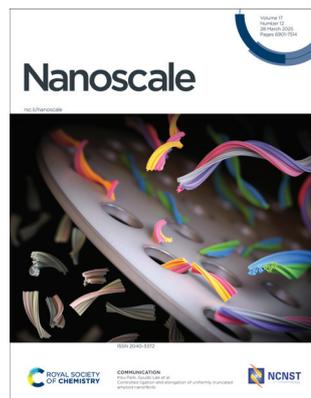


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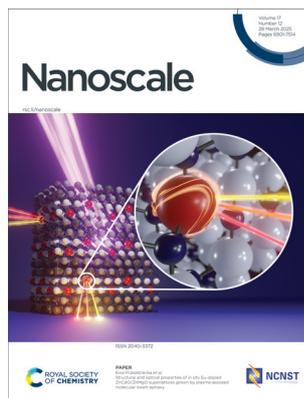
ISSN 2040-3372 CODEN NANOHL 17(12) 6901–7514 (2025)



### Cover

See Insu Park, Gyudo Lee *et al.*, pp. 6993–7001.

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### Inside cover

See Ewa Przeździecka *et al.*, pp. 7055–7065.

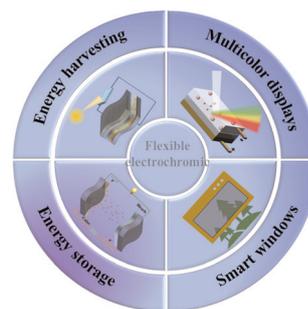
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## REVIEWS

6919

### Recent advances in flexible multifunctional electrochromic devices

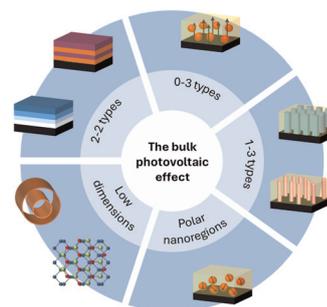
Jiamin Yu, Shanjie Wang, Lin Gao, Guoqi Qiao, Meng-Fang Lin, Cong Wei, Jingwei Chen\* and Shaohui Li\*



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### Nanostructure engineering for ferroelectric photovoltaics

Wenzhong Ji, Teng Lu\* and Yun Liu\*



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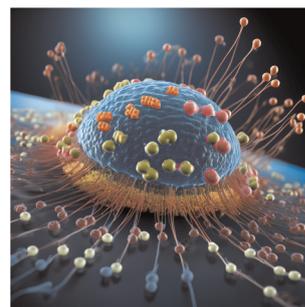
Fundamental questions  
Elemental answers

## REVIEWS

6960

**Understanding the interplay between pH and charges for theranostic nanomaterials**

Valerie Ow, Qianyu Lin, Joey Hui Min Wong, Belynn Sim, Yee Lin Tan, Yihao Leow, Rubayn Goh\* and Xian Jun Loh\*

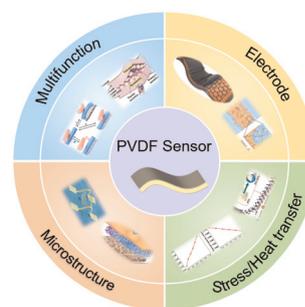


## MINIREVIEW

6981

**External strategies for enhanced sensing performance of self-powered polyvinylidene fluoride-based sensors**

Fang Wang,\* Zixuan Song, Xinchun Cai, Kai Guo, Xiaoyu Pan,\* Chuanlai Ren and Bo Li\*

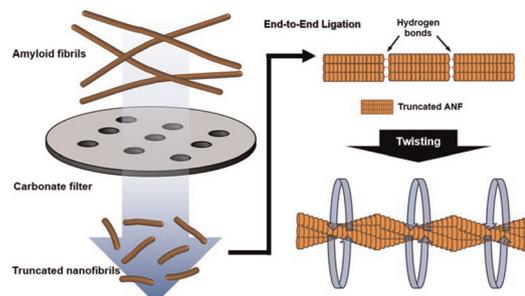


## COMMUNICATIONS

6993

**Controlled ligation and elongation of uniformly truncated amyloid nanofibrils**

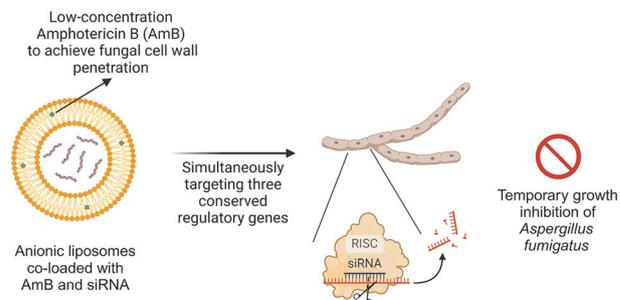
Seokbeom Roh, Da Yeon Cheong, Sangwoo Lee, Jongsang Son, Insu Park\* and Gyudo Lee\*



7002

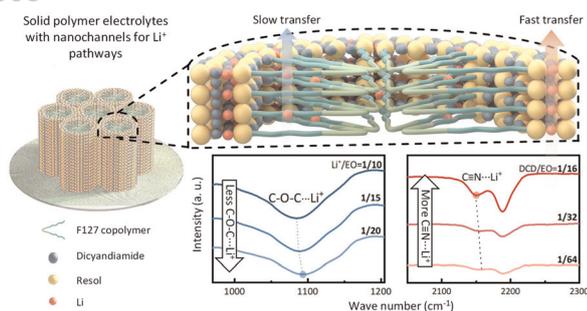
**Enhanced antifungal activity of siRNA-loaded anionic liposomes against the human pathogenic fungus *Aspergillus fumigatus***

