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香港理工大學

POLYU Academy FOR Interdisciplinary RESEARCH

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Solving scientific puzzles through collaborations

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Chief Editior's Corner

Knowledge transfer, the sharing and passing on of insights, skills, expertise and technologies across entities, is fundamental to research development and impact. PAIR's knowledge transfer takes many forms, from consultancy, engagements, collaborative projects and publications to research commercialisation. The interactions among PAIR researchers—and between PAIR and external communities—help elevate innovations, inform good practices and transform research into practical solutions, bringing valuable benefits to PAIR's overall interdisciplinary programme.

Issue 14 provides a glimpse of the diverse activities at PAIR involving the flow of ideas and diffusion of technology. In February, the PAIR International Advisory Committee (IAC), which comprises leading scientists and engineering experts from external universities and organisations, gathered for a two-day meeting, providing invaluable insights and perspectives on PAIR's strategic development. In March, PAIR hosted its inaugural Public Forum for Research and Innovation, enlightening an audience of over 1,000 on generative artificial intelligence innovations that have made AI development more accessible and less dependent on massive centralised computational resources. The News & Events section provides further details about the noteworthy events at PAIR as well as our latest external collaborations in phytonutrients research, drug development and the upcycling of food waste.

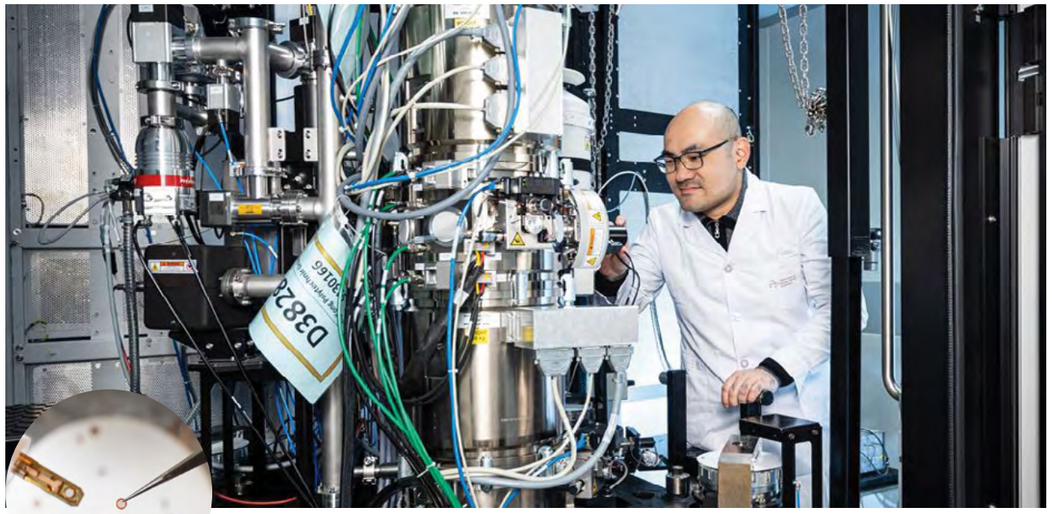
Collaboration, be it in the form of interdisciplinary research, university-industry partnership or cross-border cooperation, is integral to unleashing universities' research impact. The Feature Stories section offers the perspectives of three renowned scholars on research collaborations. PAIR Senior Fellow Prof. Iain McCULLOCH of Princeton University explains the importance of a versatile, collaborative culture for research translation and commercialisation. PAIR IAC Member, Prof. CUI Zhanfeng of Oxford University delves into the increasing trend in global universities' research collaborations with China. Prof. FAN Jintu, Director of the Research Centre of Textiles for Future Fashion (RCTFF), describes recent PolyU developments that are propelling China's textile and fashion industries forward through the transformation of textile technology research.

Last but not least, the Research Achievements section and People section include our researchers' latest breakthroughs and accomplishments in the fields of ferroelectrics, health, energy, hydroclimatology, computing, hydraulics environmental engineering and more. Our latest episode in the PAIR Research Impact Video Series is now available. I encourage you to watch our video to learn how the novel electrocatalytic carbon dioxide reduction system developed by PAIR researchers contributes to carbon neutrality by converting greenhouse gas into raw material for plastics. Thank you very much. I hope you enjoy reading Issue 14.

Prof. CHEN Qingyan
Director of PolyU Academy for Interdisciplinary Research

Research Achievements

RIAM Member makes breakthrough discovery in structure and synthesis of 2D ferroelectrics



A research team led by Prof. ZHAO Jiong, Member of the Research Institute for Advanced Manufacturing (RIAM) and Associate Professor in the Department of Applied Physics of The Hong Kong Polytechnic University (PolyU), has made significant discoveries while investigating 2D ferroelectrics and 2D van der Waals materials. The team unveiled a pioneering approach for the large-scale synthesis of indium selenide (In_2Se_3), and provided new insights into the critical mechanisms that underlie the characteristics of 2D van der Waals materials and bilayer 2D materials.

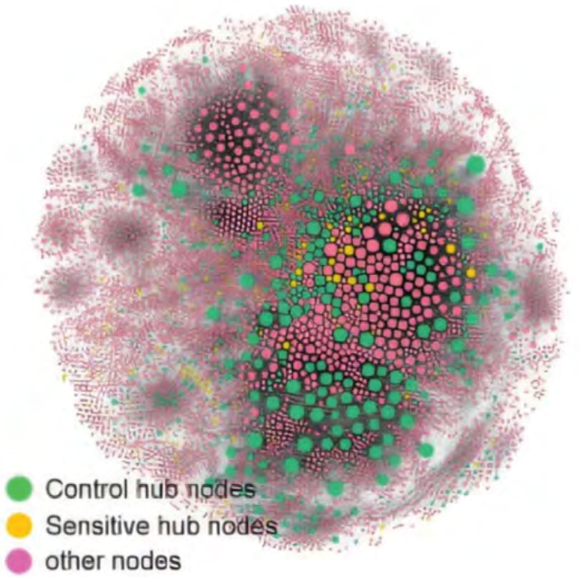
In_2Se_3 is a promising 2D ferroelectric material, but the large-scale synthesis of 2D In_2Se_3 films with the desired phase is still lacking. The team used the transmission electron microscopy (TEM) technique to directly observe and analyse the ferroelectric domains, domain walls and other crucial features at the atomic level within the materials, and successfully synthesised 2D In_2Se_3 films with a pure phase. The findings were published in in *Nature Nanotechnology*.

Furthermore, the team's work revealed the ultra-high plasticity of materials in 2D metal monochalcogenides such as InSe, and complex vortex patterns with tunable characteristics in twisted-bilayer molybdenum disulfide (MoS_2). The two findings have been published in *Nature Materials* and *Science*, respectively.

These scientific discoveries have facilitated significant technological advances in microelectronics, artificial intelligence and quantum information, and present promising prospects for diverse applications including high-density memory devices, energy conversion systems, sensing technologies and catalysis technologies.

The above studies were supported by PolyU's Atomic Transmission Electron Microscopy Laboratory and the contributions of the research team: Prof. Daniel LAU Shu-ping, Chair Professor of Nanomaterials and Head of the PolyU Department of Applied Physics; Prof. YANG Ming, Assistant Professor in the PolyU Department of Applied Physics; and Prof. LY Thuc Hue, Associate Professor in the Department of Chemistry at City University of Hong Kong.

Prof. YANG Guang develops high-performance WBG perovskite solar cells, opening new path for scalable fabrication

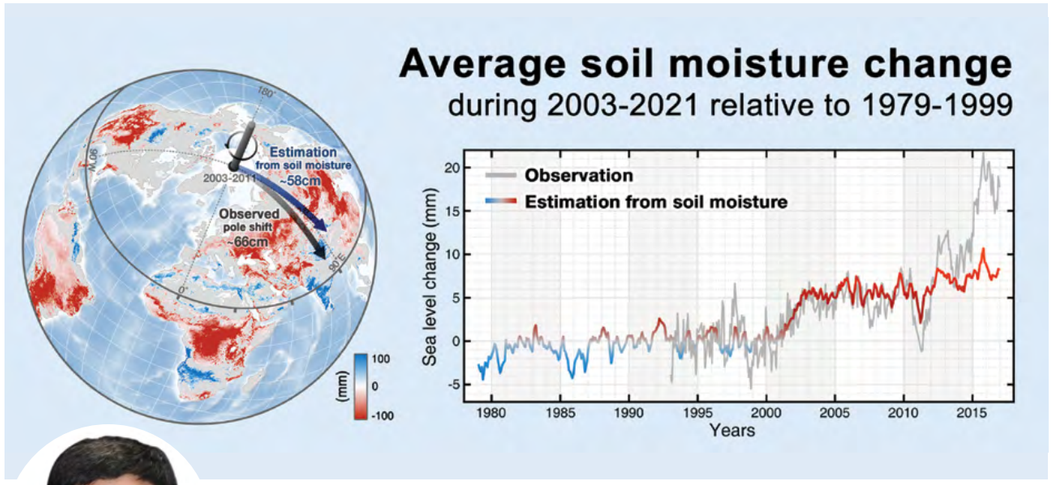


A joint research team led by Prof. YANG Guang, Member of the Otto Poon Charitable Foundation Research Institute for Smart Energy (RISE) and Assistant Professor in the Department of Electrical and Electronic Engineering (EEE) of The Hong Kong Polytechnic University (PolyU), and Prof. HUANG Jinsong of the University of North Carolina at Chapel Hill, USA, innovatively incorporated a reductive methylhydrazinium cation (Mhy^+) into wide-bandgap (WBG) perovskite materials, opening a new path for the scalable fabrication of solar cells in ambient conditions. Their ground-breaking study, titled "Reductive cation for scalable wide-bandgap perovskite solar cells in ambient air", has been published in *Nature Sustainability* (https://www.nature.com/articles/s41893-025-01529-5).

The team has achieved major progress in terms of material improvement, performance breakthrough and stability enhancement. The researchers found that Mhy^+ additive significantly reduces defect density while suppressing iodide oxidation and halide demixing, enabling scalable fabrication of efficient and stable WBG solar cells and modules in ambient air. The WBG solar cells developed by the team achieved a power conversion efficiency (PCE) of 23%, an open-circuit voltage of 1.28 V, and a voltage loss of just 0.37 V, setting new benchmarks for the field. The researchers also successfully fabricated 25 cm^2 mini-modules with a stabilised efficiency of 19.8%. These mini-modules, under accelerated aging conditions at 55±5°C, retained 94% of their initial efficiency after 700 hours of continuous light exposure, demonstrating exceptional long-term stability.

This research addresses the technical challenges of scalable fabrication of solar cells in ambient conditions and represents a significant advance in solar energy harvesting.

RILS research uncovers dramatic soil moisture depletion amid rising air temperatures and shifting rainfall patterns



In a groundbreaking study, Prof. CHEN Jianli, Core Member of the Research Institute for Land and Space (RILS) and Professor in the Department of Land Surveying and Geo-informatics, have discovered that 1,614 Gt of water were lost to the oceans between 2000 and 2002. This loss equates to a 4.5 mm rise in sea level. Prof. Chen, along with an international team of researchers, has employed an innovative approach, combining long-term records on global mean sea level (GMSL) and Earth's polar motion to reveal an alarming hydrological trend: a sharp decline in soil moisture globally.

