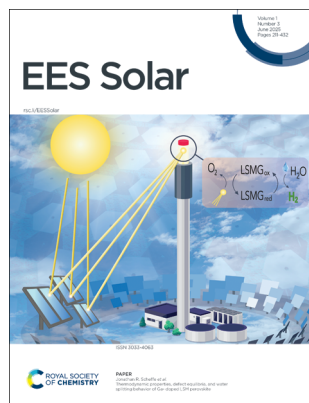


The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 3033-4063 CODEN ESEOU 1(3) 211–432 (2025)



### Cover

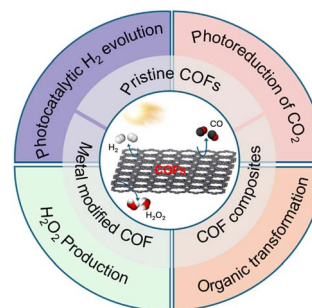
See Jonathan R. Scheffe *et al.*, pp. 267–278. Image reproduced by permission of Christi Swiers and Jonathan Scheffe from *EES Solar*, 2025, **1**, 267.

## REVIEWS

219

### Recent progress in covalent organic frameworks as heterogeneous photocatalysts for photochemical conversion

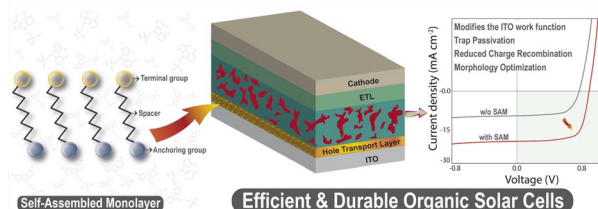
Xiangyu Zhang, Rufan Chen, Yongxiang Zhou, Zekun Chen, Guo Qin Xu and Qing-Hua Xu\*



248

### Advances in self-assembled monolayer-engineered organic solar cells

Abdul Azeez,\* Yexiao Huang, Lorreta Stanly, Zhipeng Kan and Safakath Karuthedath\*



**GOLD  
OPEN  
ACCESS**

# EES Batteries

**Exceptional research on  
batteries and energy storage**

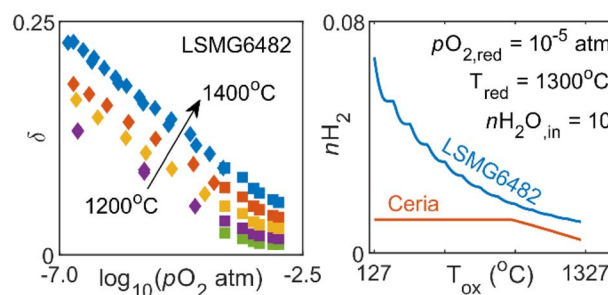
Part of the EES family

**Join  
in** | Publish with us  
[rsc.li/EESBatteries](https://rsc.li/EESBatteries)

267

### Thermodynamic properties, defect equilibria, and water splitting behavior of Ga-doped LSM perovskite

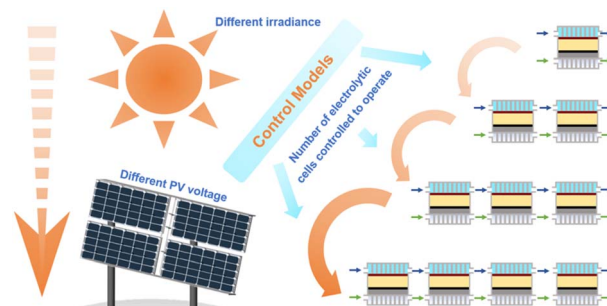
Dylan C. McCord, Caroline M. Hill, Francesca Barbieri, Elizabeth J. Gager, Juan C. Nino and Jonathan R. Scheffe\*



279

### Matching electrochemical CO<sub>2</sub> reduction with fluctuating photovoltaic power under natural illumination

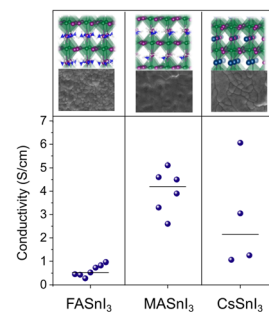
Ya Liu,\* Taiping Ye, Yifei Liu, Xiaohai Zhang, Linhong Jiang, Feng Wang, Shengjie Bai and Shaohua Shen



287

### Role of the monovalent cation in the self-doping of tin halide perovskites

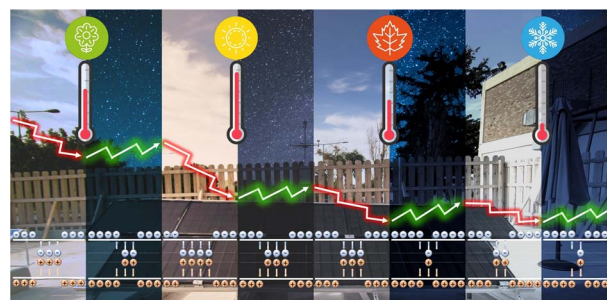
Isabella Poli,\* Edoardo Albanesi, Cesare Boriosi, Corinna Ponti, Luca Gregori, Giovanna Bruno, Daniele Meggiolaro, Pietro Rossi, Antonella Treglia, Davide Ruzza, Paola Delli Veneri, Lucia V. Mercaldo, Antonio Abate, Mario Caironi, Filippo De Angelis and Annamaria Petrozza\*



