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See Pin-Yi Zhao, Shengbo Zhang, Kwang-Leong Choy, Chengkai Yang *et al.*, pp. 6440–6484. Image reproduced by permission of Pin-Yi Zhao from *Mater. Horiz.*, 2025, **12**, 6440.

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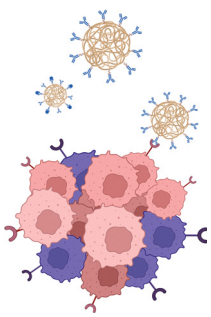
OPINION

6423

Reimagining drug nanocarriers: clinical realities and smarter strategies for targeted drug delivery

Andrew George Baker* and Ljiljana Fruk*



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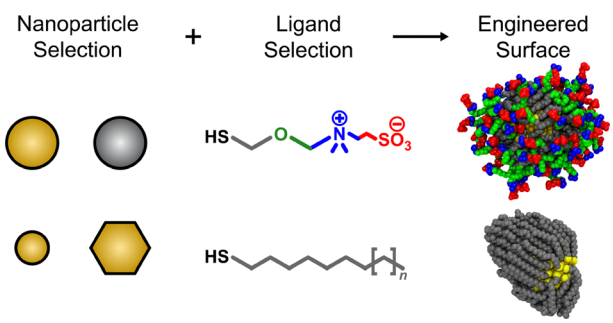
Engineering the nano-bio interface: challenges and opportunities for predicting the surface properties of monolayer-protected nanoparticles

Carlos A Huang-Zhu and Reid C. Van Lehn*



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REVIEWS

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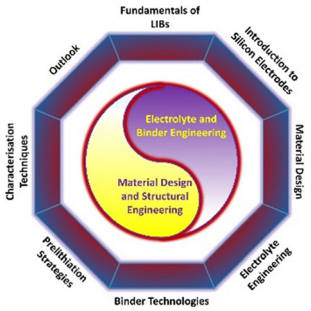
Silicon negative electrodes for lithium-ion batteries: challenges, advances, and future prospects

Pin-Yi Zhao,* Shengbo Zhang,* Kwang-Leong Choy,* Yongyi Song, Shudong Zhang, Decai Guo and Chengkai Yang*



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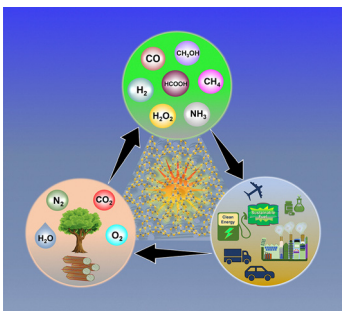
Harnessing mesoporous g-C_3N_4-based photocatalytic materials for sustainable fuel production *via* solar energy conversion: a review

Pratikshya Dash, Ashish Kumar Kar, Rajendra Srivastava* and Kulamani Parida*



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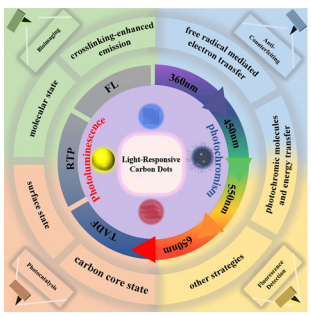
Research on light-responsive luminescence properties of carbon dots and their applications

Zhimeng Ma, Qiang Fu,* Kailin Zhang, Shouhong Sun and Mingbo Yue



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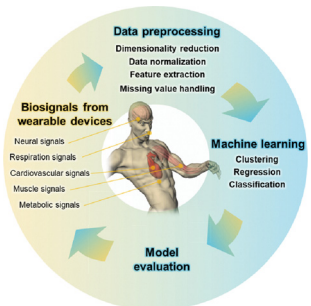
Machine learning in biosignal analysis from wearable devices

Inhea Jeong, Won Gi Chung, Enji Kim, Wonjung Park, Hayoung Song, Jakyoung Lee, Myoungjae Oh, Eunmin Kim, Joonho Paek, Taekyeong Lee, Dayeon Kim, Seung Hyun An, Sumin Kim, Hyunjoo Cho and Jang-Ung Park*



REVIEWS

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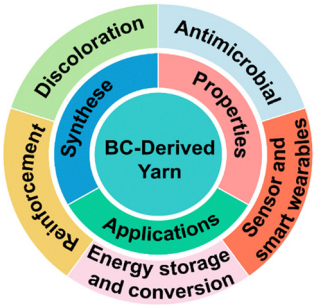

