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NEWSLETTER

2025
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RESEARCH

Shanghai University is one of China's 'Project 211' universities and has also been selected for another national excellence initiative - the 'Double First-Class' University Construction Initiative. It is a comprehensive university with 31 faculties/colleges covering the disciplines of Philosophy, Economics, Law, Education, Literature, History, Science, Engineering, Medicine, Management, Arts and a number of emerging cross-disciplines, with an enrolment of over 40,000 students.

Like the city of Shanghai, SHU has undergone dramatic changes in recent decades, becoming a multicultural community with tremendous opportunities and resources. Relying on the contribution of excellent faculty members and diligent students, it has established collaborations with 263 universities and research institutions in 55 countries and regions, and will continue to deepen its exchanges and collaborations with academic partners around the world in an open and inclusive manner.

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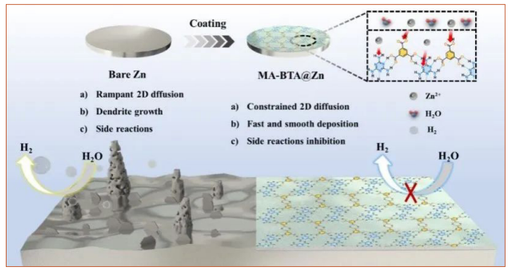
DING Jie publishes in *Angewandte Chemie International Edition*: Zincophilic Sites Enriched Hydrogen-bonded Organic Framework as Multifunctional Regulating Interfacial Layers for Stable Zinc Metal Batteries

環化學院丁潔在 *Angewandte Chemie International Edition* 發表学术论文

DING Jie, a master's student from the Department of Chemical Engineering, School of Environmental and Chemical Engineering, Shanghai University, has recently published a study in the high-impact journal *Angewandte Chemie International Edition*, titled "Zincophilic Sites Enriched Hydrogen-bonded Organic Framework as Multifunctional Regulating Interfacial Layers for Stable Zinc Metal Batteries." The work was conducted under the guidance of Associate Professor LYU Li-Ping and Professor WANG Yong.

Aqueous zinc metal batteries (AZMBs) have emerged as promising candidates for next-generation energy storage systems, thanks to their high theoretical capacity, environmental friendliness, low cost, and intrinsic safety. However, their practical deployment remains limited by two closely coupled challenges: dendritic growth and severe parasitic reactions on the zinc anode. These issues reinforce each other—dendrite formation increases the active surface area, which accelerates side reactions, and these reactions, in turn, roughen the electrode surface, exacerbating dendrite growth.

To overcome these barriers, the study introduces a hydrogen-bonded organic framework (HOF) enriched with zincophilic sites, designed as a multifunctional layer to regulate Zn anodes with controlled spatial ion flux and stable interfacial chemistry. This layer promotes uniform zinc deposition while effectively suppressing parasitic reactions, offering a robust solution to improve the stability and lifespan of AZMBs.



環化學院化工系碩士研究生丁潔在*Angewandte Chemie International Edition* 發表題為"Zincophilic Sites Enriched Hydrogen-bonded Organic Framework as Multifunctional Regulating Interfacial Layers for Stable Zinc Metal Batteries"的研究論文，指導老師為呂麗萍副教授、王勇教授。

水系鋅金屬電池（AZMBs）具有理論容量高、環境友好、成本低、安全性高等諸多優點，被認為是極具潛力的下一代儲能系統。然而，鋅金屬負極面臨的枝晶生長和嚴重副反應這兩大問題，阻礙了其實際應用的進程。枝晶生長問題和鋅負極上嚴重的副反應是高度相關的，鋅枝晶的生長會暴露更多表面，加速副反應，而這一過程也使鋅負極變得更粗糙，從而導致更嚴重的枝晶問題。同時解決這些挑戰對於提高AZMBs的性能和使用壽命來說十分關鍵。因此，設計一種既能促進均勻鋅沉積又能抑制鋅電極副反應的多功能塗層至關重要。

在这项研究工作中，作者采用分子间自组装方法制备了一种富含亲锌位点的氢键有机框架（MA-BTA HOF），作为锌负极的多功能界面调控膜，实现了锌离子快速均匀扩散和稳定的界面化学，这一过程有效抑制了锌负极副反应和枝晶的形成，大大延长了AZMBs的工作寿命。

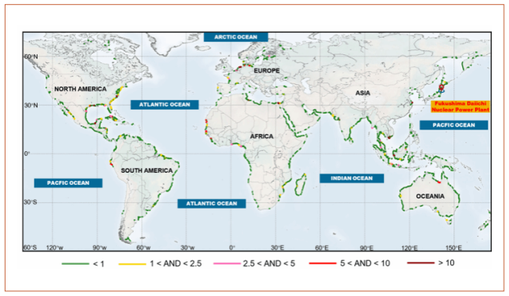
Paper link: https://onlinelibrary.wiley.com/doi/10.1002/anie.202416271

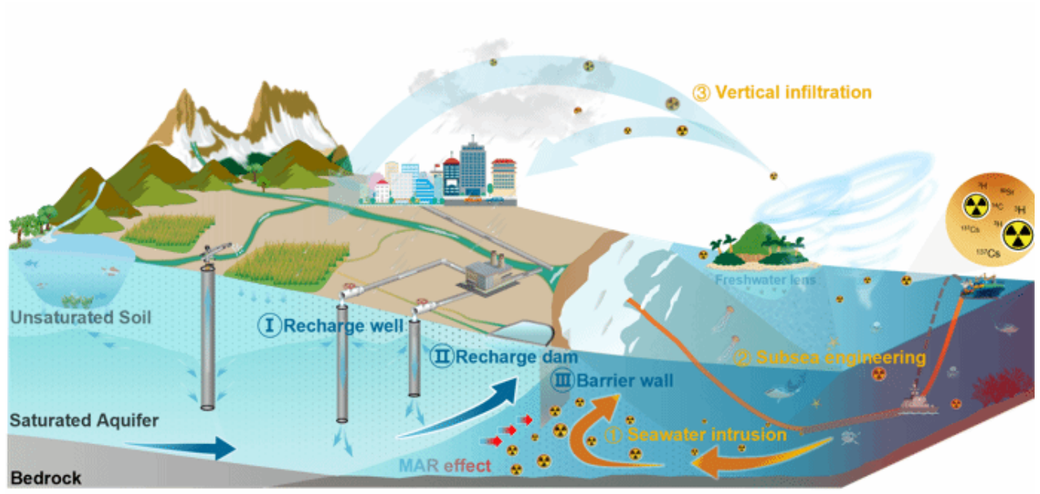
Associate Prof. WEI Yaqiang and Prof. LI Hui lead the team to publish in *Environmental Science & Technology*: Fukushima's Radioactive Water Threatens Coastal Groundwater

環化學院魏亞強副研究員、李輝研究員带领團隊在 *Environmental Science & Technology* 發表研究成果

This study investigates the potential threats posed by the discharge of radioactive water from Fukushima to coastal groundwater systems, with a particular focus on how seawater intrusion can accelerate the migration of radioactive contaminants into coastal aquifers, thus endangering groundwater security in coastal areas. The paper points out that following the Fukushima nuclear disaster, public concern has largely centered on the impact to marine ecosystems. However, the discharge of radioactive water also poses a long-term environmental risk to coastal areas that depend heavily on groundwater as a primary water source. Moreover, the authors emphasize the need for mitigation strategies such as Managed Aquifer Recharge (MAR), the construction of protective barriers, and the optimization of subsurface infrastructure designs in coastal zones, all aimed at minimizing the impact of radioactive water on coastal groundwater systems.

文章探討了福島核污水排放對沿海地下水系統造成的潛在威脅，重點分析了海水入侵如何加速核污水向含海岸帶地下水的遷移，從而危害沿海地區的地下水資源安全。文章指出，福島核事故發生後，核污水的排放不僅引發了人們對海洋環境的關注，還對以地下水為主要水源地的沿海地區構成了長期的潛在環境風險。同時，文章強調採用人工地下水補給（MAR）等有效的緩解策略，包括建設防護屏障和優化海岸帶地下構築物工程設計，以最大限度地減少核污水對海岸帶地下水的影響。





Paper link: https://doi.org/10.1021/acs.est.4c10136

Prof. JIANG Yong and Prof. ZHAO Bing lead the team to publish in *Angewandte Chemie International Edition*: A Novel Anion Receptor Additive for −40℃ Sodium Metal Batteries by Anion/Cation Solvation Engineering

環化學院蔣永員、趙兵研究員課題組在 *Angewandte Chemie International Edition* 發表關於陰離子受體添加劑實現碳酸酯電解液體系超低溫鈉金屬電池的研究成果

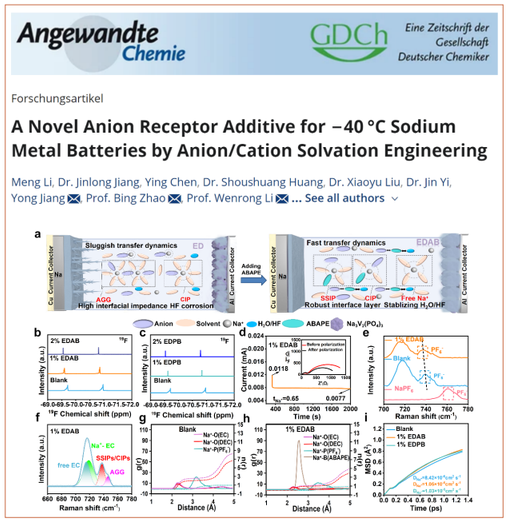
This work introduces an innovative approach using an anion receptor additive—4-aminophenylboronic pinacol ester (ABAPE)—to regulate the solvation structure of the electrolyte and develop an effective anion/cation solvation strategy for ultralow-temperature sodium metal batteries.

Through Lewis acid–base interactions, ABAPE binds with anions, increasing the population of free ions, solvent-separated ion pairs (SSIPs), and contact ion pairs (CIPs), thereby enhancing both ionic mobility and ionic conductivity. Additionally, ABAPE is incorporated into the first solvation shell of Na^+, which reduces the coordination number of carbonate solvents (EC and DEC) around Na^+.

By interacting with both cations and anions, ABAPE facilitates Na+ desolvation, resulting in a transition of sodium deposition morphology from dendritic to spherical, promoting uniform Na+ deposition. ABAPE also forms hydrogen bonds with trace water in the electrolyte, suppressing the formation of hydrofluoric acid (HF). These effects are critical in suppressing electrode corrosion and in promoting the formation of a stable electrode-electrolyte interface. The assembled Na ‖ Na+$V_2(PO_4)_3$ cell demonstrates stable cycling at -40℃ .

This study offers a practical strategy for enhancing the compatibility and applicability of conventional carbonate-based electrolytes under extreme conditions, thereby highlighting the crucial role of anions.

Paper link: https://doi.org/10.1002/ange.202413806



該工作創新性地採用陰離子受體（4- 氨基苯硼酸頻哪醇酯，ABAPE）作添加劑，調製電解液的溶劑化結構，開發了一種適用於超低溫鈉金屬電池的陰陽離子溶劑化策略。

ABAPE 通過路易士酸城作用結合陰離子，增加游離離子、溶劑分離離子對（SSIPs）和接觸離子對（CIPs）的數量，從而改善離子遷移率和傳輸電導率。ABAPE 也成功參與了 Na+ 的第一溶劑化殼層，使得碳酸乙烯基 (EC) 和碳酸二乙酯 (DEC) 的配位數降低。ABAPE 對陽離子和陰離子的雙重作用使 Na+ 更容易脫溶劑化，鈉形貌由樹枝狀沉積變為球形沉積，促進了 Na+ 的均勻沉積。

此外，ABAPE 可與電解液中的痕量水形成氫鍵，從而抑制氫氟酸（HF）的形成。這些特性在抑制電極腐蝕和促進穩定電極電解質介面層的建立方面起著至關重要的作用。組裝的 Na||Na3V2(PO4)3 電池在 -40℃實現連續穩定迴圈。

這項工作為提高傳統碳酸酯基鈉離子電池電解液在極端條件下的相容性和適用性提供了可行的策略，並強調了陰離子的重要作用。

Prof. LEI Chuanhu publishes in *Angewandte Chemie International Edition*: Diphenylacetylene-Incorporating Octaphyrin: A Rigid Macrocycle with Readily Separable Conformational Isomers

理學院化學系雷川虎教授在 *Angewandte Chemie International Edition* 發表最新研究成果

Research Article

Diphenylacetylene-Incorporating Octaphyrin: A Rigid Macrocycle with Readily Separable Conformational Isomers

Puren Han, Prof. Dr. Zhiming Duan, Min Shao, Prof. Dr. Jonathan L. Sessler, Prof. Dr. Chuanhu Lei

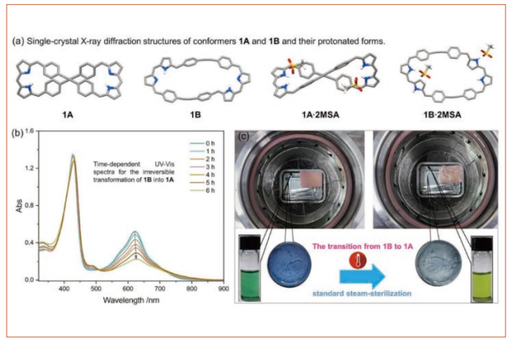
Dedicated to Prof. Julius Rebek, Jr. on the occasion of his 80th birthday

First published: 26 August 2024 | https://doi.org/10.1002/anie.202413962

Prof. LEI Chuanhu from the Department of Chemistry, College of Sciences, Shanghai University, publishes a study in *Angewandte Chemie International Edition*, titled “Diphenylacetylene-Incorporating Octaphyrin: A Rigid Macrocycle with Readily Separable Conformational Isomers.” The first author of this paper is PhD student HAN Puren, with Prof. Dr. Jonathan L. Sessler, an Academician among the notable co-authors. Shanghai University is the primary institution and the sole corresponding affiliation for this work. This research contributes to expanded porphyrin chemistry and offers new perspectives for developing advanced functional materials.

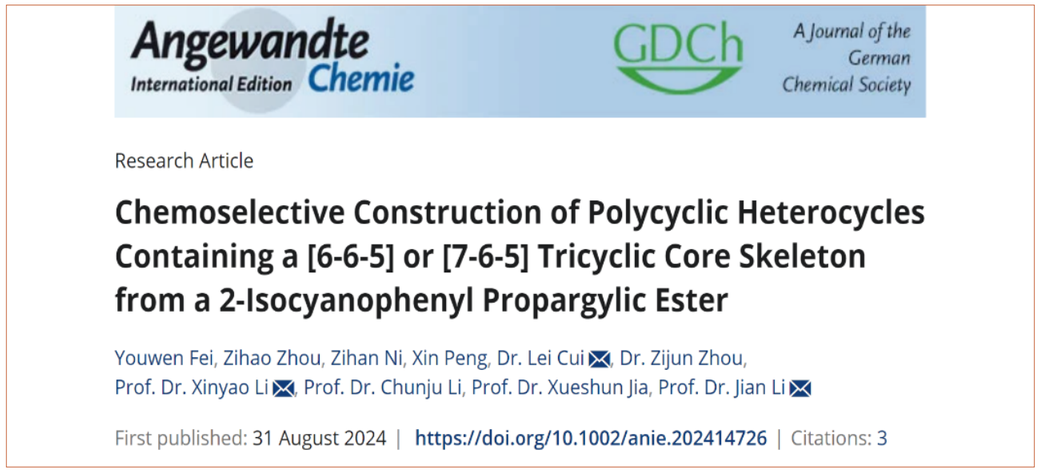
Paper link: https://onlinelibrary.wiley.com/doi/10.1002/anie.202413962

理學院化學系雷川虎教授在 *Angewandte Chemie International Edition* 發表題為“Diphenylacetylene-Incorporating Octaphyrin: A Rigid Macrocycle with Readily Separable Conformational Isomers”的研究成果。博士生韓普忍為第一作者，論文的主要作者還包括喬納森·塞斯樂院士等。上海大學為第一完成單位和唯一通訊單位。該工作不僅豐富了擴展卟啉化學的研究內容，也為開發新型功能材料提供了新的思路。



Prof. LI Jian and his team publish in *Angewandte Chemie International Edition*: Chemoselective Construction of Polycyclic Heterocycles Containing a [6-6-5] or [7-6-5] Tricyclic Core Skeleton from a 2-Isocyanophenyl Propargylic Ester

理學院化學系李建教授团队在 *Angewandte Chemie International Edition* 發表最新研究成果


Angewandte International Edition Chemie

GDCh A Journal of the German Chemical Society

Research Article

Chemoselective Construction of Polycyclic Heterocycles Containing a [6-6-5] or [7-6-5] Tricyclic Core Skeleton from a 2-Isocyanophenyl Propargylic Ester

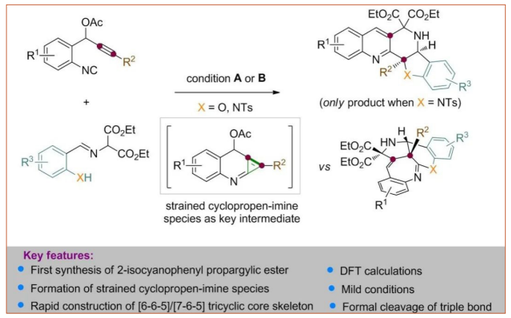
Youwen Fei, Zihao Zhou, Zihan Ni, Xin Peng, Dr. Lei Cui, Dr. Zijun Zhou, Prof. Dr. Xinyao Li, Prof. Dr. Chunju Li, Prof. Dr. Xueshun Jia, Prof. Dr. Jian Li

First published: 31 August 2024 | https://doi.org/10.1002/anie.202414726 | Citations: 3

Prof. LI Jian and his team from the Department of Chemistry, College of Sciences, Shanghai University, have recently published a study in the high-impact journal *Angewandte Chemie International Edition*, titled "Chemoselective Construction of Polycyclic Heterocycles Containing a [6-6-5] or [7-6-5] Tricyclic Core Skeleton from a 2-Isocyanophenyl Propargylic Ester."