This dramatic depletion of terrestrial water storage (TWS) is nearly twice as great as the contemporary Greenland ice melting, the largest known contributor to GMSL. Notably, the unprecedented rapid loss of TWS has been followed by a more gradual but continuous depletion, with no signs of recovery. Precipitation deficits and stable evapotranspiration are likely the key factors in this decline. Increasing atmospheric and ocean temperatures have significantly altered terrestrial water circulation and land surface fluxes, such as precipitation and evapotranspiration, potentially causing abrupt shifts in TWS.

Critically, the study has raised questions about the main drivers of declining TWS and whether global lands will continue to become drier. The team's findings suggest that changing rainfall patterns with increasing interannual variability, coupled with rising evaporative demand driven by higher air temperatures, likely contributed to the decline.

Previous challenges in measuring TWS, particularly groundwater and root zone soil moisture, limited the understanding of hydrological depletion at the continental scale. Accurately capturing soil moisture changes under a shifting climate requires improved land surface and hydrological models. Importantly, this study utilised both GMSL and polar motion data to explore global TWS depletion patterns. It also introduced novel methods for estimating global soil moisture, offering unique opportunities to evaluate and improve modeling at the continental and global scales.

The study, titled "Abrupt sea level rise and Earth's gradual pole shift reveal permanent hydrological regime changes in the 21st century", has been published in *Science* (https://www.science.org/doi/10.1126/science.adq6529).

Feature Stories

From ivory tower to business and marketplace: Versatile, collaborative research culture drives translation and commercialisation of university research

Across the globe, universities are increasingly interested in technology transfer and research commercialisation, in addition to their missions around education and basic research. Many institutions of higher education have established interdisciplinary research units and technology transfer offices that spur innovative ideas and turn them into impactful real-world applications to address today's complex, challenging issues. The entire process—from choosing the right research areas, to bringing technologies out of the "ivory tower" and transferring them to the marketplace, to maximising the reach and impact of the deliverables—requires a solid bridge between academia and industry, as well as scientific pursuits that are connected with practical concerns.

In this Issue, Prof. Iain McCULLOCH, Professor of Electrical and Computer Engineering and Director of the Andlinger Center for Energy and the Environment at Princeton University, gives PAIR his perspective on some of the vital factors in successful research translation and commercialisation. Before joining academia, Prof. McCulloch spent nearly two decades at the helm of various industrial laboratories in the United States and the United Kingdom. Through translational research in carbon-based polymers, this leading materials chemist has brought critical advances to diverse fields including optics, electronics, energy and biological sensing.

"We live in a changing environment where the climate and markets are evolving in many ways," Prof. McCulloch said. "We have to be versatile, vigilant and flexible in everything we do."

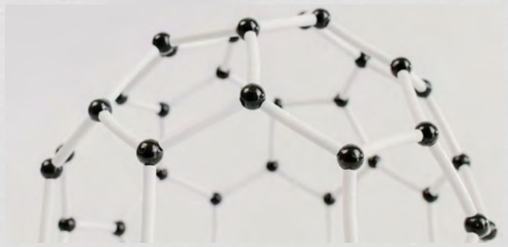
Designing small molecules with big possibilities

Your research focuses on designing, synthesising and developing semiconducting carbon-based polymers and molecules for a wide range of applications, including solar cells, electronics and drug delivery. How did you become interested in the field of functional organic polymers?

My research interests have always been application-driven—I want to take ideas and put them to use. I pursued a path in industry rather than academia after my PhD studies because I was more interested in translating ideas into products at that point.

This impulse remains for me, even though I am an academic now. I would describe myself as a chemist who is more interested in understanding the potential of molecules, making them perform beyond the state of the art, in order to satisfy the parameters required for mass production and specific applications.

I find optical materials, photonic materials and electronic materials particularly fascinating because of their complex design criteria and potential for high-value, high-function applications. These functional materials typically have to satisfy a range of requirements in performance, stability, fabrication, reliability and more. This encourages scientists to be creative in their molecular designs. Furthermore, their applications in electronics, communications, solar cells, etc., are important to society and are areas with expanding impact.



Connecting the disconnected: Linking research pursuits to real-world needs

University research often appears to be "curiosity-driven"—new innovations are driven by the "technology push", and research efforts follow a "bottom up" approach in which researchers focus on exploratory projects that interest them. These projects may develop further towards broader goals. In contrast, industrial research tends to follow the "market push" and "top down" approaches. If universities are to succeed in research translation and commercialisation, how can they bridge the gap between industry and academia?

Both perspectives are important to consider. University research units are small organisations seeking to address big, complex challenges with a limited number of faculty and limited research budget. Institutions need to decide on the research areas to focus on. From a "top down" perspective, they need to evaluate the existing external opportunities in terms of funding, high-impact publication, application potential, customers and industrial engagement. From a "bottom up" perspective, they must identify the institution's internal capabilities, research strengths and collaborative potential. It is important, from a holistic standpoint, for a research project to include industry engagement. In my view, adopting a combination of "top down" and "bottom up" approaches in research planning, development and management will facilitate the most successful outcomes in research translation and commercialisation. Universities require domain expertise in order to generate ideas which are ground-breaking and capable of producing valuable outputs.

"It is important, from a holistic standpoint, for a research project to include industry engagement."

I think PAIR has this "downstream" element in its interdisciplinary research development. The Academy's key performance indicators (KPIs) for measuring research success emphasise the generation of commercialisable technologies and not merely the answers to scientific questions, the latter of which are driven more by fundamental curiosity.

Racing against the clock in research commercialisation

KPIs highlight universities' research expectations for faculty, but the opportunities for funding and research commercialisation may vary from one discipline to another. A research unit in a certain field may not be able to generate as many tangible outcomes as another unit in a different field. What are your views on this difficult situation?

In my view, judging the research performance of scientists at PAIR by the number of papers published is a bit disingenuous, since this is not really in line with the research institution's mission.

I always feel that there is a huge amount of impatience or lack of recognitions of the timescales and investments required to create the culture for innovation and spin-offs and to deliver impact within academia. The actual timescale required for achieving commercialisation is always longer than expected. But this is a vicious cycle. If institutions cannot promise rapid commercialisation, they may experience difficulties in obtaining the funding competitively. Hence, there is a built-in disconnect between reality and research proposals when it comes to the timescales required for commercialisation.

"Universities need to be given the trust to conduct research activities and sufficient time to deliver on expectations."

Also, the expectations and investments are not in line. The investments needed for achieving commercialisation at the required level are often much larger than the amounts which universities and funders are prepared to invest. Universities need to be given the trust to conduct research activities and sufficient time to deliver on expectations. In terms of trust, this also means giving researchers the room to maximise opportunities in exploring new and promising research paths. In terms of timescale, a five-year plan is a good time frame for fostering research commercialisation. Any period longer than that can result in less accountability.

Being first in a changing market: Accelerating processes through partnerships

In a fast-paced tech environment, how can universities ensure that their research activities are in line with market needs?

Our assumptions about competition in the technology industry and the threat of technological encroachment are still valid. I think universities need to engage their customers, partners and collaborators on a regular basis, but not in an overly anxious mode. Instead, they need to "check the temperature" to see if things are still the way they expected—whether the current market deviates from initial expectations, and whether the parameters used as KPIs are still relevant.

Having partnerships in research commercialisation helps mitigate risks and accelerates processes. Being first to market requires taking risks to enjoy high margins. Second-movers experience lower risks but gain fewer rewards. It really depends on the university culture and where institutions want to position themselves. Do they want to be the first? Or do they prefer to be a bit more conservative and minimise the risks?

Expanding with finite resources: Selectivity, flexibility and maximising opportunities in research

PAIR currently has 19 constituent research units and expects to establish more units under the Academy. You are currently a Senior Fellow at PAIR and a Member of the International Advisory Committee of one of the PAIR units, the Research Institute for Intelligent Wearable Systems (RI-IWEAR). In your view, how can PAIR steer interdisciplinary efforts effectively towards research commercialisation with finite resources?

I think there has to be a certain element of Darwinian natural selection in funding research, to some extent. In other words, strive for critical mass in strategically important areas. It is unrealistic for universities to fund projects across all the areas they want to pursue. Meanwhile, small seed projects help us keep the broader research landscape in view, enabling us to observe fields that are emerging. Universities need to have flexibility in resource management so that they can support research which demonstrates promising potential for further development. It is worth diverting some funding to studies that may yield unexpectedly important results and open up new opportunities. There has to be some level of selectivity, flexibility and maximising of opportunities in university research management.

In general, it is better to have many eyes than one or two eyes in solving problems. Bringing a diversity of views and technologies to problems is crucial and extremely beneficial.

Don't let collaboration turn into confusion

PAIR is actively expanding its collaborative network in Mainland China and across the globe through its fellowship scheme, joint research projects and the establishment of joint research entities with collaborators. How can institutions ensure that these collaborative efforts are effective in yielding research translation and commercialisation?

"We live in a changing environment where the climate and markets are evolving in many ways. We have to be versatile, vigilant and flexible in everything we do."

University-industry collaboration is advantageous, although having too many of these efforts may cause confusion. Collaboration does not mean jumping into new opportunities without any ideas and just hoping for the best. Reputationally, collaborations give universities exposure, visibility and connections, which often bring new opportunities. Collaboration that produces tangible outcomes requires good leadership and strong vision. We live in a changing environment where the climate and markets are evolving in many ways. We must be versatile, vigilant and flexible in everything we do. Engaging bilaterally with leading partners in the field of application is the best pathway towards success.

On this topic, I can share one successful example from my previous industry experiences at Merck Chemicals. Back then, liquid crystal displays (LCDs) were commonly used in calculators and watches, while cathode-ray tubes (CRTs), which produce images by emitting electron beams on a phosphorescent surface, were used for computer displays. When portable computing started, Merck saw the potential of LCDs as display panels for computers. There was no incumbent technology that could satisfy the application requirements, and so this niche application became a disruptive technology. In other words, the market is entered in niche applications with a competitive advantage in the technology.

In academia, we tend to patent ideas and anticipate potential opportunities. However, it is equally important to get more downstream traction. Thus, we circle back to the need for universities to have the market awareness, trusted network and agility to go after new market opportunities when they arise. Successful research commercialisation is not just patenting in the institution's areas of core competence, but also patenting applications, anticipating their potential, locking in partners downstream and securing the market.

Science is global: Expanding international scientific collaborations in a changing research landscape

Photo taken at the PAIR distinguished lecture in April 2024, during which Prof. Cui explained the important role of interdisciplinary research in biomedical engineering innovations.

The upward trajectory of China's scientific research is an established trend. *Nature Index*, a database that tracks and ranks institutions and countries by their research outputs, revealed changing patterns in international research partnerships between 2019 and 2022. Many countries have increased their bilateral collaborations with China, and in 2022, for the first time, the country contributed the largest share of articles published in the most influential journals in the natural sciences.

