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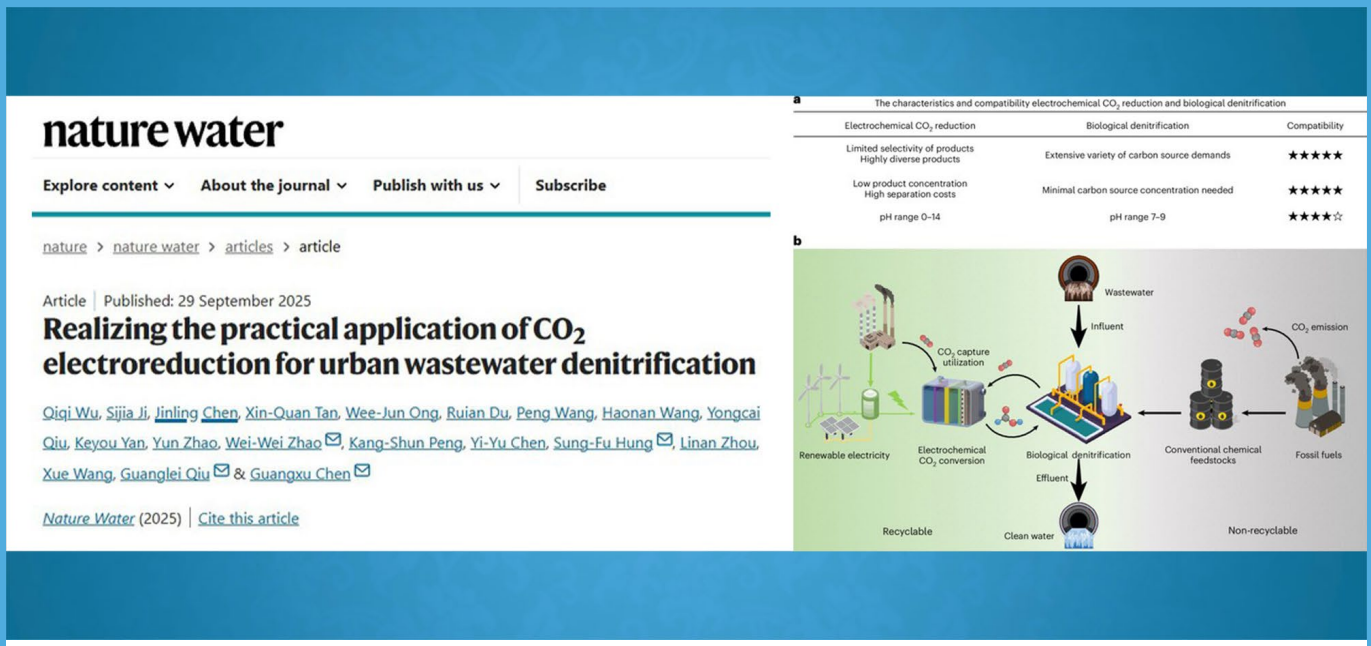
SCUT Newsletter 华工新闻快讯



1. School of Environment and Energy Makes Landmark Publication as First Author in *Nature Water*

环境与能源学院首次以第一作者单位在Nature Water发文

The team led by Professor Chen Guangxu and Professor Qiu Guanglei of South China University of Technology (SCUT) published a paper titled "Realizing the practical application of CO_2 electroreduction (CO_2RR) for urban wastewater denitrification" in the top-tier journal *Nature Water*. Based on a detailed comparison of the CO_2RR system and municipal wastewater denitrification, the team

proposed a novel electrochemical–biological hybrid system that merges CO_2 electrolysis with municipal wastewater denitrification.

