

УСПЕХИ ФИЗИЧЕСКИХ НАУК**БИБЛИОГРАФИЯ**

**Годовой тематический указатель
к журналу "Успехи физических наук" — том 180, 2010 г.,
составленный в соответствии с международной классификацией
по физике и астрономии (PACS 2010)**

DOI: 10.3367/UFNr.0180.201012m.1369

00. GENERAL**01. Communication, education, history, and philosophy****01.10.–m Announcements, news, and organizational activities**

01.10.Fv Conferences, lectures, and institutes 313, 322, 328, 415, 420, 424, 434, 439, 509, 519, 527, 535, 542, 548, 554, 647, 661, 665, 759, 773, 777, 879, 880, 884, 890, 973, 982, 988, 997, 1000, 1347

01.30.–y Physics literature and publications

01.30.Bb Publications of lectures 859, 1348, 1350, 1357
01.30.Tt Bibliographies 111, 335, 447, 783, 895, 1007, 1239, 1363

01.50.–i Educational aids

01.50.My Demonstration experiments and apparatus 1109
01.50.Pa Laboratory experiments and apparatus 735

01.55.+b General physics 1109

01.60.+q Biographies, tributes, personal notes, and obituaries
107, 109, 333, 445, 671, 781, 879, 895, 1005, 1119, 1217

01.65.+g History of science 313, 322, 337, 393, 859, 871, 874, 879, 965, 970, 1217, 1231

01.70.+w Philosophy of science 337, 393, 859

01.75.+m Science and society 1337

01.90.+g Other topics of general interest 88, 208, 264, 448, 508, 604, 758, 878, 1008, 1118, 1238, 1330

02. Mathematical methods in physics

02.30.–f Function theory, analysis 322

02.40.–k Geometry, differential geometry, and topology

02.40.Ky Riemannian geometries 970

02.50.–r Probability theory, stochastic processes, and statistics 1305

02.70.–c Computational techniques; simulations 1081

03. Quantum mechanics, field theories, and special relativity

03.30.+p Special relativity 331, 965, 970

03.50.–z Classical field theories

03.50.De Classical electromagnetism, Maxwell equations 331, 623

03.65.–w Quantum mechanics 322

03.65.Ge Solutions of wave equations: bound states 673

03.65.Vf Phases: geometric; dynamic or topological 965

03.75.–b Matter waves

03.75.Hh Static properties of condensates; thermodynamical, statistical, and structural properties 879, 890

04. General relativity and gravitation

04.20.–q Classical general relativity 313, 874, 1135

04.30.–w Gravitational waves 1135

05. Statistical physics, thermodynamics, and nonlinear dynamical systems

05.30.–d Quantum statistical mechanics

05.30.Fk Fermion systems and electron gas 55

05.30.Jp Boson systems 89

05.45.–a Nonlinear dynamics and chaos 371, 1305

07. Instruments, apparatus, and components common to several branches of physics and astronomy

07.35.+k High-pressure apparatus; shock tubes; diamond anvil cells 605

07.55.–w Magnetic instruments and components

07.55.Ge Magnetometers for magnetic field measurements 509

07.77.–n Atomic, molecular, and charged-particle sources and detectors

07.77.Gx Atomic and molecular beam sources and detectors 185

07.79.–v Scanning probe microscopes and components

07.79.Fc Near-field scanning optical microscopes 83

07.87.+v Spaceborne and space research instruments, apparatus, and components (satellites, space vehicles, etc.) 509, 554, 647, 973, 988

10. THE PHYSICS OF ELEMENTARY PARTICLES AND FIELDS**11. General theory of fields and particles**

11.10.–z Field theory

11.10.Gh Renormalization 328

11.15.–q Gauge field theories 328, 871, 874

11.30.–j Symmetry and conservation laws 871

12. Specific theories and interaction models; particle systematics

- 12.10.-g **Unified field theories and models** 1081
 12.38.-t **Quantum chromodynamics** 113, 328
 12.38.Cy Summation of perturbation theory 1081
 12.38.Mh Quark-gluon plasma 1167
 12.38.Qk Experimental tests 225
12.39.-x Phenomenological quark models
 12.39.St Factorization 113

