

# Energy & Environmental Science

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## IN THIS ISSUE

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### Cover

See Qiaoqiang Gan *et al.*, pp. 1124–1136. Image reproduced by permission of Qiaoqiang Gan from *Energy Environ. Sci.*, 2026, 19, 1124.



### Inside cover

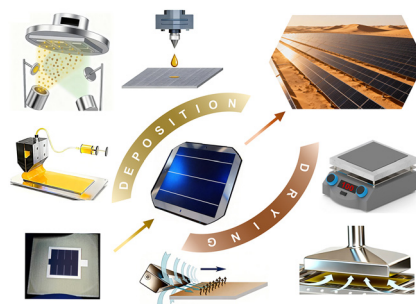
See Chao Liu, Kaicheng Zhang, Christoph J. Brabec *et al.*, pp. 1137–1147. Image reproduced by permission of Chao Liu from *Energy Environ. Sci.*, 2026, 19, 1137.

## REVIEW

1101

### Scalable deposition and drying methods toward large-area monolithic perovskite/silicon tandem solar cells

Chenxia Kan, Chao Luo and Yi Hou\*

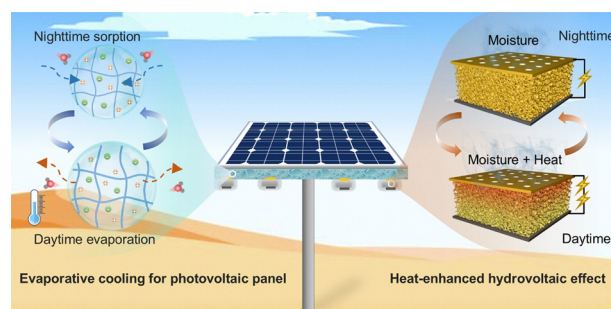


## PAPERS

1124

### Atmospheric-moisture-driven evaporative cooling and concurrent hydrovoltaic energy harvesting in photovoltaic panels

Sunmiao Fang, Yuxuan Huang, Saichao Dang, Khalid Hazazi, Yue Cao, Jiachen Wang, Pingfan Wu, Stefaan De Wolf, Hussam Qasem and Qiaoqiang Gan\*



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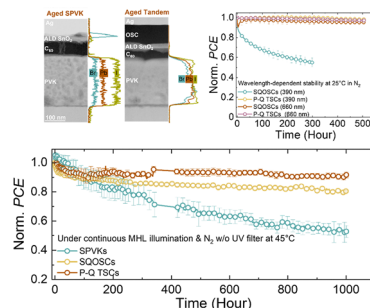
Fundamental questions  
Elemental answers



1137

### A simultaneous synergistic protection mechanism in hybrid perovskite–organic multi-junctions enables long-term stable and efficient tandem solar cells

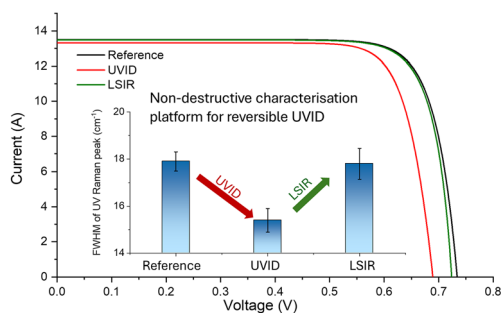
Chao Liu,\* Kaicheng Zhang,\* Xin Zhou, Mingjian Wu, Paul Weitz, Shudi Qiu, Andrej Vincze, Yuchen Bai, Michael A. Anderson, Johannes Frisch, Regan G. Wilks, Marcus Bär, Zijian Peng, Chaohui Li, Jingjing Tian, Jiyun Zhang, Jianchang Wu, Jonas Englhard, Thomas Heumüller, Jens Hauch, Yixing Huang, Ning Li, Julien Bachmann, Erdmann Spiecker and Christoph J. Brabec\*



1148

### A non-destructive UV Raman characterisation platform to enable insight into the mechanism of reversible ultraviolet-induced degradation (UVID) in TOPCon solar cells

