Faculty of Engineering and Technology
November 2020

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£730k allocated to LJMU, Probing cosmology with ultra faint dwarf, **Dr. Azadeh Fattahi-Savadjani**. UKRI Future Leaders Fellowship, 2021-25.

LOOM AND MEMARC

£18k allocated to LJMU, PopupWatch - Monitoring and evaluating traffic on emergency popup routes in the LCR, **Dr. Trung Thanh Nguyen (PI), Mrs.**

Diane Fitch and **Mr. Giorgos Tsapparellas**. Department for Transport via LCR Combined Authority, 2020-21.

£55k allocated to LJMU, Risk-Based Specifications of Portable Power Packs for Different Applications, **Dr. Musa Bashir (PI), Prof. Jin Wang, Dr. Sean Loughney** and **Dr. Ben Matellini**. Ministry of Defence (UK) via QinetiQ Ltd, 2020-21.

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

(BEST) **Dr. Ana Armada Bras** delivered a webinar "Bio-inspiring solutions for infrastructure resilience and low carbon impact", organized by the Civil Engineering Department, VNIT, India, 23rd October 2020. The talk attracted over 50 attendees from industrial and governmental bodies relating to infrastructure improvement in India.

(GERI) **Prof. David Harvey** delivered a keynote lecture, "Engineering Green Electronics", 3rd International conference on VLSI, Communications and Signal Processing, VCAS 2020, MNNIT, Allahabad, India (online), 10th October 2020.

(LOOM) **Prof. Zaili Yang** delivered a keynote address, "Risk analysis in shipping, port and maritime logistics: Advanced uncertainty modelling", Sustainable Maritime Transport Forum of World Transport Convention (WTC) (online), 12th-13th October 2020. **Prof. Yang** also delivered two invited speeches, "Quantitative Evaluation of Green Port Development", Low Carbon Transport and Cities, sponsored by the Science and Innovation Network, British Embassy Bucharest and UK Connected Places Catapult (online), 4th September 2020 and "Human Reliability Analysis: Case Studies in Maritime Operations", 4th International Conference on Maritime Safety and Smart Shipping (MSSS 2020) (online), 5th-6th October 2020.

RESEARCH IMPACT GENERATING ACTIVITIES

(LOOM) **Dr. Trung Thanh Nguyen, Mrs. Diane Fitch, Mr. Giorgos Tsapparellas, Dr. Igor Deplano, Mr. Neil Cook**, and **Ms. Amanda Wilson** as part of the ERDF-funded project LCR Sustainable Green Travel Corridors, have developed a journey planner app to help LCR citizens plan their travel, taking into account the new popup emergency cycling and walking routes recently created by local authorities in the region. To the best of their knowledge, this is among the first apps, if not the first app that supports journey planning on popup cycling and walking routes.

Dr. Nguyen, Dr. Ran Wang, Prof. Ian Jenkinson, **Mr. Alan How, Ms. Carys-Anne Evans**, and Mr. Mark Askem have completed a research project with Estate and Facilities Management which developed models to understand the capacity of LJMU buildings, in anticipation of the reopening of LJMU campus next semester, taking into account COVID-19 measures. The work has been well received, Mr. Mark Nevitt, Head of Businesses and Stakeholder Services, said "The work has been very beneficial in informing the formation of the queuing systems and the access and egress strategy for James Parsons".

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

(ARI) **Dr. Simon Pfeifer** successfully completed his PhD on the 19th August 2020. He completed within three years and has a postdoctoral position in Potsdam.

The Faculty PVC's Prizes for Best PhD Thesis 2020 were awarded at a virtual ceremony on the 23rd September 2020. The award winners were: (APM) **Dr. Chantelle Mason** "A Systems Toxicology Framework for Improving the Identification of Paracetamol Overdose", Lead Supervisor **Dr. Ian Jarman**. (ARI) **Dr. Jonathan Davies** "The influences of dark matter halo formation history on black hole growth, circumgalactic gas expulsion and galaxy evolution", Lead Supervisor **Dr. Rob Crain**. (EEE) **Dr. Ahmad Abduallah** "Independent Power Flow Control of Multiple Energy Sources Using a Single Electric Machine", Lead Supervisor **Dr. Obrad Dordevic**. (PROTECT) **Dr. Aaron Boddy** "A Machine Learning Framework For Securing Patient Records", Lead Supervisor **Dr. Will Hurst**. Award winners were congratulated for their achievements by **Prof. Mike Riley** and received certificates along with £200 each in Amazon vouchers.

EXTERNAL COLLABORATION

(BEST) Following the collaboration under the COST ACTION CA 15202, **Dr. Ana Armada Bras** has been working on a partnership with Prof Sadowski, Wroclaw University of Science and Technology on "A new microbiological paradigm for self-healing for concrete with high amount of recycled aggregate by bacterial activity".

(MEMARC) **Prof. James Ren** and MEMARC as part of the EU H2020 Marie Skłodowska-Curie Grant/Consortium Project i-Weld, jointly organised an international online seminar "Advanced Welding and Joining Techniques", 15th October 2020, with the University of Malaya, Presentations were delivered from the Ukraine, China, Malaysia and the UK.

NOTABLE PUBLICATIONS

(ARI) **Harvey, E.J.**, Redman, M.P., Boumis, P., Akras, S., Fitzgerald, K., Dulaimi, S., Williams, S.C., **Darnley, M.J., Lam, M.C.**, Kopsacheilli, M., Derlopa, S. (2020) "Two New Nova Shells associated with V4362 Sagittarii and DO Aquilae", *Monthly Notices of the Royal Astronomical Society.* DOI. This publication uses the Liverpool Telescope and Aristarchos data to uncover two previously unknown nebulae associated with historical nova events.

(EEE) Joksas, D., **Freitas, P.**, **Chai, Z.**, Ng, W.H., Buckwell, M., Li, C., **Zhang, W.D.**, Xia, Q., Kenyon, A.J., Mehonic, A. (2020) "Committee machines—a universal method to deal with non-idealities in memristor-based neural networks", *Nature Communications,* Vol. 11, Article number: 4273, pp. 1-10, DOI.

(LOOM) Yazdani, D., Omidvar, M.N., Cheng, R., Branke, J., **Nguyen, T.T.**, Yao, X. (2020) "Benchmarking Continuous Dynamic Optimization: Survey and Generalized Test Suite", *IEEE Transactions on Cybernetics*, pp. 1-14, DOI. This is the result of international collaborative research between researchers from four universities, which was partially funded by the Faculty PhD Scholarship.

(MEMARC) **Guo, J**., Feng, Y., **Tang, C., Ren. X.** (2020) "Intrinsic defects, Mo-related defects, and complexes in transition-metal carbide VC: A first-principles study", *Journal of the American Ceramic Society*, Volume 103, Issue 12, pp. 7226-7239, DOI.

