

# Journal of Materials Chemistry C

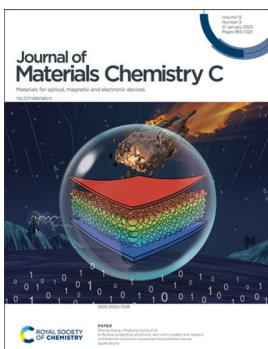
Materials for optical, magnetic and electronic devices

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## IN THIS ISSUE

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### Cover

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pp. 1146–1156.  
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*J. Mater. Chem. C*,  
2025, 13, 1146.

## EDITORIALS

981

**2024 Journal of Materials Chemistry Lectureship**  
winner: Raphaële Clément, University of California,  
Santa Barbara, United States



982

**2024 Journal of Materials Chemistry Lectureship**  
runners-up: Maxx Arguilla, University of California,  
Irvine, United States, and Phillip Milner, Cornell  
University, United States



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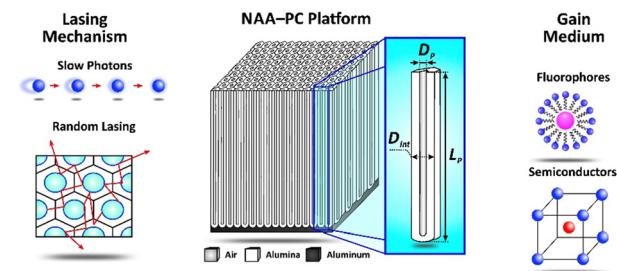


## REVIEWS

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## Nanoporous anodic alumina photonic crystals for solid-state lasing systems: state-of-the-art and perspectives

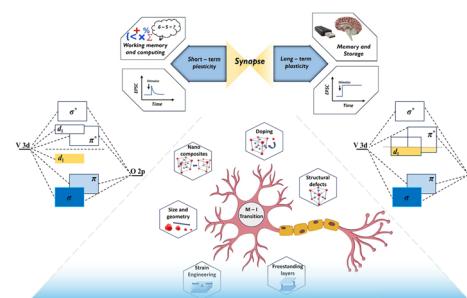
Satyathiran Gunenthiran, Juan Wang, Cheryl Suwen Law, Andrew D. Abell, Zeyad T. Alwahabi and Abel Santos\*



1013

## Mott–vanadium dioxide-based memristors as artificial neurons for brain-inspired computing: a view on current advances

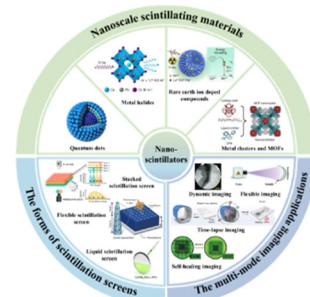
K. Gurukrishna, Aditya Uday Kamat and Shikhar Misra\*



1036

## Nanoscale scintillating materials for X-ray imaging: fundamentals and applications

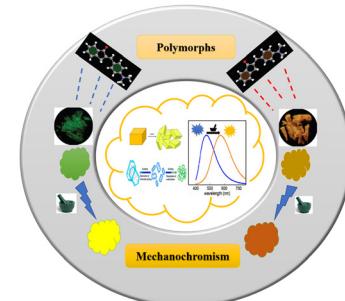
Yuan Zhong, Xujiang Yu\* and Wanwan Li\*



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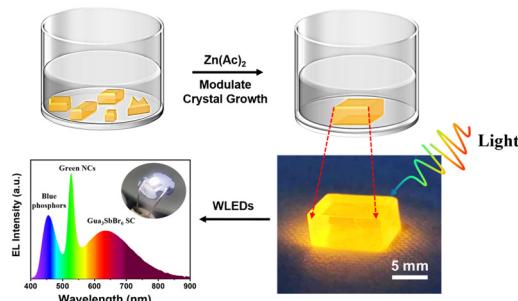
## Polymorphism in mechanochromic luminogens: recent advances and perspectives

Ramakant Gavale, Faizal Khan and Rajneesh Misra\*



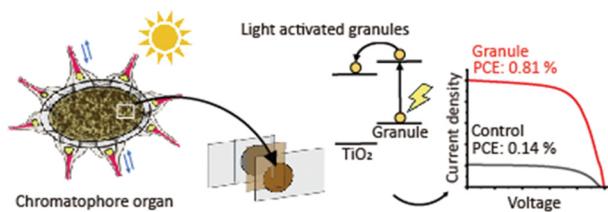
## COMMUNICATIONS

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**Centimeter-scale  $\text{Gua}_3\text{SbBr}_6$  single crystals for white light-emitting diodes enabled by inhibition of multi-site nucleation**

