

Физическое образование в вузах  
Т. 19, № 2, 2013

Содержание

- 3 Проверка базовых знаний студентов первого курса по физике и пути повышения эффективности обучения  
А.В. Черных
- 16 «Сходные» формулировки в общем курсе физики  
В.И. Николаев, Т.А. Бушина
- 26 Поперечные волны в тяжелой неупругой нити  
А.Д. Комаров
- 30 Суммарная сила Ампера и суммарный вращающий момент сил Ампера в однородном магнитном поле  
А.Н. Лузин
- 36 Лаборатория «Тень»  
Е.М. Тетелева, С.Р. Богданов, О.А. Попов
- 48 Экспериментальный учебный модуль с нетрадиционным возобновляемым автономным источником электрической энергии малой мощности потребления  
С.И. Официн
- 55 Пути формирования навыков решения задач курса общей физики у студентов технических вузов  
О.В. Мирзабекова, И.А. Агафонова
- 61 Научно-образовательный центр непрерывного физического образования (НОЦ НФО) на базе инновационного лабораторного и исследовательского оборудования  
А.Н. Долгов, С.О. Елютин, В.Н. Игнатов, Н.А. Клячин, А.Ю. Матрончик, Б.Н. Мещерин, С.С. Муравьев-Смирнов, М.В. Пентегова, В.Ф. Фёдоров, Е.В. Хангулян
- 74 О лабораторном практикуме по дисциплине «Концепции современного естествознания»  
Л.М. Бухман, Н.С. Бухман
- 83 Компьютерные расчетно-графические задания на основе лабораторных работ по физике  
Б.С. Рыбин, О.Б. Рыбина, А.Е. Сергеева
- 95 Методика построения амплитудных спектров в ядерном практикуме  
Д.Б. Чопорняк, А.В. Сомиков
- 105 Лабораторный практикум по метрологии в подготовке специалистов  
М.С. Молдабекова, И.В. Поярков, О.В. Федоренко, М.К. Асембаева
- 110 Внедрение научных методов исследований в специальный физический практикум — основа формирования профессиональных компетентностей студентов  
М.С. Молдабекова, Ю.И. Жаврин, И.В. Поярков, В. Мукамеденкызы
- 115 Мёссбауэровский спектрометр удаленного доступа  
С.К. Годовиков, Е.Б. Постников, В.В. Радченко, А.А. Силаев, А.А. Силаев
- 123 Дидактические особенности применения конструктивно-теоретического моделирования электрических полей на основе виртуального эксперимента  
А.П. Кудря, В.С. Кунаков, Ю.М. Наследников, А.Г. Стибаев
- 131 К методике изучения рентгеновских лучей в курсе физики высшей школы  
А.С. Красников, Л.И. Миркин, Д.Н. Лукичев
- 143 Дисциплина «Физика» в системе подготовки бакалавров математических и естественнонаучных профилей по направлению «Педагогическое образование»  
М.Ю. Королев, Л.В. Королева
- 148 Механический момент сил, возникающий при растяжении неоднородной швейной нити  
П.М. Меднис, О.А. Рязанцева
- 153 Технологическое применение нанотрубок. Нанотрубки: прошлое, настоящее, будущее  
Е.В. Ковалев
- 161 Уроки нанoeлектроники. 2. Модель упругого резистора и новая формулировка закона Ома в концепции «снизу—вверх»  
Ю.А. Кругляк, Н.Е. Кругляк
- 174 Аннотации

Том 19, номер 2, 2013

ISSN 1609 - 3143

# Физическое образование в вузах

том 19, номер 2 (2013)

Физическое образование в вузах

Издательский Дом Московского Физического общества

**Журнал «Физическое образование в вузах»**  
**URL: <http://pinhe.lebedev.ru>**

**Совет журнала**

**Крохин Олег Николаевич** – главный редактор, академик РАН, проф. МИФИ  
**Гладун Анатолий Деомидович** – заместитель главного редактора, проф. МФТИ  
**Калашников Николай Павлович** – заместитель главного редактора, проф., зав. каф. НИЯУ МИФИ  
**Николаев Владимир Иванович** – заместитель главного редактора, проф. МГУ им. М.В. Ломоносова, директор ЦППК при МГУ  
**Шапочкин Михаил Борисович** – заместитель главного редактора, проф., председатель Правления МФО  
**Колесников Юрий Леонидович** – проф., проректор НИУ СПбИТМО  
**Кудрявцев Николай Николаевич** – проф., ректор МФТИ (ГУ)  
**Стриханов Михаил Николаевич** – ректор НИЯУ МИФИ, проф.  
**Сысоев Николай Николаевич** – проф., декан физфака МГУ им. М.В. Ломоносова  
**Хохлов Дмитрий Ремович** – проф., зав. каф. МГУ им. М.В. Ломоносова, член-корреспондент РАН

