

Topic 4 Electromagnetic Effects About The Teacher

Apoptosis is an essential biochemical process in cell turnover, development, and chemical-induced cell death. Current knowledge and ongoing research of apoptosis highlight our understanding in designing the therapeutic approaches for several diseases. This book covers four main sections: "Apoptosis and Necrosis," "Apoptosis Inducers," "Proteasome and Signaling Pathways in Apoptosis," and "Radiation-Based Apoptosis." The first section implicitly describes the differences between apoptosis and necrosis processes. The following section elaborates the small molecule-induced apoptosis. Then, the third section deals with proteasome and signaling pathways and finally, resistance to chemotherapy and electromagnetic radiation is covered in the last section. Overall, the book deals with pathways for manipulating apoptosis and provides a unique perspective to the scientists.

The major emphasis of this book is on physical mechanisms and sources of the ULF/ELF natural electromagnetic fields noises. In the course of this text, some of these mechanisms of magnetospheric origin will be treated in detail and others in a more sketchy fashion, while the global electromagnetic resonances excited by lightning activity and other sources are the priority. The interested reader is referred to the books cited in the text for details about the ULF/ELF fields of magnetospheric origin. Much emphasis is put on studies of electromagnetic phenomena caused by rock deformation/fracture including the ULF/ELF effects possibly associated with tectonic activity, earthquakes and other natural disasters. One of the challenges of this research is to fully understand electromagnetic effects and physical processes in the rocks deep in the Earth's crust.

Through a biophysical approach, *Electromagnetic Fields in Biology and Medicine* provides state-of-the-art knowledge on both the biological and therapeutic effects of Electromagnetic Fields (EMFs). The reader is guided through explanations of general problems related to the benefits and hazards of EMFs, step-by-step engineering processes, and basic results obtained from laboratory and clinical trials. Basic biological mechanisms reviewed by several authors lead to an understanding of the effects of EMFs on microcirculation as well as on immune and anti-inflammatory responses. Based upon investigational mechanisms for achieving potential health benefits, various EMF medical applications used around the world are presented. These include the frequent use of EMFs in wound healing and cartilage/bone repair as well as use of EMFs in pain control and inhibition of cancer growth. Final chapters cover the potential of using the novel biophysical methods of electroporation and nanoelectroporation in electrochemotherapy, gene therapy, and nonthermal ablation. Also covered is the treatment of tendon injuries in animals and humans. This book is an invaluable tool for scientists, clinicians, and medical and engineering students.

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Steve and Susan Zumdahl's texts focus on helping students build critical thinking skills through the process of becoming independent problem-solvers. They help students learn to think like a chemists so they can apply the problem solving process to all aspects of their lives. In CHEMISTRY: AN ATOMS FIRST APPROACH, the Zumdahls use a meaningful approach that begins with the atom and proceeds through the concept of molecules, structure, and bonding, to more complex materials and their properties. Because this approach differs from what most students have experienced in high school courses, it encourages them to focus on conceptual learning early in the course, rather than relying on memorization and a plug and chug method of problem solving that even the best students can fall back on when confronted with familiar material. The atoms first organization provides an opportunity for students to use the tools of critical thinkers: to ask questions, to apply rules and models and to evaluate outcomes. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Tremendous theoretical and experimental developments have recently been made in the sphere of the quantum Hall effect. Among them a field-theoretical approach has presented a fascinating unified physical picture. A most significant feature of the quantum Hall system is that exotic phenomena associated with statistics transmutation are realized. For instance, an electron may undergo Bose condensation by making a charge-flux composite, and fractionally charged excitations (anyons) emerge as quasiparticles. A pedagogical and self-contained discussion on monolayer and bilayer quantum Hall systems is given in a field-theoretical framework, together with an introduction to quantum field theory, anyon physics and Chern-Simons gauge theory. Only knowledge of quantum mechanics is assumed. This invaluable book will be of great interest to students and researchers in condensed-matter, theoretical, particle and mathematical physics.

Reporting new results, this book covers the subject of biological effects of EMF in its entirety. Experimental verification of the theoretical results is given when at all possible, and the book is expected to open new areas of research, providing material for university course creation.

