

# 物 理 学 报

第 73 卷 第 17 期 2024 年 9 月 5 日

## 目 次

### 《物理学报》创刊 90 周年

- 175202 磁约束燃烧等离子体物理的现状与展望 ..... 孙有文 仇志勇 万宝年  
178103 自组装生物分子软物质材料及其物理特性 ..... 韩旭 薛斌 曹毅 王炜

### 观点和展望

- 177801 分数量子霍尔液体中的几何自由度及类引力子元激发 ..... 杨昆

### 专题: 量子通信和量子网络

- 170301 多域跨协议量子网络的域间密钥业务按需提供策略 .....  
..... 陈越 刘长杰 郑伊佳 曹原 郭明轩 朱佳莉 周星宇 郁小松 赵永利 王琴

### 仪器与测量

#### 综述

- 173701 超冷离子源研究进展 ... 周文长 方锋 罗长杰 牟宏进 卢亮 邹丽平 程锐 杨杰 杜广华  
研究论文  
178701 基于实验室光源的透射 X 射线纳米分辨显微镜研制 .....  
..... 廖可梁 何其利 宋杨 李荣刚 宋茂华 李盼云 赵海峰 刘鹏 朱佩平

### 数据论文

- 176301 新型四元硫族化合物光伏特性的高通量筛选和第一性原理研究 .....  
..... 康家兴 严全河 曹浩宇 孟威威 徐飞 洪峰

### 总论

- 170302 带电沙尘大气对微波量子照明雷达性能的影响 ..... 杨瑞科 王甲乐  
170501 活性三嵌段共聚物的凝胶化转变 封面文章 ..... 石子璇 金燕 金奕扬 田文得 张天辉 陈康  
170502 新型忆阻耦合异质神经元的放电模式和预定义时间混沌同步 ..... 贾美美 曹佳伟 白明明  
170601 基于双向吸收光谱精准标定的光频扫描干涉绝对测距 ..... 周强 吴腾飞 曾周末 郝继贵

### 核物理学

- 172401 应用于超高速流场电子密度分布测量的七通道微波干涉仪测量系统 .....  
..... 马平 田径 田得阳 张宁 吴明兴 唐璞

### 原子和分子物理学

- 173101 靛红双氮二苯胺分子开关的光致异构化机理 ..... 庞晓娟 赵凯玥 何航宇 张宁波 蒋臣威

### 电磁学、光学、声学、传热学、经典力学和流体动力学

- 174201 超快光纤激光器中可控脉冲产生与湮灭动力学 ..... 周瑞 李阳 朱润徽 张祖兴

- 174202 基于 490 nm 垂直外腔面发射激光器的长距离水下激光通信系统 ..... 王涛 王章行 沈小雨 朱仁江 蒋丽丹 陆寰宇 路永乐 宋晏蓉 张鹏
- 174203 锥角调制的圆艾里涡旋光束构建光学针 ..... 陆万利
- 174204 应用于 1064 nm 倍频实验的啁啾周期极化铌酸锂晶体的结构设计与角度鲁棒性测试 ..... 刘励强 苏伟伦 刘峻铭 邹娱 洪丽红 李志远
- 174205 基于法布里-珀罗腔的可调谐连续域束缚态及应用 ..... 任洋 李振雄 张磊 崔巍 吴雄雄 霍亚杉 何智慧
- 174301 融合环形统计矢量的复合材料褶皱缺陷超声相位迁移成像 ..... 刘淑倩 张海燕 张辉 朱文发 陈祎婷 刘雅洁
- 174701 脉动气泡在黏性介质中的声发射 ..... 申潇卓 吴鹏飞 林伟军

### 气体、等离子体和放电物理

- 175201 三维行波磁场对等离子体鞘套密度的调控作用 ... 徐子原 周辉 刘光翰 高中亮 丁丽 雷凡

### 凝聚物质: 电子结构、电学、磁学和光学性质

- 177101 微波 GaN 器件温度效应建模 ..... 王帅 葛晨 徐祖银 成爱强 陈敦军
- 177102 利用啁啾飞秒激光脉冲调控金薄膜中传输表面等离激元的群延迟色散 ..... 宋寒冰 郎鹏 季博宇 徐洋 宋晓伟 林景全
- 177501  $\text{Ti}^{4+}$  掺杂对  $\text{Ca}_3\text{Co}_2\text{O}_6$  磁性和磁-介电性能的影响 ..... 王明豪 龚高尚 张会均 何诗悦 刘若水 王利晨 杨淑娴
- 177701 热塑性聚酰亚胺/氧化铝三明治结构柔性电介质薄膜的设计制备及其高温介电储能性能 ..... 卓俊添 林铭浩 张齐艳 黄双武