**Редакционная коллегия**

**Гороховатский Юрий Андреевич** – проф., зав. каф. РГПУ им. А.И. Герцена  
**Завестовская Ирина Николаевна** – директор Института магистратуры НИЯУ МИФИ, декан Высшей школы физиков им. Н.Г. Басова НИЯУ МИФИ, ведущий научный сотрудник ФИАН  
**Лебедев Владимир Сергеевич** – проф., зав. каф. МФТИ (ГУ)  
**Лебедев Юрий Анатольевич** – проф., зам. Председателя Правления Объединённого физического общества РФ  
**Морозов Андрей Николаевич** – проф., зав. каф. НИУ МГТУ им. Н.Э. Баумана  
**Песоцкий Юрий Сергеевич** – проф., ген. дир. ассоциации «Марпут»  
**Пурышева Наталия Сергеевна** – проф., зав. каф. МПГУ  
**Салецкий Александр Михайлович** – проф., зав. каф. МГУ им. М.В. Ломоносова  
**Спирин Геннадий Георгиевич** – проф., МАИ  
**Стефанова Галина Павловна** – проф., первый проректор Астраханского госуниверситета  
**Рудой Юрий Григорьевич** – проф. РУДН  
**Чернышев Виктор Викторович** – проф., ВА им. Н.Е. Жуковского и Ю.А. Гагарина

**Ответственный секретарь**

**Калачев Николай Валентинович** – ст.н.с. ФИАН, доц. МГТУ им. Н.Э. Баумана и Финуниверситета

**Техническая редакция**

**Березин Павел Дмитриевич** – руководитель РИИС ФИАН.  
**Алексеева Татьяна Валерьевна** – инженер РИИС ФИАН.  
**Алексеева Татьяна Викторовна** – редактор РИИС ФИАН.

© Издательский дом МФО, 2013 г.

**Physics in Higher Education**

**V. 19, № 2, 2013**

**The contents**

<b>3</b>	<b>Checking the Basic Knowledge First Year Students in Physics and Ways to Improve the Effectiveness of Teaching</b> A.V. Chernykh
<b>16</b>	<b>«Similar» Formulations in General Physics Course</b> V.I. Nikolaev, T.A. Bushina
<b>26</b>	<b>The Transverse Wave in a Chain</b> A.D. Komarov
<b>30</b>	<b>The Net Ampere’s Force and the Net Ampere’s Torque in Uniform Magnetic Field</b> A.N. Luzin
<b>36</b>	<b>Laboratory «Shadow»</b> E.M. Teteleva, S.R. Bogdanov, O.A. Popov
<b>48</b>	<b>Pilot Training Module with Non-Traditional Renewable Independent Power Source of Low Power</b> S.I. Ofitsin
<b>55</b>	<b>Ways of Problem Solving Skills in the Course of General Physics for Students of Technical Universities</b> O.V. Mirzabekova, I.A. Agafonova
<b>61</b>	<b>Scientific-Educational Center of Continuous Physical Education on the Basis of Innovative Laboratory and Research Equipment</b> A.N. Dolgov, S.O. Elyutin, V.N. Ignatov, N.A. Klyachin, A.Yu. Matronchik, B.N. Mesherin, S.S. Muraviev-Smirnov, M.V. Pentegova, V.F. Fedorov, E.V. Khangulyan
<b>74</b>	<b>About Laboratory Workshop on «Concepts of Modern Natural Science»</b> L.M. Bukhman, N.S. Bukhman
<b>83</b>	<b>Computer Calculation and Graphical Tasks on the Basis of Laboratory Works in Physics</b> B.S. Rybin, O.B. Rybina, A.E. Sergeeva
<b>95</b>	<b>Technique of Creation of Amplitude Spectra in a Nuclear Practicum</b> D.B. Chopornyak, A.V. Somikov
<b>105</b>	<b>Laboratory Session of Metrology in the Improvement of Specialists’ Training</b> M.S. Moldabekova, I.V. Poyarkov, O.V. Fedorenko, M.K. Asembaeva
<b>110</b>	<b>Adoption of Scientific Methods of Researches into the Special Physical Session is a Foundation of Students’ Professional Capacity Formation</b> M.S. Moldabekova, Yu.I. Zhavrin, I.V. Poyarkov, V. Mukamedenkyzy
<b>115</b>	<b>Remotely Accessible Mossbauer Spectrometer</b> S.K. Godovikov, E.B. Postnikov, V.V. Radchenko, Aleksei A. Silaev, A.A. Silaev
<b>123</b>	<b>Application’s Didactic Features of Electric Field’s Theoretical Modeling on the Base of Virtual Experiment</b> A.P. Kudrya, V.S. Kunakov, Y.M. Naslednikov, A.G. Stibaev
<b>131</b>	<b>Procedure of Studying of a X-rays in a Course of Physics in the High School</b> A.S. Krasnikov, L.I. Mirkin, L.N. Lukichev
<b>143</b>	<b>Discipline of «Physics» in the System of Preparation of Bachelors Matematical and Natural-Scientific Profiles in the Direction of «Pedagogical Education»</b> M.Yu. Korolev, L.V. Koroleva
<b>148</b>	<b>Mechanical Moment of a Force, Arising due to an Expand of a Non-uniform Sewing Thread</b> P.M. Mednis, O.A. Ruazantseva
<b>153</b>	<b>The Most Important Technological Innovation for Last Ten Years. Nanotubes: Past, Present, Future</b> E.V. Kovalev
<b>161</b>	<b>Lessons of Nanoelectronics. 2. Elastic Resistor Model and New Ohm’s Law by Bottom – up Approach</b> Yu.A. Kruglyak, N.E. Kruglyak
<b>174</b>	<b>Abstracts</b>

