

Faculty of Engineering and Technology

November 2022

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

(ARI) £49k allocated to LJMU, Astronomy for Remote and Island Schools, STEM Clubs, **Dr. Chris Leigh (PI), Dr. Emma Smith, Alison Keen, Dr. Stacey Habergham-Mawson.** Science and Technology Facilities Council, 2022-2024.

£575k allocated to LJMU, Ernest Rutherford Fellowship for **Dr. Robert Grand:** Galaxy Formation with High Accuracy Dynamics, **Prof. Ian McCarthy (PI).** Science and Technology Facilities Council, 2022-2027.

(BEST) £20k allocated to LJMU, LJMU High Quality Cold Mix – Proof of Concept Trial with Blackpool City Council, **Prof. Hassan Al-Nageim (PI).** Velocity UK Limited, 2022-2023.

£101k allocated to LJMU, Developing an Implementation Assessment Tool for Sustainable Healthcare Waste Management: Case Study of an NHS Trust, **Dr. Kurannen Baaki (PI), Dr. Christaline Wijekoon (Co-I).** University of Cambridge THIS Institute Themed Fellowship, 2022-2024.

(LOOM) £18.3k allocated to LJMU, A Study on Recruitment for Seafarers, **Dr. Christos Kontovas (PI), Dr. Robyn Pyne, Mrs. Anna Kaparaki,** Dr. Yinan Yin (LBS). Mission to Seafarers, 2022-2023.

£40k allocated to LJMU, Forensic 3D Mapping, **Dr. Frederic Bezombes (PI), Dr. Sean Malkeson,** Dr. Heather Panter. Metropolitan Police, 2022-2023.

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

(GERI) **Emeritus Prof. David Harvey** delivered an invited keynote speech, ‘Practical Use of Nanotechnology for more Reliable Electronics Interconnections’, Green Material and Electronic Packaging Interconnect Technology Symposium (EPITS 2022), 13th-14th September 2022, Langkawi, Malaysia. **Prof. Harvey** also delivered an invited keynote speech, ‘Practical Use of Nanotechnology for more Reliable Electronics Interconnections’, VCAS 2022, India by remote presentation Saturday 15th October 2022.

(LOOM) **Dr. Christos Kontovas** delivered a presentation ‘Technical and Regulatory Discussions Related to Autonomous Vessels’, Institute of Maritime Law, University of Southampton. The workshop took place on the 30th September 2022 and was attended by a number of academics, practitioners, and policy-

makers including representatives from the UK Department for Transport, the Maritime and Coastguard Agency and the European Commission.

Prof. Zaili Yang delivered an invited talk ‘A study on Maritime Surface Autonomous Ship Safety Analysis’ in the IMO Maritime Surface Autonomous Ship (MASS) Workshop, 6th-7th September 2022. The quantitative safety assessment approaches in his speech have been recommended to the IMO Committee in the formation of new MASS regulations.

(PROTECT) **Dr Áine MacDermott** presented a research talk ‘Disappearing Messages: Privacy or Piracy’, 15th International Conference on Information Resource Management, Ontario Tech University, Canada in October 2022. **Dr. MacDermott** also met with their robotics research group to further explore security and forensic projects on Humanoid robots.

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

(FET) The Faculty of Engineering and Technology will be hosting an event in partnership with the Institute of Engineering and Technology (IET) and the Mersey and West Cheshire Network 'Celebration of Engineering: Research and Knowledge Exchange with Industry' on Wednesday 9th November 2022 between 3.30pm-8pm in the Adaptive Learning Zone, James Parsons Building. The event will attract people from regional businesses, IET members, and

chartered engineers and will showcase the current research landscape in the School of Engineering. This will provide PGRs with the opportunity to share their work, in poster or presentation format, with their peers within LJMU and to industry experts. The event is being coordinated by **Dr. Martin Sharp**, **Dr. Andre Batako** (GERI) and **Andrew Burgess** (LOOM), with support from the Research and Enterprise Team.

NOTABLE PUBLICATIONS

(ARI) **Mistry, D., Copperwheat, C.M., Darnley, J., Olier, I.**, (2022) 'Machine Learning based search or Cataclysmic Variables within Gaia Science Alerts', *NRAS*, [DOI](#).

(LOOM) Wang, X.J., Xia G.Q., Zhao, J., **Wang, J., Yang, Z., Loughney, S.**, Fang, S., Zhang, S.K., Xin, Y.H., and Liu, Z.J. (2022) 'A novel method for the risk assessment of human evacuation from cruise ships in maritime transportation', *Reliability Engineering and System Safety*, Vol. 230, pp. 108887, [DOI](#).

(RCEEE) **Tok, K. H., Zhang, J. F., Brown, J., Ye, Z., Ji, Z., Zhang, W., and Marsland, J. S.** (2022) 'AC RTN: Testing, Modelling, and Prediction', *IEEE Transactions on Electron Devices*, Vol. 69, Issue 10, pp. 5780-5786, [DOI](#).

OTHER ITEMS

(ARI) **Dr. Ben Davies** and colleagues have had a paper published 'Explosion imminent: the appearance of red supergiants at the point of core-collapse', [DOI](#). This was accompanied by the [press release](#), 'Red Alert: massive stars sound warning they are about to go supernova'. It was featured on the CBS Good Morning TV show, picked up by several major international news outlets (CBS News, The Independent, The Daily Express), as well as many popular science websites such as [Space.com](#), [Phys.org](#), and LiveScience.

Dr. Jonathan Henshaw, a postdoctoral research associate at the ARI, has been awarded a very prestigious Royal Society University Research

Fellowship. These fellowships are incredibly difficult to obtain and represent one of the highest forms of recognition an early career researcher can receive.

Prof. Shiho Kobayashi has joined the Institute of Physics Juno Assessment Panel. The aim of Project Juno is to recognise and reward physics departments and organisations in the UK who have taken action to address gender equality and to foster a more inclusive working environment.

(BEST) **Dr. Monower Sadique, Dr. Khalid Hashim, Dr. Rafal Al Mufti and Dr. Abdullah Kadhim** [have won a prestigious prize by the Institution of Civil Engineers \(ICE\)](#). The Team created a new geopolymer concrete which is free from

chemical solutions and cheaper than conventional cement. Their method was published in a paper last year titled 'Developing one-part alkali-activated metakaolin/natural pozzolan binders using lime waste' and can be viewed [here](#).

Dr. Michaela Gkantou has received the [Best Reviewer Award 2022](#) of the Springer Journal: International Journal of Steel Structures.

