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# Optical Effects In Amorphous Semiconduct

**Stanford R. Ovshinsky**



## Optical Effects In Amorphous Semiconduct:

**Optical Effects in Amorphous Semiconductors** P. C. Taylor, S. G. Bishop, 1984      **Optical effects in amorphous semiconductors: Aip conference proceedings** P. C. Taylor, S. G. Bishop, 1984      *Optical Effects in Amorphous Semiconductors* Philip Craig Taylor, S. G. Bishop, 1984      *Disordered Semiconductors* Marc A. Kastner, Stanford R. Ovshinsky, Gordon A. Thomas, 2012-12-06

Twenty four years ago Hellmut Fritzsche came to our laboratory to evaluate our work in amorphous materials. He came many times, sometimes bringing his violin to play with our youngest son, to talk to help to discover and to teach. The times with him were always exciting and rewarding. There was a camaraderie in the early years that has continued and a friendship that has deepened among Iris and me and Hellmut, Sybille and their children. The vision that Hellmut Fritzsche shared with me, the many important contributions he made to the science that he helped so firmly to establish, the courage he showed in the time of our adversity and the potential that he recognized put all of us in the amorphous field not only in his close friends and collaborators but in his debt. He helped make a science out of intuition and played an important role not only in the experimental field but also in the basic theoretical aspects. It has been an honor to work with Hellmut through the years.

Optical Properties of Crystalline and Amorphous Semiconductors Sadao Adachi, 2012-12-06

*Optical Properties of Crystalline and Amorphous Semiconductors: Materials and Fundamental Principles* presents an introduction to the fundamental optical properties of semiconductors. This book presents tutorial articles in the categories of materials and fundamental principles. Chapter 1: optical properties in the reststrahlen region; Chapter 2: those in the interband transition region; Chapters 3 and 4: and at or below the fundamental absorption edge; Chapter 5: Optical Properties of Crystalline and Amorphous Semiconductors. *Materials and Fundamental Principles* is presented in a form which could serve to teach the underlying concepts of semiconductor optical properties and their implementation. This book is an invaluable resource for device engineers, solid state physicists, material scientists and students specializing in the fields of semiconductor physics and device engineering.

*Stanford R. Ovshinsky* Brian B. Schwartz, 2008. This book highlights the achievements of the self-taught inventor, scientist, manufacturer and entrepreneur, Stanford R. Ovshinsky. This remarkable individual could, without special training, compete with the well-funded establishments of learning and industry in the second half of the last century and leave us an incredible legacy of brilliant innovations with a lasting impact on our lives. His achievements extend over amazingly diverse fields and have or are prone to create new industries of great societal value. The phase change memories of commonly used rewritable CDs and DVDs as well as of new flash memories are his invention, so are the Ni-Metal hydride batteries which are the enabling batteries for electric and hybrid electric vehicles. The future hydrogen economy will utilize his efficient and safe hydrogen storage alloys. He has developed light and ultralight photovoltaic solar panels for converting sunlight into electricity and built the largest manufacturing facility for thin film flexible solar roofing materials. A common theme of his inventions is the synthesis of new materials utilizing novel aspects of

structural and compositional disorder The book explains for each of Ovshinsky's innovations the essence of his pioneering ideas and inventions These introductions are followed by a selection of Ovshinsky's seminal publications and for each subject category a list of his patents which reveal the inventive mind of this unusually creative person Ovshinsky's example of gaining a deep understanding of the science underlying his inventions his perseverance as well as his ability to attract and inspire talented collaborators will be a role model for entrepreneurs of this century

