BOOKS AND PUBLICATIONS

All interested medical physicists are encouraged to have their names added to a list of available reviewers. Please rank your interest among radiation therapy, x-ray, imaging, nuclear medicine imaging, ultrasound imaging, MR imaging, radiation injury, radiation protection, and others. Make your interest known to Dimitris Mihailidis, Ph.D., Books Review Editor (dimitris@charlestonradiation.com). Include your name and e-mail address in the body of the response.

Magnetism in Medicine: A handbook, Second Completely Revised and Enlarged Edition. Edited by Wilfried Andrä and Hannes Nowak. Wiley-VCH, Berlin, 2006. 629 pp. $210.00 ISBN 9783527405589.

Description

This handbook provides an overview of the basic principles, instrumentation, and major applications employing magnetism in medicine. It also provides a comprehensive coverage of specific technologies and applications such as magnetocardiography (MCG), magnetoencephalography (MEG), magnetic resonance imaging (MRI), transcranial magnetic stimulation (TMS), magnetic drug targeting, and many other areas. Major emphasis is placed on the new developments over the past few years with ample clinical examples and up-to-date references. Compared to the first edition published in 1998, this new edition has been expanded with extensive updates on the topics. In many aspects, it might be more appropriate to call it a new book than a new edition.

Purpose

In medical applications of magnetism, interdisciplinary cooperation between scientists, engineers, and physicians is unarguably pivotal. The primary purpose of this book is to impart information on the state-of-the-art development of magnetism in medicine across multiple disciplines. The book is also intended to integrate basic science and clinical research by providing clinicians with essential knowledge of the technology they are using, and helping scientists and engineers gain a better understanding of the clinical challenges they are addressing. The authors and the editors should be commended for their successful effort in achieving these objectives.

Audience

This book is written primarily for scientists, engineers, and clinicians who are conducting basic and clinical research that involves magnetism in medicine. As a handbook, it can also benefit a broader audience including medical physicists and graduate students. Although many chapters can be read without a background in high-level mathematics and advanced physics, essential knowledge of calculus and college-level physics is helpful.

Dr. Andrä and Dr. Nowak are leading experts in the area of magnetism in medicine. They have assembled a group of internationally known scientists and clinicians who contributed to the individual chapters or sections of the book. In addition to their roles as editors, they have also authored or coauthored seven chapters. This gives the book a pleasing coherence that is not typically seen in an edited book involving many contributors.

Content/Features

The book's introduction contains an overview of the history, a concise description of physics pertaining to magnetism, a practical guide on how to create and measure magnetic field, and a practical discussion on safety issues. The following three parts that form the body of the book focus on biomagnetism, magnetic resonance, and magnetic substances and externally applied magnetic fields. Each part begins with an introduction that provides an overview of the topic as well as the organization of the chapters in the part.

The remaining chapters within each part give a balanced technical and clinical description. Throughout the book, there are many cross-references to help the reader obtain additional information. The book concludes with a nicely crafted summary followed by future perspectives of several exciting areas such as TMS, cardiac MRI, and magnetic nano-particles.

Assessment/Comparison

In summary, this book is an outstanding reference for both tyros and old hands. I believe that no one can read the book without learning more about the field. It should be on the shelf of every medical physicist who conducts basic and clinical research that involves magnetism in medicine.

Reviewed by Xiaohong Joe Zhou

Xiaohong Joe Zhou, Ph.D., is a tenured Associate Professor in the Departments of Radiology, Neurosurgery, and Bioengineering at the University of Illinois at Chicago (UIC). He also serves as Director of MR Physics at the Center for MR Research of the UIC Medical Center. Dr. Zhou is certified in diagnostic radiological physics (ABR) and has been active in MRI research and clinical applications for almost two decades.

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