(FET) Faculty Research and Knowledge Exchange Committee would like to offer their warmest congratulations to the following members of staff who have been successful in the 2022 round of promotion to Readership and Professorship.

Promotion to Professorship: (GERI) **Prof. Guangming Zhang** and (PROTECT) **Prof. Atif Waraich**.

Promotion to Readership: (ARI) **Dr. Renske Smit** and **Dr. Marie Martig**. (BEST) **Dr. Iacopo Carnacina** and **Dr. Khalid Hashim**. (LOOM) **Dr. Musa Bashir**, **Dr. Chia-Hsun Chang** and **Dr. Ben Matellini**. (PROTECT) **Dr. Carl Chalmers** (RCEEE) **Dr. Qian Zhang**.

We are delighted that a number of academics from the Faculty of Engineering and Technology have been named among the [world's top 2% most-cited scientists](#) in various disciplines. The ranking method is based on standardized citation metrics and has been developed by a group of scientists led by John P.A. Ioannidis (Stanford University). The updated full dataset, which ranks the world's most cited researchers (single-year impact for 2021) is accessible online [here](#). We would like to congratulate the following scholars who have been named in the list:

- (ARI) **Prof. Ivan Baldry**, **Prof. Robert Crain**, **Prof. Shiho Kobayashi**, **Prof. Paolo Mazzali**, **Prof. Ian McCarthy**, **Dr. Daniel Perley**, **Prof. Maurizio Salaris** and **Dr. Ricardo Schiavon**.
- (BEST) **Dr. Khalid Hashim** and **Prof. Patryk Kot**.
- (LOOM) **Dr. Christos Kontovas**, **Prof. Jin Wang** and **Prof. Zaili Yang**.
- (PROTECT) **Prof. Gyu Myoung Lee**.
- (RCEEE) **Dr. Martin Jones**.

The list also includes 4 LJMU Emeritus Professors. **Prof. Abir Hussain**, **Prof. Emil Levi**, **Prof. Paulo Lisboa** and **Prof. Brian Rowe**.

Prof. Jin Wang, **Dr. Russell English**, **Dr. Julia Wang** and **Lucy Lamb** organized a [UK-Malaysia University Consortium](#) Partnership event on Research & Mobility, Opportunities & Challenges in International Higher Education, 22nd September 2022, the Science Gallery, London. The event attracted over 60 delegates including 11 VCs/PVCs from Malaysia's public universities and UK universities. The event provided an opportunity for best practice sharing and plenary discussions on collaboration in research, mobility and entrepreneurship between UK and Malaysian universities with breakout sessions and networking.

Clean Growth UK (**Tony Seaman**, Project Manager, **Sharlene Whittle**, Projects Coordinator, and **Dr. Neale Davies**, Industrial Proposal Writer) have been nominated for a Times Higher Award 2022. They are one of three hubs for the project which helps business to create products and services which promote a greener, cleaner economy. With more than 2,300 members, including large firms, SME's and social enterprises, the projects' impact has prompted the Times Higher Awards, to shortlist it for Knowledge Exchange Initiative of the Year. The awards ceremony will take place on Thursday 17th November 2022.

(GERI) EU MSCA RISE project 'ReACTIVE Too' held a one-day workshop at LJMU on 14th October 2022 'Design and Reliability of Electronic and Active Systems', with keynote speakers from Osaka university Japan, City University Hong Kong, University of Glasgow, and Aptiv a major global technology/automotive company. The event also included presentations and discussions from the teams of ten consortium members. The workshop was organised by **Prof. David Harvey** and **Prof. Guangming Zhang**, LJMU, and Dr Fidelity Tchuembou-Magaia, University of Wolverhampton.

(LOOM) **Prof. Zaili Yang** has been appointed as the founding Specialty Chief Editor (on Autonomous Maritime Systems) of Frontiers in Ocean Engineering,

a newly launched open-access journal by Frontiers Open Science (the world's third most cited publisher).

(PROTECT) **Prof. Gyu Myoung Lee** attended the 2022 Huawei 13th Strategy & Technology Workshop (STW 2022), 26th-28th September 2022, Shenzhen, China & Online, as a speaker and a panelist in the

session on trustworthiness in the digital world. In this event, the global top researchers in academy and industry, as well as top technical experts of Huawei's global R&D team discussed the industry trends, shared ideas with each other, and promoted technology innovation.

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FET Research & Knowledge Exchange Committee
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Faculty of Engineering and Technology

September 2022

FET RESEARCH NEWSLETTER

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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Faculty of Engineering and Technology

July 2022

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

(DSRC) £12k allocated to LJMU, CMCA Cancer Mental Health, **Dr. Ian Jarman** (PI). Health Equalities Group, 2022.

(LOOM) £20k allocated to LJMU, Team Building 22 Brookes Bell, **Mr. Abdul Khaliq** (PI). Brookes Bell, 2022.

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

(LOOM) **Dr. Chia-Hsun Chang** delivered a lecture “Maritime Cybersecurity”, International Forum on Shipping, Ports and Airports (IFSPA), Hong Kong, 19th May 2022.

Prof. Zaili Yang delivered a plenary lecture “Use of Advanced Risk Modelling in Maritime Supply Chains”, 2nd International Symposium on Automation in

Manufacturing and Logistics, Wuhan, China, 12th-13th May 2022 (Online).

(PROTECT) **Dr. Hoshang Kolivand** delivered an invited lecture “Introduction to Computer Vision and Data Sensor using Deep Learning”, Politecnico di Milano Italy for all PhD students in Dipartimento di Meccanica, 12th May 2022.

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

(FET) The Faculty Postgraduate Research Event is well underway for 2022. The heats of the Pitch Presentations were held on Wednesday 22nd June 2022 (Online). Judges, PGR supervisors and audience members joined the event from across the Faculty to support the presenters. Those selected by the judging panels will move forward to compete in the final of the competition held on Faculty Research Day 2022 in the Adaptive Learning Zone, James Parsons Building. Photo and Posters presentations have been displayed in the Construction Professional Skills and Knowledge Hub, 1.02 GERI Building for public viewing and will be moved to the Adaptive Learning Zone for the live event. Paper submissions will be published by the British Library in the proceedings following the event. The conference programme has been circulated which includes keynote speeches from Prof. Tony Graham and Dr. Mamadou Diallo. Prize giving will be held at 2.30pm

on Wednesday 29th June, where **Prof. Ndy Ekere** and **Prof. Jin Wang** will announce the winners of the Faculty PVC's Awards for Best PhD Thesis, Best Paper, Best Photo, Best Poster, Best Potential Impact, and Best Pitch Presentation.