Yongjiang Dou, Zirui Liu, Quanzhen Huang, Tiantian Shi, Sheng Wang\* and Xuyong Yang\*

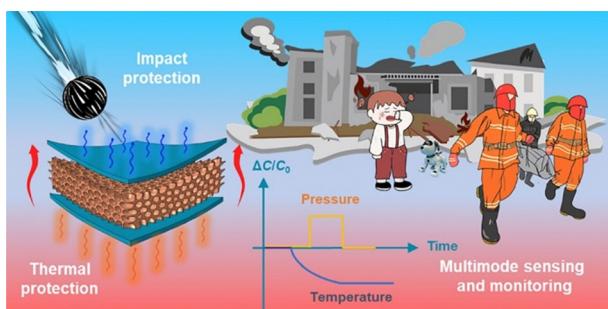
1138

**Cephalopod chromatophores contain photosensitizing nanostructures that may facilitate light sensing and signaling in the skin**

Taehwan Kim, Duncan Q. Bower and Leila F. Deravi\*

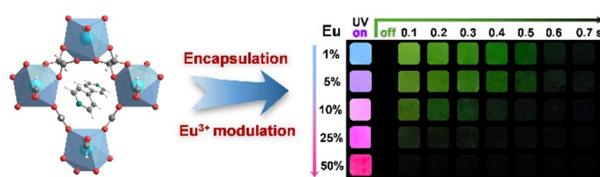
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**A flexible protective electronic skin with tunable anti-impact and thermal insulation properties for potential rescue applications**

Wenhui Wang, Sheng Wang\*, Zimu Li, Jianyu Zhou, Shuai Liu, Tingting Xuan, Junshuo Zhang and Xinglong Gong\*

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**Europium ions modulated room temperature phosphorescence in dye-encapsulated MOFs for dual-modal fluorescence-afterglow**

Jiabo Chen, Renrui Sun, Wanjun Yang, Feifei Xing, Xiaolin Yu and Lining Sun\*

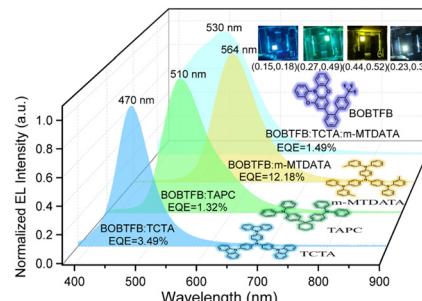


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**A novel deep-blue fluorescent emitter employed as an identical exciplex acceptor for solution-processed multi-color OLEDs**

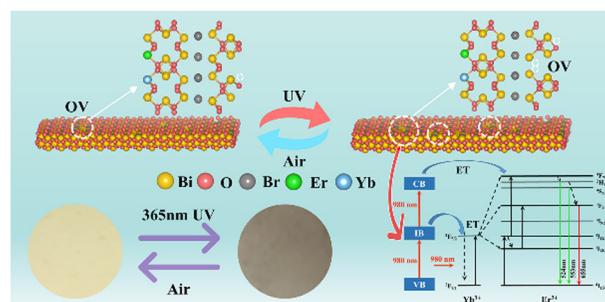
Jie Pan, Shiyue Zhang, Zhongxin Zhou, Yongtao Zhao, Shujing Jin, Yanju Luo,\* Weiguo Zhu\* and Yu Liu\*



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**Construction of oxygen-rich vacancy  $\text{Bi}_3\text{O}_4\text{Br}:\text{Yb}^{3+},\text{Er}^{3+}$  nanosheets for enhanced photoreversible color switching and upconversion luminescence**

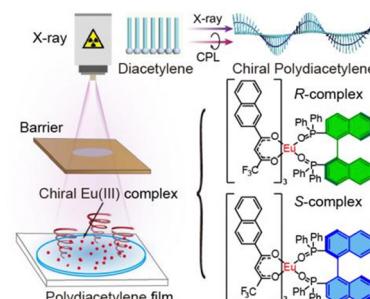
Xueting Zhao, Junhao Ma, Jindan Zha, Kuisui Huang, Chenghui Chai, Zhaoyi Yin, Zhiguo Song, Jianbei Qiu and Yongjin Li\*



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**X-Ray imaging and enantioselective photopolymerization enabled by chiral Eu(III) complex nanoscintillators**

