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## Ultrashort Pulse Spectroscopy and Applications

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# Ultrashort Pulse Spectroscopy And Applications

**Sergei Aleksandrovich Akhmanov, V.A.  
Vysloukh, A.S. Chirkin**



## **Ultrashort Pulse Spectroscopy And Applications:**

*Ultrashort Pulse Spectroscopy and Applications* M. J. Soileau, 1985      **Ultrashort Laser Pulses and Applications**  
Wolfgang Kaiser, 2013-03-14 Ten years ago Stanley L Shapiro edited the book entitled Ultrashort Light Pulses Topics Appl Phys Vol 18 which was written by eight experts in the field Six years later Charles V Shank added a bibliography 1980 1983 in the second edition with approximately one thousand new references During the past decade the field has grown so rapidly that a completely new book had to be written In particular the reduction of the time scale of light pulses into the femtosecond range has opened up new experimental possibilities never even foreseen in the preceding literature The vast literature with countless ideas and applications makes it impossible for a single person to write a comprehensive review Nine scientists actively working in the field since its beginning have decided to join forces to prepare a new book describing the present state of the art Emphasis is placed on the generation and numerous applications of ultrashort laser pulses This book covers a wide area of science physics engineering chemistry and biology The various chapters and sections are prepared in each case such that the reader is given a brief introduction to the specific subject Ample references for a more detailed study are given at the end of each chapter

*Ultrashort Laser Pulses and Applications* D. H. Auston, 1988 This authoritative book is written by ten experts in the field It provides an up to date review of the state of the art in different generation processes for ultrashort laser pulses Extensive applications in a wide range of fields in physics engineering chemistry and biology are also discussed Eight chapters deal with the following topics the generation of picosecond and femtosecond laser pulses nonlinear wave interactions new investigations in solid state physics recent progress in optoelectronics advances in coherent material excitations ultrafast vibrational lifetimes and energy redistribution in liquids new observations of chemical reactions in the liquid state the primary processes of important biological systems The book is essential reading for scientists and engineers who want to know what is going on in this rapidly advancing field It should also interest graduate students and others who seek an introduction to laser pulses

*The Spectroscopy of Semiconductors*, 1992-07-31 Spectroscopic techniques are among the most powerful characterization methods used to study semiconductors This volume presents reviews of a number of major spectroscopic techniques used to investigate bulk and artificially structured semiconductors including photoluminescence photo reflectance inelastic light scattering magneto optics ultrafast work piezo spectroscopy methods and spectroscopy at extremely low temperatures and high magnetic fields Emphasis is given to major semiconductor systems and artificially structured materials such as GaAs InSb Hg<sub>1-x</sub>CdxTe and MBE grown structures based upon GaAs AlGaAs materials Both the spectroscopic novice and the expert will benefit from the descriptions and discussions of the methods principles and applications relevant to today s semiconductor structures Key Features Discusses the latest advances in spectroscopic techniques used to investigate bulk and artificially structured semiconductors Features detailed review articles which cover basic principles Highlights specific applications such as the use of laser spectroscopy for the characterization of

GaAs quantum well structures

**Ultrashort Pulse Lasers and Ultrafast Phenomena** Takayoshi Kobayashi, 2023-03-21

This book describes the basic physical principles of techniques to generate and ultrashort pulse lasers and applications to ultrafast spectroscopy of various materials covering chemical molecular compounds solid state materials exotic novel materials including topological materials biological molecules and bio and synthetic polymers It introduces non linear optics which provides the basics of generation and measurement of pulses and application examples of ultrafast spectroscopy to solid state physics Also it provide not only material properties but also material processing procedures The book describes also details of the world shortest visible laser and DUV lasers developed by the author s group It is composed of the following 12 Sections The special features of this book is that it is written by a single author with a few collaborators in a systematic way Hence it provides a comprehensive and systematic description of the research field of ultrashort pulse lasers and ultrafast spectroscopy Generation of ultrashort pulses in deep ultraviolet to near infrared Generation of ultrashort pulses in terahertz Carrier envelope phase CEP Simple NLO processes with a few colors Multi color involved NLO processes Multi color ultrashort pulse generation NLO materials NLO processes in time resolved spectroscopy Low dimension materials Conductors and superconductors Chemical reactions and material processing Photobiological reactions [Ultrashort Laser Pulses and Applications](#) Wolfgang Kaiser, 2013-01-11 Ten years ago Stanley L Shapiro edited the book entitled Ultrashort Light Pulses Topics Appl Phys Vol 18 which was written by eight experts in the field Six years later Charles V Shank added a bibliography 1980 1983 in the second edition with approximately one thousand new references During the past decade the field has grown so rapidly that a completely new book had to be written In particular the reduction of the time scale of light pulses into the femtosecond range has opened up new experimental possibilities never even foreseen in the preceding literature The vast literature with countless ideas and applications makes it impossible for a single person to write a comprehensive review Nine scientists actively working in the field since its beginning have decided to join forces to prepare a new book describing the present state of the art Emphasis is placed on the generation and numerous applications of ultrashort laser pulses This book covers a wide area of science physics engineering chemistry and biology The various chapters and sections are prepared in each case such that the reader is given a brief introduction to the specific subject Ample references for a more detailed study are given at the end of each chapter [Industrial Applications of Laser Remote Sensing](#) Tetsuo Fukuchi, Tatsuo Shiina, 2012 This e book is an essential review of land based laser sensing methods such as differential absorption Raman scattering laser induced fluorescence Doppler effect methods laser induced breakdown spectroscopy and laser ultrasonics and their respective application to specific industrial needs such as natural gas leak detection hydrogen gas leak detection pollutant detection wind profiling for windmill sites minor constituent monitoring and concrete structure health monitoring Readers will gain an updated overview of laser remote sensing techniques and their applications to the industrial environment **Ultrashort Laser Pulses** Wolfgang Kaiser, 2006-11-14 This second edition in

paperback provides an up to date review of the state of the art in different generation processes for ultrashort laser pulses In addition extensive applications in a wide range of fields in physics engineering chemistry and biology are discussed Eight chapters deal with the following topics the generation of picosecond and femtosecond laser pulses nonlinear wave interactions new investigations in solid state physics recent progress in optoelectronics advances in coherent material excitations ultrafast vibrational lifetimes and energy redistribution in liquids new observations of chemical reactions in the liquid state the primary processes of important biological systems The book is essential reading for scientists and engineers who want to know what is going on in this rapidly advancing field It should also interest graduate students and others who seek an introduction to laser pulses

**Coherence and Ultrashort Pulse Laser Emission** F. J. Duarte, 2010-12-30 In this volume recent contributions on coherence provide a useful perspective on the diversity of various coherent sources of emission and coherent related phenomena of current interest These papers provide a preamble for a larger collection of contributions on ultrashort pulse laser generation and ultrashort pulse laser phenomena Papers on ultrashort pulse phenomena include works on few cycle pulses high power generation propagation in various media to various applications of current interest Undoubtedly *Coherence and Ultrashort Pulse Emission* offers a rich and practical perspective on this rapidly evolving field

Ultrashort Laser Pulses Wolfgang Kaiser, 2014-03-12 This second edition in paperback provides an up to date review of the state of the art in different generation processes for ultrashort laser pulses In addition extensive applications in a wide range of fields in physics engineering chemistry and biology are discussed Eight chapters deal with the following topics the generation of picosecond and femtosecond laser pulses nonlinear wave interactions new investigations in solid state physics recent progress in optoelectronics advances in coherent material excitations ultrafast vibrational lifetimes and energy redistribution in liquids new observations of chemical reactions in the liquid state the primary processes of important biological systems The book is essential reading for scientists and engineers who want to know what is going on in this rapidly advancing field It should also interest graduate students and others who seek an introduction to laser pulses

*Lasers in Chemistry* David L. Andrews, 2012-12-06 During the three years since the publication of the first edition many applications of lasers in Chemistry have moved across the boundary from academic laboratories to routine instrumental analysis laser mass spectrometry for instance New photochemical techniques have been developed for the study of molecules e g ultrafast spectroscopy In keeping with his successful concept the author has retained a balance between coverage of more widely used laser methods and new developments

**Ultrashort Laser Pulse Phenomena** Jean-Claude Diels, Wolfgang Rudolph, 2018-07-01 *Ultrashort Laser Pulse Phenomena* balances theory and applications of ultrafast optical pulses with detailed descriptions of experimental configurations and surveys of relevant data from the literature demonstrating how the technology can be applied in areas such as spectroscopy medical imaging electromagnetism optics and quantum physics The third edition streamlines the discussion of ultrashort pulse fundamentals and their main application

fields Nonlinear optics is revised and re organized from most general transient concepts leading through successive approximations to the classical concepts of nonlinear susceptibility Sections on recent developments such as comb spectroscopy attosecond science and corresponding laser sources have been added or considerably extended Showing how abstract models can be put into practice this book is an easy to understand guide to designing and constructing femtosecond and attosecond systems and applications suitable for engineers and scientists working in the areas of optics spectroscopy optical imaging photochemistry and ultrafast science and engineering Provides an easy to follow guide through faster than electronics probing and detection methods THE manual on designing and constructing femtosecond systems and experiments Discusses the essential technology for applications in micro machining femtochemistry medical imaging and attosecond science Elegant theoretical formulations in conjunction with experimental discussions on practical implementation and field applications of nonlinear and ultrafast optics Insightful presentation of measurement techniques with numerous examples of ultrafast processes in assorted materials Key Features of this edition Chapters 3 and 4 re written and combined into a single chapter starting with general concepts of coherent interaction evolving by approximations to the traditional concepts of nonlinear optics New chapter 4 on High Fields interactions to include High Harmonic Generation attosecond phenomena and particle accelerators New section on the synthesis of frequency combs cascade of Raman lines or of harmonics to create ultrashort pulses chapter 5 VECSEL lasers chapter 6 OPCPA Dazzler and Fazzler Chapter 8 Add comb spectroscopy and molecular spectroscopy in Chapter 10 Chapters 11 through 13 completely re written and updated

**Tunable Laser Applications** F.J. Duarte, 2008-08-26 Tunability has added an important dimension to a variety of laser devices and led to new systems and applications From laser spectroscopy to Bose Einstein condensation the one nexus is the tunable laser Incorporating nine new chapters since the first edition Tunable Laser Applications Second Edition reflects the significant developments

**Ultrafast Dynamics of Quantum Systems** Baldassare di Bartolo, 2006-04-11 Based on a NATO Advanced Summer Institute this volume discusses physical models mathematical formalisms experimental techniques and applications for ultrafast dynamics of quantum systems These systems are used in laser optics spectroscopy and utilize monochromaticity spectral brightness coherence power density and tunability of laser sources

*Energy Research Abstracts*, 1988 *Optics of Femtosecond Laser Pulses* Sergei Aleksandrovich Akhmanov, V.A. Vysloukh, A.S. Chirkin, 1992 Blurb Self modulation Self compression Solitons and Instabilities Parametric Interactions and Coherent Scattering of Femtosecond Pulses Fast Phase Control Compression and Shaping of Optical Pulses Optical Solitons Picosecond and Femtosecond Pulses in Optical Information Systems *Physics Briefs*, 1992 **Journal of the Optical Society of America**, 1996 *Ultrafast Processes in Spectroscopy* Orazio Svelto, S De Silvestri, G DeNardo, 1997-01-31 **New Techniques in Optical and Infrared Spectroscopy** G. W. Series, B. A. Thrush, 1982

## Reviewing **Ultrashort Pulse Spectroscopy And Applications**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is truly astonishing. Within the pages of "**Ultrashort Pulse Spectroscopy And Applications**," an enthralling opus penned by a very acclaimed wordsmith, readers set about an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve in to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

<https://www.demo.boostly.co.uk/files/Resources/fetch.php/Yertle%20The%20Turtle%20And%20Other%20Stories.pdf>

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