

# Materials Horizons

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### Cover

See Jing Wang, Yatao Zhang *et al.*, pp. 923–929. Image reproduced by permission of Jing Wang from *Mater. Horiz.*, 2024, 11, 923.



### Inside cover

See I-Chi Lee, Yi-Chen Ethan Li, Mei-Hwa Lee, Hung-Yin Lin *et al.*, pp. 876–902. Image reproduced by permission of Hung-Yin Lin from *Mater. Horiz.*, 2024, 11, 876.

## EDITORIAL

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**Materials Horizons Emerging Investigator Series:**  
Professor Dr Hai-Bo Zhao, National Engineering Laboratory for Eco-Friendly Polymer Materials (Sichuan), College of Chemistry, Sichuan University

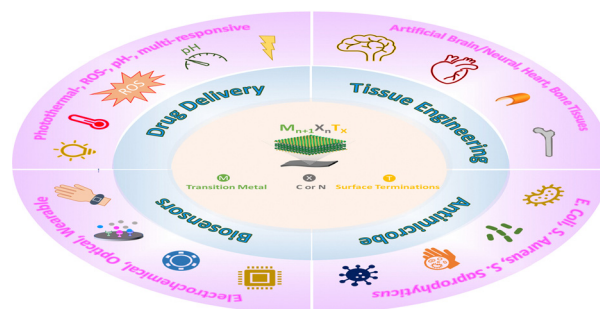


## REVIEWS

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### Recent advances using MXenes in biomedical applications

I-Chi Lee,\* Yi-Chen Ethan Li,\* James L. Thomas, Mei-Hwa Lee\* and Hung-Yin Lin\*



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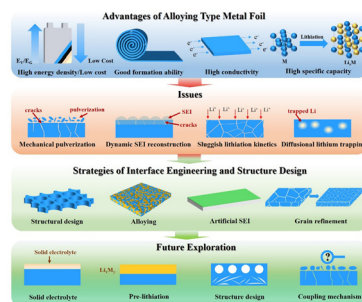


## REVIEWS

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## The interface engineering and structure design of an alloying-type metal foil anode for lithium ion batteries: a review

Rui Wang, Song Sun, Chunyi Xu, Jiazhen Cai, Huiyang Gou, Xin Zhang\* and Gongkai Wang\*

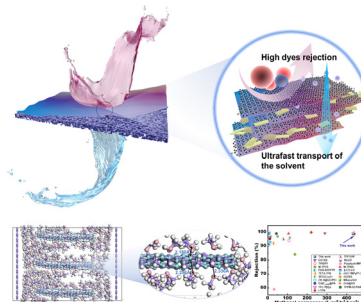


## COMMUNICATIONS

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## Polymer carbon nitride nanosheet-based lamellar membranes inspired by “couple hardness with softness” for ultrafast molecular separation in organic solvents

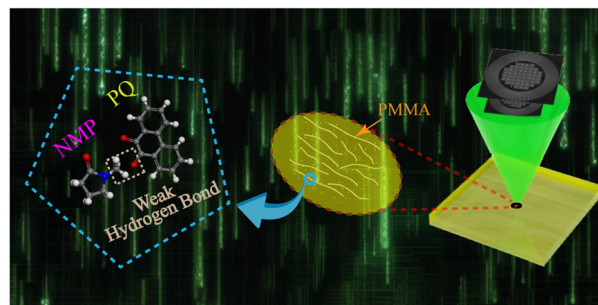
Zhipeng Yan, Liqian Zhang, Yudong Sang, Dongyang Li, Jingtao Wang, Jing Wang\* and Yatao Zhang\*



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## Highly sensitive and repeatable recording photopolymer for holographic data storage containing *N*-methylpyrrolidone