Bacterial cellulose-based functional yarns: from design to applications

Yilu Xu, Xue Lu, Cancan Jin, Danyu Liu, Yingjia Tong, Yixuan Zhang, Xun Liu, Pan Xue, Qufu Wei and Pengfei Lv*

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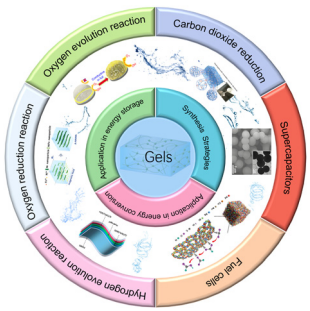

Recent progress of gel-based materials in energy storage and conversion

Shengbao Zhou, Yongchao Yang, Lei Shi, Songlin Zhang, Jingyang Wang, Feifei Zhang* and Shenlong Zhao*

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Self-powered wearable sensing devices for digital health

Yumeng Zhang, Engui Wang, Han Ouyang* and Zhou Li*

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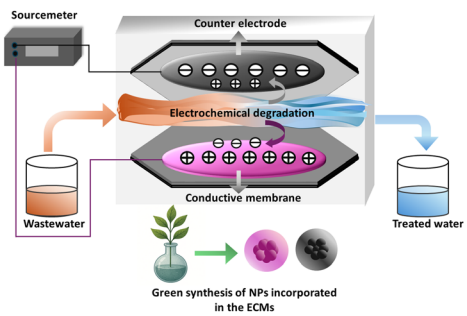

Electrically conductive nanomaterial-enhanced membranes for wastewater reclamation: mechanisms and performance insights

Priyamjeet Deka, Bipasha Saikia, Sonali Roy, Kalyan Raidongia* and Senthilmurugan Subbiah*

COMMUNICATIONS

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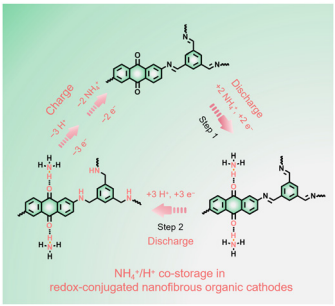
Conjugated nanofibrous organic cathodes with high-density carbonyl/imine redox sites for superior NH_4^+/H^+ co-storage

Yujia Fu, Yehui Zhang,* Qi Huang, Pingxuan Liu, Yaokang Lv, Ziyang Song, Lihua Gan* and Mingxian Liu*



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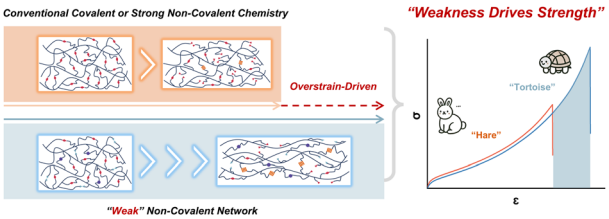
Strategic weakening for holistic strengthening: overstrain-driven synchronous strengthening-toughening in sustainable rubber *via* "weak" non-covalent networks

Wei-Chen Zhou, Xue-Qin Gao,* Jia-Hao Li, Yan Wang, Yu-Zhong Wang and Cong Deng*



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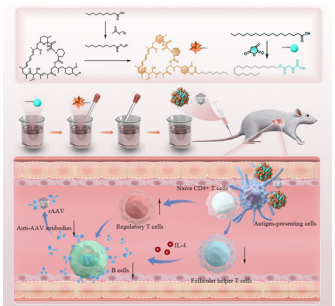
Nanotherapeutics-mediated tolerogenic induction for enabling adeno-associated virus vector gene therapy re-administration by overcoming anti-drug antibodies

Yubo Liu, Fangming Liang, Rui Zhang, Chengcheng Tang, Xin Li, Yongjun Wang,* Zhonggui He* and Hongzhuo Liu*



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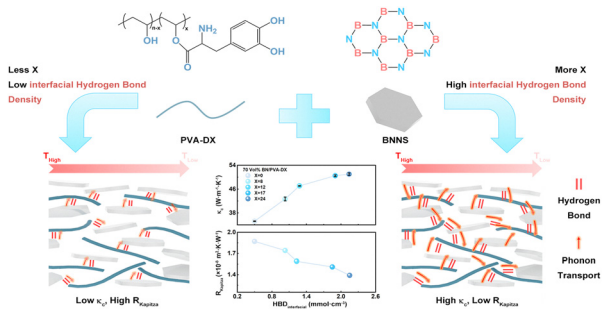
Boosting thermal conductivity of boron nitride incorporated polymer composites *via* hydrogen bonding engineering

Wenbo Lin, Yanfeng Li, Xirui Liu, Rui Xu, Jiajing Huang, Zhiyuan Jiang, Zhiguo Qu, Kai Xi* and Yue Lin*



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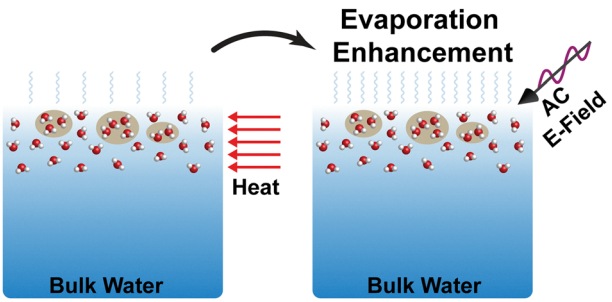

Oscillations in incident electric field enhances interfacial water evaporation

Saqlain Raza, Cong Yang, Xin Qian* and Jun Liu*

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Flexible point-of-use phosphate electrochemical sensors based on electrodeposited molybdenum oxide

Siqi Yu, Xiyu Sun, Zinan Yu, Jinwook Jung, Satoshi Ishii, Christopher T. Hayes, Valérie C. Pierre, Amar H. Flood, Jason D. Azoulay and Tse Nga Ng*

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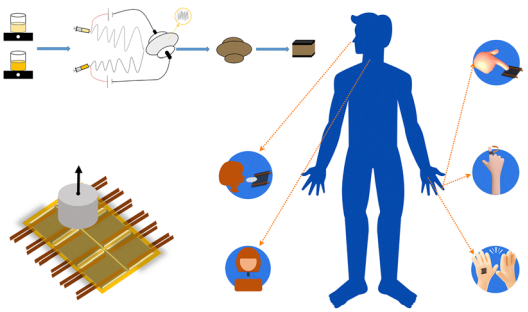

CNFs/Al_2O_3–SiC SBD flexible e-skin to achieve dual function sensing of pressure and temperature

He Gong, Lingyun Ni, Hang Zhu, Hongli Chao, Lan Luo, Mengchao Chen, JinFan Wei, Tianli Hu, Ying Guo, Zhiqiang Cheng, Ye Mu* and Xiuling Yu*

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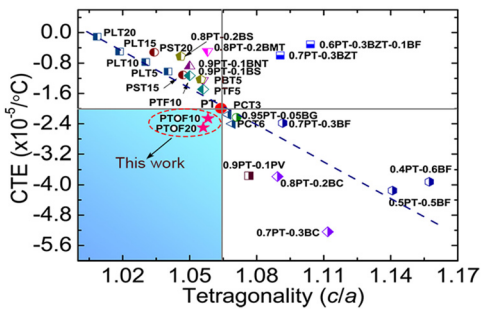

Anion-mediated unusual enhancement of negative thermal expansion in the oxyfluoride of $PbTiO_3$

Zhao Pan,* Yue-Wen Fang, Sergey A. Nikolaev, Lin Wu, Jie Zhang, Mengqi Ye, Jin Liu, Xubin Ye, Xiao Wang, Takumi Nishikubo, Yuki Sakai, Runze Yu, Shogo Kawaguchi, Nianpeng Lu, Yoshihiro Kuroiwa, Jun Chen,* Masaki Azuma,* Xianran Xing and Youwen Long*

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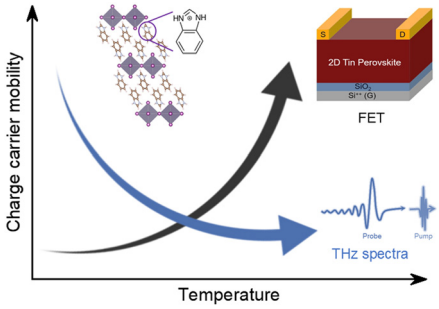
Charge carrier transport in two-dimensional benzimidazole-based perovskites

Shuanglong Wang, Lei Gao, Mukunda Mandal, Hao Wu, Zhitian Ling, Mischa Bonn, Denis Andrienko, Paul W. M. Blom, Hai I. Wang, Wojciech Pisula* and Tomasz Marszalek*



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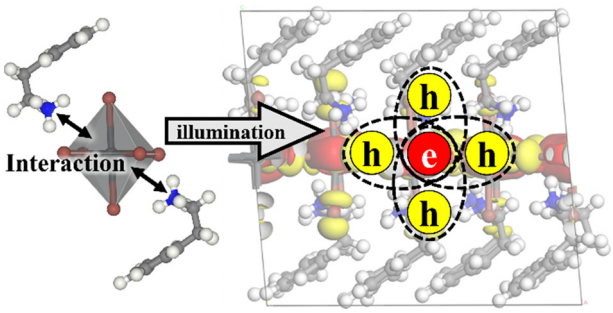
Out-of-plane quadrupolar excitons in Ruddlesden–Popper perovskites: theoretical insights into the effects of organic spacer cations

Qingjie Feng, Xu Zhang* and Guangjun Nan*



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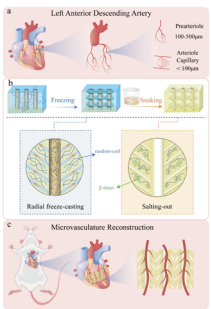
Perfusable and toughening cardiac patch with hierarchically branched microchannels for myocardial infarction revascularization

Shuaibing Liu, Kexin Feng, Zhenhao Teng, Ruiyue Zhao, Xinchang Kang, Qi Chen, Yi Yuan, Xiaomeng Li* and Jianglin Wang*



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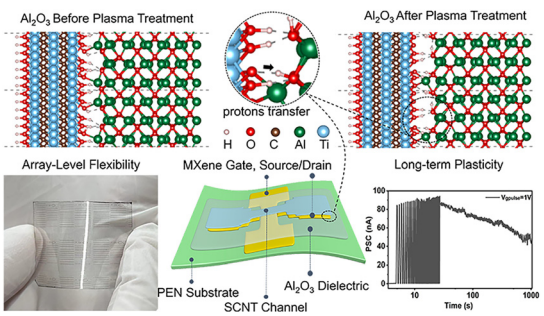
Array-level MXene electrode flexible long-term-plasticity synaptic transistors

Zifan Wang, Jiahao Zhu, Dexing Liu, Qinqi Ren, Rui Qiu, Qi Liu, Wanting Wang, Yufeng Jin and Min Zhang*



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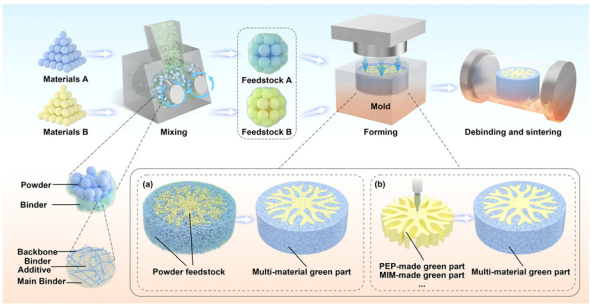

A combined plastic shaping method for powder metallurgy complex multi-material structures

Mengxiong Chen, Decai Ouyang, Yang Fu, Heng Zou, Huiwen Xiong,* Lei Zhang and Kechao Zhou

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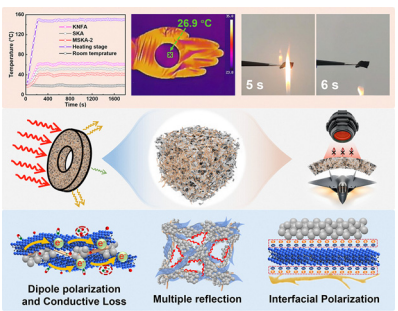

Cross-dimensional assembly of MXene/SiO_2/KNF composite aerogels for radar and infrared stealth

Shuo Zhang, Fushuo Wu, Feiyue Hu, Peiying Hu, Miaoping Li, Peng Zeng, Peigen Zhang,* Tianyu Wang, Shuangshuang Chen, Jian Liu, Longzhu Cai and ZhengMing Sun*