The paper describes a chemoselective synthetic strategy for constructing complex tricyclic polycyclic heterocycles, specifically those featuring [6-6-5] or [7-6-5] ring systems. This method offers a new pathway for efficiently building structurally diverse nitrogen-containing heterocycles with potential pharmaceuticals and materials science applications.

Master's students FEI Youwen, ZHOU Zihao, and NI Zihan are credited as co-first authors, and the study was co-led by Professor Li Xinyao and Associate Professor Cui Lei as co-corresponding authors. Shanghai University is listed as both the first author and corresponding author institution.



理學院化學系李健教授團隊在 *Angewandte Chemie International Edition* 發表題為"Chemoselective Construction of Polycyclic Heterocycles Containing a [6-6-5] or [7-6-5] Tricyclic Core Skeleton from a 2-Isocyanophenyl Propargylic Ester" 的研究成果。碩士生費有文、周子豪和倪子晗為共同一作，酈鑫耀教授和崔雷副教授為論文的共同通訊作者。上海大學為第一作者單位和通訊作者單位。

Paper link: https://onlinelibrary.wiley.com/doi/10.1002/anie.202414726

Prof. GAO Nan lead the team to publish in *Proceedings of the London Mathematical Society*: A functorial approach to monomorphism categories II: Indecomposables

理學院數學系高楠教授團隊及合作者在單態射範疇的不可分解物件研究中取得重要進展并发表最新研究成果

Prof. GAO Nan, a "Distinguished Professor of Shanghai Universities" from the Department of Mathematics, College of Sciences, Shanghai University, and his collaborators have made significant advances in the theory of monomorphism categories, particularly in studying indecomposable objects. Their paper, titled "A functorial approach to monomorphism categories II: Indecomposables," has been published in *Proceedings of the London Mathematical Society*, one of the world's leading mathematical journals (CAS Q1, Chinese Math Society T1, with only 60 articles accepted annually). Professor Gao is the first author, and Shanghai University is listed as the first-signing institution.

Monomorphism categories have been an area of research for several decades and have attracted growing interest over the past ten years. Using novel techniques, Professor Gao's team has extended this actively studied theory, producing notable results. This study investigates separable monomorphism categories over Artin algebras Λ, offering a precise characterization of their indecomposable objects. Notably, it provides a detailed description of indecomposables in the monomorphism categories of Nakayama algebras with radical square zero.


DOI: 10.1112/plms.12640

RESEARCH ARTICLE

Proceedings of the London Mathematical Society

A functorial approach to monomorphism categories II: Indecomposables

Nan Gao[1] | Julian Külshammer[2] | Sondre Kvamme[3] | Chrysostomos Psaroudakis[4]

[1]Department of Mathematics, Shanghai University, Shanghai, PR China
[2]Department of Mathematics, Uppsala University, Uppsala, Sweden
[3]Department of Mathematical Sciences, Norwegian University of Science and Technology, Trondheim, Norway
[4]Department of Mathematics, Aristotle

Abstract

We investigate the (separated) monomorphism category mono(Q, Λ) of a quiver over an Artin algebra Λ. We show that there exists an epivalence (called representation equivalence in the terminology of Auslander) from mono(Q, Λ) to rep(Q, mod Λ), where mod Λ is the

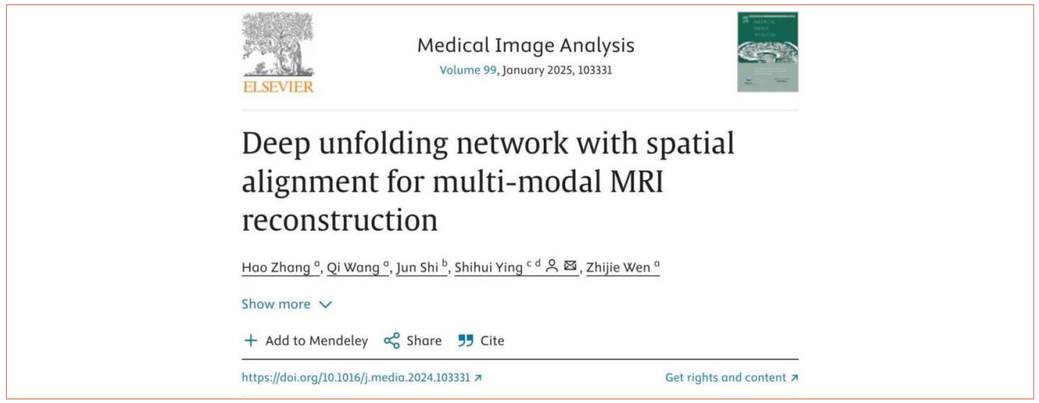
上海市高校特聘教授、理學院數學系高楠教授團隊及合作者在單態射範疇的不可分解物件研究中取得重要進展，相關研究成果"A functorial approach to monomorphism categories II: Indecomposables"發表於數學國際頂級期刊 *Proceedings of the London Mathematical Society*（中科院一區 Top，中國數學會 T1 期刊，年發文量：60 篇）。高楠教授為第一作者，上海大學為第一署名單位。

單態射範疇已經歷幾十年的發展，在最近十年受到極大關注。高楠教授與合作者採用新技巧拓展了廣受關注的單態射範疇，有一系列的成果發表。本工作研究箭圖在 Artin 代數 Λ 上的可分單態射範疇，具體刻畫了此範疇上的不可分解物件。特別地，描繪了根平方為 0 的 Nakayama 代數單態射範疇中的不可分解物件。

Paper link: https://londmathsoc.onlinelibrary.wiley.com/doi/epdf/10.1112/plms.12640

ZHANG Hao publishes in *Medical Image Analysis*: Deep unfolding network with spatial alignment for multi-modal MRI reconstruction

理學院碩士研究生張浩在導師指導下在 *Medical Image Analysis* 發表研究成果



ZHANG Hao, a master's student at the College of Sciences, Shanghai University, has recently published a study as first author in *Medical Image Analysis*, a leading journal in the field of AI-driven medical imaging (CAS Q1, IF: 10.7). The paper, titled "Deep unfolding network with spatial alignment for multi-modal MRI reconstruction," was completed under the supervision of Prof. YING Shihui and Associate Prof. WEN Zhijie.

This work proposes a novel deep unfolding network (DUN-SA) for multi-modal MRI reconstruction, grounded in mathematical optimization theory. The method is designed to simultaneously address the challenges of cross-modal spatial misalignment and multi-modal data integration through an interpretable learning framework. By incorporating a cross-modal alignment prior, DUN-SA seamlessly integrates the spatial alignment task into the reconstruction process. It alternately optimizes alignment and reconstruction, using stepwise-aligned reference modalities to guide the recovery of the target modality. Experiments on multiple real-world datasets show that DUN-SA outperforms existing state-of-the-art methods and demonstrates superior robustness to spatial misalignments across modalities.

理學院碩士研究生張浩在導師應時輝教授和溫智婕副教授的指導下，以第一作者在醫學影像人工智慧領域頂級期刊 Medical

Image Analysis（中科院一區 TOP，影響因數 10.7）線上發表了多模態 MRI 重建方面的最新工作"Deep unfolding network with spatial alignment for multi-modal MRI reconstruction"。

本文從數學優化的視角提出了一種新的深度展開網路（DUN-SA），用於在 MRI 重建中同時處理跨模態空間錯位和多模態重建問題的可解釋學習建模。通過引入跨模態對齊的先驗項，將空間對齊任務自我調整地嵌入重建過程。該方法通過反覆運算交替優化對齊和重建任務，並利用逐步對齊的參考模態提供先驗資訊，顯著提升了目標模態的重建品質。實驗結果顯示，DUN-SA 在多個真實資料集上優於現有的先進方法，並相比於其它方法對模態間的空間錯位問題更加魯棒。

Paper link: https://www.sciencedirect.com/science/article/pii/S1361841524002561

CHEN Mingyao and LIU Huimin publish in *ACS Nano*: Uncovering an Interfacial Band Resulting from Orbital Hybridization in Nickelate Heterostructures

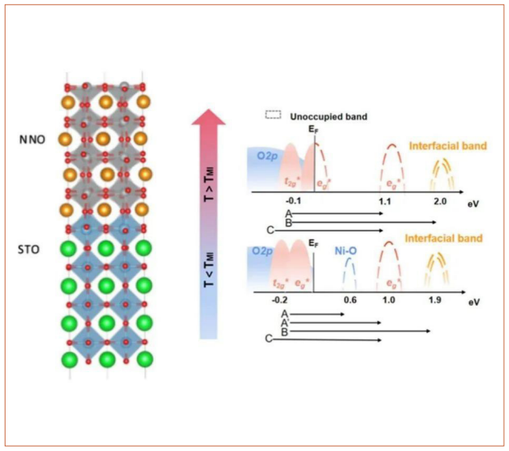
理學院物理系碩士生陳銘瑤和博士生劉慧敏在導師指導下在 *ACS Nano* 發表研究成果

CHEN Mingyao, a master's student, and LIU Huimin, a PhD student from the Department of Physics, College of Sciences, Shanghai University, and the Shanghai Key Laboratory of High-Temperature Superconductors, have recently co-authored a research paper in the top-tier journal *ACS Nano* (CAS Q1). The study, titled "Uncovering an Interfacial Band Resulting from Orbital Hybridization in Nickelate Heterostructures," was conducted under the supervision of Professor Yin Xinmao, in collaboration with international researchers.

The discovery of high-temperature superconductors has significantly advanced the frontiers of materials science and condensed matter physics, and the quest to raise the superconducting transition temperature remains a central focus. The recent observation of superconductivity in infinite-layer nickelate thin films has opened a new chapter in developing nickel-based superconductors. Nickelates also exhibit notable metal-insulator transitions (MIT) and enhanced performance in applications such as resistive switching, offering design flexibility for oxide-based electronics. Moreover, the rotational and structural distortions of NiO_6 octahedra introduce asymmetry at the oxide-substrate interface, which plays a pivotal role in the emergence of spin-orbit-coupled features and drives a variety of intriguing interfacial phenomena. Understanding these interfacial effects is critical for modulating the electronic and magnetic structures of nickelates, providing a fertile platform for developing novel electronic devices, magnetic sensors, and spintronic materials, and advancing the exploration of complex interfacial physics.

理學院物理系上海市高溫超導重點實驗室碩士生陳銘瑤和博士生劉慧敏在導師尹鑫茂教授的指導下，與合作者在國際知名期刊 *ACS Nano*（中國科學院一區 top 期刊）上發表題為 Uncovering an Interfacial Band Resulting from Orbital Hybridization in Nickelate Heterostructures 的研究論文。

高溫超導材料的發現不僅推動了材料科學和凝聚態物理等前沿領域的發展，提高其超導轉變溫度也成為科學家們不斷追求的新目標。最近，研究人員在無限層鎳氧化物薄膜中發現了超導電性（鎳基超導），為超導物理和材料研究開闢了新的方向。研究表明，在鎳氧化物材料中觀察到金屬－絕緣體相變（MIT），同時該材料可以大大提升在電阻開關等多種應用中的性能，這也為氧化物電子設備的設計提供了靈活性。此外，鎳氧化物氧八面體的旋轉和扭曲導致氧化物与基底介面的不對稱，使其在自旋－軌道耦合特徵的形成中起著關鍵作用，從而產生了多種介面現象。調節鎳氧化物系統電子和磁結構的介面效應在開發新型電子設備、感測器和磁性材料方面的研究提供了有利的環境，而且有助於探索介面內獨特而複雜的特性。



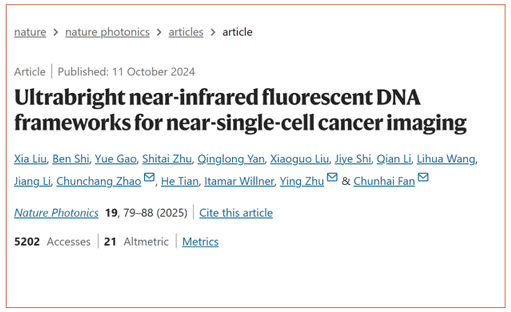
Paper link: https://doi.org/10.1021/acsnano.4c09921

Prof. ZHU Ying co-publish in *Nature Photonics* with professors from SJTU and ECUST: Ultrabright near-infrared fluorescent DNA frameworks for near-single-cell cancer imaging

理學院諸穎研究員和上海交通大學、華東理工大學教授等團隊聯合發表最新研究成果

Prof. ZHU Ying from the Institute of Materiobiology, College of Sciences, Shanghai University, in collaboration with Academician FAN Chunhai from Shanghai Jiao Tong University, Prof. ZHAO Chunchang from East China University of Science and Technology, and others, has developed a new type of framework nucleic acid (FNA) fluorescent probe for NIR-II (1000–1700 nm) fluorescence imaging and surgical navigation in live animals. The study has been published in *Nature Photonics*. This probe exhibits high fluorescence brightness, deep tissue penetration, and strong photostability, enabling the sensitive detection of near-single-cell fluorescence signals in tumor-bearing mice. It also demonstrates the capability for long-term tracking of tumor growth and metastasis in vivo.

The team established a versatile FNA-based platform that encapsulates various hydrophobic fluorescent dyes. In particular, they non-covalently encapsulated the small-molecule dye Sq964 into hydrophobic nanocavities to construct framework DNA fluorescent dots (FDF dots), which feature ultrahigh brightness, centimeter-scale tissue penetration, excellent photostability, and favorable tumor retention. Using this material, the researchers achieved NIR-II cancer imaging with near-single-cell sensitivity and successfully applied it in imaging-guided surgical resection of tiny tumor lesions.


nature > nature photonics > articles > article

Article | Published: 11 October 2024

Ultrabright near-infrared fluorescent DNA frameworks for near-single-cell cancer imaging

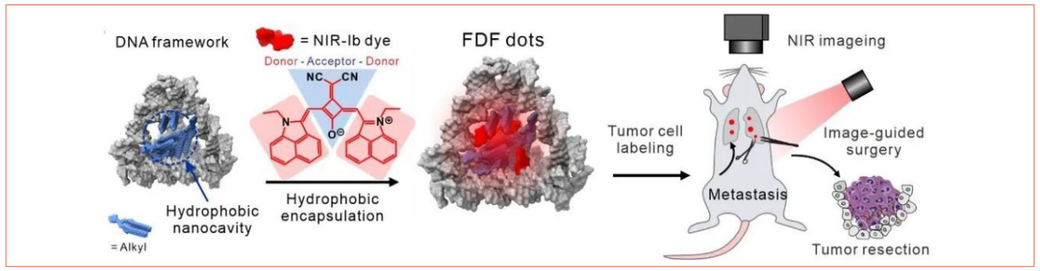
Xia Liu, Ben Shi, Yue Gao, Shitai Zhu, Qinglong Yan, Xiaoguo Liu, Jiye Shi, Qian Li, Lihua Wang, Jiang Li, Chunchang Zhao, He Tian, Itamar Willner, Ying Zhu & Chunhai Fan

Nature Photonics **19**, 79–88 (2025) | Cite this article

5202 Accesses | **21** Altmetric | Metrics

理學院材料生物學研究所諸穎研究員聯合上海交通大學樊春海院士、華東理工大學趙春常教授等團隊，研發了一種新型框架核酸螢光探針，用於活體動物近紅外二區窗口（1000–1700 nm，NIR-II）螢光成像與手術導航。這種探針具有高亮度的螢光、高組織穿透能力和高光穩定性，可靈敏探測腫瘤模型小鼠體內接近單個腫瘤細胞的螢光信號，並展示了長時間追蹤活體腫瘤生長與轉移的能力。該研究成果近期發表在 *Nature Photonics*（《自然・光子學》）雜誌上。

研究團隊基於框架核酸發展了一種通用平臺，可封裝各種類型的疏水性螢光染料。特別地，研究者通過將小分子螢光染料 Sq964 非共價封裝到疏水性納米腔中，構建了具有大小和形狀分辨能力的框架核酸螢光點（FDF dots），該材料具有超高亮度、釐米級深層組織穿透性、高光穩定性和良好的腫瘤滯留率。研究團隊應用該材料展示了近單細胞水準的超高靈敏 NIR-II 癌症成像，並成功將其應用于成像引導的微小腫瘤病灶的手術切除。



Paper link: https://www.nature.com/articles/s41566-024-01543-7

Prof. YIN Xinmao co-publish in *Progress in Materials Science* with professors from NUS and Monash Uni.: Contact resistance and interfacial engineering: Advances in high-performance 2D-TMD based devices

理學院尹鑫茂教授與新加坡國立大學、澳大利亞莫納什大學等合作發表最新研究成果

Prof. YIN Xinmao from the Department of Physics, College of Sciences, Shanghai University, and the Shanghai Key Laboratory of High-Temperature Superconductors, in collaboration with the National University of Singapore (NUS) and Synchrotron Light Source Laboratory, Monash University (Australia), and other institutions, has published a high-level review paper titled “Contact resistance and interfacial engineering: Advances in high-performance 2D-TMD based devices” in *Progress in Materials Science* (Impact Factor: 33.6, CAS Q1 Top). LIU Xiongfang, a PhD student from the Department of Physics, is the first author, and the Department of Physics and Shanghai Key Laboratory of High-Temperature Superconductors, Shanghai University is listed as both the first author affiliation and the corresponding author institution.