## Checking the Basic Knowledge First Year Students in Physics and Ways to Improve the Effectiveness of Teaching

A.V. Chernykh

Moscow Pedagogical State University; e-mail: fu3rh@mail.ru

This paper describes the inspection of basic knowledge first year students in physics and the method of improving the effectiveness of training by the modular system.

*Keywords:* input control, effectiveness of the training, quality of knowledge, modular learning system.

## «Similar» Formulations in General Physics Course

V.I. Nikolaev, T.A. Bushina

M.V. Lomonosov Moscow State University, Faculty of Physics; e-mail: bushina@rambler.ru

The question on didactic resources of similar formulations in general physics course is discussed. Examples of such formulations from different parts of the course are given. On each of examples the analysis of similarities and distinctions of the phrases being compared are given. In this regard the richness of didactic resources of physics as subject matter is noted. The option of the educational task based on use of similar formulations is offered.

*Keywords:* general physics course, didactics, similar formulation.

## The Transverse Wave in a Chain

A.D. Komarov

E-mail: qomadkomad@gmail.com

The work shows that transverse wave is associates with the phenomenon of rolling road when linear displacement is inseparable from rotation.

*Keywords:* transverse wave, flexible heavy thread, chain.

## The Net Ampere's Force and the Net Ampere's Torque in Uniform Magnetic Field

A.N. Luzin

Siberian State Geodesic Academy; e-mail: tyushev@ngs.ru

Properties of the net Ampere's force and the net Amperes torque on a curvilinear wire in uniform magnetic fields, detected earlier, are under consideration.

*Keywords:* uniform magnetic field, curved wire, Ampere's force, vector product, distributivity, magnetic moment of a circuit, torque.

## Laboratory «Shadow»

E.M. Teteleva<sup>1</sup>, S.R. Bogdanov<sup>1</sup>, O.A. Popov<sup>2</sup>

<sup>1</sup> Karelia State Pedagogical Academy; e-mail: sergey.r.bogdanov@mail.ru

<sup>2</sup> Umea University, Sweden

Objects and phenomena of outdoors environment still seem poorly explored in Russian system of science education. Meanwhile this resource possesses the great motivation and content potential and may serve as the origin and framework for context sensitive open-ended teaching units. Usually simple but unrefined outdoors experiments are naturally followed by the whole cluster of research-based problems. One of such clusters, based on the study of shadow, is presented in the paper.

*Keywords:* outdoors physics, research-based education, shadow.

## **Pilot Training Module with Non-Traditional Renewable Independent Power Source of Low Power**

S.I. Ofitsin

Ryazan State Agrotechnical University named after P.A. Kostychev; e-mail:  
s.ofitsin@yandex.ru

Scientific and technical development of modern society towards the use of alternative renewable sources of independent power relates to the new educational paradigm for training of engineering training, including productive teaching methods. This paper describes a project to create an autonomous power supply module.

