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Electrochemical Phase Formation and Growth Steps Into God's Grace Taking Steps Toward God Soot Formation in Combustion The Left Behind Millennial Osteogenesis and Bone Regeneration Digest of Sewerage Enabling Acts of the State of California Evolution of Sleep Investigating the Earliest Stages of High-mass Star Formation The Formation and Early Evolution of Stars Physics, Formation and Evolution of Rotating Stars So It Is With Us The Craft of Strategy Formation Soviet Astronomy Formations of Colonial Modernity in East Asia Step by step Transactions - The Royal Society of Edinburgh Numerical Models of the Early Stages of Planet Formation Seasonal Modulation of Stages of Memory Formation Silver Soldering Simplified Protein Amyloid Aggregation Discovering the Brain Origins: From the Protosun to the First Steps of Life (IAU S345) Atomic Habits Silicon Chemical Etching Papers and Discussions Presented Before the [Coal] Division Modern Botany JJAP Practical Modelling of Dynamic Decision Making Geological Society of America Bulletin The Health Information Exchange Formation Guide Chemistry and Biology of Serpins p.ex.2 Biogeochemistry and Genomics of Silicification and Silicifiers The Physics of Galaxy Formation Development of in situ methods for process monitoring and control and characterization of Cu-Zn-Sn-S based thin films Carbon Dioxide Capture for Storage in Deep Geologic Formations - Results from the CO2 Capture Project Surface Science Reports The First Cell The Way to the League of Nations

Modern Botany Aug 09 2020 The present book is a text book on modern topics of Botany. The first chapter of this book is on plasma membrane, wherein, details of transport mechanism is discussed. There are three sections in this book. Section I deals with the biochemistry and metabolism. Section II covers developmental physiology and the Section III is on plant biotechnology. In this section, Ti plasmid, transposable elements and transgenic plants are discussed in details. In this book there are separate chapters on bioinformatics and biosignalling. The text of this book is based on biochemical, physiological and molecular aspects, along with the modern and emerging ideas in Botany.

JJAP Jul 08 2020

Silicon Chemical Etching Oct 11 2020 In the first contribution to this volume we read that the world-wide production of single crystal silicon amounts to some 2000 metric tons per year. Given the size of present-day silicon-crystals, this number is equivalent to 100000 silicon-crystals grown every year by either the Czochralski (80%) or the floating-zone (20%) technique. But, to the best of my knowledge, no coherent and comprehensive article has been written that deals with "the art and science", as well as the practical and technical aspects of growing silicon crystals by the Czochralski technique. The same could be said about the floating-zone technique were it not for the review article by W. Dietze, W. Keller and A. Miihlbauer which was published in the preceding Volume 5 ("Silicon") of this series (and for a monograph by two of the above authors published about the same time). As editor of this volume I am very glad to have succeeded in persuading two scien tists, W. Zulehner and D. Huber, of Wacker-Chemitronic GmbH - the world's largest producer of silicon-crystals - to write a comprehensive article about the practical and scientific aspects of growing silicon-crystals by the Czochralski method and about silicon wafer manufacture. I am sure that many scientists or engineers who work with silicon crystals -be it in the laboratory or in a production environment - will profit from the first article in this volume.

The Craft of Strategy Formation Oct 23 2021 Formulating a strategy is one of the most important but also one of the most difficult challenges faced by businesses: How may one translate a concern into a structured issue and the hypotheses for addressing that issue? How should one approach the designing and executing of the analyses through which these hypotheses can be tested, thus creating the insights from which new strategic options can be developed? And how can one identify the "best bets" from among the many different strategic options available, and determine how these may be translated into a coherent business strategy that the organization and its stakeholders can buy into? This book helps to answer these questions for the senior manager responsible for company strategy; the project manager who's been asked to chart and defend a new strategic course of action; and the student wishing to "learn the ropes" of strategy-creation. This book offers no theoretical strategy "frameworks". Nor does it propagate a specific strategy of any kind. It is, quite simply, a "cook book" describing a step-by-step, focused and fast approach for creating a new strategy at medium-sized and large businesses. It is a proven method used by top management consultants to help clients develop new strategies. The Craft of Strategy Formation provides a crisp account of the consecutive steps to take (and pitfalls to watch out for) when typically vague business concerns need to be translated into actionable strategy fast. Featuring the tried-and-tested analytical and organizational approach of top management consultants, this integral account of how strategy is crafted in practice offers a welcome break from traditional handbooks featuring largely isolated frameworks, tools and cases; highly theoretical academic treatises; and largely anecdotal "infotainment" books for the general reader.

Chemistry and Biology of Serpins Mar 04 2020 Proceedings of an International Symposium held in Chapel Hill, North Carolina, April 13-16, 1996

Taking Steps Toward God Sep 02 2022 Salvation is the first step in a person's spiritual journey, but it is just that, the first step. A person must not stop there. It is the intent of God to see all His children grow into spiritual maturity. The process of moving from spiritual infancy to maturity occurs by taking one step after another in the direction of God. This journey toward maturity is what the author means by the term "spiritual formation."It is important for Christians to have a guide to help them navigate the path leading to maturity. Dr. Hayes clears a path for spiritual sojourners to travel and provides assistance to those who are willing to take the journey. Not everyone is at the same place in this expedition. Some people who read this book will be at the very beginning of the journey. Some will be a little way down the path. Not everything in this book will be new to the more mature Christian, but they will make new discoveries if they pay attention to their guide.Jesus promised Christians can live in spiritual abundance. This can be achieved if the believer will put one foot in front of the other. Taking Steps Toward God will help readers to walk in the right direction.

Origins: From the Protosun to the First Steps of Life (IAU S345) Dec 13 2020 This comprehensive collection of reviews and research reports covers the processes involved in the formation of the Sun and Earth-like planets. Specific topics range from star formation to protoplanetary disks, planet formation, and the basics of life. It provides an interdisciplinary overview of the complex chain of events leading to habitable planets and life, covering research from the fields of astrophysics, astrochemistry, planetary sciences, chemistry, and biology, through theory, observations, and experiments. These observations reveal the chemistry and dust content of young disks, the location of water that is essential to life, and some of the dynamical processes that affect the growth of forming planets. IAU Symposium 345 reviews some of the most modern concepts in star and planet formation and is essential reading for students, teachers, and researchers who will someday answer humanity's biggest question: what is our origin?

The Formation and Early Evolution of Stars Jan 26 2022 Starburst regions in nearby and distant galaxies have a profound impact on our understanding of the early universe. This new, substantially updated and extended edition of Norbert Schulz's unique book "From Dust to Stars" describes complex physical processes involved in the creation and early evolution of stars. It illustrates how these processes reveal themselves from radio wavelengths to high energy X-rays and gamma–rays, with special reference towards high energy signatures. Several sections devoted to key analysis techniques demonstrate how modern research in this field is pursued and new chapters are introduced on massive star formation, proto-planetary disks and observations of young exoplanets. