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Circular of the National Bureau of Standards Sep 04 2021

Journal of the Optical Society of America Apr 30 2021

Highly Resolved Synthetic Aperture Radar with Beam Steering Jan 16 2020

Beginning Spring Apr 18 2020 Get up to speed quickly with this comprehensive guide to Spring Beginning Spring is the complete beginner's guide to Java's most popular framework. Written with an eye toward real-world enterprises, the book covers all aspects of application development within the Spring Framework. Extensive samples within each chapter allow developers to get up to speed quickly by providing concrete references for experimentation, building a skillset that drives successful application development by exploiting the full capabilities of Java's latest advances. Spring provides the exact toolset required to build an enterprise application, and has become the standard within the field. This book covers Spring 4.0, which contains support for Java 8 and Java EE 7. Readers begin with the basics of the framework, then go on to master the most commonly used tools and fundamental concepts inherent in any Spring project. The book emphasizes practicality and real-world application by addressing needs such as meeting customer demand and boosting productivity, and by providing actionable information that helps developers get the most out of the framework. Topics include: Dependency Injection and Inversion of Control Unit testing Spring enabled Web Applications Data Access using Spring JDBC and ORM support along with Transaction Management Building Web Applications and RESTful Web Services with Spring MVC Securing Web Applications using Spring Security Spring Expression Language with its Extensive Features Aspect Oriented Programming Facilities Provided by Spring AOP Caching with 3rd Party Cache Providers' Support The Best of the Breed: Spring 4.0 The information is organized and structured an ideal way for students and corporate training programs, and explanations about inner workings of the framework make it a handy desk reference even for experienced developers. For novices, Beginning Spring is invaluable as a comprehensive guide to the real-world functionality of Spring.

Semiannual Report Aug 15 2022

Method for Determining the Resolving Power of Photographic Lenses Mar 30 2021

Circular of the Bureau of Standards Aug 23 2020

Dictionary of Critical Realism Aug 03 2021 Dictionary of Critical Realism fulfils a vital gap in the literature, Critical Realism is often criticised for being too opaque and deploying too much jargon, thereby making the concepts inaccessible for a wider audience. However, as Hartwig puts it 'Just as the tools of the various skilled trades need to be precision-engineered for specific, interrelated functions, so meta-theory requires concepts honed for specific interrelated tasks: it is impossible to think creatively at that level without them.' This Dictionary seeks to redress this problem; to throw open the important contribution of Critical Realism to a wider audience for the first time, by thoroughly explaining all the key concepts and key developments. It includes 500 entries on these themes, and has contributions from major players in field. However this text does not stop there, it goes further than simply elucidating the concepts and includes a number of essays which use the notions in important areas, thereby demonstrating the appropriate use of the concepts in action to encourage their wider use. This book will become a requisite reference tool for Critical Realist scholars and Philosophers and Social scientists alike will enjoy this vital introduction and explanatory text of the indispensable ideas contained within the dynamic and vibrant school of Critical Realism.

Ships' Routeing Mar 18 2020

Introduction to Optical Microscopy Jun 13 2022 Presents a fully updated, self-contained textbook covering the core theory and practice of both classical and modern optical microscopy techniques.

Report of the Proceedings - Jan 28 2021

A Test of Lens Resolution for the Photographer Oct 17 2022 This Circular provides the photographer with a set of charts by which the resolving power of a photographic lens may be numerically measured with respect to a definite scale of values. A detailed description is given of the procedure and technique to be followed in order that comparable values may be obtained by different observers. The test provides an objective method of testing a photographic lens.