This review synthesizes recent experimental advances and theoretical insights to provide a comprehensive overview of diversified strategies for optimizing the performance of 2D-TMD-based devices. It is posited that the realization of ultra-low contact resistance in such systems fundamentally relies on the precise modulation of interfacial electronic structures. By concurrently tailoring interfacial chemical and physical properties, it is feasible to engineer near-ideal Ohmic contacts. These findings not only elucidate the critical role of interface control in charge injection but also offer a solid theoretical foundation for the design of future-generation, low-power, high-performance 2D-TMD devices.

Paper link: https://doi.org/10.1016/j.pmatsci.2024.101390

理學院物理系上海市高溫超導重點實驗室尹鑫茂教授與新加坡國立大學 & 同步輻射光源實驗室，澳大利亞莫納什大學等合作在凝聚態物理、材料科學領域的國際權威期刊 *Progress in Materials Science*（影響因數：33.6，中國科學院一區 TOP）上發表了題為“Contact resistance and interfacial engineering: Advances in high-performance 2D-TMD based devices”的高水準綜述論文。理學院物理系博士生劉熊芳為論文第一作者。上海大學物理系上海市高溫超導重點實驗室是論文的第一完成單位和通訊單位。

這篇論文結合現有的實驗數據與理論模型，綜述了多樣化的解決方案，以進一步優化二維過渡金屬硫族化合物（2D-TMD）基器件的性能。論文指出，在 2D-TMD 基器件中，實現超低接觸電阻的關鍵在於對界面電子結構的精準調控。透過界面化學與物理特性的協同優化，有望設計出理想的歐姆接觸器件，並為未來新型低功耗、高性能的 2D-TMD 器件之設計與開發提供重要的理論指引。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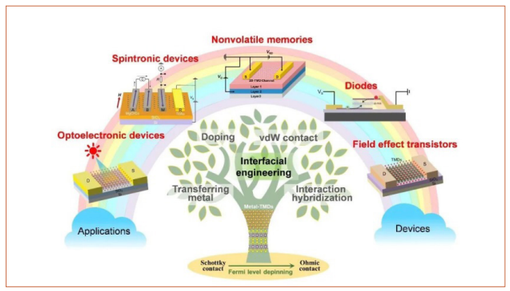
Progress in Materials Science

Volume 148, February 2025, 101390

Contact resistance and interfacial engineering: Advances in high-performance 2D-TMD based devices



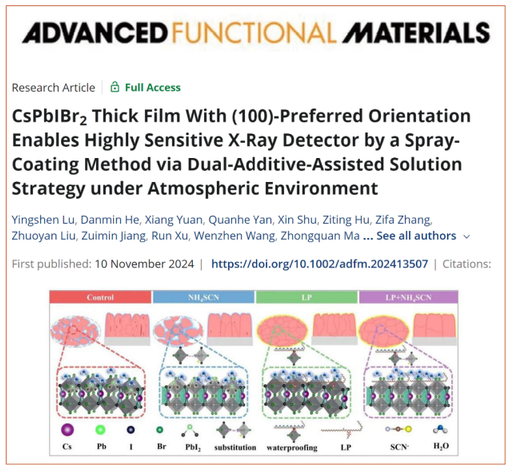
Research groups led by Prof. XU Fei, HONG Feng, and SONG Hongwei publish in *Advanced Functional Materials*: CsPbIBr2 Thick Film With (100)-Preferred Orientation Enables Highly Sensitive X-Ray Detector by a Spray-Coating Method via Dual-Additive-Assisted Solution Strategy under Atmospheric Environment

理學院徐飛課題組、洪峰課題組和宋宏偉課題組在 *Advanced Functional Materials* 發表研究成果

The research groups led by Xu Fei, Hong Feng, and Song Hongwei from the Department of Physics, College of Sciences, and the Shanghai Key Laboratory of High-Temperature Superconductors, Shanghai University, have published their latest findings in the internationally renowned journal *Advanced Functional Materials*. The paper is titled: "$CsPbIBr_2$ Thick Film With (100)-Preferred Orientation Enables Highly Sensitive X-Ray Detector by a Spray-Coating Method via Dual-Additive-Assisted Solution Strategy under Atmospheric Environment."

The teams proposed a dual-additive-assisted (LP + NH_4SCN) solution strategy to fabricate uniform, large-area $CsPbIBr_2$ thick films using a spray-coating method with gas as the carrier under ambient conditions. This approach significantly improves the quality of the perovskite thick films. Specifically, NH_4SCN enhances grain size and crystallinity, resulting in films with a (100)-preferred orientation. Meanwhile, LP additive helps eliminate impurity phases and improves the environmental stability of the film. As a result, the thick films remain stable for up to 90 days under 45–55% relative humidity in air. Moreover, the unencapsulated devices exhibit excellent long-term storage stability—maintaining 80% of their original sensitivity after 1000 hours in the same ambient conditions. These results offer valuable insights into the development of perovskite-based X-ray detectors, and hold promise for their practical applications in medical diagnostics and imaging.

Paper link: https://onlinelibrary.wiley.com/doi/10.1002/adfm.202413507



理學院物理系、上海市高溫超導重點實驗室的徐飛課題組、洪峰課題組和宋宏偉課題組在凝聚態物理及材料科學領域國際知名期刊 *Advanced Functional Materials* 發表題為"CsPbIBr2 Thick Film With (100)-Preferred Orientation Enables Highly Sensitive X-Ray Detector by a Spray-Coating Method via Dual-Additive-Assisted Solution Strategy under Atmospheric Environment"的研究成果。

課題組提出了雙添加劑輔助（LP+NH4SCN）溶液策略，使用以氣體為載體的噴塗法製備得到均勻的大面積 CsPbIBr2 厚膜，並進一步提高了厚膜的品質。一方面，NH4SCN 添加劑可以增大晶粒尺寸，提高厚膜的結晶度得到具有擇優取向的厚膜。另一方面，添加 LP 可以去除雜質相，提高厚膜的穩定性。經過該策略製備得到的厚膜，能夠在 45-55% 相對濕度的大氣環境中，在 90 天內仍然保持穩定。未封裝器件顯示出長期儲存穩定性，如在相對濕度為 45-55% 的大氣環境下，1000 小時後仍能保持原始靈敏度值的 80%。這些結果將有助於鈣鈦礦厚膜在 X 射線醫學檢測和成像領域的進一步應用。

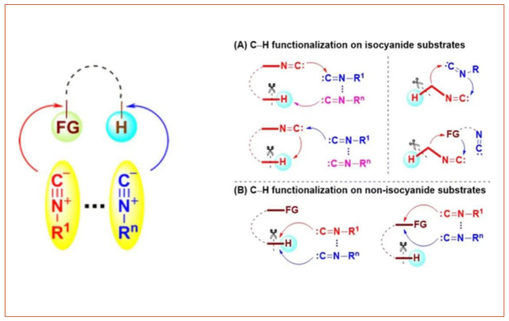
Dr. Gao Mingchun and Prof. XU Bin's team publish a review paper in *Chemical Society Reviews*: C–H Functionalization Enabled by Multiple Isocyanides

高明春博士和許斌教授团队在 *Chemical Society Reviews* 发表综述论文

A comprehensive review article titled "C–H Functionalization Enabled by Multiple Isocyanides" by Prof. XU Bin's team at Shanghai University has been published in *Chemical Society Reviews*, one of the world's top journals in chemistry. The first author of the paper is Dr. GAO Mingchun, a junior faculty member from the School of Medicine, and the corresponding author is Prof. XU Bin from the College of Sciences. Shanghai University is listed as both the first author and corresponding author affiliation. This review represents another significant contribution by Professor Xu's team to the field of isocyanide chemistry, following their previous work in *Chemical Society Reviews* in 2017 (46, 1103).

Over the years, the team has conducted systematic studies on controllable transformations involving isocyanides and copper salt anions. This enables the efficient synthesis of nitrogen-containing heterocyclic scaffolds commonly found in natural products and pharmaceutical compounds. They have also established a small-molecule compound library for drug discovery for major diseases. This article integrates the team's prior research with the latest developments in the field, thoroughly analyzing how C–H activation strategies can be combined with multiple isocyanide insertions. It offers insights into reaction design and mechanistic understanding, discusses outstanding challenges, and provides a forward-looking perspective on future directions. This review serves as a valuable reference for researchers in synthetic, medicinal, and materials chemistry.

Paper link: https://pubs.rsc.org/en/content/articlelanding/2024/cs/d4cs00028e

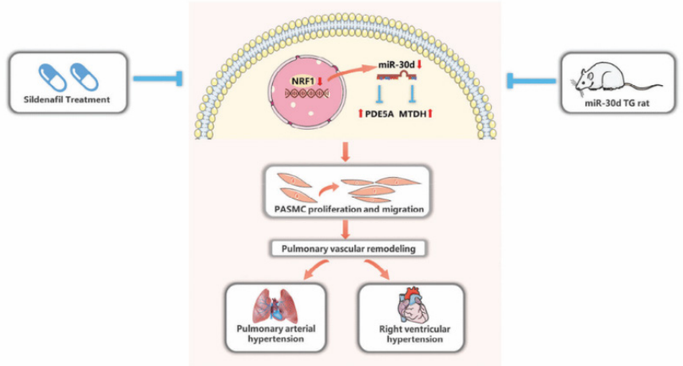


國際化學頂級期刊 *Chemical Society Reviews*（《化學會評論》）發表了我校許斌教授團隊的綜述論文"C–H Functionalization Enabled by Multiple Isocyanides"。醫學院青年教師高明春為論文的第一作者，理學院許斌教授為論文的通訊作者，上海大學為該論文的第一作者單位和通訊作者單位。這也是許斌教授團隊在該刊發表的又一篇有關異腈研究的重要綜述（Chem. Soc. Rev. 2017, 46, 1103）。

近年來，許斌教授團隊基於異腈和銅鹽陰離子的可控化學轉化進行了系統研究，高效構建了一系列天然產物和藥物分子中常見的含氮雜環骨架，並創建了小分子化合物庫用於重大疾病的藥物創制。本論文結合課題組的前期工作以及國內外相關研究進展，詳細闡述了 C–H 鍵活化和異腈多次插入反應策略的巧妙結合，從反應設計和機理研究等方面對異腈化學的發展進行了歸納和總結，對該領域面臨的問題和挑戰進行了討論，並對未來的研究進行了展望。該綜述對合成化學、藥物化學、材料化學等領域的研究具有重要的引領作用。

Prof. BEI Yihua and Prof. XIAO Junjie collaborated with Prof. Anh-Tuan Dinh-Xuan from Université Paris Cité to publish in *Advanced Science*: miR-30d Attenuates Pulmonary Arterial Hypertension via Targeting MTDH and PDE5A and Modulates the Beneficial Effect of Sildenafil

貝毅樺、肖俊傑教授與巴黎第五大學 Anh-Tuan Dinh-Xuan 教授作為共同通訊作者在 *Advanced Science* 發表研究成果



Prof. BEI Yihua and Prof. XIAO Junjie from School of Life Sciences and Institute of Cardiovascular Sciences at Shanghai University, together with Prof. Anh-Tuan Dinh-Xuan from Université Paris Cité (formerly Paris Descartes University), served as co-corresponding authors on a recent study published in *Advanced Science*. The paper, entitled "miR-30d Attenuates Pulmonary Arterial Hypertension via Targeting MTDH and PDE5A and Modulates the Beneficial Effect of Sildenafil," uncovers new insights into the molecular mechanisms of pulmonary arterial hypertension (PAH). The study demonstrates that miR-30d inhibits pulmonary vascular remodeling, reduces pulmonary hypertension, and mitigates right ventricular hypertrophy. It further identifies that elevated miR-30d expression is necessary for the therapeutic efficacy of sildenafil, a widely used clinical drug for PAH. Master's students LIANG Xuchun and ZHOU Jingwen, along with Associate Professor WANG Hongyun, are co-first authors.

生命科學學院、上海大學心血管研究所貝毅樺、肖俊傑教授與巴黎第五大學（又名巴黎西岱大學）Anh-Tuan Dinh-Xuan 教授作為共同通訊作者，在 *Advanced Science* 發表題為"miR-30d Attenuates Pulmonary Arterial Hypertension via Targeting MTDH and PDE5A and Modulates the Beneficial Effect of Sildenafil"的研究成果。該工作揭示了 miR-30d 在肺動脈高壓中具有抑制肺血管重構、改善肺高压和右心肥厚的功能，同時發現 miR-30d 表達增高是臨床藥物西地那非發揮肺動脈高壓治療效果所必需。生命科學學院研究生梁緒春、周靜雯以及副教授王紅雲為共同第一作者。

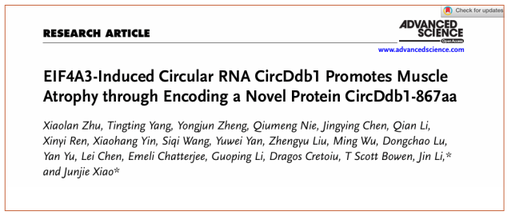
Paper link: https://onlinelibrary.wiley.com/doi/10.1002/advs.202407712

Associate Prof. LI Jin and his team publish in *Advanced Science*: EIF4A3-Induced Circular RNA CircDdb1 Promotes Muscle Atrophy through Encoding a Novel Protein CircDdb1-867aa

李進副教授等在 *Advanced Science* 發表研究成果

Associate Prof. LI Jin from the School of Life Sciences and the Institute of Cardiovascular Sciences at Shanghai University, together with collaborators, has published a research article in *Advanced Science* titled "EIF4A3-Induced Circular RNA CircDdb1 Promotes Muscle Atrophy through Encoding a Novel Protein CircDdb1-867aa." The study reveals the role and molecular mechanism of the circular RNA circDdb1 in promoting muscle atrophy and proposes that targeting circDdb1 may serve as a novel therapeutic strategy. Associate Professors LI Jin and Prof. XIAO Junjie are the co-corresponding authors, and Shanghai University is the first author affiliation.

This study identifies a conserved circular RNA, circDdb1, derived from the host gene DDB1 (damage-specific DNA binding protein 1), which regulates the development of muscle atrophy. Both in vitro and in vivo experiments showed that circDdb1 is significantly upregulated in various muscle atrophy models and in aged human muscle tissues. Functionally, overexpression of circDdb1 promotes muscle atrophy, whereas its inhibition effectively suppresses muscle atrophy induced by dexamethasone, tumor necrosis factor-α (TNF-α), or angiotensin II (AngII) in myotubes, as well as atrophy caused by denervation, AngII, or immobilization in mouse models. Mechanistically, the study found that circDdb1 encodes a novel protein, circDdb1-867aa, which promotes muscle atrophy by binding to eukaryotic elongation factor 2 (eEF2) at the Thr56 site, enhancing its phosphorylation and thereby suppressing protein translation. The study also identifies eukaryotic initiation factor 4A3 (EIF4A3) as an upstream regulator that increases circDdb1 expression during muscle atrophy. Together, these findings identify circDdb1 as a key regulator of muscle atrophy and highlight its potential as a therapeutic target.


