

Nanoscale Horizons

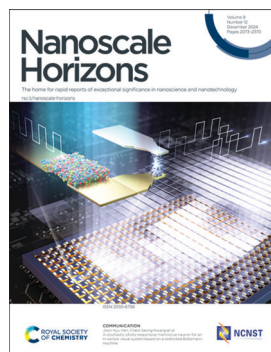
The home for rapid reports of exceptional significance in nanoscience and nanotechnology

rsc.li/nanoscale-horizons

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

IN THIS ISSUE

ISSN 2055-6756 CODEN NHAOAW 9(12) 2073-2370 (2024)



Cover

See Joon-Kyu Han,
Cheol Seong Hwang *et al.*,
pp. 2248–2258.
Image reproduced
by permission of
Joon-Kyu Han from
Nanoscale Horiz.,
2024, 9, 2248.

EDITORIALS

2081

Nanoscale Horizons Emerging Investigator Series:
**Dr Valentina Castagnola, Italian Institute of
Technology, Italy**



2083

Nanoscale Horizons Emerging Investigator Series:
Dr Pengzhan Sun, University of Macau, China



EES Catalysis

GOLD
OPEN
ACCESS

Exceptional research on energy
and environmental catalysis

Open to everyone. Impactful for all

rsc.li/EESCatalysis

Fundamental questions
Elemental answers

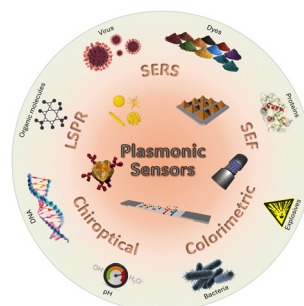


REVIEWS

2085

Plasmonic nanoparticle sensors: current progress, challenges, and future prospects

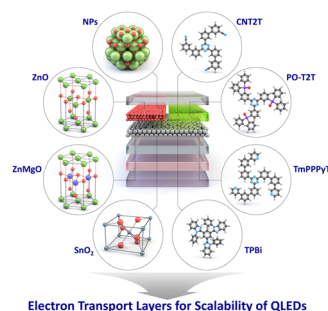
K. Kant, R. Beeram, Y. Cao, P. S. S. dos Santos, L. González-Cabaleiro, D. García-Lojo, H. Guo, Y. Joung, S. Kothadiya, M. Lafuente, Y. X. Leong, Y. Liu, Y. Liu, S. S. B. Moram, S. Mahasivam, S. Maniappan, D. Quesada-González, D. Raj, P. Weerathunge, X. Xia, Q. Yu, S. Abalde-Cela, R. A. Alvarez-Puebla, R. Bardhan, V. Bansal, J. Choo, L. C. C. Coelho, J. M. M. M. de Almeida, S. Gómez-Graña, M. Grzelczak, P. Herves, J. Kumar, T. Lohmueller, A. Merkoçi, J. L. Montaña-Priede, X. Y. Ling, R. Mallada, J. Pérez-Juste, M. P. Pina, S. Singamaneni, V. R. Soma, M. Sun, L. Tian, J. Wang, L. Polavarapu* and I. P. Santos*



2167

Recent progresses and challenges in colloidal quantum dot light-emitting diodes: a focus on electron transport layers with metal oxide nanoparticles and organic semiconductors

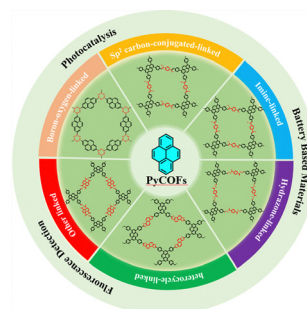
Jaehoon Kim



2198

Pyrene-based covalent organic frameworks (PyCOFs): a review

Yao Yang, Shiqiong Peng, Songhua Chen,* Fangyuan Kang, Jun Fan, Huan Zhang, Xianglin Yu, Junbo Li* and Qichun Zhang*

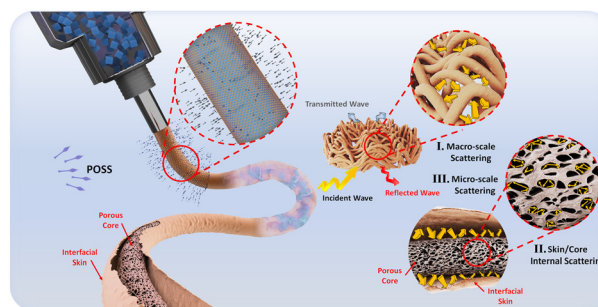


FOCUS

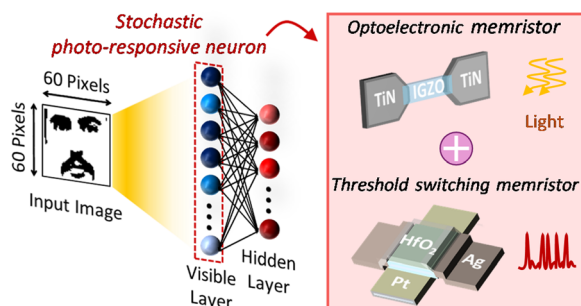
2234

Crucial role of structural design on performance of cryogel-based EMI shields: an experimental review

