

Chinese Physics B

Volume 33 Number 12 December 2024

Contents

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

120102 Editorial: Stephen J. Pennycook — A research life in atomic-resolution STEM and EELS

Hong-Jun Gao, Wu Zhou and Ryo Ishikawa

120704 Combining electron microscopy with atomic-scale calculations — A personal perspective

Sokrates T. Pantelides

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

127302 A universal resist-assisted metal transfer method for 2D semiconductor contacts

Xuanye Liu, Linxuan Li, Chijun Wei, Peng Song, Hui Gao, Kang Wu, Nuertai Jiazila, Jiequn Sun, Hui Guo, Haitao Yang, Wu Zhou, Lihong Bao and Hong-Jun Gao

SPECIAL TOPIC — Structures and properties of materials under high pressure

126104 Pressure-induced structural transitions and metallization in $ZrSe_2$

Yiping Gao, Chenchen Liu, Can Tian, Chengcheng Zhu, Xiaoli Huang and Tian Cui

126105 Pressure-induced superconductivity and phase transition in $PbSe$ and $PbTe$

Yuyang Jiang, Cuiying Pei, Qi Wang, Juefei Wu, Lili Zhang, Chao Xiong and Yanpeng Qi

127101 Design of superconducting compounds at lower pressure via intercalating XH_4 molecules ($X = B, C,$ and N) into fcc lattices

Yue Zhao, Sihan Liu, Jiao Liu, Tingting Gu, Jian Hao, Jingming Shi, Wenwen Cui and Yinwei Li

SPECIAL TOPIC — Quantum computing and quantum sensing

120301 A nanosecond level current pulse capture taper optical fiber probe based on micron level nitrogen-vacancy color center diamond

Yuchen Bian, Yangfan Mao, Honghao Chen, Shiyu Ge, Wentao Lu, Chengkun Wang, Sihan An and Guanxiang Du

120302 Automatic architecture design for distributed quantum computing

Ting-Yu Luo, Yu-Zhen Zheng, Xiang Fu and Yu-Xin Deng

120303 Nonlinear enhanced mass sensor based on optomechanical system

Xin-Xin Man, Jing Sun, Wen-Zhao Zhang, Lijuan Luo and Guangri Jin

(Continued on the Bookbinding Inside Back Cover)

120309 M²CS: A microwave measurement and control system for large-scale superconducting quantum processors

Jiawei Zhang, Xuandong Sun, Zechen Guo, Yuefeng Yuan, Yubin Zhang, Ji Chu, Wenhui Huang, Yongqi Liang, Jiawei Qiu, Daxiong Sun, Ziyu Tao, Jiajian Zhang, Weijie Guo, Ji Jiang, Xiayu Linpeng, Yang Liu, Wenhui Ren, Jingjing Niu, Youpeng Zhong and Dapeng Yu

120310 Exact quantum dynamics for two-level systems with time-dependent driving

Zhi-Cheng He, Yi-Xuan Wu and Zheng-Yuan Xue

124201 Enhanced sensing of anharmonicities in a gain-based anti-PT symmetric system

Ya-Wei Zeng, Tian-Le Yang, Qi-Yin Lin and Wan-Jun Su

INSTRUMENTATION AND MEASUREMENT

120305 Micron-resolved quantum precision measurement of magnetic field at the Tesla level

Si-Han An, Shi-Yu Ge, Wen-Tao Lu, Guo-Bin Chen, Sheng-Kai Xia, Ai-Qing Chen, Cheng-Kun Wang, Lin-Yan Yu, Zhi-Qiang Zhang, Yang Wang, Gui-Jin Tang, Hua-Fu Cheng and Guan-Xiang Du

120703 Apparatus for producing single strontium atoms in an optical tweezer array

Kai Wen, Huijin Chen, Xu Yan, Zejian Ren, Chengdong He, Elnur Hajiyev, Preston Tsz Fung Wong and Gyu-Boong Jo

125205 Influence of crystal dimension on performance of spherical crystal self-emission imager

Chenglong Zhang, Yihang Zhang, Haochen Gu, Nuo Chen, Xiaohui Yuan, Zhe Zhang, Miaohua Xu, Yutong Li, Yingjun Li and Jie Zhang