OTHER ITEMS

(ARI) The National Schools' Observatory (NSO) has been celebrating World Space Week 4th-10th October 2020 by launching a new Careers section to the website, highlighting the diversity of careers, and people, working in space-related fields. Some of these career profiles will be spot-lighted throughout the month in a celebration of Black History Month through the @SchoolsObs social media channels. The NSO also connected with Red Cross Kenya and the Travelling Telescope team in Kenya to run a remote session with ~70 Kenyan school students on using the Liverpool Telescope to hunt for asteroids (7th October 2020) and joined a panel discussion for students to ask astronomers questions (9th October 2020).

The STFC CDT School on Data Intensive Science 2020 was attended by 65 PhD students working in big data science. The online event took place week commencing 12th October 2020, hosted by the University of Liverpool, with involvement from ARI. Sessions in High Performance Computing (HPC) were organised by **Prof. Ian McCarthy** and colleagues and there was also a remote observing session with the Liverpool Telescope organised by **Dr. Chris Copperwheat** and colleagues.

Prof. Andy Newsam has a new book published, "Everything You Ever Wanted to Know About the Universe: And Our Place Within It", further details can be found here.

(BEST) £2k allocated to LJMU, [Runoff] VITCaM: Virtual Inventory Toolkit for Catchment Management, **Dr. Geoffrey Parker**. STFC, 2020-21.

(LOOM) £5k allocated to LJMU, Safer End of Engineering Life – Offshore & Ship, **Dr. Milad Armin (PI), Prof. Jin Wang** and **Dr. Sean Loughney**. Royal Academy of Engineering via the Energy Institute, 2020-21.

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£12k awarded to LJMU, Joint development programme for Optical Instrumentation and New Telescopes (JOINT), **Prof. Iain Steele (PI), Dr. Helen Jermak, Dr. Eamonn Harvey**, **and Dr. Adrian McGrath**. Royal Society International Exchange with IPM, Iran, 2020-2022.

LOOM

£170k awarded to LJMU, Lookout Awareness of Distractions: the creation of a Distraction Evaluation Ratio (LADDER), **Mr. Abdul Khalique (PI), Dr. Fang Bin Guo (RCEEE), Dr. Alan Bury, Prof. Zaili Yang, Dr. Eddie Blanco Davis and Mr. Kamil Kaminski**. MarRI-UK, 2020-2022.

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

(ARI) **Prof. Andy Newsam** delivered a remote keynote address, "National Schools' Observatory: Robotic Telescopes and STEM Engagement", Global Hands-on Universe Conference, 22nd August 2020.

Dr. Helen Jermak remotely chaired a highly successful special session, "Equality and Diversity Issues in Astronomy", Annual Meeting of the European Astronomical Society, July 2020.

Prof. Iain Steele delivered a remote invited address, "Roboticization of the Liverpool Telescope and its 15 Years of Operation", Seimei Telescope Meeting, Japan, August 2020.

(BEST) **Dr. Ana Armada Bras** delivered a webinar "Infrastructure resilience and climate action", Institution of Civil Engineers North West, 14th July 2020.

(EEE) **Dr. Karl Jones** delivered an online plenary session "Audio & Video Forensics Does the Criminal Justice System understand Engineering Fundamentals?" 9th International Conference on Advanced Technologies, Istanbul, Tukey, 10-12th August, 2020.

(LOOM) **Prof. Zaili Yang** delivered a webinar "Prioritise Vehicle Cleanliness Key Green Performance Indicators", Connected Places Catapult, 29th July 2020. The talk attracted over 100 attendees from industrial and governmental bodies relating to air quality improvement in the UK.

(PROTECT) **Dr. Hoshang Kolivand** delivered an online talk "Future Direction of Wearable" and a pre-conference webinar "Social Impacts of Big Data and IOT Applications", 5th International Conference on Recent Trends in Big Data and IoT, St. Joseph's Institute of Technology, Chennai, India, 22-24th July 2020.

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

Congratulations to all of the Postgraduate Researchers and Supervisors whose achievements were celebrated at the Doctoral Academy Awards Ceremony. Special commendation to **Dr. Michaela Gkantou** (BEST) who won Faculty Supervisor of the Year and **Mr. Fares Yousefi** (PROTECT) who won the People's Choice Award, voted for by the PGR Community, at the LJMU Three Minute Thesis Competition. The following PhD students were also recognised as Outstanding Communicators; **Dr. Hannah Dalgleish (ARI), Mr. Abdullah Kadhim (BEST), Mr. Ali Shubbar (BEST)** and **Ms. Hazel Sivori (LOOM)**. They were nominated for excellence in communicating in a wide range of environments including talks, workshops, partnerships, public engagement and outreach activities.

The LJMU Scholarship Scheme is currently open for applications (Home/EU applicants only). Applications will be judged on the calibre of the student and will also consider the quality of the project and how it meets the vision of the LJMU Research Strategy. Applications should be submitted by the PhD Supervisor to E.J.Walker@ljmu.ac.uk by 5pm on the 18th September 2020.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(ARI) **Dr. Aaron Watkins** joined the ARI as a new STFC-supported PDRA working with **Prof. Chris Collins** in the area of extragalactic astrophysics using the Large Synoptic Survey Telescope (LSST), which is due for first light in 2022. Based in northern Chile, LSST is a 2 billion dollar US-led 10 metre telescope that will image large areas of the sky to unprecedented low light levels. Dr. Watkins is leading the international effort to optimise the LSST data reduction pipeline to recover the very faint light from galaxies missing from previous surveys, which is crucial for understanding the evolution of galaxies over cosmic time. Dr. Watkins studied as an undergraduate at the University of Nebraska - Lincoln in the US and was a graduate student at Case Western Reserve University, also in the US, gaining his PhD in 2017. He then moved continent and was a Postdoctoral Scholar for 2.5 years at the University of Oulu, Finland, before moving to Liverpool, just before the Covid-19 lockdown in March 2020. The work package Dr. Watkins leads is a joint project with the University of Hertfordshire and funded by UKRI's STFC as part of the wider LSST: UK partnership.

(LOOM) **Dr. Mark Ching-Pong Poo** recently joined the School of Engineering, Technology and Maritime Operations as a Research Associate in Maritime Transport. His research interests are in the areas of transport modelling and climate change adaptation. Dr. Poo is keen to collaborate with others in areas of mutual interest.

Dr. Abbie Romano has also joined the School of Engineering as a Postdoctoral Research Associate in Marine Technology. Dr. Romano completed her PhD at LJMU in June 2020, which focused on the optimisation of water transport in bio-based building materials. Dr. Romano will now be working on the EMPORIA4KT project, which aims to work towards the design and implementation of actions between triple helix players to foster innovation and competitiveness within Blue Economy sectors.

