澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU

應用物理及材料工程研究院
INSTITUTO DE FÍSICA APLICADA E ENGENHARIA DE MATERIAIS
INSTITUTE OF APPLIED PHYSICS AND MATERIALS ENGINEERING

IAPME Newsletter

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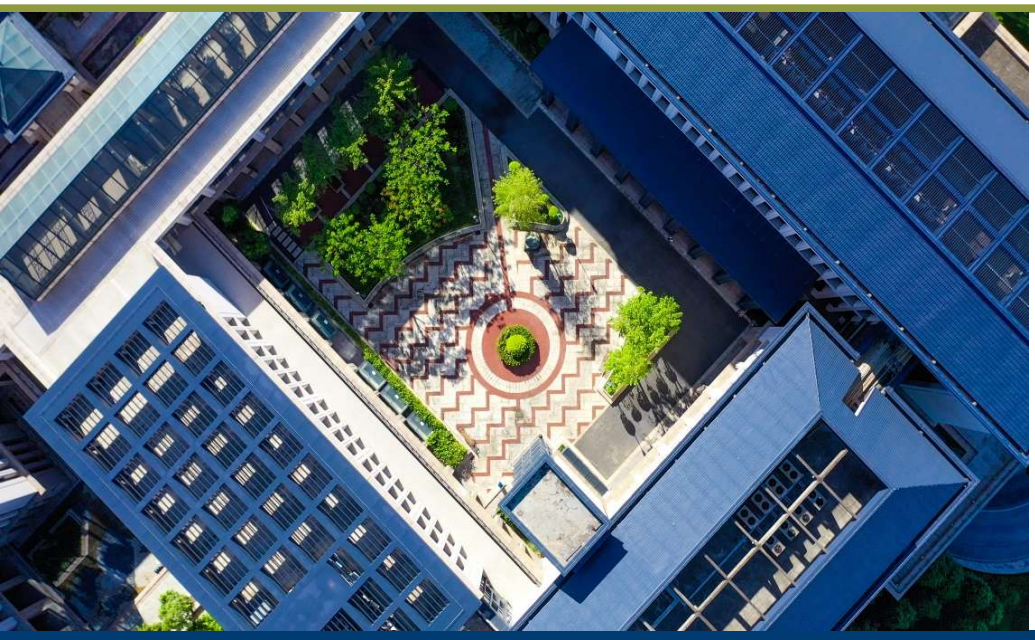

ISSUE 26

19 March 2025

✧ Content

❖ Ph.D. Student Thesis Oral Defenses

Huifang Xu of Prof. Kwun Nam Hui's group presented "Synergistically Boosting the Sulfur Redox Kinetics over Polar Catalysts in Lithium-Sulfur Batteries" in her oral defense on March 7, 2025.

Congratulations to Dr. Huifang Xu!

(from left) Prof. Haifeng Li (李海峰), Prof. Guichuan Xing (邢貴川),
Dr. Huifang Xu (徐惠芳), Prof. Kwun Nam Hui (許冠南),
Prof. Guangmin Zhou (周光敏, Tsinghua SIGS) and Prof. Bingpu Zhou (周冰朴)

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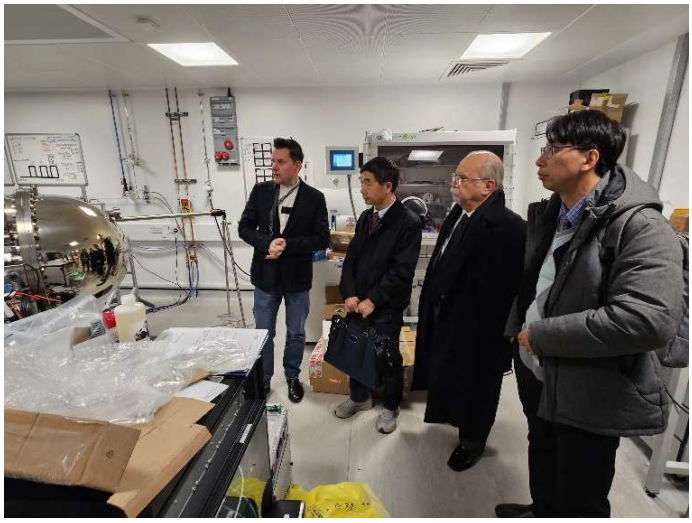
❖ UM delegation visits several UK universities to promote cooperation

Prof. Handong Sun joined a delegation led by Prof. Rui Martins, Vice Rector of the University of Macau, to visit several universities in the Midlands and North West England from 26 to 28 February, 2025 to deepen cooperation and exchanges with higher education institutions in English-speaking countries. The UM delegation also included Prof. Lianghuo Fan, Dean of UM's Faculty of Education (FED) and Prof. Sai Weng Sin, Deputy Director of the Institute of Microelectronics (IME).

