

# Journal of Materials Chemistry C

Materials for optical, magnetic and electronic devices

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## IN THIS ISSUE

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### Cover

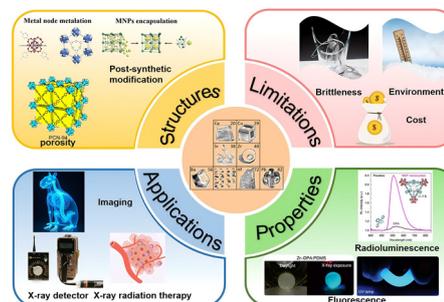
See Ulrich W. Bläß,  
Mingjian Wu, *et al.*,  
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## REVIEWS

4836

### X-ray luminescent metal–organic frameworks: design strategies and functional applications

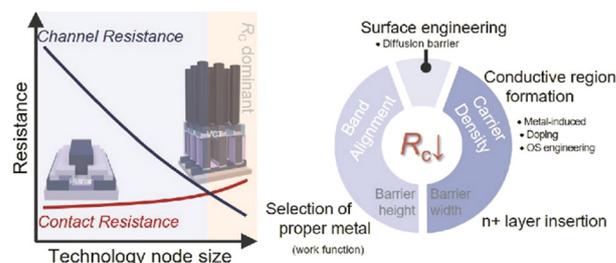
Yuan Liang, Jun-Zhe Zhu, Sheng-Yu Jin, Ya-Ru Meng,  
Shu-Fan Li, Jing-Lin Zuo,\* Gen Zhang\* and Jian Su\*



4861

### Advancements and hurdles in contact engineering for miniaturized sub-micrometer oxide semiconductor devices

Joo Hee Jeong, Jeong Eun Oh, Dongseon Kim,  
Daewon Ha and Jae Kyeong Jeong\*



# RSC Applied Polymers

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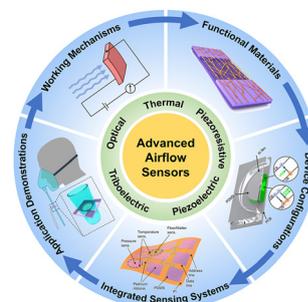
Fundamental questions  
Elemental answers

## REVIEWS

4876

## Structural design and controlled fabrication of advanced airflow sensors

Qinyuan Jiang, Khaixien Leu, Fei Wang, Run Li, Kangkang Wang, Yanlong Zhao, Aike Xi, Yonglu Zang and Rufan Zhang\*

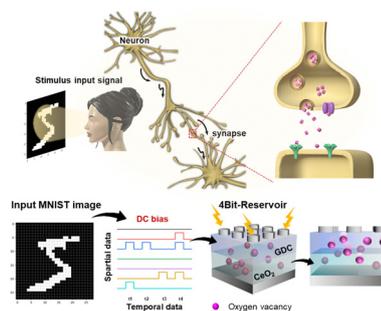


## COMMUNICATION

4894

Reservoir computing determined by nonlinear weight dynamics in Gd-doped CeO<sub>2</sub>/CeO<sub>2</sub> bi-layered oxide memristors

Sola Moon, Cheolhong Park, Yunyoung Jung, Kyeong-Sik Min, Hyunhyub Ko\* and Tae-Sik Yoon\*

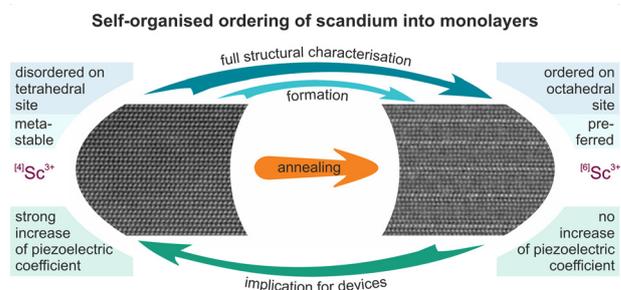


## PAPERS

4910

## Self-organised ordering of scandium into basal monolayers of aluminium nitride and its implication for the growth of well-crystallized (Al,Sc)N materials for electronic devices

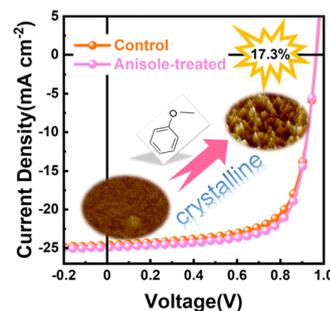
Ulrich W. Bläß,\* Mingjian Wu, Boris Epelbaum and Elke Meissner



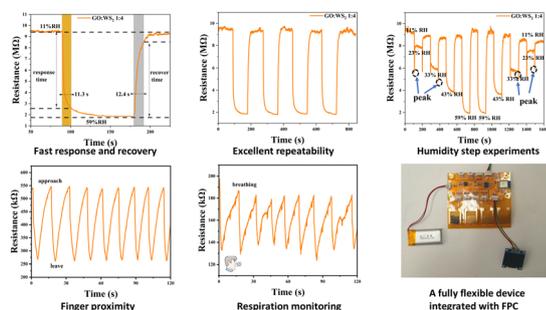
4921

## Non-halogenated solvent additive-mediated donor-acceptor phase segregation leads to efficient all-polymer solar cells

Yuanxian Liang, Zhenmin Zhao,\* Sein Chung, Yuqing Sun, Liang Bai, Jingjing Zhao, Lixing Tan, Kilwon Cho and Zhipeng Kan