Globally, institutions are increasingly interested in tapping into China's capabilities as a scientific powerhouse, embarking on joint projects, setting up joint labs and opening overseas offices. In 2018, the University of Oxford opened its first overseas centre for research in physical and engineering sciences in Suzhou, China. The Oxford Suzhou Centre of Advanced Research (OSCAR) is led by Prof. CUI Zhanfeng, Donald Pollock Professor of Chemical Engineering and Oxford University's first Chinese professor. OSCAR's opening marked the University's closer research partnerships with China.

"Science is global," said Prof. Cui. "Scientists and institutions always want to work with and learn from partners who are well established in the field." In this Issue, PAIR and Prof. Cui delve into China's scientific rise in the global research landscape and identify good practices for managing a successful research centre.

Learning from the best to be the best

China is now emerging as a science and technology powerhouse and a trusted research partner for many countries, despite reduced collaboration with some nations due to the geopolitical climate. In general, what are the key drivers of global universities' growing research partnerships with China?

It is true that research collaboration between China and the United States has become more difficult under the current climate. Aside from that, there are two reasons why countries are eager to collaborate with China in research.

"Science is global. Scientists and institutions always want to work with and learn from partners who are well established in the field."

The first and most important reason is the quality of research. China's research quality has improved significantly in recent years. We can see from top publications that the country is producing many science and technology breakthroughs in a number of fields. Science is global. Scientists and institutions always want to work with and learn from partners who are well established in the field.

The second reason is the manufacturing pathway. China is the world's factory. Universities and institutions pursuing applied research are actively looking to translate and apply their research outcomes. This is the case for Oxford University. The set-up of OSCAR in Suzhou provides an attractive, clear pathway for research translation. Potential manufacturing collaborators are right on our doorstep.

Which research areas would benefit the most from increased collaboration with Chinese institutions and partners?

We have to look at the different collaboration possibilities in terms of sectors and fields, including fundamental science, applied science, engineering, technology, etc. I see all of these as areas where foreign scientists and engineering researchers can benefit from cross-border collaboration.

In fundamental scientific research, experimental sciences rely on support from research facilities. The massive improvement in China's research facilities in recent years has helped drive scientific research progress. On the applied science side, the country's huge market makes it a very competitive partner for scientific and engineering collaborations. The surging production of electric vehicles (EVs) in China is a good example of its market competitiveness. The EV batteries and technologies manufactured in China offer very good value for the money, thus giving the country a competitive edge.

Distance is no barrier: Leading remote team collaborations

The Oxford Suzhou Centre of Advanced Research (OSCAR) is poised to foster long-term international collaboration between the UK and China. Could you briefly share with us how international collaboration is pursued at OSCAR?

OSCAR is wholly owned by Oxford University. It is not a joint venture in which two or more parties collaborate to create a new entity. All the project principal investigators at OSCAR are permanent professors at Oxford University. OSCAR researchers are recruited globally and are part of the University. They remain as full-time professors at the University and commit a portion of their time to leading research at OSCAR. This operating model is important for ensuring the quality of OSCAR's research.

OSCAR has a clear goal of pursuing interdisciplinary research and research commercialisation. How is this goal being achieved at the Centre?

OSCAR was established in 2018. The Centre is still in its early stages of development and is continuing to learn and establish the most effective ways to maximise research outcomes and generate impact.

Many institutions are actively conducting activities related to technology transfer as well as research commercialisation and translation. In my view, what institutions are really looking for behind these efforts is "impact". There is no point in setting up multiple spin-off companies if none of them become successful.

There may be different ideas about the meaning of "impact". We can consider it in several dimensions. The first one is academic impact, which refers to recognition. In academia, scholars with well-established positions in the field get noticed more easily, and their proposed concepts and methodologies are normally more likely to be accepted and adopted. The second dimension is social impact, which focuses on the capability to bring change to practices in society, including policies and government decision-making. The third dimension is economic impact, which can be achieved when one's spin-off company becomes very successful and profitable and therefore makes huge tax contributions.

Collaboration is the key to research impact

How are "research impact" and "interdisciplinarity" infused into management practices at OSCAR?

There is no perfect operating model for research management. OSCAR has inherited Oxford University's research system and culture, but this does not mean that we encourage interdisciplinary research just for the sake of doing it. Instead, we operate from an engineering perspective and look for ways to apply our research.

"The best way to solve a significant real-world problem is to collaborate."

Our approach is similar to PolyU's in the sense that applied research is in the University's genes. There is a stark contrast between basic scientists and engineering scientists. The former seek to "discover", while the latter aim to "solve", that is, to solve specific and interesting scientific problems which cannot be addressed by individual people on their own. To determine whether or not a problem is interesting, we can look at what would be gained by addressing it, and then assemble a team by gathering experts from related disciplines. This is an engineering approach to problem-solving.

The best way to solve a significant real-world problem is to collaborate. This again points to the difference between fundamental science and engineering. Basic science is built on ideas, and a basic scientist may have the chance to make a name for himself or herself with an idea at a certain point in life. Engineering and technology, on the other hand, are based on the accumulation of achievements and experiences.

Going beyond without becoming different: New branches with the same genes

From your experiences at OSCAR, what strategies would you recommend for effectively managing a research institute/centre remotely?

The first and most important thing is to have a clear objective for the centre. The clearer the goal, the easier the management becomes. This requires objective KPIs for the management team in the areas of planning, decision-making and risk assessment.

The second thing is to manage expectations on the part of the funding parties. This requires a solid communication bridge, both externally and internally. The management of the research institute/centre must be able to explain to funders the time frame needed for delivering research outcomes.

The management team also needs to effectively convey messages to the implementation team of the institute/centre. Effective communication, like educational work, is essential; we really want the team to deliver research impact. British universities have a bottom-up culture, and I often seek to convince my colleagues at OSCAR of the worth of a particular project and motivate them to take it on, rather than telling them what to do in a top-down approach.

I think this is also the case for PolyU, since Hong Kong universities have a similar culture. Hence, there is a need to identify strong leadership and undertake close engagements with funding bodies including governments and industries on the mainland, while maintaining a regular review structure and clear goals for the institute/centre.

PolyU has established translational research institutes/centres in various cities in mainland China, with the aim of enhancing PolyU's translational research and impacts in the country. What are your recommendations for helping these institutes/centres achieve sustainable growth in the long term?

All the research entities which PolyU establishes outside Hong Kong should carry the genes of the University. Their management structure and culture should be inherited from PolyU. It would be good to arrange bilateral exchanges (e.g., visits) for PolyU members based in Hong Kong and those based at mainland research institutes/centres, and provide short-term supervision for researchers who are based at the mainland institutes/centres, so that they understand PolyU's operations and practices more thoroughly.

Embracing international collaboration on many levels

PAIR is now in its second operating cycle, with a focus on expanding international collaboration. As a member of PAIR's International Advisory Committee, what tactic would you suggest to PAIR for enlarging its global network?

International collaboration is important for PAIR's sustainable development. Hong Kong is a small pl ace, and the funding opportunities in the region are limited. International collaboration, not only with foreign universities but also with industries and governments, will give PAIR more pathways by which to explore and secure research funding.

I recommend creating fellowships for academics, post-doctorate researchers and even PhD students. Members of overseas universities could come to PolyU for several months to share the current efforts/technologies at their home institutions with PolyU members and pursue collaborative work.

In academia, professors tend to have greater opportunities for moving around and traveling to different places, but younger researchers should also be supported in this type of international engagement.

Injecting PolyU technology innovations into the Chinese textiles and apparel industry

The Hong Kong Polytechnic University (PolyU) is a leading institution for fashion and textiles education and research in Asia and across the globe. The University's fashion and textiles journey can be traced back to 1957, when the Hong Kong Technical College, predecessor of PolyU, founded the Department of Textiles Industries, becoming the first institution to provide textiles education at the post-secondary level.

Six decades later, PolyU's venture into fashion and textiles has achieved resounding success. The University upgraded its Institute of Textiles and Clothing to the School of Fashion and Textiles (SFT), and has produced numerous practical applications and innovations blending textiles and design with advanced technologies including electronics, artificial intelligence and 3D printing.

In recent years, the University's expanding efforts in fashion and textiles development have led to the establishment of new research units, including the PolyU–Xingguo Technology and Innovation Research Institute in February 2025. Taking the helm of the new mainland translational research institute is Prof. FAN Jintu, Lee Family Professor in Textiles Technology and Chair Professor of Fiber Science and Apparel Engineering in SFT. In this Issue, Prof. Fan talks with PAIR about leveraging PolyU's research strengths in the development of the fashion and textiles industry in mainland China.

Making the fashion and textiles industry greener, smarter and more functional

The fashion and textiles industry has always been dynamic, with the continual introduction of new technologies. The two research units led by Prof. Fan—the Research Centre of Textiles for Future Fashion (RCTFF) and the new PolyU–Xingguo Technology and Innovation Research Institute—represent PolyU's latest strategies to expand the University's research innovation and translation capabilities in the field. RCTFF and the new institute have different but complementary foci, the former on interdisciplinary and translational research and the latter on technology transfer.

"Sustainability, digitalisation and functionality are three major drivers of innovation in the fashion and textiles industry."

Sustainability, digitalisation and functionality, according to Prof. Fan, are three major drivers of innovation in the field. "The fashion industry is a big contributor to environmental pollution, producing tonnes of clothing waste, and most of it ends up in landfills. As such, many large brands are incorporating ESG (environmental, social and governance) into their businesses," he said.

The past few decades have seen waves of technological revolution impacting operations in many industries, and the fashion and textiles sector is no exception. "In the 1980s, clothing companies were already introducing information, digital and computerised technologies into manufacturing and design. The 1990s witnessed a surge of interest in the deployment of robotics in the field. The rise of large language models in recent years has stirred a new wave of artificial intelligence applications in the fashion industry," Prof. Fan explained. He further elaborated on the quest for functionality in the field: "Planet-wide challenges such as global warming and the energy crisis have driven scientists to develop functional clothing that keeps us cool and comfortable, hence reducing our reliance on air conditioning and saving energy. Functional clothing products are also very important in healthcare."

Finding the most strategic location: Expanding the PolyU research and development pipeline in China's textile hub

The PolyU–Xingguo Technology and Innovation Research Institute, located in Xingguo county, Ganzhou city, Jiangxi province, China, focuses on cutting-edge research and innovation in the textile and fashion technology, intelligent wearable systems, smart manufacturing and sustainability. The institute aims to support the development of Xingguo into a regional and national hub for manufacturing and innovation.

"Mainland China has the world's largest textiles industry in terms of production, exports and retail."

Mainland China has the world's largest textiles industry in terms of production, exports and retail. The new institute signifies PolyU's priority focus on textiles research development in mainland China. "Currently, there is not much clothing and garment manufacturing in Hong Kong," Prof. Fan remarked. "There are about 800 manufacturers registered or headquartered in Hong Kong, including some highly successful and world-leading brands. Their innovation pods are situated locally, but their factories operate in mainland China or Southeast Asia."

