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# Materials Horizons

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**Cover**
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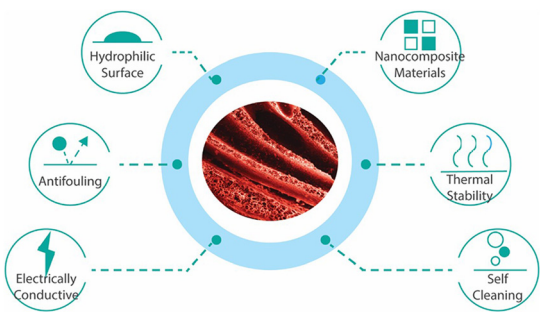
**A reflection on 'Highly dispersible polypyrrole nanospheres for advanced nanocomposite ultrafiltration membranes'**

Cheng-Wei Lin and Richard B. Kaner*



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## REVIEWS

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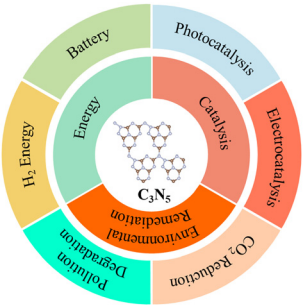
**$C_3N_5$-based nanomaterials and their applications in heterogeneous catalysts, energy harvesting, and environmental remediation**

Linfeng Xiao, Sanshuang Gao, Runhua Liao,* Yingtang Zhou,* Qingquan Kong and Guangzhi Hu*

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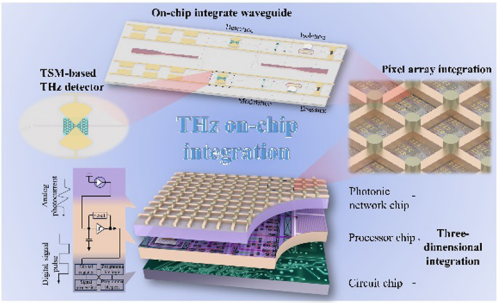
**Two-dimensional topological semimetals: an emerging candidate for terahertz detectors and on-chip integration**

Yun Li, Wenzhi Yu, Kai Zhang, Nan Cui, Tinghe Yun, Xue Xia, Yan Jiang, Guangyu Zhang, Haoran Mu* and Shenghuang Lin*

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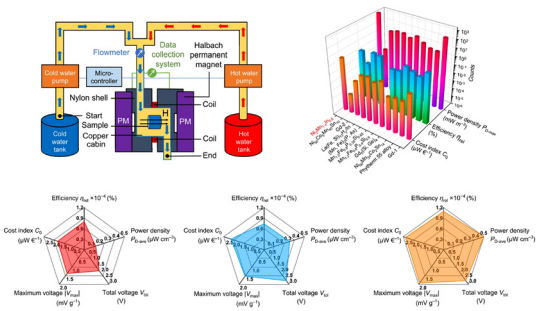
**Excellent thermomagnetic power generation for harvesting waste heat *via* a second-order ferromagnetic transition**

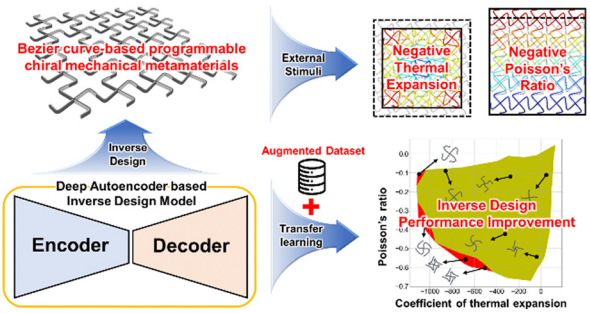
Haodong Chen, Xianliang Liu, Yao Liu, Longlong Xie, Ziyuan Yu, Kaiming Qiao, Mingze Liu, Fengxia Hu, Baogen Shen, R. V. Ramanujan, Ke Chu and Hu Zhang*




2615

**Inverse design of Bézier curve-based mechanical metamaterials with programmable negative thermal expansion and negative Poisson's ratio *via* a data augmented deep autoencoder**

Min Woo Cho, Keon Ko, Majid Mohammadhosseinzadeh, Ji Hoon Kim, Dong Yong Park, Da Seul Shin* and Sang Min Park*