Congratulations to **Ms. Nusrat Jannat**, who was the Winner (Judges' Choice) of the Poster Competition, for mid and later-stage PGRs, at the Doctoral Academy's Postgraduate Research Festival held on the 11th May 2022 in the Maritime Museum. **Ms. Jannat's** poster was titled “Development of unfired brick with agro-wastes for tropical climate”. Congratulations also to **Ms. Hannah Tang** who came Runner-up (Judges' Choice) in the Three Minute Thesis Competition for her presentation titled “Virtual Reality Systems for Lateral Ankle Sprains in Athletes”. Details of the event including all competition winners can be found [here](#).

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(PROTECT) **Dr. Daniel Doolan** has joined the School of Computer Science and Mathematics as a Senior Lecturer in Computing. Before joining LJMU, he oversaw around sixty academic staff in delivering a Computer Science Programme in England and a further sixty staff contracts to support delivery across the Department. He took a leading role securing BSC

accreditation for a number of BSc/MSc courses, the first in the Schools/Institution's history. Prior to this he oversaw a Computer Science Programme and PhD provision in Scotland. His main research interest is mobile/parallel computing, graphics, multimodal interaction, context awareness and the sensing of the surrounding environment.

REF UPDATE

(FET) Key outcomes from REF 2021 for FET

More than 150 FET researchers were judged on the quality of their scholarship in the 2021 Research Excellence Framework through the submission of four Units of Assessment (UoA 9 -Physics; UoA 11 - Computer Science and Informatics; UoA 12 - Engineering; and UoA 13 Architecture, Built Environment and Planning). All four UoAs have demonstrated a significant increase in the volume of world-leading research outputs from REF2014 to REF2021. Among top performing areas were Astrophysics, where 96.9% of the research outputs was world-leading or internationally-excellent; and Engineering with 95.8%. Both Astrophysics and Engineering have their research impact rated 100% world-leading or internationally-excellent.

FET's overall performance

FET	STAFF		GPA	OVERALL				
	Head Count (FTE)	% eligible		4*	3*	2*	1*	U
REF 2021	149	About 2/3	3.04	25	55	18	1	0
REF 2014	80.6	About 2/3	2.64	8	53	34	5	1

UoA 9 Physics

UoA 9	STAFF		GPA	OVERALL					RANK
	Head Count	% eligible		4*	3*	2*	1*	U	
REF 2021	30	85%	3.46	50	48	1	0	1	17/44
REF 2014	24	95%	3.03	23	58	18	1	0	28/41

UoA 11 Computer Science and Informatics

UoA 11	STAFF		GPA	OVERALL				
	Head Count	% eligible		4*	3*	2*	1*	U
REF 2021	42	70%	2.82	11	60	29	0	0
REF 2014	10	19.8%	2.4	0	48	46	4	2

UoA 12 Engineering

UoA 12	STAFF		GPA	OVERALL				
	Head Count	% eligible		4*	3*	2*	1*	U
REF 2021	48	65%	3.22	30	62	8	0	0
REF 2014	31	46.4%	2.5	0.8	54.6	39.3	4.5	0.7

UoA 13 Architecture, Built Environment and Planning

UoA 13	STAFF		GPA	OVERALL				
	Head Count	% eligible		4*	3*	2*	1*	U
REF 2021	34	55%	2.73	18	43	33	6	0
REF 2014	17.2	22.1%	2.49	7	45	38	10	0

80% of the Faculty's research is rated world-leading or internationally-excellent.

NOTABLE PUBLICATIONS

(ARI) **Murphy-Glaysher, F. J., Darnley, M. J., Harvey, É. J., Newsam, A. M.** et al. (2022) “V392 Persei: A γ -ray bright nova eruption from a known dwarf nova”, *Monthly Notices of the Royal Astronomical Society (MNRAS)*, [DOI](#).

(EEE) **Zhang, J.F., Gao, R., Duan, M., Ji, Z., Zhang, W., Marsland, J.S.** (2022) “Bias Temperature Instability of MOSFETs: Physical Processes, Models, and Prediction”, *Electronics*, 11 (9): 1420, [DOI](#). This is an invited review paper.

(LOOM) **Kontovas, C., Bras, A., Chang, C.H., Romano, A., Poo, M.C.P., Wang, J., Qu Z., Paraskevadakis, D., McCormack, H., Lamb, L. and Yang, Z.** (2022) “Fostering Innovation in the Blue

Economy within the United Kingdom (UK): A stakeholders’ perspective”, *Ocean and Coastal Management*, Vol. 224, pp. 106143, [DOI](#). This is a major research output from an EU funded project of €3.5m “EMPORIA4KT” – Blue Economy Knowledge Transfer.

(PROTECT) **Saba, T., Rehman, A., Sadad, T., Kolivand, H., Ali Bahaj, S.** (2022) “Anomaly-based intrusion detections system for IoT networks through deep learning model”, *Computers and Electrical Engineering*, Volume 99: 107810, [DOI](#).

OTHER ITEMS

(ARI) Dr. Rob Grand, a leading expert in galaxy formation and evolution, will be joining the ARI in early in 2023, supported on a Five-year Ernest Rutherford Fellowship from the Science and Technology Facilities Council (STFC) and UK Research and Innovation (UKRI).

Dr. Victoria Yankelevich took part in the “Three-Minute Wonder” competition organised by the Institute of Physics (IoP), on 29th April 2022, and was runner up in her heat.

Dr. Stacey Habergham-Mawson has written a very interesting piece on her path in astrophysics research, teaching and outreach. The article also delves into improving access to science for all, diversity and challenging stereotypes. The article can be found [here](#).

(FET) Under our agreement with IEEE LJMU has a limited number of token for article processing charges (APC) to cover the cost of publishing open access in both their fully open access and hybrid journals. The LJMU author must be the corresponding author and ensure that their affiliation is correct. Tokens are limited so please contact lst_research_support@ljmu.ac.uk to

reserve one before submitting your article or you may be billed if all tokens have been allocated.

(GERI) **Dr. Andre Batako** recently visited Wroclaw University of science Technology, Gliwice University of Technology, Poznan University of Technology and Witelon Collegium State University. Mutual visits are planned from Poland along with setting up Memorandums of Understanding with these Universities. **Dr. Batako** is also organising the ISPEM2023 international conference in Wroclaw, Poland.

(GERI/MEMARC) **Dr. Andre Batako** and **Prof. James Ren** as Guest Editors of the Journal of Materials MDPI (Impact Factor 3.6) are inviting paper submissions for a Special Issue, from experts in the field of material characterisation and material machining, focusing on their production processes that serve as an important resource to underpin further activities in manufacturing. Papers will cover current progress, gaps between areas and encourage new directions for research. Further information including paper submission and manuscript templates can be found [here](#). FET authors can be granted up to 50% discount

on the publication fee, please contact **Dr. Batako** and **Prof. Ren** with any enquiries. The submission deadline is the 20th November 2022.