Navigation and Vessel Inspection Circular Nov 06 2021

Semiannual Report Jul 14 2022

Magnetic Fields Near and Far Feb 09 2022 According to astrophysical theory, magnetic fields should play an important role in the structure and dynamics of the interstellar medium. While astronomical observations confirm this directly, the observational record is sparse. This is because magnetic fields can only be measured via polarimetric methods, and most of these methods can only provide an indirect inference of the magnetic field strength. The Zeeman effect, however, is the only method by which in situ measurements of astrophysical magnetic fields can be made. The spectral signature of Zeeman splitting is imprinted in the circular polarization spectrum of radiation received from an astronomical source. In order to make a reliable detection at radio frequencies, one must employ careful calibrations and account for instrumental effects. We begin this dissertation by covering the fundamentals of radio spectropolarimetry. We then offer historical details regarding the Zeeman effect and its use in single-dish radio observations. We present an outline of how one accurately measures the Zeeman effect using large single-dish radio telescopes. We follow this with results from an assessment of the polarization properties of the 100 m Green Bank Telescope (GBT). We then present magnetic field detections made via the Zeeman effect from the Galactic scale to cosmological distances. We begin with GBT observations of 21 cm emission toward the Taurus Molecular Cloud (TMC) complex. Recent observations have suggested that fields stronger than 20 microgauss are located at the distance of the TMC. Our Zeeman observations rule out fields of this strength, but do show a clear +5 microgauss detection from HI emission at the velocity of the TMC. More surprisingly, we have discovered multiple detections of a line-of-sight magnetic field of strength roughly +40 microgauss in a filament near -50 km/s. We then present a windfall of detections of milligauss-strength magnetic fields in starburst galaxies. Detected by means of Zeeman splitting of 1667 MHz hydroxyl megamaser emission, these Arecibo and GBT results represent the first extragalactic Zeeman measurements to probe the field inside an external galaxy. Finally, we climb the cosmological distance ladder, and present a dramatic GBT detection of a magnetic field in a damped Lyman-alpha absorber at a redshift of 0.692. We discuss possible scenarios for the creation of an 84 microgauss field at a look-back time of 6.4 Gyr.

Graph Drawing Oct 05 2021 This volume constitutes the refereed proceedings of the 18th International Symposium on Graph Drawing, GD 2010, held in Konstanz, Germany, during September 2010. The 30 revised full papers presented together with 5 revised short and 8 poster papers were carefully reviewed and selected from 77 submissions. The volume also contains a detailed report about the 17th Annual Graph Drawing Contest, held as a satellite event of GD 2010. Devoted both to theoretical advances as well as to implemented solutions, the papers are concerned with the geometric representation of graphs and networks and are motivated by those applications where it is crucial to visualize structural information as graphs.

Optics for Engineers Nov 18 2022 The field of optics has become central to major developments in medical imaging, remote sensing, communication, micro- and nanofabrication, and consumer technology, among other areas. Applications of optics are now found in products such as laser printers, bar-code scanners, and even mobile phones. There is a growing need for engineers to understand the principles of optics in order to develop new instruments and improve existing optical instrumentation. Based on a graduate course taught at Northeastern University, *Optics for Engineers* provides a rigorous, practical introduction to the field of optics. Drawing on his experience in industry, the author presents the fundamentals of optics related to the problems encountered by engineers and researchers in designing and analyzing optical systems. Beginning with a history of optics, the book introduces Maxwell's equations, the wave equation, and the eikonal equation, which form the mathematical basis of the field of optics. It then leads readers through a discussion of geometric optics that is essential to most optics projects. The book also lays out the fundamentals of physical optics—polarization, interference, and diffraction—in sufficient depth to enable readers to solve many realistic problems. It continues the discussion of diffraction with some closed-form expressions for the important case of Gaussian beams. A chapter on coherence guides readers in understanding the applicability of the results in previous chapters and sets the stage for an exploration of Fourier optics. Addressing the importance of the measurement and quantification of light in determining the performance limits of optical systems, the book then covers radiometry, photometry, and optical detection. It also introduces nonlinear optics. This comprehensive reference includes downloadable MATLAB® code as well as numerous problems, examples, and illustrations. An introductory text for graduate and advanced undergraduate students, it is also a useful resource for researchers and engineers developing optical systems.

Brazil May 20 2020 The Central Bank of Brazil (BCB) has shown a determined commitment to enhancing its standards and practices of banking supervision. Changes in the thinking and practices of the BCB's supervision are not limited to responses to the demands of the international regulatory reform agenda. Overall, the BCB has been guided by the principle of integration, both in terms of the expectations that it places on its own internal operations but on the standards it expects the financial institutions to meet in governing their own risks and activities. One example is the BCB's innovative and challenging work in the field of contagion analysis at the systemic level which is a perspective it also seeks to embed in its analysis of contagion risk in its prudential work at firm level. Boosting staff levels in conduct supervision, introducing a form of twin peaks, contagion risk analysis, and the prudential conglomerate approach also exemplify welcome developments.

