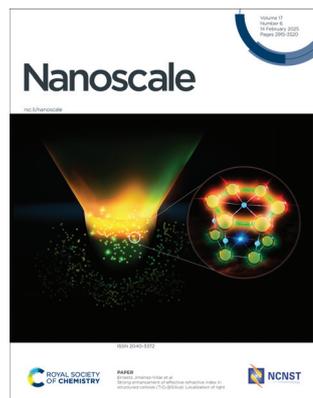


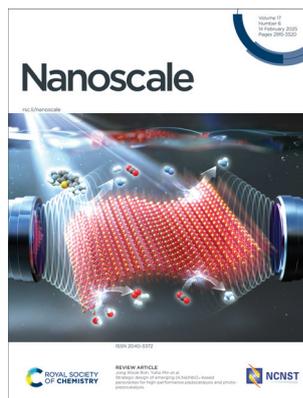
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ISSN 2040-3372 CODEN NANOHL 17(6) 2915–3520 (2025)



Cover
See Ernesto Jiménez-Villar
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Inside cover
See Jong Wook Roh,
Yuho Min *et al.*,
pp. 2931–2960.

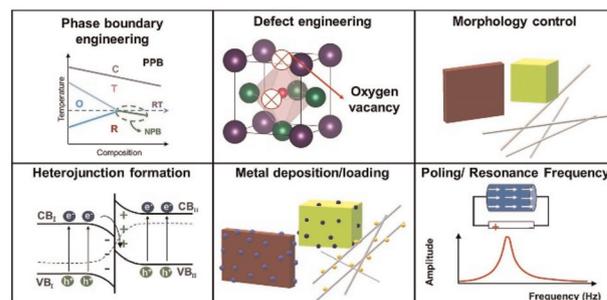
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REVIEWS

2931

Strategic design of emerging (K,Na)NbO₃-based perovskites for high-performance piezocatalysis and photo-piezocatalysis

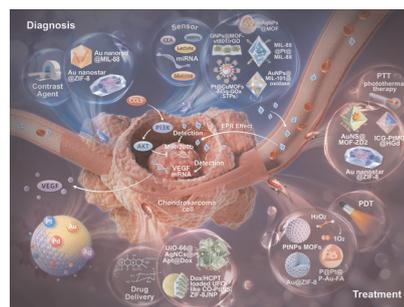
Seonhwa Park, Hui Yong Jeong, Seokhwan Kim, Mahesh Peddigari, Geon-Tae Hwang, Geon Dae Moon, Jong Wook Roh* and Yuho Min*



2961

A promising role of noble metal NPs@MOFs in chondrosarcoma management

Ziheng Huang, Keyue Tian, Yiyuan Xue and Feng Luo*



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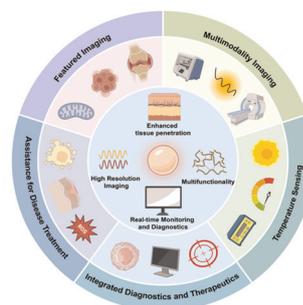


MINIREVIEWS

2985

NIR-II upconversion nanomaterials for biomedical applications

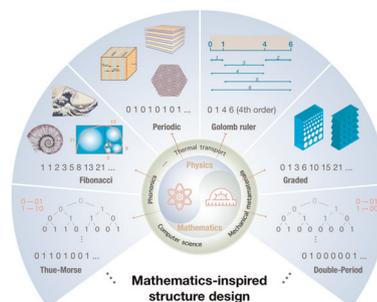
Ranran Luo, Chenxi Zhang, Zening Zhang, Pengchen Ren, Zhongsheng Xu* and Yun Liu*



3003

Mathematically inspired structure design in nanoscale thermal transport

Xin Wu* and Masahiro Nomura*

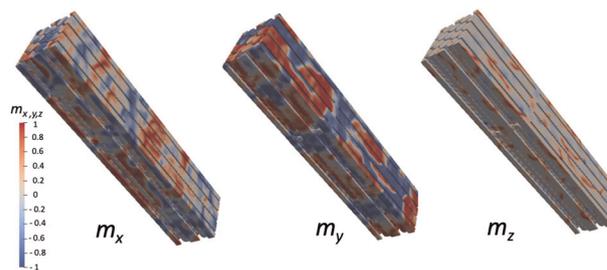


COMMUNICATIONS

3014

Magnetoelastic anisotropy drives localized magnetization reversal in 3D nanowire networks

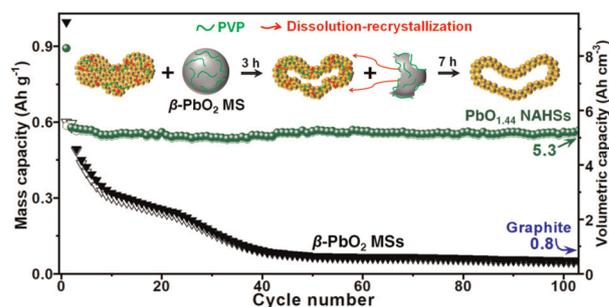
Laura G. Vivas,* Alejandra Ruiz-Clavijo, Olga Caballero-Calero, David Navas, Amanda A. Ordoñez-Cencerrado, Cristina V. Manzano, Ruy Sanz and Marisol Martín-González*