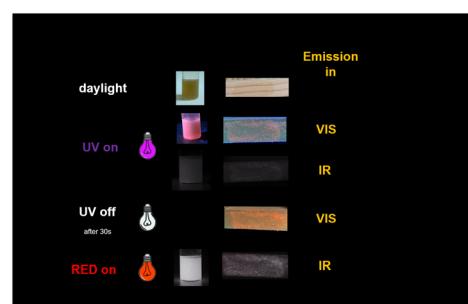
Zejian Li, Chenxi Zhang, Yan Li, Yiming Wu, Wenchao Zhang\* and Chenlu He\*



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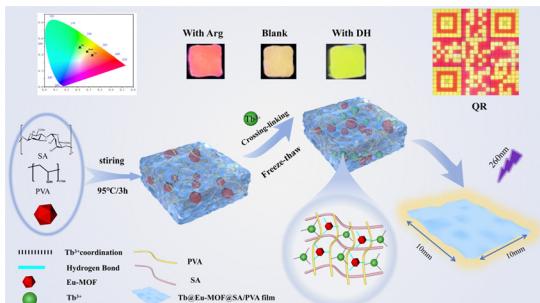
**Multimodal anti-counterfeiting inks: modern use of an ancient pigment in synergy with a persistent phosphor**

Francesco Armetta, Alessandro Lo Bianco, Vitalii Boiko, Dariusz Hreniak\* and Maria Luisa Saladino\*



## PAPERS

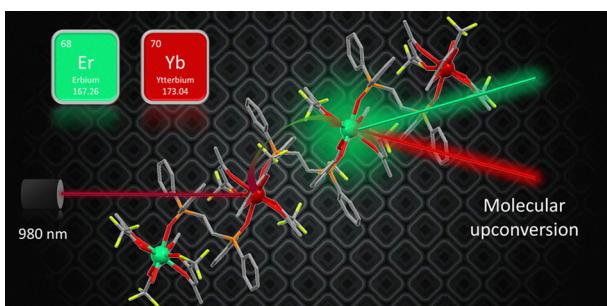
1198



**Tb(III)-functionalized MOF hybridized bis-crosslinked networked hydrogel luminescent films for arginine and dopamine hydrochloride sensing and anticounterfeiting**

Jiaxuan Pan, Jiazen Lu, Yichen Shang, Ying Li\* and Bing Yan\*

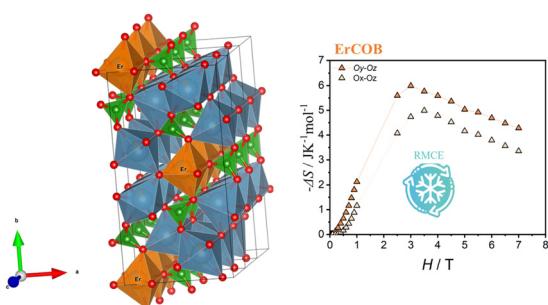
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**The role of terminal and bridge ligands in the molecular upconversion of lanthanide(III) 1D coordination polymers**

Stefano Angerami de Andrade, Airton Germano Bispo-Jr, Deborah de Alencar Simoni, Javier Ellena, João Honorato de Araujo Neto, Italo Odore Mazali and Fernando Aparecido Sigoli\*

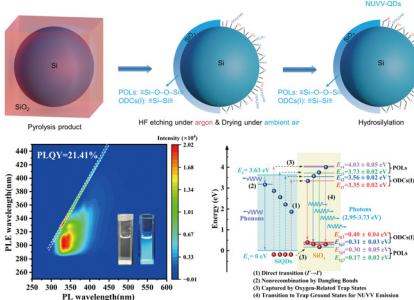
1215



**Large magnetic anisotropy and a rotating cryomagnetocaloric effect in single-crystalline paramagnetic lanthanide calcium oxyborates  $\text{LnCa}_4\text{O}(\text{BO}_3)_3$  with  $\text{Ln} = \text{Pr, Nd, Gd, Er, and Tm}$**

Fatiha Azrour, Romain Viennois,\* Jérôme Long, Corine Reibel, Jérôme Debray, Fapeng Yu, Shujun Zhang, Mickaël Beaudhuin and Jérôme Rouquette

1228



**Facile synthesis of silicon quantum dots with photoluminescence in the near-ultraviolet to violet region via wet oxidation**

Yizhou He, Qianxi Hao, Chi Zhang, Qi Wang, Wenxin Zeng, Jiamin Yu, Xue Yang,\* Shaorong Li, Xiaowei Guo\* and Serguei K. Lazarouk

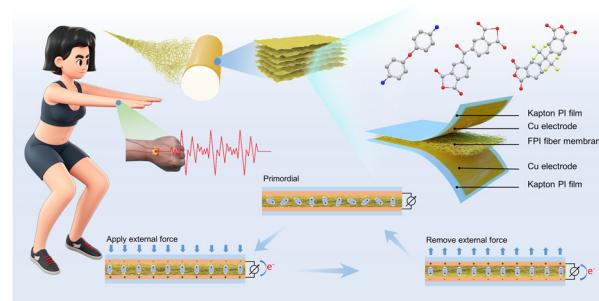


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## Unexpected piezoelectric properties of electrospun polyimide nanofibers for application in an extreme environment