Yidong Yu, Theresa Vogel, Sina Hirsch, Jürgen Groll, Krystyna Albrecht\* and Andreas Beilhack\*



## COMMUNICATIONS

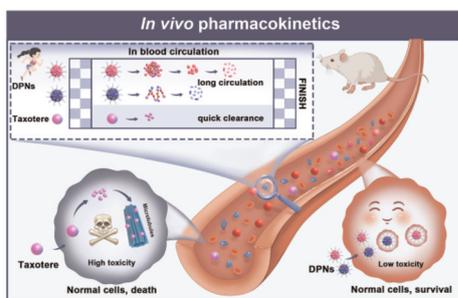
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### One-pot synthesis of long-range aligned nanochannels for Li-ion transfer pathways

Zehan Chen, Isaac Alvarez Moises, Ruth Bruker, He Jia, Shanshan Yan, Yinghui Zhang, Zhenni He, Kejie Zhou, Sorin Melinte, Laurent Rubatat, Klaus Meerholz and Jean-François Gohy\*

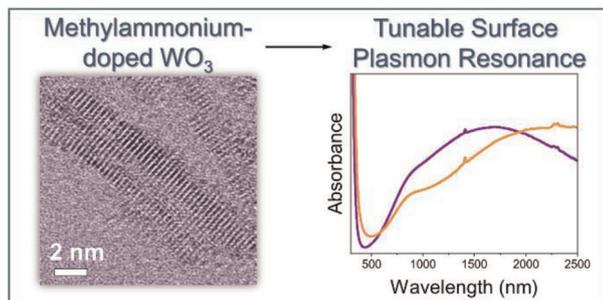
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### An assembly modules deformation strategy improved the chemical stability and self-assembly stability of docetaxel prodrugs nanoassemblies

Wenjing Wang, Shuo Wang, Shengyao Xu, Rong Chai, Jun Yuan, Hao Zhang, Yaqi Li, Xiaohui Pu, Xin Li, Jin Sun, Zhonggui He\* and Bingjun Sun\*

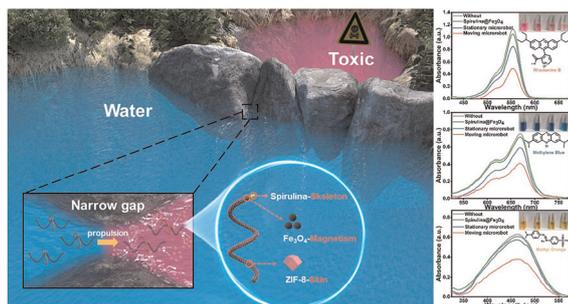
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### Tungsten oxide nanocrystals doped with interstitial methylammonium cations

Owen Kendall, Lesly V. Melendez, Merve Nur Guven Bicer, Michael Wilms, Joel van Embden, Daniel E. Gómez, Arrigo Calzolari, Deborah Prezzi\* and Enrico Della Gaspera\*

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### Biohybrid microrobots with a Spirulina skeleton and MOF skin for efficient organic pollutant adsorption

Yongcheng Li, Dajian Li, Yuhong Zheng, Sirui Lu, Yuepeng Cai\* and Renfeng Dong\*

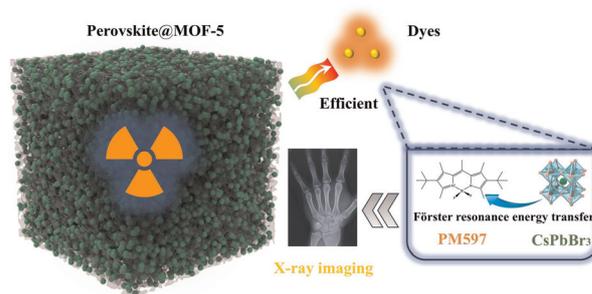


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### One stone, two birds: robust and self-absorption free flexible perovskite scintillators by metal–organic framework encapsulation

Jie Zhou, Zhouyuanhang Wang, Zhongren Shi, Xilin Zhang, Lan Yang, Yuxuan Jiang, Yan Kuai, Zhijia Hu\* and Siqi Li\*

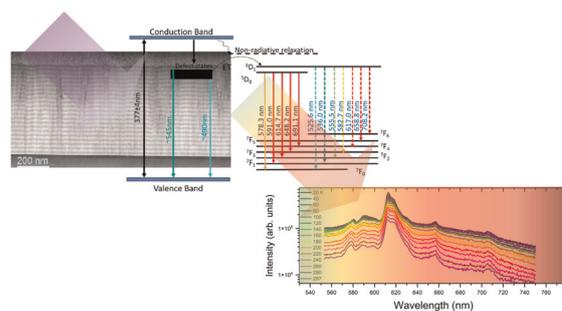


## PAPERS

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### Structural and optical properties of *in situ* Eu-doped ZnCdO/ZnMgO superlattices grown by plasma-assisted molecular beam epitaxy

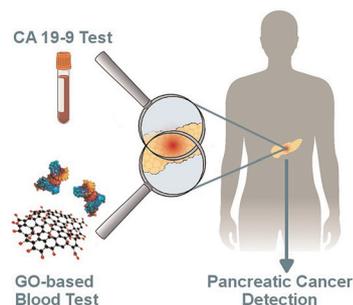
Anastasiia Lysak, Aleksandra Wierzbicka, Sergio Magalhaes, Piotr Dłużewski, Rafał Jakieta, Michał Szot, Zeinab Khosravizadeh, Abinash Adhikari, Adrian Kozanecki and Ewa Przeździecka\*