NOTABLE PUBLICATIONS

(ARI) **Shrestha, M., Steele, I. A., Piascik, A. S., Jermak, H., Smith, R. J., and Copperwheat, C. M.** (2020) "Characterization of a dual-beam, dual-camera optical imaging polarimeter", *Monthly Notices of the Royal Astronomical Society*, Volume 494, Issue 4, pp. 4676-3686, DOI.

(EEE) **Levi, E.**, Joksimovic, G., Mezzarobba, M., and Tessarolo, A. (2020) "Optimal Selection of Rotor Bar Number in Multiphase Cage Induction Motors", *IEEE Access,* Vol. 8, pp. 135558-135568, DOI.

(GERI) **Zhang, G., Harvey, D. M.**, Mohd Salleh, M. A. A., Abdullah, M. M. A. B., Ahmad, R., Mostapha, M., Yoriya, S., and Chaiprapa, J. (2020) **"**Effect of kaolin geopolymer ceramic addition on the properties of Sn-3.0Ag-0.5Cu solder joint", *Materials Today Communications,* Volume 25, 101469, DOI.

(LOOM) **Yang Z., Poo, M. C-P**., Galatioto F., Dimitriu D., Qu Z., Rushton C., Lee P. TW., Guan B., and Woodward, N. (2020) "Key Green Performance Indicators (KGPIs) for vehicle cleanliness evaluation: A buyer choice", *Transportation Research Part D: Transport and Environment*, Vol. 87, 102505, DOI.

OTHER ITEMS

(ARI) First year PhD Student **Mr. Stephen Molyneux** has been offered a place on the prestigious European Southern Observatory (ESO) Studentship Programme. He will continue his studies at ESO-Munich, for up to 2 years, from the autumn.

Dr. Chris Copperwheat, Dr. Dan Perley, Dr. Doug Arnold, Dr. Manisha Shrestha and **Dr. Eamonn Harvey** ran an online Time Domain Summer School in partnership with their colleagues in the GROWTH collaboration, 17th August 2020. The school was a big success, with 80 students from all around the world watching lectures and participating in live Python sessions. There was also a night of live observing with the Liverpool Telescope.

(BEST) **Dr. Ana Armada Bras** and **Dr Hector Martin** have been working in partnership with Prof. Azamathulla, Department of Civil and Environmental Engineering, the University of West Indies, Trinidad and Tobago on building climate resilience of infrastructure with bio-inspiring solutions.

(EEE) **Dr. Karl Jones** has been invited to serve for 3 years on the IFAC (International Federation of Automatic Control) Technical Committee on Mining, Mineral and Metal Processing.

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

<u>BEST</u>

£600k allocated to LJMU, to create a dedicated workspace in the Life Sciences Accelerator Building for the development of non-invasive diagnostics for use in infectious diseases prevention and diagnosis. **Prof. Andy Shaw (PI)**, **Dr. Patryk Kot, Dr. Magomed Muradov** and Dr. Alison Hardy. UKRI Strength in Places Fund, 2020-25. LJMU as member of a consortium led by Liverpool School of Tropical Medicine, total UKRI grant value £18.6m.

<u>EEE</u>

£487k allocated to LJMU, Realistic fault modelling to enable optimization of low power IoT and Cognitive fault-tolerant computing systems, **Prof. Jian Zhang (PI)** and **Prof. Wei Zhang**, EPSRC Standard Grant, 2020-2023.

<u>LOOM & MEMARC</u>

£330k allocated to LJMU, IRIS Information system for railway station staff, 9 month project, **Dr. Trung Thanh Nguyen (PI), Dr. Qian Zhang**, **Dr. Igor Deplano, Mr. Neil Cook, Dr. Ran Wang**, and Dr. Alison Hardy (RCEEE). Innovate UK First of A Kind 2020, July 2020-March 2021.

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

(PROTECT) **Dr. Hoshang Kolivand** delivered a keynote speech "Current and Future of Smart Wearable Devices" at the Annual Humanoid Robotics, Artificial Intelligence and Automation, Innovations and Advancements in Robotics Technologies, London, UK (online), 21 May 2020. Dr. Kolivand also delivered a workshop "The Future of Immersive Technology in Augmented and Virtual Reality", at the 3rd International Conference on Advanced Scientific Innovation in Science, Engineering and Technology, Adi Shankara Institute of Engineering and Technology, Kalady, India (online), 15-16 May, 2020.

RESEARCH IMPACT GENERATING ACTIVITIES

LOOM researchers are delivering a number of projects supporting local transport infrastructure:

- **Dr. Trung Thanh Nguyen, Ms. D. Fitch, Mr. Giorgos Tsapparellas, Dr. Igor**

Deplano, Mr. Neil Cook and **Ms. Amanda Wilson** as a part of the ERDF-funded project LCR Sustainable Green Travel Corridors, are working to help local authorities in the LCR. The team is preparing for the rollout of an

information dashboard that will give local authorities real-time sensor data and statistics for reports. The team are also working with local authorities in preparation for the monitoring and evaluation of emergency cycling/walking routes in response to COVID-19.

- **Dr. Nguyen, Dr. Wang, Dr. Deplano** and **Mr. Ahmed Makki** are starting discussions with Merseyrail to carry out simulation for passenger movement in response to COVID-19.

- **Dr. Nguyen, Prof. Ian Jenkinson, Dr. Wang**, **Mr. Alan How**, **Ms. Carys-Anne Evans** and Mr. Mark Askem are starting a project with Estate Management to develop models to understand the capacity of LJMU buildings in anticipation of the reopening of the LJMU campus in the next semester, taking into account COVID-19 measures. This project is based on a previous prototype undertaken by **Dr. Thanh Nguyen** and **Dr. Wang**.

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

(BEST) - PhD researcher and part-time tutor **Ms. Abbie Romano** was awarded this year's Student-Facing Star at the Amazing Teacher Awards 2020.

Faculty Research and Knowledge Exchange Committee is pleased to announce the Faculty PVC's Prize for Best PhD Thesis 2020, nominations of eligible candidates are being accepted for this year's awards until Friday 31st July 2020. Award winners will receive £200 in Amazon vouchers, which will be presented at a virtual awards ceremony in September.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(ARI) **Dr. Jonathan Davies** gained his PhD in April 2020 at LJMU, and now continues to work as a Postdoctoral Research Associate at the Astrophysics Research Institute. He utilises state-of-the-art cosmological simulations to investigate how galaxies like our Milky Way interact with their cosmic environments, and to understand the role this plays in their evolution.