RESEARCH ARTICLE

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EIF4A3-Induced Circular RNA CircDdb1 Promotes Muscle Atrophy through Encoding a Novel Protein CircDdb1-867aa

Xiaolan Zhu, Tingting Yang, Yongjun Zheng, Qiumeng Nie, Jingying Chen, Qian Li, Xinyi Ren, Xiaohang Yin, Siqi Wang, Yuwei Yan, Zhengyu Liu, Ming Wu, Dongchao Lu, Yan Yu, Lei Chen, Emeli Chatterjee, Guoping Li, Dragos Cretoiu, T Scott Bowen, Jin Li, and Junjie Xiao**

生命科學學院、心血管研究所李進副教授等在 *Advanced Science* 發表題為"EIF4A3-Induced Circular RNA CircDdb1 Promotes Muscle Atrophy through Encoding a Novel Protein CircDdb1-867aa"的研究成果。該工作揭示環狀RNAcircDdb1促進肌肉萎縮發生的作用和分子機制，並提出抑制 circDdb1 可以作為防治肌肉萎縮潛在的新方法。李進副教授和肖俊傑教授為共同通訊作者，上海大學為第一完成單位。

本研究鑒定了一種保守的環狀RNA——circDdb1，其來源於編碼損傷特異性 DNA 結合蛋白 1（DDB1）的宿主基因，參與調控肌肉萎縮的發生。體內外實驗表明，circDdb1 在多種類型的肌肉萎縮模型及人類衰老肌肉中，表達顯著上調。進一步研究表明，circDdb1 的高表達可導致肌肉萎縮。相反，抑制 circDdb1 可有效阻止由地塞米松、腫瘤壞死因數 α（TNF-α）或血管緊張素 II（AngII）在肌管細胞中引發的肌肉萎縮，以及去神經、血管緊張素 II 和固定引起的小鼠肌肉萎縮。研究進一步發現 circDdb1 可以編碼一種新蛋白——circDdb1-867aa，該蛋白通過與真核延伸因數 2（eEF2）的 Thr56 位點結合並增強其磷酸化水準，抑制蛋白質翻譯，進而促進肌肉萎縮。此外，作者發現真核起始因數 4A3（EIF4A3）是circDdb1在肌肉萎縮中表達升高的上游調控因數。綜上，該研究揭示了 circDdb1 作為肌肉萎縮的重要調節因數，並提出其為潛在的治療靶點。

Paper link: https://onlinelibrary.wiley.com/doi/10.1002/advs.202406986

Prof. ZHANG Yansheng and his team publish in *The Plant Journal*: An independent biosynthetic route to frame a xanthanolide-type sesquiterpene lactone in Asteraceae

章焰生教授團隊在 *The Plant Journal* 發表研究成果

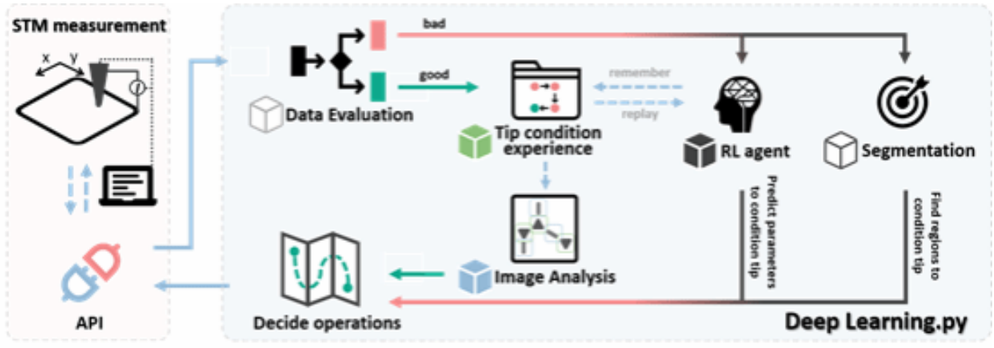
The research team led by Professor Zhang Yansheng from Shanghai University has successfully isolated glandular cells from the leaf surface of the medicinal plant Xanthium sibiricum (cang er), constructed a transcriptomic library of these cells, and elucidated the complete biosynthetic pathway of the anti-tumor compound xanthatin. This finding will make it possible to manufacture xanthatin via synthetic biology technique in the future. The study, titled "An independent biosynthetic route to frame a xanthanolide-type sesquiterpene lactone in Asteraceae," has been published in *The Plant Journal*.

生命科学学院章焰生教授團隊分離了藥用植物“蒼耳”葉片表面的腺體細胞、構建了腺體細胞轉錄組文庫、成功解析了其中抗癌成分蒼耳素的整條生物合成通路，使得將來利用合成生物學技術生產蒼耳素成為可能，研究成果以“An independent biosynthetic route to frame a xanthanolide-type sesquiterpene lactone in Asteraceae”為題發表於 *The Plant Journal* 期刊。

Paper link: http://doi.org/10.1111/tpj.17199

Prof. SUN Qiang leads the team to publish in *Journal of the American Chemical Society*: Autonomous Scanning Tunneling Microscopy Imaging via Deep Learning

孫強教授課題組在 *Journal of the American Chemical Society* 發表最新研究成果



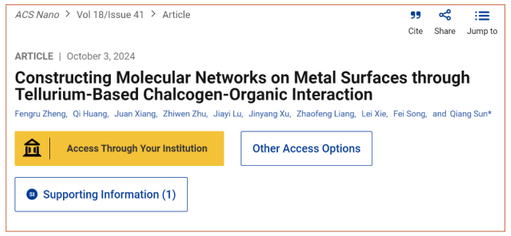
The research group led by Prof. SUN Qiang from Materials Genome Institute of Shanghai University, has published their latest work in the *Journal of the American Chemical Society* (JACS). The paper, titled "Autonomous Scanning Tunneling Microscopy Imaging via Deep Learning," demonstrates the application of deep learning techniques in autonomous scanning tunneling microscopy (STM) imaging. Motivated by advancing STM technology toward greater automation and intelligence, the research team integrated various deep learning methods to develop an autonomous STM system. This system enables long-duration, high-precision imaging at single-molecule resolution without human intervention, significantly improving the efficiency and quality of data acquisition.

材料基因組工程研究院孫強教授課題組在 *Journal of the American Chemical Society*（JACS）發表最新研究成果，展示了深度學習技術在自主化掃描隧道顯微鏡（STM）成像中的應用。論文題目為“Autonomous Scanning Tunneling Microscopy Imaging via Deep Learning”。研究團隊以推進 STM 技術向自動化和智慧化方向發展為主要動機，結合多種深度學習技術，開發了一個自主化 STM 系統。通過該系統，研究團隊實現了 STM 的自主操作，使其在無人干預的情況下長時間、高精度地獲取單分子解析度的表徵圖像，從而提升資料獲取效率和品質。

Paper link: https://pubs.acs.org/doi/10.1021/jacs.4c11674

Prof. SUN Qiang and his team publish in *ACS Nano*: Constructing Molecular Networks on Metal Surfaces through Tellurium-Based Chalcogen-Organic Interaction

孫強教授課題組在 ACS Nan 發表最新研究成果

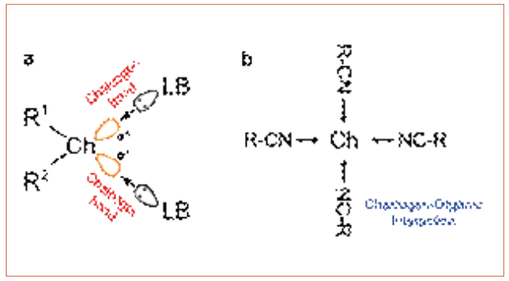


The research group led by Professor Sun Qiang from Materials Genome Institute of Shanghai University, has published a new paper in *ACS Nano* (latest Impact Factor: 17.1), titled "Constructing Molecular Networks on Metal Surfaces through Tellurium-Based Chalcogen-Organic Interaction". This work demonstrates the construction of low-dimensional molecular networks on metal surfaces based on chalcogen-organic interactions involving tellurium.

As a bottom-up approach, surface molecular self-assembly provides a unique pathway for fabricating low-dimensional nanomaterials and devices. Over the past two decades, researchers have explored various intermolecular interactions to build diverse molecular nanostructures on surfaces. While hydrogen bonding and metal coordination have been widely used, the exploration of novel bonding modes remains essential for tailoring the properties and functions of supramolecular systems and materials. Chalcogen bonding (ChB), a type of noncovalent interaction, has been recognized for decades but remains underutilized. Despite ongoing debates surrounding its energetic significance and physicochemical origin, the understanding and applications of ChB are gradually expanding. Thus, investigating chalcogen-dominated supramolecular interactions on surfaces represents a significant direction for advancing surface molecular engineering.

材料基因組工程研究院孫強教授課題組發表最新論文，展示了基於硫族元素－有機相互作用在金屬表面構建低維分子網路結構，研究成果發表於《*ACS Nano*》（最新影響因數：17.1），論文題目為"Constructing Molecular Networks on Metal Surfaces through Tellurium-Based Chalcogen-Organic Interaction"。

表面分子自組裝作為一種自下而上的方法，為製造低維納米材料和器件提供了獨特的途徑。在過去的二十年裡，研究人員探索了不同的分子間相互作用來構建各種類型的表面分子納米結構。除了常用的氫鍵和金屬配位元鍵之外，探索新的鍵合方式對於調整超分子組裝系統和材料的性質和功能至關重要。硫族鍵(ChB)是一種非共價相互作用，儘管已經被提及了幾十年，但仍未得到充分應用。雖然關於其能量意義和物理化學起源的爭論仍在繼續，但對硫族鍵的理解和應用正在逐步推進。因此，研究硫族元素主導的表面超分子相互作用是十分有意義的。



Paper link: https://pubs.acs.org/doi/10.1021/acsnano.4c11344

The research group of CAST publishes in *Journal of Materials Research and Technology*: Evolution mechanism of inclusions and microstructure in low-alloy cast steel with cerium addition

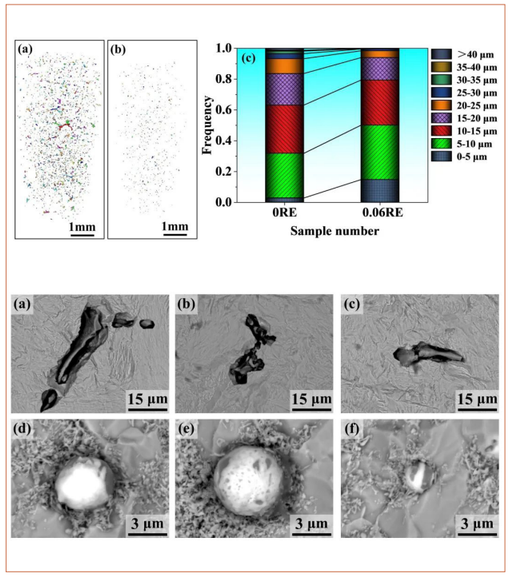
先進凝固技術中心（CAST）團隊在材料科学领域期刊 *Journal of Materials Research and Technology* 發表最新研究成果

The Center for Advanced Solidification Technology (CAST) at the School of Materials Science and Engineering, Shanghai University, has recently made notable advances in studying cerium-induced inclusion modification and microstructural evolution in low-alloy cast steel. Their findings have been published in *Journal of Materials Research and Technology*, under the title "Evolution mechanism of inclusions and microstructure in low-alloy cast steel with cerium addition." ZHAO Long, a PhD student, is the first author, and the study was jointly supervised by Senior Experimentalist CHEN Xiangru and Prof. ZHAI Qijie. Shanghai University is listed as both the first author and corresponding author affiliation.

Low-alloy cast steel is extensively used in mining, automotive engineering, and marine construction due to its superior mechanical performance. With advances in technology and increased industrial demands, there is a growing need for materials that offer enhanced strength and toughness and reduced cross-sectional size and weight to meet the requirements of specialized applications. In the steelmaking process, non-metallic inclusions are unavoidable, and their composition, morphology, distribution, and quantity have a significant impact on overall material performance. This research highlights how refining inclusions can effectively minimize crack initiation and propagation, thereby providing a critical path for improving the mechanical properties of low-alloy cast steel.

材料學院先進凝固技術中心（CAST）團隊在鈰對低合金鑄鋼中夾雜物改性和顯微組織影響機理方面的研究取得重要進展，研究成果以"Evolution mechanism of inclusions and microstructure in low-alloy cast steel with cerium addition" 為題發表在材料科學領域學術期刊 *Journal of Materials Research and Technology*。該論文第一作者為趙龍博士研究生，通訊作者為陳湘茹正高級實驗師和翟啟傑教授。上海大學為第一作者和通訊作者單位。

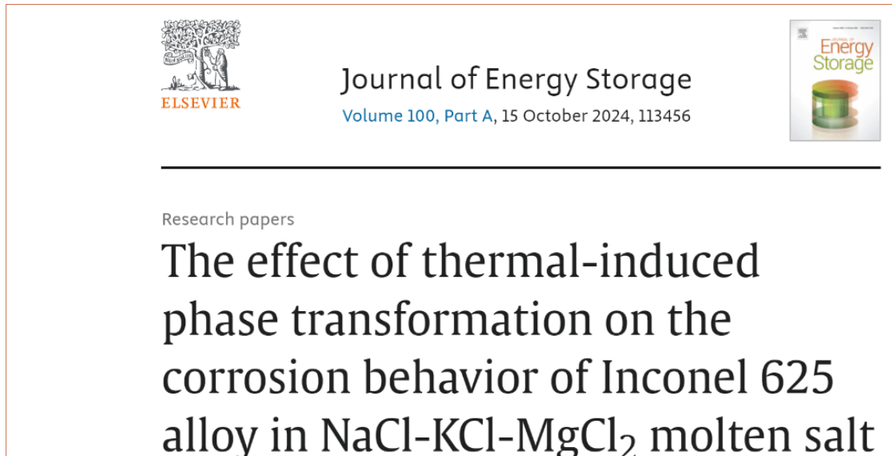
低合金鑄鋼因其卓越的性能，在礦山、汽車製造以及海洋工程等多個領域得到了廣泛應用。隨著科技的進步，工業界對低合金鑄鋼的承載能力提出了更高的標準。為了滿足這些要求，我們不僅需要增強其強度和韌性，還要努力減小其截面尺寸和重量，以更好地適應各種特定應用環境。在鋼鐵材料的生產過程中，夾雜物的存在是不可避免的，而夾雜物類型、大小、分佈以及數量等因素都會對鋼材的整體性能產生顯著的影響，因此，通過細化夾雜物來減少基體的斷裂和裂紋擴展，已經成為提高低合金鑄鋼強度和韌性的研究方向之一。



Paper link: https://doi.org/10.1016/j.jmrt.2024.09.087

The research group of CAST, in collaboration with the Shanghai Institute of Applied Physics, CAS, publish in *Journal of Energy Storage*: The effect of thermal-induced phase transformation on the corrosion behavior of Inconel 625 alloy in NaCl-KCl-MgCl2 molten salt

先進凝固技術中心（CAST）團隊聯合中國科學院上海應用物理研究所在 *Journal of Energy Storage* 发表研究成果

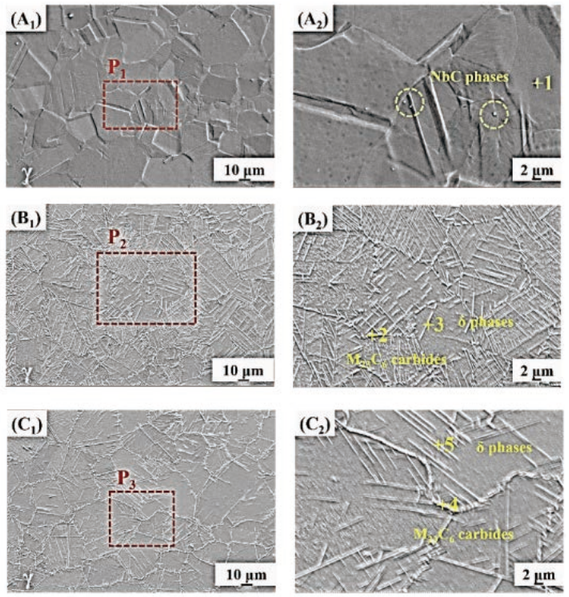


The Center for Advanced Solidification Technology (CAST) at Shanghai University, in collaboration with the Shanghai Institute of Applied Physics, Chinese Academy of Sciences, has for the first time identified the critical role of thermal-induced phase transformation in the molten salt corrosion process. The research findings were published in *Journal of Energy Storage* (CAS Q2, Top journal, Impact Factor: 9.4) under the title "The effect of thermal-induced phase transformation on the corrosion behavior of Inconel 625 alloy in NaCl–KCl–$MgCl_2$ molten salt." The first author of the paper is Jiang Jinyao, a master's student, supervised by Senior Engineer Liang Jianping from the Shanghai Institute of Applied Physics and Prof. LI Huigai from the CAST team at Shanghai University.

With the operational temperatures of next-generation concentrated solar power (CSP) and thermal energy storage (TES) systems expected to exceed 700 ° C, structural materials face increasingly stringent performance demands. Alloys used for structural components, such as nickel-based alloys and stainless steel, must offer high-temperature stability and resistance to molten salt corrosion. Chloride salts, considered among the most promising heat transfer and storage media for future CSP applications, are significantly more corrosive than nitrate salts, posing a serious challenge to alloy durability. This study focused on Inconel 625 alloy and was the first to reveal that thermal-induced phase transformation is a key mechanism driving corrosion in molten chloride salt environments.