*Keywords:* the solar module, voltage regulator, LED fluorescent lamp, an experimental active learning module, educational competence.

## **The Problems of Forming the Methods of Solving the Problems of General Physics and Solution**

O.V. Mirzabekova, I.A. Agafonova

Astrakhan State Technical University, 414025, Astrakhan, Tatischeva st. 16\*;  
e-mail: omirzabekova@yandex.ru, GORKUNIA@yandex.ru

In the article there is considering the necessity of forming the methods of solving of general form for the students of technical universities. The authors remarked the summarized methods for solving physical problems. It was determined, that didactic methods for teaching of physics had be based on multimedia technologies. And there was created and proved the theoretical base for them.

*Keywords:* learning physics students of technical colleges; methods for solving physical problems, multimedia teaching physics.

## **Scientific-Educational Center of Continuous Physical Education on the Basis of Innovative Laboratory and Research Equipment**

A.N. Dolgov, S.O. Elyutin, V.N. Ignatov, N.A. Klyachin,  
A.Yu. Matronchik, B.N. Mesherin, S.S. Muraviev-Smirnov,  
M.V. Pentegova, V.F. Fedorov, E.V. Khangulyan

National Research Nuclear University MEPhI, Moscow; e-mail:  
alnikdolgov@mail.ru, soelyutin@mephi.ru, vignatv@rambler.ru,  
naklyachin@mephi.ru, matronchik2004@mail.ru, meshcherin@gmail.ru,  
Smuraviev@list.ru, penteg@yandex.ru, fvf48@yandex.ru, EVKhangulyan@mephi.ru

Discusses the reasons for and ways of creation of the scientific-educational center the course of general physics in NRNU MEPhI. Provides a description of the laboratory works, executed in the modern, fairly complex of educational-scientific equipment with the use of computers, which allows the schoolchildren and students to apply the advanced technologies of conducting and processing the results of experiments in the course of general physics. Considered innovative laboratory work with the distance means of execution.

*Keywords:* laboratory work, equipment, measurement, x-ray workshop, computer medical systems.

## About Laboratory Workshop on «Concepts of Modern Natural Science»

L.M. Bukhman, N.S. Bukhman

Samara State University of Architecture and Civil Engineering;  
443001, Samara, e-mail: nik3141rambler@rambler.ru

The basic principles of a laboratory workshop on «Concepts of modern natural science» are under consideration and one possible implementation of this workshop is described also.

*Keywords:* teaching physics, teaching natural sciences, laboratory workshop.

## Computer Calculation and Graphical Tasks on the Basis of Laboratory Works in Physics

B.S. Rybin, O.B. Rybina, A.E. Sergeeva

Odessa National Academy of Food Technologies; e-mail: borisrybin@ukr.net, aeserg@ukr.net

Six computer calculation and graphical tasks on the basis of laboratory works from different sections of physics are briefly described. Carrying out of all the tasks involves the use of a computer. The computer is used as a powerful calculator on the one hand. On the other hand, it is used as a simulator. These tasks illustrate how the range of problems used in the educational process in physics can be expanded.

*Keywords:* physics, computer and graphical tasks, laboratory works, simulation.

## Technique of Creation of Amplitude Spectra in a Nuclear Practicum

D.B. Chopornyak, A.V. Somikov

Moscow 119991, Lenin mountains, Home 1, Scientific Research Institute of Nuclear Physics of the Moscow State University; e-mail: dbchop@mail.ru

It is told in article about a technique of construction of the peak spectra, used in nuclear practical work of Skobeltsyn Institute of Nuclear Physics of Lomonosov Moscow State University. The technology of struggle with noise signals appearing at work of the equipment is discussed and the review of used ways is given. It is shown, that analog-digital converters give out noise which cannot be considered as only casual. The formulas deduced by us for use in digital filters, giving an opportunity to increase quality of processing of the signals accept from detectors of nuclear radiations. The information on ample opportunities of the created equipment and the software for creation 3D specters is given. The reference [4] is example of one of our educational films placed on the Internet.

*Keywords:* struggle against noise; a nuclear practical work; scheme of coincidence; interactive films.