COMPUTATIONAL PROGRAMS FOR PHYSICS

120101 ScatterX: A software for fast processing of high-throughput small-angle scattering data

Fei Xie, Mei Xie, Baoyu Song, Qiaoyu Guo and Xuechen Jiao

RAPID COMMUNICATION

126802 One-step synthesis of cubic gauche polymeric nitrogen with high yield just by heating

Liangfei Wu, Yuxuan Xu, Guo Chen, Junfeng Ding, Ming Li, Zhi Zeng and Xianlong Wang

127102 Disassembling one-dimensional chains in molybdenum oxides

Xian Du, Yidian Li, Wenxuan Zhao, Runzhe Xu, Kaiyi Zhai, Yulin Chen and Lexian Yang

127201 Ultrafast reconfigurable direct charge trapping devices based on few-layer MoS₂

Hui Gao, Xuanye Liu, Peng Song, Chijun Wei, Nuertai Jiazila, Jiequn Sun, Kang Wu, Hui Guo, Haitao Yang, Lihong Bao and Hong-Jun Gao

127303 Higher-order topological corner states and origin in monolayer LaBrO

Qing Wang and Ning Hao

127401 Spin fluctuations and orbital-selective superconductivity in Ba₂CuO_{4-y}: A FLEX study

Pei-Jun Zheng, Ya-Min Quan and Liang-Jian Zou

128103 Chiral polaritons in semiconductor perovskite metasurface enhanced by bound states in the continuum

Dun Wang, Albert Y. Xiong, Julia Q. Zhang, Zengde She, Xiaofeng Kang, Ying Zhu, Sanjib Ghosh and Qihua Xiong

GENERAL

120304 Deep-learning-assisted optical communication with discretized state space of structured light

Minyang Zhang, Dong-Xu Chen, Pengxiang Ruan, Jun Liu, Dong-Zhi Fu, Jun-Long Zhao and Chui-Ping Yang

120306 Vortex clusters and their active control in a cold Rydberg atomic system with \mathcal{PT} -symmetric Bessel potential

Zhuo Fan, Yi Shi, Hang Wang, Yuan Zhao, Wei Peng and Siliu Xu

120307 Quantum state estimation based on deep learning

Haowen Xiao and Zhiguang Han

120308 Tunable phonon–photon coupling induces double magnomechanically induced transparency and enhances slow light in an atom-opto-magnomechanical system

M'bark Amghar, Noura Chabar and Mohamed Amazioug

120501 Experimental test of an extension of the Rosenzweig–Porter model to mixed integrable-chaotic systems experiencing time-reversal invariance violation

Xiaodong Zhang, Jiongning Che and Barbara Dietz

120502 Coexisting and multiple scroll attractors in a Hopfield neural network with a controlled memristor

Qing-Qing Ma, An-Jiang Lu and Zhi Huang

120503 A fractional-order chaotic Lorenz-based chemical system: Dynamic investigation, complexity analysis, chaos synchronization, and its application to secure communication

Haneche Nabil and Hamaizia Tayeb

120701 Suppression of the vapor cell temperature error in a spin-exchange relaxation-free co-magnetometer

Jia-Li Liu, Li-Wei Jiang, Chi Fang, Xin Zhao and Yuan-Qiang Chen

120702 Realization of an optimized cylindrical uniform magnetic field coil via flexible printed circuit technology

A-Hui Zhao, Yong-Le Zhang, Yue-Yue Liang, Yi Zhang, Jun-Jun Zha, Dao-Rong Rui, Xiao-Qiang Zhang and Kang Yang

ATOMIC AND MOLECULAR PHYSICS

- 123201** Electron correlation in two-electron atoms: A Bohmian analysis of high-order harmonic generation in high-frequency domain

Yang Song, Shu Han, Yujun Yang and Fuming Guo

- 123401** Momentum distributions of symmetric (H_2^+) and asymmetric (HeH^{2+}) molecular ions in a circularly polarized laser field under different ionization mechanisms

Xin-Yu Hao, Shu-Juan Yan, Ying Guo and Jing Guo

- 123701** Determining the tilt of the Raman laser beam using an optical method for atom gravimeters

