
Contents

Part I Electron transport in nanosystems

1 OPTICS OF FLAT CARBON – SPECTROSCOPIC ELLIPSOMETRY OF GRAPHENE FLAKES <i>V. G. Kravets, R. R. Nair, P. Blake, L. A. Ponomarenko, I. Riaz, R. Jalil, S. Anisimova, A. N. Grigorenko, K. S. Novoselov, and A. K. Geim</i>	3
2 RENORMALIZED PERTURBATION APPROACH TO ELECTRON TRANSPORT THROUGH QUANTUM DOT <i>A. C. Hewson, A. Oguri, and J. Bauer</i>	11
3 LOW TEMPERATURE TRANSPORT IN TUNNEL JUNCTION ARRAYS: CASCADE ENERGY RELAXATION <i>N. M. Chtchelkatchev, V. M. Vinokur, and T. I. Baturina</i>	25
4 ELECTRON TRANSPORT THROUGH MOLECULES IN THE KONDO REGIME: THE ROLE OF MOLECULAR VIBRATIONS <i>J. Mravlje and A. Ramšak</i>	45
5 WAVE DELOCALIZATION IN NONLINEAR DISORDERED MEDIA <i>S. Flach</i>	61
6 PHYSICAL LIMITS FOR SCALING OF ELECTRONIC DEVICES IN INTEGRATED CIRCUITS <i>W. Nawrocki</i>	79
7 SYNCHRONIZED ANDREEV TRANSMISSION IN CHAINS OF SNS JUNCTIONS <i>N. M. Chtchelkatchev, T. I. Baturina, A. Glatz, and V. M. Vinokur</i>	87

Part II Superconductivity

**8 JOSEPHSON EFFECT IN POINT CONTACTS
BETWEEN TWO-BAND SUPERCONDUCTORS**
A. Omelyanchouk and Y. Yerin 111

**9 SUPERCONDUCTING NANOWIRES: NEW TYPE OF
BCS-BEC CROSSOVER DRIVEN BY QUANTUM-SIZE
EFFECTS**
A. A. Shanenko, M. D. Croitoru, A. Vagov, and F. M. Peeters 119

**10 TRANSIENT RESPONSE OF A SUPERCONDUCTOR
IN AN APPLIED ELECTRIC FIELD**
M. N. Kunchur and G. F. Saracila 129

**11 INTERBAND NODAL-REGION PAIRING AND
THE ANTINODAL PSEUDOGAP IN HOLE DOPED
CUPRATES**
N. Kristoffel and P. Rubin 141

**12 ELECTRONIC STRUCTURE OF CUPRATE
SUPERCONDUCTORS IN THE PRESENCE OF
OUT-OF-PLANE IMPURITIES**
Z. Wang and S. Feng 153

**13 MULTIPLE QUASIPARTICLE PAIRS IN THE BCS
MODEL**
J. D. Fan and Y. M. Malozovsky 165

**14 CRITICAL AND NON-CRITICAL CHANNEL IN THE
DAMPING OF SUPERCONDUCTING FLUCTUATIONS
IN TWO-BAND SYSTEMS**
T. Örd, K. Rágo, and A. Vargunin 177

**15 PHASE SLIP PHENOMENA ONE AND TWO
DIMENSIONAL SUPERCONDUCTING RING**
M. Lu-Dac and V. V. Kabanov 187

**16 LOCUS OF THE SUPERCONDUCTIVITY IN THE
CUPRATES**
J.D. Dow and D.R. Harshman 197

**17 AN APPROXIMATING HAMILTONIAN METHOD IN
THE THEORY OF IMPERFECT BOSE GASES**
N. N. Bogolyubov, Jr. and D. P. Sankovich 203

Part III Spintronics

18 MAGNETIC NANOSTRUCTURES

K. Bennemann 215

**19 HEAVY FERMIONS AND SUPERCONDUCTIVITY
IN THE KONDO-LATTICE MODEL WITH PHONONS**

O. Bodensiek, R. Žitko, R. Peters, and T. Pruschke 233

**20 MAGNETIZATION CURVES FOR ANISOTROPIC
MAGNETIC IMPURITIES ADSORBED ON A NORMAL
METAL SUBSTRATE**

R. Žitko 247

**21 CONDUCTIVITY OF LAYERED SYSTEMS WITH
PLANAR AND BULK DISORDERS**

D.L. Maslov, V.I. Yudson, A.M. Somoza, and M. Ortuño 259

**22 SUPERPOSITION OF FLUX-QUBIT STATES AND
THE LAW OF ANGULAR MOMENTUM CONSERVATION**

A.V. Nikulov 269

**23 CREATION AND CONTROL OF ORDERED
NANOSTRUCTURES IN SPIN-GLASS MEDIA**

A.S. Gevorkyan, A.A. Gevorkyan, and K.B. Oganessian 281

Part IV Sensors

**24 BIOSCOPE: NEW SENSOR FOR REMOTE
EVALUATION OF THE PHYSIOLOGICAL STATE
OF BIOLOGICAL SYSTEMS**

*R. Sh. Sargsyan, A. S. Gevorkyan, G. G. Karamyan, V. T. Vardanyan,
A. M. Manukyan, and A. H. Nikogosyan* 299

**25 THERMOELECTRICITY IN DOUBLE-BARRIER
RESONANT TUNNELING STRUCTURES**

V.N. Ermakov, S.P. Kruchinin, A. Fujiwara, and S.J. O'Shea 311

26 LIGHT-EMITTING DIODES AND OPTICAL FIBERS

J.D. Dow 319

**27 GAS SENSING PROPERTIES OF THE NANOSIZED
 Pd AND Cu_xPd LAYERS**

V.G. Litouchenko, T.I. Gorbanyuk, Yu.G. Ptushinskii, and O.V. Kanach 325

Index 339

Physical Properties of Nanosystems

Bonca, J.; Kruchinin, S. (Eds.)

2011, X, 340 p., Hardcover

ISBN: 978-94-007-0043-7