7066

### Nanoparticle-protein corona enhances accuracy of Ca-19.9-based pancreatic cancer classification

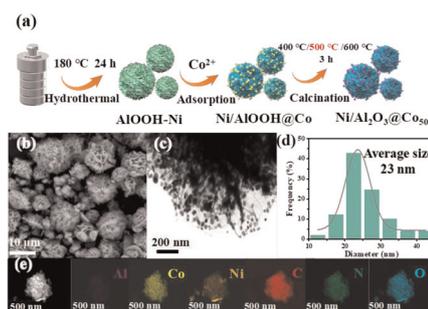
Luca Digiaco, Damiano Caputo, Roberto Cammarata, Vincenzo La Vaccara, Roberto Coppola, Erica Quagliarini, Manuela Iacobini, Serena Renzi, Francesca Giulimondi, Daniela Pozzi,\* Giulio Caracciolo\* and Heinz Amenitsch



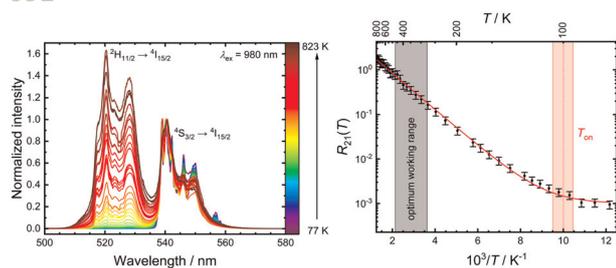
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### Densely distributed Co onto carbon-layer-coated flower-like Ni/Al<sub>2</sub>O<sub>3</sub> and its tailored integration into a stirrer for multiple catalytic degradation and solar-powered water evaporation

Shuang Jiang, Hongyao Zhao, Zichen Ma, Hongyang Zhu, Danhong Shang, Linzhi Zhai, Yanyun Wang,\* Yiyang Song\* and Fu Yang\*



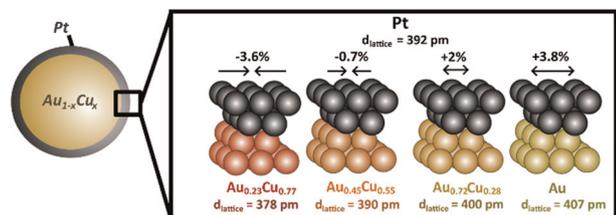
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### What makes $\beta$ - $\text{NaYF}_4:\text{Er}^{3+}, \text{Yb}^{3+}$ such a successful luminescent thermometer?

Markus Suta

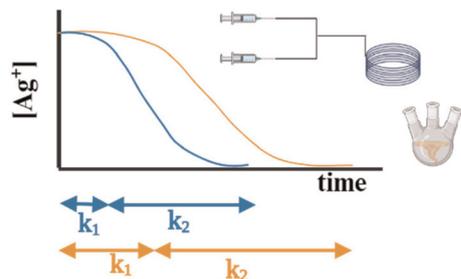
7100



### Synthetic control over lattice strain in trimetallic AuCu-core Pt-shell nanoparticles

Just P. Jonasse, Marta Perxés Perich, Savannah J. Turner and Jessi E. S. van der Hoeven\*

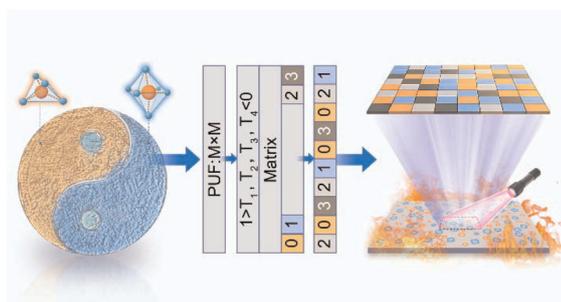
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### Kinetic analysis of silver nanowire synthesis: polyol batch and continuous millifluidic methods

Destiny F. Williams, James E. Smay and Shohreh Hemmati\*

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### Multilevel, solar-blind, and thermostable physical unclonable functions based on host-sensitized luminescence of $\beta\text{-Ga}_2\text{O}_3:\text{Dy}^{3+}$

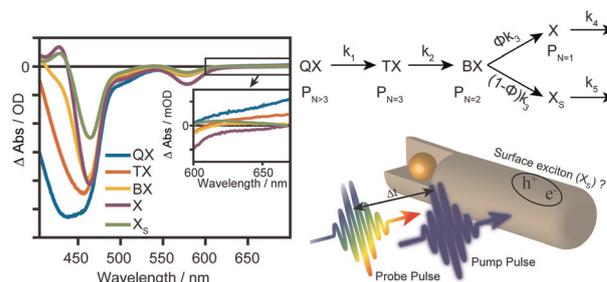
Dong Zhu, Chunfeng Wang,\* Fuhang Jiao, Jiujun Xu, Haoran Xu, Shun Han, Peijiang Cao, Yuxiang Zeng, Ming Fang, Wenjun Liu, Deliang Zhu\* and Youming Lu\*



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### Spectral and dynamical properties of multiexcitons in semiconductor nanorods

