Place **Callum McCall** (ARI) “Don’t Judge a Black Hole by its picture”.
- 3rd Place **Ciaran Pitt** (MEMARC) “We Knead You Now”.
- People’s Choice **Jessa Mae Canas** (MEMARC) “Do you even lift $\times 10^6$, bro?”

Poster Competition

- 1st Place **Jemima Briggs** (ARI) “The Formation and Evolutions of Dwarf Galaxies in Diverse Cosmological Environments”.
- 2nd Place **Lauren Coan** (PROTECT) “Automatic Glaucoma Detection using Fundus Imaging”.
- 3rd Place **Ryan Bellfield** (DSRC) “Visualisation Models of CNN Predictions”.
- People’s Choice **Osamah Al-Hashimi** (BEST) “Remediation of groundwater contaminated by pharmaceutical products using cement kiln dust as a permeable reactive barrier”.

Poster Competition (Potential Impact)

- 1st Place **Osamah Al-Hashimi** (BEST) “Remediation of groundwater contaminated by pharmaceutical products using cement kiln dust as a permeable reactive barrier”.
- 2nd Place **Abbas Alatrany** (PROTECT) “Machine Learning Approach for the Prediction of Alzheimer’s Disease Using Genome Data”.
- 3rd Place **Joseph Ford** (LOOM) “What a Waste! Decommissioning of Offshore Installations”.

Pitch Presentation Competition

- 1st Place **Jack Campbell** (MEMARC) “A Study of Turbulence and Heat Transfer in Pulsating Flows”.
- 2nd Place **Leon Newton** (MEMARC) “Effects

Of Roughness on Temporally Developing Turbulent Flow”.

- 3rd Place **Bethan Williams** (ARI) “Star and Cluster Formation in Extreme Environments”.

Faculty PVC Awards for Best Thesis 2022

- Zige Tian (GERI) “Investigation of Material Removal Mechanism of SiC in Nano-scale Machining Using Molecular Dynamics Simulation”.
- Joe Fernandez (ARI) “Compact Stellar Mergers: the origin and electromagnetic counterparts of gravitational waves”.

- Abdullah Kadhim (BEST) “Synthesis of One-Part Alkali-Activated Cement and Albite-Diopside Glass-Ceramic from Calcium-Alumina-Silicate Precursors”.
- Hiba Alsmadi (PROTECT) “Long-term Follow-up of Hydrocephalus Patients and Prediction of Risk Factors using Machine Learning”.

(PROTECT) A FET PhD researcher, **Ms. Lauren Coan** has presented her work on “Automatic detection of Glaucomatous neuropathy from fundus Images” as a contributed talk, at the International Society for Clinical Biostatistics 43rd meeting, August 2022.

NOTABLE PUBLICATIONS

(LOOM) **Liang X., Fan, S.,** Lucy, J., and **Yang, Z.** (2022) ‘Risk analysis of cargo theft from freight supply chains using a data-driven Bayesian network’, *Reliability Engineering and System Safety*, Vol. 226, pp. 108702, [DOI](#). This is a major research output from an ERC funded project TRUST – Towards Resilient and Sustainable Container Supply Chains.

(PROTECT) Vallabh, N. A., Armstrong, J., **Czanner, G.,** McDonagh, B., Choudhary, A., Criddle, D. N., Willoughby, C. E. (2022) ‘Evidence of impaired

mitochondrial cellular bioenergetics in ocular fibroblasts derived from glaucoma patients’, *Free Radic Biol Med*, Volume 189, pp. 102-110, [DOI](#).

(RCEEE) **Tok, K. H., Mehedi, M., Zhang, J. F., Brown, J., Ye, Z., Ji, Z., Zhang, W., Marsland, J. S.,** Asenov, A., and Georgiev, V. (2022) ‘An Integral Methodology for Predicting Long Term RTN’, *IEEE Transactions on Electron Devices*, Vol. 69, Issue 7, pp. 3869-3875, [DOI](#).

OTHER ITEMS

(ARI) Dr. Gavin Lamb, former undergraduate and PhD student with ARI, has been awarded a very prestigious Dorothy Hodgkin Fellowship by the Royal Society, and he has elected to bring that fellowship to the ARI. This will fund Dr. Lamb’s research for 5 years, with a possible extension for an additional 3 years, with a likely start date of 1st January 2023.

A consortium in which **Dr. Marie Martig** is Project Scientist has been given a stunning allocation of 40 nights of VLT time, using the MUSE integral field unit to study the structure and kinematics of edge-on disc galaxies.

Fiona Murphy-Glaysher and **Shaun Brown**, both PhD students, were announced as this year’s winners of ARI’s EDI Outstanding Citizen Awards, for the outstanding contribution they have made for making the ARI a better place to work and study, and for having the courage and conviction to consistently speak out against inequality and unfairness in society, and in academia.

The ARI’s Work Experience Week took place 4th - 8th July 2022, where 20 students aged 16 to 18 learned about astronomy/physics as a university choice and career path. They completed a 2 day research project and presented their posters at the end of the week.

The first NRT Oversight Committee meeting took place on 21st June 2022 in Swindon, to provide updates and discuss the progress of the project. **Prof. Iain Steele, Mr. David Copley, Mr. Adrian McGrath** and **Dr. Helen Jermak** attended. There was a positive response, with lots of useful feedback.

Several members of the NRT team attended [the SPIE telescopes and instrumentation conference](#) in Montreal, Canada in July 2022. They gave multiple talks, presented posters and met with the community to discuss the current design and project progress.

(PROTECT) **Dr. Hoshang Kolivand** was invited as an independent assessor to promote Dr. Christopher Salge to Associate Professor at the University of Hertfordshire.

Dr. Gabriela Czanner was an invited panellist at the discussion for “Bridging the Ethical Principles to Practice gap” at the Opportunities/Challenges in the Application of Ethics within AI Colloquium on the 30th June 2022, organised by the Centre for Advanced Computational Science at Manchester Metropolitan University.

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