Digitizing the Future Oct 13 2019 Provides summary information concerning the Defense Mapping Agency (DMA) digital data and related subjects and supplying the data to all components of the Dept. of Defense, federal agencies, special program offices, system developers, and their contractors. Material is presented at an executive level to promote awareness of DMA's product line, services, and ongoing activities. Includes existing products, prototype products, and special subjects. Photos and illustrations.

Theory and Applications of Satisfiability Testing – SAT 2019 May 12 2022 This book constitutes the refereed proceedings of the 22nd International Conference on Theory and Applications of Satisfiability Testing, SAT 2019, held in Lisbon, Portugal, UK, in July 2019. The 19 revised full papers presented together with 7 short papers were carefully reviewed and selected from 64 submissions. The papers address different aspects of SAT interpreted in a broad sense, including (but not restricted to) theoretical advances (such as exact algorithms, proof complexity, and other complexity issues), practical search algorithms, knowledge compilation, implementation-level details of SAT solvers and SAT-based systems, problem encodings and reformulations, applications (including both novel application domains and improvements to existing approaches), as well as case studies and reports on findings based on rigorous experimentation.

Introduction to the Physics and Techniques of Remote Sensing Jun 01 2021 The science and engineering of remote sensing--theory and applications The Second Edition of this authoritative book offers readers the essential science and engineering foundation needed to understand remote sensing and apply it in real-world situations. Thoroughly updated to reflect the tremendous technological leaps made since the publication of the first edition, this book covers the gamut of knowledge and skills needed to work in this dynamic field, including: * Physics involved in wave-matter interaction, the building blocks for interpreting data * Techniques used to collect data * Remote sensing applications The authors have carefully structured and organized the book to introduce readers to the basics, and then move on to more advanced applications. Following an introduction, Chapter 2 sets forth the basic properties of electromagnetic waves and their interactions with matter. Chapters 3 through 7 cover the use of remote sensing in solid surface studies, including oceans. Each chapter covers one major part of the electromagnetic spectrum (e.g., visible/near infrared, thermal infrared, passive microwave, and active microwave). Chapters 8 through 12 then cover remote sensing in the study of atmospheres and ionospheres. Each chapter first presents the basic interaction mechanism, followed by techniques to acquire, measure, and study the information, or waves, emanating from the medium under investigation. In most cases, a specific advanced sensor is used for illustration. The book is generously illustrated with fifty percent new figures. Numerous illustrations are reproduced in a separate section of color plates. Examples of data acquired from spaceborne sensors are included throughout. Finally, a set of exercises, along with a solutions manual, is provided. This book is based on an upper-level undergraduate and first-year graduate course taught by the authors at the California Institute of Technology. Because of the multidisciplinary nature of the field and its applications, it is appropriate for students in electrical engineering, applied physics, geology, planetary science, astronomy, and aeronautics. It is also recommended for any engineer or scientist interested in working in this exciting field.

Audits of Federal Programs Jan 08 2022

Semiannual Report to the Congress Dec 07 2021

Time: From Earth Rotation to Atomic Physics Dec 15 2019 This accessible reference presents the evolution of concepts of time and methods of time keeping, for historians, scientists, engineers, and educators. The second edition has been updated throughout to describe twentieth- and twenty-first-century advances, progress in devices, time and cosmology, the redefinition of SI units, and the future of UTC.

Advance Tax Rulings and Principles of Law Jan 20 2023 Comprehensive study on the advance tax ruling. The main procedural and substantive elements of current tax rulings systems worldwide are investigated, and the legal principles underlying advance tax rulings procedures in the United States, the Netherlands and Italy are identified. In the final chapters, an overview of the status quo of advance tax rulings systems in the EU Member States is followed by a discussion concerning the harmonization of advance rulings systems in the European Union.