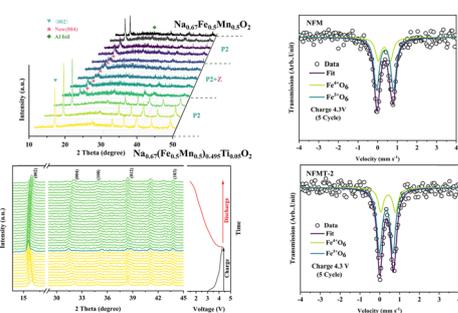
4929



### Highly sensitive flexible humidity sensors with fast response and recovery times based on the composite of graphene oxide and WS<sub>2</sub> for detection of human breath and fingertip proximity

Gaohan Wang, Qiang Gao, Ningfeng Ke, Fangcheng Si, Jiayu Wang, Jie Ding,\* Wendong Zhang\* and Xuge Fan\*

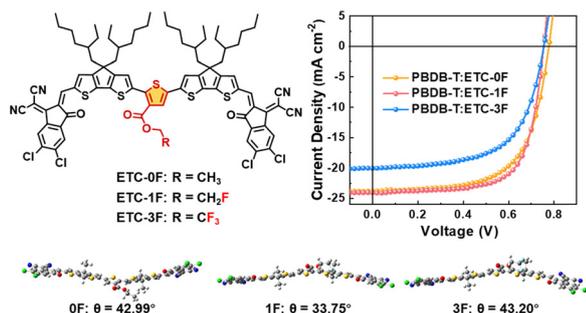
4938



### Suppressed P2-Z phase transition and Fe migration in the Na layer of an Fe/Mn-based layered oxide cathode for advanced sodium-ion batteries

Wei Zhao, Shaohua Luo,\* Lixiong Qian,\* Rui Huang, Ge Wang, Haoran Zhang, Guodong Hao and Shengxun Yan

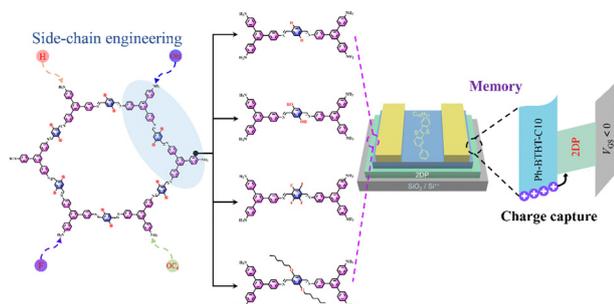
4949



### Fluorination-driven optimization of non-fused small molecular acceptors for high-efficiency organic solar cells

Shuai Liu, Tongzi Li, Wenzhao Xiong, Jiang Zhou, Xuelong Dai, Yang Yi, Huawei Hu\* and Yiwang Chen\*

4956



### Side-chain engineering of two-dimensional polymer thin films for high-performance organic non-volatile memories

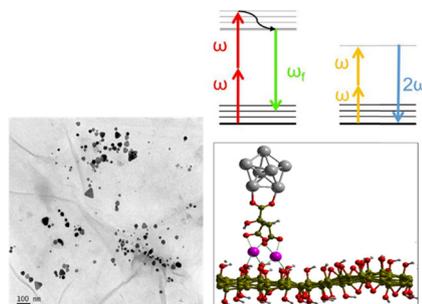
Pichao Gao, Jiamin Wang, Zhaofeng Wang, Xianshuo Wu, Dong Zeng, Xianfeng Shen, Ximeng Yao, Shuyuan Yang, Rongjin Li\* and Wenping Hu



4963

### Enhancement in the nonlinear optical properties of silver nanoprisms through graphene oxide anchoring

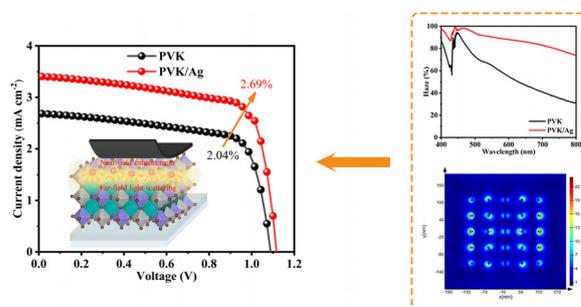
Fadeela Chundekatt Ummer, Hao Yuan, Isabelle Russier-Antoine, Fabien Rondepierre, Pierre-François Brevet, Pierre Mignon, Nandakumar Kalarikkal and Rodolphe Antoine\*



4974

### Enhanced light harvesting in lead-free Cs<sub>2</sub>AgBiBr<sub>6</sub> double perovskite solar cells with plasmonic Ag nanoparticles

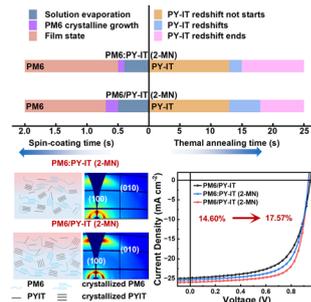
Yanyan Duan, Jiangning Li, Biao Wang, Qiong Li, Zhiheng Wu, Jing Mao, Wei Zhang, Guosheng Shao\* and Yonglong Shen\*