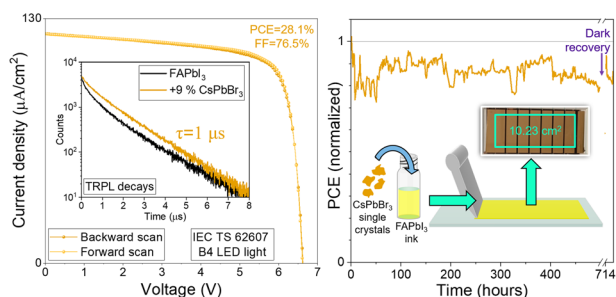
295

### Long-term outdoor performance of a solar farm enabled by graphene-perovskite panels: investigating degradation mechanisms, dark storage recovery, and visual defects

E. Spiliarotis, G. Viskadourous, K. Rogdakis, S. Pescetelli, A. Agresti, N. Tzoganakis, A. Di Carlo\* and E. Kymakis\*



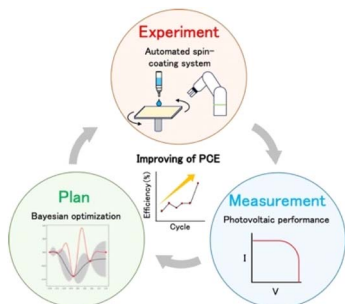
310



### Tuning FAPbI<sub>3</sub> for scalable perovskite indoor photovoltaics

Victor Marrugat-Arnal, Wanlong Wang, Mohammad Reza Kokaba, Sergey Dayneko, Dongyang Zhang, Shuang Qiu, Vishal Yeddu, Yameen Ahmed, Augusto Amaro, Muhammad Awais and Makhsud I. Saidaminov\*

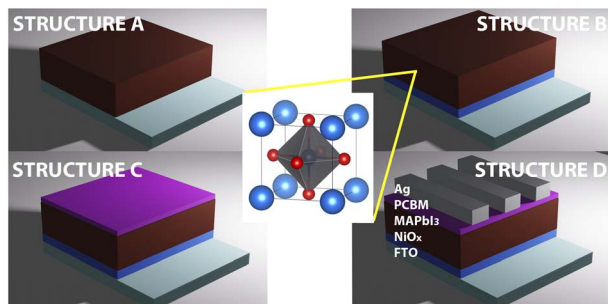
320



### Performance optimization of perovskite solar cells with an automated spin coating system and artificial intelligence technologies

Naoto Eguchi,\* Taro Fukazawa,\* Hiroyuki Kanda, Kohei Yamamoto, Takashi Miyake and Takuro N. Murakami\*

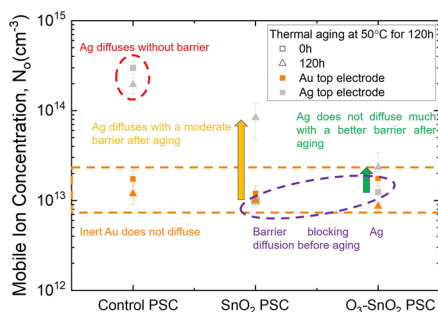
331



### An interfacial degradation mechanism in inverted perovskite solar cells with a sol-gel derived NiO<sub>x</sub> hole transport layer

Abraha Tadese Gidey,\* Elias Assayehegn, Esayas Alemayehu, Alexander R. Uhl and Jung Yong Kim\*

345



### Barrier layer design reduces top electrode ion migration in perovskite solar cells

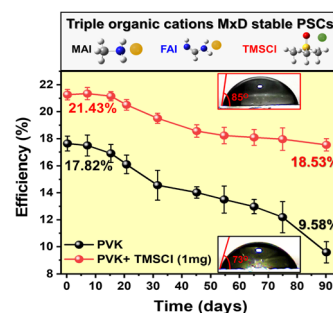
Saivineeth Penukula, Megh N. Khanal, Mohin Sharma, Mritunjaya Parashar, Ross A. Kerner, Min Chen, Melissa A. Davis, Rafikul Ali Saha, Eduardo Solano, Maarten B. J. Roeffaers, Joseph J. Berry, Joseph M. Luther, Julian A. Steele, Axel Palmstrom, Vincent R. Whiteside, Bibhudutta Rout, Ian R. Sellers and Nicholas Rolston\*



356

### A hydrophobic organic spacer cation for improving moisture resistance and efficiency in mixed-dimensional perovskite solar cells

