

Chinese Physics B

Volume 33 Number 8 August 2024

Contents

TOPICAL REVIEW — Stephen J. Pennycook: A research life in atomic-resolution STEM and EELS

086101 Three-dimensional crystal defect imaging by STEM depth sectioning

Ryo Ishikawa, Naoya Shibata and Yuichi Ikuhara

086801 Cryogenic transmission electron microscopy on beam-sensitive materials and quantum science

Gang Wang and Jun-Hao Lin

SPECIAL TOPIC — Stephen J. Pennycook: A research life in atomic-resolution STEM and EELS

086802 Controlled fabrication of freestanding monolayer SiC by electron irradiation

Yunli Da, Ruichun Luo, Bao Lei, Wei Ji and Wu Zhou

086803 Symmetry quantification and segmentation in STEM imaging through Zernike moments

Jiadong Dan, Cheng Zhang, Xiaoxu Zhao and N. Duane Loh

SPECIAL TOPIC — Quantum communication and quantum network

080301 Machine-learning-assisted efficient reconstruction of the quantum states generated from the Sagnac polarization-entangled photon source

Menghui Mao, Wei Zhou, Xinhui Li, Ran Yang, Yan-Xiao Gong and Shi-Ning Zhu

SPECIAL TOPIC — Quantum computing and quantum sensing

080302 A family of quantum von Neumann architecture

Dong-Sheng Wang

080601 Nonlinear time-reversal interferometry with arbitrary quadratic collective-spin interaction

Zhiyao Hu, Qixian Li, Xuanchen Zhang, He-Bin Zhang, Long-Gang Huang and Yong-Chun Liu

DATA PAPER

083401 Electron capture and excitation in intermediate-energy He^{2+} - $\text{H}(1s,2s)$ collisions

Yadong Liu, Congcong Jia, Mingxuan Ma, Xiang Gao, Ling Liu, Yong Wu, Xiangjun Chen and Jianguo Wang

(Continued on the Bookbinding Inside Back Cover)

087701 Physics-embedded machine learning search for Sm-doped PMN-PT piezoelectric ceramics with high performance

Rui Xin, Yaqi Wang, Ze Fang, Fengji Zheng, Wen Gao, Dashi Fu, Guoqing Shi, Jian-Yi Liu and Yongcheng Zhang

RAPID COMMUNICATION

084205 Mode coupling with Fabry–Perot modes in photonic crystal slabs

Ken Qin, Peng Hu, Jie Liu, Hong Xiang and De-Zhuan Han

086601 Comparative study of nudged elastic band and molecular dynamics methods for diffusion kinetics in solid-state electrolytes

Aming Lin, Jing Shi, Su-Huai Wei and Yi-Yang Sun

087401 Manipulation of band gap in 1T-TiSe₂ via rubidium deposition

Yi Ou, Lei Chen, Zi-Ming Xin, Yu-Jing Ren, Peng-Hao Yuan, Zheng-Guo Wang, Yu Zhu, Jing-Zhi Chen and Yan Zhang

087901 Deep-subwavelength single grooves prepared by femtosecond laser direct writing on Si

Rui-Xi Ye and Min Huang

088201 Interface and mechanical degradation mechanisms of the silicon anode in sulfide-based solid-state batteries at high temperatures

Qiuchen Wang, Yuli Huang, Jing Xu, Xiqian Yu, Hong Li and Liquan Chen

088202 Surface encapsulation of layered oxide cathode material with NiTiO₃ for enhanced cycling stability of Na-ion batteries

Zilin Hu, Bin Tang, Ting Lin, Chu Zhang, Yaoshen Niu, Yuan Liu, Like Gao, Fei Xie, Xiaohui Rong, Yaxiang Lu and Yongsheng Hu

088701 Piezoelectric fibers based on silk fibroin with excellent output performance

Wenqiang Zhen, Jie Chen, Suna Fan and Yaopeng Zhang

GENERAL

080201 Multi-soliton solutions of coupled Lakshmanan–Porsezian–Daniel equations with variable coefficients under nonzero boundary conditions