13. Specific reactions and phenomenology

- 13.66.-a Lepton-lepton interactions**
 13.66.Bc Hadron production in e^-e^+ interactions 225
13.87.-a Jets in large- Q^2 scattering 113

14. Properties of specific particles

- 14.40.-n Mesons**
 14.40.Pq Heavy quarkonia 225
 14.40.Rt Exotic mesons 225

20. NUCLEAR PHYSICS

21. Nuclear structure

- 21.10.-k Properties of nuclei; nuclear energy levels**
 21.10.Ft Charge distribution 839

24. Nuclear reactions: general

- 24.85.+p Quarks, gluons, and QCD in nuclear reactions** 1167

26. Nuclear astrophysics

- 26.30.-k Nucleosynthesis in novae, supernovae, and other explosive environments** 415
26.35.+c Big Bang nucleosynthesis 415
26.40.+r Cosmic ray nucleosynthesis 839
26.60.-c Nuclear matter aspects of neutron stars 1279

28. Nuclear engineering and nuclear power studies

- 28.20.-v Neutron physics** 673

29. Experimental methods and instrumentation for elementary-particle and nuclear physics

- 29.20.-c Accelerators** 647, 665
29.30.-h Spectrometers and spectroscopic techniques
 29.30.Hs Neutron spectroscopy 673

30. ATOMIC AND MOLECULAR PHYSICS

31. Electronic structure of atoms and molecules: theory

- 31.15.-p Calculations and mathematical techniques in atomic and molecular physics**
 31.15.X- Alternative approaches
 31.15.xh Group-theoretical methods 745

32. Atomic properties and interactions with photons

- 32.80.-t Photoionization and excitation** 185

33. Molecular properties and interactions with photons

- 33.15.-e Properties of molecules**
 33.15.Bh General molecular conformation and symmetry; stereochemistry 745
33.20.-t Molecular spectra 745

36. Exotic atoms and molecules; macromolecules; clusters

- 36.40.-c Atomic and molecular clusters** 185
 36.40.Ei Phase transitions in clusters 185

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

- 41. Electromagnetism; electron and ion optics**
41.20.-q Applied classical electromagnetism 83, 851
 41.20.Cv Electrostatics; Poisson and Laplace equations, boundary-value problems 1109
 41.20.Jb Electromagnetic wave propagation; radiowave propagation 249, 475, 509, 548, 623
41.60.-m Radiation by moving charges 851, 1135
 41.60.Bq Cherenkov radiation 1167

42. Optics

- 42.25.-p Wave optics**
 42.25.Bs Wave propagation, transmission and absorption 475
 42.25.Fx Diffraction and scattering 623, 851
42.30.-d Imaging and optical processing
 42.30.Wb Image reconstruction; tomography 475
42.55.-f Lasers
 42.55.Ye Raman lasers 639
42.62.-b Laser applications 647, 665
 42.62.Be Biological and medical applications 647, 661
 42.62.Fi Laser spectroscopy 185
42.65.-k Nonlinear optics
 42.65.Dr Stimulated Raman scattering; CARS 639
 42.65.Ky Frequency conversion; harmonic generation, including higher-order harmonic generation 639
42.70.-a Optical materials
 42.70.Mp Nonlinear optical crystals 639
 42.70.Qs Photonic bandgap materials 249
42.79.-e Optical elements, devices, and systems
 42.79.Gn Optical waveguides and couplers 1350
 42.79.Nv Optical frequency converters 639
42.81.-i Fiber optics 1350