Hua-Qing Luo, Yao-Yao Xu, Jia-Feng Cui, Xiao-Bing Deng, Min-Kang Zhou, Xiao-Chun Duan and Zhong-Kun Hu

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

- 124202** Optical image watermarking based on orbital angular momentum holography

Jialong Zhu, Jiaying Ji, Le Wang and Shengmei Zhao

- 124203** Bright soliton dynamics for resonant nonlinear Schrödinger equation with generalized cubic–quintic nonlinearity

Keyu Bao, Xiaogang Tang and Ying Wang

- 124301** Analysis and measurement of vibration characteristics of a hollowing defect based on a laser self-mixing interferometer

Yu-Xin Chen, Jin-Bo Chen, Peng Cao, You-Guang Zhao, Jun Wang, Xu-Wei Teng and Chi Wang

- 124501** Capture behavior of self-propelled particles into a hexatic ordering obstacle

Jing-Yi Li, Jin-Lei Shi, Ying-Ying Wang, Jun-Xing Pan and Jin-Jun Zhang

- 124701** Flow features induced by a rod-shaped microswimmer and its swimming efficiency: A two-dimensional numerical study

Siwen Li, Yuxiang Ying, Tongxiao Jiang and Deming Nie

PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

- 125201** Shear rheology of confined double rings of dust particles in a dusty plasma

Miao Tian, Jiaqi Li, Xuebo Yu, Xue Liu, Shaopeng Li, Qing Li, Fucheng Liu and Yafeng He

- 125202** Nonlinear ion acoustic waves in multicomponent plasmas with nonthermal electrons–positron and bipolar ions

Mai-Mai Lin, Chen-Guang Song, Fu-Yan Chen and Ming-Yue Wang

- 125203** Suppression of the Kelvin–Helmholtz instability by coating in the double-cone ignition scheme

Yuan-Kai Xie, Cheng-Long Zhang, Yi-Zhen Cheng and Ying-Jun Li

125204 Differences in the acoustic characteristics of DC bias alternating arcs in argon, helium, and nitrogen

Yutai Li, Qinghao Wen, Yangyang Fu, Xiaobing Zou, Handong Li, Zhigang Liu, Haiyun Luo, Dun Qian, Zhe Chen and Xinxin Wang

CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES

126101 Correlation of microstructure and magnetic softness of Si-microalloying FeNiBCuSi nanocrystalline alloy revealed by nanoindentation

Benjun Wang, Wenjun Liu, Li Liu, Yu Wang, Yu Hang, Xinyu Wang, Menggen Shi, Hanchen Feng, Long Hou, Chenchen Yuan, Zhong Li and Weihuo Li

126102 Upconversion photoluminescence of Er-doped $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ ceramics enhanced by vacancy clusters revealed by positron annihilation spectroscopy

Huiru Cheng, Yuhuan Li, Ziwen Pan, Jiandang Liu and Bangjiao Ye

126103 *Ab initio* study of phase stability, elastic anisotropy, and minimum thermal conductivity of MnB_2 in different crystal structures

Xiao-Fan Wang, Yi-Xian Wang, Zhuo Wang, Yu-Xuan Zhang and Jian-Bing Gu

126801 Molecular beam epitaxial growth and physical properties of AlN/GaN superlattices with an average 50% Al composition

Siqi Li, Pengfei Shao, Xiao Liang, Songlin Chen, Zhenhua Li, Xujun Su, Tao Tao, Zili Xie, Bin Liu, M. Ajmal Khan, Li Wang, T. T. Lin, Hideki Hirayama, Rong Zhang and Ke Wang

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

127103 Janus monolayers Fe_2SSeX_2 ($X = \text{Ga}, \text{In}, \text{and Tl}$): Robust nontrivial topology with high Chern number

Kang Jia, Xiao-Jing Dong, Pei-Ji Wang and Chang-Wen Zhang

127301 Strain-modulated antiferromagnetic Chern insulator in NiOsCl_6 monolayer

Bin Wu, Na Li, Xin-Lian Chen, Wei-Xiao Ji, Pei-Ji Wang, Shu-Feng Zhang and Chang-Wen Zhang