3023

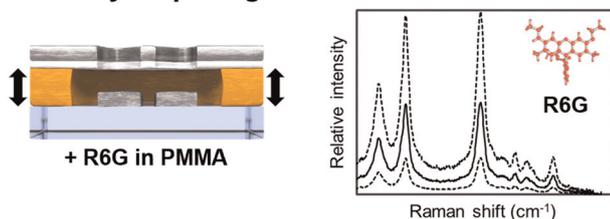
Nanoparticle-assembled interconnected PbO_{1.44} hollow spheres enabled by PVP-driven transformation of β -PbO₂ and self-sacrificial templating for superior lithium storage

Xiaoxu Bo,* Jiatong Zhang, Qian Zhang, Ruijie Wu, Sheng Wang, Shiqiang Zhao* and Shun Wang*



COMMUNICATIONS

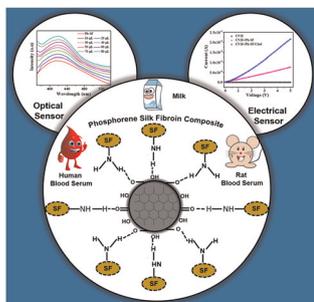
3035

Adjustment of
interlayer spacingControl of Raman
enhancement

Controlling Raman enhancement in particle–
aperture hybrid nanostructures by interlayer
spacing

Kabusure M. Kabusure, Petteri Piskunen,
Jarkko J. Saarinen, Veikko Linko* and Tommi K. Hakala*

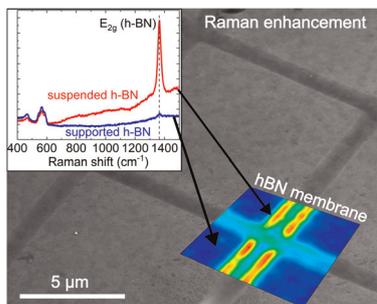
3042



A non-enzymatic dual sensing approach for the
detection of cholesterol in real samples using silk
fiber functionalized phosphorene quantum dots

Nasrin Sultana, Shreyash Vijay Andagonde,
Ratul Chakraborty, Asis Bala and Neelotpal Sen Sarma*

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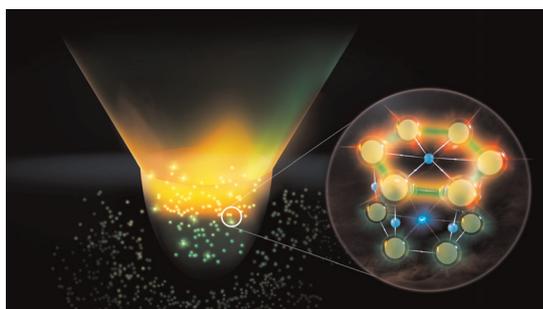


Polarisation-dependent Raman enhancement in
hexagonal boron nitride membranes

Jakub Rogoża, Johannes Binder,* Kirill V. Voronin,
Iris Niehues, Katarzyna Ludwiczak,
Aleksandra K. Dąbrowska, Mateusz Tokarczyk,
Rafał Bożek, Alexey Y. Nikitin, Rainer Hillenbrand,
Roman Stępniewski and Andrzej Wysmótek

PAPERS

3061



Strong enhancement of effective refractive index in
structured colloids (TiO₂@Silica): Localization of
light

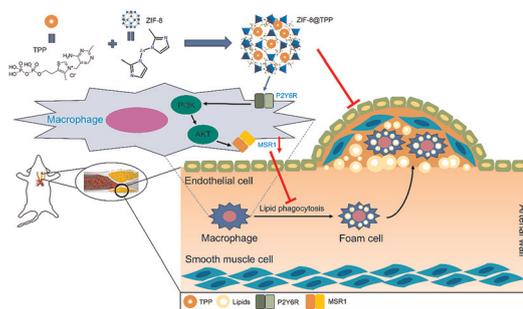
Jessica Dipold, Niklaus U. Wetter, Francisco C. Marques,
Aristide Dogariu and Ernesto Jiménez-Villar*



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Metal–organic framework-based nanoplatforms for synergistic anti-atherosclerosis therapy by regulating the PI3K/AKT/MSR1 pathway in macrophages

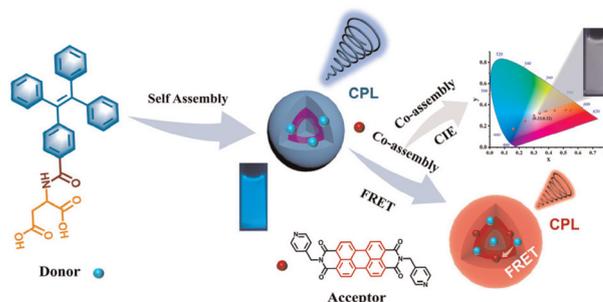
Chenlin Zeng, Zhiyou Peng, Sida Huang, Zhijue Xu, Zhaoxi Peng, Zhaoyu Wu, Jiahao Lei, Xing Zhang, Jinbao Qin, Kaichuang Ye, Bo Li, Zhen Zhao,* Ying Pan,* Minyi Yin* and Xinwu Lu*