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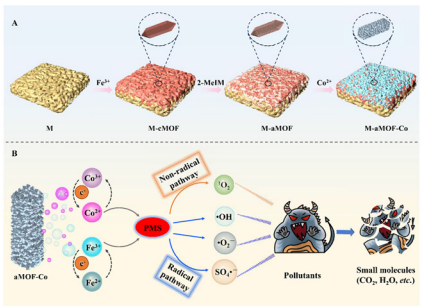

Heterostructural amorphous catalyst decorated membranes with excellent anti-fouling performances in wastewater purification

Yuling Yang, Yingxin Zhang, Ping Zhu, Gang Wang, Zhanghui Wang, Lijing Zhu* and Zhixiang Zeng*

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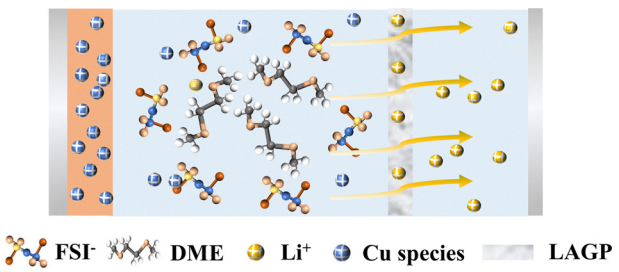

Synergistic solid–liquid hybrid electrolyte for cycle-stable and high-efficiency Li–$CuCl_2$ batteries

Qianqian Shen, Yechao Lin, Hongge Pan, Mi Yan, Xuan Zhang* and Yinzhu Jiang*

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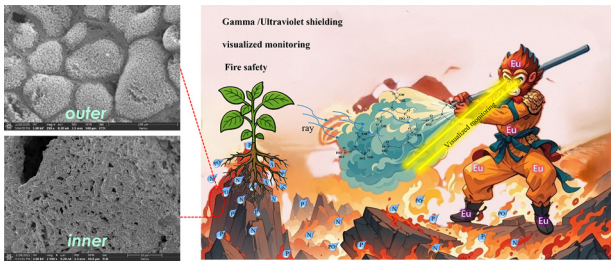
Biomimetic sand-fixation-inspired flame retardants: enhanced char stabilization and multifunctional polyurethane with integrated fire safety, radiation shielding, and visual monitoring

Xingyao Li, Meina Xie, Jiangyan Gao, Kunpeng Song, Xiangmei Li, Junming Geng,* Jiyu He* and Rongjie Yang



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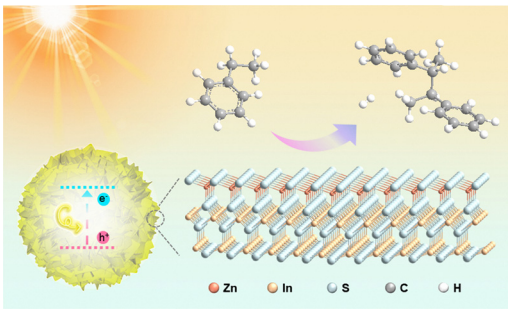
Customizing $ZnIn_2S_4$ photocatalysts by regulating sulfur sources for C(sp^3)–H transformation

Jian-Hui Zheng, Chang-Long Tan, Ming-Yu Qi,* Zi-Rong Tang* and Yi-Jun Xu*



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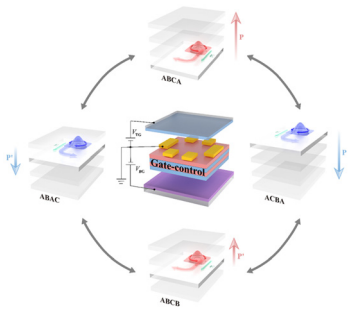
Gate-controllable quadri-layertronics in a 2D multiferroic antiferromagnet

Ting Zhang,* Mingsheng Wang, Xilong Xu, Ying Dai and Yandong Ma*



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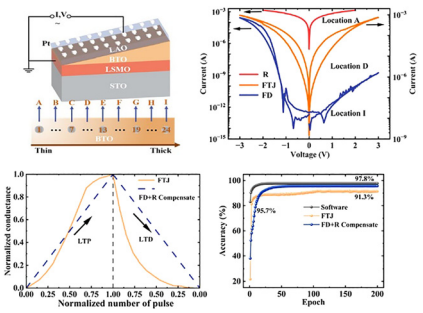
Adaptive ferroelectric memristors with high-throughput $BaTiO_3$ thin films for neuromorphic computing