Sara Rostami, Ahmadreza Ghaffarkhah, Seyyed Alireza Hashemi, Stefan Wuttke, Orlando J. Rojas and Mohammad Arjmand*



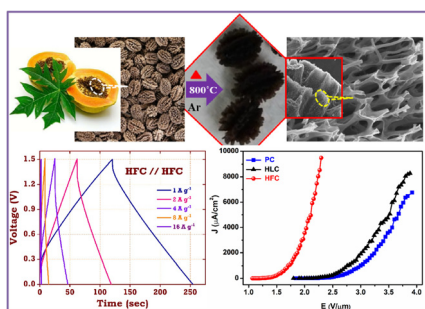
2248



A stochastic photo-responsive memristive neuron for an in-sensor visual system based on a restricted Boltzmann machine

Jin Hong Kim, Hyun Wook Kim, Min Jung Chung, Dong Hoon Shin, Yeong Rok Kim, Jaehyun Kim, Yoon Ho Jang, Sun Woo Cheong, Soo Hyung Lee, Janguk Han, Hyung Jun Park, Joon-Kyu Han* and Cheol Seong Hwang*

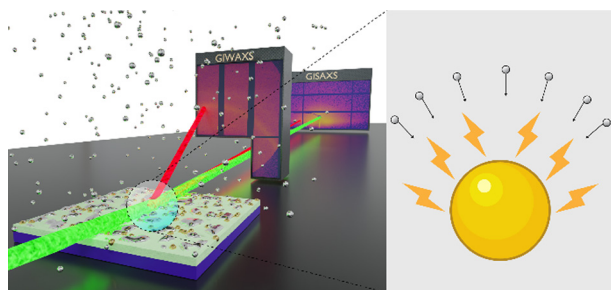
2259



Surface modification of a biomass-derived self-supported carbon nano network as an emerging platform for advanced field emitter devices and supercapacitor applications

Pallavi Mutadak, Amol Vedpathak, Sambhaji Warule,* Nilima Chaudhari, Shrikrishna Sartale, Mahendra More* and Dattatray J. Late*

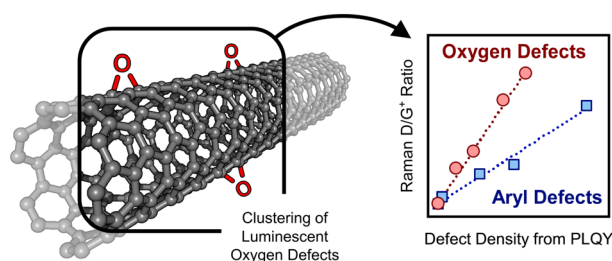
2273



In situ studies revealing the effects of Au surfactant on the formation of ultra-thin Ag layers using high-power impulse magnetron sputter deposition

Suzhe Liang, Tianfu Guan, Shanshan Yin, Suo Tu, Renjun Guo, Yusuf Bulut, Kristian A. Reck, Jonas Drewes, Wei Chen, Thomas Strunskus, Matthias Schwartzkopf, Franz Faupel, Stephan V. Roth, Ya-Jun Cheng and Peter Müller-Buschbaum*

2286



How to recognize clustering of luminescent defects in single-wall carbon nanotubes

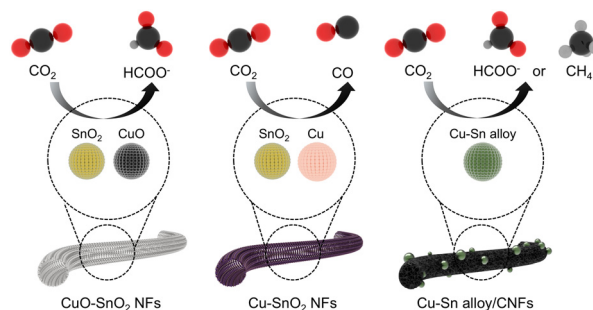
Finn L. Sebastian, Simon Settele, Han Li, Benjamin S. Flavel and Jana Zaumseil*



2295

Thermodynamic phase control of Cu–Sn alloy electrocatalysts for selective CO₂ reduction

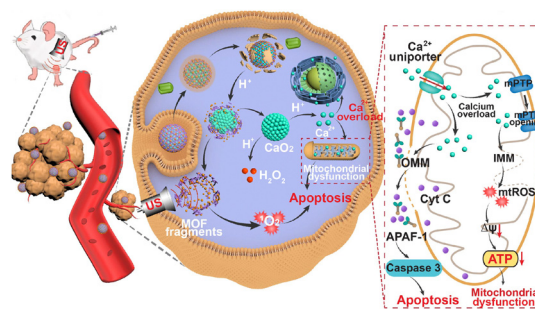
Soohyun Go, Woosuck Kwon, Deokgi Hong, Taemin Lee, Sang-Ho Oh, Daewon Bae, Jeong-Heon Kim, Seolha Lim, Young-Chang Joo and Dae-Hyun Nam*