3086

White circularly polarized luminescence from a dual-component emitter induced by FRET between tetraphenylene and PDI derivatives

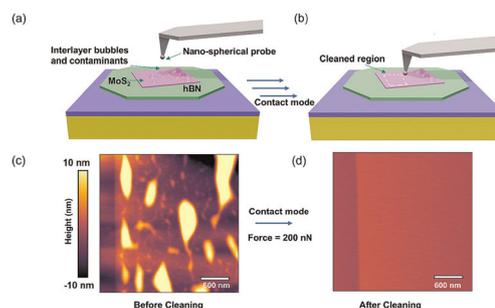
Huanhuan Dong, Huajing Li, Enquan Tian, Yijun Zhang, Jian Kong and Yuangang Li*



3095

Nano-spherical tip-based smoothing with minimal damage for 2D van der Waals heterostructures

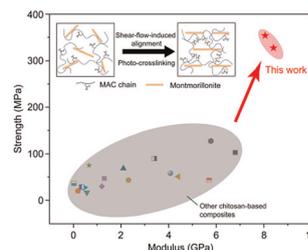
Xiaolei Ding, Boshi Qiao, Paul C. Uzoma, Muhammad Abid Anwar, Yuxuan Chen, Lansheng Zhang, Yang Xu* and Huan Hu*



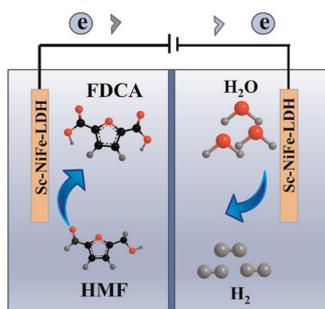
3105

High strength chitosan-based nanocomposites with aligned nanosheets and crosslinked networks

Xiaodong Yu, Jihao Fan, Shengquan Zheng, Linlin Ma, Xiaojing Liu, Yue Wu, Chuangqi Zhao* and Lei Jiang



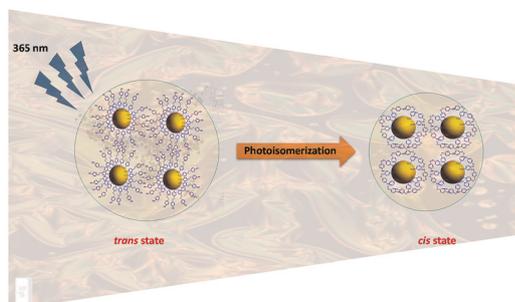
3114



Construction of an Sc-NiFe-LDH electrocatalyst for highly efficient electrooxidation of 5-hydroxymethylfurfural at industrial current density

Yufeng Wu, Zhiyan Hou and Changlong Wang*

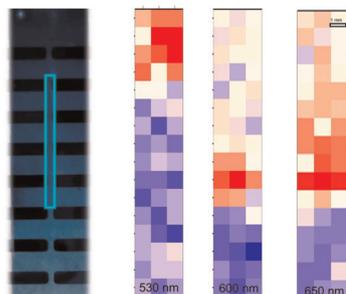
3123



Tuning the optical properties of gold nanoparticles via photoactive liquid crystalline azo ligands

Sachin Ashok Bhat,* Shankar Rao, Subbarao Krishna Prasad and Channabasaveshwar Yelamaggad*

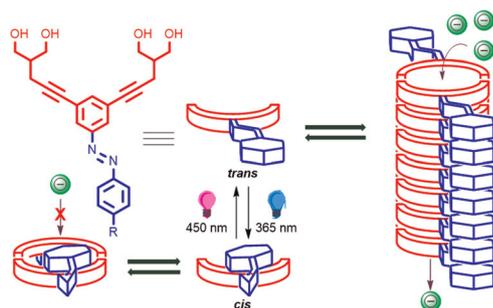
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Film thickness dependence of nanoscale arrangement of a chiral electron donor in its blends with an achiral electron acceptor

Giulia Pancotti, C. Elizabeth Killalea, Thomas W. Rees, Letizia Liirò-Peluso, Sergi Riera-Galindo, Peter H. Beton, Mariano Campoy-Quiles, Giuliano Siligardi and David B. Amabilino*

3145



Dynamic regulation of ion transport through a bis(1,3-propanediol)-based channel via allosteric azobenzene photoswitching

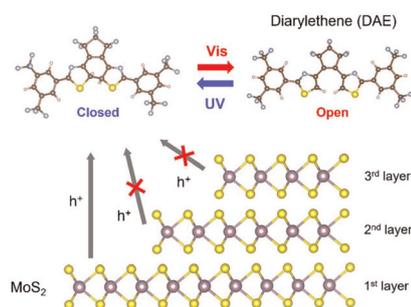
Manzoor Ahmad, Susmita Sarkar, Ravindra Bhogade, Abhishek Mondal, Debashis Mondal, Jagannath Mondal and Pinaki Talukdar*