Ya-Fei Jiang, Huai-Yu Peng, Yu Cai, Ya-Ting Xu, Meng-Yao Fu, Min Feng, Bo-Wen Wang, Ya-Qiong Wang, Zhao Guan, Bin-Bin Chen, Ni Zhong, Chun-Gang Duan and Ping-Hua Xiang*



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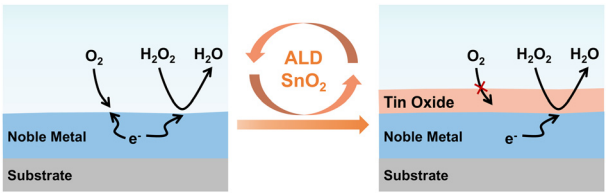

High O_2 tolerant metal-based catalysts for selective H_2O_2 reduction by constructing an ultra-thin oxide passivation layer

Yaolan Li, Zhenyao Ding, Yifan Zhou, Zhiping Liu, Lihui Huang, Liping Chen* and Xinjian Feng*

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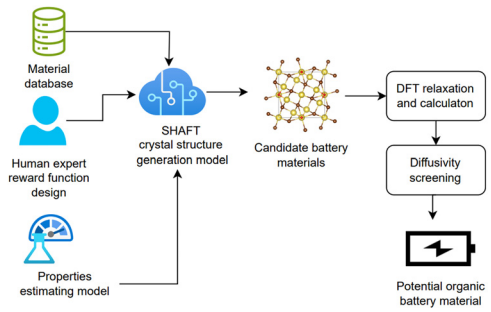

The search for superionic solid-state electrolytes using a physics-informed generative model

Tri Minh Nguyen,* Sherif Abdulkader Tawfik, Truyen Tran, Sunil Gupta, Santu Rana and Svetha Venkatesh

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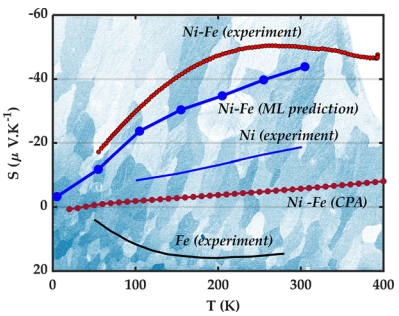

High thermoelectric power factor in Ni–Fe alloy for active cooling applications

Shuai Li, Sree Sourav Das, Haobo Wang, Kacper Pryga, Sujit Bati, Bartlomiej Wiendlocha, Junichiro Shiomi, Jerrold A. Floro, Prasanna V. Balachandran and Mona Zebarjadi*

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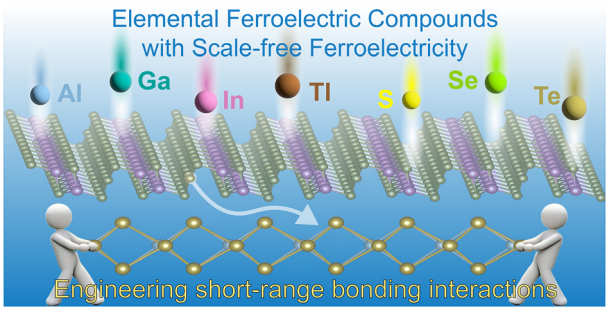

Prediction of scale-free ferroelectricity in the elemental ferroelectric compound M_2X_5 with distinctive structural prototype

Huidong Wang, Xiaojun Shi, Ran Xia and Xiaoming Zhang*

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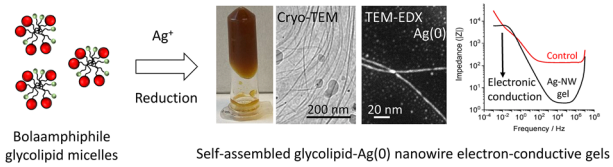
Electron conductive self-assembled hybrid low-molecular weight glycolipid-nanosilver gels

Korin Gasia Ozkaya, Othmane Darouich, Hynd Remita, Isabelle Lampre, Lionel Porcar, Alain Carvalho, Marc Schmutz, Sandra Casale, Christel Laberty-Robert and Niki Baccile*