The first edition of this book has been recognized as the standard reference on biological effects of electric and magnetic fields from DC to microwaves. But much has changed in this science since the book's original publication in 1986. With contributions from eighteen leading researchers, this latest edition includes authoritative discussions of many new developments and will quickly become the new, must-have resource handbook. Dielectric properties of biological tissue are thoroughly examined, followed by chapters on physical mechanisms and biological effects of static and extremely low frequency magnetic fields. New chapters on topics that were treated very briefly in the first edition now receive extensive treatment. These topics include electric and magnetic fields for bone and soft tissue repair, electroporation, and

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epidemiology of ELF health effects. The chapter on computer methods for predicting field intensity has been substantially revised to describe new numerical techniques developed within the last few years and includes calculations of power absorbed in the human head from cellular telephones. The chapter discussing experimental results on RF interaction with living matter now contains information on effects of very high power, very short duration pulses. A new appendix on safety standards is based on the latest publications of governmental, as well as quasi-governmental organizations (such as the U.S. Council on Radiation Protection) in the United States, Europe, and Australia. With all its revisions, this updated version of the CRC Handbook of Biological Effects of Electromagnetic Fields provides the most comprehensive overview available of this rapidly changing science.

Everyone, whether they like it or not, is exposed to electromagnetic fields, most of the time, at very low levels. In this case, they are inconsequential, but they can cause adverse health effects when they become intense enough. This topic is complex and sensitive. Covering frequencies from 0 Hz to 300 GHz, Human Exposure to Electromagnetic Fields provides an overview of this vast topic. After a reminder of the concepts of electromagnetic fields, the author presents some examples of sources of radiation in daily life and in the industrial or medical sectors. The biophysical and biological effects of these fields on the human body are detailed and the exposure limits are recalled. The exposure assessment and the implementation of the appropriate regulation within companies are also covered. Technically and practically, this book is aimed at people with a scientific background, risk prevention actors, health physicians, especially occupational doctors, and equipment designers.

This book - a sequel of previous publications 'Flows and Chemical Reactions', 'Chemical Reactions Flows in Homogeneous Mixtures' and 'Chemical Reactions and Flows in Heterogeneous Mixtures' - is devoted to flows with chemical reactions in the electromagnetic field. The first part, entitled basic equations, consists of four chapters. The first chapter provides an overview of the equations of electromagnetism in Minkowski spacetime. This presentation is extended to balance equations, first in homogeneous media unpolarized in the second chapter and homogeneous fluid medium polarized in the third chapter. Chapter four is devoted to heterogeneous media in the presence of electromagnetic field. Balance equations at interfaces therein. The second part of this volume is entitled applications. It also includes four chapters. Chapter five provides a study of the action of fields on fire. Chapter six deals with a typical application for the Peltier effect, chapter seven is devoted to metal-plasma interaction, especially in the Langmuir probe and finally Chapter Eight deals with the propulsion Hall effect. Are given in appendix supplements the laws of balance with electromagnetic field and described the methodology for establishing one-dimensional equations for flow comprising active walls as is the case in some Hall effect thrusters.

Primary Science: Promoting positive attitudes to conceptual learning is a full colour, core textbook to support, inform and inspire anyone training to teach Science at primary level. This book is a new kind of text linking subject knowledge and pedagogy in one package, rather than treating them as separate entities. The text aims to encourage trainee teachers to teach scientific concepts in

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contexts which will inspire the children to look at the world in new and intriguing ways, rather than presenting it as a list of facts and definitions. Encouraging critical reflection and offering practical support, this book will help trainee teachers to overcome negative attitudes to Science. The two part structure of the book first presents insights into the nature of science and science education, exploring issues such as the value and purpose of teaching Science in the primary school and the value of scientific enquiry. It then moves on to cover subject knowledge, relating it to pedagogy.

