

# Materials Horizons

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### Cover

See Moin Khwaja and Takuya Harada, pp. 4311–4320. Image reproduced by permission of Moin Khwaja from *Mater. Horiz.*, 2024, 11, 4311.



### Inside cover

See Bhagya Dharmasiri, Luke C. Henderson *et al.*, pp. 4321–4328. Image reproduced by permission of Luke Henderson from *Mater. Horiz.*, 2024, 11, 4321.

## EDITORIAL

4237

**Materials Horizons Emerging Investigator Series: Dr Bhagya Dharmasiri, Deakin University, Australia**

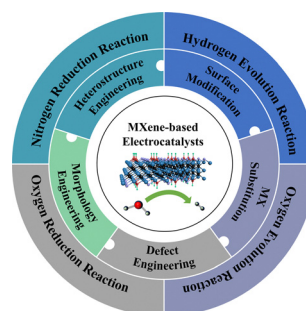


## REVIEWS

4239

**Advances and challenges in MXene-based electrocatalysts: unlocking the potential for sustainable energy conversion**

Lei He, Haizheng Zhuang, Qi Fan, Ping Yu, Shengchao Wang, Yifan Pang, Ke Chen and Kun Liang\*



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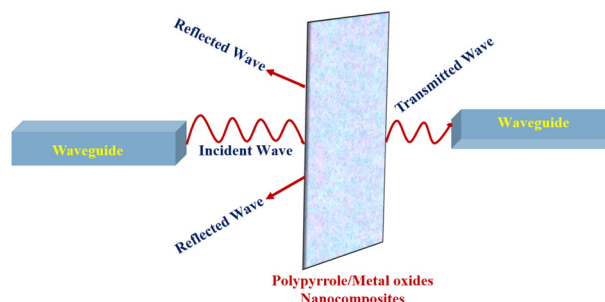
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## REVIEWS

4256

### Exploring the efficacy and future potential of polypyrrole/metal oxide nanocomposites for electromagnetic interference shielding: a review

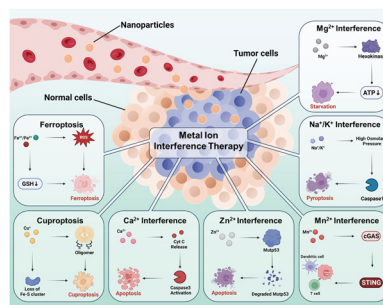
Yuvika Sood, Harish Mudila, Pankaj Chamoli, Parveen Saini\* and Anil Kumar\*



4275

### Metal ion interference therapy: metal-based nanomaterial-mediated mechanisms and strategies to boost intracellular "ion overload" for cancer treatment