先進凝固技術中心（CAST）團隊聯合中國科學院上海應用物理研究所，首次發現“熱誘導相變”在熔鹽腐蝕過程中起到關鍵作用，結果發表在 *Journal of Energy Storage*（中科院二區 top，IF9.4）。研究成果以“The effect of thermal-induced phase transformation on the corrosion behavior of Inconel 625 alloy in NaCl-KCl-MgCl2 molten salt”為題，論文第一作者為姜金耀碩士研究生，指導老師為中國科學院上海應用物理研究所梁建平正高級工程師、上海大學 CAST 團隊李慧改教授。

新一代光熱發電（CSP）和高溫儲熱（TES）工況溫度將達到 700℃以上，對結構材料提出了更高的要求。必須採用耐熔鹽腐蝕、耐高溫的合金作為結構部件用材，例如不銹鋼、鎳基合金等。氯化物鹽是新一代光熱發電最有競爭力的儲換熱工質，然而，氯化物鹽的腐蝕性遠高於硝酸鹽，對合金材料的要求更加苛刻。該論文選擇 Inconel 625 合金作為研究对象，首次發現“熱誘導相變”是造成合金熔鹽腐蝕的關鍵因素。



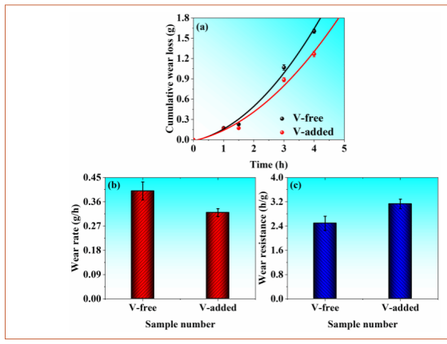
Paper link: https://doi.org/10.1016/j.est.2024.113456

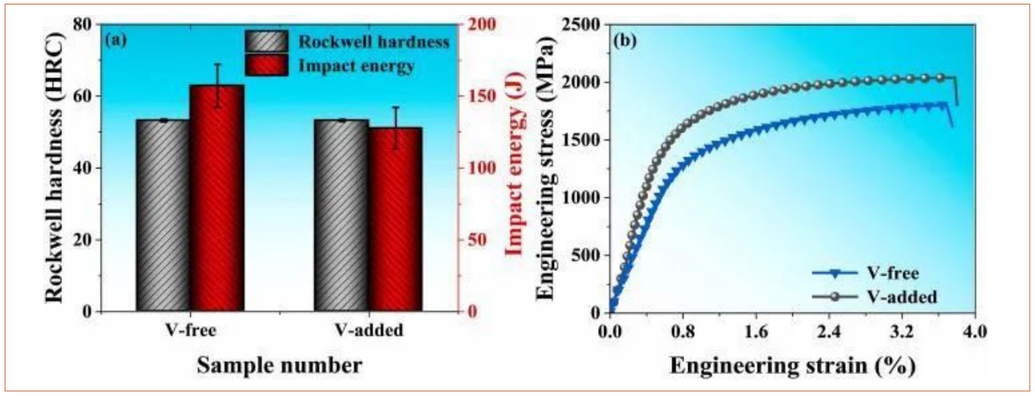
The research group of CAST publishes in *Wear*: Mechanical properties and impact abrasive wear resistance in vanadium microalloyed medium carbon CrMo cast steel strengthened with nanoprecipitates

先進凝固技術中心（CAST）團隊在工程技術領域學術期刊 *Wear* 发表最新研究成果

The Center for Advanced Solidification Technology (CAST) at the School of Materials Science and Engineering, Shanghai University has made substantial progress in understanding the wear resistance mechanism of vanadium-induced nanoprecipitates in medium-carbon CrMo cast steel. The research article, titled "Mechanical properties and impact abrasive wear resistance in vanadium microalloyed medium carbon CrMo cast steel strengthened with nanoprecipitates," has been published in *Wear*, a peer-reviewed journal in the field of engineering and materials technology. ZHAO Long, a PhD student, is the first author, and Senior Experimentalist CHEN Xiangru is the corresponding author. Shanghai University is listed as both the first author affiliation and the corresponding author institution. In this study, vanadium (V) was introduced to regulate the density, size, and distribution of nanoprecipitates in medium-carbon CrMo cast steel. The work systematically investigates the influence and mechanism of these nanoprecipitates on impact abrasive wear resistance, laying a foundation for enhancing the service life of CrMo cast steel liners.

先進凝固技術中心（CAST）團隊在納米析出相對中碳 CrMo 鑄鋼的耐磨性能影響機理方面研究取得重要進展，研究成果以“Mechanical properties and impact abrasive wear resistance in vanadium microalloyed medium carbon CrMo cast steel strengthened with nanoprecipitates”為題發表在工程技術領域學術期刊 *Wear*。該論文第一作者為趙龍博士研究生，通訊作者為陳湘茹正高級實驗師。上海大學為第一作者和通訊作者單位。文章通過添加 V 元素調控中碳 CrMo 鑄鋼中納米析出相的密度、尺寸和分佈，以研究其納米析出相對中碳 CrMo 鑄鋼耐磨性能的影響規律及其機制，為提高中碳 CrMo 鑄鋼襯板的使用壽命奠定一定的基礎。





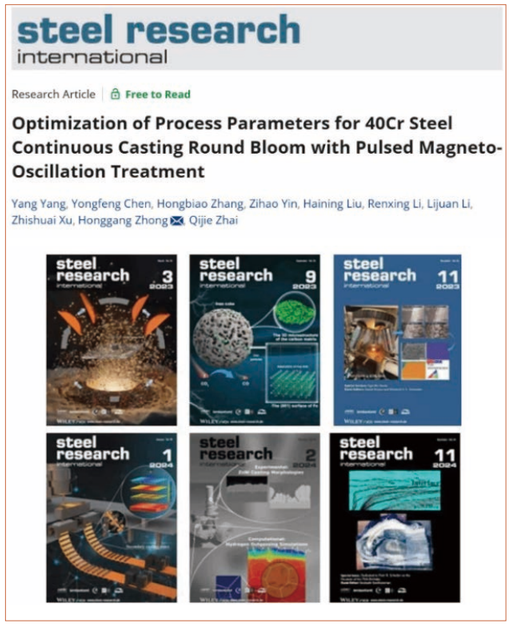
Paper link: https://doi.org/10.1016/j.wear.2024.205679

The CAST team's original paper is selected for the "Best of steel research international – 2024" collection: Optimization of Process Parameters for 40Cr Steel Continuous Casting Round Bloom with Pulsed Magneto-Oscillation Treatment

先進凝固技術中心（CAST）原創論文入選“Best of steel research international-2024”最佳論文專輯

The CAST team at the School of Materials Science and Engineering, Shanghai University has been recognized for its original Pulsed Magneto-Oscillation (PMO) technology, which was applied to continuous casting of round blooms. The related paper, titled "Optimization of Process Parameters for 40Cr Steel Continuous Casting Round Bloom with Pulsed Magneto-Oscillation Treatment," has been selected for the "Best of steel research international – 2024" collection. This special issue features 20 of the most outstanding articles published in steel research international over the past two years. YANG Yang, a Master's student, is the first author, and Prof. Zhong Honggang is the corresponding author. Shanghai University is listed as the first author affiliation, with Wuhu Xinxing Ductile Iron Pipes Co., Ltd. as the collaborating institution.

To improve the quality of continuous casting round billets, we studied the effect of pulse magnetic-oscillation (PMO) on the solidification structure and macroscopic segregation of 40Cr alloy steel Φ 300 mm continuous casting round blooms. The industrial test results show that by combining appropriate PMO parameters with increased casting speed, highly homogenized castings can be obtained. This indicates that PMO treatment can significantly improve production efficiency while improving the homogenization of casting billet solidification.



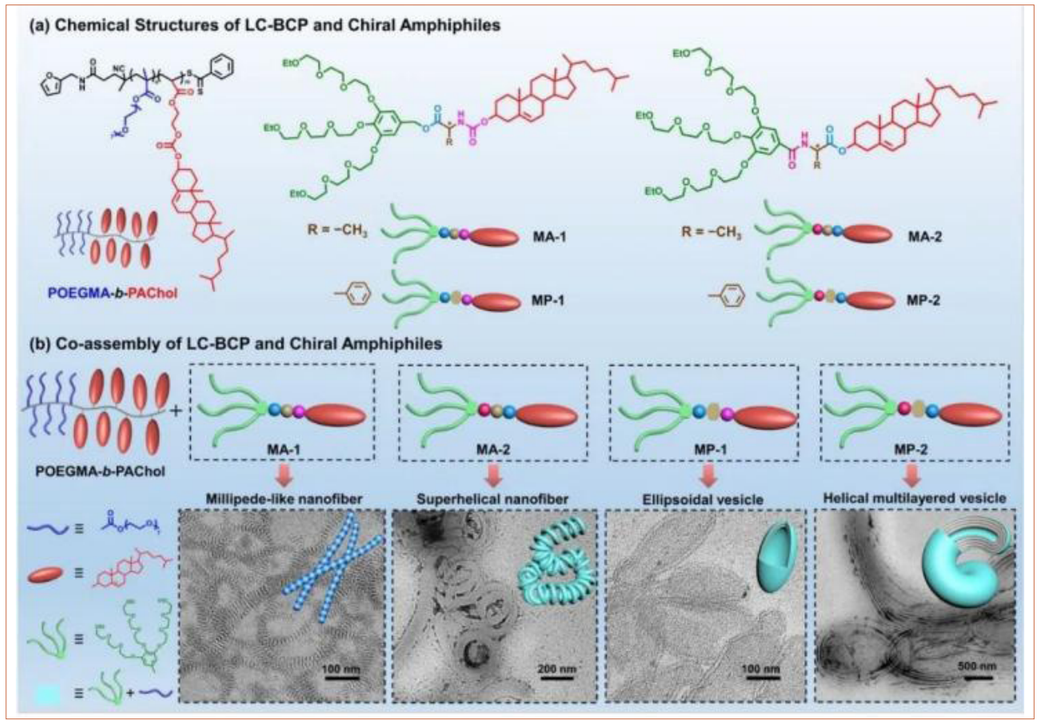
CAST 原創 PMO 技術在連鑄圓坯中應用的論 文“Optimization of Process Parameters for 40Cr Steel Continuous Casting Round Bloom with Pulsed Magneto-Oscillation Treatment”入選“Best of steel research international-2024”最佳論文專輯。專輯選出了過去兩年中在 steel research international 上發表的二十篇最優秀論文（The most outstanding articles）。該論文第一作者為碩士研究生楊陽，通訊作者為仲紅剛，上海大學為第一作者單位，合作單位為蕪湖新興鑄管有限責任公司。

為提高連鑄圓坯品質，雙方合作開展了脈衝磁振盪（PMO）對 40Cr 合金鋼 Φ300 mm 連鑄圓坯凝固組織和宏觀偏析影響的研究。工業試驗結果顯示，合適的 PMO 參數結合提高拉速，可獲得高均質化鑄坯。這表明 PMO 處理在提高鑄坯凝固均質化的同時，還可以顯著提高生產效率。

Paper link: https://onlinelibrary.wiley.com/doi/10.1002/srin.202300660

Associate Prof. JIA Lin leads the team to publish in *Angew. Chem. Int. Ed.*: Fabrication of Hierarchical Nanostructures Featuring Amplified Asymmetry through Co-assembly of Liquid Crystalline Block Copolymer and Chiral Amphiphiles

賈林副研究員带领课题组在 *Angew. Chem. Int. Ed.* 发表最新研究成果



The research group led by Associate Prof. JIA Lin from the School of Materials Science and Engineering, Shanghai University, has made substantial progress in co-assembly of liquid crystalline block copolymers and chiral amphiphiles. The research paper, titled "Fabrication of Hierarchical Nanostructures Featuring Amplified Asymmetry through Co-assembly of Liquid Crystalline Block Copolymer and Chiral Amphiphiles," has been published in *Angewandte Chemie International Edition* (Impact Factor: 16.1). LU Yue, a PhD student from the Department of Polymer Materials, is the first author, and Associate Prof. JIA Lin is the corresponding author.

材料學院賈林課題組在液晶嵌段共聚物與手性雙親分子的共組裝研究領域取得重要進展，研究成果以"Fabrication of Hierarchical Nanostructures Featuring Amplified Asymmetry through Co-assembly of Liquid Crystalline Block Copolymer and Chiral Amphiphiles"為題發表在國際權威期刊 *Angew. Chem. Int. Ed.*（影響因數 16.1）。高分子材料系博士生盧悅為論文第一作者，賈林副研究員為論文的通訊作者。

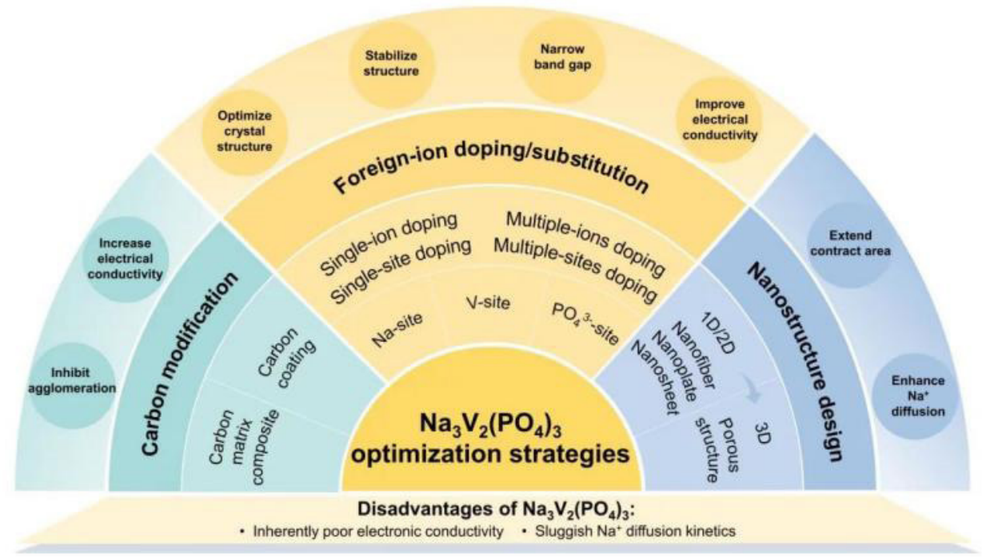
Paper link: https://onlinelibrary.wiley.com/doi/10.1002/anie.202417573

Prof. DING Changsheng and Prof. GAO Yanfeng lead the team to publish a review paper in *Nano-Micro Letters*: Optimization Strategies of Na3V2(PO4)3 Cathode Materials for SodiumIon Batteries

丁常勝 / 高彦峰教授團隊在 *Nano-Micro Letters* 發表題綜述論文

The research team led by Professors Ding Changsheng and Gao Yanfeng from the School of Materials Science and Engineering, Shanghai University, has published a review article in the internationally renowned journal *Nano-Micro Letters* (Impact Factor: 31.6), titled "Optimization Strategies of $Na_3V_2(PO_4)_3$ Cathode Materials for Sodium-Ion Batteries." The first author of the paper is HU Jiawen, a master's student at the School of Materials Science and Engineering, Shanghai University. The corresponding authors are Prof. DING Changsheng and Prof. GAO Yanfeng, with Prof. LIU Yu from the Shanghai Institute of Ceramics, Chinese Academy of Sciences (CAS), listed as a co-author.