(BEST) **Dr. Saiful Islam Bhuiyan** has joined the Department of Built Environment as a Senior Lecturer.

He finished his PhD from Anglia Ruskin University in March 2020. His PhD research included development of a refurbishment tool kit for the social housing in the UK. The tool kit considered the multi-criteria objectives of the social housing asset management under key point indicators (KPIs) and suggested the optimal solution using analytical hierarchy process (AHP). His research interests are in the area of future climate change, adaptation, sustainability, and mitigation against overheating due to future climate change.

REF UPDATE

The National REF Team have confirmed that the REF2021 submission date has been revised to the 31 March 2021. There has also been an extension to the impact window for case studies to 31 December 2020 from 31 July 2020 (this is optional for ICS not affected by COVID-19).

NOTABLE PUBLICATIONS

(BEST) **Al Khaddar, R., Kot, P., Hashim, K.** (eds.) (2020) "Advanced Applications of Electrocoagulation in Water and Wastewater", *Water (Special Issue),* DOI.

(EEE) **Abduallah, A. A., Dordevic, O., Jones, M., Levi, E.** (2020) "Regenerative test for multiple three-phase machines with even number of neutral points", *IEEE Trans. on Industrial Electronics*, vol. 67, no. 3, pp. 1684-1694, DOI.

(GERI) **Baishya, K., Harvey, D. M., Zhang, G., Braden, D. R.** (2020) "Investigation into how the floor plan layout of a manufactured PCB influences flip-chip susceptibility to vibration", *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 10, issue 5, pp. 741-748, DOI.

(LOOM) **Fan, S., Blanco-Davis, E., Yang, Z.,** Zhang, J. and Yan, X. (2020) "Incorporation of human factors into maritime accident analysis using a data-driven Bayesian network", *Reliability Engineering & System Safety*, vol. 203, 107070, DOI.

OTHER ITEMS

(ARI) **Dr. Hannah Dalgleish**, who successfully defended her PhD thesis in May 2020, has been elected as a Royal Astronomical Society Councillor for a term of three years.

(LOOM) £16k internal LJMU funding awarded to **Dr. Trung Thanh Nguyen, Dr. Ran Wang, Prof. Ian Jenkinson** and Mr. Mark Askem to develop models to understand the capacity of LJMU buildings in anticipation of the reopening of LJMU campus in the next semester, taking into account COVID-19 measures.

£8.5k internal LJMU funding awarded to **Prof. Ian Jenkinson** and Dr Touraj Ehtezazito to carry out a technical study to enable dental practices to develop and implement measures to minimise or potentially eliminate patient and dental staff exposure to Coronavirus Covid-19.

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

APM

£60k allocated to LJMU, PhD Studentship - Accurate, fast, data efficient and interpretable algorithm for glaucoma screening to avoid preventable blindness in Arcadia, India, **Dr. Gabriela Czanner (PI), Dr. Silvester Czanner**, Prof. Colin Willoughby (Ulster University) and Dr. Kavitha Srinivasan (Aravind, India). British Council for Prevention of Blindness, 2020-2023.

ARI

£797k allocated to LJMU, Stellar Clusters as the nurseries of black holes, **Dr. Sebastian Kamman**. UKRI Future Leaders Fellowship, 2020-2024.

£208k allocated to LJMU, A telescope control system for the next generation of facilities, **Dr. Chris Copperwheat (PI), Prof. Iain Steele, Dr. Andrzej Piascik** and **Mr. Robert Smith.** British Council Newton STFC-NARIT, 2020-22.

£107k allocated to LJMU, Telescopes for Thai students: Astronomy as a tool for long-term capacity building in STEM, **Prof. Andy Newsam (PI).** British Council Newton STFC-NARIT, 2020-2022.

LOOM & MEMARC

$15k allocated to LJMU, M-REASONS (Maritime-Risk Evaluation and Safety Optimization in Narrow Straits), **Dr. Sean Loughney (PI)** and **Prof. Jin Wang.** LJMU as lead partner for the grant of $20k, IAMU's Young Academic Staff FY2020, May 2020 – May 2021.

£13k allocated to LJMU, Safe and Sustainable Decommissioning of Offshore Structures Taking into Consideration the Peculiarities of the ASEAN & South Asia Regions, **Prof. Jin Wang (PI), Dr. Musa Bashir, Dr. Milad Armin** and **Prof. Zaili Yang.** LJMU as a consortium partner for the grant of £199k, Royal Academy of Engineering, 2020-2024.

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

(APM) **Dr. Sandra Ortega Martorell** delivered a keynote address on "Big Data: Challenges and Opportunities", Big Data Symposium 2020 as part of a symposium (10 February 2020) and workshops (11-12 February 2020) in Bahrain. The University of Bahrain and LJMU organized the second Big Data Symposium as part of the activities of the MSc in Big Data Science and Analytics which was recently launched and validated by LJMU to be the first MSc program of its kind in the

Kingdom of Bahrain. The symposium attracted academics, professionals, and MSc students to learn more about critical issues relevant to big data.

(PROTECT) **Dr. Hoshang Kolivand** delivered a talk on "Engaging New Technologies to Enhance Your Current Research", Second International Multidisciplinary Graduation Conference, Lahore, Pakistan, 7 March, 2020.

RESEARCH IMPACT GENERATING ACTIVITIES

(LOOM) Research projects led by **Dr. Trung Thanh Nguyen** are contributing to the Liverpool City Region's response to COVID-19. The ERDF-funded project LCR Sustainable Green Travel Corridors **(Ms. Diane. Fitch, Mr. Giorgos Tsapparellas, Mr. Igor. Deplano, Mr. Neil. Cook** and **Ms. Amanda Wilson)** have been monitoring motion data (cars, cyclists, pedestrians etc.) via motion sensors across the Liverpool City Region. The team are producing analysis reports for Local Authorities, as well as the Combined Authority, on the impact of the measures imposed. The headline so far in this data has been the significant increase in cyclists in every area of the LCR. These reports and data have been and will continue to be shared with the Department for Transport and the LAs. In the coming weeks, they should also be able to report on Air Quality and Weather data at the same locations with newly installed IoT sensors. Correlation of these data sets in the context of the lockdown should produce some interesting findings.

Dr. Nguyen, **Mr. Neil Cook, Mr. Igor Deplano**, **Ms. Samantha Gibbons**, **Dr. Ran Wang, Mr. Ahmed Makki** and **Dr. Yannis Ancele** are continuing to provide a rail passenger information system at Liverpool South Parkway. During the lockdown the system continues to provide keyworker passengers and frontline staff with real-time train journey and disruption information. It also provides the transport operator with statistics on the impact of COVID-19 on traffic.

