

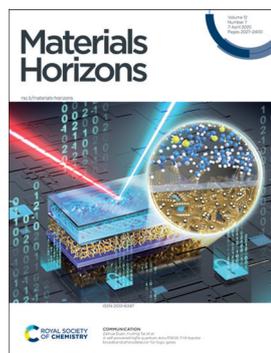
Materials Horizons

rsc.li/materials-horizons

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2051-6347 CODEN MHAOAL 12(7) 2027-2400 (2025)



Cover

See Zaihua Duan, Hailing Tai *et al.*, pp. 2179–2186. Image reproduced by permission of Zaihua Duan from *Mater. Horiz.*, 2025, 12, 2179.



Inside cover

See Kepeng Song, Weiming Lv, Limei Zheng *et al.*, pp. 2187–2196. Image reproduced by permission of Kepeng Song from *Mater. Horiz.*, 2025, 12, 2187.

EDITORIALS

2038

Materials Horizons Emerging Investigator Series:
Dr Dibyajyoti Ghosh and Dr Satyaprasad P. Senanayak, Indian Institute of Technology, Delhi and National Institute of Science Education and Research, India



2040

Emerging horizons in polymer applications

Calum T. J. Ferguson and Kostas Parkatzidis



**GOLD
OPEN
ACCESS**

EES Batteries

**Exceptional research on
batteries and energy storage**

Part of the EES family



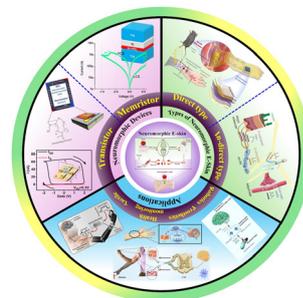
**Join
in** | Publish with us
rsc.li/EESBatteries

REVIEWS

2045

Neuromorphic devices for electronic skin applications

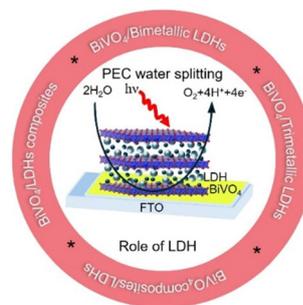
Chandrashekhar S. Patil, Sourabh B. Ghode, Jungmin Kim, Girish U. Kamble, Somnath S. Kundale, Abdul Mannan, Youngbin Ko, Muhammad Noman, Qazi Muhammad Saqib, Swapnil R. Patil, Seo Yeong Bae, Jin Hyeok Kim, Jun Hong Park and Jinho Bae*



2089

Layered double hydroxide modified bismuth vanadate as an efficient photoanode for enhancing photoelectrochemical water splitting

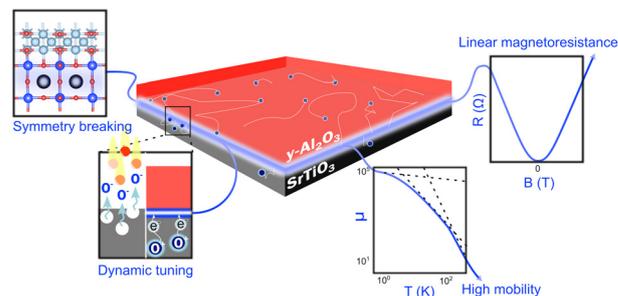
Md. Masum Billah and Go Kawamura*



2119

Unearthing the emerging properties at buried oxide heterointerfaces: the γ -Al₂O₃/SrTiO₃ heterostructure

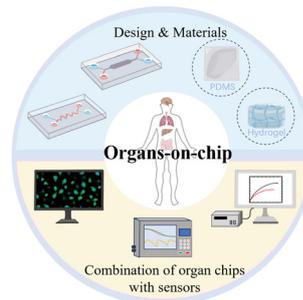
Tristan Sebastian Steegemans* and Dennis Valbjørn Christensen*



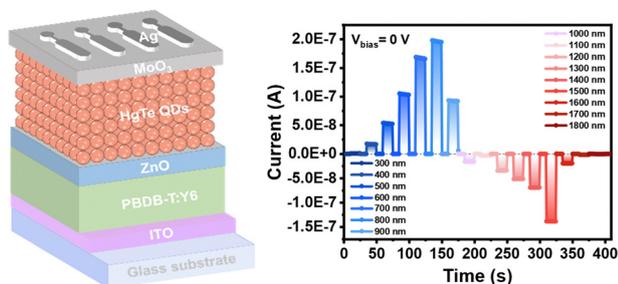
2161

Sensor-combined organ-on-a-chip for pharmaceutical and medical sciences: from design and materials to typical biomedical applications

Yumeng Liao, Danni Chai, Quan Wang, Xueqi Wang, Qian Yong, Zhaoming Cheng, Chuanjun Zhang, Di Zhang, Boshi Liu,* Rui Liu* and Zheng Li*



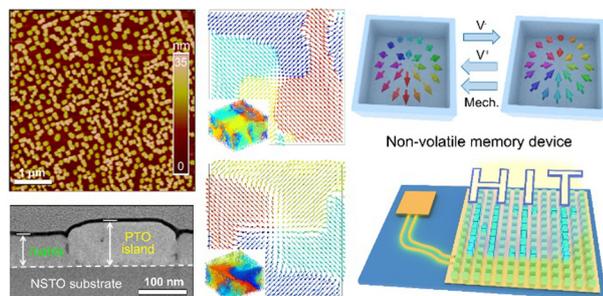
2179



A self-powered HgTe quantum dots/PBDB-T:Y6 bipolar broadband photodetector for logic gates

Wenxin Zeng, Zaihua Duan,* Yichen Bu, Haichao Yu, Changhong Wang, Xing Tang, Jingwen Yang, Zhen Yuan, Yadong Jiang and Huiling Tai*

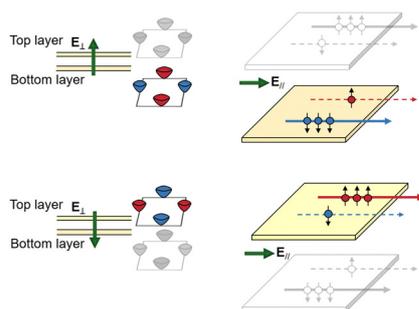
2187



Polar topology in self-assembled PbTiO₃ ferroelectric nano-islands

Jie Wang, Chao Yang, Dongqing Qi, Ning Lu, Chuanhui Chen, Gang Tian, Hong Fang, Kepeng Song,* Weiming Lv* and Limei Zheng*

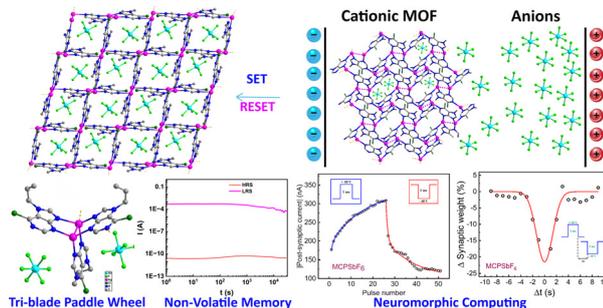
2197



All-electrical layer-spintronics in altermagnetic bilayers

Rui Peng,* Jin Yang, Lin Hu, Wee-Liat Ong, Pin Ho, Chit Siong Lau, Junwei Liu and Yee Sin Ang*

2208



Silver-purine MOFs for high-performance multi-terminal neuromorphic memory

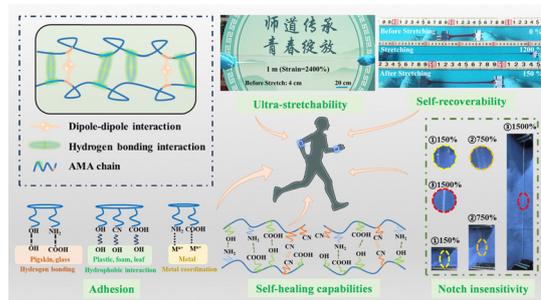
Subhra Jyoti Panda, Kanha Ram Khator, Priyanka Deswal, Shashwat Nayak, Durgesh Pandey, Suraj K. Patel, Suraj Kumar Agrawalla, Dibyajyoti Ghosh,* Satyaprasad P. Senanayak* and Chandra Shekhar Purohit*