3152

Layer-number-dependent photoswitchability in 2D MoS₂-diarylethene hybrids

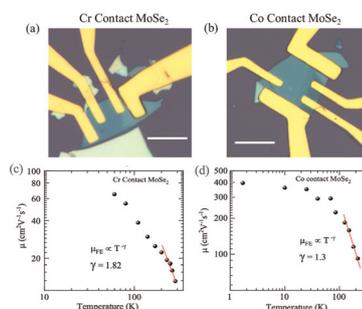
Sewon Park, Jaehoon Ji, Srajan Pillai, Henry Fischer, Jean Rouillon, Carlos Benitez-Martin, Joakim Andréasson, Jeong Ho You and Jong Hyun Choi*



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Percolative phase transition in few-layered MoSe₂ field-effect transistors using Co and Cr contacts

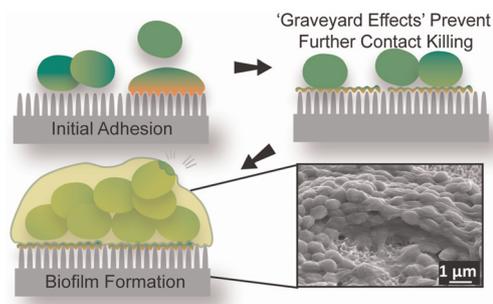
Roshan Padhan, Carlos Garcia, Ralu Divan, Anirudha V. Sumant, Daniel Rosenmann, Sujit A. Kadam, Akshay Wali, Suzanne Miller, Stephen A. McGill* and Nihar R. Pradhan*



3170

Graveyard effects of antimicrobial nanostructured titanium over prolonged exposure to drug resistant bacteria and fungi

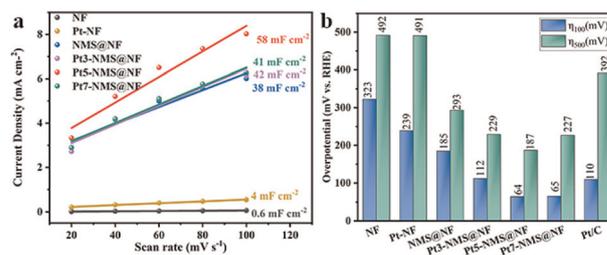
Louisa Z. Y. Huang, Rowan Penman, Rashad Kariuki, Pierre H. A. Vaillant, Soroosh Gharehgozlo, Z. L. Shaw, Vi Khanh Truong, Jitraporn Vongvivut, Aaron Elbourne* and Rachel A. Caruso*



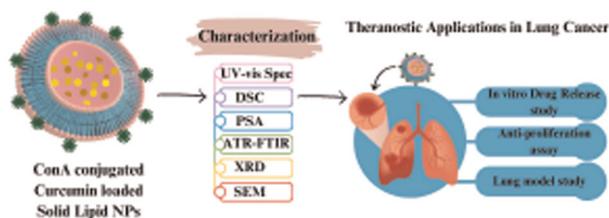
3189

An efficient hydrogen evolution catalyst constructed using Pt-modified Ni₃S₂/MoS₂ with optimized kinetics across the full pH range

Maoyuan Li, Zhongrui Yu, Zulin Sun, Yuchen Liu, Simiao Sha, Jiancheng Li, Riyue Ge, Liming Dai, Bin Liu,* Qingqiao Fu* and Wenxian Li*



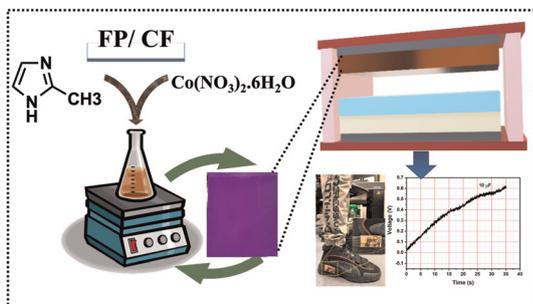
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Fabrication and characterization of ConA-conjugated curcumin-loaded solid lipid nanoparticles for theranostic applications in lung cancer treatment

Vinit Nikwade, Nisha Choudhary, Raghu Solanki, Ashish Patel,* Virendra Kumar Yadav,* Saleh H. Salmen, Abdullah A. Alarfaj, Mohammad Javed Ansari and Vivekanand Chatap*

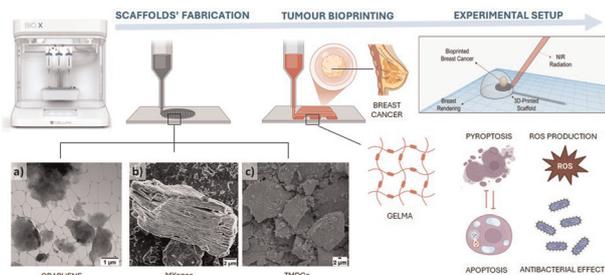
3211



Growth of the metal–organic framework ZIF-67 on cellulosic substrates for triboelectric nanogenerators

Gaurav Khandelwal,* Dina Anna John, Venkateswaran Vivekananthan, Nikolaj Gadegaard, Daniel M. Mulvihill* and Sang-Jae Kim*