Appeals to a Wide Audience Fueled by more than 30 years of intensive research and debate on the impact of electromagnetic fields (EMF) on everyday life—starting with residential exposure to magnetic fields and the development of childhood cancer in the 70s and continuing with risk of exposure via wireless communications in present day—Epidemiology of Electromagnetic Fields addresses ongoing public and scientific controversy surrounding the possible effects of electromagnetic fields (EMF) to human health, and provides an in-depth introduction into the methodology of environmental epidemiology that is appropriate for all levels, from student to practicing engineer. Exposure to EMF Focusing primarily on EMF examples, the author presents the general principles and methodological concepts in environmental epidemiology. Topics of importance in the first part of the book include epidemiological study designs, exposure assessment methods and implications for the study results, as well as selection bias, confounding, and other biases including reverse causality and ecological fallacy. The second part of the book covers environmental epidemiological methods in detail and outlines key examples such as childhood leukemia and exposure to extremely low-frequency magnetic fields, as well as examples that look at brain tumors and mobile phone use. The book also offers a detailed discussion on the range of EMF sources and exposures. In addition, it highlights the sophisticated assessment methods required to address exposure situations, and provides a historical perspective. The third part of the book examines how EMF exposure from the use of wireless communication techniques and other challenges affect risk assessment today and also details future developments. Explores environmental epidemiological methods in detail, while critically discussing epidemiological findings Provides a state-of-the-art overview of the scientific evidence of the health effects of EMF Considers how novelty, the steep increase of radiofrequency (RF) EMF exposure from wireless communications, and other challenges affect risk assessment today Epidemiology of Electromagnetic Fields provides a thorough overview of the subject, and evaluates the scientific evidence surrounding the possible health effects of EMFs.

The possible health effects of electro-magnetic (EMF) from high-voltage electric power lines have been discussed since the 1970s. The concern was triggered by epidemiological studies in the United States and Europe that suggested a slightly increased incidence of leukaemia's and brain tumours occurred among those living and working near high-voltage power lines. Although studies can indicate an associate between factor and effect, the studies themselves cannot confirm a cause-effect relationship. Whether EMF is producing these ill effects must be confirmed by experimental studies.

This book explores the design of ultra wideband (UWB) technology for wireless body-area networks (WBAN). The authors describe a novel implementation of WBAN sensor nodes that use UWB for data transmission and narrow band for data reception,

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enabling low power sensor nodes, with high data rate capability. The discussion also includes power efficient, medium access control (MAC) protocol design for UWB based WBAN applications and the authors present a MAC protocol in which a guaranteed delivery mechanism is utilized to transfer data with high priority. Readers will also benefit from this book's feasibility analysis of the UWB technology for human implant applications through the study of electromagnetic and thermal power absorption of human tissue that is exposed to UWB signals.

This quarterly digest presents current awareness information on the biological effects of nonionizing electromagnetic radiation (microwave and radio frequency) in the range of 0 Hz to 100 GHz. The effects of magnetic and electric fields (static and alternating) are also covered. Each issue contains abstracts of English and foreign current literature, summaries of ongoing research investigations, news items, and a directory of meetings and conferences.

33 Years NEET Chapterwise & Topicwise Solved Papers PHYSICS (2020 - 1988) 15th Edition Disha

Publications Electrostatic and Electromagnetic Effects of Overhead Transmission Lines Workbook for Radiologic Science for Technologists - E-Book Physics, Biology, and Protection Elsevier Health Sciences

This is the first book that comprehensively addresses the issues relating to the effects of radio frequency (RF) signals and the environment of electrical and electronic systems. It covers testing methods as well as methods to analyze radio frequency. The generation of high-powered electromagnetic (HPEM) environments, including moderate band damped sinusoidal radiators and hyperband radiating systems is explored. HPEM effects on component, circuit, sub-system electronics, as well as system level drawing are discussed. The effects of HPEM on experimental techniques and the standards which can be used to control tests are described. The validity of analytical techniques and computational modeling in a HPEM effects context is also discussed. Insight on HPEM effects experimental techniques and the standards which can be used to control tests is provided, and the validity of analytical techniques and computational modeling in a HPEM effects context is discussed. This book dispels myths, clarifies good experimental practice and ultimately draws conclusions on the HPEM interaction with electronics. Readers will learn to consider the importance of HPEM phenomena as a threat to modern electronic based technologies which underpin society and to therefore be pre-emptive in the consideration of HPEM resilience.