### 物理学交叉学科及有关科学技术领域

- 178101 单壁碳纳米管/聚酰亚胺电磁屏蔽薄膜的制备与性能 ..... 王天赐 夏乾善 黄信佐 王永正 刘斌 张晋通 黎涛
- 178102 基于准连续域束缚态的强圆二色性超表面 ..... 夏兆生 刘宇行 包正 王丽华 吴博 王刚 王辉 任信钢 黄志祥
- 178801 单靶磁控溅射  $\text{Cu}(\text{In}, \text{Ga})\text{Se}_2$  太阳电池的背接触界面设计 ..... 田杉杉 高倩 高泽冉 熊雨晨 丛日东 于威
- 178901 基于高斯混合模型的无向网络重构 ..... 何瑞辉 张海峰 王欢 马闯

文章图片的彩色效果详见网刊



扫码阅读  
电子版

# ACTA PHYSICA SINICA

Vol. 73, No. 17, September 5, 2024

## CONTENTS

The 90th Anniversary of *Acta Physica Sinica*

175202 Current status and prospects of burning plasma physics in magnetically confined fusion  
*Sun You-Wen Qiu Zhi-Yong Wan Bao-Nian*

178103 Self-assembled biomolecular soft materials and their physical properties  
*Han Xu Xue Bin Cao Yi Wang Wei*

### VIEWS AND PERSPECTIVES

177801 Geometric degrees of freedom and graviton-like excitations in fractional quantum Hall liquids  
*Kun Yang*

### SPECIAL TOPIC—Quantum communication and quantum network

170301 On-demand provisioning strategy for inter-domain key services in multi-domain cross-protocol quantum networks  
*Chen Yue Liu Chang-Jie Zheng Yi-Jia Cao Yuan Guo Ming-Xuan Zhu Jia-Li  
Zhou Xing-Yu Yu Xiao-Song Zhao Yong-Li Wang Qin*

### INSTRUMENTATION AND MEASUREMENT

#### REVIEW

173701 Research progress of ultracold ion source  
*Zhou Wen-Chang Fang Feng Luo Chang-Jie Mou Hong-Jin Lu Liang Zou Li-Ping  
Cheng Rui Yang Jie Du Guang-Hua*

#### ARTICLE

178701 Development of a transmission X-ray nanometer-resolution microscope based on laboratory light source  
*Liao Ke-Liang He Qi-Li Song Yang Li Rong-Gang Song Mao-Hua Li Pan-Yun  
Zhao Hai-Feng Liu Peng Zhu Pei-Ping*

### DATA PAPERS

176301 Photovoltaic properties of novel quaternary chalcogenides based on high-throughput screening and first-principles calculations  
*Kang Jia-Xing Yan Quan-He Cao Hao-Yu Meng Wei-Wei Xu Fei Hong Feng*

### GENERAL

170302 Effect of charged sand/dust atmosphere on performance of microwave quantum illumination radar  
*Yang Rui-Ke Wang Jia-Le*

170501 Gel transition of active triblock copolymers **COVER ARTICLE**  
*Shi Zi-Xuan Jin Yan Jin Yi-Yang Tian Wen-De Zhang Tian-Hui Chen Kang*

(Continued)

170502 Firing modes and predefined-time chaos synchronization of novel memristor-coupled heterogeneous neuron  
*Jia Mei-Mei Cao Jia-Wei Bai Ming-Ming*

170601 Absolute ranging of optical frequency scanning interferometry based on accurate calibration of bidirectional absorption spectroscopy  
*Zhou Qiang Wu Teng-Fei Zeng Zhou-Mo Zhu Ji-Gui*

## NUCLEAR PHYSICS

172401 A seven-channels microwave interferometer measurement system for measuring electron density distribution in hypervelocity transient plasma flow  
*Ma Ping Tian Jing Tian De-Yang Zhang Ning Wu Ming-Xing Tang Pu*