Dr. Nguyen and **Dr. Ancele** are deploying a bike delivery routing system to test its application in delivering food to organisations such as food banks to improve their response to COVID-19.

(Industry Support) As COVID-19 is forcing many industries to consider how they can be more resilient, FET's industry support unit is continuing to work with businesses in solving their latest innovation challenges. A recent initiative ran in partnership with Wirral Chamber of Commerce and funded by Research England, was led by the Faculty's Clean Growth UK team who developed a series of online virtual workshops. The sessions have been designed to help businesses identify and learn about the most impactful actions which can be taken through a whistle stop tour of energy solutions, process, product and service innovations, strategy development and grant funding. The sessions have attracted a number of local companies all of whom have since gone on to engage with the CGUK team on one to one support projects. The team are planning a number of further workshops in the future.

EXTERNAL COLLABORATION

(APM) **Dr. Gabriela Czanner** became a Full College Member of EPSRC (August 2019) and served on a prioritisation panel and interview for EPSRC Hubs for Mathematical Sciences in Healthcare, Swindon, Feb 2020.Dr. Czanner also delivered an invited talk "Automated detection of glaucoma from optic disc photographs", Royal College of Surgeons, Edinburgh, Feb 2020.

(BEST) Conference Director **Prof. Hassan Al Nageim** led the 2020 LJMU 19th Annual International Conference on Highways and Airports Pavement Engineering, Asphalt Technology and Infrastructure, 11-12 March 2020, Sensor City, Liverpool. The conference attracted a wide range of industrial companies, highways and airports authorities, research centres and academics.

(BEST) **Dr. Monower Sadique** delivered a virtual workshop "Organise your writing – potentiality of endnote" organised by University of Kufa, Iraq, 22 April 2020.

(MEMARC) **Prof. James Ren** hosted Dr Elena Kostenevich from the Experimental Design-Technological Office of the E.O. Paton Electric Welding Institute of the National Academy of Sciences of Ukraine through his EU RISE project (i-Weld) working on modelling of residual stresses in welding stainless steels.

NOTABLE PUBLICATIONS

(APM) Vinciguerra, R., Rehman, S., Vallabh, N.A., Batterbury, M., **Czanner, G.,** Choudhary, A., Cheeseman, R., Elsheikh, A., Willoughby, C.E. (2020), "Corneal biomechanics and biomechanically corrected intraocular pressure in primary open-angle glaucoma, ocular hypertension and controls", *British Journal of Ophthalmology*. Vol 104, Issue 1, pp. 121-126. DOI. This is one major publication from the current collaboration with Royal Liverpool Hospital on understanding the measurement and structure of cornea.

(ARI) Fitzgerald, K., **Harvey, E.J.,** Keaveney, N., Redman, M.P. (2020), "Introducing Pycross, PyCloudy Rendering of Shape Software for pseudo 3D ionization modelling or nebulae", *Journal of Astronomy and Computing,* Volume 32, 100382. DOI.

(ARI) Aydi, E., Sokolovsky, K.V., **Harvey, E.J**. et al. (2020) "Direct Evidence for Shock Powered Optical Emission in a Nova", *Nature Astronomy.* DOI.

(LOOM) **Yazdani, D.**, Omidvar, M.N., Branke, J., **Nguyen, T. T.**, Yao, X. (2020) "Scaling up Dynamic Optimization Problems: A Divide-and-Conquer Approach." *IEEE Transactions on Evolutionary Computation*,

Volume 24 pp. 1-15. DOI. This is an international collaborative project, partially funded by the FET Dean's Scholarship and the Royal Academy of Engineering.

(PROTECT) Kaihao L., Yongjian Y., En W., Zheli L., **Thar Baker, S.**, Ali B. (2020), "Reinforcement Learning Based Advertising Strategy Using Crowdsensing Vehicular Data", *IEEE Transactions on Intelligent Transportation Systems*, . DOI. This work is funded by the National Natural Science Foundations of China, Natural Science Foundation of China for Young Scholars, China Postdoctoral Science Foundation, and Changchun Science and Technology Development Project.

OTHER ITEMS

Following the LJMU Coronavirus/COVID-19 Pandemic: Rapid Response call, the following FET applications have been awarded:

1) (LOOM) **Prof. Ian Jenkinson, Dr. Dave Evans** and Dr. Touraj Ehtezazi, £9k, "A technical study to enable dental practices to develop and implement measures to minimize or potentially eliminate patient and dental staff exposure to Coronavirus COVID-19".

2) (LOOM) **Dr. Trung Thanh Nguyen, Dr. Ran Wang** and **Mr. Igor Deplano,** £15k, "Simulation research to investigate and optimise social distancing in public transport in the Liverpool City Region".

LJMU GCRF funds have been repurposed to support initiatives tackling the COVID-19 pandemic as follows:

1) (ARI) **Prof. Steve Longmore** and Prof. Serge Wich, £24k, "Tourism, great apes, and COVID-19" – (May-July 2020).

2) (LOOM) **Prof. Zaili Yan**g, **Dr. Christos Kontovas** and **Dr. Chia-Hsun Chang,** £33k, "Emergency Logistics Response to Outbreak Risk of COVID-19: Phase 1 Risk Analysis" (June-July 2020).

(ARI) The Astro-Ecology Group featured in a BBC 1 Nature Documentary series on Primates. Episode 3 'Protecting Primates' includes their field trip to Madagascar last year, where they attempted to help save highly endangered species of lemur. The episode can be viewed on BBC iPlayer here.

(LOOM) Dr. Zhuohua Qu (PI), **Prof. Zaili Yang, Prof. Jin Wang and Prof. Ian Jenkinson** (CoIs) received €14k additional funding to support their joint EU GOLF (supply chain management) project, (June 2020-

December 2022). The fund is allocated to LJMU business school where Dr Qu is based.

(LOOM) **Prof. Zaili Yang** will receive £6k from Manchester Metropolitan University to support his research on "Transport Adaptation to Climate Change" (June to December 2020).

(LOOM) **Dr. Trung Thanh Nguyen, Dr. Ran Wang, Prof. Mike Riley, Prof. Ian Jenkinson, Prof. Jin Wang** and **Dr. Christian Matthews** have delivered two mathematical models to help evaluate and understand how social distancing measures can be implemented in the James Parsons building in response to COVID-19. The team is also working on developing simulation models to investigate more complex scenarios.

