THE Awards Asia 2025

Research Project of the Year: STEM

Institution Name	Nanyang Technological University, Singapore
Submission title or project name	Evaluation of Wolbachia-mediated sterility (Project Wolbachia, Singapore)
Nominee / key personnel	Lim Jue Tao, Lee Kong Chian School of Medicine, Nanyang Technological University Team: Environmental Health Institute, National Environment Agency, Singapore (Project Wolbachia Study Team)
URL	https://www.nea.gov.sg/corporate-functions/resources/research/environmental_health_institute/wolbachia-aedes-mosquito-suppression-strategy
Submission	This research project evaluated the environmental and human health impact of Wolbachia-mediated sterility – a novel technology where male-Wolbachia infected mosquitoes are released to suppress wild-type mosquito populations, aiming to reduce the transmission of mosquito-borne diseases. The project provided the global first evidence of the efficacy of this technology in reducing mosquito abundance and suppressing dengue transmission. It has also shown that the technology can be employed in large-scale, high-rise urban settings, where the burden of mosquito-borne diseases are the highest and, at present, these trials have had a huge impact on human health – there has been an estimated reduction of up to 77% of dengue cases in locations where the intervention has taken place. The body of work provided evidence of the efficacy of a new class of tools to stem dengue incidence in the face of climate change.

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Research Project of the Year: STEM

Institution Name	Suranaree University of Technology
Submission title or project name	Lightweight Engineered Aggregate from Polystyrene Foam Waste for Lightweight Concrete Product Applications
Nominee / key personnel	Assistant Professor Dr Utai Meekum, School of Polymer Engineering
URL	https://www.youtube.com/watch?app=desktop&v=YWTZWgWmvqg
Submission	A lightweight engineered aggregate from polystyrene (PS) foam waste was formulated for use in construction applications. It is an upcycling strategy for waste management. The box cushion PS foam is crushed into large pieces and then ground into pellets by a mechanical grinding machine. The pelletised foam is coated with an epoxy adhesive and second coated with fly ash in the mixing chamber. The final double-coated foam pellets are then cured for at least 6 hours. The resulting lightweight aggregate material is used in various product design applications, particularly construction. Testing of the manufactured prototype lightweight concrete block demonstrated that the mechanical properties of the block were comparable to those of commercial products. One obvious benefits of the designed block is that no special type of cement is required for the construction process – normal cement is sufficient.

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Research Project of the Year: STEM

Institution Name	James Cook University Singapore, in collaboration with Republic Polytechnic, Singapore Food Agency and The Fish Farmer
Submission title or project name	Advancing Red Snapper (Lutjanus malabaricus) Aquaculture: Optimising Feeds for Greater Productivity and Sustainability
Nominee / key personnel	Xueyan Shen, Associate Professor; Katheline Hua, Associate Professor/Principal Research Fellow Aquaculture; Si Yan Ngoh, Scientist, Singapore Food Agency; Dean Jerry, Professor; Malcolm Ong, CEO, Metropolitan Fishery Group, Singapore; Chiradip Chatterjee, Senior Lecturer, Republic Polytechnic
URL	https://www.jcu.edu.sg/news/releases/new-sustainable-fish-feed-to-contribute-to-singapores-30-by-30-food-sustainability-goal
Submission	Red snapper (Lutjanus malabaricus) is a vital marine food fish species recognised for its high market value and consumer acceptance. Supporting Singapore's "30 by 30" food security strategy to produce 30% of nutritional needs sustainably by 2030, red snapper aquaculture plays a crucial role in achieving this vision. However, a major challenge persists: the lack of commercial feeds tailored to meet the nutritional requirements of this carnivorous species. Current practices rely heavily on generic marine fish feeds, which often contain high fish meal and fish oil levels, leading to increased production costs. In response, a dedicated research team led by the Tropical Futures Institute at James Cook University Singapore, in collaboration with Republic Polytechnic, Singapore Food Agency, and Metropolitan Fishery Group (a local commercial fish farm producer), have developed a sustainable, cost-effective feed optimised for red snapper. This innovative formulation boosts commercial productivity while reducing environmental nutrient loss.

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Research Project of the Year: STEM

Institution Name	Universiti Tunku Abdul Rahman (UTAR)
Submission title or project name	Revolutionary 3D Multi-Material Printing System
Nominee / key personnel	Dr Tey Jing Yuen; Dr Bryan Cheong Chee Yuen; Dr Yeo Wei Hong; Dr Tee Shiau Fong; Ang Xiang; Sean Fong wei zen; Lim Jeng Jit
URL	https://solid-lab.com/
Submission	Our project introduces a groundbreaking 3D printing technology that pioneers the use of polymer-binder slurry feedstock for multi-material printing, a first in the industry. This novel approach replaces costly laser-based systems, enabling safer, room-temperature printing of metal and ceramic components without handling hazardous powders. By drastically reducing costs and simplifying post-processing, our solution makes advanced additive manufacturing (AM) accessible to industries across South-east Asia. The system's versatility in printing various metal alloys and ceramics on a single platform opens new possibilities for innovation, particularly for small and medium-sized enterprises (SMEs). Developed entirely in Malaysia, the project has spurred the creation of Solid Lab Sdn Bhd to commercialise the technology. Set for market launch in 2025, this eco-friendly, cost-effective 3D printing solution is poised to transform local manufacturing, foster economic growth and enhance global competitiveness.