This E-Book focuses on conducted and radiated emission noise generated by different power converters such as Switch Mode power Supplies and DC-AC Inverters. EMI filter design and different approaches to predict common mode and differential mode noise are

This "know-how" book gives readers a concise understanding of the fundamentals of EMC, from basic mathematical and physical concepts through present, computer-age methods used in analysis, design, and tests. With contributions from

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leading experts in their fields, the text provides a comprehensive overview. Fortified with information on how to solve potential electromagnetic interference (EMI) problems that may arise in electronic design, practitioners will be better able to grasp the latest techniques, trends, and applications of this increasingly important engineering discipline. Handbook of Electromagnetic Compatibility contains extensive treatment of EMC applications to radio and wireless communications, fiber optics communications, and plasma effects. Coverage of EMC-related issues includes lightning, electromagnetic pulse, biological effects, and electrostatic discharge. Practical examples are used to illustrate the material, and all information is presented in an accessible and organized format. The text is intended primarily for those practicing engineers who need a good foundation in EMC, but it will also interest faculty and students, since a good portion of the material covered can find use in the classroom or as a springboard for further research. The chapters are written by experts in the field. Details the fundamental principles, then moves to more advanced topics. Covers computational electromagnetics applied to EMC problems. Presents an extensive treatment of EMC applications to: Radio and wireless communications, Fiber optic communications, Plasma effects, Wired circuits, Microchips, Includes practical examples, Fiber optic, Communications, Plasma effects, Wired circuits, Microchips, Includes practical examples. Electromagnetic Instabilities in an Inhomogeneous Plasma presents a comprehensive survey of the theory of electromagnetic instabilities in a magnetized inhomogeneous plasma, mainly in the classical approximation of straight and parallel magnetic field lines as well as magnetic-field curvature effects. Using his expertise and experience, the author skillfully guides the reader through the theory; presenting the most important results from leading Russian and Western scientists. This timely and important work will enable new or experienced researchers to improve their knowledge of this important field of plasma research.

The modern microprocessor based electronic equipment most vulnerable to Intentional Destructive Electromagnetic Interferences (IDEI) includes High-Altitude Electromagnetic Pulse (HEMP) in all substation equipment. However, power equipment and especially transformers are also subject to the influence of HEMP. The book discusses problems and solutions for both kinds of substation equipment. Separated into eight chapters, the book covers: Technological progress and its consequences; Intentional Destructive Electromagnetic Interferences (IDEI); Methods and means of Digital Protective Relay (DPR) protection from electromagnetic pulse; Passive methods and means of DPR protection from electromagnetic pulse; Active methods and means of DPR protection from electromagnetic pulse; Tests of DPR resistance to IDEI impacts; Organizational and technical measures to protect DPR from HEMP; and Protection of power equipment and transformers from HEMP. Key features: Practical approach focusing on technical solutions for difficult problems. Full data on electromagnetic threats and methods of their prevention are concentrated. Addresses a gap in

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knowledge in the power system industry. This book emphasizes practical recommendations on protection of power substations' electric equipment from IDEI that intended for not only staff operating electric equipment, but also for manufacturers of this equipment, specialists of designing companies, managers of electric energy industry as well as for teachers and postgraduate students.

A comprehensive resource that explores electromagnetic compatibility (EMC) for aerospace systems Handbook of Aerospace Electromagnetic Compatibility is a groundbreaking book on EMC for aerospace systems that addresses both aircraft and space vehicles. With contributions from an international panel of aerospace EMC experts, this important text deals with the testing of spacecraft components and subsystems, analysis of crosstalk and field coupling, aircraft communication systems, and much more. The text also includes information on lightning effects and testing, as well as guidance on design principles and techniques for lightning protection. The book offers an introduction to E3 models and techniques in aerospace systems and explores EMP effects on and technology for aerospace systems. Filled with the most up-to-date information, illustrative examples, descriptive figures, and helpful scenarios, Handbook of Aerospace Electromagnetic Compatibility is designed to be a practical information source. This vital guide to electromagnetic compatibility:

- Provides information on a range of topics including grounding, coupling, test procedures, standards, and requirements
- Offers discussions on standards for aerospace applications
- Addresses aerospace EMC through the use of testing and theoretical approaches

Written for EMC engineers and practitioners, Handbook of Aerospace Electromagnetic Compatibility is a critical text for understanding EMC for aerospace systems.