2223

Ultra-stretchable, self-recoverable, notch-insensitive, self-healable and adhesive hydrogel enabled by synergetic hydrogen and dipole–dipole crosslinking

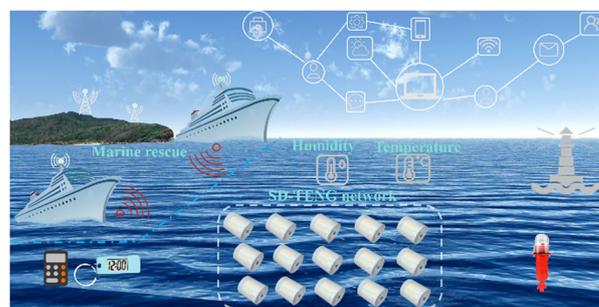
Wanting Yuan, Yi He, Qianqian Liang, Hongyi Lv, Ziqi Wang, Haitao Wu, Jinrong Wu, Lijuan Zhao* and Yi Wang*



2234

High-performance triboelectric nanogenerator employing a swing-induced counter-rotating motion mechanism and a dual potential energy storage and release strategy for wave energy harvesting

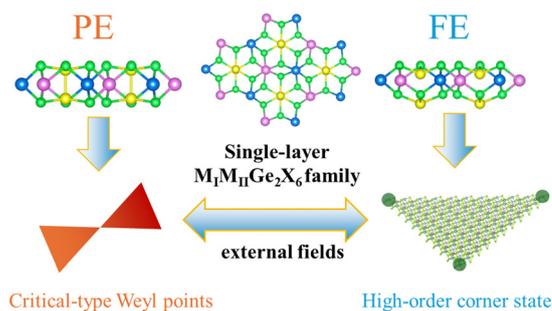
Feixiang Wang, Bao Cao, Leilei Shu, Zhe Li, Wen He, Zhongzhu Wang and Peihong Wang*



2248

Controllable topological phase transition via ferroelectric–paraelectric switching in a ferromagnetic single-layer $M_1M_{II}Ge_2X_6$ family

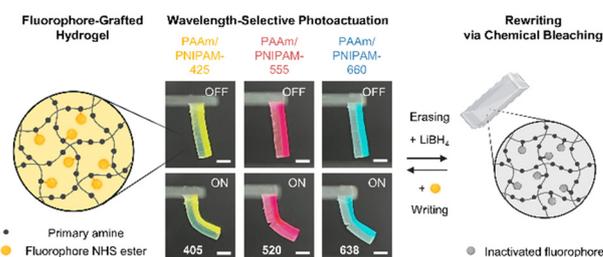
Jingbo Bai, Tie Yang, Zhenzhou Guo,* Ying Liu, Yalong Jiao, Weizhen Meng* and Zhenxiang Cheng*



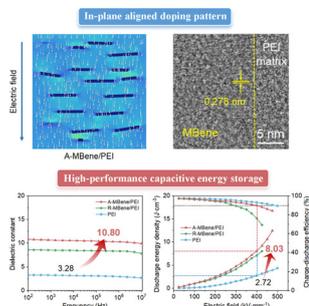
2255

Rewritable wavelength-selective hydrogel actuators grafted with fluorophores

Hye Been Koo, Haemin Yeon, Young Bin Yoon, Taek-Jun Lee, Young-Tae Chang and Jae-Byum Chang*



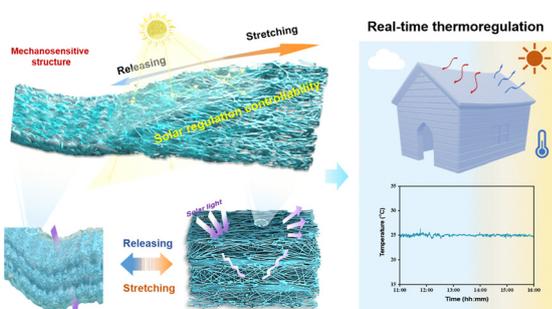
2267



In-plane aligned doping pattern in electrospun PEI/MBene nanocomposites for high-temperature capacitive energy storage

Sidi Fan, Ding Ai, Wenqi Zhang, Rui Yang, Guangyi Shen, Xiao Yang, Yonghong Cheng* and Xiang Yu*