Yutang Li, Yandong Wang, Li Zhao, Martina H. Stenzel\* and Yanyan Jiang\*

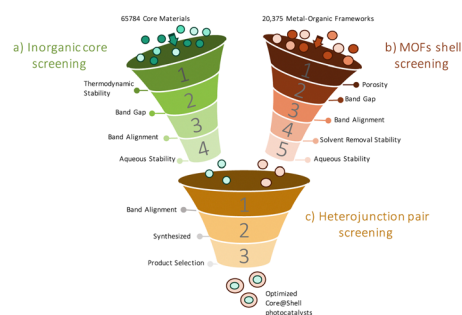


## COMMUNICATIONS

4311

### High-throughput screening of nano-hybrid metal-organic-frameworks for photocatalytic CO<sub>2</sub> reduction

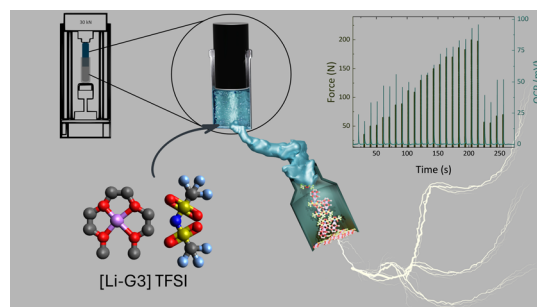
Moin Khwaja and Takuya Harada\*



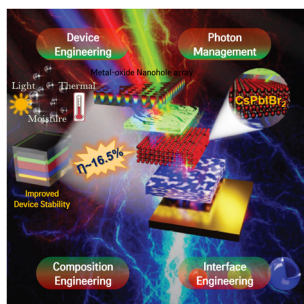
4321

### From stress to charge: investigating the piezoelectric response of solvate ionic liquid in structural energy storage composites

Žan Simon, Bhagya Dharmasiri,\* Timothy Harte, Peter C. Sherrell and Luke C. Henderson\*



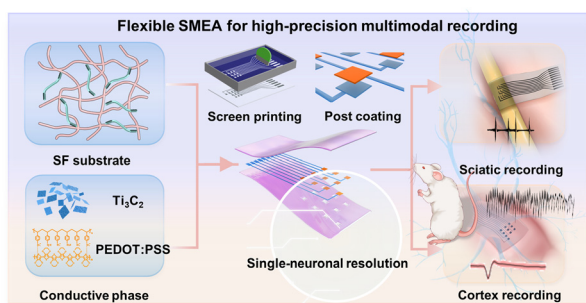
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### Revealing the full potential of CsPbI<sub>2</sub>Br<sub>2</sub> perovskite solar cells: advancements towards enhanced performance

Mohammad Ismail Hossain,\* Md. Shahiduzzaman,\* Junayed Hossain Rafij, Asman Tamang, Md. Akhtaruzzaman, Almohamadi Hamad, Jamal Uddin, Nowshad Amin, Jean-Michel Nunzi and Tetsuya Taima

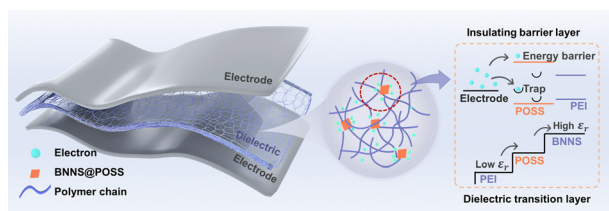
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### Flexible silk-fibroin-based microelectrode arrays for high-resolution neural recording

Jie Ding, Mingze Zeng, Yuan Tian, Zhihong Chen, Zi Qiao, Zhanwen Xiao, Chengheng Wu, Dan Wei,\* Jing Sun and Hongsong Fan\*

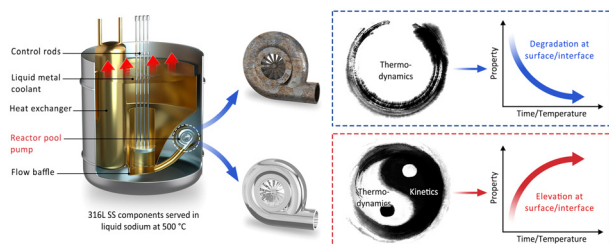
4348



### Enhancing the high-temperature energy storage properties of PEI dielectrics by constructing trap-rich covalently cross-linked networks via POSS-functionalized BNNS

Yijie Zhou, Zongwu Zhang, Qiufan Tang, Xiaoyan Ma\* and Xiao Hou

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### A self-organized sandwich structure of chromium nitride for ultra-long lifetime in liquid sodium

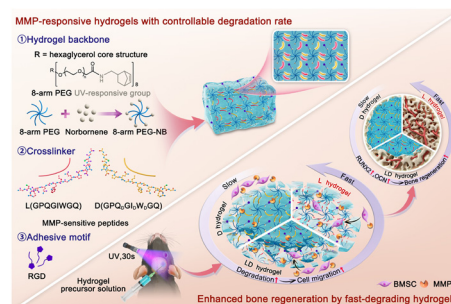
Ming Lou, Ran Chen, Kai Xu, Jibin Pu\* and Keke Chang\*