43. Acoustics

- 43.20.-f General linear acoustics**
 43.20.Gp Reflection, refraction, diffraction, interference, and scattering of elastic and poroelastic waves 475
43.25.-x Nonlinear acoustics
 43.25.Nm Acoustic streaming 97

47. Fluid dynamics

- 47.10.-g General theory in fluid dynamics** 97
 47.10.A- Mathematical formulations
 47.10.ad Navier-Stokes equations 97
47.15.-x Laminar flows
 47.15.Uv Laminar jets 97

- 47.52. +j Chaos in fluid dynamics** 1305
47.60. -i Flow phenomena in quasi-one-dimensional systems
 47.60.Kz Flows and jets through nozzles 97
- 50. PHYSICS OF GASES, PLASMAS, AND ELECTRIC DISCHARGES**
- 51. Physics of gases**
- 51.50. +v Electrical properties (ionization, breakdown, electron and ion mobility, etc.)** 165
- 52. Physics of plasmas and electric discharges**
- 52.25. -b Plasma properties**
 52.25.Dg Plasma kinetic equations 139
- 52.27. -h Basic studies of specific kinds of plasmas**
 52.27.Lw Dusty or complex plasmas; plasma crystals 1055, 1095
- 52.30. -q Plasma dynamics and flow**
 52.30.Cv Magnetohydrodynamics (including electron magnetohydrodynamics) 973, 982, 997
- 52.35. -g Waves, oscillations, and instabilities in plasmas and intense beams** 735
 52.35.Mw Nonlinear phenomena: waves, wave propagation, and other interactions 55
 52.35.Py Macroinstabilities 973
 52.35.Ra Plasma turbulence 55
 52.35.Sb Solitons; BGK modes 55
 52.35.Vd Magnetic reconnection 973, 982, 988, 997
- 52.55. -s Magnetic confinement and equilibrium**
 52.55.Fa Tokamaks, spherical tokamaks 1055
- 52.65. -y Plasma simulation**
 52.65.Yy Molecular dynamics methods 1095
- 52.80. -s Electric discharges** 139, 165
 52.80.Mg Arcs; sparks; lightning; atmospheric electricity 218, 223
- 52.90. +z Other topics in physics of plasmas and electric discharges** 165
- 60. CONDENSED MATTER: STRUCTURAL, MECHANICAL, AND THERMAL PROPERTIES**
- 61. Structure of solids and liquids; crystallography**
- 61.05. -a Techniques for structure determination**
 61.05.F- Neutron diffraction and scattering
 61.05.fg Neutron scattering (including small-angle scattering) 1009
- 61.44. -n Semi-periodic solids**
 61.44.Fw Incommensurate crystals 561
- 61.46. -w Structure of nanoscale materials** 1009
- 61.48. -c Structure of fullerenes and related hollow and planar molecular structures**
 61.48.De Structure of carbon nanotubes, boron nanotubes, and other related systems 265
- 61.72. -y Defects and impurities in crystals; microstructure**
 61.72.J- Point defects and defect clusters 1095
- 62. Mechanical and acoustical properties of condensed matter**
- 62.25. -g Mechanical properties of nanoscale systems**
 62.25.Fg High-frequency properties, responses to resonant or transient (time-dependent) fields 1331
 62.25.Jk Mechanical modes of vibration 1331
- 62.50. -p High-pressure effects in solids and liquids** 605
- 63. Lattice dynamics**
- 63.20. -e Phonons in crystal lattices** 503
 63.20.Ry Anharmonic lattice modes 1331
- 64. Equations of state, phase equilibria, and phase transitions**
- 64.30. -t Equations of state of specific substances** 605
64.70. -p Specific phase transitions
 64.70.D- Solid-liquid transitions 1095
- 67. Quantum fluids and solids**
- 67.30. -n ^3He**
 67.30.E- Normal phase of ^3He
 67.30.er Magnetic properties, NMR 879, 884
67.85. -d Ultracold gases, trapped gases 89
- 68. Surfaces and interfaces; thin films and nanosystems (structure and nonelectronic properties)**
- 68.03. -g Gas-liquid and vacuum-liquid interfaces**
 68.03.Hj Liquid surface structure: measurements and simulations 1035
- 68.35. -p Solid surfaces and solid-solid interfaces: structure and energetics**
 68.35.B- Structure of clean surfaces (and surface reconstruction) 1035
 68.35.Fx Diffusion; interface formation 1035
- 68.37. -d Microscopy of surfaces, interfaces, and thin films** 1035, 1055
 68.37.Ef Scanning tunneling microscopy 289
 68.37.Vj Field emission and field-ion microscopy 83
- 70. CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES**
- 71. Electronic structure of bulk materials**
- 71.15. -m Methods of electronic structure calculations**
 71.15.Mb Density functional theory, local density approximation, gradient and other corrections 587
- 71.23. -k Electronic structure of disordered solids**
 71.23.Ft Quasicrystals 561
- 71.36. +c Polaritons (including photon-phonon and photon-magnon interactions)** 105, 106
- 71.38. -k Polaron and electron-phonon interactions** 449
- 72. Electronic transport in condensed matter**
- 72.15. -v Electronic conduction in metals and alloys**
 72.15.Gd Galvanomagnetic and other magnetotransport effects 503
 72.15.Jf Thermoelectric and thermomagnetic effects 821
- 72.20. -i Conductivity phenomena in semiconductors and insulators**
 72.20.Pa Thermoelectric and thermomagnetic effects 503, 821
- 73. Electronic structure and electrical properties of surfaces, interfaces, thin films, and low-dimensional structures**
- 73.20. -r Electron states at surfaces and interfaces** 249, 1035
73.23. -b Electronic transport in mesoscopic systems 1197
73.40. -c Electronic transport in interface structures