Image Understanding Workshop Sep 16 2022

Digitizing the Future Nov 13 2019

National Bureau of Standards Circular Oct 25 2020

Activities of the VA Office of Inspector General Mar 10 2022

Development and Evaluation of High Resolution Quadrupole Mass Analyzer and an Inductively Coupled Plasma-Mach Disk as an Emission Source Jul 22 2020 In the development and the evaluation pinched plasma Mach disk as an emission source, the axial channel of conventional argon inductively coupled plasma (ICP) is extracted through a circular orifice into an evacuated quartz chamber. Emission from the Mach disk region is focused on the entrance slit of an echelle spectrometer equipped with two segmented-array charge-coupled-device detectors (CCDs). The background pressure in the extraction chamber is 1000 Pa (7.5 torr). At this pressure two barrel shocks and Mach disks are visible. Deliberate use of a mild secondary discharge between the plasma and the sampler enhances emission from the Mach disk for a variety of lines from typical analytes (Ca, Sr, Mg and Mn) by factors of 11 to 25. Detection limits are in the range 0.1-2 [Mu]g l⁻¹. Sodium chloride at concentrations up to 10,000 mg l⁻¹ induces only a modest loss (0 to 6 %) of intensity for ion lines, in contrast to the much more severe matrix

effects seen in ICP mass spectrometry. The fundamental and practical aspects are described for a multiple pass high resolution quadrupole mass analyzer. The peak shape narrows and the resolution improves if the ions are simply reflected back and forth through a conventional quadrupole mass analyzer. CO and N₂⁺ have been separated with a conventional quadrupole mass spectrometer by using a multiple pass quadrupole mass analyzer. The minimum resolving power needed for the separation of CO⁺ and N₂⁺ is 2500 at 50% valley definition. A resolution of 22,000 defined by the full width at half maximum with 63% of the total signal remaining was attained in the experiment.

The Electronics Handbook Feb 15 2020 The superb organization of The Electronics Handbook means that it is not only a comprehensive and fascinating reference, but also a pleasure to use. Some of these organizational features include:

NBS Special Publication Jul 02 2021

Theory and Applications of Satisfiability Testing – SAT 2020 Dec 19 2022 This book constitutes the proceedings of the 23rd International Conference on Theory and Applications of Satisfiability Testing, SAT 2020, which was planned to take place in Alghero, Italy, during July 5-9, 2020. Due to the coronavirus COVID-19 pandemic, the conference was held virtually. The 25 full, 9 short, and 2 tool papers presented in this volume were carefully reviewed and selected from 69 submissions. They deal with SAT interpreted in a broad sense, including theoretical advances (such as exact algorithms, proof complexity, and other complexity issues), practical search algorithms, knowledge compilation, implementation-level details of SAT solvers and SAT-based systems, problem encodings and reformulations, applications (including both novel application domains and improvements to existing approaches), as well as case studies and reports on findings based on rigorous experimentation.

Three-dimensional Resolution for Circular Synthetic Aperture Radar Feb 21 2023 Abstract: Three-dimensional (3-D) spotlight-mode Synthetic Aperture Radar (SAR) image processing is typically performed by interferometry using data collected along identical azimuthal paths at two or more elevation angles or by reconstruction using data collected on a densely sampled 3-D grid in azimuth and elevation. This thesis considers 3-D image formation using a circular SAR geometry with data collected along a single, circular flight path of 3600 azimuth at a constant elevation angle. A closed-form expression for the far-field 3-D point-spread function (PSF), or impulse response function (IPR), for circular SAR is derived as a means of evaluating 3-D resolution, and resulting images are compared with images generated by a backprojection algorithm. SAR image resolution for varying azimuthal extents is examined for range, cross-range, and height. Range and cross-range resolution analysis demonstrates that wide apertures provide range resolution independent of bandwidth, and concurrent optimal resolution of one-quarter wavelength in meters in range and cross-range is achieved for 3600 azimuth, as previously reported in the literature. An azimuthal extent threshold is revealed, and quantified, which indicates the aperture extent required to ensure improvement in range resolution for a given bandwidth. Azimuthal apertures less than the described threshold exhibit equivalent resolution in range. An analogy between circular SAR and depth-of-focus in microscopy is offered to motivate the necessity for a non-traditional measure of height resolution. A novel definition of z-resolution, denoted the "complementary z-resolution," is presented and analyzed for varying aperture extents to illustrate the benefit of using 3600 azimuth. In addition, a newly defined measure of 3-D image resolution, designated "6 dB volume resolution," further validates the benefits of employing wide apertures given a single elevation angle. The 6 dB volume resolution also indicates that elevation angles near 45° provide enhanced SAR image resolution. Finally, a Cramér-Rao Lower Bound (CRLB) analysis of a far-field 3-D parametric scattering model for a point target confirms the desirability of wide apertures and 45° elevation angles.