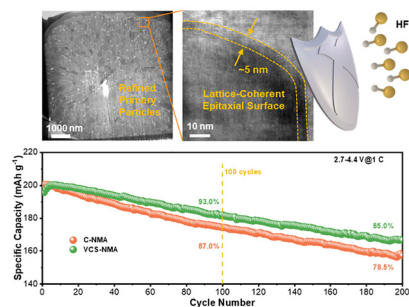
Pengfei Zhang, Caixia Li, Ziheng Liu,\* Jialiang Huang, Jialin Cong, Jingwen Cao, Kun Yu, Jing Zhou, Liyan Miao, Jingming Zheng, Tingting Li, Jie Yang, Wusong Tao, Xinyu Zhang, Hao Jin, Minglei Sun, Jefferson Zhe Liu, Su-huai Wei, Martin A. Green and Xiaojing Hao\*



1159

### Lattice-coherent epitaxial surface engineering in highly stable Co-free ultrahigh-Ni cathodes

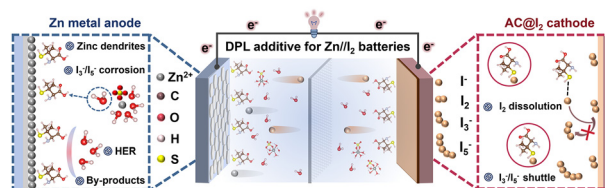
Fuqiren Guo, Liangchi Yang, Shuli Zheng, Xianyan Qiao, Heng Zhang, Yong Ming, Fang Wan, Zhenguo Wu, Lang Qiu\* and Xiaodong Guo\*



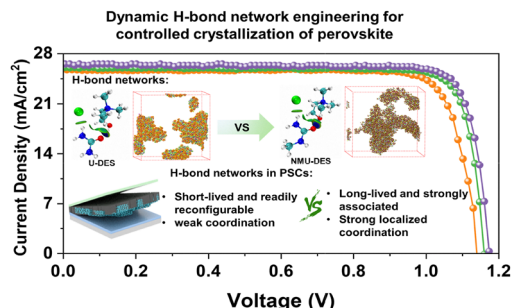
1170

### An amino acid-based functional additive enables fast polyiodide conversion kinetics for durable Zn–I<sub>2</sub> batteries

Xinran Fu, Yicai Pan, Zhixiang Chen, Fulong Li, Yongqiang Yang, Min Chen, Haoran Tu, Tianyu Qiu, Zhenyue Xing, Peng Rao, Zhenye Kang, Wenjun Zhang, Xiaodong Shi,\* Lutong Shan\* and Xinlong Tian\*



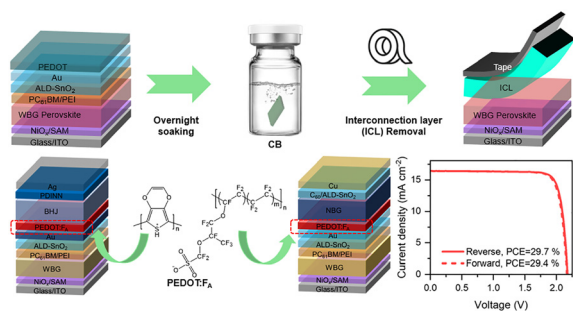
1180



## Dynamic reconfiguration of hydrogen-bonded networks to modulate perovskite crystallization

Jiaxue Zhai, Huān Bi, Shiji Zhang, Lin Xie,\* Bin Wu, Peng Wang, Shifeng Ge, Shafidah Shafian, Jiayan Chen, Wenhua Zhang, Yong Zhang,\* Nam-Gyu Park\* and Yong Hua\*