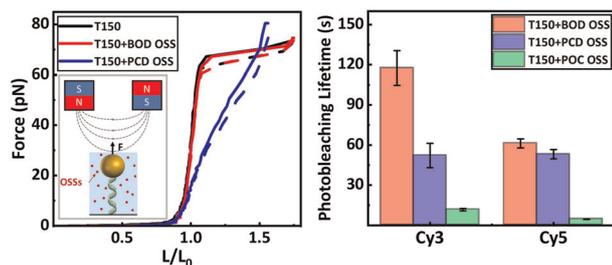
3221



Impact of different 2D materials on the efficacy of photothermal and photodynamic therapy in 3D-bioprinted breast cancer

Giordano Perini, Antonio Minopoli, Dario Zambrano, Lishan Cui, Valeria Ferrara, Caterina Perfili, Giulia Artemi, Marco De Spirito, Valentina Palmieri,* Andreas Rosenkranz and Massimiliano Papi*

3236



An oxygen-scavenging system without impact on DNA mechanical properties in single-molecule fluorescence experiments

Shang Gao, Jialun Liang, Chuang Tan* and Jie Ma*

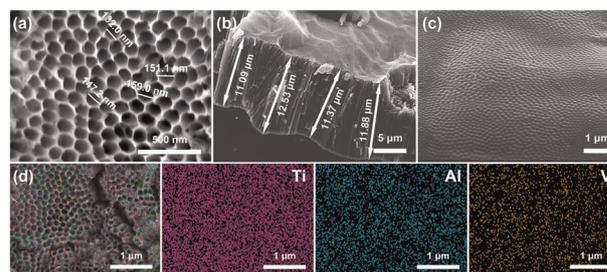


PAPERS

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In situ synthesis of an Al and V co-doped TiO₂ NTA interlayer-enhanced PbO₂ composite for efficient zinc electrowinning

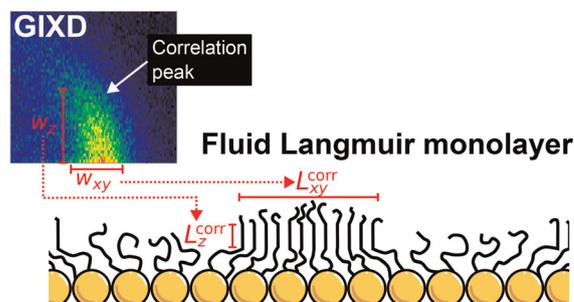
Shengyou Su, Xuanbing Wang, Linjing Yang, Tianyang Liu, Junli Wang* and Ruidong Xu*



3257

Grazing-incidence X-ray diffraction elucidates structural correlations in fluid monolayers of lipids and surfactants

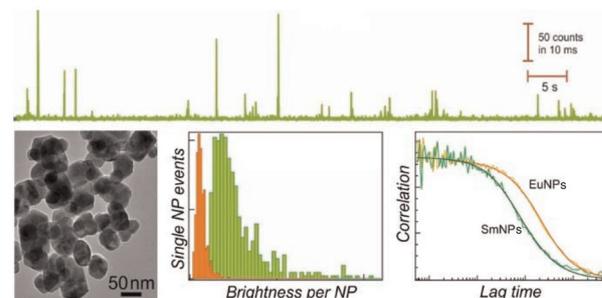
Joshua Reed, Miriam Grava, Chen Shen, Gerald Brezesinski and Emanuel Schneck*



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Watching lanthanide nanoparticles one at a time: characterization of their photoluminescence dynamics at the single nanoparticle level

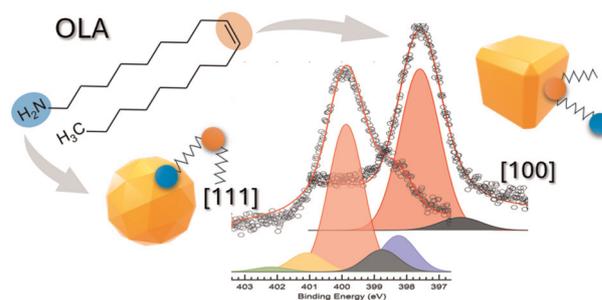
Malavika Kayyil Veedu, Gemma Lavilley, Mohamadou Sy, Joan Goetz, Loïc J. Charbonnière and Jérôme Wenger*



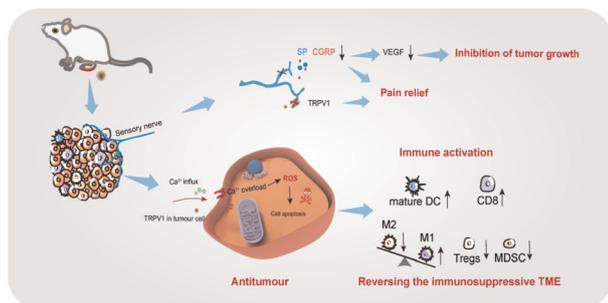
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Versatile role of oleylamine in the controlled synthesis of copper nanoparticles with diverse morphologies