华南理工大学陈光需教授和邱光磊教授团队以题为"Realizing the practical application of CO_2 electroreduction for urban wastewater denitrification"发表于顶级期刊*Nature Water*。团队通过仔细对比CO_2RR与城市污水反硝化处理两个系统的特点，提出了一种新型的电化学-生物耦合体系，将二氧化碳电还原与城市污水反硝化过程相结合。

In this hybrid system, CO_2 was efficiently and electrocatalytically converted into formate (formate□e), which directly serves as the carbon source and energy carrier for biological denitrification. Results show that the system achieves an excellent nitrate nitrogen (NO_3−-N) removal rate (~3.06 mg L-1h-1). Moreover, after long-term continuous operation of the tailored denitrification bioreactor, formate-e exhibits a higher denitrification rate than acetate, a widely used commercial carbon source. Further environmental and techno-economic analyses indicate that integrating this electrochemical–biological hybrid system with an electrochemical recovery and separation system can significantly reduce electrolyte costs, thereby enabling large-scale application of the hybrid system. This research offers a novel approach for the coordinated development of CO_2 mitigation and urban wastewater treatment and demonstrates the significant potential of directly applying electrochemical products in environmental governance. With ongoing engineering design optimization, the system holds promise of achieving both technical and economic viability. More importantly, by recycling and utilizing CO_2 released from sources such as thermal power generation, sludge or waste incineration, and biological denitrification processes as a reaction feedstock, the system is expected to achieve net-zero or even carbon-negative emissions.

在该体系中，CO_2被高效电催化转化为甲酸盐（formate-e），并直接作为微生物反硝化的碳源与能量载体。实验结果表明，该体系不仅实现了优异的硝酸盐去除速率（~3.06 mg/L/h），而且在菌群长期连续驯化后，formate-e的反硝化效果超越了传统的商业碳源乙酸盐。通过进一步的环境与技术经济分析显示，若结合电化学回收与分离系统，可显著降低系统成本，为该耦合系统的规模化应用创造条件。这一研究为CO_2减排与城市污水处理的协同发展提供了全新思路，也展现了电化学产物直接应用于环境治理的巨大潜力。随着工程设计的持续优化，该体系有潜力实现技术可行性与经济可行性的统一。更重要的是，通过回收并利用火电、污泥或垃圾焚烧以及生物反硝化过程中释放的CO_2作为反应原料，有望实现净零排放，甚至迈向碳负排放。

2. SCUT Wins 6 Gold Medals and 1 Silver Medal as the China International College Students' Innovation Competition 2025 Concludes

2025中国国际大学生创新大赛落幕　华南理工斩获6金1银

On October 13, the on-site finals of the China International College Students' Innovation Competition 2025 (CICSIC 2025) were held at Zhengzhou University. SCUT advanced to the finals with seven projects, winning six gold medals and one silver medal, ranking first among universities in Guangdong Province and among the top nationwide in terms of the number of gold medals.

10月13日，中国国际大学生创新大赛（2025）总决赛现场赛在郑州大学举办，华南理工共有7个项目进入总决赛，最终斩获金奖6项和银奖1项，金奖数量位居广东高校第一、全国前列。

The CICSIC 2025 is a global event jointly organized by the Ministry of Education and 11 other departments. With the theme of "Dare to Differ, Dare to Win", the event has attracted 6.19 million projects and 24.43 million participants from 5,673 universities across 161 countries and regions worldwide, further enhancing its role as a great platform uniting "hundreds of countries, thousands of colleges, and millions of people".

2025年中国国际大学生创新大赛是由教育部等12个部门联合主办的全球性赛事，主题为“我敢闯，我会创”，吸引全球161个国家和地区、5673所学校的619万个项目、2443万人次参赛，"百国千校千万人"大平台持续巩固并不断拓展。

Gold Medal-winning projects:

金奖项目列表：

Fast-Charging Pioneer: Ester Polymer-Based Solid-State Lithium Batteries—School of Chemistry and Chemical Engineering, SCUT

酯类聚合物固态锂电池快充领航者 化学与化工学院

Pioneer of Next-Gen Magnetic Storage Chip Architecture—School of Microelectronics, SCUT

新一代磁存储芯片架构的引领者 微电子学院

Multimodal and IoT Large Model for Intelligent Connectivity—School of Mechanical & Automotive Engineering, SCUT

多模态物联大模型智联万象 机械与汽车工程学院

Rural Revitalization Pioneer Empowered by Targeted Recovery of Valuable Metals from Water Bodies in Mining Area—School of Environment and Energy, SCUT

矿区水体有价金属靶向回收赋能乡村振兴开拓者 环境与能源学院

High-Efficiency and High-Performance Metal Micro- and Nano-Manufacturing with Non-Uniform Double-Beams—School of Mechanical & Automotive Engineering, SCUT