4983

### Improving the aggregation of layer-by-layer processed all-polymer solar cells with an additive during the film deposition and thermal annealing

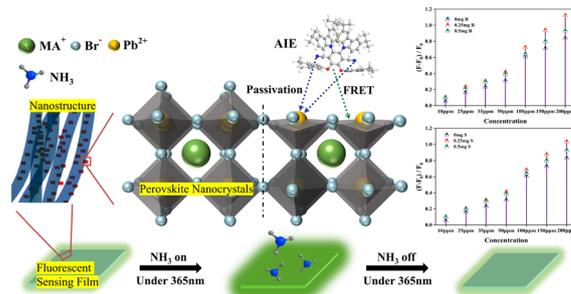
Luzhuo Li, Hanyue Gao, Mingyu Zuo, Yu Shen, Qiang Zhang\* and Yanchun Han\*



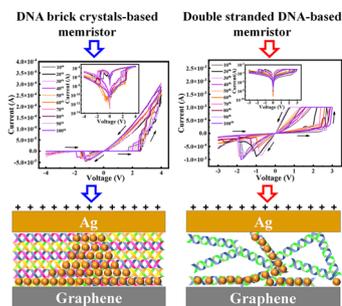
4993

### Enhanced ammonia sensing with the MAPbBr<sub>3</sub> perovskite and (R/S)-OBN-tCz: a study on sensitivity and stability improvements

Chang Zhang, Xin Zhang,\* Wei Wang, Hao Xue, Qian He, Fenglin Li, Xiaoli Wang, Qinghui Jin, Kun Zhou\* and Jiawen Jian



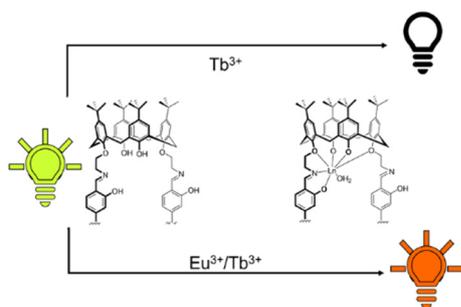
5005



### Deoxyribonucleic acid brick crystals-based memristor as an artificial synapse for neuromorphic computing

Zhongrong Wang, Xinran Liu, Jiahang Li, Xiaohan Li, Haowan Shi, Yichao Wang,\* Ziyang Guan, Mao Zhang, Jianhui Zhao, Zhenyu Zhou, Jianzhong Lou and Xiaobing Yan\*

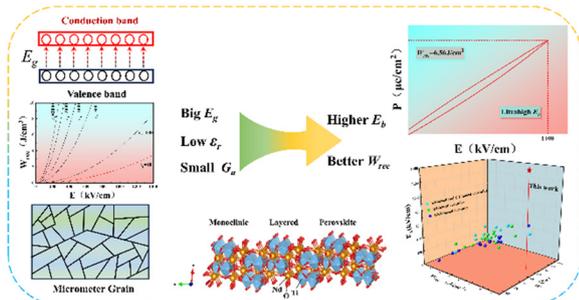
5017



### Luminescent lanthanide complexes supported by ditopic Schiff-base/calix[4]arene macrocycles: synthesis, structure, and luminescence properties of $[\text{Ln}_2(\text{H}_2\text{L}^2)(\text{H}_2\text{O})_2]$ (Ln = La, Eu, Tb, Yb)

Christian Zocher, Josef Taut, Christian Laube, Martin Börner, Patrick Melix, Steve Ullmann, Bernd Abel, Ralf Tonner-Zech and Berthold Kersting\*

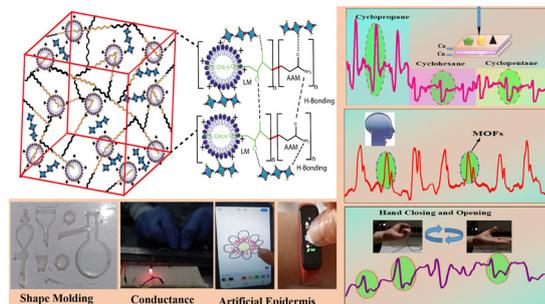
5031



### Layered perovskite-type $\text{Nd}_2\text{Ti}_2\text{O}_7$ energy-storage ceramics with ultrahigh $E_b$ ( $\sim 1.4 \text{ MV cm}^{-1}$ ) and large $E_g$ ( $\sim 3.76 \text{ eV}$ )

Tao Wang, Qin Feng,\* Changlai Yuan, Jiejie Qin, Xiyong Chen, Ronghao Jia, Zhenyong Cen, Hui You,\* Jianan Hu and Nengneng Luo\*

5041



### Ex situ synergistic reinforcement of a MOF-based supramolecular polymer enables tough, highly flexible, and responsive artificial epidermis-inspired hydrogels

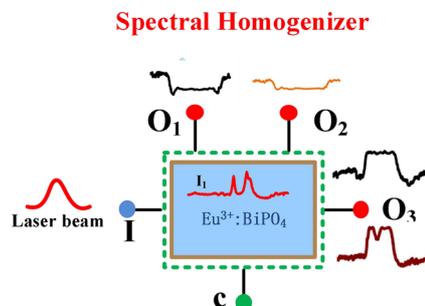
Al Nimra, Muhammad Sher, Mansoor Khan, Luqman Ali Shah,\* Jun Fu and Essam A. Ali