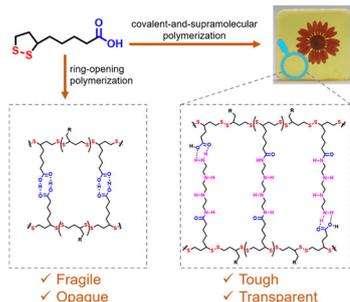
2279



Mechanosensitive stacking structure with continuous solar controllability for real-time thermal management

Richu Luo, Baiqi Song, Haixing Jiao, Qian Zhang,* Fangling Li, Xiaofang Zhang* and Weilin Xu

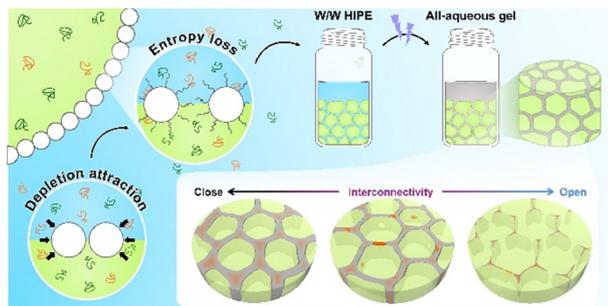
2287



Supramolecular transparent plastic engineering via covalent-and-supramolecular polymerization

Yunfei Zhang, Changyong Cai,* Zhiyuan Guo, Xing Li,* Gai Zhao* and Shengyi Dong*

2298



Processable and controllable all-aqueous gels based on high internal phase water-in-water emulsions

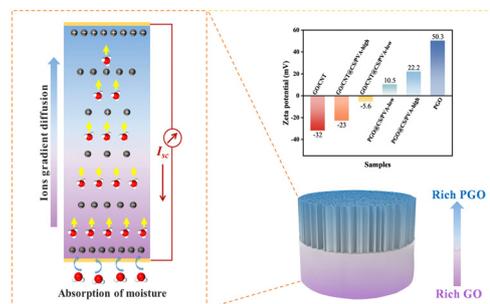
EunSuk Lee, YoungSeon Jo, YeRin Kim, Hojoon Yoon, SeoYoung Choi, Baekmin Q. Kim, Subeen Kim and KyuHan Kim*



2309

A self-sustained moist-electric generator with enhanced energy density and longevity through a bilayer approach

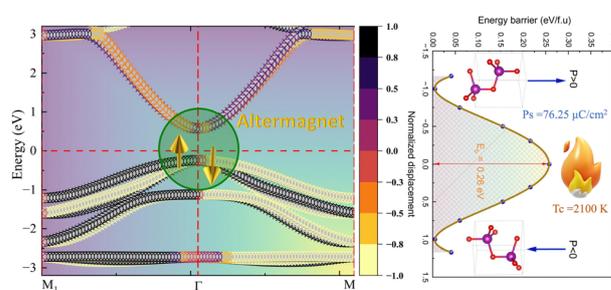
Jie Chen, Xuezhong Zhang, Minhan Cheng, Qianyang Li, Shuaijiang Zhao, Mao Zhang, Qiang Fu and Hua Deng*



2319

Coexistence of altermagnetism and robust ferroelectricity in a bulk MnO wurtzite structure

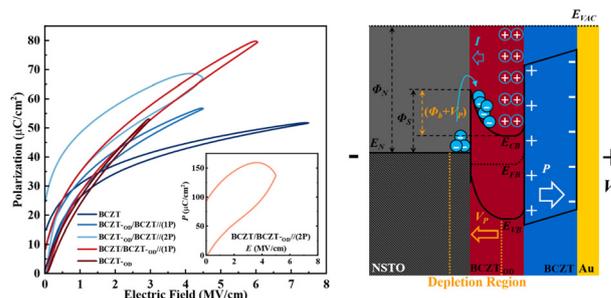
Imran Khan, Djamel Bezzerga and Jisang Hong*



2328

Boosting the energy storage performance of BCZT-based capacitors by constructing a Schottky contact