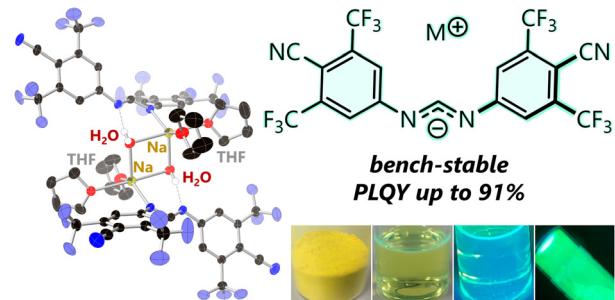
Liangkang Huang, Jianwei Li,\* Shuting Chen, Bilin Zhang, Shengping Li, Wei Fan, Qiangli Zhao and Xuman Wang



1254

## Intense fluorescence of air-stable sodium diarylformamidinate: effective control with a novel electron-withdrawing 4-cyano-3,5-bis(trifluoromethyl)phenyl group

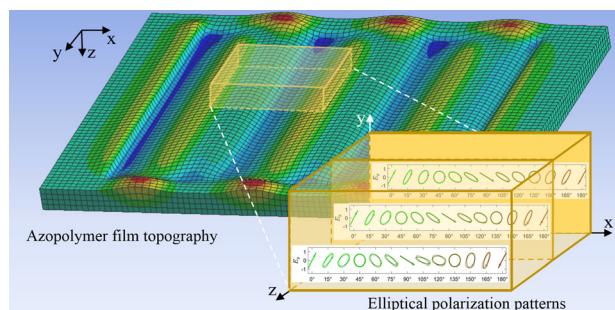
Kenichi Michigami,\* Daiki Kawakami, Ichiro Ueda, Shunya Ito, Takuya Ogaki, Hiroshi Ikeda and Masato Ohashi\*



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## Viscoplastic photoalignment modeling of asymmetric surface restructuring in azopolymer films by elliptically polarized light

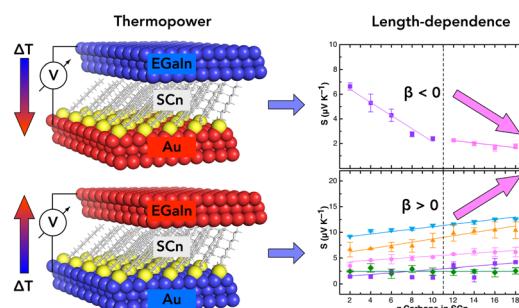
Nina Tverdokhleb, Biagio Audia, Pasquale Pagliusi\* and Marina Saphiannikova\*



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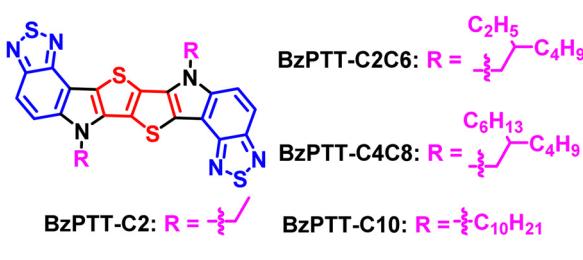
## Length-dependent thermopower of self-assembled monolayers of alkanethiolates depends on direction of temperature gradient

C. Lungani Mthembu and Ryan C. Chiechi\*



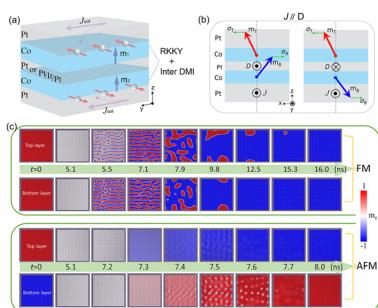
## PAPERS

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**Design, synthesis, and optoelectronic properties of benzothiadiazole-fused sulfur and nitrogen-containing polycyclic heteroaromatics**