非均值双光束高效高性能金属微纳制造 机械与汽车工程学院

Intelligent Robot System for Brain-Computer Interface—Shien-Ming Wu School of Intelligent Engineering, SCUT

脑机接口的智能机器人系统 吴贤铭智能工程学院

3. SCUT's National School for Elite Engineers "Goes Global"—The "China–Peru Institute for Excellent Engineers" was unveiled by Chancellor Zhang Xichun

推动卓越工程师学院“出海”　章熙春书记赴秘鲁为“中国-秘鲁卓越工程师学院”揭牌

From October 24 to November 2, Zhang Xichun, Chancellor of SCUT, led a delegation to Peru, aiming to advance the "going global" initiative of SCUT's National School for Elite Engineers and jointly shape a new ecosystem for global engineering education with partner universities. This visit significantly expanded SCUT's cooperation with leading universities in Peru, Turkey and Brazil.

10月24日至11月2日，为推动卓越工程师学院"出海"，共塑全球工程教育新生态，华南理工大学党委书记章熙春率团赴秘鲁并深度拓展与"一带一路"重要节点国家土耳其、巴西多所著名高校的教育合作。

The delegation visited the National University of San Marcos—the oldest university in the Americas and a member organization of the China–Peru Institute for Excellent Engineers—and unveiled the establishment of the Institute. The delegation also visited Istanbul Technical University and Boğaziçi University in Turkey, as well as the State University of Campinas and the University of São Paulo in Brazil, holding friendly discussions on further inter-university cooperation. Additionally, the delegation collaborated with leading Chinese companies operating overseas, such as Huawei, BYD, and China Southern Power Grid, exploring the construction of an innovative community through tripartite collaboration among SCUT, Chinese enterprises, and local universities, aiming to achieve innovation in both cooperation regions and models.

出访期间，章书记率团访问中秘卓工院秘鲁共建高校-国立圣马尔科斯大学（美洲最古老的大学），揭牌中秘卓越工程师学院，并访问了土耳其伊斯坦布尔理工大学、海峡大学、巴西坎皮纳斯州立大学和圣保罗大学，就进一步加强校级合作进行友好洽谈，协同华为、比亚迪、南方电网等出海标杆企业，共同探索构建"华工-中资企业-当地高校"三方联动的创新共同体，实现合作区域和合作模式的创新。

4.SCUT Participates in the CACIE 2025 and Shares New Paradigms for Cultivating Excellent Engineers and Locally-Based International Talents

华南理工亮相中国国际教育年会　分享卓越工程师、在地国际化人才培养新范式

From October 29 to 31, the 26th China Annual Conference & Expo for International Education (CACIE 2025), themed "Bridging Education and Beyond", was held in Beijing. Li Weiqing, Vice President of SCUT, attended the CACIE, and delivered a keynote speech entitled *SCUT's Practice in Cultivating International Excellent Engineers* at one of the side events—the 2nd New Zealand-China High-level Education Forum. Li shared SCUT's innovative practices in developing a model for cultivating excellent engineers to address global challenges, which resonated widely with attendees.

10月29日至31日，第26届中国国际教育年会在北京举办。本届年会主题为"以教育见世界"，华南理工大学党委副书记、副校长李卫青参加第26届中国国际教育年会系列活动，并在年会的系列活动之一第二届中国-新西兰教育发展论坛以《国际化卓越工程师人才培养的华工实践》发表主题发言，分享构建应对全球

挑战的卓越工程师培养模式的创新实践，引起广泛共鸣。

It is reported that the CACIE 2025 brought together education leaders, experts, scholars, and industry representatives from more than 70 countries and regions worldwide to explore new trends and opportunities in global education development.

据悉，本次年会汇聚全球70多个国家和地区的教育界领袖、专家学者、行业代表，共同探讨全球教育发展的新趋势新机遇。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Article | Published: 29 October 2025

Atomically resolved edges and defects in lead halide perovskites

Biao Yuan, Zeyu Wang, Shuchen Zhang, Christoph Hofer, Chuang Gao, Tamazouzt Chennit, Hongsheng Shi, Xiaoyan Wu, Yu Han, Letian Dou ✉, Yi Yu ✉ & Timothy J. Pennycook ✉

Nature **647**, 364–368 (2025) | Cite this article

10k Accesses | **4** Citations | **47** Altmetric | Metrics

5.Co-authored Paper by SCUT Researchers Published in *Nature*

华南理工大学合作研究成果在Nature发表

On October 30, Dr. Yuan Biao, a postdoctoral researcher, and Professor Han Yu of South China University of Technology (SCUT) published a co-authored study titled "Atomically resolved edges and defects in lead halide perovskites" in *Nature*.