**Disordered Materials** Stadford R. Ovshinsky, 2012-12-06 Landmark contributions to science and mechanisms for the origin of the phenomena and technology are rarely recognized at the time of reached important conclusions about the physical publication Few people even in technical areas nature of the materials at equilibrium and their recognized the importance of developments such as electronic nonequilibrium properties Many of these the transistor the laser or electrophotography ideas were condensed into a publication for Physical until well after their successful demonstration Review Letters paper 1 in this collection This So called experts in fact tend to resist new paper immediately attracted attention to the field inventions a natural instinct based on a combination and directly lead to the initiation of large research tion of fear of obsolescent expertise and jealousy efforts at both industrial laboratories and universities arising from lack of active participation in the ties throughout the world Inevitably there was discovery the usual amount of controversy with many experts Denigration of new ideas is a relatively simultaneously taking positions 2 and 3 above safe modus operandi since the vast majority It has now been well over 20 years since eventually are abandoned well short of commerciality the original publication date and an objective view However a successful device can be identified by can be taken in hindsight

*Physics of Disordered Materials* David Adler, 2012-12-06 This volume and its two companion volumes entitled Tetrahedrally Bonded Amorphous Semiconductors and Localization and Metal Insulator Transitions are our way of paying special tribute to Sir Nevill Mott and to express our heartfelt wishes to him on the occasion of his eightieth birthday Sir Nevill has set the highest standards as a physicist teacher and scientific leader Our feelings for him include not only the respect and admiration due a great scientist but also a deep affection for a great human being who possesses a rare combination of outstanding personal qualities We thank him for enriching our lives and we shall forever carry cherished memories of this noble man Scientists best express their thanks by contributing their thoughts and observations to a Festschrift This one honoring Sir Nevill fills three volumes with literally hundreds of authors meeting a strict deadline The fact that contributions poured in from all parts of the world attests to the international cohesion of our scientific community It is a tribute to Sir Nevill's stand for peace and understanding transcending national borders The editors wish to express their gratitude to Ghazaleh Koefod for her diligence and expertise in deciphering and typing many of the papers as well as helping in numerous other ways The blame for the errors that remain belongs to the editors

*Physics Of Non-conventional Energy Sources And Material Science For Energy - Proceedings Of The International Workshop* Giuseppe Furlan, A A M Sayigh, N A Mancini, Bernhard O Seraphin, 1987-06-01 An up to date account on the

advancement in science and technology and the most recent developments on materials used for solar energy devices is presented with detailed description in the following areas selective coating for heating and cooling photovoltaic conversion and comparison among single crystalline silicon concentrating cells and amorphous silicon and advance tendum coating for selective spectrum which can be used for greenhouse homes and in energy conservation

**Science And Technology Of An American Genius, The: Stanford R Ovshinsky** Brian Schwartz, Hellmut Fritzsche, 2008-10-09 This book highlights the achievements of the self taught inventor scientist manufacturer and entrepreneur Stanford R Ovshinsky This remarkable individual could without special training compete with the well funded establishments of learning and industry in the second half of the last century and leave us an incredible legacy of brilliant innovations with a lasting impact on our lives His achievements extend over amazingly diverse fields and have or are prone to create new industries of great societal value The phase change memories of commonly used rewritable CDs and DVDs as well as of new flash memories are his invention so are the Ni Metal hydride batteries which are the enabling batteries for electric and hybrid electric vehicles The future hydrogen economy will utilize his efficient and safe hydrogen storage alloys He has developed light and ultralight photovoltaic solar panels for converting sunlight into electricity and built the largest manufacturing facility for thin film flexible solar roofing materials A common theme of his inventions is the synthesis of new materials utilizing novel aspects of structural and compositional disorder The book explains for each of Ovshinsky s innovations the essence of his pioneering ideas and inventions These introductions are followed by a selection of Ovshinsky s seminal publications and for each subject category a list of his patents which reveal the inventive mind of this unusually creative person Ovshinsky s example of gaining a deep understanding of the science underlying his inventions his perseverance as well as his ability to attract and inspire talented collaborators will be a role model for entrepreneurs of this century