## ATOMIC AND MOLECULAR PHYSICS

173101 Photoinduced isomerization mechanism of isatin N<sup>2</sup>-diphenylhydrazones molecular switch  
*Pang Xiao-Juan Zhao Kai-Yue He Hang-Yu Zhang Ning-Bo Jiang Chen-Wei*

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

174201 Controlled pulse generation and annihilation dynamics in ultrafast fiber lasers  
*Zhou Rui Li Yang Zhu Run-Hui Zhang Zu-Xing*

174202 Long-range underwater wireless optical communication system based on 490 nm vertical-external-cavity surface-emitting laser  
*Wang Tao Wang Zhang-Xing Shen Xiao-Yu Zhu Ren-Jiang Jiang Li-Dan Lu Huan-Yu Lu Yong-Le Song Yan-Rong Zhang Peng*

174203 Optical needle constructed by conical-angle modulated circular Airy vortex beams  
*Lu Wan-Li*

174204 Design and angular robustness test of chirped periodically poled lithium niobate crystal for 1064 nm second-harmonic generation experiment  
*Liu Li-Qiang Su Wei-Lun Liu Jun-Ming Zou Yu Hong Li-Hong Li Zhi-Yuan*

174205 Tunable continuous domain bound states based on Fabry-Perot cavities and their applications  
*Ren Yang Li Zhen-Xiong Zhang Lei Cui Wei Wu Xiong-Xiong Huo Ya-Shan He Zhi-Hui*

174301 Ultrasonic phase shift migration imaging of wrinkled defects in composite materials fused with circular statistical vectors  
*Liu Shu-Qian Zhang Hai-Yan Zhang Hui Zhu Wen-Fa Chen Yi-Ting Liu Ya-Jie*

174701 Acoustic emission of pulsating bubbles in viscous media  
*Shen Xiao-Zhuo Wu Peng-Fei Lin Wei-Jun*

## PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES

175201 Effect of three-dimensional traveling wave magnetic field on plasma sheath density  
*Xu Zi-Yuan Zhou Hui Liu Guang-Han Gao Zhong-Liang Ding Li Lei Fan*

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

177101 Modeling of temperature effect on DC characteristics of microwave GaN devices  
*Wang Shuai Ge Chen Xu Zu-Yin Cheng Ai-Qiang Chen Dun-Jun*

(Continued)

177102 Tailoring group delay dispersion of surface plasmon polaritons propagating on thin gold film by chirped femtosecond laser pulses  
*Song Han-Bing Lang Peng Ji Bo-Yu Xu Yang Song Xiao-Wei Lin Jing-Quan*

177501 Effect of  $\text{Ti}^{4+}$  doping on magnetism and magnetodielectric properties of  $\text{Ca}_3\text{Co}_2\text{O}_6$   
*Wang Ming-Hao Gong Gao-Shang Zhang Hui-Jun He Shi-Yue Liu Ruo-Shui Wang Li-Chen Yang Shu-Xian*

177701 Design, fabrication, and high-temperature dielectric energy storage performance of thermoplastic polyimide/aluminum oxide sandwich-structured flexible dielectric films  
*Zhuo Jun-Tian Lin Ming-Hao Zhang Qi-Yan Huang Shuang-Wu*

## INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

178101 Preparation and properties of single-walled carbon nanotube/polyetherimide electromagnetic shielding film  
*Wang Tian-Ci Xia Qian-Shan Huang Xin-Zuo Wang Yong-Zheng Liu Bin Zhang Jin-Tong Li Tao*

178102 Strong circular dichroism chiral metasurfaces generated by quasi bound state in continuum domain  
*Xia Zhao-Sheng Liu Yu-Hang Bao Zheng Wang Li-Hua Wu Bo Wang Gang Wang Hui Ren Xin-Gang Huang Zhi-Xiang*

178801 Design of back-contact interface of  $\text{Cu}(\text{In,Ga})\text{Se}_2$  solar cells by single-target magnetron sputtering  
*Tian Shan-Shan Gao Qian Gao Ze-Ran Xiong Yu-Chen Cong Ri-Dong Yu Wei*

178901 Gaussian mixture model based reconstruction of undirected networks  
*He Rui-Hui Zhang Hai-Feng Wang Huan Ma Chuang*

Color figures can be viewed in the online issue.



Online issue