New cross-university research group, Wellbeing & Ecologies for Sustainable Futures

Colleagues from four Faculties, including FET, have joined forces to set up a new interdisciplinary, applied research group. Designed to have a positive impact on society, infrastructure and industry. In response to the climate change emergency, and guided by principles of sustainable development the Wellbeing & Ecologies for Sustainable Futures group have been working in partnership with local communities, businesses and government departments to develop solutions through collaboration which begin to mitigate the effects of climate change, reduce carbon emissions and create healthier environments for ourselves and future generations to live within. Placing emphasis on education and holistic sustainable development, WEAFs research ambition is to implement new initiatives, which influence behavioural change in the way we do, see and think about climate change. Focusing on not only the latest technologies but also the values and attitudes needed to effectively respond to climate change.

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

<u>ARI</u>

£12k allocated to LJMU, GROWTH Summer School in Time Domain Astrophysics 2020, **Dr. Chris Copperwheat**. STFC, 2020.

<u>LOOM & MEMARC</u>

£12k allocated to LJMU, BAT Approach to Guide Aerial Vehicles Safely Through Cluttered Environments, **Dr.**

Linghai Lu. Royal Society International Exchange with Johns Hopkins University, USA, 2020.

<u>PROTECT/Computer Science</u>

$66k allocated to LJMU, Developing a machine learning method to count orangutan nest in Malaysia and Indonesia on drone images to increase survey efficiency, Prof. Serge Wich (Faculty of Science) (PI), **Dr. Paul Fergus, and Dr. Carl Chalmers.** US Fish and Wildlife Service, 2020-2021.

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

(BEST) **Dr. Monower Sadique** received the Best Paper Award at the 5th International Conference on Civil Engineering for Sustainable Development: ICCESD 2020, Khulna, Bangladesh sponsored by ICE, UK.

(GERI) **Dr. Andre Batako** has been awarded African/Togo Diaspora Prize for Excellent Achievements in Research Outside the Continent, by the Minister of Foreign Affairs, African Integration, Togo, Dec. 2019.

RESEARCH IMPACT GENERATING ACTIVITIES

(GERI) **Dr. Andre Batako's** work on resonance machining has been used at a company in Harbin-China to develop products that are now on the market in China.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(PROTECT) **Dr. Liang Men** has joined the Department of Computer Science as a Lecturer in Computer Science.

He did his PhD at EPSRC & AHRC funded Media and Arts Technology Centre for Doctoral Training, Queen

Mary University of London. His research interest is in the area of collaborative virtual reality and human-computer interaction. His research tries to understand and support people's creative collaboration better in immersive virtual reality. More information about his projects and research can be found at www.menliang.ml.

Dr. John Carr gained his PhD in 2010 at the University of Nottingham where he studied Serious Games. He subsequently spent ten years in industry as a software developer and then head of computing at a mechanical simulator manufacturing business. His research interests are novel gameplay systems, HCI, and systems with physical interaction through sensors or motion feedback; particularly where these can be utilised to benefit those with physical or mental disabilities. He is looking to get back into some research so feel free to drop into room 6.06 to have a chat.

EXTERNAL COLLABORATION

(GERI) The EU Life funded Laserfence project (PI **Dr. Martin Sharp**) held its final conference at LJMU. As well as partner presentations relating to the project, Ruth Cox (Animal & Plant Health Agency) gave a presentation on animal identification using Deep Learning methods, and Jessica Magnus (Joint Nature Conservancy Committee) delivered a presentation about the last opportunity for the UK to apply for EU Life funding.

Dr. Andre Batako delivered an invited talk at the Theory of Machine, Nottingham, TecQuipment open day on 19th February 2020. Future collaborations are planned. Dr. Batako also visited the National School of Engineers at the University of Lorraine, France, in January 2020, as part of an ERASMUS exchange. During the visit an Industry-Academia International platform for industry 4 was established.

(LOOM) **Prof. Zaili Yang** has been appointed as an advisor of a large research project funded by Norwegian Research Council, "COAST - *Centre of Excellence in Maritime Simulator Training and Assessment (COAST)" (110m NOK) led by Norway South East University, Norwegian University of Science and Technology and Kongsberg Maritime.* This project, together with an EU H2020 RISE project ENHANCE, helps LOOM researchers to access the world leading facilities and expertise in maritime human factors and reliability research to develop collaborative work.

NOTABLE PUBLICATIONS

(LOOM) **Wang Y.F., Wang J. and Yang Z.** (2020) "Modelling ship collision risk based on the statistical analysis of historical data: A case study in Hong Kong waters", *Ocean Engineering*, Vol. 197, pp. 106869, DOI.

(EEE) Slunjski, M., Dordevic, O., Jones, M., Levi, E. (2020) "Symmetrical/asymmetrical winding reconfiguration in multiphase machines", *IEEE Access*, vo. 8, no. 1, pp. 12835-12844, DOI.

OTHER ITEMS

(APM) **Dr. Gabriela Czanner** has been awarded £9k from the LJMU Global Challenges Research Fund (GCRF) to host a Visiting Research Fellow. Mr Krishna Adithya Venkatesh of Aravind Eye Hospital, India, will visit the Faculty for 3 months in 2020, to work on a project titled "Artificial Intelligence Development for

Automated Glaucoma Screening for Aravind Eye Care System in India".

(ARI) The Liverpool Telescope had its strongest ever year in 2019, with 76 refereed journal publications based on data from the telescope, an increase of 30% over the previous year.

Dr. Witold Maciejewski will be chairing the [17th Vatican Observatory Summer School in Astrophysics](#), 1-26 June 2020, Castelgandolfo, Italy.

(Correction) (BEST) **Dr. Raj Shah** has been awarded £4.5k from the LJMU Global Challenges Research Fund (GCRF) for a project "Sustainable management of construction materials extracting from rivers to reduce degradation of farmland and saving livelihood of the communities depending on agriculture around rivers in Nepal". This forms part of a group award for research with Nepal, totaling £27k across LJMU, from January to June 2020.

£1.6k allocated to LJMU, "Development of a space congestion planning tool to reduce carbon emission in Collaboration with Miyagi University, Japan", **Dr. Raj Shah.** Sasakawa Foundation Continuation Grant, 2019 - 2021.

FET RESEARCH NEWSLETTER

EXTERNAL RESEARCH GRANTS SECURED (THRESHOLD: £10K)

ARI

£20k allocated to LJMU, In depth citizen science with robotic telescopes, **Prof. Andy Newsam**. UKRI, 2020.

£15k allocated to LJMU, Using astronomy to create STEM clubs in schools in low science capital areas, **Prof. Andy Newsam**. STFC, 2020.

$76k allocated to LJMU, continued study with the Hubble Space Telescope of the annually erupting recurrent nova in the Andromeda Galaxy, **Matt Darnley** (PI). Hubble Space Time, 2020.

£820k allocated to LJMU, LT Ops 2020, **Prof. Iain Steele**. STFC, 2020-2023.

BEST

£295k allocated to LJMU, Construction Skills Escalator, **Prof. Mike Riley**. Liverpool City Region Combined Authority, 2019-20.