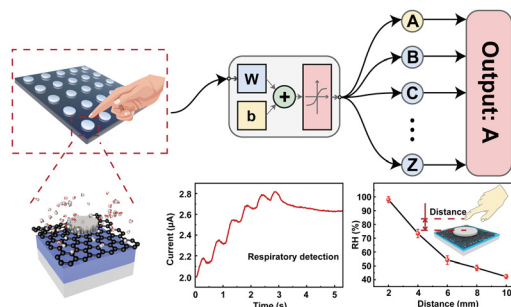
Junchao Jin, Po Hu, Haiyang Song, Jinhong Li, Junhui Wu, Zeyi Zeng, Qingdong Li, Li Wang, Xiao Lin\* and Xiaodi Tan\*



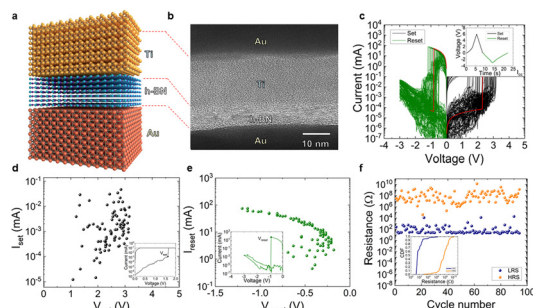
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## An in-sensor humidity computing system for contactless human–computer interaction

Meng Qi, Runze Xu, Guanglong Ding, Kui Zhou, Shirui Zhu, Yanbing Leng, Tao Sun, Ye Zhou and Su-Ting Han\*



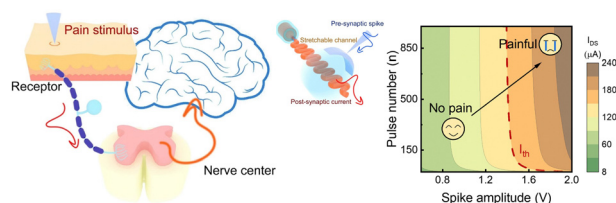
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### 3D simulation of conductive nanofilaments in multilayer h-BN memristors via a circuit breaker approach

D. Maldonado, A. Cantudo, F. M. Gómez-Campos, Yue Yuan, Yaqing Shen, Wenwen Zheng, M. Lanza\* and J. B. Roldán\*

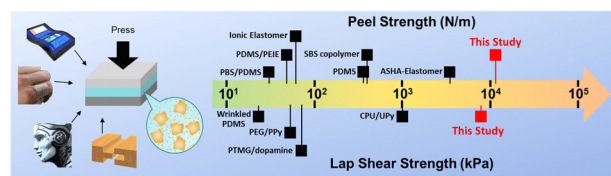
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### Stretchable and neuromorphic transistors for pain perception and sensitization emulation

Yutong Xu, Dapeng Liu, Shilei Dai, Junyao Zhang, Ziyi Guo, Xu Liu, Lize Xiong\* and Jia Huang\*

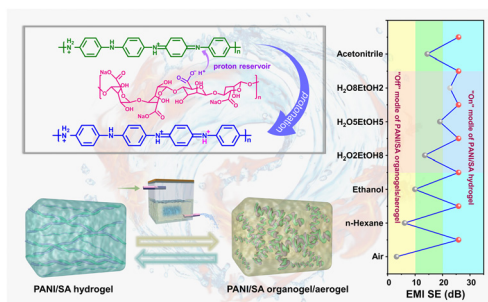
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### Ductile adhesive elastomers with force-triggered ultra-high adhesion strength

Xiao Zhao, Zoriana Demchuk, Jia Tian, Jiancheng Luo, Bingrui Li, Ke Cao, Alexei P. Sokolov, Diana Hun,\* Tomonori Saito\* and Peng-Fei Cao\*

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### Controllable proton-reservoir ordered gel towards reversible switching and reliable electromagnetic interference shielding

Yan-Qin Wang, Min Cao, Bo-Wen Liu, Fu-Rong Zeng, Qiang Fu, Hai-Bo Zhao\* and Yu-Zhong Wang\*

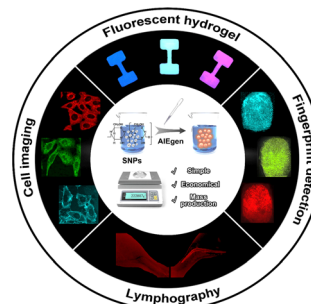




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## A facile strategy for the large-scale preparation of starch-based AIE luminescent nanoaggregates via host–guest interactions and their versatile applications