(LOOM) **Prof. Jin Wang** has been appointed to the post of Editor-in-Chief of the Journal of Marine

Engineering and Technology (JMET) since May 2022. JMET publishes four issues per year and it is in its 21st volume this year. Its Impact Factor is 3.192 (2020), making it within Q1 (2020) Impact Factor Best Quartile.

Volume 8, Issue 4
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Faculty of Engineering & Technology
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FET Research & Knowledge Exchange Committee
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Faculty of Engineering and Technology

May 2022

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

(BEST) £135k allocated to LJMU, Knowledge Transfer Partnership with Laing O'Rourke PLC, **Dr. Denise Lee**. Innovate UK, 2022-23.

(LOOM) £12k allocated to LJMU, Incorporation of ship dynamic motion models into real-time collision risk prediction of autonomous ships, **Prof. Zaili Yang (PI), Prof. Jin Wang, Dr. Sean Loughney and Dr. Huanhuan Li**. Royal Society International Exchange (NSFC Cost Share) with Shanghai Jiao Tong University, 2022-2024.

£159k allocated to LJMU, Smart Technologies for the Green Sustainable Travel Corridors Programme, **Prof. Trung Thanh Nguyen (PI) and Mrs. Diane Fitch**. Department for Transport via the Liverpool City Region Combined Authority, 2022-2023.

€25k allocated to LJMU, ARCWIND: Adaptation and implementation of floating wind energy conversion technology for the Atlantic region (extension), **Dr. Musa Bashir (PI), Prof. Jin Wang, and Dr. Sean Loughney**. European Commission, 2022-23.

(PROTECT) £12k allocated to LJMU, Primitive matrix sets and slowly synchronising automata, **Dr. Paul Bell (PI), Dr. Matt Webster, and Dr. Martin Randles**. Royal Society International Exchange with Université Catholique de Louvain (BE), 2022-2024.

RESEARCH IMPACT GENERATING ACTIVITIES

(BEST) **Prof. Hassan Al-Nageim** and his Research Team are engaged with their pavement engineering industrial partners on the construction of a footway trial in Blackburn to include the use of a new novel cold mix asphalt technology. Applying cold mix rather than hot mix offers incredible benefits, including no carbon emissions and eliminating the need to prepare and keep hot mix asphalt at high temperatures during transportation and construction. Other benefits include a reduced financial outlay and the removal of head and smoke for operatives. Their work has been publicised in Transport Infrastructure News, the full article can be found [here](#).

(LOOM) **Prof. Trung Thanh Nguyen, Mrs. Diane Fitch and Dr. Ahmed Makki** are carrying out a study with three secondary schools and Sefton Council to set up LJMU air quality monitoring solutions in these schools. Evaluation of technologies and internal tests have been completed. A first installation has been attempted and future installations will follow in the

next few weeks. This research is expected to provide schools with insights regarding air quality inside and outside schools, raising awareness regarding air pollution, and help schools contribute to the Net Zero target.

Prof. Nguyen, Mrs. Fitch, Dr. Makki along with their colleagues **Mr. Giorgos Tsapparellas** and **Ms. Chloe Jones** are continuing an on-going pilot with Sefton Council to evaluate a number of sensor technologies to calculate air quality and air pollution, against DEFRA references. This research has informed the council with the most suitable technologies for monitoring air pollution, leading to the council's recent investment in air quality sensors.

The real-time passenger flow monitoring and information system that **Prof. Nguyen, Dr. Makki** in addition to **Dr. Igor Deplano, Mr. Alan Palin, Mr. Neil Cook** and **Mr. Nick Croce** installed in Liverpool's busiest stations such as Liverpool Central and Liverpool South Parkway has been helping

Merseyrail to understand the capacity of their network as well as managing the flow of passengers in both normal daily situations and busy events such as the recent Grand National.

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

(ARI) LJMU and the University of Liverpool are to jointly host a new Centre for Doctoral Training (CDT) in Data Intensive Science. Funded by the Science and Technology Facilities Council (STFC) and supported by a consortium of international partners, including Harvard University, CERN and Fermilab, as well as leading North-West partners, including Daresbury Laboratory, Hartree Centre, and several NHS Trusts in the Liverpool region. [LIV.INNO](#) will be an inclusive hub for training diverse cohorts of excellent students in data intensive science. It will provide targeted training to meet a growing skills gap in the area of data science which has seen a dramatic increase in many fields of science and engineering, due to the advancement of sensors, mobile devices, biotechnology, digital communication, and internet applications. LIV.INNO students will receive exactly the skills and training they require to help drive the Knowledge Economy, which has been identified as a key sector for the Liverpool City Region. The CDT LIV.INNO network will fund 4 studentships over the next 3 years.

STFC has awarded ARI 3 fully funded PhD studentships to start in October 2022. The award letter stated that ARI's Postgraduate Researchers (PGRs) have maintained a successful completion rate of 94%, which is quite impressive and is credit to the PGRs, their supervisors and Faculty Research Degrees Committee.

(FET) The Faculty will be holding their annual Postgraduate Research Day on Wednesday 29th June 2022. The event will be in a hybrid format this year, with photo and poster galleries available to view from the 23rd May 2022 and a face-to-face event concluding this year's activities in the Adaptive Learning Zone. The face-to-face event will include the final of the Pitch Presentation Competition, Keynote speakers and an opportunity for networking. PGRs will be presenting either a photo, poster, pitch or paper depending on the stage of their research. Colleagues are encouraged to 'save the date' in their diaries. Further information including the conference programme will be shared in due course.

EXTERNAL COLLABORATION

(FET) The UK–Malaysia University Consortium (UK-MUC)'s Launch Meeting took place on the 30th March 2022. As part of the British Council's Going Global Partnerships programme, the Consortium is designed to be a flagship initiative that promotes strategic engagement and bilateral cooperation in higher education between its partner universities. The project will lay a foundation for creating long term collaborations, shared priorities, and complementary expertise in higher education between the UK and Malaysia. It will also reinforce the global perceptions of both countries as centres of higher education excellence. The Consortium is managed by LJMU as

the Consortium Secretariat **Prof. Jin Wang, Dr. Russell English**, Dr. Julia Wang (International Relations) and **Lucy Lamb**. The project will last for two years. Further information about UK-MUC can be found [here](#).

