

# Nanoscale Advances

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ISSN 2516-0230 CODEN NAADAI 6(4) 1027–1276 (2024)



### Cover

See Cheng-Yu Wang, Tomoyuki Kurioka, Yung-Jung Hsu *et al.*, pp. 1039–1058. Image reproduced by permission of Yung-Jung Hsu from *Nanoscale Adv.*, 2024, 6, 1039.



### Inside cover

See Irene C. Turnbull and Angelo Gaitas, pp. 1059–1064. Image reproduced by permission of Irene C. Turnbull and Angelo Gaitas from *Nanoscale Adv.*, 2024, 6, 1059. Used with permission of ©Mount Sinai Health System. Cover illustration created by Jill K. Gregory.

## EDITORIAL

### 1037

#### Introduction to advances in multicomponent plasmonic hybrid nanoarchitectures for versatile applications

Hao Jing\*

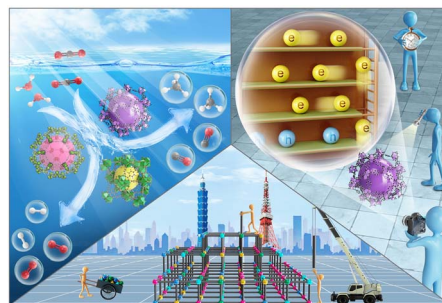


## MINIREVIEW

### 1039

#### Manipulation of interfacial charge dynamics for metal–organic frameworks toward advanced photocatalytic applications

Chien-Yi Wang, Huai-En Chang, Cheng-Yu Wang,\* Tomoyuki Kurioka,\* Chun-Yi Chen, Tso-Fu Mark Chang, Masato Sone and Yung-Jung Hsu\*



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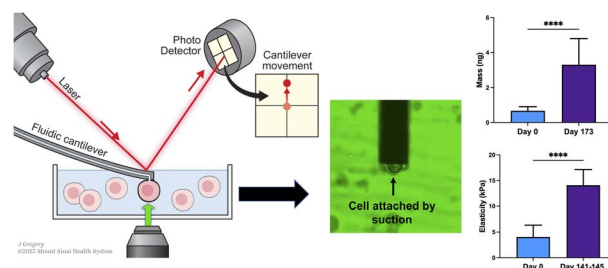


## COMMUNICATIONS

1059

### Characterizing induced pluripotent stem cells and derived cardiomyocytes: insights from nano scale mass measurements and mechanical properties

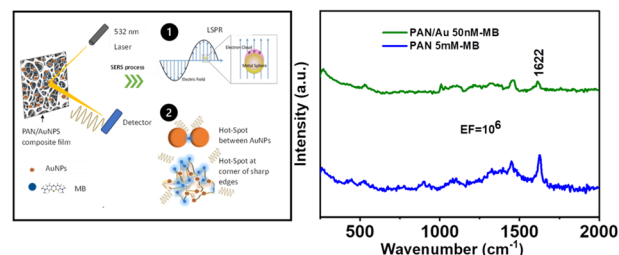
Irene C. Turnbull\* and Angelo Gaitas\*



1065

### Polyacrylonitrile as a versatile matrix for gold nanoparticle-based SERS substrates

Saloni Sharma, Rajesh Kumar\* and Ram Manohar Yadav\*

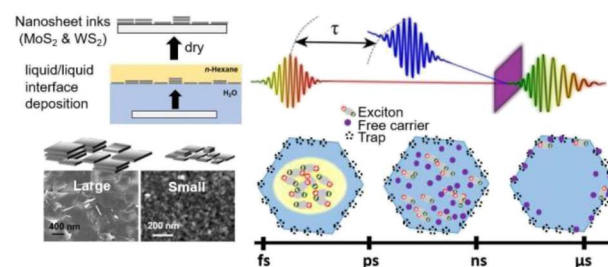


## PAPERS

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### Long lived photogenerated charge carriers in few-layer transition metal dichalcogenides obtained from liquid phase exfoliation