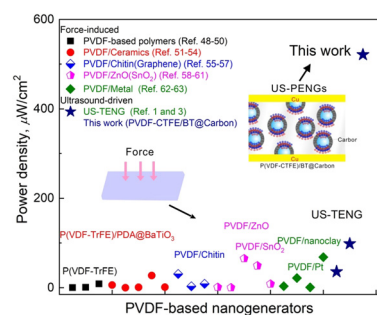
Yupeng Shi, Yaning Xia, Mengyang Zhou, Qiuna Shi, Li Meng, Chuen Kam, Hui Gao, Jingliang Cheng, Ben Zhong Tang, Sijie Chen\* and Engui Zhao\*



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## High-performance sono-piezoelectric nanocomposites enhanced by interfacial coupling effects for implantable nanogenerators and actuators

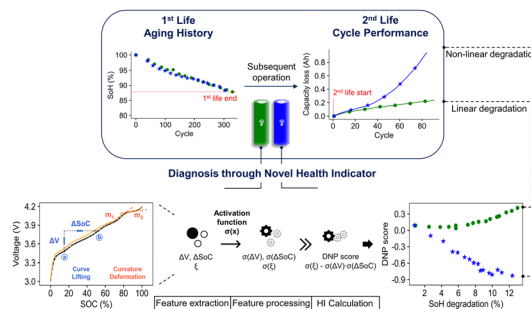
Yingxin Chen, Jingchao Shi, Guowei Yang, Ning Zhu, Lei Zhang, Dexin Yang, Ni Yao, Wentao Zhang, Yongshuang Li, Qiyun Guo, Yuxiang Wang, Yan Wang, Tao Yang, Xiaolian Liu and Jian Zhang\*



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## Diagnosis of high-Ni NCA/Gr-Si cells before rapid capacity drop by monitoring the heterogeneous degradation

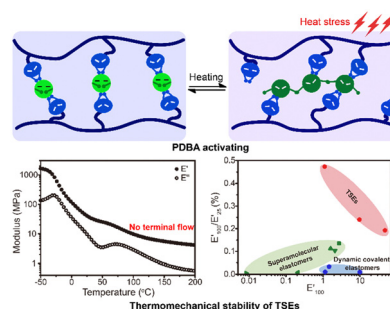
Taeyoung Kim, Soobin Park, JunWoo Bae, DaWoon Jung, Hansu Cheon, Wang-geun Lee\* and Yunseok Choi\*



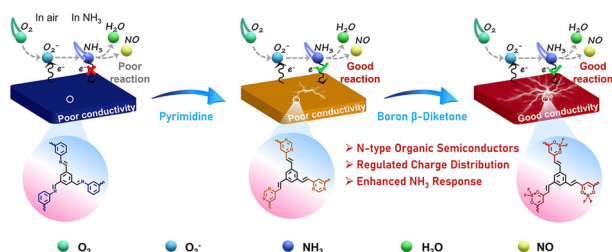
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## Thermomechanically stable supramolecular elastomers inspired by heat shock proteins

Qi Wu, Hui Liu, Hui Xiong, Yujia Hou, Yan Peng, Lijuan Zhao and Jinrong Wu\*



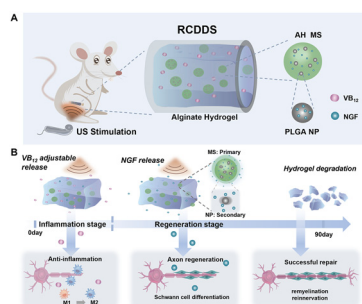
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### n-Type boron $\beta$ -diketone-containing conjugated polymers for high-performance room temperature ammonia sensors

Weichen Song, Jiankun Sun, Qian Wang, Han Wu, Kunpeng Zheng, Binbin Wang, Zhong Wang and Xiaojing Long\*