5056

### Prospects for photon–phonon dressing and crystal-field non-Hermitian alignment of $\text{Eu}^{3+}:\text{BiPO}_4$

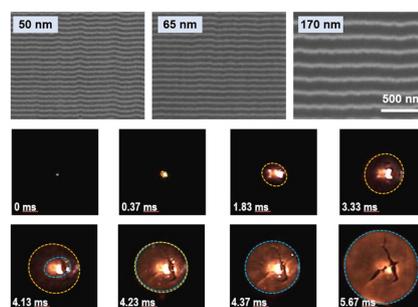
Muhammad Usman, Iqbal Hussain, Muhammad Kashif Majeed, Faisal Munir, Faisal Nadeem, Muhammad Waqas Usmani, Irfan Ahmad, Faizan Raza\* and Yanpeng Zhang\*



5073

### Control of self-propagating reactions and phases in Ni/Si reactive multilayers

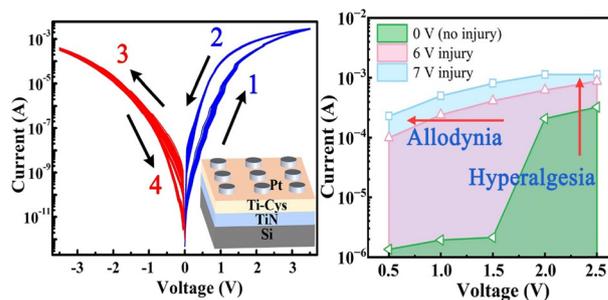
Yi-Chen Chen, Yuan-Wei Chang, Cheng-Chih Hsiang, Yi-Pang Chiu, Kuan-Wei Su and Yi-Chia Chou\*



5085

### Molecular layer deposition of biomimetic amino acid-based hybrid thin films for artificial nociceptors

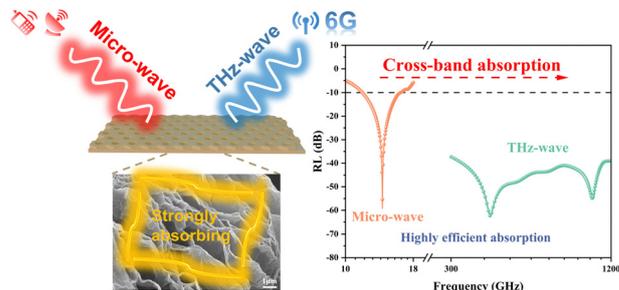
Lin Zhu, Chu-Yi Zhang, Li Gao, Li-Ling Fu, Chen Wang, Yan-Qiang Cao, Wei-Min Li and Ai-Dong Li\*



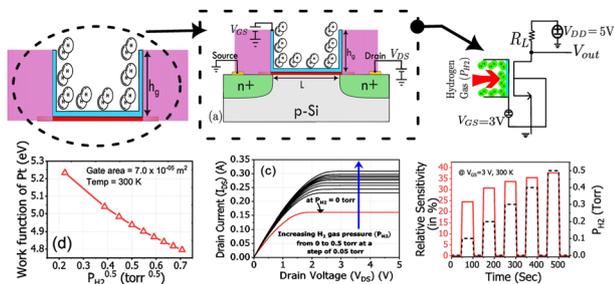
5097

### Graphene with multiscale synergistic optimization: achieving superior cross-band electromagnetic wave absorption performance

Pei Liu, Kai Xu, Qingqing Gao, Yin Xu Ni, Zhilei Hao, Changtian Zhu, Jin Chen, Guohui Tang, Zixuan Ding, Zhixiang Li, Gaojie Xu, Hui Zhang\* and Fenghua Liu\*



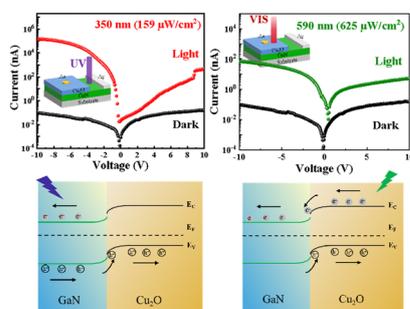
5110



### Design and analysis of a vertically extended gate field effect transistor (VEG-FET)-based hydrogen gas sensor: a comprehensive modeling and simulation approach

Pramod Martha,\* Mayank Kohli, Rahul Kumar and Santosh Kumar Behera\*

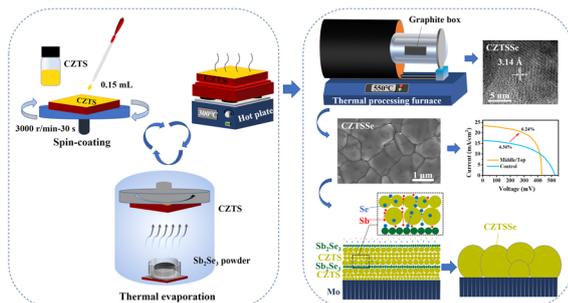
5119



### A dual-color ultraviolet-visible photodetector based on a $\text{Cu}_2\text{O}/\text{GaN}$ heterojunction: high responsivity, fast response, and high spectral selectivity