This quarterly digest presents current awareness information on the biological effects of nonionizing electromagnetic radiation (microwave and radio frequency) in the range of 0 Hz to 100 GHz. The effects of magnetic and electric fields (static and alternating) are also covered. Each issue contains abstracts of English and foreign current literature, summaries of ongoing research investigations, news items, and a directory of meetings and conferences. (Author).

A Landmark text thoroughly updated, including a new CD As digital devices continue to be produced at increasingly lower costs and with higher speeds, the need for effective electromagnetic compatibility (EMC) design practices has become more critical than ever to avoid unnecessary costs in bringing products into compliance with governmental regulations. The Second Edition of this landmark text has been thoroughly updated and revised to reflect these major developments that affect both academia and the electronics industry. Readers familiar with the First Edition will find much new material, including:

- * Latest U.S. and international regulatory requirements
- * PSpice used throughout the textbook to simulate EMC analysis solutions
- * Methods of designing for Signal Integrity
- * Fortran programs for the simulation of Crosstalk supplied on a CD
- * OrCAD(r) PSpice(r) Release 10.0 and Version 8 Demo Edition software supplied on a CD

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The final chapter on System Design for EMC completely rewritten * The chapter on Crosstalk rewritten to simplify the mathematics Detailed, worked-out examples are now included throughout the text. In addition, review exercises are now included following the discussion of each important topic to help readers assess their grasp of the material. Several appendices are new to this edition including Phasor Analysis of Electric Circuits, The Electromagnetic Field Equations and Waves, Computer Codes for Calculating the Per-Unit-Length Parameters and Crosstalk of Multiconductor Transmission Lines, and a SPICE (PSPICE) tutorial. Now thoroughly updated, the Second Edition of Introduction to Electromagnetic Compatibility remains the textbook of choice for university/college EMC courses as well as a reference for EMC design engineers. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

Bioengineering and Biophysical Aspects of Electromagnetic Fields primarily contains discussions on the physics, engineering, and chemical aspects of electromagnetic (EM) fields at both the molecular level and larger scales, and investigates their interactions with biological systems. The first volume of the bestselling and newly updated Handbook of Biological Effects of Electromagnetic Fields, Third Edition, this book adds material describing recent theoretical developments, as well as new data on material properties and interactions with weak and strong static magnetic fields. Newly separated and expanded chapters describe the external and internal electromagnetic environments of organisms and recent developments in the use of RF fields for imaging. Bioengineering and Biophysical Aspects of Electromagnetic Fields provides an accessible overview of the current understanding on the scientific underpinnings of these interactions, as well as a partial introduction to experiments on the interactions themselves.

In this book, a variety of topics related to electromagnetic fields and waves are extensively discussed. The topics encompass the physics of electromagnetic waves, their interactions with different kinds of media, and their applications and effects.

Classical Electromagnetic Radiation, Second Edition focuses on the classical electrodynamics with emphasis on radiation problems and the wave attributes of the electromagnetic field. This book aims to provide a modern and practically sophisticated mathematical treatment of classical electrodynamics at the undergraduate level. Organized into 13 chapters, this edition starts with an overview of the basic principles of electromagnetism. This text then presents a detailed discussion of Laplace's equation and a treatment of multiple effects, since such material is of considerable significance in the development of radiation theory. Other chapters consider the electromagnetic field equations, which are developed in the time-dependent form. This book discusses as well the subjects of wave propagation in space as well as in material media. The final chapter presents an introduction to relativistic electrodynamics. This book is a

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valuable resource for physicists, engineers, and readers who are interested in the applications of electrodynamics in modern physics.