He emphasised that PolyU's mainland translational research institute is strategically important: "Setting up a research facility in mainland China is conducive to PolyU's fashion and textiles research. It enables PolyU researchers to collaborate directly with manufacturers there in applying PolyU technologies to industry challenges and enhancing their business competitiveness. The industry in mainland China possesses the equipment and facilities that PolyU researchers need in order to scale up and incubate their research."

Situated in Ganzhou city, Xingguo county is about two and a half hours from Hong Kong by high-speed rail. Establishing the new research institute in Xingguo allows it to take full advantage of the county's economic opportunities and geographic features. "The Ganzhou Municipal Government and Xingguo County Government in Jiangxi province have been very proactive in initiating and setting up this institute to drive the growth of the local economy there," Prof. Fan shared.

He went on to describe the changing landscape of the textiles industry in China: "Dongguan city used to be one of the largest hubs for textiles in China. As labour costs in these cities have risen, a number of garment businesses have decided to move their factories either to other countries such as Vietnam, or to the northern regions of China. However, many companies would rather relocate to Ganzhou city because it is geographically closer to Dongguan. This allows companies to retain some manufacturing operations in Dongguan, while moving the more labour-intensive and less technologically demanding operations elsewhere. Xingguo county is a fairly attractive option because of its convenient location and generally low labour and material costs."

This tectonic shift in the Chinese textiles industry is giving rise to a new economy. "Xingguo has a large population, making it easy for factories to recruit workers. When businesses relocate, they do not send their existing workers to the new location to do low-paying jobs; instead, they recruit locals at lower wages. This way, Xingguo residents can stay in town to work and look after their families," Prof. Fan said.

University-industry partnership: A win-win situation

In his new capacity as the Director of the PolyU–Xingguo Technology and Innovation Research Institute, Prof. Fan hopes to achieve a "win-win" situation for the university and the local government. "From the university's perspective, the new institute is for research development, for example, leveraging the facilities and equipment in Xingguo to scale up PolyU technologies and potentially create spin-off companies there," he noted. "From the local government's perspective, the new institute is for industrial and economic development. They have clear plans for developing a new industrial ecosystem in Xingguo, where manufacturing companies and research facilities are housed in a single industrial complex."

Creating impact through research is a goal pursued by many universities. Prof. Fan views the two research units he leads as being complementary in terms of research impact. He described the different focus areas of the units: "RCTFF focuses on applied fundamental research, while the new institute focuses on technology transfer. Of course, RCTFF can also carry out technology transfer activities, such as licensing, so that PolyU technologies can be applied to enterprises and businesses. In contrast, the new institute in Xingguo is more inclined towards incubation, that is, establishing new start-ups together with the local government."

He further explained that RCTFF's future development will place more emphasis on technology development and commercialisation, and the centre will evaluate existing efforts and identify specific research areas in which the team may achieve the most success.

Roadblocks to technology transfer

In the transfer of technology from lab to market, obstacles are often encountered. Intellectual property (IP) protection and the technology transfer ecosystem are two major challenges, according to Prof. Fan.

"Intellectual property protection and the technology transfer ecosystem are two major challenges."

"There are very few technologies that cannot be imitated," he observed. "When you come up with a technological innovation and obtain a patent, it can sometimes be difficult to protect it. This is because competitors may try to observe and copy the technology. IP protection is easier to achieve if a developer also owns the manufacturing pipeline. In this way, patents can be protected because the technology is directly used in manufacturing."

He continued to explain the need for Hong Kong universities to expand research beyond the region: "Currently, Hong Kong's manufacturing industry is very small in scale, and opportunities to apply new technologies for mass production are limited. Our ecosystem is not conducive to innovation. As a result, researchers are increasingly interested in collaborating with industry in mainland China. However, many challenges arise in cross-border collaboration due to differences in culture, policies and practices."

Finding your focus and adapting to evolving research trends

Prof. Fan's research focuses on improving the understanding of interactions among the human body, clothing and the environment and, on that basis, developing fibrous materials and fashionable clothing with enhanced functional performance.

The fashion and textiles industry adapts quickly to changing market and technological trends. When asked if these fast-paced dynamics require researchers to change foci from time to time, Prof. Fan accentuated the importance of interdisciplinary research. "My research involves instrumentation, computational modelling, biomimetics, nanotechnology and artificial intelligence, as well as psychology. Because of the interdisciplinarity of my research, although my research focus has not changed much over the years, I have become adaptive to new technologies and market trends. This mindset is essential to fashion and textiles research and development."

People

Four PAIR members appointed to leadership positions at new Mainland Translational Research Institutes

Four members of the PolyU Academy for Interdisciplinary Research (PAIR) have been appointed to lead two newly established technology and innovation translational research institutes in mainland China, reinforcing PolyU's commitment to translational research and industry-academia research collaboration.

Prof. FAN Jintu, Director of the Research Centre of Textiles for Future Fashion (RCTFF), and Prof. SHOU Dahua, Member of RCTFF, have taken on leadership roles as Director and Associate Director, respectively, of the PolyU–Xingguo Technology and Innovation Research Institute. Established on 11 February 2025, the Institute is dedicated to advancing cutting-edge innovation in textile and fashion technology, intelligent wearable systems, smart manufacturing and sustainability. By leveraging PolyU's strengths in technology transfer and incubation, the Institute will help to elevate Xingguo's position as a regional and national hub for manufacturing and innovation in mainland China's textile and fashion industries.

Prof. CHEN Wu, Associate Director of the Research Institute for Artificial Intelligence of Things (RIAIoT), and Prof. YAN Feng, Associate Director of the Research Institute for Intelligent Wearable Systems (RI-IWEAR), have been appointed as Director and Associate Director, respectively, of the PolyU–Hefei Technology and Innovation Research Institute. Incorporated on 13 February 2025, the Institute focuses on pioneering research in deep space exploration, the low-altitude economy and sensing technology. Committed to sustainable development, it will drive technological research and development, entrepreneurial incubation and talent cultivation. The Institute will also integrate Hefei's robust resources and PolyU's research excellence to accelerate the translation of scientific innovations and facilitate their practical applications in the industry.

The establishment of these institutes underscores the important role of PolyU in advancing regional innovation networks and industry-academia research partnerships to address global challenges, and demonstrates PolyU's contributions to China's strategic efforts in the areas of science and technology.


Prof. FAN Jintu


Prof. SHOU Dahua


Prof. CHEN Wu


Prof. YAN Feng

PAIR researchers shine at International Exhibition of Inventions Geneva

The Hong Kong Polytechnic University (PolyU) won a total of 36 accolades at the 50th International Exhibition of Inventions Geneva (Geneva Inventions Expo), a widely recognised annual event devoted exclusively to inventions. This remarkable achievement highlights the University's strong research capabilities and commitment to innovation on the global stage. Thirty-three PolyU innovations captured the 36 accolades, including 2 Special Prizes, 10 Gold Medals with Congratulations of the Jury, 8 Gold Medals, 11 Silver Medals, 4 Bronze Medals and 1 Special Merit Award.

Both of the PolyU innovations winning Special Prizes were led by PAIR researchers. The "Surface Sampling and Packing System for Chang'e-5 and -6 Lunar Sample Return Missions", developed by a research team led by Prof. YUNG Kai-leung, Director of the Research Centre for Deep Space Explorations (RCDSE), in collaboration with the China Academy of Space Technology, is the first space-qualified robotic sampling and automatic packaging system of its kind. It successfully collected over 1.5 kg of surface samples on the lunar front side and 1.6 kg on the far side in the Chang'e-6 mission, the world's first-ever lunar far-side surface sampling mission.

The medical device "Hearing Hope: A Smart Sensor for Enhanced Safety and Precision in Hearing Restoration Procedures", developed by a research team led by Prof. TAM Hwa-yaw, Associate Director of the Photonics Research Institute (PRI), enhances surgical precision and reduces trauma in cochlear implantation by incorporating an optical fibre sensor within the electrode array.

Award-winning projects led by PAIR researchers:

**In order of prize level and then in alphabetical order by project name*

Project	Principal Investigator(s)
Saudi Innovation Excellence Prize – Ministry of Education Gold Medal with Congratulations of the Jury	
Surface Sampling and Packing System for Chang'e-5 and -6 Lunar Sample Return Missions	**Prof. YUNG Kai-leung** Director of Research Centre for Deep Space Explorations; Sir Sze-yuen Chung Professor in Precision Engineering; Chair Professor of Precision Engineering and Associate Head of Department of Industrial and Systems Engineering
Thailand Award for the Best International Invention & Innovation Gold Medal with Congratulations of the Jury	
Hearing Hope: A Smart Sensor for Enhanced Safety and Precision in Hearing Restoration Procedures	**Prof. TAM Hwa-yaw** Associate Director of Photonics Research Institute; Chair Professor of Photonics, Department of Electrical and Electronic Engineering
Special Merit Award from French Inventors Federation and Europe-France Inventors Gold Medal with Congratulations of the Jury	
Seeing the Invisible: Generating Non-invasive Angiography as an Alternative to Invasive Retinal Examinations	**Dr SHI Danli** Member of Research Centre for SHARP Vision; Research Assistant Professor, School of Optometry
Gold Medal with Congratulations of the Jury	
A Customisable Wearable Saliva Sensing Platform	**Prof. YAN Feng** Associate Director of Research Institute for Intelligent Wearable Systems; Member of Otto Poon Charitable Foundation Research Institute for Smart Energy; Chair Professor of Organic Electronics, Department of Applied Physics
Smart Fire Extinguisher for Spacecraft	**Prof. HUANG Xinyan** Member of Research Institute for Sustainable Urban Development, Research Centre for Resources Engineering towards Carbon Neutrality and Otto Poon Charitable Foundation Research Institute for Smart Energy; Associate Professor, Department of Building Environment and Energy Engineering; Co-founder, Widemount Dynamics Tech Limited (a PolyU startup)