**Optical Materials** ,1987

**Proceedings of the 17th International Conference on the Physics of Semiconductors** J.D. Chadi, W.A. Harrison, 2013-12-01 The Proceedings of the 17th International Conference on the Physics of Semiconductors are contained in this volume A record 1050 scientists from 40 countries participated in the Conference which was held in San Francisco August 6 1 0 1984 The Conference was organized by the ICPS Committee and sponsored by the International Union of Pure and Applied Physics and other professional government and industrial organizations listed on the following pages Papers representing progress in all aspects of semiconductor physics were presented Far more abstracts 765 than could be presented in a five day meeting were considered by the International Program Committee A total of 350 papers consisting of 5 plenary 35 invited and 310 contributed were presented at the Conference in either oral or poster sessions All but a few of the papers were submitted and have been included in these Proceedings An interesting shift in subject matter in comparison with earlier Conferences is manifested by the large number of papers on surfaces interfaces and quantum wells To facilitate the use of the Proceedings in finding closely related papers among the sometimes relatively large number of contributions

within a main subject area we chose not to arrange the papers strictly according to the Conference schedule We have organized the book as can be seen from the Contents into specific subcategories and subdivisions within each major category Plenary and invited papers have been placed together with the appropriate contributed papers

**Effect of Disorder and Defects in Ion-Implanted Semiconductors: Optical and Photothermal Characterization**, 1997-06-12 Defects in ion implanted semiconductors are important and will likely gain increased importance as annealing temperatures are reduced with successive IC generations Novel implant approaches such as MdV implantation create new types of defects whose origin and annealing characteristics will need to be addressed Publications in this field mainly focus on the effects of ion implantation on the material and the modification in the implanted layer after high temperature annealing The editors of this volume and Volume 45 focus on the physics of the annealing kinetics of the damaged layer An overview of characterization techniques and a critical comparison of the information on annealing kinetics is also presented Provides basic knowledge of ion implantation induced defects Focuses on physical mechanisms of defect annealing Utilizes electrical physical and optical characterization tools for processed semiconductors Provides the basis for understanding the problems caused by the defects generated by implantation and the means for their characterization and elimination

**Scientific and Technical Aerospace Reports**, 1994

**Comprehensive Semiconductor Science and Technology**, 2011-01-28 Semiconductors are at the heart of modern living Almost everything we do be it work travel communication or entertainment all depend on some feature of semiconductor technology Comprehensive Semiconductor Science and Technology Six Volume Set captures the breadth of this important field and presents it in a single source to the large audience who study make and exploit semiconductors Previous attempts at this achievement have been abbreviated and have omitted important topics Written and Edited by a truly international team of experts this work delivers an objective yet cohesive global review of the semiconductor world The work is divided into three sections The first section is concerned with the fundamental physics of semiconductors showing how the electronic features and the lattice dynamics change drastically when systems vary from bulk to a low dimensional structure and further to a nanometer size Throughout this section there is an emphasis on the full understanding of the underlying physics The second section deals largely with the transformation of the conceptual framework of solid state physics into devices and systems which require the growth of extremely high purity nearly defect free bulk and epitaxial materials The last section is devoted to exploitation of the knowledge described in the previous sections to highlight the spectrum of devices we see all around us Provides a comprehensive global picture of the semiconductor world Each of the work s three sections presents a complete description of one aspect of the whole Written and Edited by a truly international team of experts

**Physics Of Semiconductors - Proceedings Of The 20th International Conference (In 3 Volumes)** E M Anastassakis, John D Joannopoulos, 1990-11-29 Gathering top experts in the field the 20th ICPS proceedings reviews the progress in all aspects of semiconductor physics The proceedings will include state of the art lectures with special emphasis

on exciting new developments It should serve as excellent material for researchers in this and related fields