4367

### Injectable hydrogels for bone regeneration with tunable degradability *via* peptide chirality modification

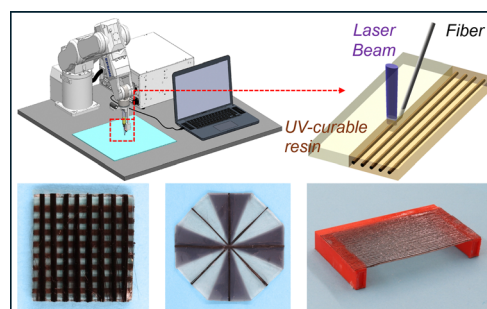
Weikai Chen, Shihao Sheng, Kai Tan, Sicheng Wang, Xiang Wu, Jiayi Yang, Yan Hu, Liehu Cao, Ke Xu, Fengjin Zhou,\* Jiacan Su,\* Qin Zhang\* and Lei Yang\*



4378

### Embedded 3D printing of UV-curable thermosetting composites with continuous fiber

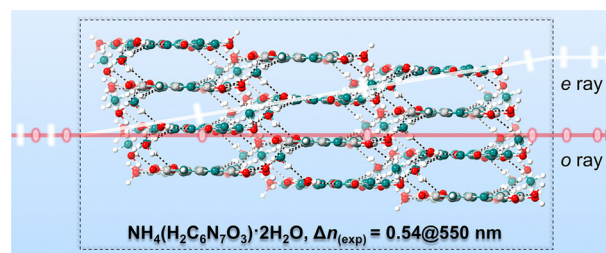
Yuchen Ding, Alston X. Gracego, Yuanrui Wang, Guoying Dong, Martin L. Dunn\* and Kai Yu\*



4393

### A highly birefringent metal-free crystal assembled by cooperative non-covalent interactions

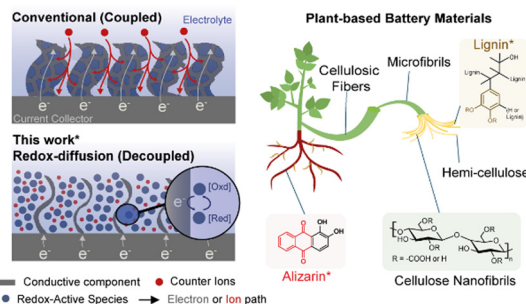
Yanqiang Li, Yang Zhou, Belal Ahmed, Qianting Xu, Weiqi Huang, Yipeng Song, Xianyu Song, Bin Chen, Junhua Luo and Sangen Zhao\*



4400

### Stretchable and biodegradable plant-based redox-diffusion batteries

Aiman Rahmanudin,\* Mohsen Mohammadi, Patrik Isacson, Yuyang Li, Laura Seufert, Nara Kim, Saeed Mardi, Isak Engquist, Reverant Crispin and Klas Tybrandt\*

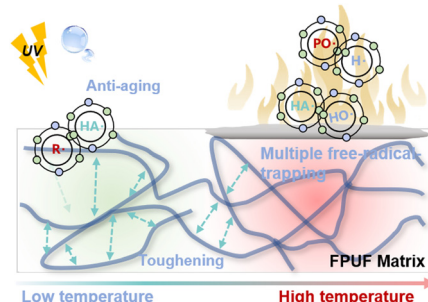




4462

### Multiple free-radical-trapping and hydrogen-bonding-enhanced polyurethane foams with long-lasting flame retardancy, aging resistance, and toughness