10月30日，华南理工大学博士后原彪博士、韩宇教授参与研究的一项合作成果以题为"Atomically resolved edges and defects in lead halide perovskites"发表于*Nature*。

The team employed an event-driven direct electron detector to acquire data under ultralow electron doses and, together with an advanced electron ptychography method, achieved the first direct atomic-scale imaging of the crystal edges and defect structures in the hybrid perovskite methylammonium lead iodide ($MAPbI_3$), elucidating the dynamic mechanisms of beam-induced structural degradation. In addition to resolving the edge-termination modes of $MAPbI_3$, the study identifies iodine vacancies as the key defects that trigger structural deterioration. Beyond providing direct evidence for the microscopic origins of instability in hybrid perovskites, the results highlight the methodological value and broad potential of ultralow-dose atomic imaging for studying electron-beam-sensitive materials.

研究团队采用事件驱动型直接电子探测器，在超低电子剂量条件下完成数据采集，并结合先进的电子叠层衍射重建算法，首次实现了对甲基铵铅碘（$MAPbI_3$）杂化钙钛矿晶体边缘及缺陷结构的原子尺度直接成像，揭示了其在电子束辐照下的动态结构损伤机制。研究不仅阐明了 $MAPbI_3$ 晶体边缘的终止模式，还确

认碘空位是诱发结构退化的关键缺陷。该工作为深入理解杂化钙钛矿的微观不稳定性提供了直接证据，并展示了超低剂量原子成像在电子束敏感材料研究中的重要潜力与方法学价值。

6.SCUT Reaches Multiple Cooperation Outcomes with Italian Universities at 2025 China-Italy University Presidents' Forum Held in Beijing

2025中意大学校长对话会在京举行　华南理工大学与意大利高校达成多项合作成果

On November 13, under the theme of "Advancing Interdisciplinary Integration to Address Global Challenges", the 2025 China-Italy University Presidents' Forum was held in Beijing. Tang Hongwu, President of SCUT, attended the Forum and delivered a keynote speech on "Cultivating Talent Through Interdisciplinary Integration: Writing a New Chapter of China-Italy Collaboration", which was well-received by the attendees. During the Forum, on behalf of SCUT, President Tang signed Memorandums of Understanding with the University of Ferrara and the University of Salento, to further deepen cooperation in talent development and scientific research innovation.

11月13日，2025中意大学校长对话会在京举行，对话会主题为"推进学科交叉融合发展，共同应对全球性挑战"。华南理工大学校长唐洪武参加2025中意大学校长论坛并以"交叉融通育英才中意携手创新篇"发表主题发言，引起与会赞赏。大会期间，唐洪武代表华南理工与费拉拉大学、萨兰托大学分别签署了校际合作备忘录，进一步深化在人才培养与科研创新等领域的合作。

The China-Italy University Presidents' Forum is a key platform for institutional dialogue in higher education between the two countries. The forum is held annually to advance people-to-people and academic exchange between China and Italy. This year's forum was attended by representatives from more than 60 universities and educational institutions from both countries.

据悉，中意大学校长对话会是中意高等教育机制性对话重要平台，每年双方定期会晤，推进中意人文交流。中意两国60余所高校和机构代表出席本次两国教育界交流盛会。

7.SCUT President Tang Hongwu Leads a Delegation to Promote Cooperation in Asia-Pacific Area

奋力谱写亚太合作新篇章　华南理工校长唐洪武率团出访

From November 27 to December 6, Tang Hongwu, President of SCUT, led a delegation to Singapore, Australia, and New Zealand, to deepen cooperation and exchanges with world-class universities.