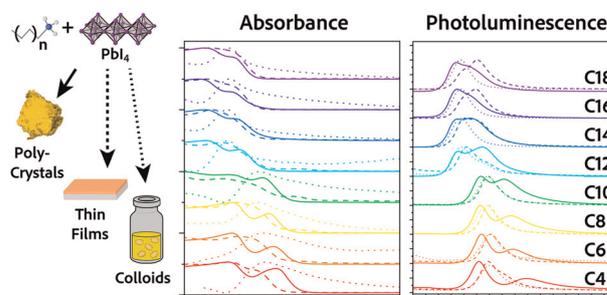
Krishan Kumar\* and Maria Wächtler\*



7153

### Studying the effect of dimensions and spacer ligands on the optical properties of 2D lead iodide perovskites

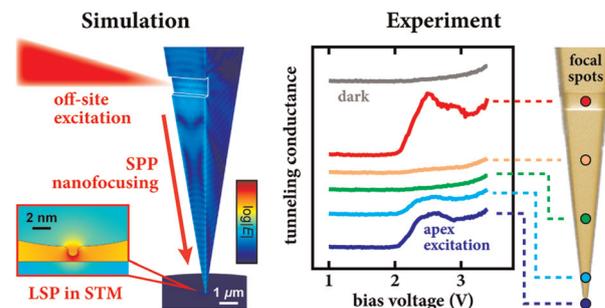
Orly Abarbanel, Rawan Hirzalla, Leehie Aridor, Elisheva Michman and Ido Hadar\*



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### Quantitative comparison of local field enhancement from tip-apex and plasmonic nanofocusing excitation via plasmon-assisted field emission resonances

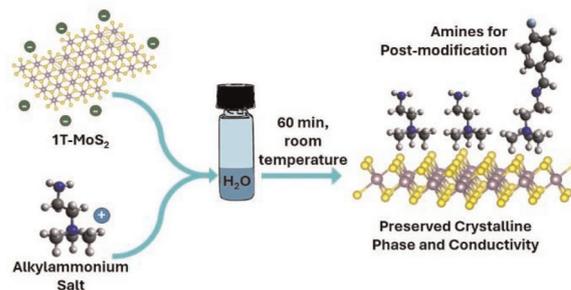
Chenfang Lin,\* Jie Li, Guoao Li, Wenjie Luo, Shuyi Liu, Adnan Hammud, Yang Xia, Anlian Pan, Martin Wolf, Melanie Müller and Takashi Kumagai\*



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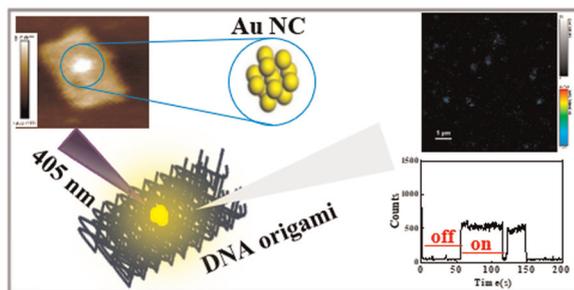
### Supramolecular electrostatic functionalization of 1T-MoS<sub>2</sub> based on alkylammonium salts

Giuseppe Misia, Michele Cesco, Maurizio Prato\* and Alessandro Silvestri\*



## PAPERS

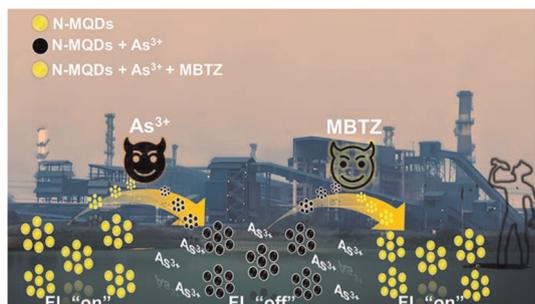
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### DNA origami-templated individual gold nanoclusters: probing their photophysical dynamics using single-molecule fluorescence spectroscopy

Shikha Rai, Vishaldeep Kaur, Charanleen Kaur, Mridu Sharma and Tapasi Sen\*

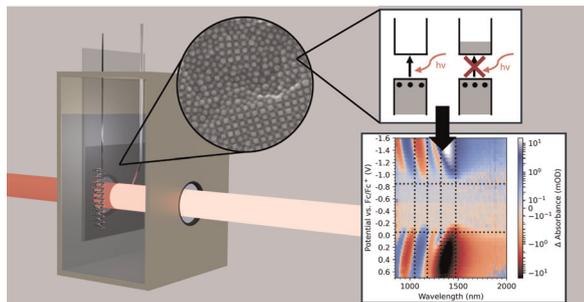
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### Bright yellow fluorescent N-doped $\text{Ti}_3\text{C}_2$ MXene quantum dots as an "on/off/on" nanoprobe for selective $\text{As}^{3+}$ ion detection

Santanu Bera and Susanta Kumar Bhunia\*

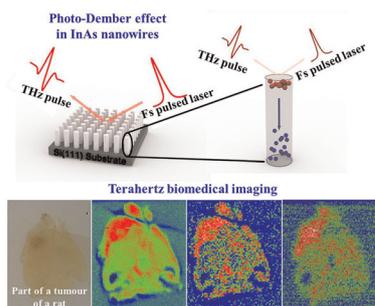
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### Spectroelectrochemistry with hydrogen-doped indium oxide electrodes monitors electron and hole injection into PbS quantum dots

Sophia Westendorf, Shangjing Li, Patrick Michel, Bin Hu\* and Marcus Scheele\*

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### Terahertz biomedical imaging using a terahertz emitter based on InAs nanowires

Dong Woo Park, Young Bin Ji, Ilgyu Choi, Jeongwoo Hwang, Jae Cheol Shin, Jin Chul Cho, Eui Su Lee, Seung Jae Oh,\* Siyun Noh, Jaehyeok Shin and Jin Soo Kim\*

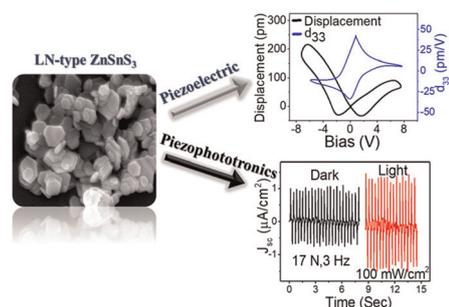


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### Exploring piezoelectric and piezophototronic properties of nanostructured LN-ZnSnS<sub>3</sub> for photoresponsive vibrational energy harvesting