EEE

£255k allocated to LJMU, United Automation KTP, **Dr. Muhammad Ateeq** (Lead Academic) and **Dr. Badr Abdullah** (Academic Supervisor). Innovate UK, 2020-2023.

LOOM & MEMARC

£30k allocated to LJMU, Mind My Bumpy Ride, **Dr. Trung Thanh Nguyen (PI)**, **Mr. Igor Deplano, Mr. Giorgos Tsapparellas, Prof. Jin Wang**, and **Prof. Andy Ross** (BEST). Department for Transport, 2020.

£259k allocated to LJMU, On the Development of a Novel Approach in Modelling of Turbulent Pulsating Flows, **Dr. Mehdi Seddighi**. EPSRC New Investigator Award, June 2020 - December 2022.

£678k allocated to LJMU, Liverpool City Region Green Sustainable Corridor, **Dr. T.T. Nguyen (PI), Prof. J. Wang, Prof. Z. Yang, Prof. I. Jenkinson, Dr. C. Matthews, Prof. M. Riley, Dr. B. Abdullah, Prof. D.Al-Jumeily, Dr. J.Ren, Dr. Q. Zhang, Dr. P. Johnson, Dr. J. Cullen, Dr. W. Hurst, Dr. D. Paraskevadakis, Dr. C. Kontovas, Dr. B. Matellini, Dr. L. Lu, Dr. M. Messina, Prof. X. J. Ren, Dr. L. Li, Dr. R. Darlington, Dr. G. My. Lee, Dr. A. Ashkanfar, Dr. S. Lougney, Dr. C-H. Chang, Dr. M. Bashir, Dr. F. Bezombes, Dr. R. Bartlett, Dr. A. Muhammad, Dr. M. Seddighi** and Dr. C. Phillips,. LJMU as the consortium partner for the grant with £8.35M external funding from EU ERDF, 2019-2021.

€1.99m allocated to LJMU, TRUST- Towards Resilient and Sustainable Container Transport, **Prof. Z. Yang**. European Research Council Consolidator Grant, June 2020 – May 2025.

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

(APM) **Dr. Ivan Olier, Mark Pieroni, Philippa McCabe, Patrick Riley, Ryan Bellfield** and **Sabrina Marnell** won first place and €25k at the [GALP Datathon](#) Data Science competition. The team produced a workable way to optimise the performance of the GALP's refinery process.

(BEST) **Prof. Andy Ross** delivered a keynote address "Collaboration for a Sustainable Construction Industry" at the World Construction Symposium, Colombo Moratuwa, Sri Lanka, 8th November 2019.

(EEE) **Prof. Emil Levi** has been awarded an [Editor-in-Chief Award](#) (2019) from the IET. The IET Journal Outstanding Editor awards recognise Editors and

Editorial Board Members from across the IET Journal portfolio for exceptional work and involvement to maintain and further develop the high standards and reputation of the IET's journals.

RESEARCH IMPACT GENERATING ACTIVITIES

(BEST) On 14th October 2019, **Dr. Ana Bras and Prof. Mike Riley** organised the '1st International Symposium on the infrastructure development-shaping the future using bio-based solutions for structures and buildings'. Held at LJMU, the symposium was an opportunity for industry and academics to discuss trends and develop collaboration on the field. Several universities and industrial organisations from UK, France, Norway, Greece and Spain participated. The event will be repeated at LJMU in 2020.

(LOOM) **Dr. Dimitrios Paraskevadakis** was a panelist for a debate article published in industry publication *Ship Management International* Issue 82, p44-48. **Dr. Robyn Pyne** was interviewed by Liverpool Business News for an article "EU customs checks are an 'opportunity' for the Port of Liverpool", December 2019.

LOOM researchers are delivering a number of projects supporting local transport infrastructure:

- A passenger information system, developed by **Dr. Trung Thanh Nguyen, Mr. Igor Deplano, Mr. Neil Cook, Ms. Samantha Gibbons, Dr. Ran Wang, Mr. Ahmed Makki,** and **Mr. Yannis Ancele** has been in operation at Liverpool South Parkway station since October 2019. The system was used by 26,000 people in its first week, and has received excellent feedback from staff and passengers for providing useful information during disruptions.
- A motion sensor system has been installed in Halton council as a part of the ERDF-funded Liverpool City Region Green Sustainable Corridor (**Dr. Trung Thanh Nguyen, Mrs. Diane Fitch, Mr. Giorgos Tsapparellas, Mr. Igor Deplano,** and **Mr. Neil Cook**) The system counts and differentiates traffic in the region, to give the local authority and the project team valuable information about the road usage, active travel and traffic flow. This is the first of a series of motion and IoT sensors to be installed by the project team across the Liverpool City Region.
- Analyses on the impact of autumn weather and slippery tracks on the performance of trains has been delivered to the industry partners Merseyrail and the RSSB by **Dr. Trung Thanh Nguyen, Mr. Igor Deplano, Mr. Ala Al-Kafri, Dr. Ran Wang,** and **Dr. Qian Zhang**. The analyses provide insights to help the industry to better understand driving behavior in autumn, better maintain the tracks and more accurately forecast.
- A prototype system developed by **Dr. Trung Thanh Nguyen, Mr. Igor Deplano, Dr. Charly Lersteau,** and **Dr. Qian Zhang** to predict reactionary delays on trains has been delivered to and is being tested by Merseyrail on off-line data. The system is capable of accurately predicting the spreading effect of train delays when tested on historical data.

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

(ARI) **Hannah Dalgleish** won the Merseyside Heat of the Institute of Physics' Three Minute Wonder on 13th November 2019. The final of the competition will take place at the Royal Institution, London, in May. Ms. Dalgleish has also published a Comment in *Nature Astronomy*, assessing the influence of the International Astronomical Youth Camp over its 50-year history.

INTRODUCTION TO NEWLY APPOINTED RESEARCH ACTIVE MEMBERS

(BEST) **Dr. Steffen Heinig** has joined the Department of Built Environment as a Senior Lecturer in Real Estate. He holds and MSc (2014) and PhD from the University of Reading (2019). Dr. Heinig worked in industry at a national real estate investor as a senior data scientist. His research has so far been focusing on sentiment in the European commercial real estate market, using various sentiment proxies (Natural Language Processing and Topic Modelling techniques). His work is situated in the fields of behavioural finance and real estate finance and investment.

EXTERNAL COLLABORATION

(APM) **Dr. Gabriela Czanner** delivered an invited talk "On the role of statistical uncertainty in disease diagnosis and screening" at symposium APTOS2019 (Asia Pacific Tele-Ophthalmology Society), 21-22 September, Chennai, India.