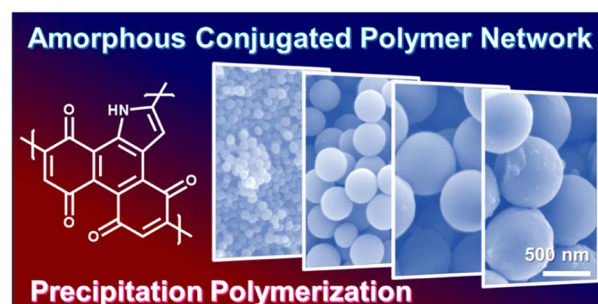
Floriana Morabito,\* Kevin Synnatschke, Jake Dudley Mehew, Sebin Varghese, Charles James Sayers, Giulia Folpini, Annamaria Petrozza, Giulio Cerullo, Klaas-Jan Tielrooij, Jonathan Coleman, Valeria Nicolosi and Christoph Gadermaier\*



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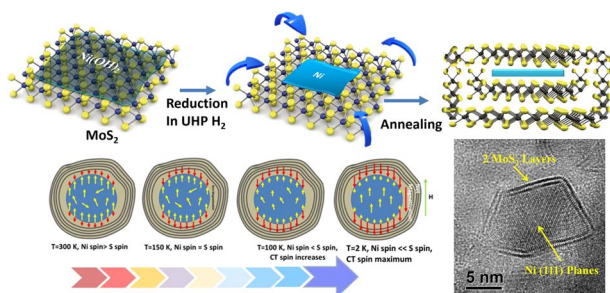
### Morphology and size control of an amorphous conjugated polymer network containing quinone and pyrrole moieties via precipitation polymerization

Ryuto Sugiura, Hiroaki Imai and Yuya Oaki\*





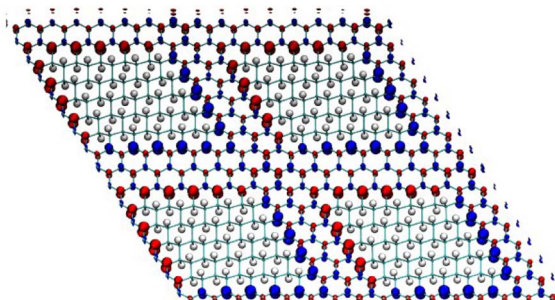
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### Interfacial negative magnetization in Ni encapsulated layer-tunable nested MoS<sub>2</sub> nanostructure with robust memory applications

Shatabda Bhattacharya, Tatsuhiko Ohto, Hirokazu Tada and Shyamal K. Saha\*

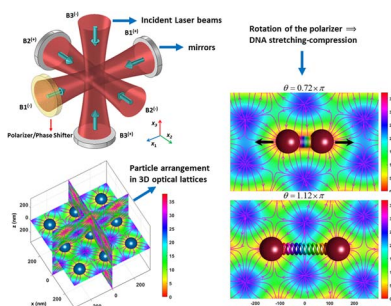
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### The chimera of 2D- and 1D-graphene magnetization by hydrogenation or fluorination: critically revisiting old schemes and proposing new ones by *ab initio* methods

Andrea Albino, Francesco Buonocore, Massimo Celino and Federico Totti\*

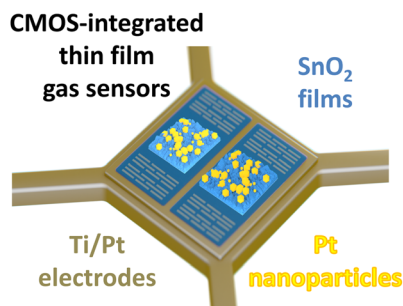
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### Light-driven nanomotors with reciprocating motion and high controllability based on interference techniques

Mohammadbagher Mohammadnezhad, Salah Raza Saeed, Sarkew Salah Abdulkareem and Abdollah Hassanzadeh\*