127501 Tuning the magnetocaloric and structural properties of $\text{La}_{0.67}\text{Sr}_{0.28}\text{Pr}_{0.05}\text{Mn}_{1-x}\text{Co}_x\text{O}_3$ refrigeration materials

Changji Xu, Xinyu Jiang, Zhengguang Zou, Zhuojia Xie, Weijian Zhang and Min Feng

127502 Distance-dependent magnetization modulation induced by inter-superatomic interactions in Cr-doped $\text{Au}_6\text{Te}_{12}\text{Se}_8$ dimers

Yurou Guan, Nanshu Liu, Cong Wang, Fei Pang, Zhihai Cheng and Wei Ji

127503 Valley modulation and topological phase transition in staggered kagome ferromagnets

Yuheng Xing, Wenjuan Qiu, Xinxing Wu and Yue Tan

- 127504 Cu-doped nanocomposite $\text{Pr}_2\text{Fe}_{14}\text{B}/\alpha\text{-Fe}$ ribbons with high $(BH)_{\text{max}}$**
Mehran Khan Alam, Shahzab Raza, Chengyong Gao, Guangbing Han and Shishou Kang
- 127801 Optical properties of La_2O_3 and HfO_2 for radiative cooling via multiscale simulations**
Lihao Wang, Wanglin Yang, Zhongyang Wang, Hongchao Li, Hao Gong, Jingyi Pan, Tongxiang Fan and Xiao Zhou
- 127802 Enhanced near-field radiative heat transfer between borophene sheets on different substrates**
Xiaoyang Han and Chunzhen Fan
- INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY**
- 128101 Screening A-site ordered quadruple perovskites for alkaline hydrogen evolution reaction via unifying electronic configuration descriptor**
Ning Sun, Wenbo Li, Yang Qin, Zhichuan Zheng, Bowen Zhang, Xiangjiang Dong, Peng Wei, Yixiao Zhang, Xian He, Xinyu Xie, Kai Huang, Lailei Wu, Ming Lei, Huiyang Gou and Runze Yu
- 128102 Effects of TMIn flow rate during quantum barrier growth on multi-quantum well material properties and device performance of GaN-based laser diodes**
Zhenyu Chen, Degang Zhao, Feng Liang, Zongshun Liu, Jing Yang and Ping Chen
- 128501 Quantum-mechanical understanding on structure dependence of image potentials of single-walled boron nitride nanotubes**
Yu Zhang, Zhiman Zhang, Weiliang Wang, Shaolin Zhang and Haiming Huang
- 128502 A macro model of spin-transfer torque magnetic tunnel junction**
Ming-Bo Chen, Kun-Kun Li, Xiao-Lei Yang, Xue Peng, Wang-Da Li, En-Long Liu, Hui-Zhen Wu and Shi-Kun He
- 128503 Back-side stress to ease p-MOSFET degradation on e-MRAM chips**
Zhi-Meng Yu, Xiao-Lei Yang, Xiao-Nan Zhao, Yan-Jie Li, Shi-Kun He and Ye-Wu Wang
- 128701 Influences of short-term and long-term plasticity of memristive synapse on firing activity of neuronal network**
Zhi-Jun Li and Jing Zhang
- 128702 A Weibo local network growth model constructed from the perspective of following-followed**
Fu-Zhong Nian and Ran-Qing Yao
- 128703 Effect of different injection strategies considering intravenous injection on combination therapy of magnetic hyperthermia and thermosensitive liposomes**
Jiajia Zhu, Yundong Tang, Rodolfo C. C. Flesch and Tao Jin

128901 Simulation of crowd evacuation under attack considering emotion spreading

Yang Wang, Ning Ding, Dapeng Dong and Yu Zhu

128902 Hyperbolic map unravels eight regions in temperature volatility regionalization of Mainland China

Yuxuan Song, Changgui Gu, Muhua Zheng, Aixia Feng, Yufei Xi, Haiying Wang and Huijie Yang

128903 Impact of environmental factors on the coevolution of information–emotions–epidemic dynamics in activity-driven multiplex networks

Liang'an Huo, Bingjie Liu and Xiaomin Zhao