CAIE A LEVEL Past Year Q & A Series - CAIE A LEVEL Physics Paper 2. All questions are sorted according to the sub chapters of the new A LEVEL syllabus. Questions and sample answers with marking scheme are provided. Please be reminded that the sample solutions are based on the marking scheme collected online. Chapter 1 : General physics 1.1 Length and time 1.2 Speed, velocity and acceleration 1.3 Mass and weight 1.4 Density 1.5 Forces 1.6 Energy, work and power 1.7 Pressure Chapter 2 : Thermal physics 2.1 Simple kinetic molecular model of matter 2.2 Thermal properties 2.3 Transfer of thermal energy Chapter 3 : Properties of waves, including light and sound 3.1 General wave properties 3.2 Light 3.3 Sound Chapter 4 : Electricity and magnetism 4.1 Simple phenomena of magnetism 4.2 Electrical quantities 4.3 Electric circuits 4.4 Dangers of electricity 4.5 Electromagnetic effects 4.6 Cathode-ray oscilloscopes Chapter 5 : Atomic physics 5.1 Radioactivity 5.2 The nuclear atom

Ultra-wideband (UWB), short-pulse (SP) electromagnetics are now being used for an increasingly wide variety of applications, including collision avoidance radar, concealed object detection, and communications. Notable progress in UWB and SP technologies has been achieved by investigations of their theoretical bases and improvements in solid-state manufacturing, computers, and digitizers. UWB radar systems are also being used for mine clearing, oil pipeline inspections, archeology, geology, and electronic effects testing. Ultra-wideband Short-Pulse Electromagnetics 9 presents selected papers of deep technical content and high scientific quality from the UWB-SP9 Conference, which was held from July 21-25, 2008, in Lausanne, Switzerland. The wide-ranging coverage includes contributions on electromagnetic theory, time-domain computational techniques, modeling techniques, antennas, pulsed-power, UWB interactions, radar systems, UWB communications, broadband systems and components. This book serves as a state-of-the-art reference for scientists and engineers working in these applications areas.

Reinforce your understanding of diagnostic imaging and sharpen your radiographic skills! Corresponding to the chapters in Bushong's Radiologic Science for Technologists, 12th Edition, this workbook helps you review key concepts and gain the technical knowledge needed to become an informed and confident radiographer. More than 100 worksheets include engaging exercises allowing you to assess your comprehension and apply your knowledge to imaging practice. More than 100 worksheets make it easy to review specific topics from the text, and are numbered according to textbook chapter. In-depth coverage of the textbook's topics lets you review medical imaging concepts and apply them to practice. Penguin icons highlight important information from the textbook, making it easier to understand concepts and complete the worksheet exercises. NEW! Closer correlation of worksheets to the textbook simplifies your review of radiologic physics, which can be a difficult subject to understand.

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NEW! New worksheets on digital radiographic technique and the digital image display correspond to the new content covered in the textbook.

Translated from the Russian original (1981, Leningrad U. Press). The purpose of this work is not only to derive rigorous and stable analytic algorithms for calculating the fields in linear multilayer media, but to demonstrate the need for a very cautious approach to the monograph, that any process in a layered media is unique, due to the complexity of its dependence on the geometrical and material properties of the elements of the medium. Book club price \$59. Annotation copyrighted by Book News, Inc., Portland, OR

The two volumes of this new edition of the Handbook cover the basic biological, medical, physical, and electrical engineering principles. They also include experimental results concerning how electric and magnetic fields affect biological systems—both as potential hazards to health and potential tools for medical treatment and scientific research. They also include material on the relationship between the science and the regulatory processes concerning human exposure to the fields. Like its predecessors, this edition is intended to be useful as a reference book but also for introducing the reader to bioelectromagnetics or some of its aspects.

FEATURES • New topics include coverage of electromagnetic effects in the terahertz region, effects on plants, and explicitly applying feedback concepts to the analysis of biological electromagnetic effects • Expanded coverage of electromagnetic brain stimulation, characterization and modeling of epithelial wounds, and recent lab experiments on at all frequencies • Section on background for setting standards and precautionary principle • Discussion of recent epidemiological, laboratory, and theoretical results; including: WHO IARC syntheses of epidemiological results on both high and low frequency fields, IITRI lab study of cancer in mice exposed to cell phone-like radiation, and other RF studies • All chapters updated by internationally acknowledged experts in the field

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