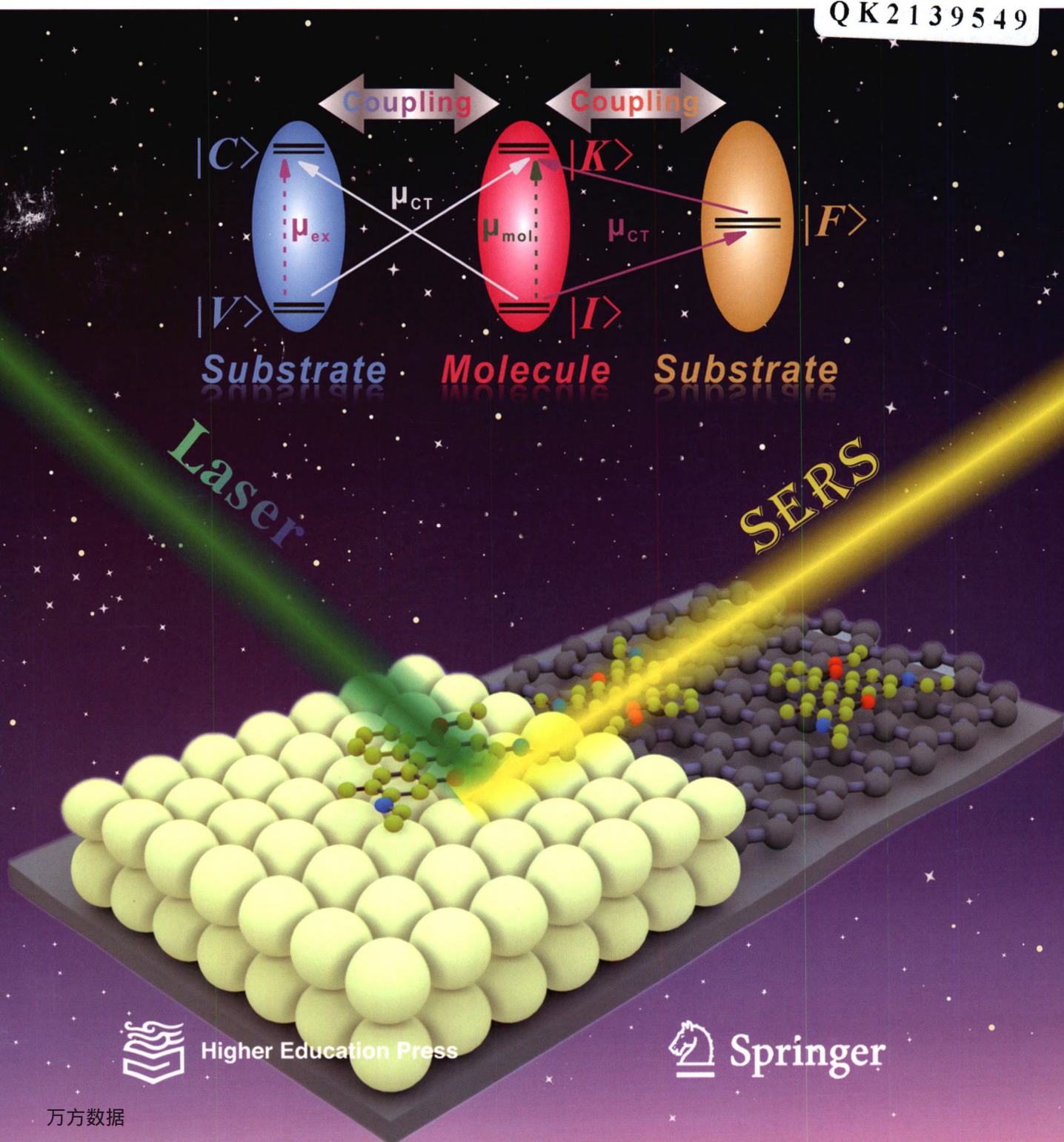


# Frontiers of Physics

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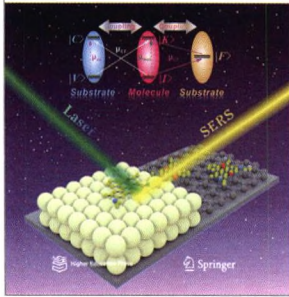
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# CONTENTS