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## COMMUNICATIONS

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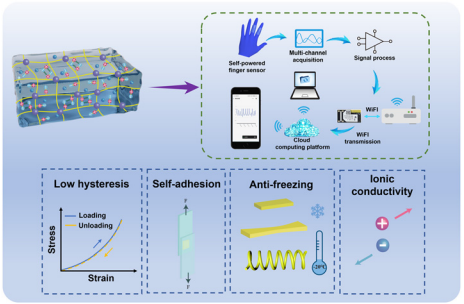


**Low hysteresis zwitterionic supramolecular polymer ion-conductive elastomers with anti-freezing properties, high stretchability, and self-adhesion for flexible electronic devices**

Hongying Wang, Baocheng Liu, Danyang Chen, Zhuoya Wang, Haolun Wang, Siyu Bao, Ping Zhang,* Jianhai Yang* and Wenguang Liu

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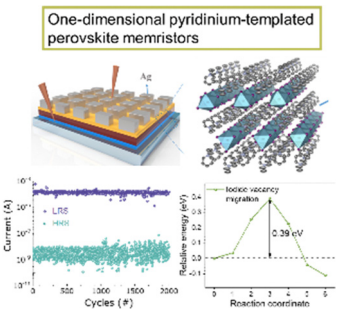


**High-performance one-dimensional halide perovskite crossbar memristors and synapses for neuromorphic computing**

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*

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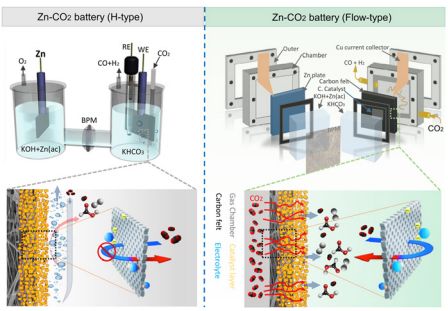


**Unlock flow-type reversible aqueous Zn–$CO_2$ batteries**

Muhammad Kashif Aslam, Herui Wang, Zhihao Nie, Sheng Chen, Qiang Li* and Jingjing Duan*

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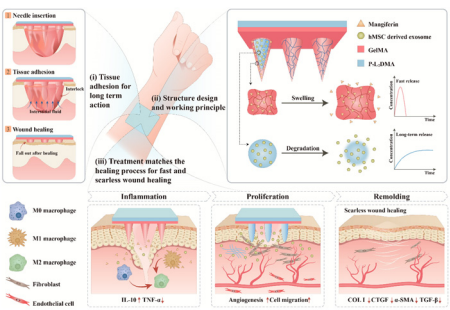


**A differential-targeting core–shell microneedle patch with coordinated and prolonged release of mangiferin and MSC-derived exosomes for scarless skin regeneration**

Shang Lyu, Qi Liu, Ho-Yin Yuen, Huizhi Xie, Yuhe Yang, Kelvin Wai-Kwok Yeung, Chak-yin Tang, Shuqi Wang, Yaxiong Liu, Bin Li,* Yong He* and Xin Zhao*


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## COMMUNICATIONS

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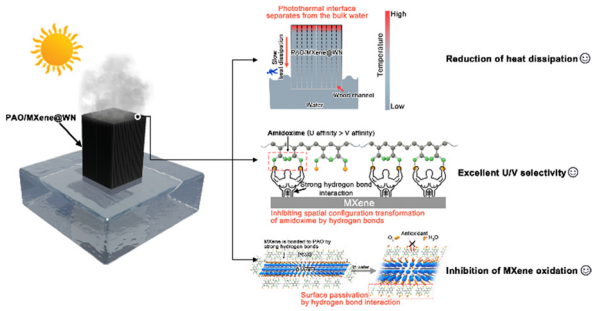
**Achieving ultrahigh uranium/vanadium selectivity of poly(amidoxime) *via* coupling MXene-enabled strong intermolecular interaction and separated photothermal interface**

Hao Ye, Ming-Bang Wu,* Qi-Hui Ye, Rou-Ming Wen, Zhang-Ting Hu, Juming Yao* and Chao Zhang*

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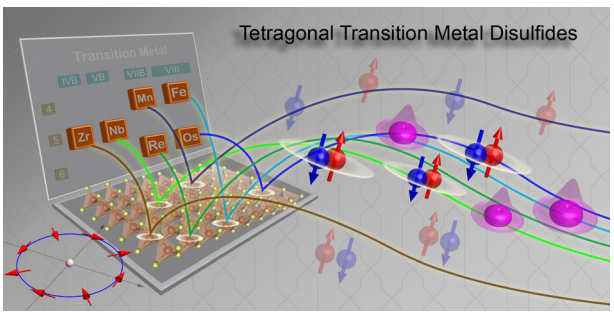
**Prediction of superconductivity in a series of tetragonal transition metal dichalcogenides**