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### Adjusting surface coverage of Pt nanocatalyst decoration for selectivity control in CMOS-integrated SnO<sub>2</sub> thin film gas sensors

F. Sosada-Ludwikowska, L. Reiner, L. Egger, E. Lackner, J. Krainer, R. Wimmer-Teubenbacher, V. Singh, S. Steinhauer, P. Grammatikopoulos\* and A. Koeck

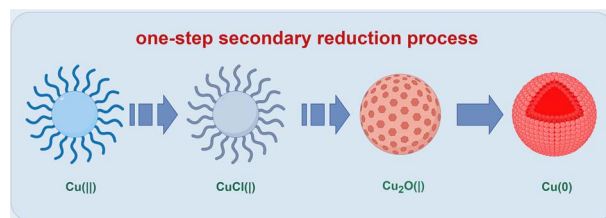


## PAPERS

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### Study on the preparation of ascorbic acid reduced ultrafine copper powders in the presence of different protectants and the properties of copper powders based on methionine protection

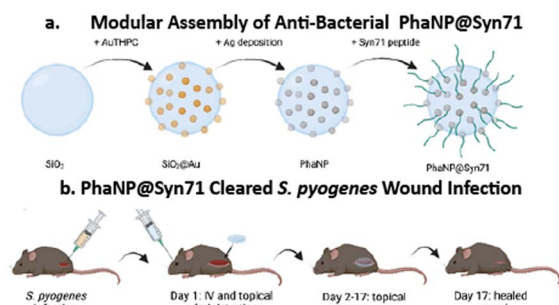
Xin Ke, Bingqing Xie, Jingguo Zhang,\* Jianwei Wang,\* Weiying Li, Liqing Ban, Qiang Hu, Huijun He, Limin Wang and Zhong Wang\*



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### Antimicrobial peptide-conjugated phage-mimicking nanoparticles exhibit potent bactericidal action against *Streptococcus pyogenes* in murine wound infection models

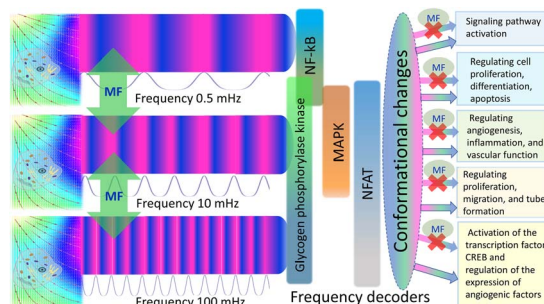
Johanna Olesk, Deborah Donahue, Jessica Ross, Conor Sheehan, Zach Bennett, Kevin Armknecht, Carlie Kudary, Juliane Hopf, Victoria A. Ploplis, Francis J. Castellino, Shaun W. Lee and Prakash D. Nallathambiy\*



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### Modulation of calcium signaling and metabolic pathways in endothelial cells with magnetic fields

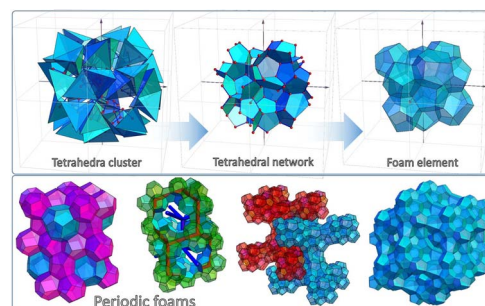
Oksana Gorobets,\* Svitlana Gorobets, Tatyana Polyakova and Vitalii Zablotskii\*



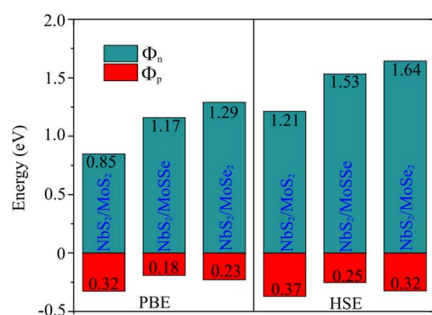
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### Tetrahedron clusters serving as a platform for foam-like structure design