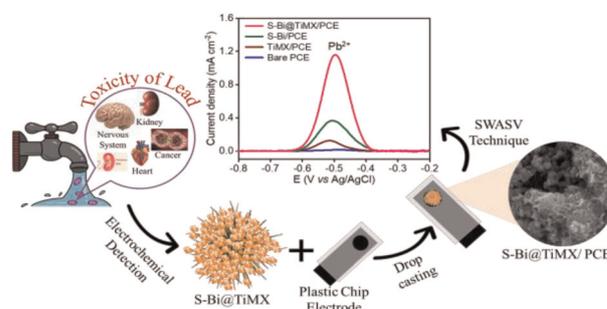
Surajit Das, Swadesh Paul and Anuja Datta\*



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### A modified MXene composite sensor with sulphur impurities for electrochemical detection of lead in the aqueous system

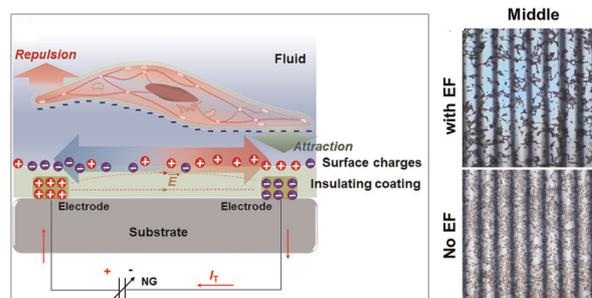
Km Sapna, Vartika Sharma, Manoj Kumar\* and Vaibhav Kulshrestha\*



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### Inhibitory effects on smooth muscle cell adhesion and proliferation due to oscillating electric fields by nanogenerators

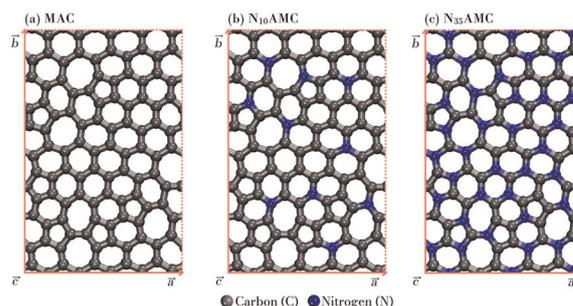
Zulmari Silva Pedraza, Fengdan Pan, Pengfei Chen, Steven Melendez Rosario, Grace Wu, Derui Wang, Jooyong Kim, Qianfan Yang, Bo Liu\* and Xudong Wang\*



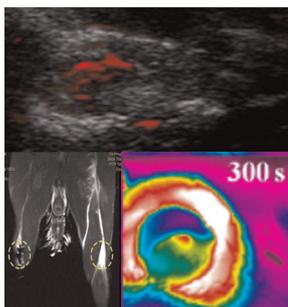
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### Exploring the electronic and mechanical properties of the recently synthesized nitrogen-doped amorphous monolayer carbon

Emanuel J. A. dos Santos, Marcelo L. Pereira, Junior,\* Raphael M. Tromer, Douglas S. Galvão and Luiz A. Ribeiro, Junior



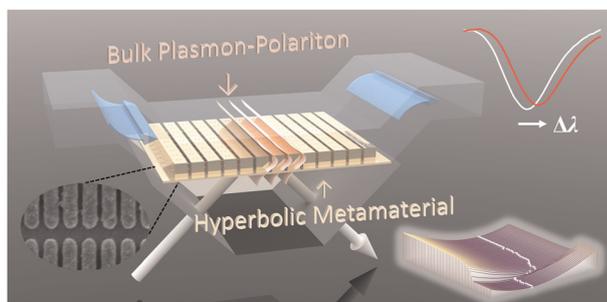
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### Magnetic nanoparticle-mediated non-invasive imaging and eradication of lymph nodes

Wei Gao, Xiaojun Cai, Yan Wang, Dechao Niu\* and Yuanyi Zheng\*

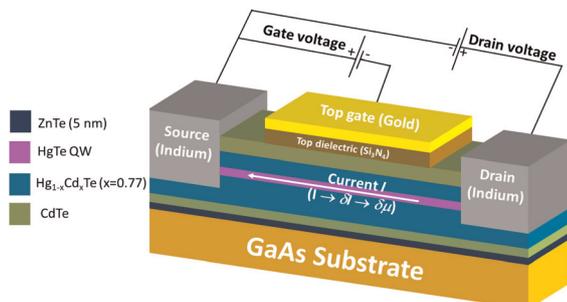
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### Composite metamaterial of hyperbolic nanoridges and gold nanoparticles for biosensing

Xinzhao Yue, Tao Wang,\* Yaohua Cai, Huimin Wang, Enze Lv, Xuyang Yuan, Jinwei Zeng, Wenyu Zhao\* and Jian Wang\*

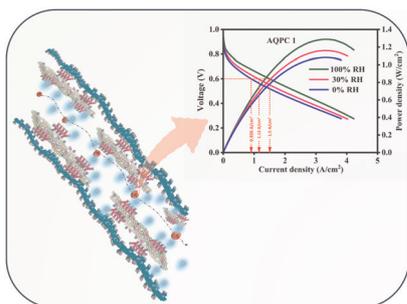
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### Temperature and electron concentration dependences of $1/f$ noise in $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$ – evidence for a mobility fluctuations mechanism