Sonia Hadaoui, Giang Tran, Ahmed Naitabdi* and Alexa Courty*



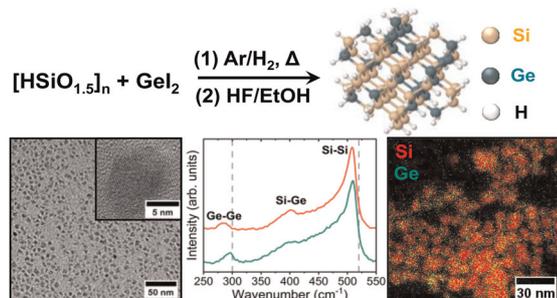
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Capsaicin-induced Ca^{2+} overload and ablation of TRPV1-expressing axonal terminals for comfortable tumor immunotherapy

Jian Sun, Deqiang Wang, Yiyang Wei, Danyang Wang, Zhengkun Ji, Wanru Sun, Xin Wang, Pingyu Wang, Nicola Paccione Basmadji, Eider Larrarte, José Luis Pedraz, Murugan Ramalingam,* Shuyang Xie* and Ranran Wang*

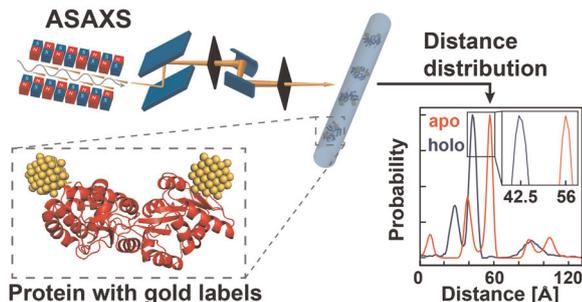
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Solid-state synthesis of $\text{Si}_{1-x}\text{Ge}_x$ nanoalloys with composition-tunable energy gaps and visible to near infrared optical properties

Griffin C. Spence, David S. Pate, Corentin Villot, Roshana M. Fouzie, Lisa S. Graves, Ka Un Lao, Ümit Özgür and Indika U. Arachchige*

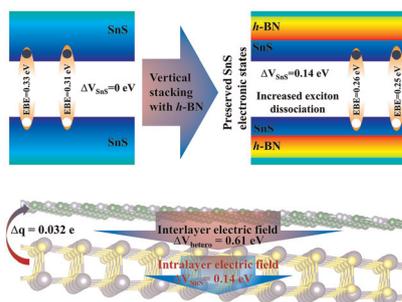
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Determination of absolute intramolecular distances in proteins using anomalous X-ray scattering interferometry

Samuel Stubhan, Anna V. Baptist, Caroline Körösy, Alessandra Narducci, Gustavo Gabriel Moya Muñoz, Nicolas Wendler, Aidin Lak, Michael Sztucki, Thorben Cordes* and Jan Lipfert*

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Enhancing the optoelectronic properties of SnS via mixed-phase heterostructure engineering

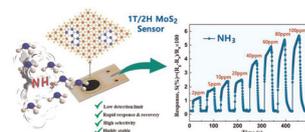
Dhanjit Talukdar,* Dambarudhar Mohanta and Gazi A. Ahmed



3341

Harnessing mixed-phase MoS₂ for efficient room-temperature ammonia sensing

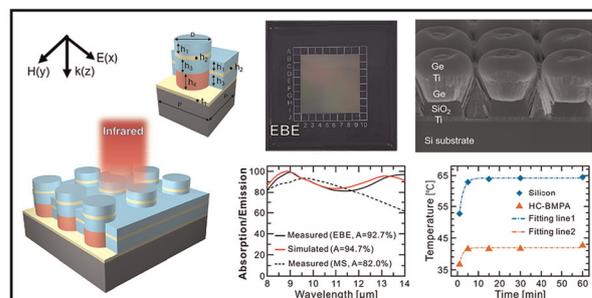
M. A. Jalil, Kamrul Hassan, Anh Tuan Trong Tran, Tran Thanh Tung, Manas Ranjan Panda, Sally El Meragawi, Tetsuya Kida, Mainak Majumder and Dusan Losic*



3353

Long-wavelength infrared metamaterial absorber with polarization and angle insensitivity using compact hybrid cylindrical structures

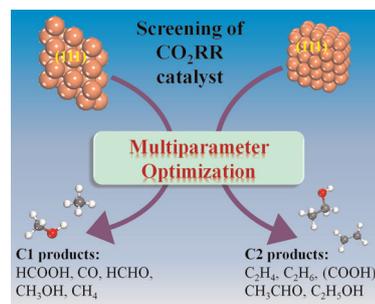
Wenqian Zhang, Youxin Chen,* Jiang Wei, Yan Miao, Qingkang Wang and Kaiyu Wu



3360

Size-, shape-, facet- and support-dependent selectivity of Cu nanoparticles in CO₂ reduction through multiparameter optimization