Vol. 16 No. 4 August 2021

## Particle, Nuclear Physics, Astrophysics & Cosmology

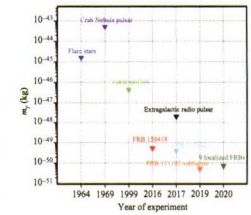
- 44300 **Testing fundamental physics with astrophysical transients**  
Jun-Jie Wei, Xue-Feng Wu

## Atomic, Molecular & Optical Physics

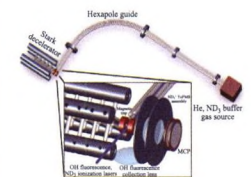
- 42300 **Molecular collisions: From near-cold to ultra-cold**  
Yang Liu, Le Luo
- 41501 **Remote preparation for single-photon state in two degrees of freedom with hyper-entangled states**  
Mei-Yu Wang, Fengli Yan, Ting Gao

## Condensed Matter & Materials Physics

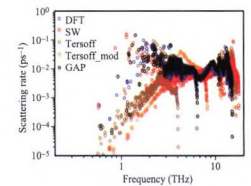
- 43200 **Machine learning approach for the prediction and optimization of thermal transport properties**  
Yulou Ouyang, Cuiqian Yu, Gang Yan, Jie Chen
- 43201 **A brief review of thermal transport in mesoscopic systems from nonequilibrium Green's function approach**  
Zhi-Zhou Yu, Guo-Huan Xiong, Li-Fa Zhang
- 43202 **Organic single crystal phototransistors: Recent approaches and achievements**  
Changbin Zhao, Muhammad Umair Ali, Jiaoyi Ning, Hong Meng
- 43203 **Theoretical progress on direct Z-scheme photocatalysis of two-dimensional heterostructures**  
Zhaobo Zhou, Shijun Yuan, Jinlan Wang
- 43300 **The origin of ultrasensitive SERS sensing beyond plasmonics**  
Leilei Lan, Yimeng Gao, Xingce Fan, Mingze Li, Qi Hao, Teng Qiu
- 43301 **Optoelectronic characteristics and application of black phosphorus and its analogs**  
Ying-Ying Li, Bo Gao, Ying Han, Bing-Kun Chen, Jia-Yu Huo
- 43500 **Pairing symmetry in monolayer of orthorhombic CoSb**  
Tian-Zhong Yuan, Mu-Yuan Zou, Wen-Tao Jin, Xin-Yuan Wei, Xu-Guang Xu, Wei Li
- 43501 **Tuning the magnetic and electronic properties of strontium titanate by carbon doping**  
Hui Zeng, Meng Wu, Hui-Qiong Wang, Jin-Cheng Zheng, Junyong Kang
- 43502 **Impurity effect as a probe for the pairing symmetry of graphene-based superconductors**  
Yuan-Qiao Li, Tao Zhou



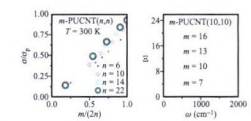
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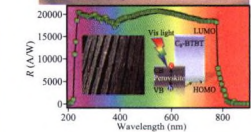
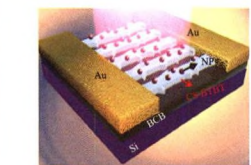
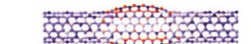
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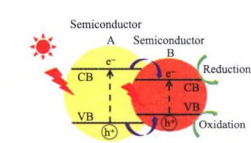
43200



43201



43202



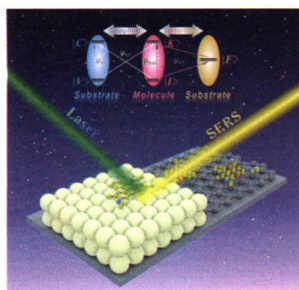
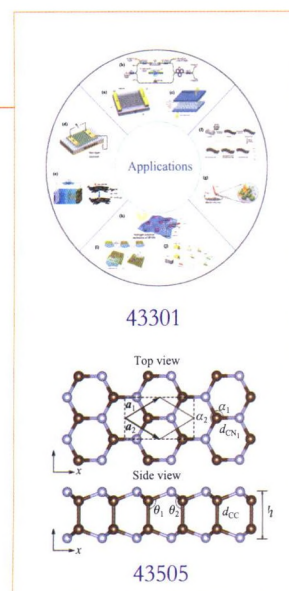
Straddling gap (type-I)