Adil Rehman,\* Volodymyr Petriakov, Ivan Yahniuk, Aleksandr Kazakov, Iwona Rogalska, Jakub Grendysa, Michał Marchewka, Maciej Haras, Tomasz Wojtowicz, Grzegorz Cywiński,\* Wojciech Knap and Sergey Romyantsev\*

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### Radical initiated polymerization of *p*-styrenesulfonate on graphitic carbon nitride for interconnected water networks in short-side-chain PFSA membranes for low-humidity hydrogen fuel cells

Maniprakundil Neeshma, Punnappadam Rajan Suraj, Baskaran Mohan Dass and Santoshkumar D. Bhat\*

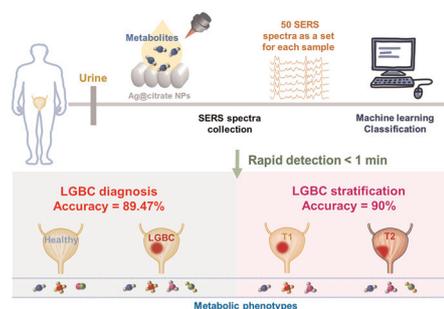


## PAPERS

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### Non-invasive and rapid diagnosis of low-grade bladder cancer *via* SERSomes of urine

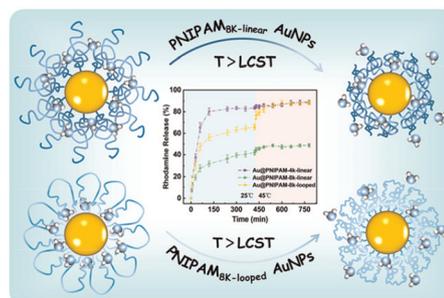
Yao Lu, Jiayi Wang, Xinyuan Bi, Hongyang Qian, Jiahua Pan\* and Jian Ye\*



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### Improving colloidal stability and response performances using looped thermal-responsive brushes

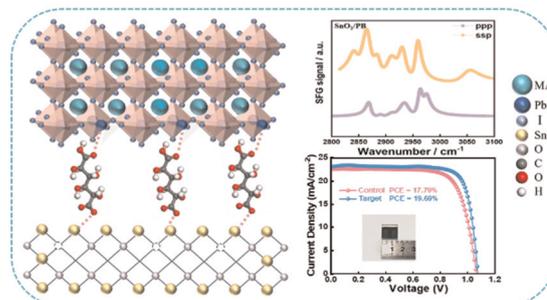
Chi Li, Jin Jing, Yanxiong Pan,\* Xiangling Ji and Wei Jiang\*



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### Interface-oriented bridges toward efficient carbon-based perovskite solar cells

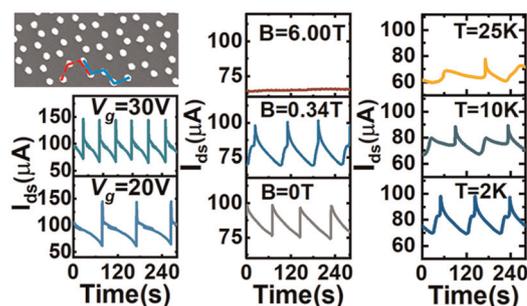
Yan Chen, Zhensang Tong, Feifei Ding, Huanyi Zhou, Ye Yang, JinYan Huang, Jianwu Wei, Qionghua Su, Zihui Liu, HanChi Cheng,\* Liya Zhou\* and Peican Chen\*



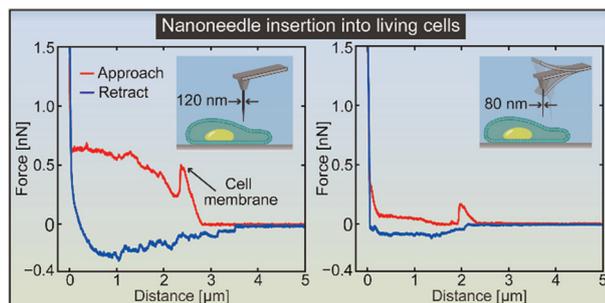
7335

### Constant voltage driving current oscillation in artificial graphene ribbons with deterministic chiral edges

Yan Zhan, Qiang Huang, Jingpu Yang, Wei Luo, Zuimin Jiang and Zhenyang Zhong\*



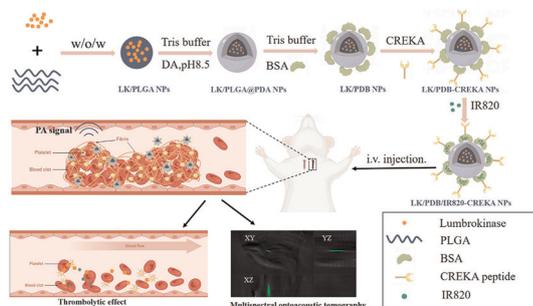
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### Significant reduction of cell invasiveness in nanoneedle insertion into a living cell with an electron-beam-deposited probe: impacts of probe geometry, speed and vibration

Mohammad Shahidul Alam, Marcos Penedo,\* Takehiko Ichikawa, Mohammad Mubarak Hosain, Kyosuke Matsumoto, Keisuke Miyazawa and Takeshi Fukuma\*

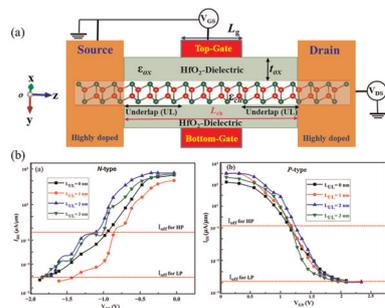
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### Construction of fibrin-targeted nanoparticles for imaging diagnosis and treatment of arterial thrombosis