Chunmei Wu, Yong Wang,\* Lujia Cong and Yongcun Li

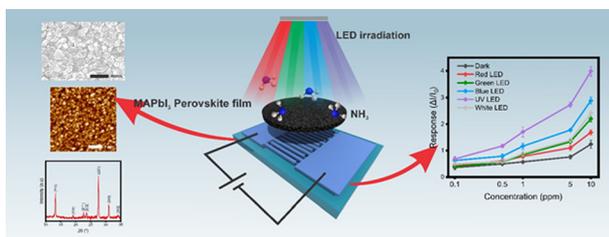
5129



### Promoting the grain growth of CZTSSe solar cells by incorporating $\text{Sb}_2\text{Se}_3$ and annealing in an atmosphere devoid of toxic selenium

Yaowei Wei, Xianghuan Meng, Xiangyu Sun, Ruxin Guo, Ke Zhou, Jiajia Tian,\* Yonglong Shen\* and Guosheng Shao\*

5140



Light illumination improves the performance of resistive  $\text{NH}_3$  gas sensors utilizing the metal halide perovskite  $\text{MAPbI}_3$ .

### Achieving high response of perovskite-based ( $\text{MAPbI}_3$ ) ammonia gas sensors at room temperature via light enhancement

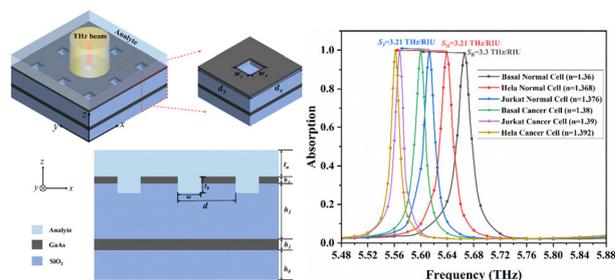
Chih-Chien Lee,\* Ade Kurniawan, Johan Iskandar, Cheng-Shane Chu and Chih-Yi Liu\*



5148

## High sensitivity terahertz sensor based on semiconductor material for biosensing detection

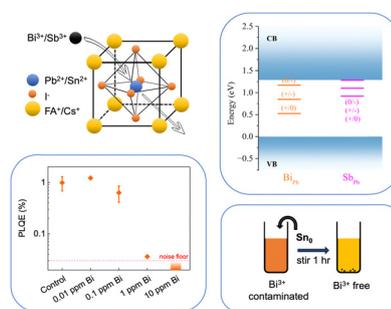
Xu Huang and Bo Wang\*



5161

## Effects of Bi and Sb ion incorporation on the optoelectronic properties of mixed lead–tin perovskites

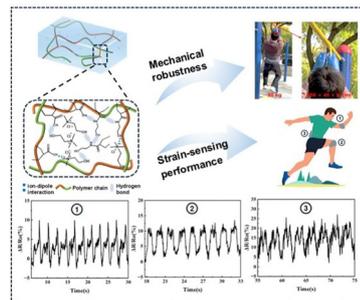
F. M. Rombach, L. Gregori, A. Sidler, J. Whitworth, S. Zeiske, H. Jin, E. Y.-H. Hung, S. Motti, P. Caprioglio, A. Armin, M. Lenz, D. Meggiolaro,\* F. De Angelis and H. J. Snaith\*



5172

## A transparent ionogel with mechanical robustness enabled by synergistic noncovalent interactions

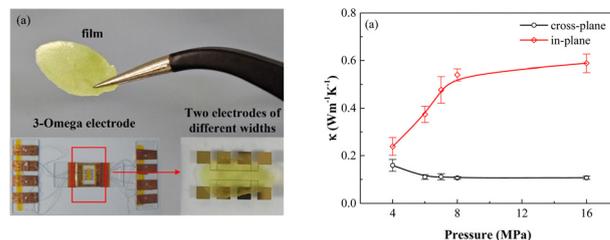
Ran Wei, Chuanjiang Zhou, Sijia Yang, Wei Sun, Shengjie Liu, Zhaoqiang Wu\* and Hong Chen



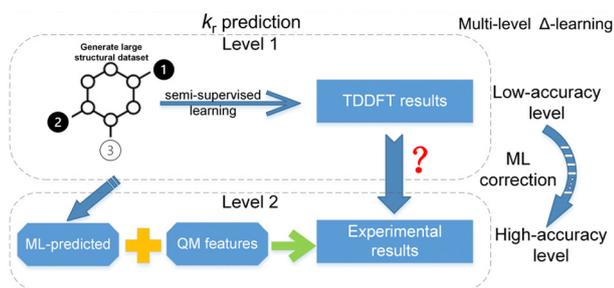
5180

## Achieving ultra-high anisotropy in thermal conductivity of plastic crystals through megapascal pressure via hot pressing

Zhipeng Wu, Mingzhi Fan, Yangjun Qin, Guangzu Zhang\* and Nuo Yang\*



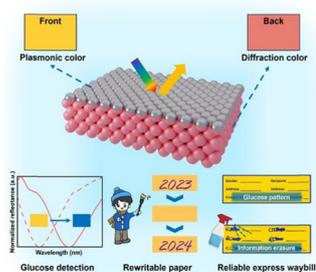
5189



## Multi-level $\Delta$ -learning for predicting the radiative decay rate constant of phosphorescent platinum(II) complexes