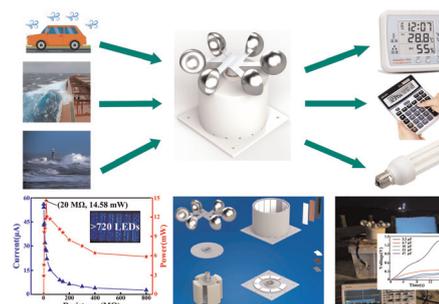
Anjana Tripathi and Ranjit Thapa*



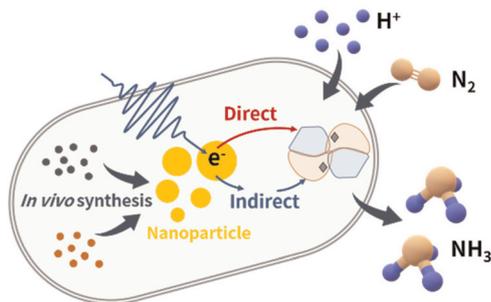
3370

A roller-type triboelectric nanogenerator based on rotational friction between wool and stacked interfaces for omnidirectional wind energy harvesting

Xiaonan Su, Yuxiang Su,* Hongjun Yan,* Xinyao Zhang, Guanyu Dai, Xin Dong, Jinlin Wu, Xizeng Zhao, Keyang Zhao and Zhenhua Li*



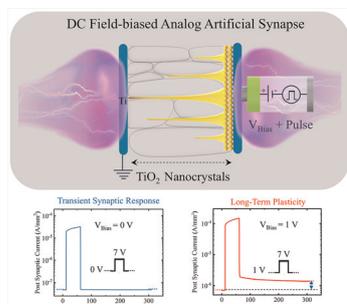
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In vivo synthesis of semiconductor nanoparticles in *Azotobacter vinelandii* for light-driven ammonia production

Gui-Min Kim, Yoojin Choi, Kyeong Rok Choi, Ilsong Lee, Jayeong Kim, Byunghyun Lee, Sang Yup Lee* and Doh C. Lee*

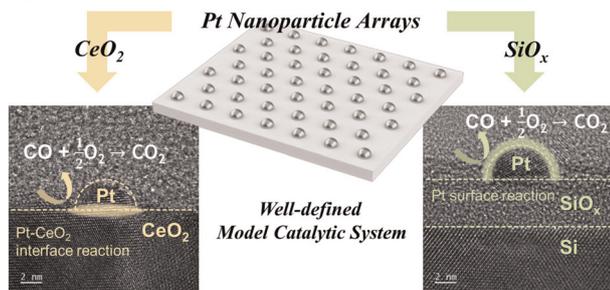
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DC field-biased multibit/analog artificial synapse featuring an additional degree of freedom for performance tuning

Milad Jabri and Faramarz Hossein-Babaei*

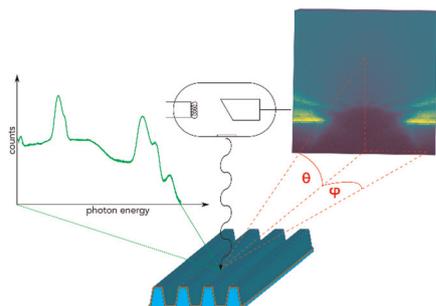
3402



Monodisperse Pt nanoparticle arrays via block copolymer nanopatterning and their reaction kinetics on CO oxidation

Geon Gug Yang, Hyeong Min Jin, Minsu Park, Minha Kim, Dong-Wook Shin, Sang Ouk Kim,* WooChul Jung* and Siwon Lee*

3411



Investigation of Ti nanostructures via laboratory scanning-free GEXRF

Steffen Staeck,* Jonas Baumann, Philipp Hönicke, Nils Wauschkunn, Ferdinand Spikermann, Daniel Grötzsch, Holger Stiel and Birgit Kanngießner

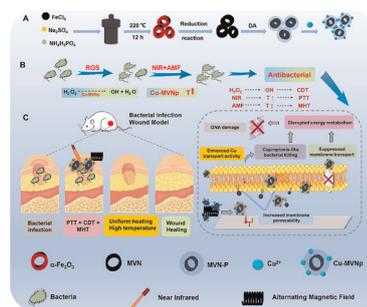


PAPERS

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Copper doped magnetic vortex nanoring based nanotherapeutics for bacterial infection tri-therapy: interplay of magnetic hyperthermia, chemodynamic therapy and photothermal therapy

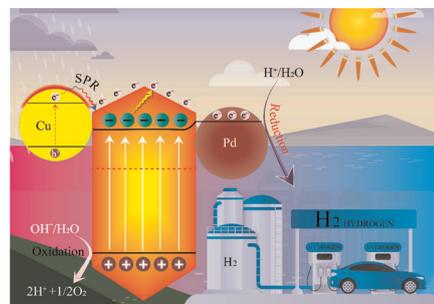
Jing Wang,* Wenqian Zhao,* Hui Tu, Xiangyang Zu, Jinghua Li, Kun Lei, Jing Li, Yuchuan Zhuang, Yanbo Dong, Andrey Tulupov, Fengshou Zhang* and Jianfeng Bao*



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Unveiling the potential of Cu–Pd/CdS catalysts to supply and rectify electron transfer for H₂ generation from water splitting