Project	Principal Investigator(s)
Gold Medal with Congratulations of the Jury	
CO_2-driven Superhydrophobic Carbon-sink Concrete	**Prof. POON Chi-sun** Director of Research Centre for Resources Engineering towards Carbon Neutrality; Michael Anson Professor in Civil Engineering; Chair Professor of Sustainable Construction Material and Head of Department of Civil and Environmental Engineering
SweatMD: Health-monitoring Wearable Sweat Sensor	**Prof. SHOU Dahua** Associate Director of Research Centre of Textiles for Future Fashion; Member of Otto Poon Charitable Foundation Research Institute for Smart Energy and Research Centre for Resources Engineering towards Carbon Neutrality; Associate Director of PolyU–Xingguo Technology and Innovation Research Institute; Limin Endowed Young Scholar in Advanced Textiles Technologies; Associate Professor, School of Fashion and Textiles
Gold Medal	
A Multi-objective Yaw-control System for Wind Farm Optimisation Based on Novel 3D Wake Model	**Prof. YANG Hongxing** Management Committee Member of Research Institute for Sustainable Urban Development; Member of Otto Poon Charitable Foundation Research Institute for Smart Energy; Professor, Department of Building Environment and Energy Engineering
AI-empowered Digital Twin for Smart Building Management	**Prof. XIAO Fu** Associate Director of Otto Poon Charitable Foundation Research Institute for Smart Energy; Management Committee Member of Research Centre for Digital Transformation of Tourism; Member of Research Institute for Sustainable Urban Development; Associate Dean, Faculty of Construction and Environment; Professor, Department of Building Environment and Energy
Multi-mode Optical Characterisation Interferometer (MOCI)	**Prof. CHEUNG Chi-fai Benny** Associate Director of Research Centre for SHARP Vision; Management Committee Member of Research Centre for Resources Engineering towards Carbon Neutrality; Member of Research Institute for Advanced Manufacturing; Chair Professor of Ultra-precision Machining and Metrology, Department of Industrial and Systems Engineering; Director, State Key Laboratory of Ultra-precision Machining Technology
Smart Structural Integrity Monitoring System	**Prof. WONG Man-sing Charles** Associate Director of Research Institute for Sustainable Urban Development; Associate Dean, Faculty of Construction and Environment; Professor, Department of Land Surveying and Geo-Informatics **Mr CHAN Pak Kwan** Managing Director & Co-founder, LeafIoT Technology Limited (a PolyU startup)
Behaviour Recognition Method, Device and Wearable Device	**Prof. HE Mingguang** Director of Research Centre for SHARP Vision; Henry G. Leong Professor in Elderly Vision Health; Chair Professor of Experimental Ophthalmology, School of Optometry **Dr TO Yuen-ying Elaine** Postdoctoral Fellow in Ophthalmology, School of Optometry

Project	Principal Investigator(s)
Gold Medal	
Eye-on-a-chip Device	**Dr ZHOU Liping** Member of Research Centre for SHARP Vision; Research Assistant Professor, School of Optometry and Department of Applied Biology and Chemical Technology; Principal Investigator, InnoHK Centre for Eye and Vision Research; Director, Eyenova Biotech Limited (a PolyU startup) **Dr PHAN Chau-Minh** Research Assistant Professor, School of Optometry and Vision Science, University of Waterloo; Principal Investigator, InnoHK Centre for Eye and Vision Research; Director, Eyenova Biotech Limited (a PolyU startup)
Silver Medal	
Last-centimetre Drone Delivery in Urban Environments	**Prof. HUANG Hailong** Member of Research Institute for Sustainable Urban Development, Research Institute for Sports Science and Technology, Research Institute for Artificial Intelligence of Things and Otto Poon Charitable Foundation Smart Cities Research Institute; Assistant Professor, Department of Aeronautical and Aviation Engineering
IHAC Film: Intelligent Humidity Control and Atmospheric Water Collection Film	**Prof. YAN Jinyue Jerry** Management Committee Member of Research Institute for Sustainable Urban Development; Member of Otto Poon Charitable Foundation Research Institute for Smart Energy; Chair Professor of Energy and Buildings, Department of Building Environment and Energy Engineering
AI-based Railway Obstacle Intrusion Detection System with Multimodal Transformers	**Prof. NI Yiqing** Member of Research Institute for Sustainable Urban Development; Yim, Mak, Kwok & Chung Professor in Smart Structures; Chair Professor of Smart Structures and Rail Transit; Director of National Rail Transit Electrification and Automation Engineering Technology Research Centre (Hong Kong Branch); Director of PolyU–Hangzhou Technology and Innovation Research Institute
LungRT Pro: Advanced Radiotherapy Support System	**Prof. CAI Jing** Management Committee Member of Research Institute for Intelligent Wearable Systems and Research Institute for Smart Ageing; Head and Professor, Department of Health Technology and Informatics; Technical Advisor, InsightRT Limited (a PolyU startup)
EmoFriends	**Prof. WANG Jia Stephen** Member of Research Institute for Artificial Intelligence of Things, Research Institute for Intelligent Wearable Systems and Otto Poon Charitable Foundation Smart Cities Research Institute; Professor, School of Design
The EyeFatigue Tracker: Exploring Visual Health through Wearable Devices and Deep-Learning Technology	**Dr CHEN Yanxian** Member of Research Centre for SHARP Vision; Research Assistant Professor, School of Optometry

Project	Principal Investigator(s)
Silver Medal	
STARS: Smartphone AI Refraction System	**Prof. DO Chi-wai** Member of Research Institute for Future Food, Research Institute for Smart Ageing, Research Centre for Chinese Medicine Innovation and Research Centre for SHARP Vision; Associate Professor, School of Optometry **Prof. Grace NGAI** Member of Research Centre for SHARP Vision; Associate Professor, Department of Computing
Biomimetics Nanoplatform for the Treatment of Retinal Diseases	**Prof. DO Chi-wai** Member of Research Institute for Future Food, Research Institute for Smart Ageing, Research Centre for Chinese Medicine Innovation and Research Centre for SHARP Vision; Associate Professor, School of Optometry **Prof. Emmanuel HO** Professor, School of Pharmacy, University of Waterloo; Principal Investigator, InnoHK Centre for Eye and Vision Research
Wellsees Orthokeratology Contact Lens	**Dr Jason Ki-Kit LAU** Technical Director, Wellsees Technologies Co Ltd **Mr Roger Jing ZHANG** Founder, Wellsees Technologies Co., Ltd. **Prof. KEE Chea-su** Associate Director of Research Centre for SHARP Vision; Member of Research Institute for Artificial Intelligence of Things; Head, School of Optometry; Co-Founder, Wellsees Technologies Co., Ltd. **Dr Andy WANG** Associate Professor, College of Mechatronics and Control Engineering, Shenzhen University; Co-Founder, Wellsees Technologies Co., Ltd. (a PolyU startup)
Bronze Medal	
Advanced Self-cleaning Oil Fume Purification System for Commercial Kitchens	**Prof. LEE Shun-cheng** Member of Research Institute for Sustainable Urban Development; Professor, Department of Civil and Environmental Engineering; Technical Advisor, AeroGreen Technology Company Limited (a PolyU startup) **Dr LI Xinwei** Postdoctoral Fellow, Department of Civil and Environmental Engineering; Founder, AeroGreen Technology Company Limited (a PolyU startup) **Dr HAN Shuwen** Alumnus, Department of Civil and Environmental Engineering; Chief Technology Officer, AeroGreen Technology Company Limited (a PolyU startup)
Next-generation Sportswear with Polylactic Acid, Auxetic Knitting Structure and Ergonomic Design	**Prof. Erin CHO** Member of Research Centre of Textiles for Future Fashion; Dean of School of Fashion and Textiles; Limin Professor in Integrated Strategies and Leadership in Fashion; Advisor, Leopitorca Global Limited (a PolyU startup)
3D-printed Superior Light and Breathable Wearable Textiles	**Prof. JIANG Shou-xiang Kinor** Member of Research Institute for Intelligent Wearable Systems and Research Centre of Textiles for Future Fashion; Professor, School of Fashion and Textiles

Prof. Daniel LUO named distinguished member of Association for Computing Machinery

Prof. Daniel LUO Xiapu, Member of the Research Institute for Artificial Intelligence of Things (RIAIoT) and the Otto Poon Charitable Foundation Smart Cities Research Institute (SCRI), Associate Dean (Research) of the Faculty of Computer and Mathematical Sciences and Professor in the Department of Computing, has been inducted as a Distinguished Member of the Association for Computing Machinery for 2024, in recognition of his seminal contributions to safeguarding blockchain and smart contracts along with Android and its applications. A total of 56 scholars were awarded this prestigious honour, and they were selected by peers for their significant technical achievements and volunteer service to the professional community.

Prof. DUAN Huan-feng honoured with “2024 Dayu Water Conservancy Science and Technology Progress Award”

Prof. DUAN Huan-feng, Member of the Research Institute for Land and Space (RILS) and the Research Institute for Sustainable Urban Development (RISUD), and Professor in the Department of Civil and Environmental Engineering, received the “2024 Dayu Water Conservancy Science and Technology Progress Award (2nd Class)” from the Ministry of Water Resources of China, for his project titled “Key Technologies for Real-time Hydraulic Simulation and Precise Regulation of Complex Urban Water Supply Networks”. This accolade is given to individuals who have made exceptional technological innovations and significant contributions to the advancement of water science and technology, bringing substantial economic and social benefits.

Prof. Duan’s research focuses on the critical areas of hydraulics and water resources, including urban hydraulics, urban asset management, coastal urban flooding, hydro-environmental management and computational fluid mechanics. He has spearheaded numerous significant research projects and secured grants from various funding bodies in Hong Kong and mainland China.

Prof. Nathanael JIN receives AAEES “40 Under 40 Recognition Program” Award 2025

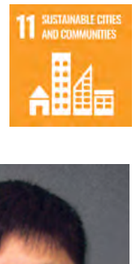
Prof. Nathanael JIN Ling, Member of the Research Institute for Future Food (RiFood) and the Research Institute for Sustainable Urban Development (RISUD), and Assistant Professor in the Department of Civil and Environmental Engineering and Department of Health Technology and Informatics, has been recognised by the American Academy of Environmental Engineers and Scientists (AAEES) as one of the recipients of the “40 Under 40 Recognition Program” Award for 2025.

Prof. Jin’s interdisciplinary research focuses on the intersection of environmental chemistry, toxicology and microbiology. His works addresses critical worldwide health challenges, including air pollution’s impact on human health and marine pollution’s effects on wildlife. Prof. Jin’s research has been recognised by multiple Best Paper and Most Popular Paper awards. He was invited by *Nature* to contribute commentaries on global issues such as microbial hazards in plastic waste and health disparities arising from air pollution.

RiFood Director appointed as Chairman of Advisory Panel on Safety Assessment of Cultured Meat

Prof. WONG Ka-hing, Director of the Research Institute for Future Food (RiFood), was appointed as the Chairman of the Advisory Panel on the Safety Assessment of Cultured Meat by the Expert Committee on Food Safety of the HKSAR Government, for a term of four years with effect from 14 February 2025. The panel advises the Director of Food and Environmental Hygiene on the criteria used to assess the safety of cultured meat and its derived products for human consumption.

Prof. MA Wei receives Smart Traffic funding to develop AI-enabled parking garage vacancy prediction service



Prof. MA Wei, Member of the Otto Poon Charitable Foundation Smart Cities Research Institute (SCRI), Research Institute for Sustainable Urban Development (RISUD) and Research Centre for Digital Transformation of Tourism (RCDTT), and Assistant Professor in the Department of Civil and Environmental Engineering of PolyU, has been awarded about HK$2.9 million from the Smart Traffic Fund for a period of 18 months, for his project titled "Parking Garage Vacancy Prediction Services in Hong Kong: AI-enabled Solutions for Enhanced Reliability and Extensibility".

This project aims to develop a deep learning-based vacancy prediction service for off-street carparks in Hong Kong. By leveraging artificial intelligence (AI) technology and combining big data with real-time data, the service will predict parking vacancies and estimate queuing times for fully occupied garages, helping to reduce motorists' cruising time and enhance road efficiency.