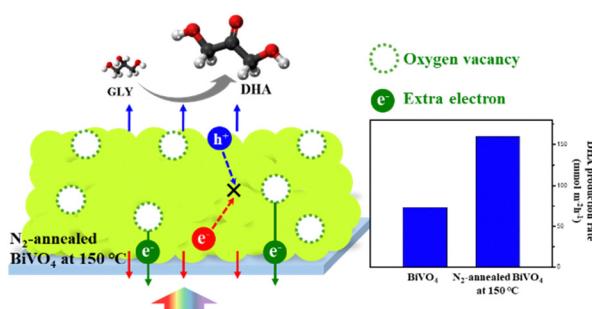
Yuxin Yin, Rui Shi, Zhongwei Liu, Yanru Li, Ting Jiang, Lingxu Zhao, Jie Li,\* Deyang Ji, Liqiang Li and Zhuping Fei\*

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**Micromagnetic dynamics in field-free magnetization switching assisted by interlayer Dzyaloshinskii–Moriya interaction**

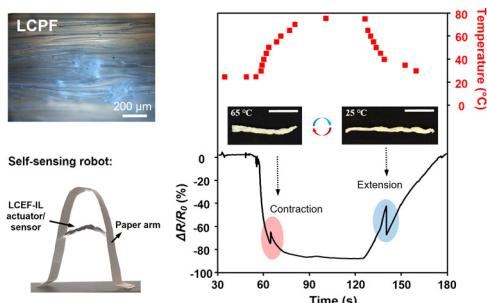
Cuixiu Zheng, Wenqing He, Mo Zhu, Caihua Wan, Xiufeng Han\* and Yaowen Liu\*

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**Robust dihydroxyacetone production via photoelectrochemical glycerol oxidation using an oxygen vacant  $\text{BiVO}_4$  photoanode**

Yeji Lee, Yeseul Jo and Youn Jeong Jang\*

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**Temperature and locomotion dual self-sensing soft robots based on liquid crystal polymer foams**

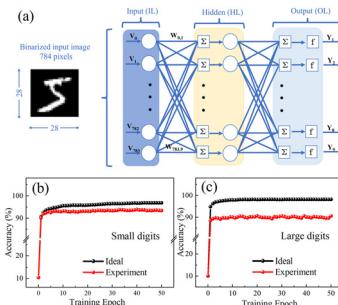
Shuyun Zhuo, Jie Jiang, Yaru Ma, Yiming Chen and Yue Zhao\*

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## Solution-processed LiGdO solid electrolyte for an $\text{In}_2\text{O}_3$ synaptic transistor and its application in neuromorphic computing

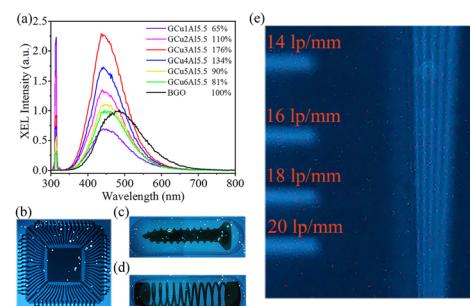
Xixiao Du, Wenlan Xiao, Guangtan Miao, Zezhong Yin, Ranran Ci, Guoxia Liu\* and Fukai Shan\*



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## An efficient $\text{Cu}^+$ doped Gd-based fluoroaluminosilicate scintillator glass for X-ray detectors

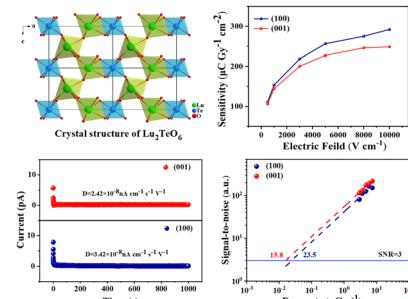
Guanlin He, Lianjie Li, Junyu Chen, Yujia Gong and Hai Guo\*



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## Oxide $\text{Lu}_2\text{TeO}_6$ single crystals for X-ray detection with an ultralow detection limit

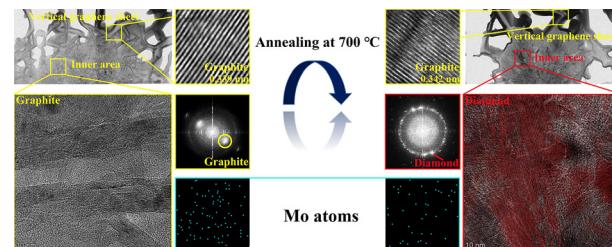
Tingting Cao, Feifei Guo,\* Fuai Hu, Xutang Tao and Zeliang Gao\*



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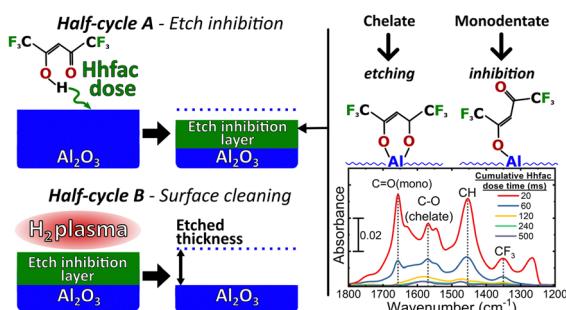
## Vertical graphene and nanodiamond composites prepared by loading monodispersed molybdenum atoms and annealing