- 73.40.Gk Tunneling 1197
73.50.-h Electronic transport phenomena in thin films
 73.50.Lw Thermoelectric effects 821
73.63.-b Electronic transport in nanoscale materials and structures 265
 73.63.Fg Nanotubes 897

74. Superconductivity

- 74.20.-z Theories and models of superconducting state** 449, 1231
74.25.-q Properties of superconductors 1231
74.55.+v Tunneling phenomena: single particle tunneling and STM 1197
74.62.-c Transition temperature variations, phase diagrams 3
74.72.-h Cuprate superconductors 449
74.78.-w Superconducting films and low-dimensional structures 3
74.81.-g Inhomogeneous superconductors and superconducting systems, including electronic inhomogeneities 3

75. Magnetic properties and materials

- 75.20.-g Diamagnetism, paramagnetism, and superparamagnetism** 785
75.30.-m Intrinsic properties of magnetically ordered materials
 75.30.Ds Spin waves 879, 890
 75.30.Kz Magnetic phase boundaries 709
75.40.-s Critical-point effects, specific heats, short-range order 709, 879, 880
75.45.+j Macroscopic quantum phenomena in magnetic systems 879, 884, 890
75.47.-m Magnetotransport phenomena; materials for magnetotransport 759
75.50.-y Studies of specific magnetic materials 879
 75.50.Ee Antiferromagnetics 709, 879, 880
 75.50.Lk Spin glasses and other random magnets 561
 75.50.Mm Magnetic liquids 1009
75.60.-d Domain effects, magnetization curves, and hysteresis 785
 75.60.Ch Domain walls and domain structure 709
75.70.-i Magnetic properties of thin films, surfaces, and interfaces 709, 879, 880
75.76.+j Spin transport effects 759, 773, 777
75.80.+q Magnetomechanical effects, magnetostriction 785

76. Magnetic resonances and relaxations in condensed matter, Mössbauer effect

- 76.30.-v Electron paramagnetic resonance and relaxation** 759, 777
76.60.-k Nuclear magnetic resonance and relaxation 879, 884