Prof. YUNG Kai-leung awarded Innovation and Technology funding to develop applied key space technology for terrain cameras

Congratulations to Ir Prof. YUNG Kai-leung, BBS, Director of the Research Centre for Deep Space Explorations (RCDSE), Sir Sze-yuen Chung Professor in Precision Engineering and Chair Professor of Precision Engineering, and Associate Head of the Department of Industrial and Systems Engineering, for receiving HK$32 million in funding from the Innovation and Technology Support Programme (ITSP) of the Innovation and Technology Fund (ITF), for the three-year project titled "Key Space Technology Capability Research and Development with Application to Terrain Cameras". This large external funding achievement underscores Prof. Yung's pivotal role in advancing space technology innovation and further reinforces PolyU's contributions to the Nation's space exploration programme.

The ITSP, administered by the Innovation and Technology Commission of the HKSAR, supports applied research and development (R&D) projects undertaken by R&D Centres or designated local public research institutes with a view to transferring the R&D results to local industries.

Prof. QIU Anqi appointed as Director of Mental Health Research Centre

We are delighted to announce that Prof. QIU Anqi, Professor in the Department of Health Technology and Informatics, has been appointed as Director of the Mental Health Research Centre (MHRC) under the PolyU Academy for Interdisciplinary Research (PAIR), effective from 1 May 2025.

Prof. Qiu is a Global STEM Scholar under the Global STEM Professorship Scheme of the HKSAR government. She also holds an adjunct professorship in the Department of Biomedical Engineering at Johns Hopkins University. Her previous roles include Deputy Head for Research and Enterprises at the Department of Biomedical Engineering of the National University of Singapore (NUS), Director of the BME Innovation Centre at the NUS Suzhou Research Institute, and Master of Eusoff Hall at NUS.

Specialising in computational analyses, Prof. Qiu is deeply committed to understanding the origin of individual health differences across a lifespan. Her research team develops innovative technologies in medical data analysis deep learning to leverage complex and informative datasets that include disease phenotypes, neuroimaging and genetics. Prof. Qiu's research has yielded high-impact publications in *Nature, Nature Neuroscience, Nature Mental Health, American Journal of Psychiatry, Biological Psychiatry, IEEE Transactions in Medical Imaging and Medical Image Analysis,* among others.

More recently, Prof. Qiu has been elected as Council Chair of the Organization for Human Brain Mapping, an international society dedicated to advancing the understanding of the anatomical and functional organization of the human brain using neuroimaging.

Ir Dr ZHENG Pai honoured with "HKIE Young Engineer of the Year Award 2025"

Congratulations to Ir Dr ZHENG Pai, Member of the Research Institute for Advanced Manufacturing (RIAM), Wong Tit Shing Young Scholar in Smart Robotics and Associate Professor in the Department of Industrial and Systems Engineering, on being conferred the Young Engineer of the Year Award 2025 by The Hong Kong Institution of Engineers (HKIE). The award presentation took place at the HKIE Grand 50th Annual Dinner on 3 April 2025 at the Hong Kong Convention and Exhibition Centre. The Award recognises local outstanding young engineers who have made valuable contributions to the continuous development of Hong Kong through their engineering achievements.

News & Events

PolyU scholars discuss the latest developments in AI, demonstrating the University's leadership in AI education and research

PAIR hosted its inaugural Public Forum for Research and Innovation on 11 March 2025. Titled "DeepSeek and Beyond", the keynote speech was delivered by Prof. YANG Hongxia, Associate Dean (Global Engagement) of the PolyU Faculty of Computer and Mathematical Sciences and Professor in the Department of Computing, who highlighted the latest developments in artificial intelligence (AI). The event attracted over a thousand participants, including faculty members, students, alumni, and leaders from the innovation and technology sector, as well as other members of academia and the general public. Additionally, over 390,000 viewers tuned in through live streaming platforms.

The large AI model developed by the mainland Chinese startup DeepSeek has garnered wide acclaim around the world for its low-cost, high-performance, and open-source framework, disrupting the traditional "computing power-first" logic of AI model training. At the Forum, Prof. Yang highlighted the potential of generative AI (GenAI): abundant opportunities for various sectors, including healthcare, finance, manufacturing, retail, media and fashion, and applications in medical imaging analysis, fraud detection, predictive maintenance, retail inventory management, content creation, and design and marketing.

Prof. Yang also recounted the evolution of AI and shared her professional milestones with the audience, notably the development of the M6 large model, which trained a 10-trillion-parameter model using just 512 GPUs. Prof. Yang then explained how her GenAI project, Co-GenAI, improves the accessibility of AI technology while minimising dependence on large-scale centralised computing resources, thereby transforming the trajectory of AI progress. This ground-breaking effort has positioned Hong Kong and the Mainland at the forefront of global advancements in GenAI.

In addition, a panel discussion was moderated by Prof. Zhang Chenqi, Chair Professor of Artificial Intelligence of the PolyU Department of Data Science and Artificial Intelligence, and Director of the PolyU Shenzhen Research Institute. The discussion featured esteemed panellists Prof. Yang Hongxia and Prof. LI Qing, Head and Chair Professor of Data Science of the PolyU Department of Computing, and Co-Director of the Research Centre for Digital Transformation of Tourism (RCDTT). The scholars discussed the opportunities and challenges that advancements in AI present for higher education and research. They also engaged in fruitful discussion with participants during a question-and-answer session. The topics included the application of AI in industry, the regulation of information, the impact of AI on the employment environment and economic development, and the integration of AI technologies.

The 4th Annual PAIR International Advisory Committee meeting concludes

he 4th annual meeting of the PAIR International Advisory Committee (IAC) was successfully held from 20 to 21 February 2025. The two-day programme comprised various opportunities for professional exchange: meeting sessions, business meals, and tours of the campus and laboratories. The annual meeting aimed at promoting interflow between IAC members and specific groups of stakeholders at PAIR and PolyU, including PAIR Management Committee members, Research Institute/ Research Centre Directors and PAIR administrative staff, as well as young researchers and Research Postgraduate students. All IAC members had a productive visit to PolyU, offering valuable advice to PAIR members and providing constructive feedback to the Director of PAIR and the University.

PAIR IAC membership: https://polyu.hk/PMQME

Two Nobel laureates share insights with PolyU community at "Together with Scientists" thematic event

PolyU and the Hong Kong Alumni Association of Beijing Universities (HKAABJU) co-organised the "Together with Scientists" thematic event, as one of the key parts of the second Hong Kong World Youth Science Conference. On 15 April 2025, Dr Elizabeth LEE, HKAABJU President, accompanied Prof. Andre GEIM, 2010 Nobel Laureate in Physics, and Prof. Harvey James ALTER, 2020 Nobel Laureate in Physiology or Medicine, to the PolyU campus. These two brilliant minds discussed the diverse applications of graphene and offered insights on the roadmap to success, respectively. The event brought together over 150 faculty members, students, scholars and researchers onsite, and more than 126,000 online participants, to explore cutting-edge scientific issues.

The 38th PAIR Distinguished Lecture: Prof. Pedro ALVAREZ explores breakthroughs in nanotechnology for water treatment

Prof. Pedro ALVAREZ, George R. Brown Professor of Civil and Environmental Engineering at Rice University, USA, delivered the 38th PAIR Distinguished Lecture titled "Nanotechnology-Enabled Water Treatment" on 6 May 2025 on the PolyU campus. The lecture attracted over 60 participants in person and captured an online audience of over 13,000 from different countries and regions who watched the live broadcast on multiple social media platforms, including Bilibili, WeChat, Weibo and YouTube.

Prof. Alvarez highlighted limitations in conventional water treatment, stressing the urgent need for technological advancements to tackle the challenges. He also discussed the emerging opportunities that nanotechnology offers to revolutionise water treatment systems. He then explained how it can improve pollutant-removal efficiency, reduce energy consumption, and enable cost-effective decentralised solutions. In conclusion, Prof. Alvarez affirmed that nanotechnology holds significant promise for advancing sustainable resources management, enabling safe and low-energy water treatment and reuse. He envisioned that high-performance modular systems that would deliver multifunctional solutions with minimal infrastructure requirements.

Prof. SO Kwok-fai shares lifestyle interventions for mental health at PAIR Distinguished Lecture

Prof. SO Kwok-fai, Director of GHM Institute of CNS Regeneration at Jinan University, Guangzhou, China, delivered the 37th PAIR Distinguished Lecture titled "Mental Health and Lifestyle Intervention" on 17 April 2025 on the PolyU campus. The lecture attracted about 100 participants in person and captivated an online audience of over 13,300 from different countries and regions who watched the live broadcast on multiple social media platforms, including Bilibili, WeChat, Weibo and YouTube.

Prof. So underscored the vital role of disease prevention in protecting health, noting that rapid economic development, fast-paced lifestyles and heightened social competition exacerbate mental health issues, chronic diseases, sub-health syndromes and ageing-related conditions. He detailed neuropathological mechanisms—monoamine neurotransmitters, neural circuits and neuroglial cells—and explained the effects of circulating hormones (e.g., glucocorticoids) on mental health, pointing to interactions between the peripheral and central nervous systems. He also highlighted the antidepressant effects of light therapy and the role of nucleus reuniens in mediating treatment outcomes, as well as the potential of glycopeptides for easing depression without side effects. Prof. So concluded by advocating a shift in healthcare focus from treatment to prevention, and the adoption of exercise, light therapy and goji glycopeptide supplements as key preventive strategies.

Noted scholar Prof. Jesse ZHU shares cornerstones of successful research career at PAIR Distinguished Lecture

Prof. Jesse ZHU, Senior Advisor to the President, Eastern Institute of Technology, Ningbo, China, delivered the 36th PAIR Distinguished Lecture titled "Research Strategy and Planning: How to Prepare a Research Career?" on 12 March 2025 on the PolyU campus. In his presentation, Prof. Zhu emphasised the importance of academic rigour and real-world relevance as factors in the choice of a research topic. The lecture attracted over 110 participants to join in person and captivated an online audience of over 13,300 from different countries and regions who watched the live broadcast on multiple social media platforms, including Bilibili, WeChat, Weibo and YouTube.

Prof. Zhu kickstarted his presentation by sharing his personal anecdotes from his journey through academia and industry, emphasising that innovation, curiosity and a commitment to societal impact have guided his research trajectory. He illustrated these principles with examples from his cross-disciplinary work. Prof. Zhu underscored the transformative role of research in advancing global well-being, advocating for a balance between theoretical exploration and applied solutions. In conclusion, he urged students to cultivate resilience, collaborate across disciplines, and align their work with societal needs, that is, "persistence and purpose are the bedrock of a fulfilling research career."

RILS Associate Director shares research on floating solutions at Consul General Talk

The 6th Consul General Talk, organised by the Policy Research Centre for Innovation and Technology (PReCIT) and supported by the Faculty of Applied Social Sciences, Global Engagement Office and Research Institute for Land and Space (RILS) of PolyU, was successfully held on 25 March 2025 on campus.