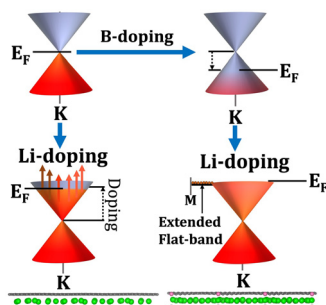
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### A responsive cascade drug delivery scaffold adapted to the therapeutic time window for peripheral nerve injury repair

Yizhu Shan, Lingling Xu, Xi Cui, Engui Wang, Fengying Jiang, Jiaxuan Li, Han Ouyang, Tailang Yin, Hongqing Feng,\* Dan Luo,\* Yan Zhang\* and Zhou Li\*

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### High density electron doping in boron-doped twisted bilayer graphene: a ladder to extended flat-band

Khagesh Tanwar,\* Xi Wu,\* Xin Tan, Sean C. Smith, Jia Li\* and Ying (Ian) Chen\*

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### Functional polymeric molecules for performing autonomous synthesis of particles with core-shell structures and customizable shapes

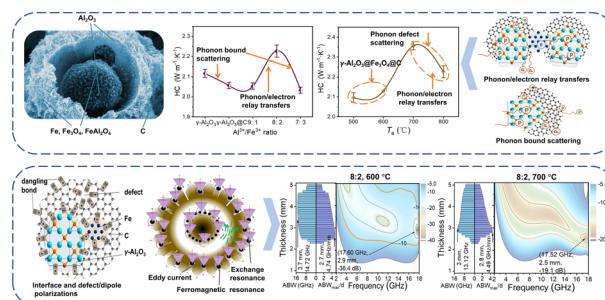
Linfeng Chen, Han Rou Low, Yan Jiang, Wan Yu Zhang, Chi Kit Ao, Yan Jie Neriah Tan, Kang Hui Lim and Siowling Soh\*



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## Constructing magnetic/dielectric dual loss and phonon/electron thermal carriers $\gamma$ - $\text{Al}_2\text{O}_3$ -based yolk-shell microspheres to collaboratively advance microwave absorption and heat conduction

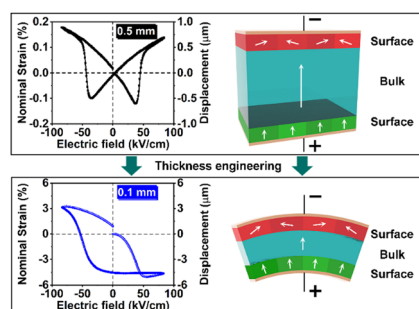
Kang Fu, Qibin Yao, Lingling Xu, Wanyi Zhou, Zijian Wang, Yujia Yang, Guoxiu Tong,\* Xiaojuan Wang and Wenhua Wu



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## Ultra-large electromechanical deformation in lead-free piezoceramics at reduced thickness

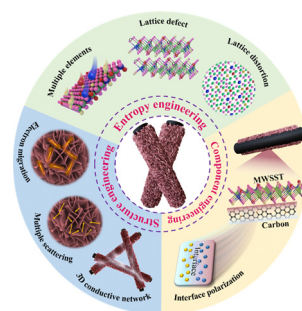
Xiang He, Muzaffar Ahmad Boda, Chen Chen, Rongmin Dun, Lu Wang, Yizheng Bao, Dongfang Pang, Lin Guo, Huarong Zeng, Yongxiang Li and Zhiguo Yi\*



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## Entropy engineering enhances the electromagnetic wave absorption of high-entropy transition metal dichalcogenides/N-doped carbon nanofiber composites

Shipeng Wang, Qiangchun Liu, Shikuo Li,\* Fangzhi Huang\* and Hui Zhang\*



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## Kirkendall effect induced ultrafine VOOH nanoparticles and their transformation into $\text{VO}_2(\text{M})$ for energy-efficient smart windows

Liangfei Wu, Antonio Teng, Ming Li,\* Liang Li, Zhulin Huang, Xinyang Li, Jie Yu, Sichao Xu, Fengxia Zou, Andy Zou, Jinghui Zhang, Tao Jiang, Ye Xin, Xiaoye Hu\* and Guanghai Li\*