77. Dielectrics, piezoelectrics, and ferroelectrics and their properties

- 77.55.-g Dielectric thin films** 209
 77.55.D- High-permittivity gate dielectric films 587
77.80.-e Ferroelectricity and antiferroelectricity 209
77.84.-s Dielectric, piezoelectric, ferroelectric, and antiferroelectric materials
 77.84.Cg PZT ceramics and other titanates 209

78. Optical properties, condensed-matter spectroscopy and other interactions of radiation and particles with condensed matter

- 78.56.-a Photoconduction and photovoltaic effects** 759, 773

79. Electron and ion emission by liquids and solids; impact phenomena

- 79.60.-i Photoemission and photoelectron spectra** 1035

80. INTERDISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

81. Materials science

- 81.05.-t Specific materials: fabrication, treatment, testing, and analysis**
 81.05.U- Carbon/carbon-based materials
 81.05.ue Graphene 265
81.07.-b Nanoscale materials and structures: fabrication and characterization 185
 81.07.Ta Quantum dots 289
81.15.-z Methods of deposition of films and coatings; film growth and epitaxy
 81.15.Hi Molecular, atomic, ion, and chemical beam epitaxy 289

82. Physical chemistry and chemical physics

- 82.20.-w Chemical kinetics and dynamics**
 82.20.Rp State to state energy transfer 1331
82.33.-z Reactions in various media 1357
 82.33.Xj Plasma reactions (including flowing afterglow and electric discharges) 139

85. Electronic and magnetic devices; microelectronics

- 85.30.-z Semiconductor devices** 587, 1348, 1357
85.35.-p Nanoelectronic devices
 85.35.Kt Nanotube devices 897
85.45.-w Vacuum microelectronics
 85.45.Db Field emitters and arrays, cold electron emitters 897
85.60.-q Optoelectronic devices
 85.60.Gz Photodetectors 1348, 1357
85.75.-d Magnetoelectronics; spintronics: devices exploiting spin polarized transport or integrated magnetic fields 759, 773, 777
85.80.-b Thermoemagnetic and other devices
 85.80.Fi Thermoelectric devices 821

87. Biological and medical physics

- 87.10.-e General theory and mathematical aspects** 931
87.15.-v Biomolecules: structure and physical properties 393, 931
87.16.-b Subcellular structure and processes 931
87.18.-h Biological complexity
 87.18.Sn Neural networks and synaptic communication 371
87.19.-j Properties of higher organisms
 87.19.L- Neuroscience 371
 87.19.Ij Neuronal network dynamics 371
87.23.-n Ecology and evolution 337
87.50.-a Effects of electromagnetic and acoustic fields on biological systems