The talk featured Mr Maurits ter KUILE, Consul General of the Kingdom of the Netherlands to Hong Kong and Macau, who shared his experiences and insights in Dutch diplomacy. The Netherlands is a pioneer in the development of floating solutions, serving as an exemplary model of the new generation of water-based architecture and public space. Taking this opportunity, Prof. ZHAO Xiao-lin, Associate Director of RILS, presented several examples of floating structures in the Netherlands, the vision of floating cities, and research at RILS in this exciting field.

Nine PolyU projects awarded Environment and Conservation funding

Nine projects led by scholars at The Hong Kong Polytechnic University (PolyU) have been supported by the Environment and Conservation Fund, with a total grant of approximately HK$6.99 million. The awarded projects aim to advance environmental protection and conservation efforts through cutting-edge technologies and innovative research. They cover a range of pressing environmental issues, including carbon reduction, the problem of noise, ozone formation, and sea water treatment.

The Environment and Conservation Fund provides support for educational initiatives, community waste reduction and recovery, research, technology demonstration, and other projects related to environmental and conservation matters. Each awarded project must help to enhance the overall environmental quality of Hong Kong, raise the environmental awareness of the local community, and promote public participation in green, low-carbon living.

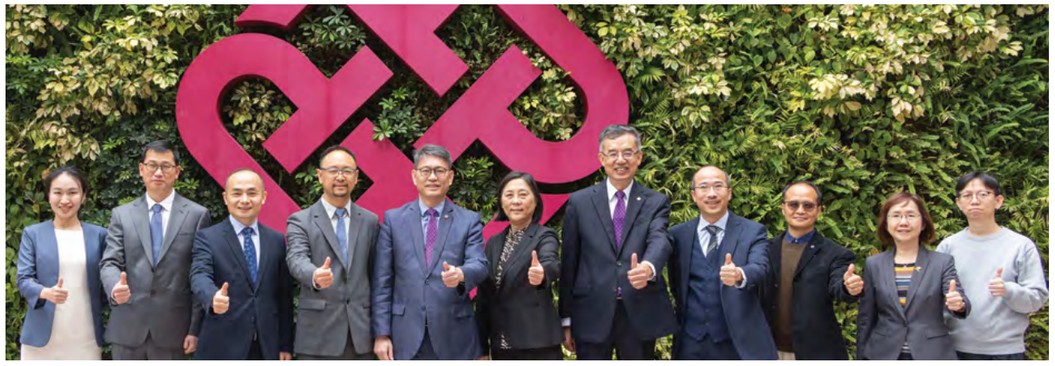
Projects led by PAIR members:

Principal Investigator	Affiliation with PAIR	Project Title	Amount
Prof. DU Liangfen Assistant Professor in the Department of Building Environment and Energy Engineering	Otto Poon Charitable Foundation Smart Cities Research Institute (SCRI) and Research Institute for Sustainable Urban Development (RISUD)	A Novel Acoustic Metagrating Barrier for Traffic Noise Reduction	HK$760,592
Prof. WANG Tao Chair Professor of Atmospheric Environment in the Department of Civil and Environmental Engineering	Research Institute for Land and Space (RILS) and Research Institute for Sustainable Urban Development (RISUD)	Investigating Atmospheric Oxidation Capacity of Hong Kong: Measurement and Modelling of Hydroxyl Radicals, Hydroperoxyl Radicals, and Hydroxyl Radicals Reactivity	HK$1,469,500
Prof. CHOY Yat-sze Associate Professor in the Department of Mechanical Engineering	Research Institute for Sustainable Urban Development (RISUD)	Sonic Metagrating Barrier for Broadband Sound Absorption and Wave Manipulation	HK$472,000
Prof. Randolph LEUNG Chi Kin Associate Professor in the Department of Mechanical Engineering	Research Institute for Advanced Manufacturing (RIAM) and Research Institute for Sustainable Urban Development (RISUD)	Integrating Close-Proximity Sound Power Measurement and Numerical Propagator Technologies for Realistic Prediction and Assessment of Tyre/Road Noise Nuisance in Hong Kong Urban Environment	HK$1,060,140
Prof. TSANG Yuen-hong Professor in the Department of Applied Physics	Research Institute for Advanced Manufacturing (RIAM), Photonics Research Institute (PRI) and Otto Poon Charitable Foundation Research Institute for Smart Energy (RISE)	Designing a Prototype for Simultaneous Solar Desalination and Hydrogen Production	HK$500,000

PolyU and Amway (China) establish Joint Laboratory for Phytonutrients and Aging Research

The Hong Kong Polytechnic University (PolyU) and Amway (China) signed a strategic cooperation memorandum on 17 March 2025 for the establishment of the Joint Laboratory for Phytonutrients and Ageing Research. Over the next three years, both parties will allocate research funding, co-train postdoctoral researchers, and establish a phytonutrient database alongside functional assessment models to support the advancement of the Greater Bay Area's health sector.

The memorandum was signed by Prof. Christopher CHAO, Vice President (Research and Innovation), and Mr Johnson HAN, General Manager of Innovation and Science of Amway (China). The signing was witnessed by Prof. WONG Wing-tak, Deputy President and Provost; Prof. CHEN Qingyan, Director of PolyU Academy for Interdisciplinary Research (PAIR); Dr Eric Du, Principal Scientist of the Research and Development Centre of Amway (China); and Dr Clark Chen, Senior Scientist of the Research and Development Centre of Amway (China). Over 20 experts, including Prof. WONG Man-sau, Director of the Research Centre for Chinese Medicine Innovation (RCMI), and Prof. LEE Ming-yuen, Chair Professor of Biomedical Sciences in the Department of Food Science and Nutrition, joined this momentous occasion.



PolyU and Anguo join forces to advance research translation and talent training in traditional Chinese medicine

The Hong Kong Polytechnic University (PolyU) and Yaodu Yanxuan Health Industry Group (Anguo) Co., Ltd. signed a Memorandum of Understanding on 26 March 2025, to jointly translate traditional Chinese medicine (TCM) research results into clinical applications and commercialisable products and to enhance talent training in the field, with a view to promoting the general health of the community. The two parties will collaborate in the research and development of products based on medicine and food homology, functional foods, external treatment methods and appropriate TCM technologies, transforming scientific and technological achievements into products that enhance public health, and will jointly design education programmes to promote talent training in the field.

Dr Gail CHANG introduces groundbreaking fat replacer AkkMore™ in *Ming Pao*

Dr Gail CHANG Jinhui, Member of the Research Institute for Future Food (RiFood) and Research Assistant Professor in the Department of Food Science and Nutrition, was interviewed by Ming Pao Daily in March about her innovative fat replacer AkkMore™.

Akkermansia muciniphila (Akk), a beneficial gut bacterium linked to reduced risks of obesity, diabetes, fatty liver disease, cardiovascular issues and inflammation, is not naturally abundant in the human gut. Historically, there have been no simple methods to boost the bacterium's growth. However, Prof. Chang and her team discovered that polysaccharides extracted from mushrooms can be used to create AkkMore™, a prebiotic that nourishes Akk.

This innovation also doubles as a plant-based fat substitute in food production. The team found that AkkMore™'s thickening and emulsifying properties allow it to partially replace animal fats like butter and cream in products such as ice cream and biscuits. For example, Cream Mate, an AkkMore™-based cream substitute, reduces ice cream fat content from 15–16% to 2.7%, cutting calories by over 50%. Similarly, Butter Mate lowers biscuit fat from 36% to 18%. These substitutes mimic the texture of animal fat, and small amounts of fat, sugar, or salt are strategically added to enhance the flavour of food products without compromising health benefits.

Commercialised via Bo InnoHealth Biotechnology, the products have gained recognition at international innovation exhibitions and are used by businesses like Hotel ICON and Pacific Coffee. While primarily sold business-to-business (B2B), low-fat cookies and pineapple pastries are available for public purchase via PolyU's platform. The team aims to balance health benefits with sensory appeal, avoiding artificial additives like margarine while keeping costs competitive.

Prof. NI Meng discusses hydrogen energy development on RTHK TV programme

Prof. NI Meng, Management Committee Member of the Otto Poon Charitable Foundation Research Institute for Smart Energy (RISE), Member of the Research Institute for Sustainable Urban Development (RISUD), Associate Dean (Research) of the Faculty of Construction and Environment and Chair Professor of Energy Science and Technology, shared his expertise on hydrogen energy in a recent interview with RTHK TV programme *Hong Kong Connection.*

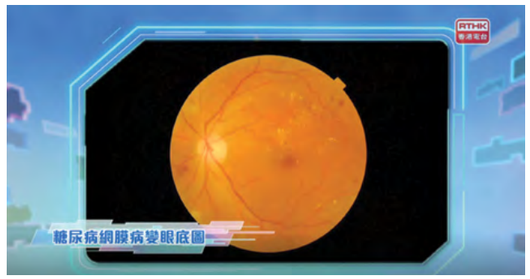
Prof. Ni elaborated on the benefits and limitations of grey, blue and green hydrogen, emphasising their important roles in the global transition to sustainable energy systems. He also pointed out that renewable energy supply and demand are not always matched, resulting in over-generation of renewable energy and thus the waste of this energy. If the excess renewable energy were used to produce hydrogen, he explained, not only would energy waste be avoided, but zero-emission hydrogen production could truly be achieved, contributing to carbon neutrality and sustainability.

PolyU's AI-powered healthcare technologies featured in RTHK TV programme

Prof. HE Mingguang, Director of the Research Centre for SHARP Vision (RCSV), Chair Professor of Experimental Ophthalmology and Henry G. Leong Professor in Elderly Vision Health, and Ir Prof. ZHENG Yongping, Director of the Research Institute for Smart Ageing (RISA), Chair Professor of Biomedical Engineering and Henry G. Leong Professor in Biomedical Engineering, were featured in RTHK's TV programme "Hong Kong United".

In the interview, Prof. He outlined his team's development of a portable, AI-powered retinal fundus camera for improving the efficiency and accuracy of diabetic retinopathy detection. This innovation addresses critical healthcare challenges in Hong Kong, where 10% of the population have diabetes and require regular eye screenings. Traditional methods rely on bulky equipment and specialist expertise, making screenings costly and time-consuming. The new device, integrated with an AI analysis system, streamlines the process, enabling rapid, cost-effective screenings with over 90% accuracy. Unlike conventional exams that take about 30 minutes, the AI system delivers results in two minutes. Faster identification of at-risk patients allows timely referrals, thereby improving patient outcomes. This solution helps to meet the rising demand for eyecare, particularly among the over-65s, who comprise 10–15% of the population and are at higher risk for eye disease. By enabling affordable, accessible and quick screenings, the technology could encourage the public to seek eyecare services without an increased burden on the strained healthcare workforce. This system presents a viable solution to diabetic retinopathy and the shortage of ophthalmologists and optometrists, benefitting both patients and the healthcare system.