On 26 February, 2025, UM delegation visited the University of Warwick and was received by Pro-Vice-Chancellor Michael Scott. The two parties held a meeting to discuss cooperation in student and faculty exchanges, dual degree programmes, and joint research projects, and reached several agreements. Besides, they also visited the University of Leicester and met with Pro Vice-Chancellor Sarah Davies and several faculty representatives. Both sides recognised the similarities in their academic structures and research layouts, and expressed optimism for future cooperation in dual degree programmes, student exchanges, and research collaboration.

On 27 February, 2025, the delegation visited the University of Nottingham and met with Associate Pro-Vice-Chancellor Nigel Mongan. The discussions focused on key disciplines such as education, Portuguese studies, social sciences, and engineering, with plans to systematically advance cooperation in student exchange programmes, dual degree programmes, and international academic conferences. Besides, they also visited the University of Sheffield and met with Vice-President Malcolm Butler and faculty representatives from School of Electrical and Electronic Engineering and School of Mathematical and Physical Sciences. They shared each other's research focus and explored the potential collaboration in research projects. The two parties focused on the strengths of both universities in electronic and electrical engineering, mathematics, physics, and education, and explored directions for future cooperation.

Then, the delegation visited University of Leeds and met with Dean of Global Engagement Manuel Barcia Paz and representatives from the Faculty of Engineering and Physical Sciences and the School of Education. They discussed strengthening teaching and research collaboration in electronic and electrical engineering, chemistry, materials science, and education. In the last station of the tour, the delegation visited the University of Manchester and discussed with representatives and scholars of the Faculty of Science and Engineering, and explored research collaboration in the fields of computer science, electrical and electronic engineering, and materials science. During the visit, they also had a lab tour of the Photon Science Institute and Henry Royce Institute.



❖ Upcoming Events

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IAPME Seminar

Centrosymmetric metamaterials for discerning chiral light based on metasurface-assisted Valleytronics

20 March 2025

Prof. Weibo GAO
Nanyang Technological University
Venue: N23-4018
Time: 10:00 - 11:00
Hosted by: Prof. Shen LAI

Abstract

The full-range, high-sensitivity, and integratable detection of circularly polarized light (CPL) is critically important for quantum information processing, advanced imaging systems, and optical sensing technologies. However, the mainstream CPL detectors rely on chiral absorptive materials, and thus suffer from limited response wavelengths, low responsivity and poor discrimination ratio. Here, we present a chiral light detector by utilizing valley materials to observe the spin angular momentum (SAM) carried by chiral light. Delicately designed centrosymmetric metamaterials that can preserve the sign of optical SAM and highly enhance its intensity in the near field are harnessed as a medium to inject polarized electrons into valley materials, which are then detected by the Valley Hall effect. This enables high sensitivity infrared CPL detection at room temperature by valleytronic transistors, and the detection wavelength is extended to the infrared. This approach opens pathways for chiral light detection and provides insights into potential applications of valleytronics in optoelectronic sensing.

Biography

Prof. Weibo GAO, received his Bachelor in 2005 from University of Science and Technology of China, and PhD from the same university in 2010. From 2010 to 2014, he worked as a Postdoc and Marie Curie Fellowship in ETH, Zurich. He joined Nanyang Technological University (NTU) as an Assistant Professor in 2014. The same year, he has won National Research foundation fellowship award. From 2019, Prof. Gao serves as Tenured Professor and provost's Chair Professor in Physics in NTU. Since 2024, he serves as Endowed Professor in EEE&SPMS in NTU. His current research interest is quantum photonics and condensed matter physics based on solid state systems. He published on high impact publications including more than 50 Nature/Science series journals and Phys. Rev. Letters. He has won several awards for his creative work, including 2017 Singapore President's Young Scientist Award (YSA), 2023 NTU Nanyang Award (YSA).

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