Jiale Liu, Huidong Wang, Xiaojun Shi and Xiaoming Zhang*

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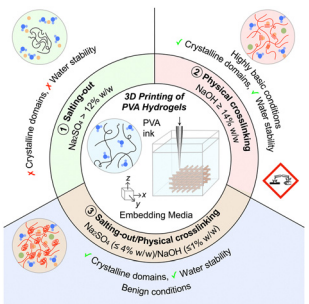
**3D printing of polyvinyl alcohol hydrogels enabled by aqueous two-phase system**

Rahul Karyappa, Nidhi Nagaraju, Kento Yamagishi, Xue Qi Koh, Qiang Zhu and Michinao Hashimoto*

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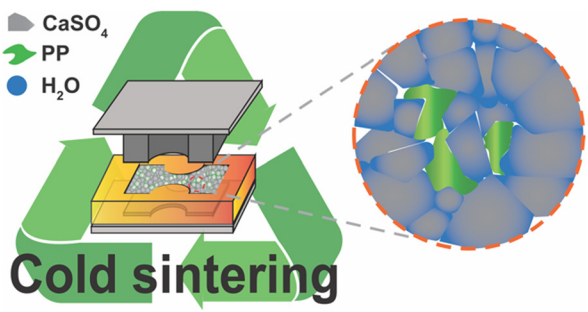
**Upcycling plastic waste into fully recyclable composites through cold sintering**

Po-Hao Lai, Shelby L. Hall, Yi-Chen Lan, Jia-Ruey Ai, Arian Jaberi, Amir Sheikhi, Rui Shi, Bryan D. Vogt* and Enrique D. Gomez*



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## COMMUNICATIONS

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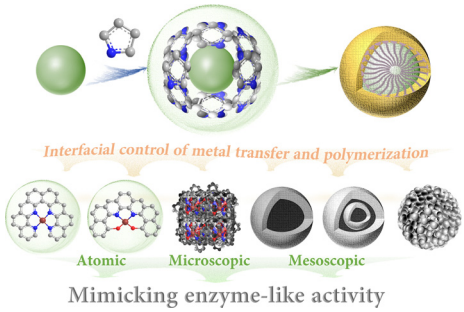


**Linking atomic to mesoscopic scales in multilevel structural tailoring of single-atom catalysts for peroxide activation**

Li Yu,* Shaosong Xin, Yuchan Li and Hsien-Yi Hsu

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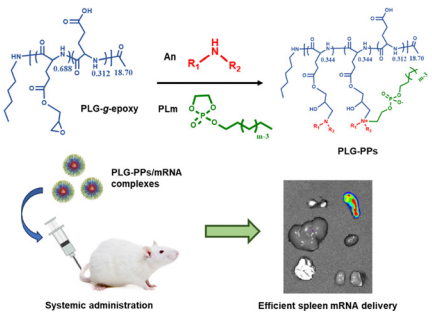


**A polyamino acid-based phosphatidyl polymer library for *in vivo* mRNA delivery with spleen targeting ability**

Hanqin Zhao, Sheng Ma, Yibo Qi, Yuxi Gao, Yuyan Zhang, Minhui Li, Jie Chen, Wantong Song* and Xuesi Chen*

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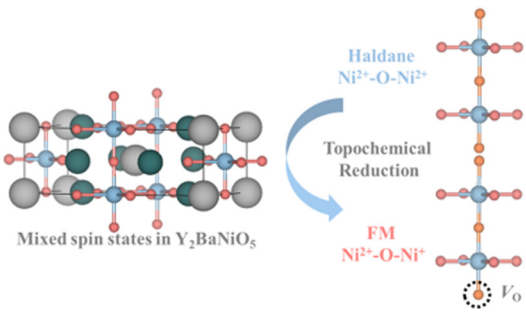


**Spin-degree manipulation for one-dimensional room-temperature ferromagnetism in a haldane system**

Pengfei Tan, Chuanhui Zhu, Xiaosheng Ni, Han-Qing Wu, Shuang Zhao, Tao Xia, Jinjin Yang, Tao Han, Mei-Huan Zhao, Yifeng Han, Yuanhua Xia, Zheng Deng, Muwei Wu, Dao-Xin Yao* and Man-Rong Li*

## CORRECTION

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