## **Laboratory Session of Metrology in the Improvement of Specialists' Training**

M.S. Moldabekova, I.V. Poyarkov, O.V. Fedorenko, M.K. Asembaeva

Abay Kazakh National Pedagogical University, Kazakhstan, 050010, Almaty,  
Dostyk avenue, 13

Al-Farabi Kazakh National University, 050038, Kazakhstan, Almaty, al-Farabi  
avenue, 71; e-mail: mairamold@mail.ru, p-igor@inbox.ru

Problems of the professional skills acquisition of metrologists when making the laboratory works and preparing the investigation report with the use of modern means and measuring methods are considered.

*Keywords:* laboratory works, measurement assurance, inaccuracy of measurements, devices and conversion device.

## **Adoption of Scientific Methods of Researches into the Special Physical Session is a Foundation of Students' Professional Capacity Formation**

M.S. Moldabekova, Yu.I. Zhavrin, I.V. Poyarkov, V. Mukamedenkyzy

Abay Kazakh National Pedagogical University, Kazakhstan, 050010, Almaty,  
Dostyk avenue, 13

Al-Farabi Kazakh National University, 050038, Kazakhstan, Almaty, al-Farabi  
avenue, 71; e-mail: mairamold@mail.ru, p-igor@inbox.ru

Problems of the students' professional competence development when making the laboratory works on the research facilities studying the modern thermalphysic processes and phenomena are considered.

*Keywords:* scientific research, special disciplines, professional capacity, experimental methods of thermalphysic laboratory session.

## **Remotely Accessible Mossbauer Spectrometer**

S.K. Godovikov, E.B. Postnikov, V.V. Radchenko, Aleksei A. Silaev, A.A. Silaev

MSU SINP, 1(2), Leninskie gory, GSP-1, Moscow 119991; e-mail: postn@dec1.sinp.msu.ru

The subject of the paper is a remote access laboratory of Mossbauer spectroscopy, which has recently been developed by the authors. The device description is given together with the spectroscopy basics. Remote access principles are also under consideration. In conclusion there is a brief outline of the future projects, and the web-link to the remote lab official site, which is included into the remote labs register of Russian nanotechnology Internet-portal ROSNANO.

*Keywords:* Mossbauer effect, remote laboratory, distant learning, Mossbauer spectroscopy, gamma resonance, magnetic resonance, gamma rays, spectrum.

## **Application's Didactic Features of Electric field's Theoretical Modeling on the Base of Virtual Experiment**

A.P. Kudrya, V.S. Kunakov, Y.M. Naslednikov, A.G. Stibaev

344000, Rostov-on-Don, Gagarin square 1, Don State Technical University, Physics

Dep. e-mail: [hexman@live.ru](mailto:hexman@live.ru) ,

Didactic features structurally - theoretical modeling of electric fields are analyzed in article on the basis of virtual experiment in physics. Concrete examples of use of the developed computer product in lecture, practical, laboratory researches and in tasks of research character are resulted.

*Keywords:* didactics section «The Electricity and magnetism»; computer modeling; virtual experiment; structurally - theoretical modeling of electric fields.

## **Procedure of Studying of a X-rays in a Course of Physics in the High School**

A.S. Krasnikov, L.I. Mirkin\*, L.N. Lukichev

Ryazan' State University named by S. Esenin; e-mail: [a.krasnikov@rsu.edu.ru](mailto:a.krasnikov@rsu.edu.ru)

\* Institute of mechanics, M.V. Lomonosov Moscow State University;

e-mail: [mirkin@imec.msu.ru](mailto:mirkin@imec.msu.ru)

In this work application of physical computer experiment when studying x-ray ranges is considered. In it the short theory of a question is submitted, and also the experimental data obtained on the device simulator are given, and their comparison with known experimental data is given.

*Keywords:* application of physical computer experiment, studying x-ray ranges, the device simulator.

## **Discipline of «Physics» in the System of Preparation of Bachelors Mathematical and Natural-Scientific Profiles in the Direction of «Pedagogical Education»**

M.Yu. Korolev, L.V. Koroleva

Moscow Pedagogical State University (MPSU),

Department of physics for natural faculties; e-mail: [koroleva\\_lv@list.ru](mailto:koroleva_lv@list.ru)

The role and the place of discipline of «Physics» are discussed by preparation of bachelors of mathematical and natural-scientific profiles in the direction of «Pedagogical education». Explicitly the problem of the continuous falling of level of physical education is considered that significantly undermines fundamental preparation of students of pedagogical higher education institutions, formation of professional and common cultural competences.

*Keywords:* pedagogical education, Federal state educational standards of higher professional education, training of students, bachelors, mathematical and natural-scientific profiles, curriculums, discipline of «Physics».