Yaxue Liu, Yu Li, Junlong Chen, Pei Xie and Zongning Yin\*

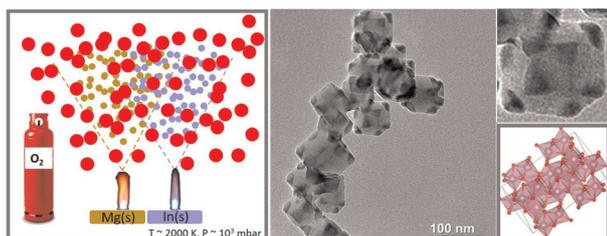
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### Quantum transport simulations of monolayer $\beta$ -AgI: a prospective nanochannel material in sub-1 nm gate-length MOSFETs

Mudasser Husain,\* Nasir Rahman and Jing Lu\*

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### Low-dimensional $\text{In}_2\text{O}_3$ nanostructures on MgO cubes

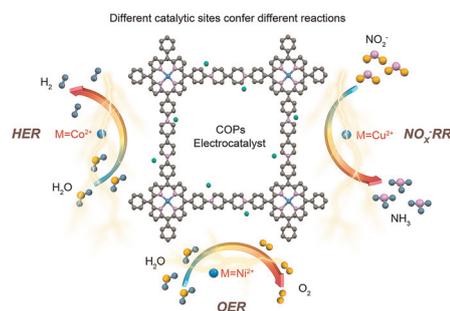
Jacek Goniakowski,\* Cédric Baumier, Franck Fortuna and Slavica Stankic\*



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### Construction of hydrophilic-and-cationic metalloporphyrin-based polymers for electrocatalytic small molecule activation

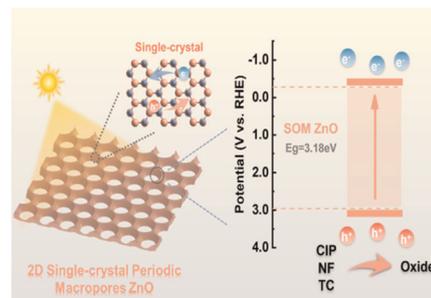
Dengmeng Song, Chunyu Zhou, Yujia Wang, Li Xia, Dan Xue, Jun Li and Ning Wang\*



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### Two-dimensional single-crystal periodic macroporous ZnO sheets for extraordinary photocatalytic performance for antibiotics

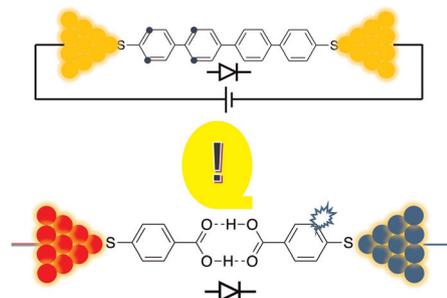
Ling Zhou, Yongjun Fu, Manxing Mo, Yihan Tong, Ping Niu, Junchao Wei, Rongbin Zhang, Ruihong Deng\* and Xuewen Wang\*



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### Anharmonicity-induced thermal rectification of a single diblock molecular junction inspired by the Aviram–Ratner diode

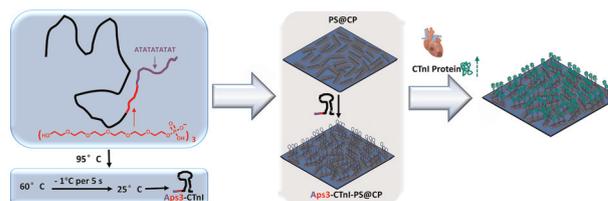
Hisao Nakamura\* and Naoyuki Karasawa



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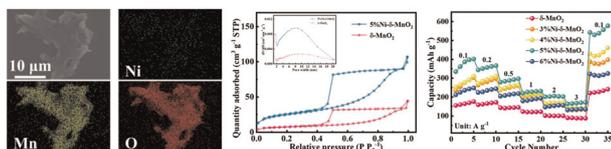
### Novel paper sensor with modified aptamer for accurate detection of clinical cardiac troponin I

Qing Xie, Danfeng Wu, Qinran Chen, Haiyan Liang,\* Leyu Wang\* and Xiaozhong Qiu\*



## PAPERS

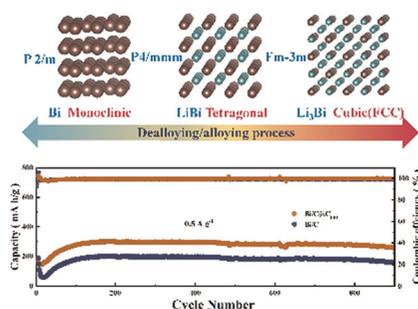
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### Nickel-doped $\delta$ -MnO<sub>2</sub> abundant in oxygen vacancies as a cathode material for aqueous Zn-ion batteries with superior performance

Shaolin Yang,\* Fangfang Li, Panpan Fu, Cheng Zhen, Jiandong Wu, Hui Lu, Chunping Hou and Zhilin Sheng