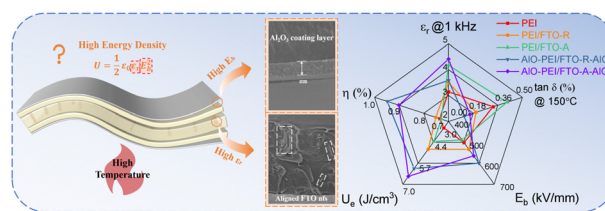
Lei He, Ming-Jun Chen,\* Fu-Rong Zeng, Ting Wang, Wei-Luo, Dan-Xuan Fang, Shuai-Qi Guo, Cong Deng, Hai-Bo Zhao\* and Yu-Zhong Wang\*



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### Magnetic-assisted alignment of nanofibers in a polymer nanocomposite for high-temperature capacitive energy storage applications

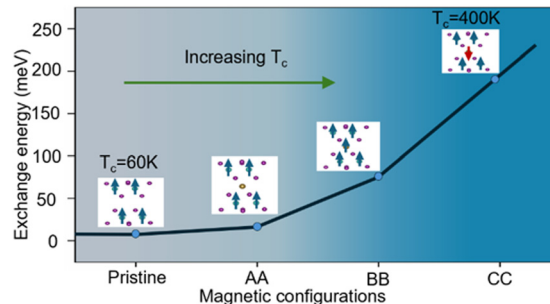
Zhi Li, Jian Wang, Junjie Zou, Shuxuan Li, Xin Zhen, Zhonghui Shen, Baowen Li, Xin Zhang\* and Ce-Wen Nan\*



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### Enhancement of interlayer exchange coupling via intercalation in 2D magnetic bilayers: towards high Curie temperature

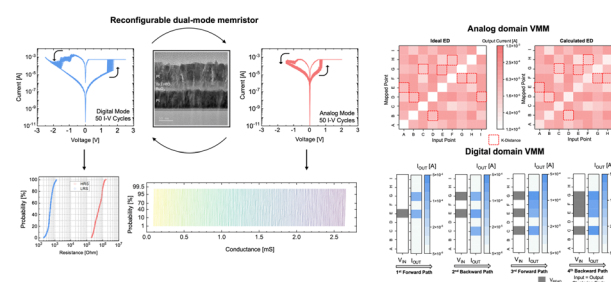
Suman Mishra, In Kee Park, Saqib Javaid, Seung Hwan Shin\* and Geunsiik Lee\*



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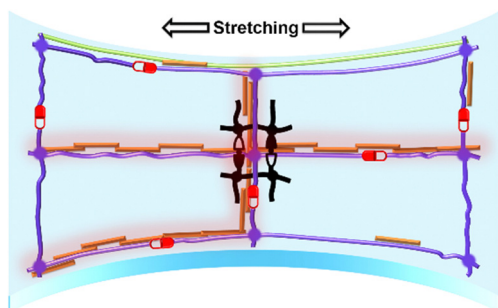
### Heterogeneous density-based clustering with a dual-functional memristive array

Dong Hoon Shin, Sunwoo Cheong, Soo Hyung Lee, Yoon Ho Jang, Taegyun Park, Janguk Han, Sung Keun Shim, Yeong Rok Kim, Joon-Kyu Han, In Kyung Baek, Néstor Ghenzi\* and Cheol Seong Hwang\*



## COMMUNICATIONS

4507

**Highly flexible yet strain-insensitive conjugated polymer**

Wen Wen Deng, Ze Ping Zhang,\* Min Zhi Rong\* and Ming Qiu Zhang\*

## CORRECTION

4519

**Correction: High-performance one-dimensional halide perovskite crossbar memristors and synapses for neuromorphic computing**

Sujaya Kumar Vishwanath,\* Benny Febriansyah, Si En Ng, Tisita Das, Jyotibdha Acharya, Rohit Abraham John, Divyam Sharma, Putu Andhita Dananjaya, Metikoti Jagadeeswararao, Naveen Tiwari, Mohit Ramesh Chandra Kulkarni, Wen Siang Lew, Sudip Chakraborty,\* Arindam Basu and Nripan Mathews\*