(MEMARC) As part of the EU RISE Project 'I-Weld' led by **Prof. James Ren**, two PhD researchers, Mr. Sufian Raja and Mr. Safwan Mansor, from the Centre of Advanced Manufacturing and Material Processing, University of Malaya have commenced their research secondment at LJMU, they will be visiting until October 2022.

NOTABLE PUBLICATIONS

(ARI) **Hill, A. D., Crain, R. A., McCarthy, I. G., Brown, S. T.** (2022) “Intrinsic alignments of the extended radio continuum emission of galaxies in the EAGLE simulations”, *Monthly Notices of the Royal Astronomical Society*, Volume 511, Issue 3, pp. 3844-3862, [DOI](#).

(LOOM) Wang X.J., Liu Z.J., **Loughney S., Yang Z., Wang Y.F. and Wang J.** (2022) “Numerical Analysis and Staircase Layout Optimization for a Ro-Ro Passenger Ship during Emergency Evacuation”, *Reliability Engineering and System Safety*, Volume 217, pp. 108056, [DOI](#).

(PROTECT) **Bell, P. C.** (2022) “Polynomially ambiguous probabilistic automata on restricted languages”, *Journal of Computer and System Sciences*, Vol. 127, pp. 53-65, [DOI](#). This paper previously appeared in the 46th International Colloquium on Automata, Languages, and Programming, ICALP 2019 and led to an invited talk at the University of Oxford in 2020.

OTHER ITEMS

(ARI) A wide variety of outreach events were undertaken by the ARI during British Science Week including a build your own telescope workshop, a science careers event at Ladybridge Community Primary School in Bolton and a workshop at the FireFit Hub in Toxeth where young people designed and made vehicles to protect a mini astronaut. Full details of all events can be found [here](#).

Prof. Andy Newsam helped organise and attended the first meeting of a new inter-disciplinary and international group interested in dark skies and darkness more generally. A group brought together by former ARI PhD student Dr. Hannah Dalglish. The meeting was held in Oxford and had about 40 attendees from areas as diverse as the lighting industry, ecology, philosophy, tourism and art as well as some astrophysicists. The meeting was extremely successful and is likely to lead to a number of impactful, cross-disciplinary collaborations.

Work undertaken by **Dr. Helen Jermak** and **Dr. Manisha Shrestha**, on an unusual X-ray emitting black hole binary system, has been attracting a lot of attention recently. **Dr. Jermak** is quoted extensively in a [Newsweek piece](#) on this system, which has a remarkably large misalignment between the spin of the black hole, and the orbital plane of the binary. The observations were made with the Nordic Optical Telescope and, of course, the Liverpool Telescope.

Prof. Shiho Kobayashi and the Equality, Diversity and Inclusion Team managed the successful renewal of the IoP Juno Practitioner status, for gender equality practices within the ARI. The renewal statement acknowledges some existing strengths and improvements since the last award and provides useful guidance for further development.

Dr. Helen Jermak was invited to deliver an in-person talk about the New Robotic Telescope (NRT) at the Institute of Physics 'Supernova Neutrinos in the Multimessenger Era' workshop, hosted at Kings College, London, 7th April 2022.

Dr. Victoria Yankelevich delivered an online talk for the Cosmology Seminar at the University of Arizona, 25th March 2022.

Prof. Habib Khosroshahi, Director of the Iranian National Observatory, who has been responsible for bringing to completion a 3.4 metre telescope in Iran, recently visited the NRT Team. Prof. Khosroshahi's visit was part of a Royal Society-funded collaboration, where he contributed his knowledge and experience to a wide variety of discussions relating to the NRT project, as the team prepare for critical design review.

(LOOM) **Mrs. Diane Fitch** was recognised by IMarEST on the 25th March 2022 by receiving their 'Marine Ambassador' award as part of their Outstanding Contribution Award Winners for 2020. The award is recognition of her work under the

Maritime SuperSkills Project and particularly the apprenticeship standards for Marine Surveyor and Marine Technical Superintendent.

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FET Research & Knowledge Exchange Committee
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FET RESEARCH NEWSLETTER

RESEARCH IMPACT GENERATING ACTIVITIES

(PROTECT) **Dr. Mark Taylor** has been working with Merseyside Fire and Rescue Service examining accidental dwelling fire injuries as part of an Impact

Case Study for REF 2027/28 resulting in three publications.

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

(ARI) **Mr. Conor Ransome's** first paper to be published in MNRAS on In supernovae was picked up as a monthly 'Research Highlight' in Nature Astronomy 'SUPERNOVAE: As sweet by any other name?'

Mr. Stephen Molyneux, PhD student at ARI, who is currently on a highly prestigious ESO studentship in Munich, recently contributed to the magazine "All About Space" (27th January 2022 edition, Issue 126) as part of their "Ask Space" section. Mr. Molyneux provided an answer to the question, 'How do we know the Milky Way is a spiral galaxy?'

(FET) The Dual PhD Agreement between LJMU and Wuhan University of Technology has been renewed in January 2022. A Dual PhD student will be joining LJMU next month.

FET's PGR Mentoring Programme continues into 2022, PGR Mentors have now been paired with mentees within the Faculty. Mentors support their mentees to settle into life in Liverpool and into PGR life at LJMU. PGR Mentors have been trained through the ILM Coaching and Mentoring Programme, which is supported by the Faculty PVC.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(ARI) **Dr. Oliver Newton** joined the HPC group on 17th January 2022 and will be working on the E-MOSAICS project until August 2022, testing the influence of galaxy assembly histories on the formation and disruption of globular cluster populations. **Dr. Newton's** expertise is in the use of numerical simulations to constrain the nature of DM from the properties of small scale structure. He joins the ARI from the University of Lyon, where he worked on constrained realisation simulations and the large HESTIA simulation suite. Prior to that, he completed his PhD at the University of Durham.

(PROTECT) **Dr. Athanasios (Thanos) Zolotas** joined the School of Computer Science and Mathematics as a Senior Lecturer in Software Engineering. Before joining LJMU, he was a Research Fellow at the Computer Science Department at The University of York. His research interests are in areas of Model-Based Software Engineering, Parallel Processing of Big Data and Safety Assurance. He is keen on collaborating with others in areas of mutual interest.

NOTABLE PUBLICATIONS

(DSRC) Bacciu, D. (ed.), **Lisboa, P. J. G.** and Vellido, A. (2022) *Deep Learning in Biology and Medicine*. London: World Scientific Publishing Europe Ltd, [DOI](#).