2306

Biodegradable persistent ROS-generating nanosensitizers for enhanced synergistic cancer therapy by inducing cascaded oxidative stress

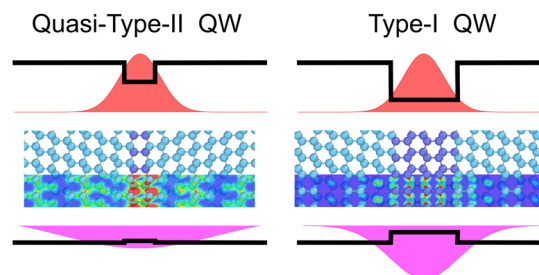
Yue Chen, Tong Ding, Zhengzheng Qian, Zerui Ma, Liming Zhou, Zhiling Li, Runkai Lv, Yinghui Xu, Yingjie Xu, Linhui Hao, Chen Zhu,* Xikuan Yao,* Wenyong Yu* and Wenpei Fan*



2320

Polytypic quantum wells in Si and Ge: impact of 2D hexagonal inclusions on electronic band structure

Anna Marzegalli, Francesco Montalenti and Emilio Scalise*

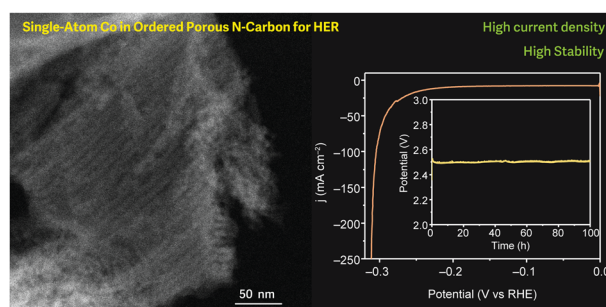


Direct band gap 2D-hexagonal Ge insertions

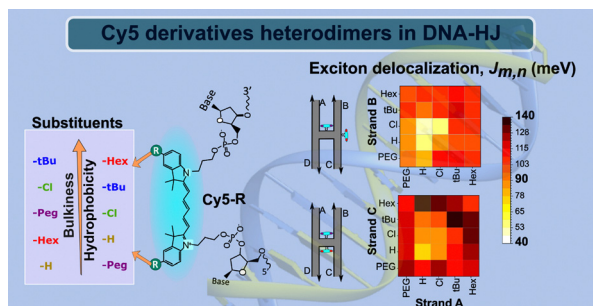
2326

Improved high-current-density hydrogen evolution reaction kinetics on single-atom Co embedded in an order pore-structured nitrogen assembly carbon support

Jiaqi Yu, Yu Yan, Yuemin Lin, Hengzhou Liu, Yuting Li, Shaohua Xie, Simin Sun, Fudong Liu, Zhiguo Zhang, Wenzhen Li, Jin-Su Oh, Lin Zhou, Long Qi,* Bin Wang* and Wenyu Huang*



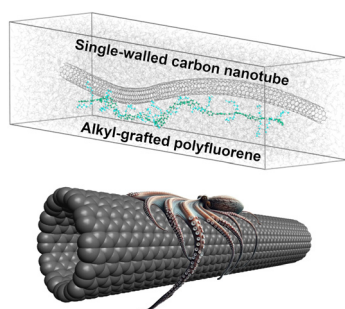
2334



Towards tunable exciton delocalization in DNA Holliday junction-templated indodicarbocyanine 5 (Cy5) dye derivative heterodimers

Gissela Pascual, Sebastián A. Díaz,* Simon K. Roy, Adam Meares, Matthew Chiriboga, Kimihiro Susumu, Divita Mathur, Paul D. Cunningham, Igor L. Medintz, Bernard Yurke, William B. Knowlton, Joseph S. Melinger* and Jeunghoon Lee*

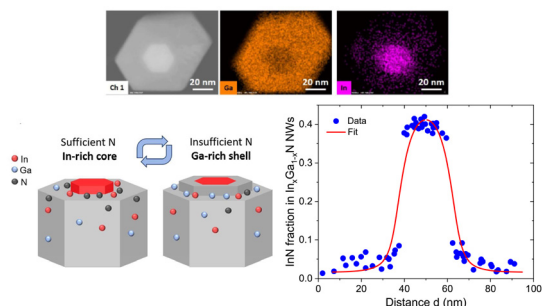
2349



Explicating conjugated polymer extraction used for the differentiation of single-walled carbon nanotubes

Dominik Just,* Tomasz Wasiak, Andrzej Dzieńia, Karolina Z. Milowska, Anna Mielańczyk and Dawid Janas*

2360



Instantaneous growth of single monolayers as the origin of spontaneous core-shell $\text{In}_x\text{Ga}_{1-x}\text{N}$ nanowires with bright red photoluminescence

Vladimir G. Dubrovskii,* George E. Cirlin, Demid A. Kirilenko, Konstantin P. Kotlyar, Ivan S. Makhov, Rodion R. Reznik and Vladislav O. Gridchin