Meanwhile, Prof. Zheng introduced his invention "Scolioscan®", a portable palm-sized 3D ultrasound imaging device for radiation-free assessment of scoliosis. While X-rays remain the clinical gold standard for evaluating spinal curvature, they expose patients to harmful radiation. This poses a significant health challenge, especially to teenagers with scoliosis who require regular monitoring during rapid growth phases. By using an ultrasound imaging method, the technology allows closer monitoring of spinal curvature progression without health hazards. Its compact, portable design also enables scoliosis screenings to be carried out in community settings such as schools or local clinics. This innovation helps to expand access to safe, accurate assessments for teenagers across diverse regions, facilitating timely interventions for scoliosis patients and improving patient outcomes.



RCDTT unveils large language model-based tourist satisfaction index, providing comprehensive analysis to enhance Hong Kong tourism service quality

RCDTT unveils large language model-based tourist satisfaction index, providing comprehensive analysis to enhance Hong Kong tourism service quality

The Research Centre for Digital Transformation of Tourism (RCDTT) has developed an innovative, large language model (LLM)-based assessment framework—the "Hong Kong Tourist Satisfaction Index" (HKTSI)—to evaluate the satisfaction level of inbound tourists to Hong Kong from 2012 to 2024 across various tourism-related sectors, temporal scales and regions. Although the findings indicated clear performance variations from one region to another, the TSI rebounded and reached its highest-ever recorded score after the temporary decline during the pandemic.

The TSI was initially introduced in 2009, using a questionnaire-based method to evaluate tourists' satisfaction with various tourism services. Seeking to provide a more comprehensive and accurate analysis, the team has transformed the framework by adopting an interdisciplinary approach that integrates theories from management science, economics and computer science, and by leveraging the advanced LLM technology.

The enhanced TSI framework offers multi-dimensional analysis, enabling TSI measurement across a variety of dimensions, such as service topics, service sectors and trip types, temporal scales (monthly and annually), and regions. This adaptable approach provides stakeholders with timely, data-driven insights to guide service improvement, policy development and strategic decision-making.

Prof. SONG Haiyan featured on local news and TV programme on smart tourism

Prof. SONG Haiyan, Director of RCDTT, Associate Dean and Chair Professor of the School of Hotel and Tourism Management (SHTM), and Mr and Mrs Chan Chak Fu Professor in International Tourism, was interviewed by Now News about the use of robotics and AI to address manpower shortages and enhance customer experiences in the hotel industry. "Some people think that the development of AI and robotics may replace certain jobs in the hotel industry, and this is indeed true, "said Prof. Song. "However, the use of robotics and AI also creates opportunities for new and higher-level jobs. As the hotel and tourism industry evolves in the future, many new business operating models and applications of science and technology will emerge."

Prof. Song Haiyan was also interviewed by i-CABLE News programme "Inno Action" for his insights on the digital transformation of the hospitality and tourism industry. He explained that smart tourism involves leveraging technologies such as the Internet of Things (IoT), artificial intelligence (AI), robotics and big data to optimise the tourism value chain. He also emphasised that these technologies can be applied throughout the entire process before, during and after the trip, in order to enhance the tourist experience and help the industry improve services and marketing through data analytics.

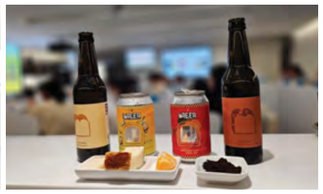
In addition, Prof. Song remarked that Hong Kong's many technological and geographical advantages are boosting smart tourism development, although there is still room for improvement in terms of policies and the use of robotics in hotels. For instance, over 80% of hotels in mainland China now employ robots for tasks like room service and check-in, while similar applications in Hong Kong are still in the trial phase. He suggested that the government adopt more flexible policies to attract tech firms to Hong Kong and encourage various businesses in the supply chain to work together to drive smart tourism.

RiFood co-organises workshops to promote food upcycling and reduce food waste

The Research Institute for Future Food (RiFood) co-organised two workshops in February 2025 with the aim of promoting food upcycling and reducing both food waste and carbon footprints.

The workshop, titled "From Waste to Worth: What Is Upcycled Food and Why Should We Try It?", was held in collaboration with the School of Hotel and Tourism Management (SHTM) and the Campus Facilities and Sustainability Office (CFSO) on 10 February 2025. Participants discussed the significance of food upcycling in minimising food waste and lowering carbon emissions. They also had the opportunity to sample upcycled snacks.

Additionally, in the "Brew-tiful Workshop" co-organised with the Food and Wine Academy of SHTM on 11 February 2025, participants explored the art of crafting beers—upcycling coffee grounds, bread and fruit into beers with unique flavours, distinct from traditional wheat-brewed varieties.


PolyU and CSD sign MOU to promote upcycling of food waste and development of eco-friendly products

The Hong Kong Polytechnic University (PolyU) and the Correctional Services Department (CSD) signed a Memorandum of Understanding (MoU) on 7 February 2025 to jointly promote the upcycling of food waste and the development of environmentally friendly products, injecting new impetus into sustainable development within the correctional industry.

The MoU sets out a framework for collaboration between PolyU and CSD to jointly promote innovative development initiatives over the next five years. One of these initiatives is the application of PolyU's scientific research results in the area of food waste upcycling to industrial production in correctional institutions. Another initiative is the provision of vocational training to persons in custody (PICs) in the design and production of environmentally friendly products by PolyU to enhance their employability. The collaboration not only promotes environmental protection but also assists in the rehabilitation of PICs.

In the first phase of the collaboration, PolyU's patented technology for making 3D printing material with spent coffee grounds will be applied to the industrial production work performed by PICs. PolyU will also provide vocational training in product design to enable PICs to develop more environmentally friendly products from spent coffee grounds.

These environmentally friendly products will be available for purchase on the CSD Sports Association's online charity gift sales platform, Made In Prison, to promote messages of supporting rehabilitation and environmental protection to the public. All proceeds from sales, after the deduction of necessary costs, will be donated to various local registered charities, providing PICs with opportunities to contribute to the community.

Ir Prof. POON Chi-sun featured in short documentary film "Carbon Revolution in China"

Ir Prof. POON Chi-sun, Director of the Research Centre for Resources Engineering towards Carbon Neutrality (RCRE), Head of the Department of Civil and Environmental Engineering, Michael Anson Professor in Civil Engineering and Chair Professor of Sustainable Construction Materials—was featured in the short documentary film "Carbon Revolution in China", in which he introduced the Eco-blocks developed by his team. Eco-blocks are a type of green construction material produced from construction and other waste materials; they can absorb carbon dioxide and store it permanently, thereby reducing greenhouse gas emissions.

Produced by the Hong Kong Coalition, the documentary film features efforts in mainland China and Hong Kong aimed at carbon reduction and energy saving, and tells positive stories of the Nation's advances towards its "dual carbon" goals.

PAIR Research Impact Video Series Episode 3 is now available online

PAIR is excited to present the third episode of the PAIR Research Impact Video Series. The Series invites PAIR researchers to share their latest research achievements and solutions to major challenges in society.

Titled "Electrocatalytic carbon dioxide reduction: Transforming greenhouse gas into raw material for plastics", the episode features Prof. Daniel LAU, Associate Director in the Photonics Research Institute (PRI), Member of the Research Centre for Deep Space Explorations (RCDSE), Head of the Department of Applied Physics and Chair Professor of Nanomaterials.

In this episode, Prof. Lau introduces the novel electrocatalytic carbon dioxide (CO_2) reduction system developed by his team. The system can efficiently convert CO_2 into ethylene, a key raw material for plastics, thereby contributing to carbon neutrality. The "catalyst material test device" has been carried into space as part of the aerospace programme of the China National Space Administration to evaluate its stability in space. The team is collaborating with industry partners to enhance the device's stability and explore its application in overseas petrochemical plants and waste-to-energy facilities.

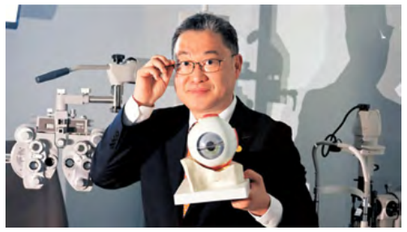
Watch the video now to discover how this chemical process works!
(https://www.youtube.com/watch?v=nrzF8HsMGq8)

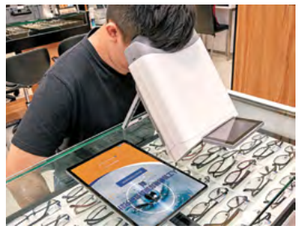
Prof. HE Mingguang featured in *Wen Wei Po* on pioneering ophthalmology technologies

Prof. HE Mingguang, Director of the Research Centre for SHARP Vision (RCSV), Chair Professor of Experimental Ophthalmology and Henry G. Leong Professor in Elderly Vision Health, was interviewed by *Wen Wei Po* regarding two ground-breaking innovations he developed.

The AI-powered, portable retinal fundus camera is designed for self-testing screening for diabetic eye, enabling efficient, comprehensive and accurate screening without the need for trained technicians. It automatically targets the subject's eyes to capture fundus images within one minute without pupil dilation or fluorescein injection. The device then transmits the images to an AI system, which assesses the optic nerves and fundi of both eyes and detects signs of glaucoma, diabetic retinopathy or cataract, without requiring interpretation by medical professionals. The research team has collaborated with OPTICAL 88 to install these devices in designated retail stores for public use.

For myopia management, Prof. He's team developed a non-invasive repeated low-level red-light (RLRL) therapy to reduce the progression of childhood myopia. The team has recently improved the treatment by reducing light intensity, shortening treatment duration and optimising the illumination system. The therapy can halt myopia progression and even reduce the degree of myopia. Research has shown that individuals with high myopia have their prescriptions reduced from 500 degrees to 450 degrees after the treatment. This advancement offers a breakthrough solution for managing the global rise of myopia among children.





MHRC promotes mental health and resilience on PolyU campus through ReST Hub

The Resilient Students Training Hub (ReST Hub), launched this academic year by the School of Nursing and the Mental Health Research Centre (MHRC), is a five-year research-driven service and education initiative aimed at enhancing the mental health and resilience of PolyU students.

To celebrate this year's project achievements, the organisers held a celebratory event on 3 April 2025. The occasion was officiated by Dr the Hon. LAM Ching-choi, SBS, JP, Member of the Executive Council of the Government of the HKSAR. PolyU representatives included Prof. Horace MUI, Interim Dean of Students, Prof. David SHUM, Dean of the Faculty of Health and Social Sciences, Prof. Sylvia CHEN, Interim Director of MHRC, Prof. Justina LIU, Associate Head of the School of Nursing, and Dr Florence WU, Section Head of Counselling and Wellness of the Student Affairs Office. The event featured interactive games, inspirational talks by local music artist Mr Alfred HUI and Olympic badminton player Mr LEE Cheuk-yiu, and a performance by the PolyU Music Society, bringing together over 200 participants from PolyU and the local community.

The project will introduce further initiatives in the coming years, with the goal of fostering ecosystems that actively promote mental health and resilience on the university campus.

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