Llanera, D. K., Wilmington, R., Shoo, H., **Lisboa, P. J. G., Jarman, I.**, Wong, S., Nizza, J., Sharma, D., Kalathil, D., Rajeev, S., Williams, S., Yadav, R., Qureshi, Z., Narayanan, R.P., Furlong, N., Westall, S., Nair, S. (2022) “Clinical Characteristics of COVID-19 Patients in a Regional Population with Diabetes Mellitus: The ACCREDIT Study”, *Frontiers in Endocrinology*, Vol. 12, [DOI](#).

(LOOM) Fang, S., Liu, Z., Wang, X., **Wang, J.** and **Yang, Z.** (2022) “Simulation of evacuation in an inclined passenger vessel based on an improved social force model”, *Safety Science*, Vol. 148, pp. 105675, [DOI](#).

(PROTECT) Mehta, J., **Czanner, G.**, Harding, S., Newsham, D., Robinson, J. (2022) Visual Risk Factors for Falls in Older Adults: a case-control study, *BMC Geriatr*, Vol. 22, Issue 134, [DOI](#).

OTHER ITEMS

(ARI) **Dr. Dave Eden**, PDRA, has secured, as Principal Investigator, no less than 1392 observing hours, out of 4200 available, in a relatively recent JCMT (James Clerk Maxwell Telescope - based in Hilo, Hawaii) time allocation round. This award of time has a cash equivalent of \$1.4 million. It will enable **Dr. Eden** to continue and extend his work on surveying the molecular gas content in the outer parts of the Galaxy, and to explore the relation between gas density and the star formation rate.

The Royal Astronomical Society announced its 2022 awards and the EAGLE Team (which includes **Prof. Rob Crain** and **Prof. Ian McCarthy**) was named as the [Group Award Winner](#), LJMU is specifically named as one of the project's host institutes.

Dr. Renske Smit gave a live interview on BBC news on 25th January 2022 about the James Webb Space Telescope, which reached its destination, one million miles from Earth, after being launched on Christmas Day. **Dr. Smit** is one of a handful of scientists who will get to use the world's most powerful telescope, which will spend months uncovering the secrets of the birth of the Universe.

Dr. Dan Perley gave a press conference in January on a recent supernova discovery, possibly related to the collapse of a star to a black hole. It was picked up by Cosmos Magazine, and it featured on the LJMU webpage and that of a few observatories. In association

with this, he also [delivered a presentation for NASA's "Universe of Learning"](#) (an online site for connecting educators with NASA-related research; and wrote an article for [The Conversation](#).

(BEST) **Prof. Patryk Kot** and **Prof. Andy Shaw's** sensor technology has been published in the iiCON newsletter. The new diagnostic tool is the result of a collaboration that brings together the expertise of iiCON lead partner Liverpool School of Tropical Medicine (LSTM), LJMU, and a Merseyside SME manufacturing partner 4D Products Ltd. The hand-held sensor device designed by colleagues in BEST, uses advanced AI analysis and electromagnetic wave technology to detect residual Alpha-Cypermethrin on sprayed wall surfaces in India, and measure whether the correct dose has been applied. The innovative and easy-to-use tool has undergone rigorous testing under both laboratory and field conditions, using the WHO approved gold standard methods as the comparator for device performance. The full article can be viewed [here](#).

(FET) The following were successful in their bids for internal research funding:

(DSRC/PROTECT) Business Support, non-recurrent QR: **Dr. Ivo Siekmann** (PI), **Dr. Gabriela Czanner**, **Dr. Stewart Chidlow** and **Dr. Robert Wilkinson** (Co-Is), “Towards Assessing Agricultural Technology beyond Animal Testing – a new collaboration with Syngenta” £7,500.

(PROTECT) Enhancing Research Culture. **Dr. Gabriela Czanner** (PI), “Risk from mathematical and non-mathematical perspective: promoting research interests and participation in quantitative risk assessment” £3,500.

(PROTECT) **Dr. Mark Taylor** has become a member of the Academic Reference Group for HM Inspectorate of Constabulary and Fire and Rescue Services.

Dr. Hoshang Kolivand delivered an invited talk “Challenges in Augmented and Virtual Reality”, International Webinar on Global Healthcare and Nutrition, 10th-11th February 2022, France. **Dr. Kolivand** also delivered an invited lecture “Challenges in Augmented and Virtual Reality” 16th February 2022, Staffordshire University, UK.

Research by **Dr. Carl Chalmers, Prof. Paul Fergus** and colleagues, features in New Scientist magazine. The article reports on how they have further developed their analysis techniques of drone and camera trap footage, which can now not only recognise different types of animals, but also identify those that are injured. This can help conservationists and can be used to crack down on poachers.

(RCEEE) **Dr. Karl O. Jones** has joined the Editorial Board of the International Journal on Information Technologies and Security. December 2021.

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FET Research & Knowledge Exchange Committee
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Faculty of Engineering and Technology

January 2022

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

(ARI) £108k allocated to LJMU, Royal Society Research Fellows Enhanced Research Expenses, **Prof. Rob Crain**. Royal Society, 2021-2022.

(BEST) £24k allocated to LJMU, Durability analysis of a cement free breakwaters developed using waste based geopolymer and recycled aggregate - an approach to decarbonise shore protection globally, **Dr. Monower Sadique (PI)**, **Dr. Iacopo Carnacina** and **Prof. Thanh Nguyen (LOOM)**. Institution of Civil Engineers, 2021-2022.

£35k allocated to LJMU, Novel technology for extending the life of trench reinstatements, **Prof. Hassan Al Nageim**. Local Council Roads Innovation Group, 2022-2023.

(GERI/LOOM/MEMARC/RCEEE) £49k allocated to LJMU, Reducing maritime emissions, **Dr. Eddie Blanco Davis (PI)** and **Prof. Jin Wang**. Innovate UK, 2021-2023.

US\$60k allocated to LJMU, Addressing human error and enhancing performance through human factors, **Dr. Fang Bin Guo (PI)**, **Prof. Zaili Yang** and **Prof. Ian Jenkinson**. International Association of Maritime Universities, 2022-2023.

£100k allocated to LJMU, UK-Malaysia University Consortium, **Prof. Jin Wang (PI)**, **Prof. Mike Riley (BEST)**, **Prof. Dhiya Al-Jumeily (PROTECT)**, **Prof. Alison Cotgrave (BEST)**, **Dr. John Marsland (RCEEE)**, **Dr. Russell English (MEMARC)** and **Dr. Atif Waraich (PROTECT)**. British Council, 2022-2024.

(PROTECT) £40k allocated to LJMU, Digital catalyst for graduate employability, **Prof. Dhiya Al-Jumeily (PI)**, **Dr. Wasiq Khan**, **Dr. Atif Waraich**, **Janet Lunn**, **Helen McCormack**, **Prof. Jin Wang (LOOM)** and **Prof. Mike Riley (BEST)**. British Council, 2022-2023.

