

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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Faculty of Engineering & Technology
Liverpool John Moores University
Liverpool, L3 3AF, UK

FET Research & Knowledge Exchange Committee
(Contact: FET-FRKEC@ljmu.ac.uk)

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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Faculty of Engineering & Technology
Liverpool John Moores University
Liverpool, L3 3AF, UK

FET Research & Knowledge Exchange Committee
(Contact: FET-FRKEC@ljmu.ac.uk)

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.