Prof. Paulo Lisboa welcomed Fabian Silva Aravena, a student from University of Talca, Chile, for a 3 month collaboration.

(BEST) **Dr. Ana Bras** hosted Dr. Fabiano Tavares, from Cordoba University, Spain, to develop a joint collaboration for 1 month on the project 'Self-sensing self-healing concrete'. This collaboration was funded by the COST CA 15202 Self-healing as preventive repair of concrete structures (September to October 2019). Dr. Bras also welcomed Prof. Rahul V. Ralegaonkar Visvesvaraya National Institute of Technology, India, for a collaborative visit in November 2019.

In November-December 2019 **Dr. Patryk Kot** welcomed two research visitors, Dr. Jakub Markiewicz and Dr. Slawomir Lapinski, of the Faculty of Geodesy and Cartography, Warsaw University of Technology, Poland.

(GERI) **Prof. Mike Morgan** hosted Assoc. Prof. Martin Melichar and Prof. Jan Rehor of the University of West Bohemia in Pilsen, Czech Republic, for a short visit in November 2019.

(LOOM) **Dr. Sean Loughney** hosted Prof Ab Saman Abd Kader of Universiti Teknologi Malaysia, for a 2 month visit. Dr. Loughney also welcomed Dr. Daozheng Huang of Shanghai Maritime University, China, for a short research visit, and Mr Xinjian Wang, Dalian Maritime University, China, who will be working with LOOM until March 2020.

(MEMARC) **Dr. Sam Tammas-Williams** delivered an invited lecture at the 3rd Conference on Light Materials organised by the German Society for Materials Science (DGM). The title of the talk was: Morphology of thermally regenerated porosity after HIPing of Ti-6Al-4V additively manufactured parts.

Dr. Noor Fifinatasha Shahedan of the Centre of Excellence Geopolymer and Green Technology School of Materials Engineering, Malaysia, commenced a 5 month visit to MEMARC, hosted by Dr. Tammas-Williams.

NOTABLE PUBLICATIONS

(APM), **Czanner, G.** (2019) "Statistical analysis and design in ophthalmology: toward optimizing your data", Book Chapter, *Computational Retinal Image Analysis,* Elsevier, Link.

(ARI) **Dalgleish, H., Kamann, S.,** and **Usher, C.**, et al (2020) "The WAGGS project – III. Discrepant mass-to-light ratios of Galactic globular clusters at high metallicity", *MNRAS*, DOI.

(EEE) **Hatem, F., Chai, Z., Zhang, W., Zhang, J.F., Marsland, J.,** and **Freitas, P.** et al. (2019) "Endurance improvement of more than five orders in GexSe1-x OTS selectors by using a novel refreshing program scheme," *Technical Digest of the International Electron Devices Meeting (IEDM)*, pp. 827-830, San Francisco, Dec. 7-11, 2019

(LOOM) **Deplano, I. Lersteau, C.,** and **Nguyen, T.T.** (2019) "A mixed-integer linear model for the Multiple Heterogeneous Knapsack Problem with realistic container loading constraints and bins' priority", *International Transactions in Operational Research,* DOI. This is a major research output from a Royal Academy of Engineering project.

(PROTECT) **Baker, T.,** et al. (2019) "ThinORAM: Towards Practical Oblivious Data Access in Fog Computing Environment", *IEEE Transactions on Services Computing*, DOI. This is a major research output from an international project among Nankai University (China), The University of Hong Kong (Hong Kong), LJMU, and National Institute of Technology (India). The project is funded by the National Natural Science Foundation of China, National Natural Science Foundation of Tianjin and National Natural Science Foundation for Outstanding Youth Foundation.

OTHER ITEMS

(ARI) £5k allocated to LJMU, The 2020 GROWTH Summer School for Time Domain Astronomy, **Dr. Chris Copperwheat**. Royal Astronomical Society, 2020.

£6k allocated to LJMU, *'Deep Learning Ultra Low-Frequency Heart Rate Variability from raw ECG'*, **Dr. Gabriela Czanner**. BBSRC funded project led by University of Liverpool, 2019-2021.

(BEST) **Dr. Monower Sadique** has been nominated as Member of Academic Adviser Panel of Commonwealth Scholarship Commission in the UK, 2020-2023.

Ten projects led by FET have been awarded funding from the LJMU Global Challenges Research Fund (GCRF). Research England awarded £274k to LJMU for the academic year 2019-2020, for projects supporting the economic and societal development of countries on the OECD DAC List. All awards are for January to June 2020.

Networking and emerging opportunities funding:

(BEST) **Dr. Iacopo Carnacina (PI), Dr. Ariel Edesess** (LoCal-I), **Prof. Rafid Al-Khaddar,** £10k, Low cost recycled run-off river hydropower turbine for rural areas in Kenya.

Dr. Mike Farragher (PI), Dr. Wilfred Matipa, Mr. Edward Saul, £8k, The development of an analysis framework to enable the open source development of resilient housing in the slums of Uganda.

Dr. Georgios Kamaris (PI), Dr. Michaela Gkantou, £9k, A novel minimal-damage structural device for improving the earthquake resilience and sustainability of buildings in China.

Dr. Kunal Kansara, Dr. Rafal Latif Al-Mufti, Dr. Ziad Abdeldayem, Prof. Zaili Yang (LOOM), £4k, Development of strategies, tools and techniques for sustainability and climate-resilience maximisation for new and existing infrastructure in India.

(LOOM) **Dr. Musa Bashir (PI), Dr. Sean Loughney,** £5k, Operational framework and vessel concept development to support marine manufacturing for sustainable artisanal fishing in Kenya.

Dr. Ben Matellini (PI), £6k, Dynamic risk management of natural disasters for vulnerable communities in Peru.

(MEMARC) **Dr. Ava Shahrokhi (PI),** £8k, Feasibility study of novel renewable power generation solutions for sustainable electricity and water desalinization in the deprived southeast coasts of Iran.

Follow on Funding building on earlier GCRF investment:

(APM) **Dr. Gabriela Czanner (PI), Dr. Sylvester Czanner** (PROTECT), £16K, Grant proposal strengthening to improve glaucoma case detection in India using low cast retinal images and fully automated image analysis.

(BEST) **Dr. Ana Bras (PI), Prof. Mike Riley, Prof. Andy Shaw,** £14k, Self-healing house - restoring power and safety to thousands of households in India.

Dr. Patryk Kot, Dr. Magomed Muradov (EEE), **Dr. Michaela Gkantou, Dr. Georgios Kamaris, Dr. Bill Atherton, Dr. Khalid Hashim,** £13k, Novel Electromagnetic Sensor Technology for Monitoring Post-Earthquake Structural Damage in Concrete Members, (Sri Lanka).