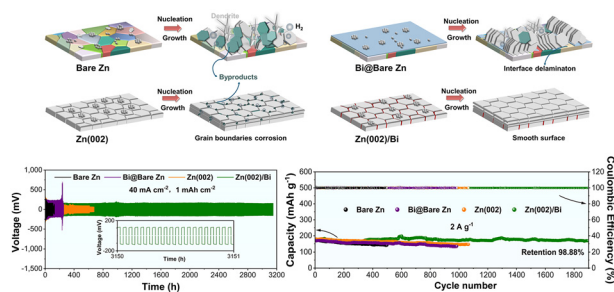
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## Universal non-destructive interconnection layer engineering for efficient and stable perovskite tandem photovoltaics

Jiandong He, Jianan Wang, He Zhu, Ruihan Wu, Xuepeng Chen, Dongni Li, Youyu Jiang, Keli Wang, Changling Zhan, Peng Gao, Yabin Ma, Rui Zhu, Jing Li, Chengbo Tian, Zhanhua Wei, Lei Meng, Yinhua Zhou, Wei Chen, Yicheng Zhao,\* Zonghao Liu\* and Qing Zhao\*

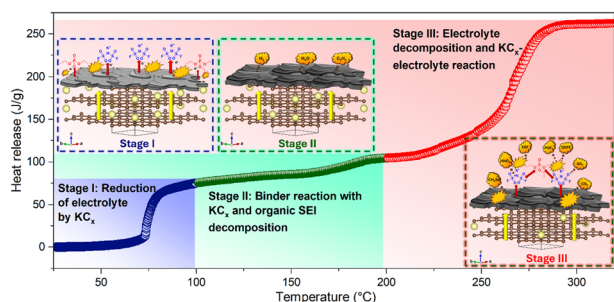
1202



## Grain boundary engineering enables (002)-textured zinc metal anodes with superior reversibility under ultra-high current density

Xijun Liu, Le Zhang, Qiangchao Sun, Shuyu Bi, Min Lin, Guanghui Cao, Xionggang Lu and Hongwei Cheng\*

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## Thermal decomposition pathways and interfacial reactivity in potassium-ion batteries: focus on the electrolyte and anode

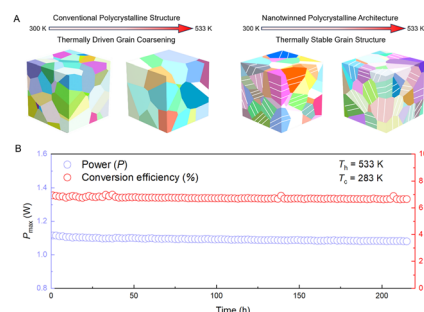
Siddhartha Nanda, Andrei Dolocan, Ayrton Yanyachi, Saurabh Sandip Satpute, Doosoo Kim, Kami L. Hull, Donal Finegan, Ofodike Ezekoye and Hadi Khani\*



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## Nanotwin engineering enables exceptional thermal stability in p-type bismuth telluride thermoelectrics

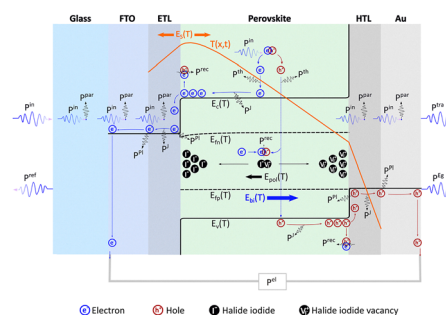
Chuangdong Zhou, Jiaze Zhu, Shuxin Zhang, Zhen'ao Zhang, Zongwei Zhang, Jianfeng Cai, Qiang Zhang, Ruijie Li, Lianghan Fan, Jingtao Xu, Guoqiang Liu, Xiaojian Tan,\* Bo Liang\* and Jun Jiang\*



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## On the role of thermo-electro-ionic dynamics in hysteresis and transient performance of perovskite solar cells

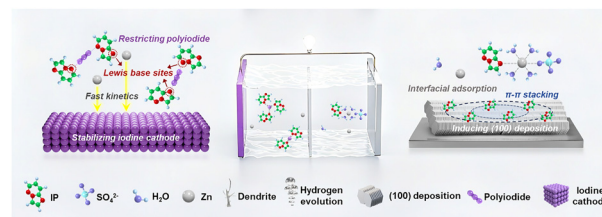
Hadi Rostamzadeh\* and Hamid Montazeri



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## Fused-ring topology orchestrates crystallographic control and polyiodide sequestration for ultra-durable zinc-iodine batteries