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

(ARI) **Dr. Ben Davies** delivered an invited talk, "Outflows in Evolved Stars", IAU Symposium, 2nd November 2021.

(FET) **Prof. Zaili Yang (LOOM)** is the winner of this year's VC Excellence in Research award. Prof. Yang is the holder of a prestigious £1.5m EU Horizon grant and considered a 'world eminence' in maritime risk and safety. **Dr. Ana Armada Bras (BEST)** is the winner of this year's Excellence in the Promotion of Sustainability for her innovative research into bacteria-based self-healing construction materials. The following were also recognised with Faculty Awards: FET's Research and Enterprise Administration Team (Faculty Winner,

Excellence in Research and Knowledge Exchange Support); **Dr. Eddie Blanco-Davis (LOOM)** (Faculty Winner, Postgraduate Research Supervisor); **Mr. Paul Dickson** (Faculty Winner, Excellence in Knowledge Exchange); **Dr. Atif Waraich (PROTECT)** (Faculty Winner, Promotion of EDI in Research and Knowledge Exchange); **Prof. Patryk Kot (BEST)** (Faculty Winner, Excellence Rising Star) and **Prof. Dhiya Al-Jumeily (PROTECT)** (Faculty Winner, Response to the Covid-19 Pandemic).

(LOOM) **Prof. Zaili Yang** delivered a plenary speech, "Risk analysis and prediction of cycling accident severity", 10th International Conference on

Transportation and Traffic Engineering (ICTTE 2021), 24th-26th December 2021, Chengdu, China. **Prof. Yang** also acted as the Chair of the Conference Programme Committee. **Prof Yang's** "Modeling categorized truck arrivals at ports big data for traffic predication" received the second best student paper award, 10th International Conference on Logistics and Maritime Systems (LOGMS2021), 29th-30th October 2021, Zhoushan, China (coauthored with Haotian Sheng (first author, PhD student), Na Li, Pingyao Wang, Yulin Jia and Zhihong Jin).

(PROTECT) **Dr. Hoshang Kolivand** delivered an invited talk, "Future Directions of Wearable Devices in Nanotechnology", [International Meet on Nanotechnology](#), 13th-15th September 2021, Porto, Portugal. **Dr. Kolivand** also delivered a keynote talk, "Human Computer Interaction: Today vs Tomorrow", [International Conference on Innovative Computing, Intelligent Communication and Smart Electrical systems \(ICSES -2021\)](#) 24th-25th September 2021, organised by St. Joseph's Institute of Technology, Chennai, India.

RESEARCH IMPACT GENERATING ACTIVITIES

(ARI) Astro-ecology's drone work for fire monitoring was featured in a session at the [International Peatland Society Event CoP26](#) on the 5th November 2021. There was an invited 4 minute video featuring the group's work, which was presented by Mark Harrison and Darmae Nasir of Borneo Nature Foundation

International, a partner of the Astro-ecology group, which consists of **Prof. Steve Longmore** (ARI), Prof. Serge Wich (SCS), **Prof. Paul Fergus** and **Dr. Carl Chalmers** (PROTECT). This will contribute to the next REF Impact Case Study and will count as international/world impact.

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

(ARI) A bid for a new [STFC Centre for Doctoral Training \(CDT\) in Data Intensive Science](#) was recently submitted. It is a joint bid with the University of Liverpool for one of 5 CDTs the government will fund. A successful bid will see an investment of £1.3M from STFC to train three cohorts of PhD students. At LJMU, 12 staff within the ARI and CSM were involved in the bid development, with **Dr. Andreea Font** and **Prof. Ian McCarthy** coordinating the overall effort. The outcome will be announced in early February 2022.

(FET) The following have been awarded LJMU VC PhD Scholarships for 2021/22:

- 1) (RCEEE) **Dr. Karl Jones**, Steve Stroud, "Audio Zooming Aligned with Video Zoom in a Drone Surveillance System for Police Forensic Evidence Gathering".
- 2) (RCEEE) **Dr. Yongqiang Qiu**, Blair Duncan, "Ultrasonic Manipulation of Nano-/micro-sized Drug Carriers for Targeted Drug Delivery Controlled".
- 3) (LOOM) **Dr. Musa Bashir**, Louie Larsen, "Influence of platform flexibility (hydroelasticity) on optimal performance of Floating Photovoltaic (FPV) Installation".

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(MEMARC) **Dr. Hiren Kotadia** joined Liverpool John Moores University from the University of Warwick, where he was Associate Professor. **Dr. Kotadia** was educated in India where he obtained his first degree and his Masters from the University of Sheffield and PhD

from the Brunel University London. He joined Warwick Manufacturing Group at the middle of 2015 to lead lightweight research. His research focus is solidification, phase transformation and new alloy development. In particular, **Dr. Kotadia's** interest is

to understand nucleation and growth by employing a novel combined approach of modelling and experimentation and linking these with the mechanical

and chemical properties of materials. His research work has led to industry-wide impact by establishing the material-process-application relationship.

NOTABLE PUBLICATIONS

(APM) Overton, C.E., **Wilkinson, R.R.**, Loyinmi, A., Miller, J.C., Sharkey, K.J. (2022) “Approximating Quasi-Stationary Behaviour in Network-Based SIS Dynamics”, *Bulletin of Mathematical Biology*, 84, Article No. 4, [DOI](#).

(DSRC) **Olier-Caparroso, I.**, Orhobor, O.I., Dash, T., Davis, A.M., Soldatova, L.N., Vanschoren, J., King, R.D. (2021) “Transformational machine learning: Learning how to learn from many related scientific problems”, *Proceedings of the National Academy of Sciences* 118 (49), [DOI](#).

(EEE) **Zhang, Q., Liu X.**, Spurgeon, S.K., **Yu, D.** (2021) “A two-layer modelling framework for predicting passenger flow on trains: A case study of London underground trains”, *Transportation Research Part A Policy and Practice*, Vol. 151, pp.119-139, [DOI](#).

(LOOM) Wang, X.J., Liu, Z.J., **Loughney, S., Yang, Z.**, Wang, Y.F., **Wang, J.** (2021) “Numerical Analysis and Staircase Layout Optimization for a Ro-Ro Passenger Ship during Emergency Evacuation”, *Reliability Engineering and System Safety*, Vol. 271, [DOI](#).