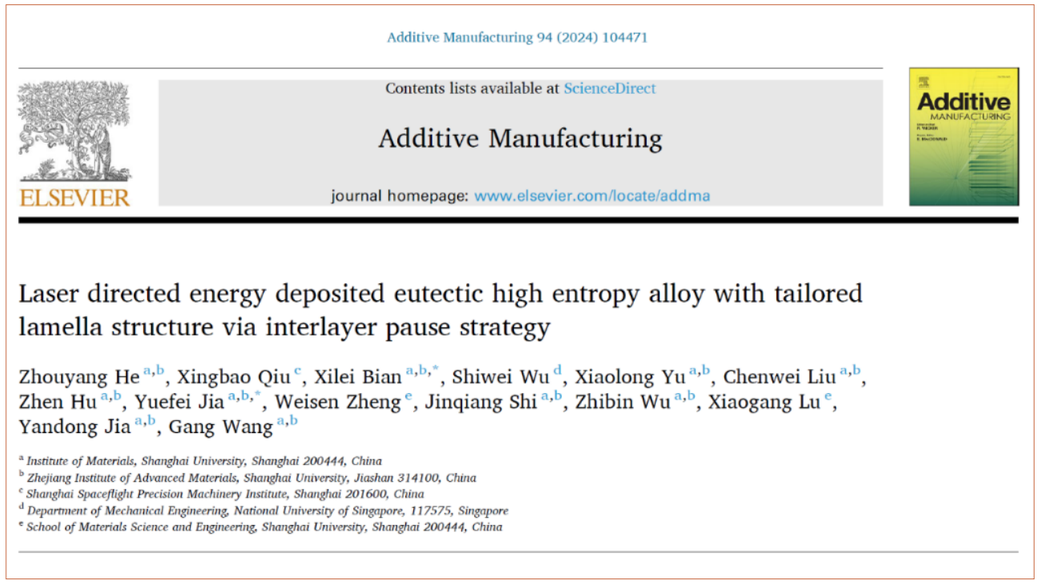
材料學院丁常勝 / 高彦峰教授團隊在國際知名期刊《*Nano-Micro Letters*》（影響因數：31.6）上發表題為"Optimization Strategies of Na3V2(PO4)3 Cathode Materials for SodiumIon Batteries"的綜述論文。該論文第一作者為上海大學材料學院碩士生胡佳雯，通訊作者為上海大學材料學院丁常勝教授和高彦峰教授，合作者有中國科學院上海矽酸鹽研究所劉宇研究員。



Paper link: https://doi.org/10.1007/s40820-023-01162-x

The Disordered Alloys Research Team publishes in *Additive Manufacturing*: Laser directed energy deposited eutectic high entropy alloy with tailored lamella structure via interlayer pause strategy

材料学院無序合金團隊在增材製造領域期刊 *Additive Manufacturing* 發表最新研究成果



Additive Manufacturing 94 (2024) 104471

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journal homepage: www.elsevier.com/locate/addma

Laser directed energy deposited eutectic high entropy alloy with tailored lamella structure via interlayer pause strategy

Zhouyang He [a,b], Xingbao Qiu [c], Xilei Bian [a,b,*], Shiwei Wu [d], Xiaolong Yu [a,b], Chenwei Liu [a,b], Zhen Hu [a,b], Yuefei Jia [a,b,*], Weisen Zheng [e], Jinqiang Shi [a,b], Zhibin Wu [a,b], Xiaogang Lu [e], Yandong Jia [a,b], Gang Wang [a,b]

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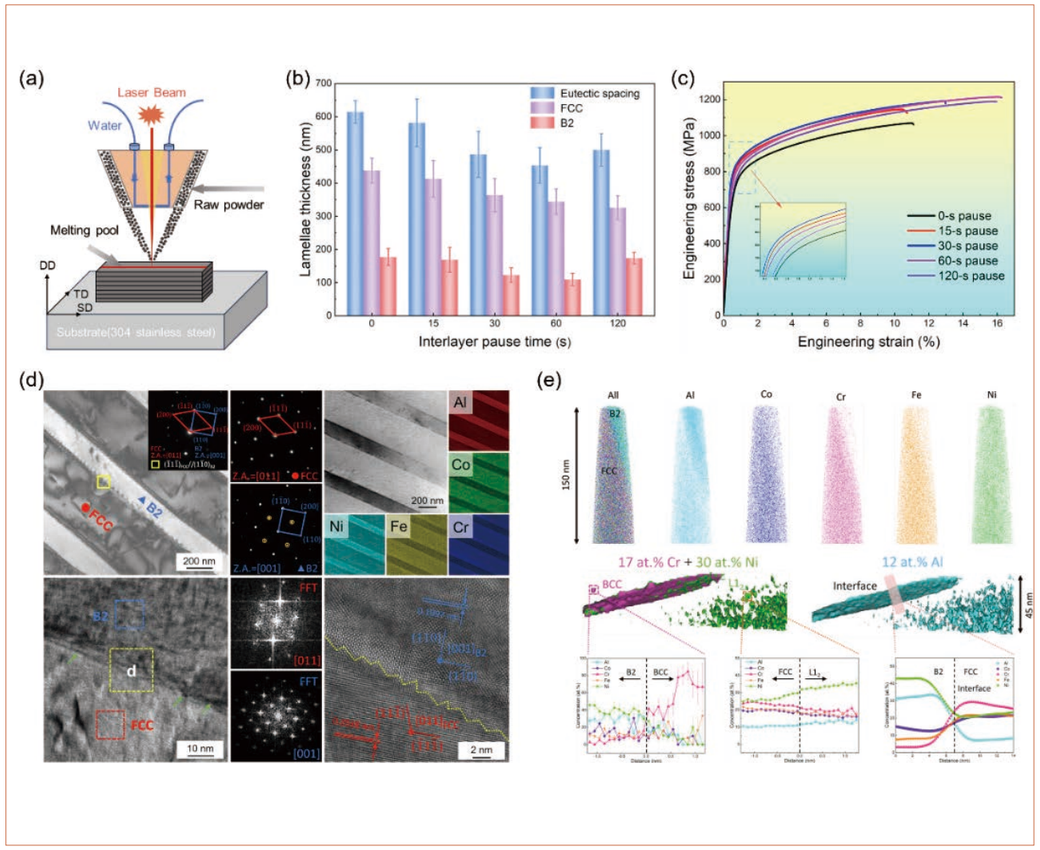
The Disordered Alloys Research Team from the School of Materials Science and Engineering, Shanghai University has proposed a simple and novel interlayer pause strategy to address the unsatisfactory strength–ductility trade-off of AlCoCrFeNi$_{2.1}$ eutectic high-entropy alloys (EHEAs) fabricated by laser directed energy deposition (LDED). The study, titled "Laser directed energy deposited eutectic high entropy alloy with tailored lamella structure via interlayer pause strategy," has been published in *Additive Manufacturing*, a top-tier journal in the field (CAS Q1, Impact Factor: 10.3). Master's student HE Zhouyang is the first author, and Associate Prof. BIAN Xilei (advisor) and Postdoctoral researcher JIA Yuefei are the co-corresponding authors.

The results show that the interlayer pause strategy significantly refines the lamellar structure of the eutectic phase. Compared to samples fabricated without a pause, a 60-second interlayer pause leads to approximately 40% refinement in lamellar spacing, a ~14% increase in tensile strength, and a ~47% improvement in uniform elongation. Further characterization using SEM, EBSD, TEM, and APT reveal that the refined lamellae enhance hetero-deformation-induced (HDI) strengthening and strain hardening capability, effectively relieving stress concentration, delaying fracture, and preserving ductility. This work demonstrates that the interlayer pause strategy offers a simple yet effective pathway for in-situ microstructure control during LDED, enabling the development of high-entropy alloys with excellent mechanical performance and broadening their potential for engineering applications.

材料學院無序合金團隊針對當前 LDED 技術製備的 AlCoCrFeNi2.1 共晶高熵合金（EHEAs）並未表現出令人滿意的強度－延展性組合這一難題，提出了一種簡單、新穎的層間暫停策略，可原位調控共晶片層的微觀組織結構，以增強合金的強度和延展性。相關成果以題為“Laser directed energy deposited eutectic high entropy alloy with tailored lamella structure via interlayer pause strategy”發表在增材製造領域期刊 *Additive Manufacturing*（中國科學院一區 Top 期刊，IF=10.3）。何洲洋碩士研究生為論文第一作者，卞西磊副研究員（導師）、賈岳飛博後為共同通訊作者。

研究表明，層間暫停策略可顯著細化共晶片層結構，與無層間暫停的情況相比，暫停 60s 樣品的片層結構細化程度提高近 40%，合金的抗拉強度提高 ~14%，均勻伸長率提高 ~47%。通過 SEM、EBSD、TEM 和 APT 等表徵手段進一步發現，細化的共晶片層結構提升了異質變形誘導（HDI）強化和應變硬化能力，能夠有效緩解應力集中，從而延遲斷裂並保持塑性。本研究中提出的層間暫停策略為通過 LDED 增材製造工藝開發具有原位可調控微觀結構、優異機械性能的高熵合金提供了一種簡單而有效的方法，為其工程應用開闢了新的可能性。

Paper link: https://doi.org/10.1016/j.addma.2024.104471

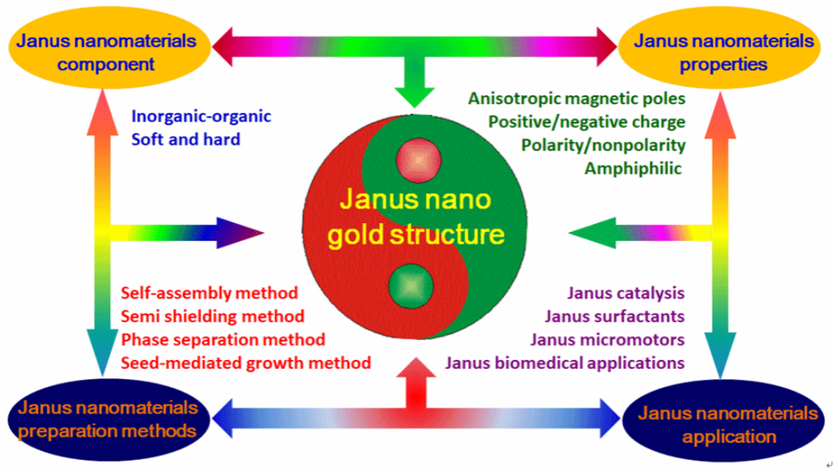


Associate Prof. LI Yunbo and the team publish a review paper in *Advances in Colloid and Interface Science*: Recent advances in gold Janus nanomaterials: Preparation and application

李運波副教授課題組在 *Advances in Colloid and Interface Science* 發表綜述論文

The research group led by Associate Prof. LI Yunbo from the School of Materials Science and Engineering, Shanghai University, has published a review article in the top-tier journal *Advances in Colloid and Interface Science* (Impact Factor: 15.9), titled “Recent advances in gold Janus nanomaterials: Preparation and application.” The School of Materials Science and Engineering, Shanghai University is listed as the first author affiliation. Building on the group’s earlier work and the current progress in China, this review provides an overview of the research status and recent trends in Janus nanomaterials, focusing on the synthesis and applications of gold-based Janus nanomaterials. The paper offers a comprehensive discussion of fabrication methods, potential application areas, and the emerging trends and challenges associated with gold Janus nanostructures.

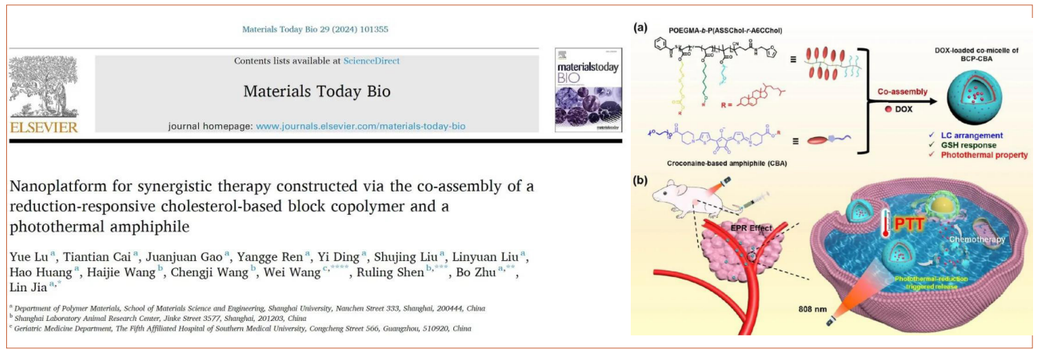
材料學院李運波副教授課題組在 *Advances in Colloid and Interface Science*（影響因數：15.9）發表題為“Recent advances in gold Janus nanomaterials: Preparation and application”的綜述論文。該論文以上海大學材料科學與工程學院為第一單位。本綜述基於課題組前期研究及國內研究現狀，首先概述了 Janus 納米材料的現狀，回顧了當前的研究趨勢，並詳細介紹了金納米材料的製備與應用，全面探討了 Janus 金納米顆粒的製備方法和應用前景，並對 Janus 金納米材料的新興趨勢及挑戰進行了概括和探討。



Paper link: https://doi.org/10.1016/j.cis.2024.103315

The research groups of JIA Lin and ZHU Bo publish in *Materials Today Bio*: Nanoplatform for synergistic therapy constructed via the co-assembly of a reduction-responsive cholesterol-based block copolymer and a photothermal amphiphile

賈林課題組、朱波課題組在 *Materials Today Bio* 發表研究成果



The research groups of JIA Lin and ZHU Bo from the School of Materials Science and Engineering, Shanghai University have made new progress in the development of photo-thermal and reduction dual-responsive co-micelles for synergistic photothermal-chemotherapy. Their latest work, titled “Nanoplatform for synergistic therapy constructed via the co-assembly of a reduction-responsive cholesterol-based block copolymer and a photothermal amphiphile,” has been published in *Materials Today Bio* (CAS Q1, Impact Factor: 8.7). LU Yue, a PhD student from the Department of Polymer Materials, is the first author of the paper.

Building on the group’s previous studies (Small 2024, 20, 2304955; *Angew. Chem. Int. Ed.* 2024, e202417573, VIP paper), this work employs a synergistic co-assembly strategy, integrating a cholesterol-based block copolymer containing disulfide bonds with a photothermal amphiphile bearing a cholesterol moiety. This design leverages the liquid crystalline ordering and superior biocompatibility of cholesterol-based materials to construct a nanoplatform with dual responsiveness to photothermal and reductive stimuli, enabling smart drug delivery for cancer therapy.

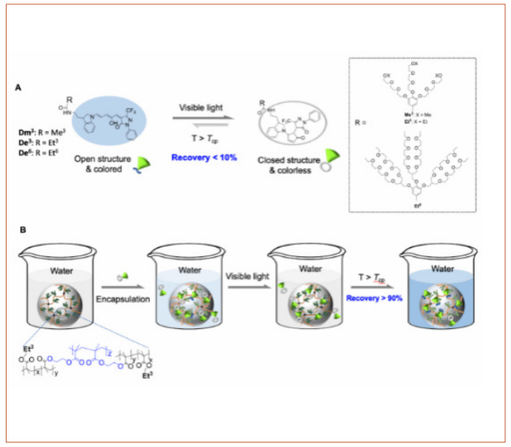
材料學院賈林課題組、朱波課題組在共混組裝製備光熱－還原雙響應共膠束用於光熱－化療協同治療領域取得研究進展，相關成果以“Nanoplatform for synergistic therapy constructed via the co-assembly of a reduction-responsive cholesterol-based block copolymer and a photothermal amphiphile”為題發表在 *Materials Today Bio*（中科院一區，影響因數 8.7）。高分子材料系博士生盧悅為論文第一作者。

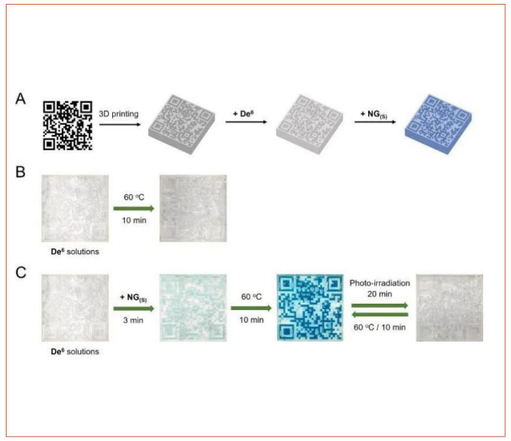
本工作在課題組前期研究基礎上（Small 2024, 20, 2304955; *Angewandte Chemie International Edition* 2024, e202417573, VIP paper），利用發展的協同組裝策略，將含雙硫鍵的膽固醇液晶嵌段共聚物與含膽固醇基元的光熱雙親分子進行共組裝，巧妙的利用了膽固醇類材料具有液晶排列有序性以及優異的生物相容性的特點，製備了一類生物相容性高且具有光熱－還原雙響應藥物智慧遞送體系。

Paper link: https://doi.org/10.1016/j.mtbio.2024.101355

The research groups led by Prof. LI Wen and Prof. ZHANG Afang publish in *Chemical Engineering Journal*: Enhanced confinements to modulate efficient reversible isomerization of donor–acceptor Stenhouse adducts in water through cooperative crowding in thermoresponsive dendronized nanogels

李文 / 張阿方教授團隊在 *Chemical Engineering Journal* 發表研究成果





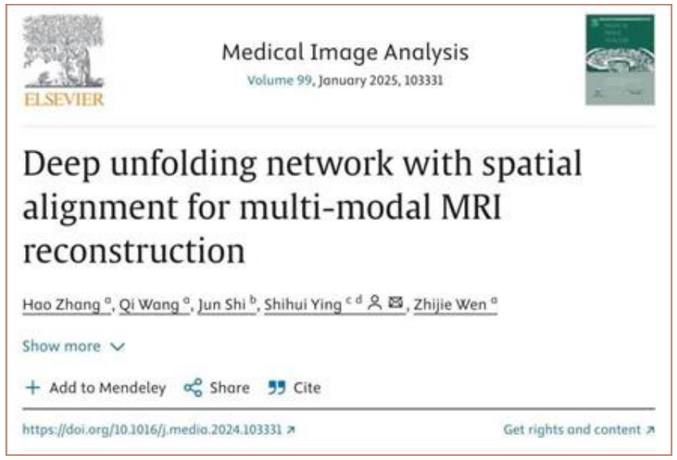
The research team led by Prof. LI Wen and Prof. ZHANG Afang from the International Joint Laboratory of Biomimetic and Smart Polymers, School of Materials Science and Engineering, Shanghai University, has made significant progress in the construction of confined microenvironments using thermoresponsive dendronized nanogels. The research article, titled "Enhanced confinements to modulate efficient reversible isomerization of donor–acceptor Stenhouse adducts in water through cooperative crowding in thermoresponsive dendronized nanogels," has been published in *Chemical Engineering Journal* (Impact Factor: 13.4). ZHANG Jiaxing, a PhD student, is the first author, and Prof. LI Wen is the corresponding author. Shanghai University is the first author and corresponding author affiliation, and the University of Queensland, Australia, is the collaborating institution.