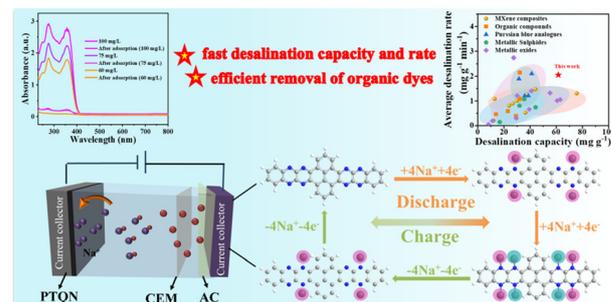
Zixiong Sun,* Haoyang Xin, Liming Diwu, Zhanhua Wang,* Ye Tian, Hongmei Jing, Xiuli Wang, Wanbiao Hu, Yongming Hu* and Zhuo Wang*



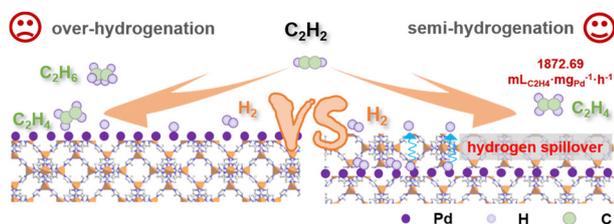
2341

A ladder-type organic molecule with pseudocapacitive properties enabling superior electrochemical desalination

Yujie Cui, Yueheng Tao, Jun Yang,* Houxiang Wang, Peipei Zhang, Guangxing Li, Minjie Shi* and Edison Huixiang Ang*



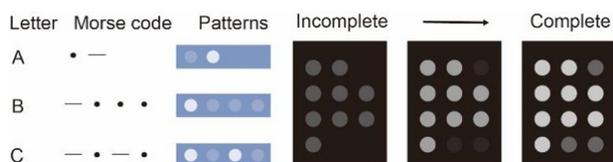
2351



Acetylene semi-hydrogenation catalyzed by Pd single atoms sandwiched in zeolitic imidazolate frameworks *via* hydrogen activation and spillover

Yan-Ting Li, Wen-Gang Cui, Ying-Fei Huo, Lei Zhou, Xinqiang Wang, Fan Gao, Qiang Zhang, Wei Li and Tong-Liang Hu*

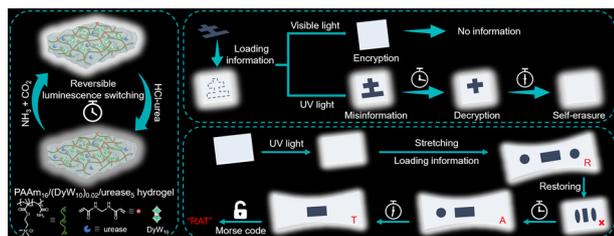
2360



Long-chain crosslinker-induced patterning on an elastic polymer film for robust and reversible information encryption/decryption

Qitong He, Qiuhua Zhao and Lidong Zhang*

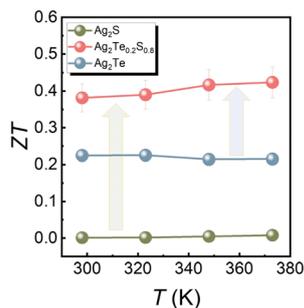
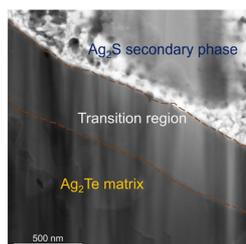
2369



Lanthanide–polyoxometalate-based self-erasing luminescent hydrogels with time-dependent and resilient properties for advanced information encryption

Yumei Hua, Jingfang Li,* Min Gao, Liye Liang, Sicong Zhao and Guangming Li*

2380



Solvothermally optimizing Ag₂Te/Ag₂S composites with high thermoelectric performance and plasticity

Min Zhu, Xiao-Lei Shi, Meng Li, Hao Wu, De-Zhuang Wang, Liang-Cao Yin, Ting Wu, Wei-Di Liu, Yan Huang, Zhi-Gang Chen* and Qingfeng Liu*



2389

Ultimate water capillary evaporation in bamboo-inspired evaporator

Kefan Shi, Marliyana Aizudin, Meilan Pan* and Edison Huixiang Ang*