## Mechanical Moment of a Force, Arising due to an Expand of a Non-uniform Sewing Thread

P.M. Mednis, O.A. Ruazantseva

<sup>1</sup> Novosibirsk State Pedagogical University; e-mail: pmednis@inbox.ru,  
ruazanceva.olga@mail.ru

The rotary oscillations of a load suspended to a non-uniform hanger like sewing thread are considered. It is shown that dynamics of an initial movement, i.e. rotation of the load at the time that is less than the period of oscillation in course of several angle turns may be used for the comparative measurement of moment of inertia of the load and estimation of an initial moment of force that is arising due to longitudinal loading of the tread.

*Keywords:* mechanical moment of force, moment of inertia, rotary oscillation, non-uniform sewing thread.

## The Most Important Technological Innovation for Last Ten Years. Nanotubes: Past, Present, Future

E.V. Kovalev

Kemerovo State University, Physics Department; e-mail: evgeny\_1991@mail.ru

A technological innovation is the process through which new technologies are developed and brought into widespread use, products based there is an opinion in this article about the most important technological innovation for last ten years. Also basic properties of such a materials as nanotubes are described here. More than that the most important and the most interesting applications of nanotubes of the day are presented and there are probable applications in the future.

*Keywords:* technological innovation, nanotubes, fullerene, composites, applications of nanotubes.

## Lessons of Nanoelectronics. 2. Elastic Resistor Model and New Ohm's Law by Bottom – up Approach

Yu.A. Kruglyak<sup>1</sup>, N.E. Kruglyak<sup>2</sup>

<sup>1</sup> Odessa State Environmental University, Odessa, Ukraine;  
e-mail: quantumnet@yandex.ua

<sup>2</sup> Odessa National University. I.i. Mechnikov University, Odessa, Ukraine;  
e-mail: krtstudio@yandex.ua

Elastic resistor model, ballistic and diffusion transport and new formulation of the Ohm's law are discussed in the frame of the bottom – up approach of modern nanoelectronics.

*Keywords:* nanoelectronics, molecular electronics, bottom – up, electric current, elastic resistor, conductivity modes, Ohm's law.

Подписано в печать 20 июня 2013 г.

Формат 70x100/16. Заказ № 62. Тираж 400 экз. П.л. 11,25.

Отпечатано в типографии ООО «Издательский Дом МФО».  
Москва, В-333, Ленинский проспект, 53. Тел.: (499) 132 66 51

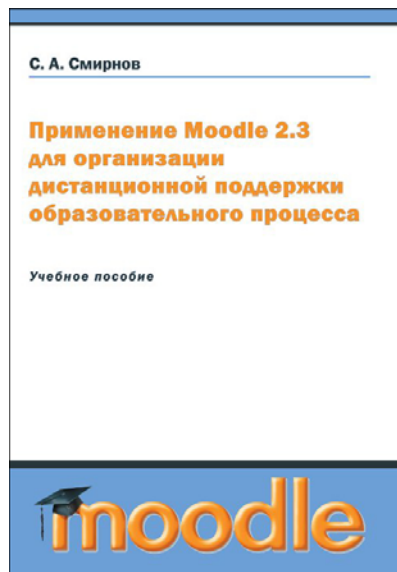


Уважаемые читатели журнала!

*Вашему вниманию предлагается учебное пособие*  
**«Применение Moodle 2.3 для организации  
 дистанционной поддержки образовательного процесса»**

Пособие предназначено для преподавателей вузов, школьных учителей, студентов педагогических вузов и всех интересующихся методикой организации дистанционной поддержки образовательного процесса с применением системы управления обучением Moodle. Книга ориентирована на выполнение практической работы, содержит большое количество иллюстраций. Представленный материал включает большое количество примеров и аналогий, раскрывает в равной мере как общие, так и частные принципы и технологии работы преподавателя в системе управления обучением Moodle 2 в рамках организации дистанционной поддержки образовательного процесса.

Автор пособия – **Сергей Александрович Смирнов**, кандидат педагогических наук, докторант кафедры теории и методики обучения физике МПГУ, начальник отдела информационного обеспечения образовательных процессов управления информатизации МПГУ, администратор Портала дистанционной поддержки образовательного процесса МПГУ, преподаватель курсов повышения квалификации по авторской программе «Дистанционная поддержка образовательного процесса (с применением Moodle 2)».



**<http://moodlebook.ru>** – подробная информация, содержание,  
 ознакомительная версия, приобретение