材料學院仿生與智能高分子國際聯合實驗室李文 / 張阿方教授團隊在溫敏樹枝化納米凝膠構築受限微環境方面取得重要進展，研究成果近日發表在 *Chemical Engineering Journal*（影響因數 13.4），論文題目為"Enhanced confinements to modulate efficient reversible isomerization of donor–acceptor Stenhouse adducts in water through cooperative crowding in thermoresponsive dendronized nanogels"，論文第一作者為博士研究生張佳星，李文教授為通訊作者。上海大學為第一作者和第一通訊作者單位，澳大利亞昆士蘭大學為合作單位。

Paper link: https://www.sciencedirect.com/science/article/pii/S1385894724100095

ZHANG Hao publishes in *Medical Image Analysis*: Deep unfolding network with spatial alignment for multi-modal MRI reconstruction

理學院碩士研究生張浩在导师應時輝教授和溫智婕副教授指导下發表研究成果



ZHANG Hao, a Master's student at the College of Sciences, Shanghai University, has recently published a study as first author in *Medical Image Analysis*, a leading journal in the field of medical AI (CAS Q1, IF: 10.7). The paper, titled "Deep unfolding network with spatial alignment for multi-modal MRI reconstruction," was completed under the supervision of Prof. YING Shihui and Associate Prof. WEN Zhijie.

This work proposes a novel deep unfolding network (DUN-SA) for multi-modal MRI reconstruction, grounded in mathematical optimization theory. The method is designed to simultaneously address the challenges of cross-modal spatial misalignment and multi-modal data integration through an interpretable learning framework. By incorporating a cross-modal alignment prior, DUN-SA seamlessly integrates the spatial alignment task into the reconstruction process. It alternately optimizes alignment and reconstruction, using stepwise-aligned reference modalities to guide the recovery of the target modality. Experiments on multiple clinical datasets show that DUN-SA outperforms existing state-of-the-art methods and demonstrates superior robustness to spatial misalignments across modalities.

理學院碩士研究生張浩在導師應時輝教授和溫智婕副教授的指導下，以第一作者在醫學影像人工智慧領域頂級期刊《Medical Image Analysis》（中科院一區 TOP，影響因數 10.7）線上發表了多模態 MRI 重建方面的最新工作"Deep unfolding network with spatial alignment for multi-modal MRI reconstruction"。

本文從數學優化的視角提出了一種新的深度展開網路（DUN-SA），用於在 MRI 重建中同時處理跨模態空間錯位和多模態重建問題的可解釋學習建模。通過引入跨模態對齊的先驗項，將空間對齊任務自我調整地嵌入重建過程。該方法通過反覆運算交替優化對齊和重建任務，並利用逐步對齊的參考模態提供先驗資訊，顯著提升了目標模態的重建品質。實驗結果顯示，DUN-SA 在多個真實資料集上優於現有的先進方法，並相比於其它方法對模態間的空間錯位問題更加魯棒。

Paper link: https://www.sciencedirect.com/science/article/pii/S1361841524002561

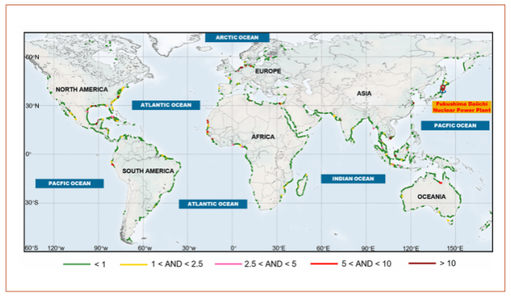
Associate Prof. WEI Yaqiang and Prof. LI Hui lead the team to publish in *Environmental Science & Technology*: Fukushima's Radioactive Water Threatens Coastal Groundwater

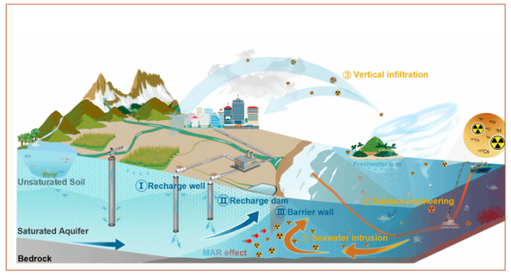
魏亞強副研究員、李輝研究員團隊在環境領域期刊 *Environmental Science & Technology* 發表研究成果

The research team led by Associate Prof. WEI Yaqiang and Prof. LI Hui from the School of Environmental and Chemical Engineering, Shanghai University, has published a paper in the top-tier environmental journal *Environmental Science & Technology*, titled "Fukushima's Radioactive Water Threatens Coastal Groundwater."

This study investigates the potential threats posed by the discharge of radioactive water from Fukushima to coastal groundwater systems, with a particular focus on how seawater intrusion can accelerate the migration of radioactive contaminants into coastal aquifers, thus endangering groundwater security in coastal areas.

The article points out that following the Fukushima nuclear disaster, public concern has largely centered on the impact to marine ecosystems. However, the discharge of radioactive water also poses a long-term environmental risk to coastal areas that depend heavily on groundwater as a primary water source. Moreover, the authors emphasize the need for mitigation strategies such as Managed Aquifer Recharge (MAR), the construction of protective barriers, and the optimization of subsurface infrastructure designs in coastal zones, all aimed at minimizing the impact of radioactive water on coastal groundwater systems.





環化學院魏亞強副研究員、李輝研究員團隊在環境領域國際頂級期刊 *Environmental Science & Technology* 發表題為"Fukushima's Radioactive Water Threatens Coastal Groundwater"的論文。文中探討了福島核污水排放對沿海地下水系統造成的潛在威脅，重點分析了海水入侵如何加速核污水向含海岸帶地下水的遷移，從而危害沿海地區的地下水資源安全。

文章指出，福島核事故發生後，核污水的排放不僅引發了人們對海洋環境的關注，還對以地下水為主要水源地的沿海地區構成了長期的潛在環境風險。同時，文章強調採用人工地下水補給（MAR）等有效的緩解策略，包括建設防護屏障和優化海岸帶地下構築物工程設計，以最大限度地減少核污水對海岸帶地下水的影響。

Paper link: https://doi.org/10.1021/acs.est.4c10136

The research groups led by Prof. JIANG Yong and Prof. ZHAO Bing publish in *Angewandte Chemie International Edition*: A Novel Anion Receptor Additive for −40℃ Sodium Metal Batteries by Anion/Cation Solvation Engineering

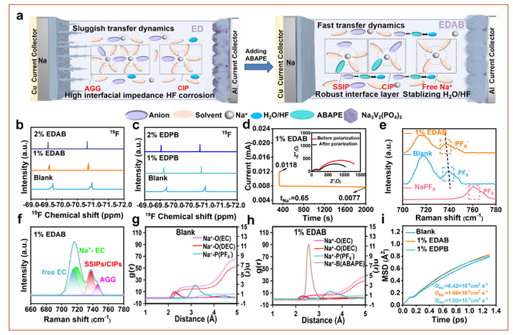
蔣永、趙兵研究員課題組在 *Angewandte Chemie International Edition* 發表研究成果

The research groups led by Prof. JIANG Yong and Prof. ZHAO Bing from the School of Environmental and Chemical Engineering, Shanghai University, have published a study in the internationally renowned journal *Angewandte Chemie International Edition*, titled "A Novel Anion Receptor Additive for -40℃ Sodium Metal Batteries by Anion/Cation Solvation Engineering."

This work introduces an innovative approach using an anion receptor additive—4-aminophenylboronic pinacol ester (ABAPE)—to regulate the solvation structure of the electrolyte and develop an effective anion/cation solvation strategy for ultralow-temperature sodium metal batteries. Through Lewis acid–base interactions, ABAPE binds with anions, increasing the population of free ions, solvent-separated ion pairs (SSIPs), and contact ion pairs (CIPs), thereby enhancing both ionic mobility and ionic conductivity. Additionally, ABAPE is incorporated into the first solvation shell of Na+, which reduces the coordination number of carbonate solvents (EC and DEC) around Na+. By interacting with both cations and anions, ABAPE facilitates Na+ desolvation, resulting in a transition of sodium deposition morphology from dendritic to spherical, promoting uniform Na+ deposition. ABAPE also forms hydrogen bonds with trace water in the electrolyte, suppressing the formation of hydrofluoric acid (HF). These effects are critical in suppressing electrode corrosion and in promoting the formation of a stable electrode-electrolyte interface. The assembled Na ‖ Na3V2(PO4)3 cell demonstrates stable cycling at -40 ℃ . This study offers a practical strategy for enhancing the compatibility and applicability of conventional carbonate-based electrolytes under extreme conditions, thereby highlighting the crucial role of anions.

環化學院蔣永研究員、趙兵研究員課題組在國際知名期刊《*Angewandte Chemie International Edition*》上發表關於陰離子受體添加劑實現碳酸酯電解液體系超低溫鈉金屬電池的研究成果，論文題目為"A Novel Anion Receptor Additive for -40 ℃ Sodium Metal Batteries by Anion/Cation Solvation Engineering"。

該工作創新性地採用陰離子受體（4- 氨基苯硼酸頻哪醇酯，ABAPE）作添加劑，調製電解液的溶劑化結構，開發了一種適用於超低溫鈉金屬電池的陰陽離子溶劑化策略。ABAPE 通過路易士酸城作用結合陰離子，增加游離離子、溶劑分離離子對（SSIPs）和接觸離子對（CIPs）的數量，從而改善離子遷移率和傳輸電導率。ABAPE 也成功參與了 Na+ 的第一溶劑化殼層，使得碳酸乙烯基 (EC) 和碳酸二乙酯 (DEC) 的配位數降低。ABAPE 對陽離子和陰離子的雙重作用使 Na+ 更容易脫溶劑化，鈉形貌由樹枝狀沉積變為球形沉積，促進了 Na+ 的均勻沉積。此外，ABAPE 可與電解液中的痕量水形成氫鍵，從而抑制氫氟酸（HF）的形成。這些特性在抑制電極腐蝕和促進穩定電極電解質介面層的建立方面起著至關重要的作用。組裝的 Na||Na3V2(PO4)3 電池在 -40℃實現連續穩定迴圈。這項工作為提高傳統碳酸酯基鈉離子電池電解液在極端條件下的相容性和適用性提供了可行的策略，並強調了陰離子的重要作用。



Paper link: https://doi.org/10.1002/ange.202413806

The research team led by Prof. MIAO Zhonghua publishes in *Computers and Electronics in Agriculture*: Efficient occlusion avoidance based on active deep sensing for harvesting robots

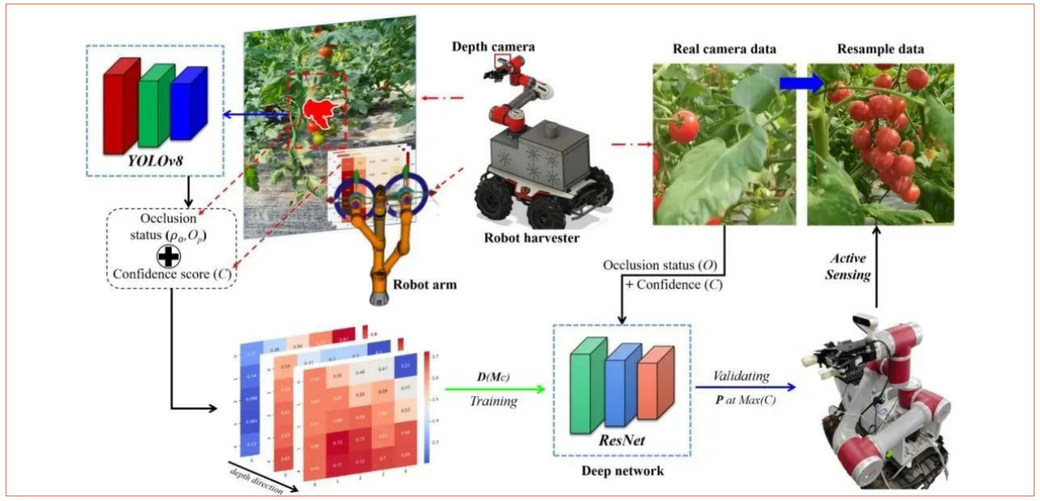
機自學院苗中華教授團隊在 *Computers and Electronics in Agriculture* 發表研究論文

Prof. MIAO Zhonghua and his research team from the School of Mechatronic Engineering and Automation, Shanghai University, have recently published a research paper titled "Efficient occlusion avoidance based on active deep sensing for harvesting robots" in *Computers and Electronics in Agriculture*, a leading international journal in the field of agricultural automation (CAS Q1).

As the issue of labor shortages in agriculture becomes increasingly severe, the development of harvesting robots is drawing urgent attention. Most robotic systems rely on visual target localization, but occlusions—commonly caused by leaves, branches, or neighboring fruits—often reduce recognition accuracy, or in severe cases, lead to complete target detection failure. Although active perception has proven effective in mitigating occlusion, determining the optimal viewpoint remains challenging, often resulting in inefficient and time-consuming repetitive actions. To address this, the research team developed an active deep sensing method tailored to harvest clustered and individual fruits, enabling more efficient and accurate perception under occluded conditions. This work offers a practical solution to improve the real-time performance and reliability of intelligent harvesting systems, contributing to the broader advancement of precision agriculture.

機自學院苗中華教授團隊在農業自動化領域國際著名期刊 *Computers and Electronics in Agriculture*（中科院一區 TOP 期刊）上發表題為"Efficient occlusion avoidance based on active deep sensing for harvesting robots"的研究論文。

隨著農業勞動力短缺問題日益加劇，收穫機器人的發展變得越來越迫切。大多數機器人需要通過視覺定位目標，但農業環境中常見的遮擋現象限制了視覺目標識別的準確性，甚至在嚴重情況下導致識別失敗。主動感知方法是一種有效手段，但如何有效找到最佳觀測位置仍然是一個難題，以避免重複無效動作所造成的時間浪費。針對這些問題，該研究團隊提出了一種用於收穫成簇和單個果實的主動深度感知方法。



Paper link: https://auto.shu.edu.cn/info/1125/79662.htm

Prof. SU Jiacan's team publishes a review paper in *Theranostics*: Bacterial extracellular vesicles-based therapeutic strategies for bone and soft tissue tumors therapy

轉化醫學研究院蘇佳燦教授研究團隊在生物醫學雜誌 *Theranostics* 發表研究成果

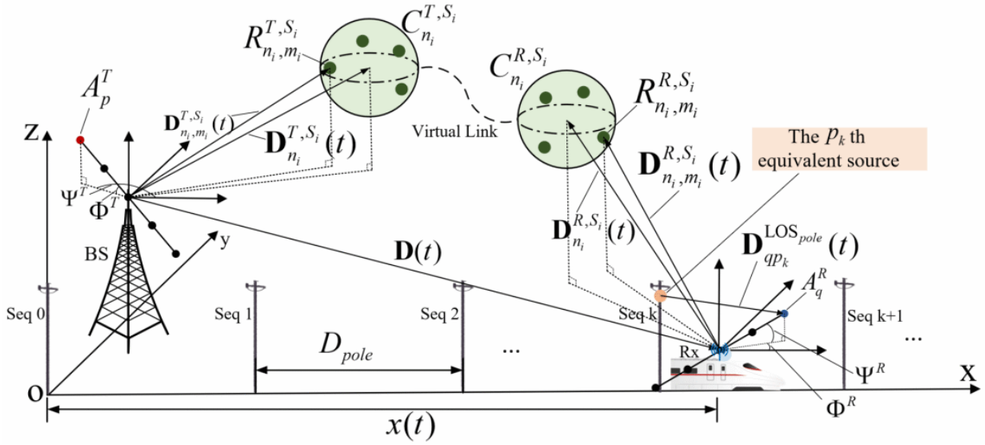
The research team led by Prof. SU Jiacan from the Institute of Translational Medicine, Shanghai University, has published a review paper in the biomedical journal *Theranostics* (2021 Impact Factor: 11.600), titled "Bacterial extracellular vesicles-based therapeutic strategies for bone and soft tissue tumors therapy." This review provides a systematic overview of the biogenesis, isolation, and purification methods and the cellular internalization mechanisms of bacterial extracellular vesicles (BEVs). It further summarizes the host sources and application strategies of BEVs in tumor therapy and explores their therapeutic potential, advantages, and challenges in treating bone and soft tissue tumors (BSTTs). A comprehensive understanding of BEVs in cancer treatment is expected to facilitate the development of innovative therapeutic strategies for BSTTs.