Shuai Wang, ChiYung Yam,\* LiHong Hu, Faan-Fung Hung, Shuguang Chen, Chi-Ming Che\* and GuanHua Chen\*

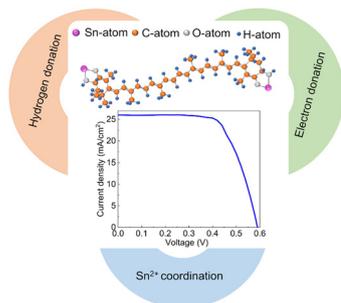
5200



## Novel plasmonic–photonic Janus films with aluminum nanoisland-coated colloidal arrays for versatile applications

Kai Zhao, Zhumin Yu, Hao Zhou, Lei Chen, Shuoran Chen, Bo Liu and Changqing Ye\*

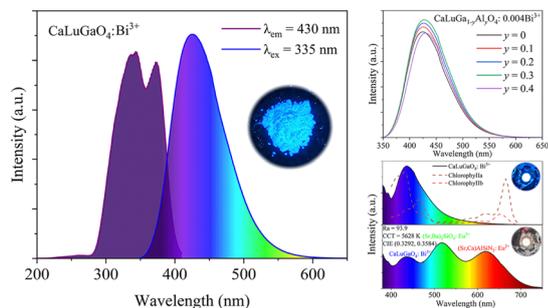
5209



## Stability and performance improvement of cesium tin halide perovskites with astaxanthin treatment

Barbara Nakamanya, Nan Yu, Tonny Kakooza, Qianwen Sun, Andrew Balilonda, Shengyuan Yang\* and Meifang Zhu

5221



## CaLuGaO<sub>4</sub>:Bi<sup>3+</sup>, Al<sup>3+</sup> blue phosphor with excellent thermal stability for multiple LED applications

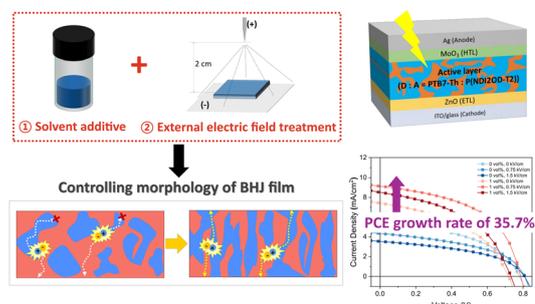
Zhicheng Liao, Qian Zhang, Liting Qiu, Xiantao Wei, Yonghu Chen\* and Min Yin\*



5232

### Improving the efficiency of all-polymer solar cells through morphology control *via* a combination approach: polar solvent additives and external electric field

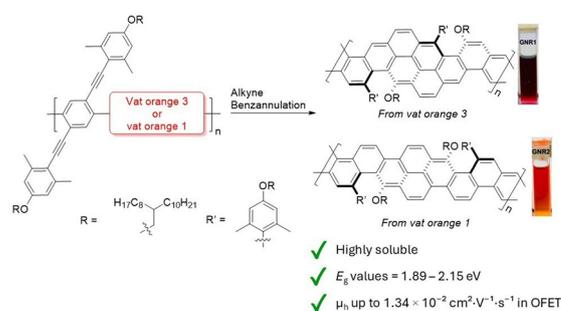
Yina Moon, Nara Han, Minwoo Lee, Geon Chang Song, Dongseong Yang, Jeongwoo Beak and Dong-Yu Kim\*



5241

### Contorted graphene nanoribbons from vat dyes: synthesis, properties and charge carrier mobility

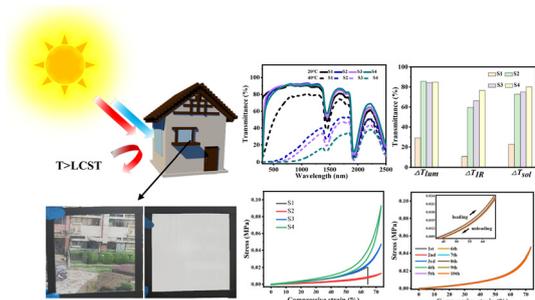
Ali Darvish, Madison Mooney, Tiago C. Gomes, Félix Gagnon, Simon Rondeau-Gagné and Jean-François Morin\*



5248

### Highly solar modulated and robust PNIPAM/HEMC smart windows

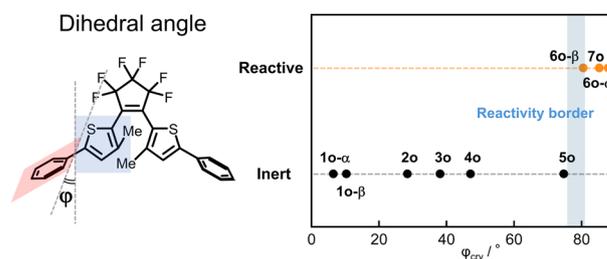
Shuming Liu, Kai Yao, Jiakui Xu, Zhenhui Hu, Xianglong Zeng, Longhao Xiao, Zheng Fang, Yuwei Hu, Xi Chen, Yongsheng Yang,\* Wenxin Li\* and Yujie Ke\*