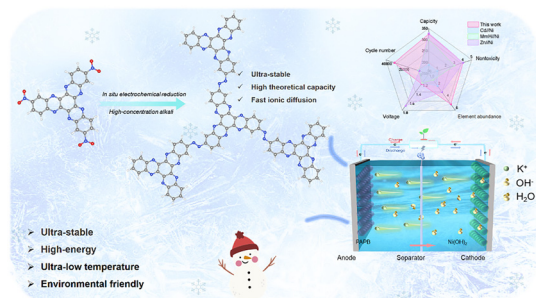
Yan Jin, Jihao Qin, Jin Cao,\* Zhenyang Zhang, Xin An, Shenghan Wang and Xuelin Yang\*



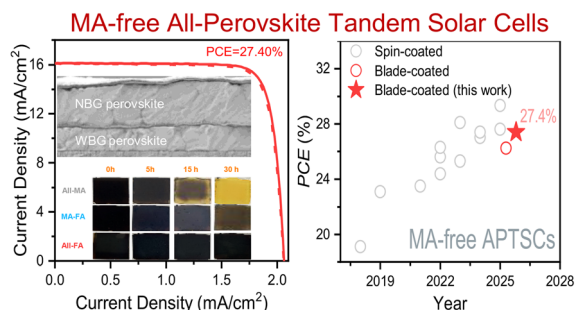
1282

## An *in situ* engineered azo-linked conjugated polymer anode enabling ultra-stable, high-energy aqueous alkaline batteries at $-60\text{ }^{\circ}\text{C}$

Mengxiao Li, Yu Li, Huijie Wang, Mingjun Hu\* and Jun Yang\*



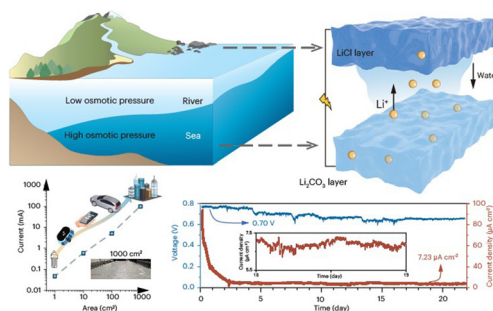
1296



### Synchronizing crystallization enables thermally stable all-FA Pb–Sn perovskites for printable MA-free all-perovskite tandem solar cells

Hongbing Li, Wei Feng, Jianan Wei, Qingchen He, Haojiang Shen, Yi He, Shi Chen,\* Yang Hao, Christoph J. Brabec, Yaohua Mai\* and Fei Guo\*

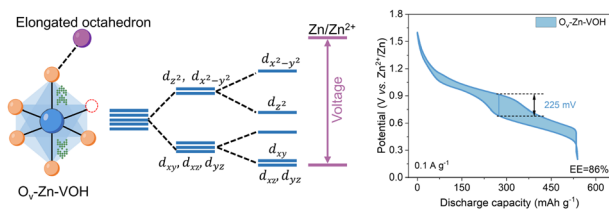
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### An estuarine-inspired dual-gradient hydrogel for stable and scalable moisture energy harvesting up to a single-module 100 mA output

Jie Miao, Haonan Wang,\* Nan He, Bingsen Wang, Mengting Zhang, Dawei Tang and Lin Li\*

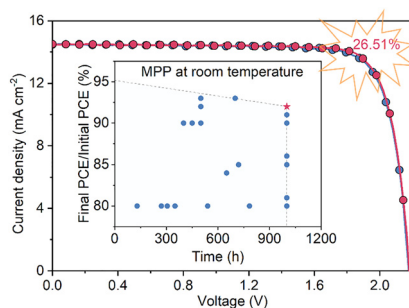
1319



### Ligand-field regulation enables high energy-efficiency cathodes for aqueous zinc-ion batteries

Quan Zong,\* Xuelian Liu, Keyi Chen, Qilong Zhang, Haoran Yuan, Shuang Zhou, Gongxun Bai, Guoying Wei and Anqiang Pan\*