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Research Project of the Year: STEM

Institution Name	Istanbul Gelişim University
Submission title or project name	Artificial Intelligence-Powered 3D Mapping
Nominee / key personnel	Mustafa Sencer Kacar (IGU); Yahya Kemal Kıran (Technology Transfer Officer of IGU); Bahri Sahin (Rector of IGU)
URL	https://tto.gelisim.edu.tr/en/administrative-content-artificial-intelligence-powered-3d-mapping
Submission	The AI-supported 3D Mapping Software project aims to provide fast and accurate 3D mapping for crisis situations, such as natural disasters, by using aerial images and AI algorithms. Traditional methods are inefficient, and despite Lidar's accuracy, its high cost and impracticality for large areas limit its use. The project focuses on creating high-resolution maps with minimal human intervention, enhancing disaster response. It employs AI to automatically recognise and classify terrain features, offering detailed interactive models. Challenges include processing images in diverse conditions and creating large datasets for AI training. The software aids disaster management by enabling quick damage assessment and supporting reconstruction efforts. It has potential applications in environmental monitoring and agriculture. The project was awarded in the gold category at the ISIF24 International Invention Fair, highlighting its user-friendly design and wide data format support as key advantages.

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Research Project of the Year: STEM

Institution Name	The Chinese University of Hong Kong, in collaboration with Harvard T.H. Chan School of Public Health
Submission title or project name	Using real-world big data to inform treatment strategies for long Covid
Nominee / key personnel	Professor Marc Ka-chun Chong; Professor Eng-kiong Yeoh, Centre for Health Systems and Policy Research, The Chinese University of Hong Kong
URL	https://www.med.cuhk.edu.hk/press-releases/cuhk-study-shows-oral-antiviral-drug-paxlovid-can-reduce-the-risk-of-post-acute-death-and-sequelae-among-hospitalised-covid-19-patients
Submission	Long Covid encompasses prolonged health effects post-recovery. Although nirmatrelvir–ritonavir was recommended for an acute treatment in non-hospitalised high-risk individuals, there is still no consensus on whether nirmatrelvir–ritonavir should be used to treat long Covid. Hong Kong – a setting with rich, digitalised inpatient data – offers a valuable source for innovative solutions in patient care. Riding on real-world big population data, our project aims to optimise long Covid treatment strategies. In collaboration with a Harvard team, our study revealed nirmatrelvir–ritonavir's extended benefits for treating long Covid in hospitalised and immuno-compromised patients, supporting an enhancement of current clinical guidelines for Covid-19 management. The findings have been published in world-leading journals. By integrating data-driven insights into patient care, our project aims to not only relieve the burdens of long Covid but also optimise healthcare resource allocation, and ultimately foster a healthier and more resilient community.

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Research Project of the Year: STEM

Institution Name	The Chinese University of Hong Kong
Submission title or project name	Living matter produces regular vortex pattern with multi-scale order
Nominee / key personnel	Dr Haoran Xu, postdoctoral fellow of CUHK Physics; Professor Yilin Wu, Department of Physics (mentor)
URL	https://www.phy.cuhk.edu.hk/ylwu/Gallery/Serratia_VortexLattice_M1.html
Submission	The formation of self-organised structures governs the orderly operation of living systems. Ranging from subcellular organelle biogenesis to embryo development, self-organised, ordered spatial structures formed by aggregation of cells are common in living systems, and these structures play important physiological functions. The formation of such structures was generally explained as a result of intricate chemical signalling. The Living Matter Physics laboratory, led by Professor Yilin Wu, has discovered “self-enhanced mobility” – a simple, physical mechanism for spontaneous formation of ordered spatial patterns in living systems.

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Research Project of the Year: STEM

Institution Name	Carlos Hilado Memorial State University
Submission title or project name	Penroscope: A compact digital microscope
Nominee / key personnel	Ceejay Faala
URL	https://www.rappler.com/philippines/visayas/penroscope-negros-occidental-student-trash-pen-sized-digital-microscope/?utm_campaign=SocialFlow&utm_source=Facebook&utm_medium=Social&fbclid=IwY2xjawFmu71leHRuA2FlbQIxMAABHfFuwJltUSHz94RmzCM781oa8Z5ix0jIZLqK15-SyPXu1MjsmPW5b_jcNQ_aem_2w53YSst_ODgPehaO5stiQ&mibextid=xfxF2i
Submission	Ceejay Faala, a 21-year-old student from Carlos Hilado Memorial State University in the Philippines, identified a significant gap in educational resources, particularly the lack of affordable microscopes in underfunded schools. To address this issue, he developed the “penroscope”, a compact digital microscope made from discarded electronics, measuring just 9×3 cm. Designed to connect to smartphones and other devices, the penroscope allows students to observe micro-organisms such as amoebas and ringworms, enhancing their engagement with scientific exploration. Faala's innovative approach focuses on sustainability and affordability, making the device 10 times cheaper than traditional microscopes. Despite challenges in sourcing materials and technical integration, Faala successfully completed the project in August. The penroscope not only provides immediate educational benefits but also aims to inspire future generations of scientists. With plans for mass production and enhancements to increase magnification capabilities, Faala's work exemplifies how creativity can overcome socio-economic barriers in education.