**Semiconductors** T. F. Connolly, 2012-12-06 And often on request from the issuing installation USAEC reports are also available from International Atomic Energy Agency Kaerntnerring A 1010 Vienna Austria National Lending Library Boston Spa England Monographs and reports of the National Bureau 01 Standards are for sale by Superintendent of Documents U S Government Printing Office Washington D C 20402 Theses listed as Dissertation Abstracts number are available in North and South America from University Microfilms Dissertation Copies P O Box 1764 Ann Arbor Michigan 48106 and elsewhere from University Microfilms Ltd St John s Road Tylers Green Penn Buckinghamshire England Conlenls Addendum xiii 1 Information Centers and Other Services 1 2 Journals 3 3 Methods of Crystal Growth Books and Reviews 5 4 Semiconductors General Reviews and Bibliographies 11 5 1 V VI Compounds 21 6 li IV V2 Compounds 23 7 II V Compounds 29 a General Reviews and Bibliographies 29 b Zinc Compounds 30 1 Zn3P2 30 2 ZnAs 30 3 ZnSb 30 4 Zn Mixed Systems 31 c Cadmium Compounds 31 31 1 Cd3P2 2 Cd3As2 31 3 CdSb Cd3Sb2 33 37 8 li VI Compounds a General Reviews and Bibliographies 37 b Zinc Compounds 39 1 ZnO 39 Preparation and Properties 39 Electrical Properties 41 Optical Properties 45 Physical Properties and Structure 47 2 ZnS 49 3 ZnSe 52 4 ZnTe 54 5 Zn Mixed Systems 55 55 c Cadmium Compounds 55 1 CdS 2 CdSe 60 3 CdTe 61 4 CdTernaries 62 d Mercury Compounds 64

**Semiconductor Physics** Karlheinz Seeger, 2013-06-29 This book now in its eighth edition still has the character of a textbook with the emphasis on Physics I have refrained from sacrificing topics such as the Seebeck Thomson Peltier and quantum Hall effects although they do not have a large scale practical application The various kinds of field effect transistors such as HBT HEMT MODFET and the chip technology have not been considered because going into details would necessarily end up with referring the interested reader to commercially available computer programs i e to the Big Business world What is new compared with the previous edition In Chap 1 you will now find a short description of production processes of pure single crystal silicon which is nearly free of lattice defects In Sect 4 14 the calculation of current in a sample subject to combined de and high frequency ac fields is based on quantum mechanics rather than classical physics called photon assisted tunneling The calculation is applied to charge transport in quantum wires and dots in Chap 14 This chapter includes production methods for quantum dots in their regular arrangement and a dot laser which operates at room temperature In Chap 15 there is a new section on doped Fullerenes in view of a field effect transistor based on this material There are two more appendices One provides a calculation of the potentials in quantum wells and the other is a table of 38 semiconductors and semimetals with their characteristic data

Energy and the Environment A. A. M. Sayigh, 2012-12-02 As the governments and peoples of the world come to face the global impact of the technological revolution it is appropriate to consider the future of world energy supplies This conference approached the task not only of developing the means of tapping renewable energy sources but also of showing renewable energy to be a viable alternative to current harmful sources of energy Economic and educational problems were addressed along with the

scientific ones The development of alternative energy is of no use if it cannot be made economically viable or if people are not convinced of its advantages

Non-Crystalline Chalcogenides M.A. Popescu, 2006-04-11

The earliest experimental data on an oxygen free glass have been published by Schulz Sellack in 1870 1 Later on in 1902 Wood 2 as well as Meier in 1910 3 carried out the first researches on the optical properties of vitreous selenium The interest in the glasses that exhibit transparency in the infrared region of the optical spectrum rose at the beginning of the twentieth century Firstly were investigated the heavy metal oxides and the transparency limit was extended from the case of the classical oxide glasses up to wavelength In order to extend this limit above the scientists tried the chemical compositions based on the elements of the sixth group of the Periodic Table the chalcogens sulphur selenium and tellurium The systematic research in the field of glasses based on chalcogens called chalcogenide glasses started at the middle of our century In 1950 Frerichs 4 investigated the glass and published the paper New optical glasses transparent in infrared up to 12 Several years later he started the study of the selenium glass and prepared several binary glasses with sulphur 5 Glaze and co workers 6 developed in 1957 the first method for the preparation of the glass at the industrial scale while Winter Klein 7 published reports on numerous chalcogenides prepared in the vitreous state



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