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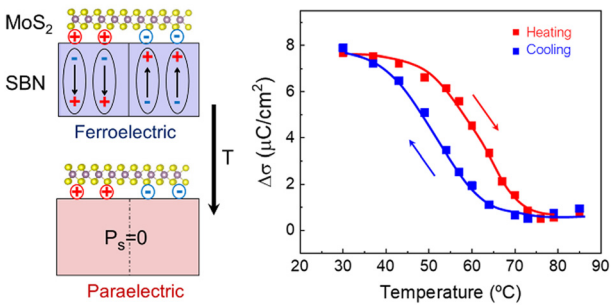
Electron density modulation in monolayer MoS_2 through the phase transition of a relaxor ferroelectric substrate

David Hernández-Pinilla, Dennis P. Cachago, Yi An Xia, Guillermo López-Polín, Mariola O Ramírez and Luisa E. Bausá*



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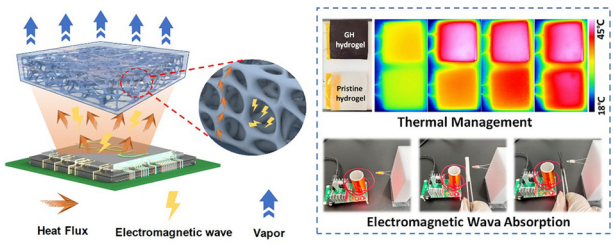
GO-HNT framework-based hydrogels with efficient water evaporation-driven cooling and superior electromagnetic wave absorption

Yang Tao, Junwei Li, Yongxin Qian, Shuangfu Gang, Hao He, Wang Li, Yubo Luo, Xin Li* and Junyou Yang*



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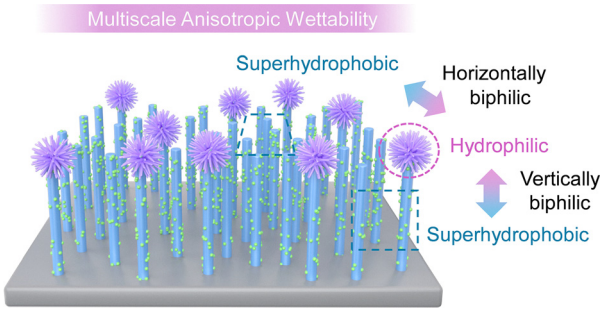
Enhancing liquid–vapor phase behavior through multiscale anisotropic wettability gradient in dandelion-inspired nanostructures

Jiayu Song, Francis Eric P. Almaquer, Zixuan Xiong, Xiong Wang, Meng Li, Xiao Yan, Wei Han, Qiong Wu, Michael Kappl, Youmin Hou, Hans-Jürgen Butt and King Lun Yeung*



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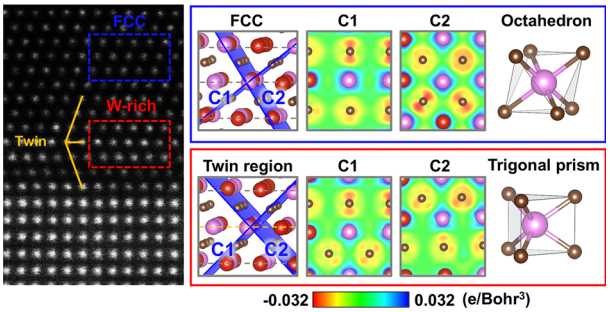

A new twinning mechanism induced by solute electronic structures

Wenjin Zheng, Huasheng Lei, Wei Lai, Xiaoyuan Ye, Junwen Fu, Chongze Hu,* Fu-Zhi Dai* and Zhiyang Yu*

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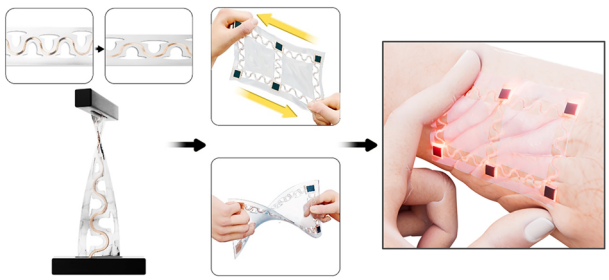

Designing pores to suppress crack generation at the interface between serpentine interconnects and elastomers for highly durable stretchable electronics

Seungkyu Lee, Jun Chang Yang* and Steve Park*