

Physics–Uspekhi

Advances in Physical Sciences



April 2013

Volume 56, Number 4

Translation of the Russian journal

Успехи физических наук, Uspekhi Fizicheskikh Nauk

April 2013, Volume 183, No. 4



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'*

PI Arseev *PN Lebedev Physical Institute, RAS, Moscow*

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

VB Braginskii *M V Lomonosov 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 Dreminev *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*

MB Mensky *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 Sadovskii *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, TB Larionova,
TP Romanova, 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.

© 2013 Uspekhi Fizicheskikh Nauk and P N 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 56, 2013, monthly)

For all countries, except the United States, Canada, Central and South America, the subscription rates are: Print + Online (1958 – 2013) £ 1717; Online only (1958 – 2013) £ 1545; Single issue £ 172. Delivery is by air-speeded mail from the UK.

Orders, back issues, change of address to: Physics–Uspekhi, Journals Subscription Fulfilment, IOP Publishing, Temple Circus, Temple Way, Bristol BS16HG, United Kingdom

For the United States, Canada, Central and South America, the subscription rates are:
Print + Online (1958 – 2013) US \$3091; Online only (1958 – 2013) US \$ 2782; Single issue US \$ 309. Delivery is by transatlantic airfreight and onward mailing. **United States Postal Identification Statement** *Physics – Uspekhi*, volume 56, published monthly. Periodicals Postage Paid at Continental Station, PA and additional mailing offices. POSTMASTER: Send orders, address changes to *Physics – Uspekhi*, IOP Publishing, PO Box 320, Congers, NY 10920-0320, USA.

Online services: Since 2008 electronic access to the journal content is hosted by IOP Publishing. All subscriptions to the journal include electronic access dating from the first English translation volume. 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: P N Lebedev Physical Institute, RAS, Leninskiĭ prospekt 53, 119991 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

© 2013 Uspekhi Fizicheskikh Nauk and P N Lebedev Physical Institute of the Russian Academy of Sciences

Contents

337	Quasispherical subsonic accretion in X-ray pulsars N I Shakura, K A Postnov, A Yu Kochetkova, L Hjalmarsdotter	321
365	Quasiadiabatic dynamics of charged particles in a space plasma L M Zelenyi, A I Neishtadt, A V Artemyev, D L Vainchtein, H V Malova	347
417	A rule for a joint of three boundary lines in phase diagrams V E Antonov	395
423	The 120th anniversary of the birth of Academician D V Skobeltsyn (Joint meeting of the scientific session of the Physical Sciences Division of the Russian Academy of Sciences and the Research Councils of the Lebedev Physical Institute of the Russian Academy of Sciences and of the Skobeltsyn Institute of Nuclear Physics of Lomonosov Moscow State University, 28 November 2012):	401
423	Academician D V Skobeltsyn and FIAN G A Mesyats	401
426	Academician D V Skobeltsyn and Moscow State University V A Sadovnichy	404
428	Academician D V Skobeltsyn as the founder of the MSU school of nuclear physics M I Panasyuk, E A Romanovskii	406
433	Synchrotron and undulator radiations and their applications in spectroscopy V V Mikhailin	412
439	The Petersburg period in the life and scientific work of D V Skobeltsyn I N Toptygin	417
445	On the prospects of bubble cavitation-induced fusion A A Goverdovskii, V S Imshennik, V P Smirnov	423
416	Physics news on the Internet Yu N Eroshenko	426

◇ ◇ ◇

In the next issue

Relativistic mirrors in plasmas — novel results and perspectives
S V Bulanov, T Zh Esirkepov, M Kando, A S Pirozhkov, N N Rosano

New life of complete integrability
L D Faddeev

*Rayleigh convective instability in the presence of phase transitions of water
vapor. The formation of large-scale eddies and cloud structures*
B Ya Shmerlin, M V Kalashnik

Conferences and symposia

Personalia

Bibliography

Physics news on the Internet

