

Physics–Uspekhi

Advances in Physical Sciences



June 2011

Volume 54, Number 6

Translation of the Russian journal

Успехи физических наук, Uspekhi Fizicheskikh Nauk

June 2011, Volume 181, No. 6



Turpion

IOP Publishing



PHYSICS- USPEKHI

ISSN 1063-7869 (Print)

ISSN 1468-4780 (Online)

CODEN: PHUSEY

Uspekhi Fizicheskikh Nauk

Editor

LV Keldysh *PN Lebedev Physical Institute,
Russian Academy of Sciences (RAS), Moscow*

First Deputy Editor

VA Rubakov *Institute for Nuclear Research, RAS, Moscow*

Associate Editors

LP Pitaevskii *PL Kapitza Institute for Physical Problems,
RAS, Moscow*

OV Rudenko *M V Lomonosov Moscow State University,
Moscow*

Managing Editor

MS Aksent'eva *Uspekhi Fizicheskikh Nauk, RAS, Moscow*

Editorial Board

EB Aleksandrov *All-Russian Research Center
'SI Vavilov State Optical Institute'*

VS Beskin *PN Lebedev Physical Institute, RAS, Moscow*

VB Braginskii *M V Lomonosov Moscow State University,
Moscow*

LP Grishchuk *PK Shternberg State Astronomical Institute,
Moscow State University, Moscow*

Yu V Gulyaev *Institute of Radioengineering and Electronics,
RAS, Moscow*

SP Denisov *Russian State Research Center
'Institute for High Energy Physics'*

IM Dremin *PN Lebedev Physical Institute, RAS, Moscow*

GR Ivanitskii *Institute of Theoretical and Experimental
Biology, RAS, Pushchino, Moscow Region*

AA Kaplyanskii *A F Ioffe Physico-Technical Institute,
RAS, St.-Petersburg*

GN Kulipanov *GI Budker Institute of Nuclear Physics,
RAS, Novosibirsk*

EG Maksimov *PN Lebedev Physical Institute, RAS, Moscow*

MB Menskii *PN Lebedev Physical Institute, RAS, Moscow*

GA Mesyats *PN Lebedev Physical Institute, RAS, Moscow*

LB Okun' *Russian State Research Center
'Institute of Theoretical and Experimental
Physics', Moscow*

VI Ritus *PN Lebedev Physical Institute, RAS, Moscow*

MV Sadvovskii *Institute of Electrophysics, Ural Branch of RAS,
Ekaterinburg*

BM Smirnov *Institute for High Temperatures, RAS, Moscow*

VE Fortov *Institute for High Energy Density,
RAS, Moscow*

Scientific and Staff Editors

MS Aksent'eva, EA Frimer, TP Romanova,

TS Vaisberg, EV Zakharova

Uspekhi Fizicheskikh Nauk (Успехи Физических Наук, www.ufn.ru) publishes reviews of the current state of the most topical problems in physics and in associated fields under the general headings: reviews of topical problems, physics of our days, instruments and methods of investigation, methodological notes, from the history of physics, conferences and symposia, personalia, physics news on the Internet, and bibliography. The journal was founded in 1918 and is published monthly.

© 2011 Uspekhi Fizicheskikh Nauk and PN Lebedev Physical Institute of the Russian Academy of Sciences

Physics – Uspekhi

Scientific Editors

MS Aksent'eva, A Radzig, A M Semikhatov

English Language Editor

K Franchuk, *M.A., Carleton University, Ottawa, Canada*

Desk Editors

AV Bobkov, NV Gribkova, OV Morgunova

Physics–Uspekhi (Advances in Physical Sciences) is the English edition of the Russian monthly journal *Uspekhi Fizicheskikh Nauk*. Translation into English started with Russian volume 66. From 1958 until 1992 the journal was published by American Institute of Physics under the title *Soviet Physics–Uspekhi* and in 1993 under its current title *Physics – Uspekhi*. Since 1994 *Physics – Uspekhi* has been published jointly by Uspekhi Fizicheskikh Nauk and Turpion Ltd. From the beginning of 1996 *Physics – Uspekhi* is being translated, typeset and edited in Moscow by Uspekhi Fizicheskikh Nauk (UFN). **From 2009 published by Uspekhi Fizicheskikh Nauk, Moscow**
Printed by Page Bros, Norwich, UK.