轉化醫學研究院蘇佳燦教授研究團隊在生物醫學雜誌 *Theranostics*（2021 IF: 11.600）發表題為"Bacterial extracellular vesicles-based therapeutic strategies for bone and soft tissue tumors therapy"的綜述文章，系統介紹了 BEVs 的生物發生機制、分離純化方法與內化機制；隨後全面總結了 BEVs 在腫瘤治療中的宿主來源與應用策略；進一步展望了 BEVs 在 BSTTs 的治療潛力及其優勢與挑戰。在腫瘤治療領域對 BEVs 的全面瞭解有助於產生更多創新的 BSTTs 治療方案。

Paper link: https://www.thno.org/v12p6576.htm

FENG Yichen publishes in *IEEE Transactions on Intelligent Transportation Systems* under the guidance of Prof. WANG Rui and Prof. ZHENG Guoxin

博士研究生馮翌宸在導師王瑞教授、鄭國莘教授指導下发表研究成果



Ph.D. student FENG Yichen from the School of Communication and Information Engineering at Shanghai University, under the guidance of Prof. WANG Rui and ZHENG Guoxin, has published a paper as the first author in *IEEE Transactions on Intelligent Transportation Systems* (*TITS*), a leading journal in the transportation field (CAS Q1, Impact Factor: 7.9). The paper is titled "A 3D Non-Stationary Small-Scale Fading Model for 5G High-Speed Train Massive MIMO Channels".

通信與資訊工程學院博士研究生馮翌宸在導師王瑞教授、鄭國莘教授的指導下，以第一作者在國際交通領域頂刊*IEEE Transactions on Intelligent Transportation Systems*（中科院一區期刊，影響因數：7.9）上發表題為"A 3D Non-Stationary Small-Scale Fading Model for 5G High-Speed Train Massive MIMO Channels"的研究論文。

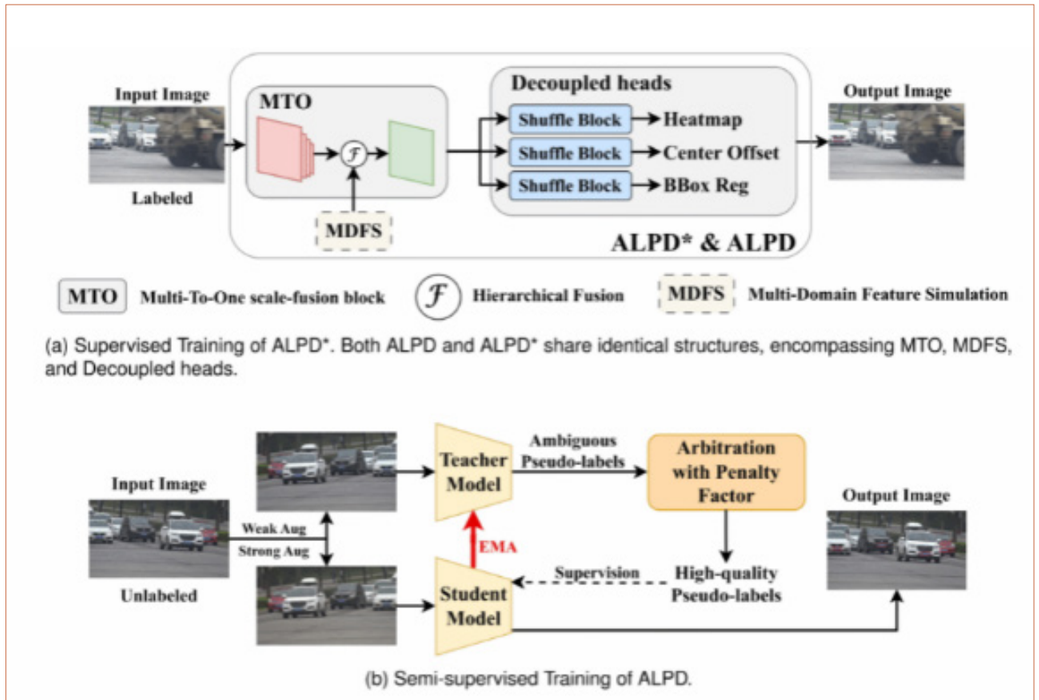
Paper link: https://ieeexplore.ieee.org/document/10570352

PENG Zhongxing publishes in *IEEE Transactions on Intelligent Transportation Systems* (*TITS*) under the guidance of Prof. XU Shugong

碩士研究生彭中星在導師指導下在 *TITS* 发表研究成果

Peng Zhongxing, a master's student from the School of Communication and Information Engineering at Shanghai University, has recently published a research article as first author in *IEEE Transactions on Intelligent Transportation Systems* (*TITS*), a leading journal in the field of intelligent transportation systems (CAS Q1, Impact Factor: 7.9). The paper, titled "Toward Reliable License Plate Detection in Varied Contexts: Overcoming the Issue of Undersized Plate Annotations".

通信與資訊工程學院碩士研究生彭中星在導師徐樹公教授的指導下，以第一作者在國際智慧交通領域頂刊*IEEE Transactions on Intelligent Transportation Systems*（*TITS*，中科院一區期刊，影響因數：7.9）上發表研究論文。論文題為"Toward Reliable License Plate Detection in Varied Contexts: Overcoming the Issue of Undersized Plate Annotations"。



(a) Supervised Training of ALPD*. Both ALPD and ALPD* share identical structures, encompassing MTO, MDFS, and Decoupled heads.

(b) Semi-supervised Training of ALPD.

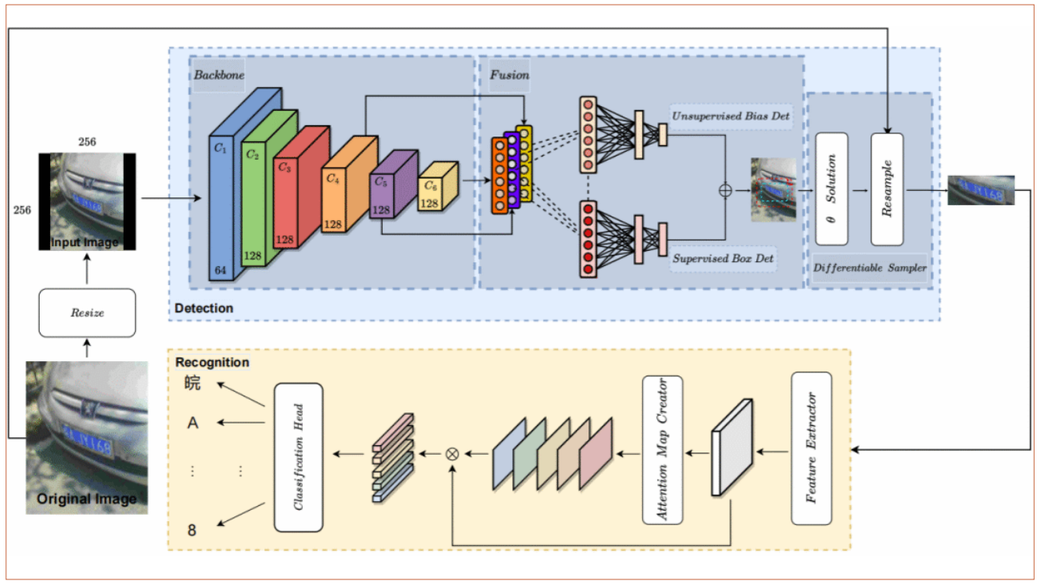
Paper link: https://ieeexplore.ieee.org/document/10598829

GAO Yinlin publishes his second paper in *IEEE Transactions on Intelligent Transportation Systems* (*TITS*) under the guidance of Prof. XU Shugong

博士研究生高一麟在導師指導下在 *TITS* 再次发表研究成果

Gao Yilin, a PhD student from the School of Communication and Information Engineering at Shanghai University, has published his second research paper as the first author in *IEEE Transactions on Intelligent Transportation Systems* (*TITS*), a top-tier journal in the field of intelligent transportation (CAS Q1, Impact Factor: 7.9). The new article is titled "Toward Unified End-to-End License Plate Detection and Recognition for Variable Resolution Requirements."

通信與資訊工程學院博士研究生高一麟在導師徐樹公教授的指導下，以第一作者在國際智慧交通領域頂刊 *IEEE Transactions on Intelligent Transportation Systems* (*TITS*，中科院一區期刊，影響因數：7.9) 第二次發表研究論文。新論文題為"Toward Unified End-to-End License Plate Detection and Recognition for Variable Resolution Requirements"。



Paper link: https://ieeexplore.ieee.org/abstract/document/10457971

Associate Prof. XU Xiaoshu publishes in *Journal of Comparative Economics*: Bureaucracy–business relationship, corruption and the implications for Marketization

經濟學院產經中心徐曉書副教授在 *Journal of Comparative Economics* 發表学术论文

ELSEVIER

Journal of Comparative Economics

Volume 52, Issue 3, September 2024, Pages 634-644

Bureaucracy-business relationship, corruption and the implications for marketization ☆

Shaoqing Huang [a] ✉, Weisi Xie [b] ✉, Xiaoshu Xu [c] ✉

[a] Antai College of Economics and Management, Shanghai Jiao Tong University, China
[b] The Economist Group, China
[c] School of Economics, Shanghai University, China

A research article titled "Bureaucracy–business relationship, corruption and the implications for marketization", authored by Associate Professor Xu Xiaoshu from the Center for Industrial Economics, School of Economics, Shanghai University, has been published in the *Journal of Comparative Economics*, a leading journal in the field of institutional and transitional economics. Associate Professor Xu served as the corresponding author of the paper. The findings yield valuable insights for guiding market reforms in countries with underdeveloped institutional systems.

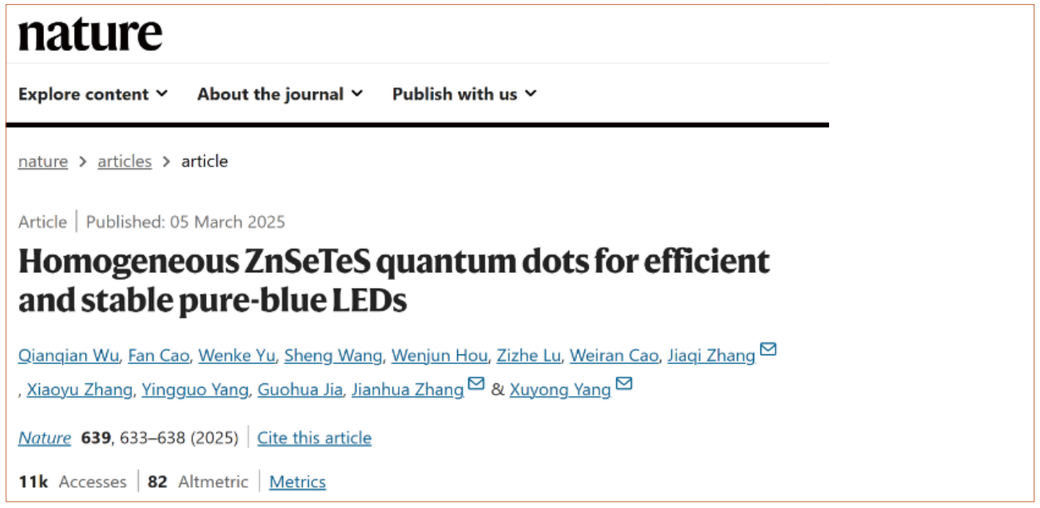
由經濟學院產經中心徐曉書副教授擔任通訊作者的論文 Bureaucracy–business relationship, corruption and the implications for

marketization（《政企關係、腐敗及其對市場化進程的影響》）在 *Journal of Comparative Economics* 發表。該文為制度薄弱國家的市場化進程提供了新穎且富有洞察力的啟示。

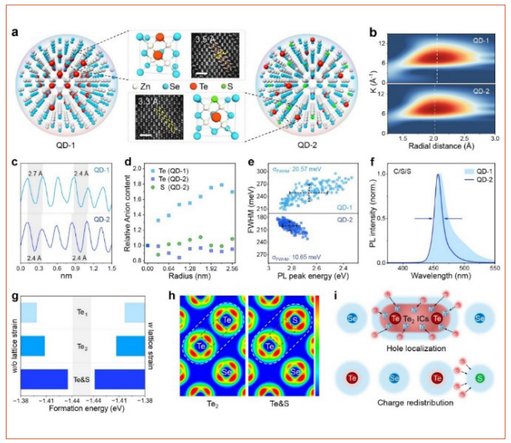
Paper link: https://doi.org/10.1016/j.jce.2024.06.004

The research teams led by Prof. YANY Xuyong and Prof. ZHANG Jianhua, in collaboration with Prof. ZHANG Jiaqi from Jilin University, publish the latest research in *Nature*: Homogeneous Zn-SeTeS Quantum Dots for Efficient and Stable Pure-Blue LEDs

楊緒勇教授和張建華教授團隊聯合吉林大學張佳旗教授團隊在 *Nature* 發表最新成果

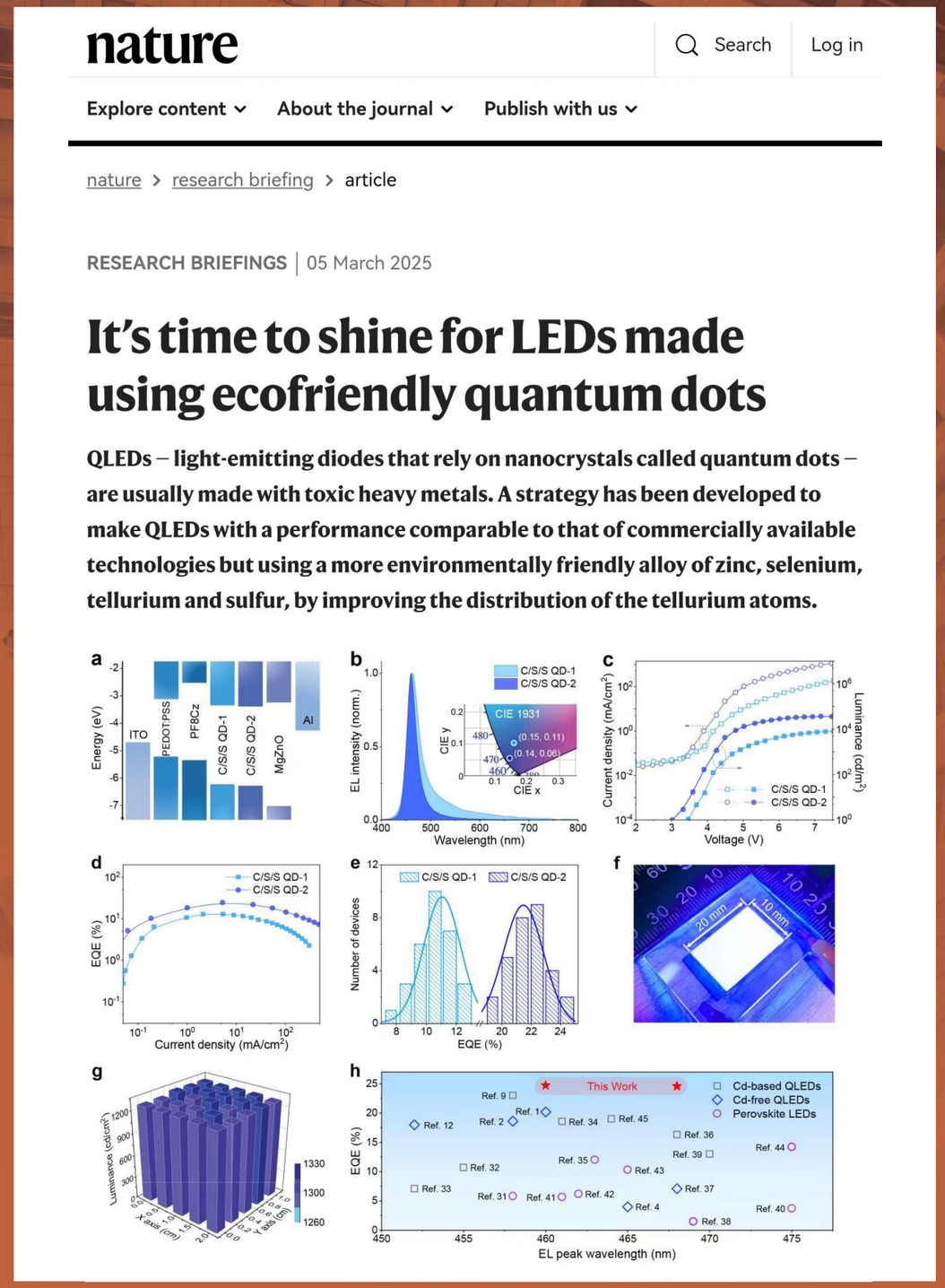


The research teams led by Prof. YANY Xuyong and Prof. ZHANG Jianhua from the Key Laboratory of Advanced Display and System Applications of Ministry of Education, Shanghai University, in collaboration with Prof. ZHANG Jiaqi from Jilin University, has published a breakthrough research article on environmentally friendly blue quantum dot light-emitting diodes (QLEDs) in the top academic journal *Nature*. The paper is titled: "Homogeneous ZnSeTeS Quantum Dots for Efficient and Stable Pure Blue LEDs".



上海大學新型顯示技術及應用集成教育部重點實驗室楊緒勇教授、張建華教授團隊聯合吉林大學張佳旗教授團隊以"Homogeneous ZnSeTeS Quantum Dots for Efficient and Stable Pure-Blue LEDs"為題，在國際頂級學術期刊*Nature* 發表關於環保型藍光量子點發光二極體（QLEDs）的突破性研究文章。

Paper link: https://www.nature.com/articles/s41586-025-08645-4



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