- 87.50.W – Optical/infrared radiation effects 647, 661
87.56. – v Radiation therapy equipment 647, 665
87.63. – d Non-ionizing radiation equipment and techniques 647, 661
- 89. Other areas of applied and interdisciplinary physics**
- 89.60. – k Environmental studies**
 89.60.Gg Impact of natural and man-made disasters 843
89.65. – s Social and economic systems
 89.65.Cd Demographic studies 1337
- 90. GEOPHYSICS, ASTRONOMY, AND ASTROPHYSICS**
- 91. Solid Earth physics**
- 91.25. – r Geomagnetism and paleomagnetism; geoelectricity**
 91.25.G – Spatial variations in geomagnetism 509
91.30. – f Seismology 303
 91.30.Nw Tsunamis 843
91.45. – c Tectonophysics
 91.45.Hc Subduction and obduction zone processes 303
91.50. – r Marine geology and geophysics
 91.50.Wy Subduction zone processes 303
- 92. Hydrospheric and atmospheric geophysics**
- 92.05. – x General aspects of oceanography**
 92.05.Bc Analytical modeling and laboratory experiments 843
 92.05.Hj Physical and chemical properties of seawater (salinity, density, temperature) 843
92.10. – c Physical oceanography
 92.10.H – Ocean waves and oscillations
 92.10.hl Tsunamis 843
 92.10.Hm Ocean waves and oscillations 843
92.60. – e Properties and dynamics of the atmosphere; meteorology
 92.60.Pw Atmospheric electricity, lightning 218, 223, 509, 527
- 93. Geophysical observations, instrumentation, and techniques**
- 93.85. – q Instruments and techniques for geophysical research: Exploration geophysics**
 93.85.Jk Magnetic and electrical methods 509, 527
- 94. Physics of the ionosphere and magnetosphere**
- 94.05. – a Space plasma physics**
 94.05.Sd Space weather 509, 535
94.20. – y Physics of the ionosphere 509, 535, 542, 548, 554, 735
 94.20.Ss Electric fields; current system 509, 527
94.30. – d Physics of the magnetosphere 509, 519, 535
94.80. + g Instrumentation for space plasma physics, ionosphere, and magnetosphere 509, 548, 554
- 95. Fundamental astronomy and astrophysics; instrumentation, techniques, and astronomical observations**
- 95.30. – k Fundamental aspects of astrophysics**
 95.30.Qd Magnetohydrodynamics and plasmas 1241
95.35. + d Dark matter 415, 434, 439
95.36. + x Dark energy 415, 439
95.55. – n Astronomical and space-research instrumentation 389
 95.55.Ev Solar instruments 647
- 95.55.Ka X- and γ -ray telescopes and instrumentation 415, 420, 424
 95.55.Vj Neutrino, muon, pion, and other elementary particle detectors; cosmic ray detectors 839, 957
95.75. – z Observation and data reduction techniques; computer modeling and simulation 389
95.85. – e Astronomical observations
 95.85.Pw γ -ray 415, 420, 424
 95.85.Ry Neutrino, muon, pion, and other elementary particles; cosmic rays 509, 519, 957
 95.85.Sz Gravitational radiation, magnetic fields, and other observations 1121
- 96. Solar system; planetology**
- 96.30. – t Solar system objects** 509, 542
 96.30.Za Meteors, meteorites and tektites 839
96.50. – e Interplanetary physics
 96.50.Ci Solar wind plasma; sources of solar wind 542
 96.50.S – Cosmic rays 509, 519, 957, 973, 1000
 96.50.sb Composition, energy spectra and interactions 839
96.60. – j Solar physics 647, 973, 988
 96.60.Q – Solar activity 973, 982
 96.60.qe Flares 973, 997
- 97. Stars**
- 97.60. – s Late stages of stellar evolution (including black holes)**
 97.60.Bw Supernovae 973, 1000, 1121
 97.60.Gb Pulsars 1241, 1279
 97.60.Jd Neutron stars 1279
 97.60.Lf Black holes 1241
97.80. – d Binary and multiple stars 1121
- 98. Stellar systems; interstellar medium; galactic and extragalactic objects and systems; the Universe**
- 98.38. – j Interstellar medium (ISM) and nebulae in Milky Way**
 98.38.Dq Molecular clouds, H₂ clouds, dense clouds, and dark clouds 415
98.54. – h Quasars; active or peculiar galaxies, objects, and systems 723
98.62. – g Characteristics and properties of external galaxies and extragalactic objects
 98.62.En Electric and magnetic fields 723
 98.62.Hr Spiral arms and bars; galactic disks 415, 434
 98.62.Nx Jets and bursts; galactic winds and fountains 973, 1000, 1241
98.65. – r Galaxy groups, clusters, and superclusters; large scale structure of the Universe 415, 434
98.70. – f Unidentified sources of radiation outside the Solar System
 98.70.Rz γ -ray sources; γ -ray bursts 415, 420, 424
 98.70.Sa Cosmic rays 723
98.80. – k Cosmology 313
 98.80.Cq Particle-theory and field-theory models of the early Universe 415, 439
 98.80.Es Observational cosmology 389