(PROTECT) Sood, D., **Czanner, G.**, Somerville, T., Sood, I., Rowe, F.J. (2021) “Standard automated perimetry using size III and size V stimuli in advanced stage glaucoma: an observational cross-sectional comparative study”, *BMJ Open*, 11 (9), [DOI](#).

OTHER ITEMS

(ARI)A 4 day design review of the New Robotic Telescope project was undertaken by an international panel of experts from academia, industry and other major telescope projects from 29th November to 2nd December 2021. The review considered the current design plans in terms of feasibility, risk and cost and will provide a formal report to the project team in the New Year with its evaluation of progress to date and recommendations for future activities.

Dr. Renske Smit and **Prof. Steve Longmore** recently organised a week-long, [international, in-person research school on star formation](#). Given the pandemic, it was the first meeting many PhD students have attended and it was very well received.

Prof. Rob Crain was named in this year's [Clarivate Highly Cited Researchers List](#).

Prof. Steve Longmore delivered the Jeremiah Horrocks Lecture (outreach lecture series) “Astro-Ecology: using astrophysics research techniques to help

tackle challenges facing the planet”, 8th December 2021. University of Central Lancashire.

Around 3,500 pupils from about 200 primary schools (about a third of them from the Liverpool City Region) shared in some Astrophysics research on 15th December 2021 by joining the annual National Schools' Observatory Christmas Lecture (held online this year). Guided by the NSO team and several ARI researchers, the pupils toured the Universe to help Santa's elves find lost presents. They learnt about everything from planets to supermassive black holes and even Dark Energy. They asked lots of excellent questions (as well as stretching a bit with some Space Yoga!). The event was recorded and will be available online soon.

(FET) The following are recipients of this year's Pump Prime Awards:

- 1) **Dr. Abhijit Ganguli** (PI), **Dr. Monower Sadique** (Co-I) (BEST), £5,000.

- 2) **Dr. Chia-Hsun Chang (PI), Dr. Fang Bin Guo (Co-I)** (LOOM/RCEEE), £2,000.
- 3) **Dr. Georgios Nikitas (PI), Dr. Ana Armada Bras, Dr. Michaela Gkantou, Dr. Georgios Kamaris and Prof. Andy Shaw (Co-Is)** (BEST), £5,000.
- 4) **Dr. Hiren Kotadia (PI)** (MEMARC) £4,990.
- 5) **Dr. Hu Du (PI), Dr. Jeff Cullen, Dr. Laurence Brady and Dr. Badr Abdullah (Co-Is)** (BEST), £5,000.
- 6) **Dr. Karl Jones (PI), Dr. Gerard Edwards and Dr. Colin Robinson (Co-Is)** (RCEEE), £4,045.
- 7) **Dr. Magomed Muradov (PI), Prof. Patryk Kot, Prof. Andy Shaw and Dr. Jakub Markiewicz (Co-Is)** (BEST), £3,550.
- 8) **Dr. Maria Ferentinou (PI), Dr. Iacopo Carnacina, Dr. Georgios Kamaris and Dr. Michaela Gkantou (Co-Is)** (BEST), £5,000.
- 9) **Dr. Max Hashem Eiza (PI) Prof. Qi Shi and Dr. Princy Johnson (Co-Is)** (PROTECT/RCEEE), £4,999.
- 10) **Dr. Musa Bashir (PI), Dr. Ava Shahrokhi (Co-I)** (LOOM/MEMARC), £4,950.
- 11) **Dr. Pelumi Ojuri (PI), Dr. Georgios Nikitas and Prof. Patryk Kot (Co-Is)** (BEST), £5,000.
- 12) **Dr. Tahsin Opoz (PI), Dr. Ariyan Ashkanfar, Dr. Juan Ahuir Torres, Dr. Fyaz Ismail and Dr. Alistair Fielding (Co-Is)** (GERI/MEMARC), £5,000.
- 13) **Dr. Wasiq Khan (PI), Prof. Abir Hussain, Prof. Dhiya Al-Jumeily and Dr. Emily Bethell (Co-Is)** (PROTECT), £3,905.
- 14) **Dr. Yongqiang Qiu (PI), Dr. Guangming Zhang (Co-I)** (RCEEE/GERI), £5,000.
- 15) **Dr. Zelong Yu (PI), Dr. Magomed Muradov and Prof. Patryk Kot (Co-Is)** (BEST), £4,000.

LJMU received a total of 111 applications for QR Policy Support Funding, of these 22 have been funded. The following are FET's recipients of this year's awards:

- 1) **Prof. Trung Thanh Nguyen (PI), Ms. Diane Fitch and Dr. Giorgos Tsapparellas** (LOOM /BEST), "Smart Green Things for Schools", £9,632.70.

- 2) **Dr. Sean Loughney (PI) and Dr. Cameron Kelly** (LOOM/BEST), "Carbon Management Planning - Net-Zero Carbon Decision Support Tool for SMEs", £10,000.
- 3) **Dr. Gabriela Czanner (PI) and Dr. Ivo Siekmann** (DSRC), "Cornea in health and disease: A study to explore the experience of clinicians and patients when diagnosing disease Keratoconus", £10,000.
- 4) **Dr. Ana Bras (PI), Prof. Andy Shaw** (BEST), and Prof. Rosalind Jones (BLW), "Bio-materials to increase infrastructure durability in Central India and Ghana", £9,981.
- 5) **Dr. Karl O. Jones (PI), Dr. John Marsland, Mr. Colin Robinson** (RCEEE), Dr. Helen Burrell and Dr. Suzanne McColl (SCS), "Audio and Video/CCTV Forensic Standards for the UK Criminal Justice System", £8,000.

(LOOM) **Visiting Professor Tony Graham**, FREng delivered his inaugural lecture on the 1st December 2021, sharing his comprehensive industrial experience in Marine Technology and Project Management. Tony was trained as a Naval Constructor and achieved the exceptional rank of Constructor Rear Admiral alongside his appointment as Head of the Royal Corps of Naval Constructors. He led several well-known projects including the Landing Ship Dock Auxiliary, MARS Fleet Tanker, and Queen Elizabeth Aircraft Carrier programmes. He also served as the Chief Operating Officer of Cammell Laird. He currently a Director of Bluewater Portfolio Limited and the Chairman of OCEA (UK). Tony also presented his VP activities at LJMU over the next three years.

(PROTECT) **Prof. Gyu Myoung Lee** was a member of the Steering Committee for the ITU Kaleidoscope Conference, 6th-10th December 2021. **Prof. Lee** chaired the session 'contributions to security' as well as presenting a co-authored paper.

(RCEEE) **Dr. Karl Jones** has joined the Editorial Board of the International Journal on Information Technologies and Security, December 2021.