Jacek Jenczyk\*



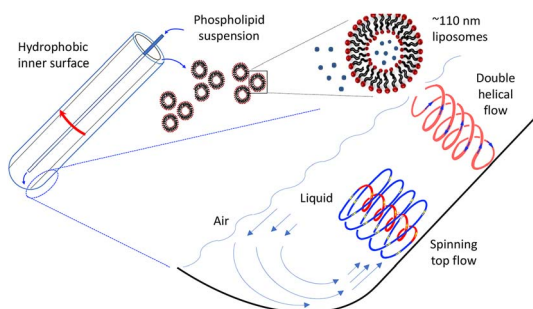
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### Theoretical prediction of electronic properties and contact barriers in a metal/semiconductor NbS<sub>2</sub>/Janus MoSSe van der Waals heterostructure

P. H. Nha, Chuong V. Nguyen, Nguyen N. Hieu, Huynh V. Phuc\* and Cuong Q. Nguyen\*

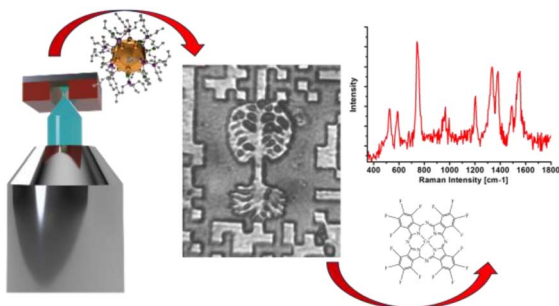
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### Vortex fluidic regulated phospholipid equilibria involving liposomes down to sub-micelle size assemblies

Nikita Joseph, Marzieh Mirzamani, Tarfah Abudiyah, Ahmed Hussein Mohammed Al-Antaki, Matt Jellicoe, David P. Harvey, Emily Crawley, Clarence Chuah, Andrew E. Whitten, Elliot Paul Gilbert, Shuo Qian, Lilin He, Michael Z. Michael, Harshita Kumari\* and Colin L. Raston\*

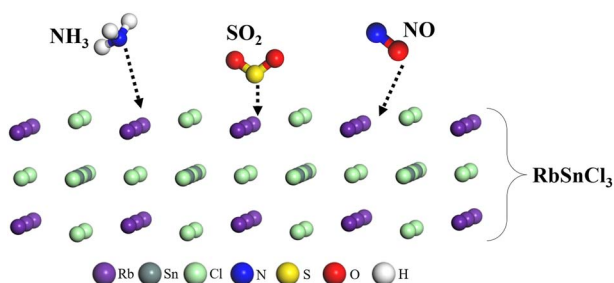
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### Direct laser induced writing of high precision gold nanosphere SERS patterns

Olympia Geladari, Philipp Haizmann, Andre Maier, Markus Strienz, Martin Eberle, Marcus Scheele, Heiko Peisert, Andreas Schnepf,\* Thomas Chassé, Kai Braun\* and Alfred J. Meixner\*

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### A first principles study of RbSnCl<sub>3</sub> perovskite toward NH<sub>3</sub>, SO<sub>2</sub>, and NO gas sensing

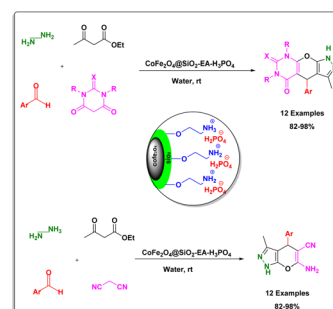
Mohammad Tanvir Ahmed,\* Debashis Roy, Abdullah Al Roman, Shariful Islam and Farid Ahmed