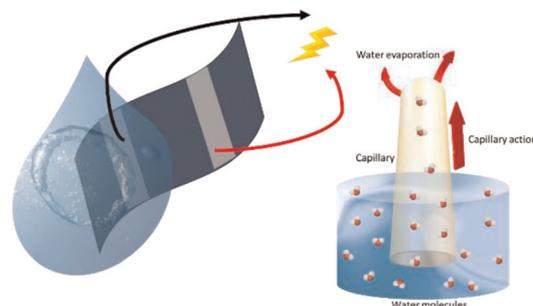
Ejaz Hussain,* Mamoona Idrees, Muhammad Jalil, Muhammad Zeeshan Abid, Khalid Aljohani and Khezina Rafiq*



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Can structure influence hydrovoltaic energy generation? Insights from the metallic 1T' and semiconducting 2H phases of MoS₂

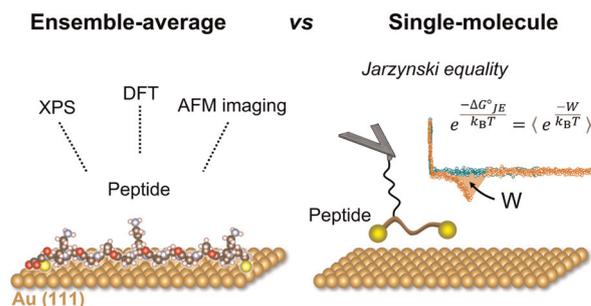
Kaushik Suvigya, Saini Lalita, Siva Nemala Sankar, Andrea Capasso, Li-Hsien Yeh and Kalon Gopinadhan*



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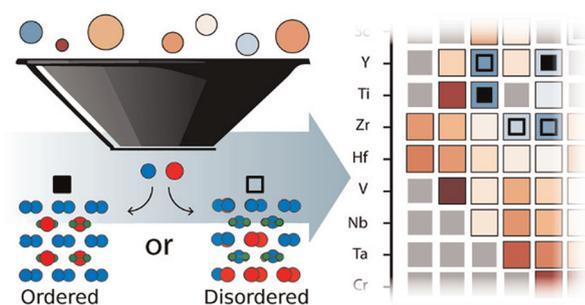
Binding mechanism of oligopeptides on solid surface: assessing the significance of single-molecule approach

Joanne Lê-Chesnais, Marie Steffenhagen, Christophe Méthivier, Dominique Costa, Daniela Rodriguez, Jean-François Lambert,* Emmanuel Maisonhaute* and Jessem Landoulsi*



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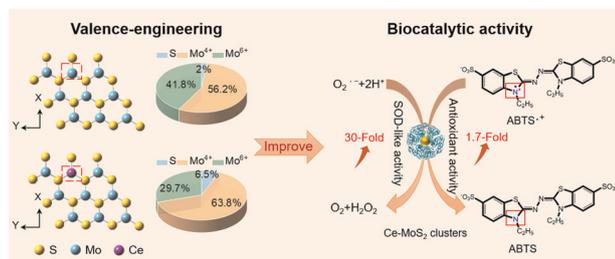
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Computational exploration of M-sites with chemical order and disorder in $M'_2M''B_2$ and $M'_4M''B_3$ compounds

Adam Carlsson, Rodrigo Mantovani Ronchi, Johanna Rosen and Martin Dahlqvist*

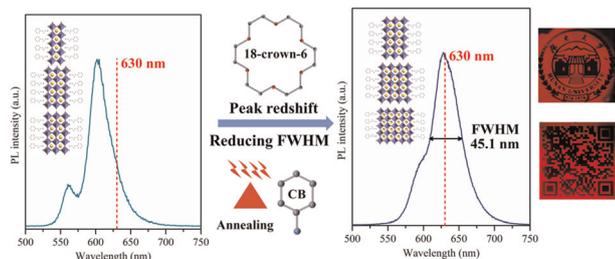
3487



Valence-engineering modulation of MoS_2 clusters for enhancing biocatalytic activity

Xiaoyan Xue, Meili Guo,* Hao Zhang, Qingshan Liu, Xuyan Li, Xin Sun, Xiaoyu Mu* and Xiao-Dong Zhang*

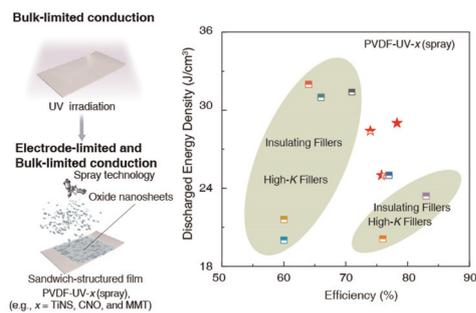
3498



Pure red emission with spectral stability in full iodine-based quasi-2D perovskite films by controlling phase distribution

Zhiqiang Ming, Siyao Li, Xinyi Luo, Siman Liu, Danliang Zhang, Xiaoli Zhu, Anlian Pan and Xiao Wang*

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Interface engineering of 2D dielectric nanosheets for boosting energy storage performance of polyvinylidene fluoride-based nanocomposites with high charge-discharge efficiency

Hexing Liu, Jian Wang, Yunfan Wang, Zhonghui Shen, Xin Zhang and Bao-Wen Li*