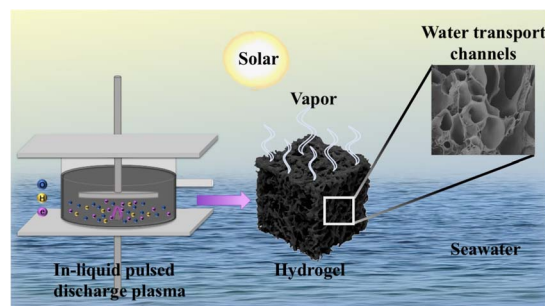
Prasun Kumar, Satinder Kumar Sharma and Ranbir Singh\*



366

### One-step preparation of a hydrogel evaporator by in-liquid pulsed discharge for efficient solar desalination

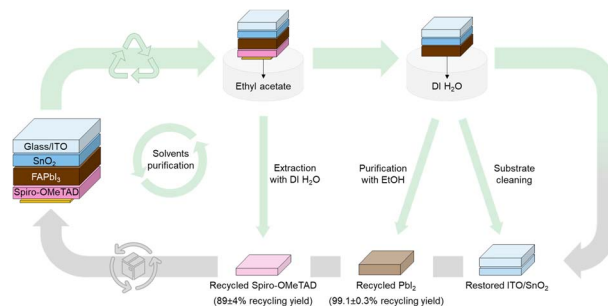
Tianyu Sun, Yanbin Xin,\* Jiabao Sun, Bing Sun and Xinfei Fan\*



378

### Circular management of perovskite solar cells using green solvents: from recycling and reuse of critical components to life cycle assessment

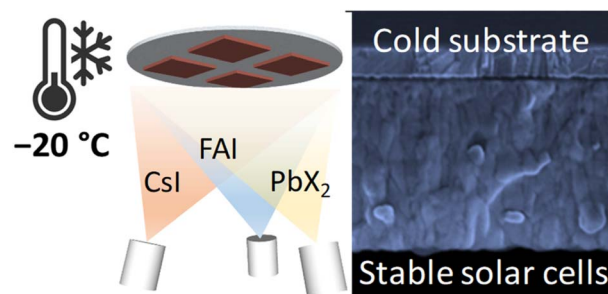
Valentina Larini, Changzeng Ding, Bingzheng Wang, Riccardo Pallotta, Fabiola Faini, Lorenzo Pancini, Zhenhua Zhao, Silvia Cavalli, Matteo Degani, Michele De Bastiani, Filippo Doria, Chang-Qi Ma, Fengqi You and Giulia Grancini\*



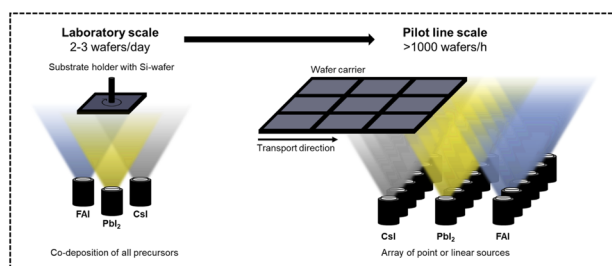
391

### Tuning substrate temperature for enhanced vacuum-deposited wide-bandgap perovskite solar cells: insights from morphology, charge transport, and drift-diffusion simulations

Lidón Gil-Escrig,\* Jasmeen Nespoli, Fransien D. Elhorst, Federico Ventosinos, Cristina Roldán-Carmona, L. Jan Anton Koster, Tom J. Savenije, Michele Sessolo\* and Henk J. Bolink



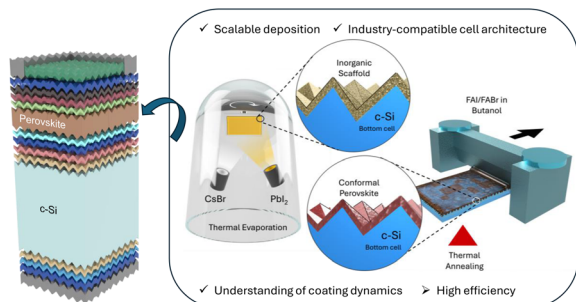
404



### Industrialization of perovskite solar cell fabrication: strategies to achieve high-throughput vapor deposition processes

Julian Petry,\* Viktor Škorjanc, Alexander Diercks, Thomas Feeney, Amedeo Morsa, Sara Rose Kimmig, Jens Baumann, Frank Löffler, Stefan Auschill, Joshua Damm, Daniel Baumann, Felix Laufer, Jona Kurpiers, Michael Müller, Lars Korte, Steve Albrecht, Marcel Roß,\* Ulrich W. Paetzold\* and Paul Fasl\*

419



### Coating dynamics in two-step hybrid evaporated/blade-coated perovskites for scalable fully-textured perovskite/silicon tandem solar cells

Oussama Er-raji,\* Ahmed A. Said, Anand S. Subbiah, Vladyslav Hnapovskyi, Badri Vishal, Anil R. Pininti, Marco Marengo, Martin Bivour, Markus Kohlstädt, Juliane Borchert, Patricia S. C. Schulze, Stefaan De Wolf and Stefan W. Glunz