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## Nanomagnetic $\text{CoFe}_2\text{O}_4@\text{SiO}_2\text{-EA-H}_3\text{PO}_4$ as a zwitterionic catalyst for the synthesis of bioactive pyrazolopyranopyrimidines and dihydropyrano[2,3-*c*]pyrazoles

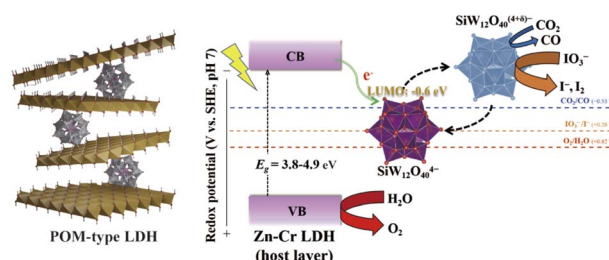
Ali Mirzaie, Lotfi Shiri,\* Mosstafa Kazemi, Nourkhoda Sadeghifard and Vahab Hassan Kaviar



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## Synthesis of polyoxometalate-pillared Zn–Cr layered double hydroxides for photocatalytic $\text{CO}_2$ reduction and $\text{H}_2\text{O}$ oxidation

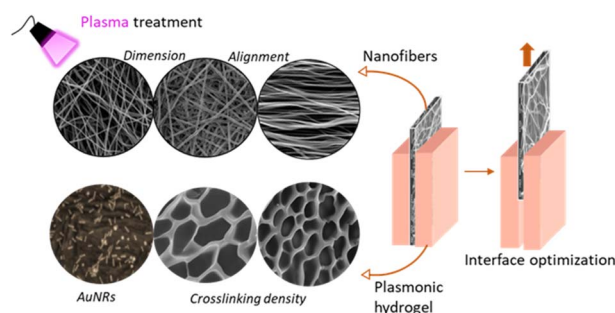
Xiaotong Zhao, Haoyang Jiang,\* Yongcheng Xiao and Miao Zhong\*



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## Developing strategies to optimize the anchorage between electrospun nanofibers and hydrogels for multi-layered plasmonic biomaterials

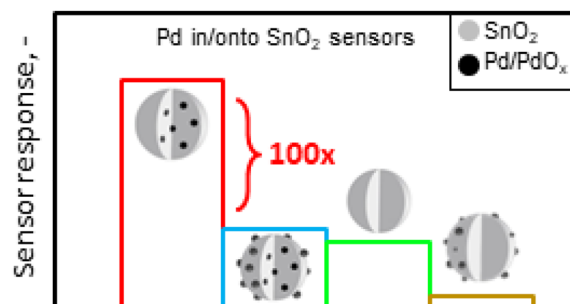
Yasamin Ziai, Massimiliano Lanzi, Chiara Rinoldi, Seyed Shahrooz Zargarian, Anna Zakrzewska, Alicja Kosik-Koziot, Paweł Nakielski and Filippo Pierini\*



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## Embedding Pd into $\text{SnO}_2$ drastically enhances gas sensing

Katarzyna Jabłczyńska, Alexander Gogos, Christian M. P. Kubsch and Sotiris E. Pratsinis\*



## CORRECTIONS

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**Correction: Effect of pomelo seed-derived carbon on the performance of supercapacitors**

Zhenyao Yin, Yaping Xu, Jinggao Wu and Jing Huang\*

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**Correction: A hierarchical porous P-doped carbon electrode through hydrothermal carbonization of pomelo valves for high-performance supercapacitors**

Jing Huang,\* Jie Chen, Zhenyao Yin and Jinggao Wu

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**Correction: Celery-derived porous carbon materials for superior performance supercapacitors**

Sirui Liu, Yaping Xu, Jinggao Wu and Jing Huang\*

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**Correction: Bio-inspired hierarchical nanoporous carbon derived from water spinach for high-performance supercapacitor electrode materials**

Xinyu Lin, Yaping Xu, Jinggao Wu\* and Jing Huang\*