11月27日至12月6日，华南理工大学校长唐洪武率团出访新加坡、澳大利亚及新西兰，深入推进与世界一流高校的合作交流。

During the visit, President Tang and his delegation paid visits to world-class universities, including the National University of Singapore, Nanyang Technological University, the University of Western Australia, the University of Auckland, and the University of Canterbury. During the visit, multiple agreements on talent development and research cooperation were signed, and the "University of Canterbury - South China University of Technology International Joint Laboratory on Smart Medtech Automation Research and Technology (SMART)" was formally inaugurated. Focusing on new models of cooperation, the delegation explored forward-looking initiatives such as establishing micro-campuses, organizing overseas training programs for administrative staff, promoting reciprocal faculty appointments and exchanges, and jointly exploring alumni-donated land in New Zealand to advance industry–university–research integration. These efforts further strengthened and expanded SCUT's strategic partnerships with leading universities in Singapore, Australia, and New Zealand, injecting new momentum into the establishment of an all-round, multi-level and effective international cooperation framework.

出访期间，唐洪武校长一行先后访问新加坡国立大学、南洋理工大学、澳大利亚西澳大学、新西兰奥克兰大学及坎特伯雷大学等多所世界一流高校，签署多项人才培养与科研合作协议，为“坎特伯雷大学—华南理工大学智慧医疗国际联合实验室”揭牌。代表团聚焦合作模式创新，重点探讨了建设微校园、开展管理人员海外实训、推动师资互聘互访、共同开发新西兰校友捐赠用地用于产学研融合等前瞻性举措，进一步巩固并拓展了与新加坡、澳大利亚、新西兰高水平大学之间的战略伙伴关系，为学校构建全方位、多层次、实效化的国际合作体系注入新动能。

8.12th National College Student Contest of Chemical Engineering Safety Design Held: SCUT Project Wins Special Prize

第12届全国大学生化工安全设计大赛举行　华南理工大学项目获特等奖

On December 6th, the final of the Salubris Cup 12th National College Student Contest of Chemical Engineering Safety Design and the Chemical Engineering Safety Education Forum were held at SCUT. The SCUT team "Verdant Vigor" won the special prize with their project "Annual Production of 80,000 Tons of 1,4-Butanediol from Maleic Anhydride via esterification and hydrogenation".

12月6日，“信立泰杯”第十二届全国大学生化工安全设计大赛决赛暨化工安全教育论坛在华南理工大学举行。华南理工大学“醇凭实力”队的“顺酐酯化加氢法年产8万吨1,4-丁二醇”项目斩获决赛特等奖。

This event (forum) was hosted by the Chemical Industry and Engineering Society of China, organized by SCUT, and co-organized by Shenzhen Salubris Pharmaceuticals Co., Ltd. It aims to build an open platform for enterprises and universities to exchange ideas on chemical safety technology and chemical safety talent education. More than 200 teams from universities across the country participated in the contest.

本次赛事（论坛）由中国化工学会主办，华南理工大学承办，深圳信立泰药业股份有限公司协办，旨在搭建一个供企业、高校就化工安全技术及化工安全人才教育进行交流的开放平台，有来自全国高校的超200支队伍参赛。

9.BWF AirBadminton World Cup Concludes: SCUT Athletes Shine on the International Stage

世界羽联户外羽毛球世界杯落幕　华南理工运动健将闪耀国际赛场

On December 15, the 2025 BWF AirBadminton World Cup was held in Sharjah, United Arab Emirates. On behalf of China, Chen Lu, a 2023 graduate student in Physical Education at SCUT, Huang Baizhi, a 2025 master's alumnus, and Feng Xueying, a 2019 undergraduate alumna, won the women's triples world championship, claimed the silver medal in the mixed team event, and reached the quarterfinals in the men's triples competition.

12月15日，2025世界羽联户外羽毛球世界杯在阿联酋沙迦举办。华南理工大学体育专业2023级研究生陈露、2025届硕士校友黄柏智、2019届本科校友冯雪颖代表中国队征战，斩获女子三人赛世界冠军、混合团体赛亚军，并在男子三人赛中入围八强。

Hosted by the Badminton World Federation, the BWF AirBadminton World Cup is a premier international tournament, featuring the top three teams from all continents. Renowned for its high competitive standard and professional organization, the event commands widespread recognition within the global sports community.

本届世界羽联户外羽毛球世界杯由世界羽毛球联合会主办，是全球顶级赛事，汇聚了全球各大洲前三强的顶尖队伍，其含金量与专业度备受体育界关注。

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