43203

Contents Continued ►

# CONTENTS

- 43503 **An analytical solution for quantum scattering through a  $PT$ -symmetric delta potential**  
Ying-Tao Zhang, Shan Jiang, Qingming Li, Qing-Feng Sun
- 43504 **Surface plasmon resonance and field confinement in graphene nanoribbons in a nanocavity**  
Sa Yang, Ren-Long Zhou, Yang-Jun Huang
- 43505 ***Ab initio* study of anisotropic mechanical and electronic properties of strained carbon-nitride nanosheet with interlayer bonding**  
Hao Cheng, Jin-Cheng Zheng
- i **Special Focus: School of Physics, Southeast University**

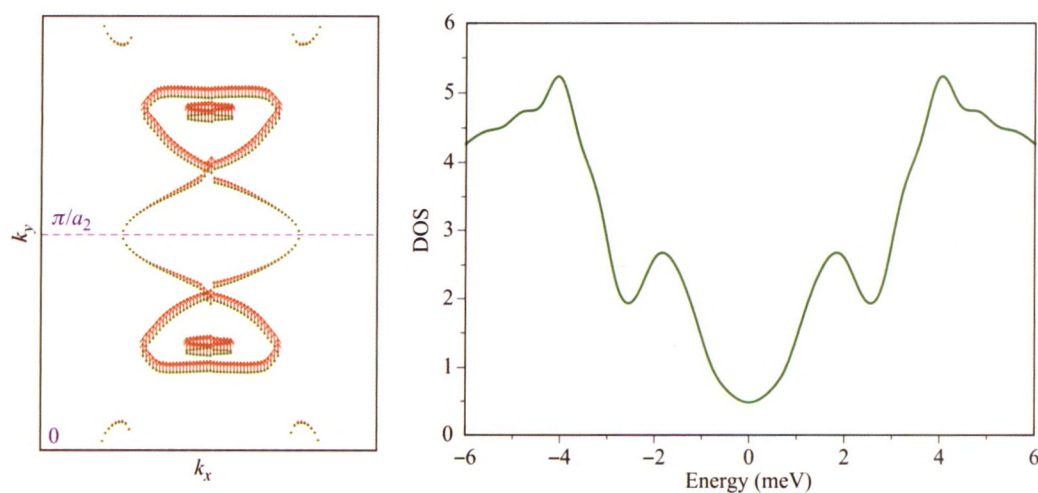


## Cover

Compared with traditional plasmonic-based surface-enhanced Raman scattering (SERS) substrates, plasmon-free SERS substrates, as new frontiers, have attracted tremendous attention for their abundant sources, excellent chemical stability, superior biocompatibility, good signal uniformity, and unique selectivity to target molecules. Recently, researchers have made great progress in fabricating novel plasmon-free SERS substrates and exploring new enhancement strategies to improve their sensitivity. This review summarizes the recent developments of plasmon-free SERS substrates and specially focuses on the enhancement mechanisms and the enhancement strategies. Moreover, the promising applications, current challenges, and future research opportunities in plasmon-free SERS substrates are discussed. For more details, please refer to the article entitled “The origin of ultrasensitive SERS sensing beyond plasmonics” by Leilei Lan, *et al.*, *Front. Phys.* 16(4), 43300 (2021). [Photo credit: Teng Qiu at Southeast University.]

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Vol. 16 No. 4 August 2021



Left: A schematic plot for the gap nodal structure of non-unitary pairing on the Fermi surface topologies. Right: The DOS as a function of energy for the non-unitary superconducting state. See: Tian-Zhong Yuan, Mu-Yuan Zou, Wen-Tao Jin, Xin-Yuan Wei, Xu-Guang Xu, and Wei Li, Pairing symmetry in monolayer of orthorhombic CoSb, *Front. Phys.* 16(4), 43500 (2021).

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