Hui-Chao Zhao, Lei-Nuo Ma and Xi-Yang Xie

080202 Topological phases and edge modes of an uneven ladder

Wen-Chuang Shang, Yi-Ning Han, Shimpei Endo and Chao Gao

080303 Massive Dirac particles based on gapped graphene with Rosen–Morse potential in a uniform magnetic field

A. Kalani, Alireza Amani and M. A. Ramzanpour

080304 New construction of mutually unbiased bases for odd-dimensional state space

Chenghong Wang, Kun Wang and Zhu-Jun Zheng

080305 Micron-sized fiber diamond probe for quantum precision measurement of microwave magnetic field

Wen-Tao Lu, Sheng-Kai Xia, Ai-Qing Chen, Kang-Hao He, Zeng-Bo Xu, Yi-Han Chen, Yang Wang, Shi-Yu Ge, Si-Han An, Jian-Fei Wu, Yi-Han Ma and Guan-Xiang Du

080306 Security analysis of satellite-to-ground reference-frame-independent quantum key distribution with beam wandering

Chun Zhou, Yan-Mei Zhao, Xiao-Liang Yang, Yi-Fei Lu, Yu Zhou, Xiao-Lei Jiang, Hai-Tao Wang, Yang Wang, Jia-Ji Li, Mu-Sheng Jiang, Xiang Wang, Hai-Long Zhang, Hong-Wei Li and Wan-Su Bao

080307 Effects of quantum noise on teleportation of arbitrary two-qubit state via five-particle Brown state

Ao Wang, Yu-Zhen Wei, Min Jiang, Yong-Cheng Li, Hong Chen and Xu Huang

080308 Quantum block coherence with respect to projective measurements

Pu Wang, Zhong-Yan Li and Hui-Xian Meng

080401 Detecting short-term gravitational waves from post-merger hyper-massive neutron stars with a kilohertz detector

Yikang Chen and Zong-Hong Zhu

080701 Deep learning-assisted common temperature measurement based on visible light imaging

Jia-Yi Zhu, Zhi-Min He, Cheng Huang, Jun Zeng, Hui-Chuan Lin, Fu-Chang Chen, Chao-Qun Yu, Yan Li, Yong-Tao Zhang, Huan-Ting Chen and Ji-Xiong Pu

ATOMIC AND MOLECULAR PHYSICS

083101 All-electron basis sets for H to Xe specific for ZORA calculations: Applications in atoms and molecules

C. S. Gomes, F. E. Jorge and A. Canal Neto

083102 Steering the energy sharing of electrons in nonsequential double ionization with orthogonally polarized two-color field

Guangqi Fan, Zhijie Yang, Fenghao Sun, Jinmei Zheng, Yuntian Han, Mingqian Huang and Qingcao Liu

ELECTROMAGNETISM, OPTICS, ACOUSTICS, HEAT TRANSFER, CLASSICAL MECHANICS, AND FLUID DYNAMICS

084201 Surface phonon resonance: A new mechanism for enhancing photonic spin Hall effect and refractive index sensor

Jie Cheng, Chenglong Wang, Yiming Li, Yalin Zhang, Shengli Liu and Peng Dong

084202 Optical storage of circular airy beam in atomic vapor

Hong Chang, Xin Yang, Yan Ma, Xinqi Yang, Mingtao Cao, Xiaofei Zhang, Ruifang Dong and Shougang Zhang

084203 Enhanced picosecond terahertz wave generation based on cascade effects in a terahertz parametric generator

Jingxi Zhang, Yuye Wang, Bingfeng Xu, Kai Chen, Zikun Liu, Hongru Ma, Degang Xu and Jianquan Yao

084204 Design of a high sensitivity and wide range angular rate sensor based on exceptional surface

Xinsheng Ding, Wenyao Liu, Shixian Wang, Yu Tao, Yanru Zhou, Yu Bai, Lai Liu, Enbo Xing, Jun Tang and Jun Liu

084206 Interface state-based bound states in continuum and below-continuum-resonance modes with high- Q factors in the rotational periodic system

Jialing Yang, Aoqian Shi, Yuchen Peng, Peng Peng and Jianjun Liu

084401 A graph neural network approach to the inverse design for thermal transparency with periodic interparticle system

Bin Liu and Yixi Wang

084701 Influence of liquid film shape on evaporation performance of agitated thin film evaporator

Xin-Qiang Gu, Yao Huang, Kun Zou and Yi-Tian Peng

084702 Deformation and mutual influence of two cylindrical water columns in tandem subjected to shock wave

Zhen-Yu Hong, Yang Song, Rui Wang, Zong-Qiang Ma, Dong-Jun Ma and Pei Wang

084703 Integrated analysis of plasma rotation effect on HL-3 hybrid scenario

Miao Xue, Guo-Yao Zheng, Lei Xue, Jia-Xian Li, Shuo Wang, Hai-Long Du, Yi-Ren Zhu and Yue Zhou

PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

085201 Ion acoustic solitary waves in an adiabatic dusty plasma: Roles of superthermal electrons, ion loss and ionization

Qianghua Rao, Hui Chen, Sanqiu Liu and Xiaochang Chen

085202 Tunable energy spectrum betatron x-ray sources in a plasma wakefield

Chuan-Yi Xi, Yin-Ren Shou, Li-Qi Han, Abdughupur Ablimit, Xiao-Dan Liu, Yan-Ying Zhao and Jin-Qing Yu

085203 Quasi-three-dimensional hydrodynamics of the corona region of laser irradiation of a slab

Xiao-Mei Dong, Ben-Jin Guan and Ying-Jun Li

085204 Spectral characteristics of laser-plasma instabilities with a broadband laser

Guo-Xiao Xu, Ning Kang, An-Le Lei, Hui-Ya Liu, Yao Zhao, Shen-Lei Zhou, Hong-Hai An, Jun Xiong, Rui-Rong Wang, Zhi-Yong Xie, Xi-Chen Zhou, Zhi-Heng Fang and Wei Wang

085205 Calculation and prediction of divertor detachment via impurity seeding by using one-dimensional model

Wen-Jie Zhou, Xiao-Ju Liu, Xiao-He Wu, Bang Li, Qi-Qi Shi, Hao-Chen Fan, Yan-Jie Yang and Guo-Qiang Li

CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

086102 Performance optimization of the neutron-sensitive image intensifier used in neutron imaging

Jinhao Tan, Yushou Song, Jianrong Zhou, Wenqin Yang, Xingfen Jiang, Jie Liu, Chaoyue Zhang, Xiaojuan Zhou, Yuanguang Xia, Shulin Liu, Baojun Yan, Hui Liu, Songlin Wang, Yubin Zhao, Jian Zhuang, Zhijia Sun and Yuanbo Chen

086103 Effect of interlayer bonded bilayer graphene on friction

Yao-Long Li, Zhen-Guo Tian, Hai-Feng Yin and Ren-Liang Zhang

086104 Step-edge-guided nucleation and growth mode transition of α -Ga₂O₃ heteroepitaxy on vicinal sapphire

Jinggang Hao, Yanfang Zhang, Yijun Zhang, Ke Xu, Genquan Han and Jiandong Ye

086105 Quasi-plastic deformation mechanisms and inverse Hall–Petch relationship in nanocrystalline boron carbide under compression

Zhen Yue, Jun Li, Lisheng Liu and Hai Mei

086301 First-principles study on stability and superconductivity of ternary hydride LaYH_x ($x = 2, 3, 6$ and 8)

Xiao-Zhen Yan, Xing-Zi Zhou, Chao-Fei Liu, Yin-Li Xu, Yi-Bin Huang, Xiao-Wei Sheng and Yang-Mei Chen

086804 Surface evolution of thermoelectric material KCu₄Se₃ explored by scanning tunneling microscopy

Yumin Xia, Ni Ma, Desheng Cai, Yuzhou Liu, Yitong Gu, Gan Yu, Siyu Huo, Wenhui Pang, Chong Xiao and Shengyong Qin

CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES

087101 Multi-objective global optimization approach predicted quasi-layered ternary TiOS crystals with promising photocatalytic properties

Yi-Jie Xiang, Siyan Gao, Chunlei Wang, Haiping Fang, Xiangmei Duan, Yi-Feng Zheng and Yue-Yu Zhang