Chengke Chen, Chengquan He, Luxiao Hong and Xiaojun Hu\*



## PAPERS

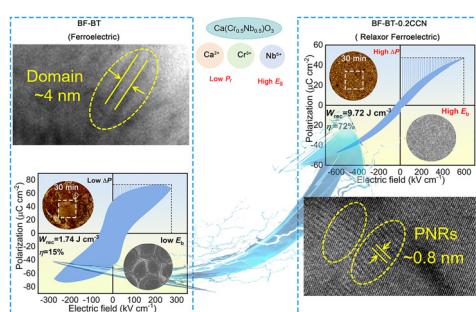
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### Investigation of the atomic layer etching mechanism for $\text{Al}_2\text{O}_3$ using hexafluoroacetone and $\text{H}_2$ plasma

Nicholas J. Chittock, Joost F. W. Maas, Ilker Tezsevin, Marc J. M. Merkx, Harm C. M. Knoops, Wilhelmus M. M. (Erwin) Kessels and Adriaan J. M. Mackus\*

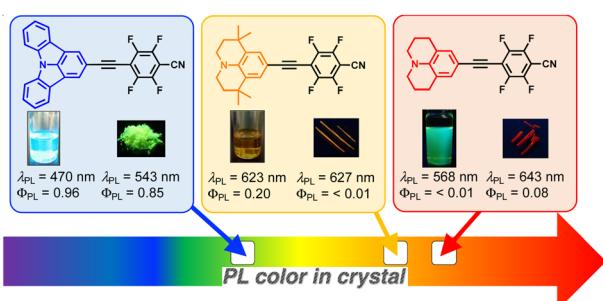
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### Enhancing energy storage density in lead-free $\text{BiFeO}_3$ -based relaxor ferroelectric ceramics through multiple optimization designs

Hengtong Zhao, Pei Han,\* Tiantian Zhang, Hao Li, Jianhua Wu, Liwen Zhang, Jinhua Du, Junyan Zhang, Ye Zhao,\* Yunying Liu\* and Yong Li\*

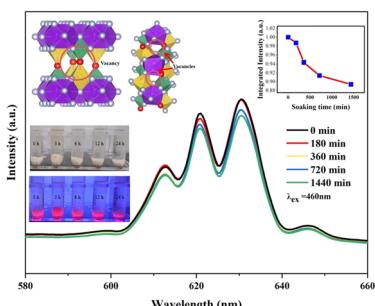
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### Solid-state red fluorescence of intramolecularly ring-fused donor-π-acceptor-type fluorinated diphenylacetylenes achieved by enhancing intramolecular charge transfer properties

Kazuki Kobayashi, Shigeyuki Yamada,\* Masato Morita, Tsuneaki Sakurai, Motohiro Yasui and Tsutomu Konno

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### The structure transition and luminescence performance of a high moisture resistant $\text{KNaNbOF}_5:\text{Mn}^{4+}$ red phosphor

Daoyuan Ma, Yunzheng Liu, Wenfa Fang, Jinliang Huang and Libin Xia\*

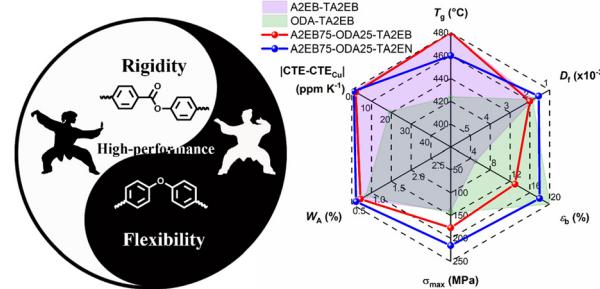


## PAPERS

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## The structure design of poly(ester imide)s with low dielectric loss and high mechanical properties

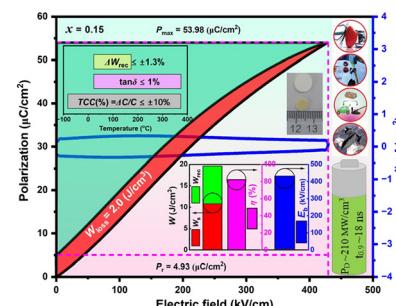
Chenggang Zhang, Xiaojie He and Qinghua Lu\*



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## Enhanced energy storage performance with excellent thermal stability of BNT-based ceramics via the multiphase engineering strategy for pulsed power capacitor