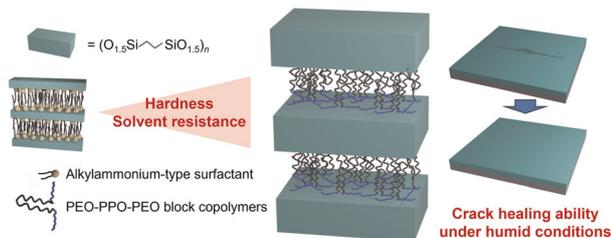
7434



### Microstructure modulation improving the stability performance of a Bi anode for lithium-ion batteries

Yi-wen Chen, Cheng-Lu Yang, Jun Guo,\* Bu-Ming Chen,\* Hui Huang and Rui-dong Xu

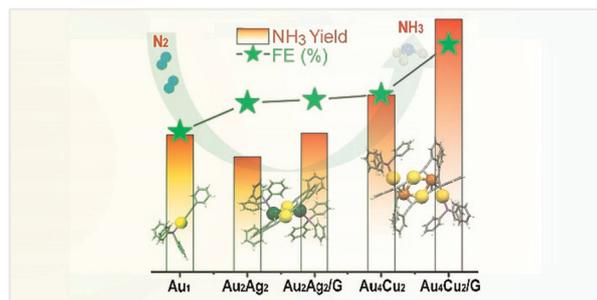
7445



### Tuning structures and properties of self-healing silsesquioxane films using block copolymers

Yoshiaki Miyamoto, Takamichi Matsuno and Atsushi Shimojima\*

7453



### Electrocatalytic nitrogen reduction to ammonia by graphene-supported Au<sub>4</sub>Cu<sub>2</sub> and Au<sub>2</sub>Ag<sub>2</sub> nanoclusters

Aamir Shehzad, Qiuhaoyi, Chaonan Cui and Zhixun Luo\*

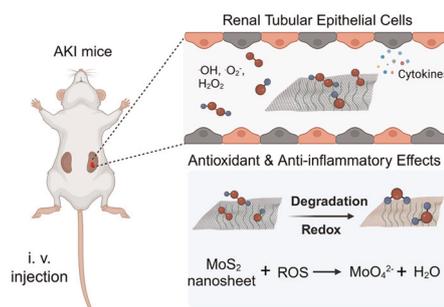


## PAPERS

7460

### Engineered molybdenum disulfide nanosheets as scavengers against oxidative stress inhibit ferroptosis to alleviate acute kidney injury

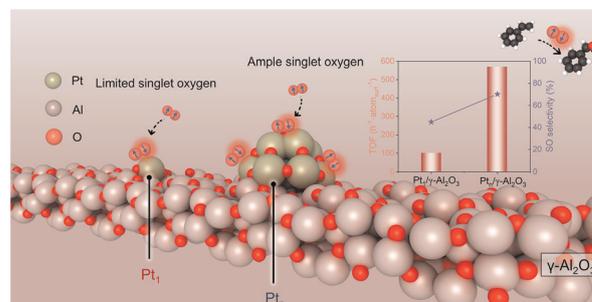
Xuwu Zhang, Zhipeng Xu, Yongzheng Zhang, Dan Wei, Shuping Zhang, Jianning Wang\* and Jiayu Ren\*



7474

### Proper aggregation of Pt is beneficial for the epoxidation of styrene by O<sub>2</sub> over Pt<sub>x</sub>/γ-Al<sub>2</sub>O<sub>3</sub> catalysts

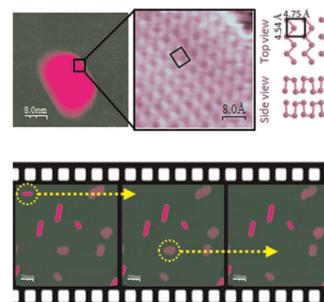
Fengfeng Li, Chenyang Shen, Yu He, Haoyu Lu, Rongtian Gu, Jun Yao, Zhewei Zhang, Feifei Mei, Taotao Zhao, Xiangke Guo, Nianhua Xue and Weiping Ding\*



7482

### Growing and nanomanipulating heterostructures of α-bismuthene in a nearly isolated state

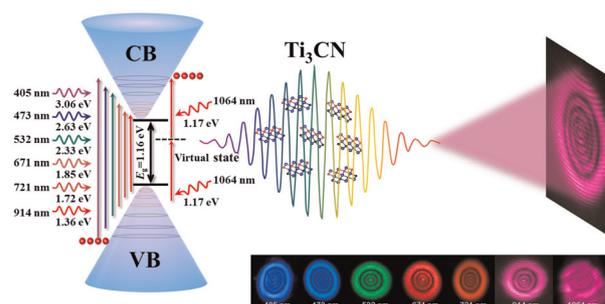
Antonio J. Martínez-Galera\* and José M. Gómez-Rodríguez



7488

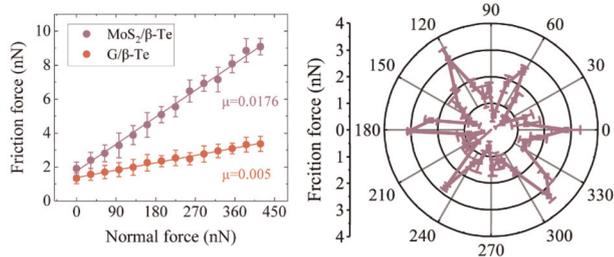
### Efficient spatial self-phase modulation in the near-infrared and visible regimes of transition metal carbonitride Ti<sub>3</sub>CN

Jiawei Cao, Xiaodan Xu, Yixuan Huang, Tengdong Zhang, Ying Liu, Haotian Yang, Jimin Zhao,\* Jun Li\* and Yanling Wu\*



## PAPERS

7497



### Interfacial polarization-induced tribological behavior in MoS<sub>2</sub>/β-Te and G/β-Te heterostructures

Guoliang Ru, Weihong Qi,\* Kaiyuan Xue, Mengzhao Wang and Xuqing Liu

## CORRECTION

7511

### Correction: Simulation of the resistance switching performance and synaptic behavior of TiO<sub>2</sub>-based RRAM devices with CoFe<sub>2</sub>O<sub>4</sub> insertion layers

Fei Yang,\* Bo Hu, Zijian He, Bingkun Liu, Shilong Lou, Duogui Li and Wentao Wang