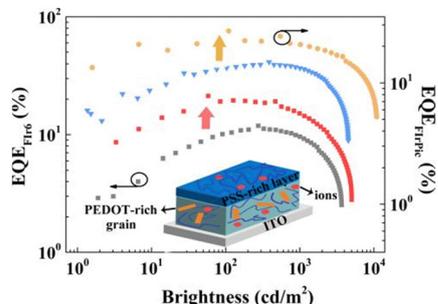
5259

### The impact of dihedral angle in aryl groups on the photocyclization reactivity of inverse-type diarylethenes

Misato Suganuma, Daichi Kitagawa,\* Shota Hamatani, Hikaru Sotome,\* Cédric Mittelheisser, Michel Sliwa,\* Syoji Ito, Hiroshi Miyasaka and Seiya Kobatake\*



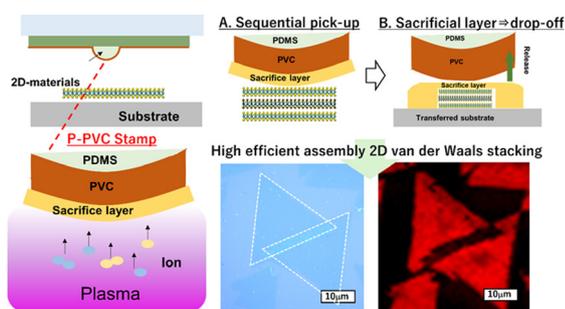
5268



## Doubling the efficiency of solution-processed blue phosphorescent organic light-emitting diodes via modified PEDOT:PSS hole-injection layers

Jingyu Wang, Tingyu Pan, Tongtong Zhang, Danyang Zhang, Guibin Wang\* and Liang Zhou\*

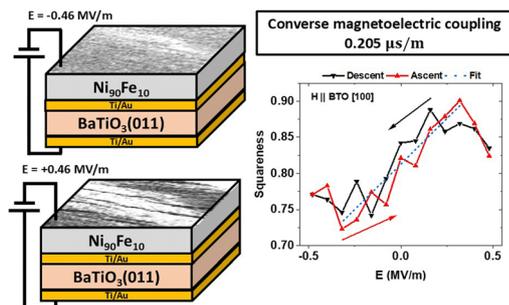
5279



## Assembly of van der Waals structure from CVD-grown 2-dimensional materials using plasma-treated polyvinyl chloride

Bin Xu, Satoru Masubuchi, Yusai Wakafuji, Yuanzhe Li, Tomoki Machida\* and Junichiro Shiomi\*

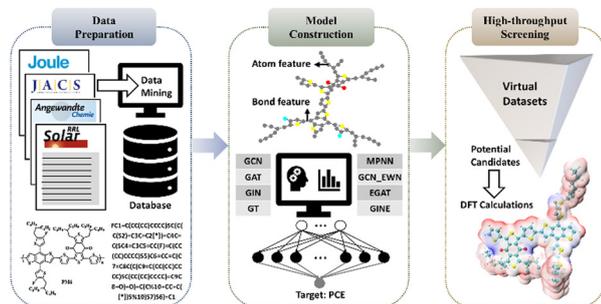
5287



## Voltage-control of the in-plane magnetic anisotropy in hybrid magnetolectric Ni<sub>90</sub>Fe<sub>10</sub>/BaTiO<sub>3</sub>(011) heterostructures

A. Begué, M. W. Khaliq, N. Cotón, M. A. Niño, M. Foerster and R. Ranchal\*

5295



## Deep learning accelerated high-throughput screening of organic solar cells

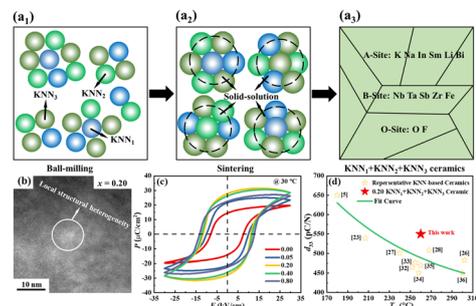
Wenlin Zhang, Yurong Zou, Xin Wang, Junxian Chen and Dingguo Xu\*



5307

### Simultaneous enhancement of piezoelectricity and Curie temperature in KNN-based ceramics via a multiple formula solid solution

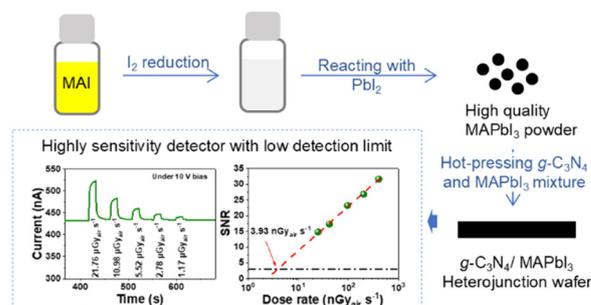
Hongjiang Li, Ning Chen, Jie Xing, Wenbin Liu, Zhi Tan,\*  
Hao Chen, Manjing Tang, Mingyue Mo and Jianguo Zhu\*



5317

### Synergistic effects of precursor reduction and ion migration blocking result in highly sensitive MAPbI<sub>3</sub> X-ray detectors with a low detection limit