Handbook of Reflector Antennas and Feed Systems Volume III: Applications of Reflectors Jun 20 2020 This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three volumes. Volume III focuses on the range of reflector antenna applications, including space, terrestrial, and radar. The intent of this book volume is to provide practical applications and design information on reflector antennas used for several communications systems. This book covers recent developments of reflector antennas used for satellite communications, terrestrial communications, and remote sensing applications. New subjects are introduced for the first time, including satellite antennas, Terahertz antennas, PIM, multipaction, corona, deployable mesh reflector antennas, and mechanical aspects of reflector antennas. In addition, this book contains a separate topic on integrated feed assembly for reflector antennas covering analysis, design, fabrication, and test.

Antenna Handbook Apr 11 2022 Technology has advanced to such a degree over the last decade that it has been almost impossible to find up-to-date coverage of antennas. Antenna Handbook, edited by two of the world's most distinguished antenna specialists, presents the most advanced antenna theory and designs and demonstrates their application in a wide variety of technical fields. They offer a staggering amount of in-depth data and analysis on a wide range of topics, supported by formulas, curves, and results, as well as derivations.

Brain Dopaminergic Systems: Imaging with Positron Tomography Nov 25 2020 Imaging of the Dopaminergic system in the human brain with the in vivo use of Positron Emission Tomography has emerged in the late 1980s as a tool of major importance in Clinical Neurosciences and Pharmacology. The last few years have witnessed the rapid development of new radiotracers specific to receptors, reuptake sites and enzymes of the dopamine system; the application of these radiotracers has led to major breakthroughs in the pathophysiology and therapy of movement disorders and schizophrenic-like psychoses. This book is the first to collect, in a single volume, state-of-the-art contributions to the various aspects of this research. Its contents address methodological issues related to the design, labelling, quantitative imaging and compartmental modelisation of radioligands of the post-synaptic, pre-synaptic and enzyme sites of the dopamine system and to their use in clinical research in the fields of Parkinson's disease as well as other movement disorders, psychoses and neuroleptic receptor occupancy. The chapters were written by leading European scientists in the field of Positron Emission Tomography, gathered together in Caen (France, November 1990) under the aegis of the EEC Concerted Action on "PET Investigations of Cellular Regeneration and Degeneration. This book provides a current and comprehensive overview on PET studies of the brain dopamine system which should aid and interest neurologists, psychiatrists, pharmacologists and medical imaging scientists. J.C. Baron D. Comar L. Farde J.L. Martinot B. Mazoyer August 1991 ix LIST OF CONTRIBUTORS Dr Yves Agid DrL.

National Bureau of Standards Circular Feb 26 2021

Cognitive Engineering Sep 23 2020 What we profoundly witness these days is a growing number of human-centric systems and a genuine interest in a comprehensive understanding of their underlying paradigms and the development of solid and efficient design practices. We are indeed in the midst of the next information revolution, which very likely brings us into a completely new world of ubiquitous and invisible computing, Ambient Intelligent (AMI), and wearable hardware. This requires a totally new way of thinking in which cognitive aspects of design, cognitive system engineering and distributed approach play a pivotal role. This book fully addresses these timely needs by filling a gap between the two well-established disciplines of cognitive sciences and cognitive systems engineering. As we put succinctly in the preface, with the psychological perspective of human cognition in mind, "the book explores the computational models of reasoning, learning, planning and multi-agent coordination and control of the human moods". This is an excellent, up to the point description of the book. The treatise is focused on the underlying fundamentals, spans across a vast territory embracing logic perspectives of human cognition, distributed models, parallel computing, expert systems, and intelligent robotics.

The Uses of Argument Dec 27 2020