Institutional subscription information

 (volume 54, 2011, monthly)

For all countries, except the United States, Canada, Central and South America, the subscription rates are: Print + Online (2001 – 2011) £ 1580; Print + Online with historic archive (1958 – 2011) £ 1700; Online only (2001 – 2011) £ 1422; Online only with historic archive (1958 – 2011) £ 1542; Single issue £ 158. Delivery is by air-speeded mail from the UK.

Orders, back issues, change of address to: Physics–Uspekhi, Journals Subscription Fulfilment, Institute of Physics Publishing, Dirac House, Temple Back, Bristol BS1 6BE, United Kingdom

For the United States, Canada, Central and South America, the subscription rates are:

Print + Online (2001 – 2011) US \$2844; Print + Online with historic archive (1958 – 2011) US \$ 3060; Online only (2001 – 2011) US \$ 2560; Online only with historic archive (1958 – 2011) US \$ 2776; Single issue US \$ 284. Delivery is by transatlantic airfreight and onward mailing. **United States Postal Identification Statement** *Physics – Uspekhi*, volume 54, published monthly. Periodicals Postage Pending at Huntington Station, NY and at additional mailing offices. **POSTMASTER:** Send orders, address changes to *Physics – Uspekhi*, American Institute of Physics, Suite 1N01, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA.

Online services: Since 2008 electronic access to the journal content is hosted by IOP Publishing. The electronic version of the journal is available at <http://iopscience.org/phu>. All questions regarding online access should be sent to customer services at custserv@iop.org or custserv@turpion.ru

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photographic, recording, or otherwise, without the prior permission of Uspekhi Fizicheskikh Nauk.

Editorial Office

Leninskii prospekt 15, 119071 Moscow, Russian Federation
Tel. (7-499) 132 62 65, (7-499) 132 63 48, (7-499) 190 34 52
Tel. / Fax (7-499) 190 42 44. E-mail: ufn@ufn.ru

© 2011 Uspekhi Fizicheskikh Nauk and PN Lebedev Physical Institute of the Russian Academy of Sciences

Contents

| | | |
|-----|--|------------|
| 569 | Study of neutrino oscillations in long-baseline accelerator experiments Yu G Kudenko | 549 |
| 595 | Spin wave acoustics of antiferromagnetic structures as magnetoacoustic metamaterials Yu V Gulyaev, S V Tarasenko, V G Shavrov | 573 |
| 627 | Acoustic gradient barriers (exactly solvable models) A B Shvartsburg, N S Erokhin | 605 |
| 647 | Rigorous results of nonequilibrium statistical physics and their experimental verification L P Pitaevskii | 625 |
| 655 | In memory of V L Ginzburg (Scientific session of the Physical Sciences Division of the Russian Academy of Sciences, 27 October 2010): | 633 |
| 655 | Cosmology and the Large Hadron Collider V A Rubakov | 633 |
| 665 | V L Ginzburg and higher-spin fields M A Vasiliev | 641 |
| 672 | V L Ginzburg and the development of experimental work on high-temperature superconductivity at LPI: 'iron superconductors' V M Pudalov, O E Omel'yanovskii, E P Khlybov, A V Sadakov, Yu F El'tsev, K V Mitsen, O M Ivanenko, K S Pervakov, D R Gizatulin, A S Usol'tsev, A S Dormidontov, S Yu Gavrilkin, A Yu Tsvetkov, Ya G Ponomarev, S A Kuzmichev, M G Mikheev, S N Tchesnokov, T E Shanygina, S M Kazakov | 648 |
| 679 | Aleksandr Alekseevich Boyarchuk (on his 80th birthday) | 655 |
| 678 | Physics news on the Internet Yu N Eroshenko | 659 |

◇ ◇ ◇

In the next issue

*Multiparametric crystallography using the multiplicity scattering pattern
diversity of Bragg and diffuse waves (diffuse-dynamical multiparametric
diffractometry)*

V B Molodkin, A P Shpak, M V Kovalchuk, V F Machulin, V L Nosik

Processes involving clusters and small particles in buffer gas

B M Smirnov

On the types of quantum statistics for ensembles of a finite number of particles

E D Trifonov

Conferences and symposia

Letters to the editors

Personalia

Physics news on the Internet