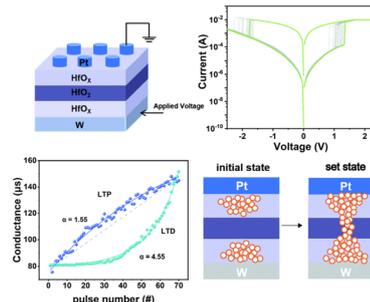
Long Jiang,\* Chengzhi Xue, Jiatian Cheng, Nan Li,  
Xinyu Fan, Yuanbo Yang, Tiantian Li, Liwei Li,  
Yucheng Liu, Jiangshan Feng, Shengzhong (Frank) Liu\*  
and Zhou Yang\*



5326

### An ion-gating synaptic memristor based on tri-layer HfO<sub>x</sub> composition regulation

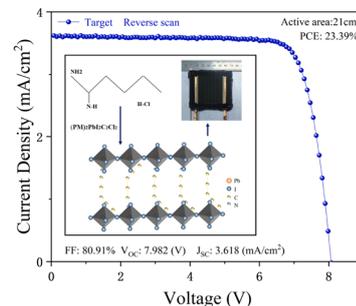
Lanqing Zou, Junming Zhang, Yunhui Yi, Jiawang Ren,  
Huajun Sun,\* Chuqian Zhu, Jiyang Xu, Sheng Hu, Lei Ye,  
Weiming Cheng, Qiang He and Xiangshui Miao



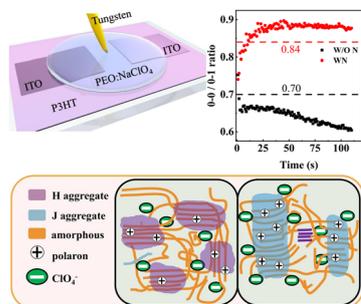
5332

### Enhancing the stability of perovskite solar cells and modules by two-dimensional (PM<sub>2</sub>)<sub>2</sub>PbI<sub>2</sub>Cl<sub>2</sub>

Yin Gao, Yanyan Gao, Maoyuan Wu, Shaohang Wu,\*  
Qian Chen, Yang Li\* and Yaohua Mai



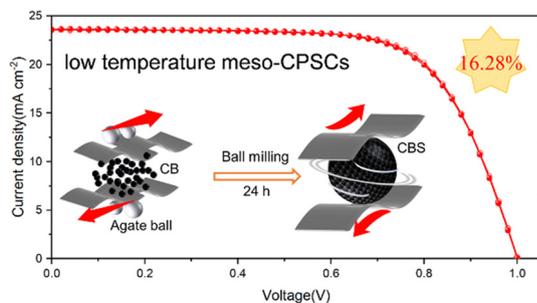
5338



### Enhancing ion doping and charge transport in polymer electrochemical transistors through poly(3-hexylthiophene) nanowire integration

Yadan Deng, Jingzan Jiang, Xinmu Chen, Jun Sun, Zhidong Lou, Yanbing Hou, Feng Teng\* and Yufeng Hu\*

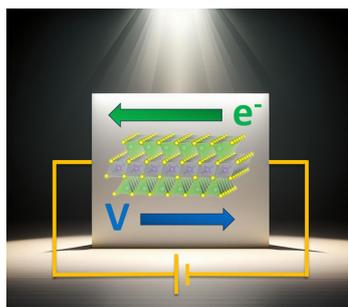
5346



### Breaking down the confinement effect on perovskite growth to fabricate efficient, carbon electrode-based mesoscopic perovskite solar cells via low-temperature and all-air procedures

De'en Guo, Jiao Ma, Heng Peng, Xiaohan Yu, Junhao Xue, Haipeng Xie, Han Huang, Deming Kong and Conghua Zhou\*

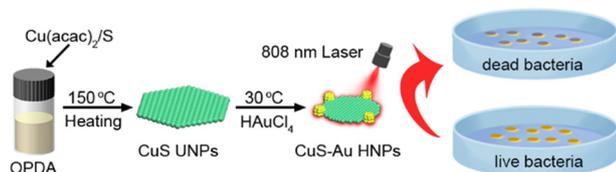
5356



### A photodetector based on the non-centrosymmetric 2D pseudo-binary chalcogenide $\text{MnIn}_2\text{Se}_4$

Marco Serra,\* Nikolas Antonatos, Luc Lajaunie, Josep Albero, Hermenegildo Garcia, Mouyi Weng, Lorenzo Bastonero, Kalyan Jyoti Sarkar, Rui Gusmão, Jan Luxa, Rafał Bartoszewicz, Jakub Ziembicki, Iva Plutnarová, Nicola Marzari, Robert Kudrawiec and Zdenek Sofer\*

5370



### Enhancing near-infrared photothermal activity through precise in-plane interface engineering in CuS–Au and CuS@Au ultrathin nanoplates for combating multidrug-resistant bacteria

Yuxin Wu, Qi He, Heng Zhang, Xiaolin Meng, Yuanyuan Min, Yi Wang,\* Xiaohu Wu,\* Pu Zhang,\* Yanyun Ma and Yiqun Zheng\*



## CORRECTION

5385

**Correction: Influence of shape on crystal structure and optical properties of heterocyclic conjugated molecules**

Elisa Guzmán, Yu Yan, Peter Müller, Justin Amengual, Chung-Hao Liu, Mu-Ping Nieh and Samuel W. Thomas, III\*

## RETRACTION

5386

**Retraction: Integration of photovoltaic organic materials into mm-wave technologies: towards self-powered phase shifters**

Suraj Manikandan and Jens Wenzel Andreasen\*