- 087102 Topological phase transition in compressed van der Waals superlattice heterostructure BiTeCl/HfTe₂**
Zhilei Li, Yinxiang Li, Yiting Wang, Wenzhi Chen and Bin Chen
- 087201 Effect of Lewis acid-base additive on lead-free Cs₂SnI₆ thin film prepared by direct solution coating process**
Saqib Nawaz Khan, Yan Wang, Lixiang Zhong, Huili Liang, Xiaolong Du and Zengxia Mei
- 087301 Topological superconductors with spin-triplet pairings and Majorana Fermi arcs**
Shi Huang and Xi Luo
- 087302 GaInX₃ (X = S, Se, Te): Ultra-low thermal conductivity and excellent thermoelectric performance**
Zhi-Fu Duan, Chang-Hao Ding, Zhong-Ke Ding, Wei-Hua Xiao, Fang Xie, Nan-Nan Luo, Jiang Zeng, Li-Ming Tang and Ke-Qiu Chen
- 087402 Experimental observation of Fermi-level flat band in novel kagome metal CeNi₅**
Xue-Zhi Chen, Le Wang, Shuai Zhang, Ren-Jie Zhang, Yi-Wei Cheng, Yu-Dong Hu, Cheng-Nuo Meng, Zheng-Tai Liu, Bai-Qing Lv and Yao-Bo Huang
- 087403 Control of interfacial reaction and defect formation in Gd/Bi₂Te_{2.7}Se_{0.3} composites with excellent thermoelectric and magnetocaloric properties**
Tianchang Xue, Ping Wei, Chengshan Liu, Longzhou Li, Wanting Zhu, Xiaolei Nie and Wenyu Zhao
- 087404 Half-integer Shapiro steps in MgB₂ focused He ion beam Josephson junctions**
Dali Yin, Xinwei Cai, Tiequan Xu, Ruining Sun, Ying Han, Yan Zhang, Yue Wang and Zizhao Gan
- 087501 Evolution of anomalous Hall effect in ferromagnetic Weyl semimetal Nb_xZr_{1-x}Co₂Sn**
Bo-Wen Chen and Bing Shen
- 087502 First-principles study of electronic and magnetic properties of Fe atoms on Cu₂N/Cu(100)**
Jiale Chen and Jun Hu
- 087503 Frequency combs based on magnon-skyrmion interaction in magnetic nanotubes**
Tijjani Abdulrazak, Xuejuan Liu, Zhejunyu Jin, Yunshan Cao and Peng Yan
- 087504 Magnetic domain structures in ultrathin Bi₂Te₃/CrTe₂ heterostructures**
Tirui Xia, Xiaotian Yang, Yifan Zhang, Xinqi Liu, Xinyu Cai, Chang Liu, Qi Yao, Xufeng Kou and Wenbo Wang
- 087702 Dielectric anisotropy in liquid crystal mixtures with nematic and smectic phases**
Xing-Zhou Tang, Jia-Yao Ye, Zi-Ye Wang, Hao-Yi Jiang, Xiao-Hu Shang, Zhao-Yan Yang and Bing-Xiang Li
- 087801 Quantitative analysis of laser-generated ultrasonic wave characteristics and their correlation with grain size in polycrystalline materials**
Zhaowen Xu, Xue Bai Jian Ma, Zhuangzhuang Wan and Chaoqun Wang

INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

- 088101 Single crystal growth and transport properties of narrow-bandgap semiconductor RhP₂**
De-Sheng Wu, Ping Zheng and Jian-Lin Luo
- 088203 Defect chemistry engineering of Ga-doped garnet electrolyte with high stability for solid-state lithium metal batteries**
Sihan Chen, Jun Li, Keke Liu, Xiaochen Sun, Jingwei Wan, Huiyu Zhai, Xinfeng Tang and Gangjian Tan
- 088702 Subtraction of liposome signals in cryo-EM structural determination of protein–liposome complexes**
Shouqing Li, Ming Li, Yumei Wang and Xueming Li
- 088703 Tuning the diffusion constant to optimize the readout of positional information of spatial concentration patterns**
Ka Kit Kong, Chunxiong Luo and Feng Liu
- 088901 CRB: A new rumor blocking algorithm in online social networks based on competitive spreading model and influence maximization**
Chen Dong, Gui-Qiong Xu and Lei Meng
- 088902 Influence of network structure on spreading dynamics via tie range**
Min Li, Yurong Song, Bo Song, Ruqi Li, Guo-Ping Jiang and Zhang Hui
- 088903 Detecting the core of a network by the centralities of the nodes**
Peijie Ma, Xueza Ren, Junfang Zhu and Yanqun Jiang