



## CONTENTS

### Fields and Elementary Particles

- Heidari A., Ghorbani F., Ghorbani M.* A New Method for Investigating and Accurately Solving the One-Dimensional Quantum Ising Model in Constant and Variable Transverse Magnetic Fields . . . . . 411
- Gorkavenko V.M., Sitenko Yu.A., Stepanov O.B.* Casimir Force Induced on a Plane by an Impenetrable Flux Tube of Finite Radius . . . . . 424

### Optics, Lasers, and Quantum Electronics

- Glushko E.Ya.* The Intensity-Dependent Band Shift Effect in 1D Photonic Crystals for Optical Signal Processing. . . . . 432
- Romanenko V.I., Romanenko A.V., Udovitskaya Ye.G., Yatsenko L.P.* Momentum Diffusion of Atoms and Nanoparticles in an Optical Trap Formed by Sequences of Counter-Propagating Light Pulses . . . . . 438

### Plasmas and Gases

- Kovtun Yu.V., Skibenko E.I., Skibenko A.I., Yuferov V.B.* Rotation of Plasma Layers with Various Densities in Crossed  $\mathbf{E} \times \mathbf{B}$  Fields . . . . . 450

### Soft Matter

- Shvets V.T., Kozyskiy S.V.* Thermodynamics of Metallic Helium . . . . . 458

### Solid Matter

- Mirsagatov Sh.A., Zaveryukhin B.N., Ataboev O.K., Zaveryukhina N.N.* Cascade Injection Photodetector for the 500–650-nm Spectral Range on the Basis of Solid Solutions of  $A^2B^6$  Compounds . . . . . 465
- Kurchak A.I., Morozovska A.N., Strikha M.V.* Rival Mechanisms of Hysteresis in the Resistivity of Graphene Channel . . . . . 472

### Nanosystems

- Petrenko V.Yu., Slominskii Yu.L., Smirnova G.L., Mazarchuk I.A., Dimitriev O.P.* Influence of CdTe Nanoparticles on the Formation of J-Aggregates of Thiamonomethinecyanine Dyes . . . . . 480
- Bolesta I.M., Rovetskiy I.N., Partyka M.V., Karbovnyk I.D., Kulyk B.Ya.* Formation of Nanostructures on the VdW-Surface of CdI<sub>2</sub> Crystals . . . . . 490

### General Problems of Theoretical Physics

- Yushchenko O.V., Badalyan A.Yu.* Microscopic Description of Nonextensive Systems in the Framework of the Ising Model . . . . . 497