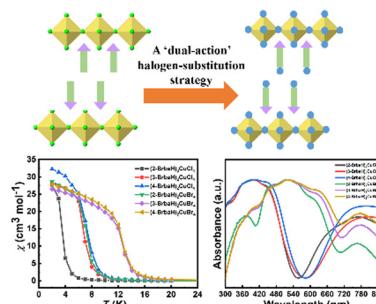
Maqbool Ur Rehman, Aiwen Xie, Attaur Rahman, Yi Zhang, Ao Tian, Xuewen Jiang, Xinchun Xie, Cong Zhou, Tianyu Li, Liqiang Liu, Xin Gao, Xiaokuo Er and Ruzhong Zuo\*



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## Stronger polar ferromagnetism and narrower optical band gaps in two-dimensional hybrid copper perovskites induced by bromine-substitution

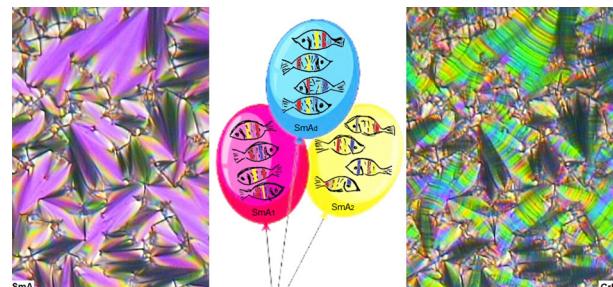
Ceng Han,\* Jason A. McNulty, Alasdair J. Bradford, Alexandra M. Z. Slawin, Stephen L. Lee and Philip Lightfoot\*



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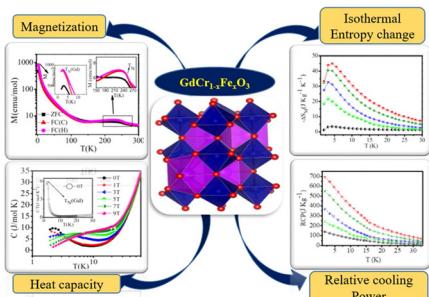
## Polar-end 3,5-diarylisoazole liquid crystals with SmA and highly ordered CrE mesophases

Caroline S. B. Weber, Rafaela R. da Rosa, Bruno B. de Araújo, Lindiomar B. Avila, Leonardo N. Furini, Ivan H. Bechtold, Juliana Eccher and Aloir A. Merlo\*



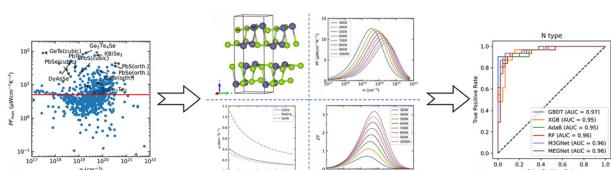
## PAPERS

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**Giant magnetocaloric effect in Fe-doped rare earth orthochromite  $\text{GdCr}_{0.5}\text{Fe}_{0.5}\text{O}_3$** 

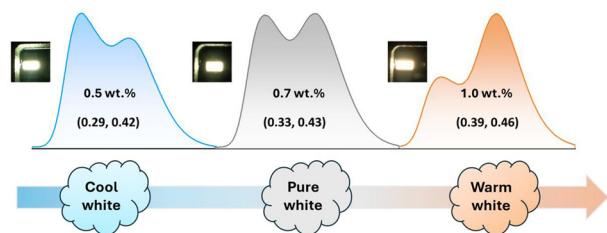
Abinash Prusty, Sudipta Mahana, B. Sheetal Priyadarshini, Andrei Gloskovskii, D. Topwal and U. Manju\*

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**Combining machine-learning models with first-principles high-throughput calculations to accelerate the search for promising thermoelectric materials**

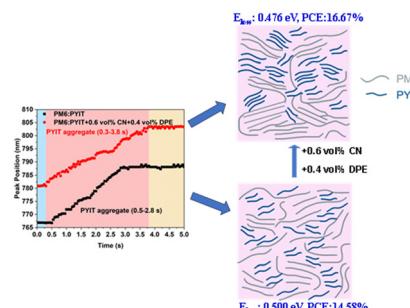
Tao Fan\* and Artem R. Oganov

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**Tunable color-stable hybrid white OLEDs by combining fluorescent and TADF emitters in a single emissive layer**

Upasana Deori, Thamodharan Viswanathan, Nisha Yadav and Pachaiyappan Rajamalli\*

1457

**Enhancing molecular aggregation and decreasing the optical gap by a dual-additive to reduce the energy loss of all-polymer organic solar cells**