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### Multidentate silane bridging for stable and efficient perovskite–organic tandem solar cells

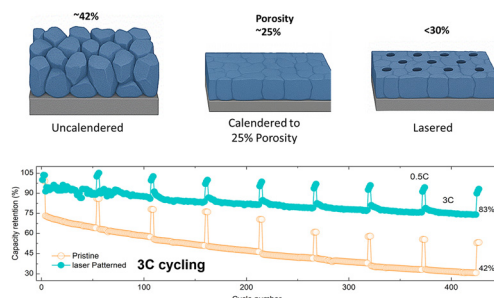
Dong Zhang, Baoze Liu, Xue Wang, Qi Liu, Danpeng Gao,\* Xianglang Sun,\* Xin Wu, Zexin Yu, Chunlei Zhang, Ning Wang, Yan Wang, Nikhil Kalasariya, Francesco Vanin, Weidong Tian, Shuai Li, Jianqiu Gong, Lina Wang, Yang Bai, Shuang Xiao, Bo Li, Martin Stollerfoht, Xiao Cheng Zeng,\* Shangfeng Yang\* and Zonglong Zhu\*



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### Enhancing power density and cycle life of NMC811 battery cathodes via combined dense calendaring and laser patterning

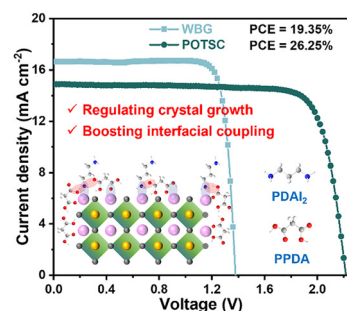
Kumar Raju,\* Stephen W. T. Price, Alice J. Merryweather, Aleksandar Radić, May Ching Lai, Debashis Tripathy, Daniel Lorden, Edward Saunders, Israel Temprano, Sulki Park, Caterina Ducati, Akshay Rao, Angkur Shaikeea, Clare P. Grey and Michael De Volder\*



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### Hydrogen-bond-driven synergistic regulation of crystallization and interfacial coupling in 1.85 eV wide-bandgap perovskites for high-performance organic tandem solar cells

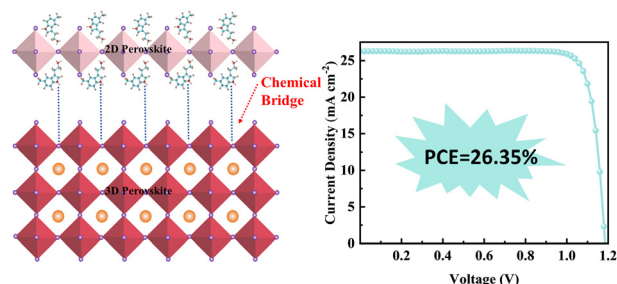
Qi Wang, Yingying Wang, Wei Hui, Lin Song, Xiaopeng Xu, Yihui Wu\* and Qiang Peng\*



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### Chemical bridging in a 2D/3D heterojunction via dual-anchoring functionalized molecules for efficient, stable and flexible perovskite solar cells

Lei Zhao, Jie Zhang, Yikun Hua, Xinyue Song, Chao Wu, Ruiqian Chen, Yang Feng, Haoran Deng, Jiacheng Su, Lei Gu, Wei Hui, Weiyuan Chen, Chunming Yang and Lin Song\*



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### Solvation geometry engineering for stable high-voltage potassium-ion batteries

Zhe Zhang, Wenli Qi, Shiwang Zhang, Jiacheng Zhu, Linlin Wang, Yue Bai, Jiale Chen, Yifan Chen, Guangqiang Hou, Xiaogang Niu, Xuefeng Wang,\* Jitao Chen,\* Xiao Ji\* and Yujie Zhu\*