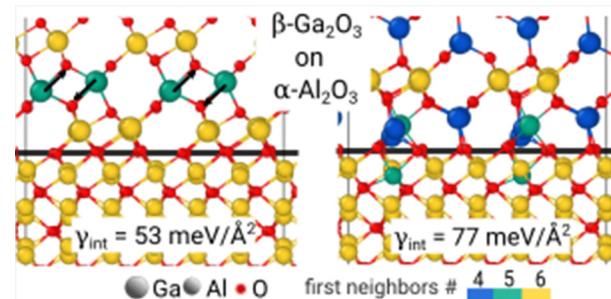
Jiaqi Pan, Qiang Zhang, Jian Guan, Hanyue Gao, Luzhuo Li, Rui Zhang, Hongxiang Li, Xinhong Yu and Yanchun Han\*

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## Interface energies of $\text{Ga}_2\text{O}_3$ phases with the sapphire substrate and the phase-locked epitaxy of metastable structures explained

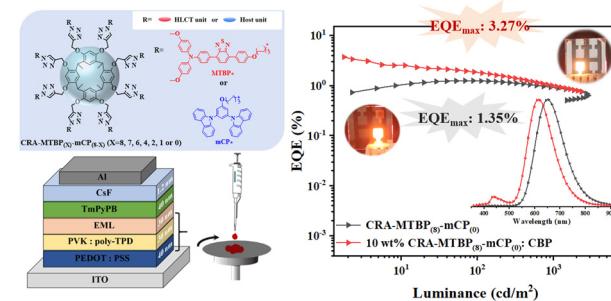
Ilaria Bertoni,\* Aldo Uogolotti, Emilio Scalise, Roberto Bergamaschini and Leo Miglio



1477

## Solution-processable benzothiadiazole/triphenylamine-based hybridized local and charge-transfer (HLCT) hyper-structured molecular red emitters for OLEDs

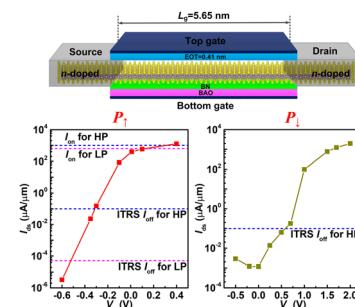
Xiaoyu Yin, Junrong Pu, Chen Ma, Yi Wu, Kunlun Wang, Yingliang Liu, Shaokui Cao, Shi-Jian Su\* and Shengang Xu\*



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## Ferroelectrically gated sub-6 nm monolayer $\text{MoS}_2$ transistors for high-performance and low-power applications

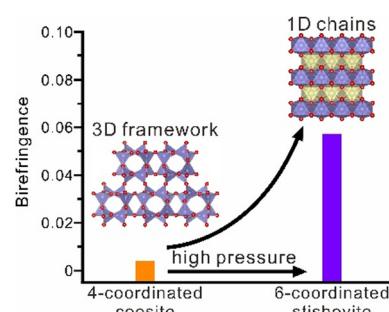
Jin Yuan, Jian-Qing Dai,\* Miao-Wei Zhao, Yun-Ya Zhong and Da-Wei Deng



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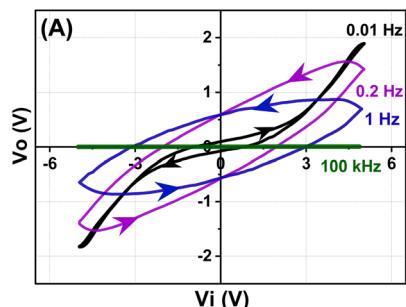
## Enhanced optical anisotropy of six-coordinated silica polymorphs via high-pressure hydrothermal treatment

Junwei Li, Yanqiang Li, Weiqi Huang, Takayuki Ishii, Yanhao Lin, Binbin Yue, Sangen Zhao\* and Qingyang Hu\*



## PAPERS

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## Colossal dielectric permittivity and superparaelectricity in phenyl pyrimidine based liquid crystals

Yuri P. Panarin, Wanhe Jiang, Neelam Yadav, Mudit Sahai, Yumin Tang, Xiangbing Zeng, O. E. Panarina, Georg H. Mehl\* and Jagdish K. Vij\*

## CORRECTION

1519

### Correction: Facile synthesis of silicon quantum dots with photoluminescence in the near-ultraviolet to violet region *via* wet oxidation

Yizhou He, Qianxi Hao, Chi Zhang, Qi Wang, Wenxin Zeng, Jiamin Yu, Xue Yang,\* Shaorong Li, Xiaowei Guo\* and Serguei K. Lazarouk

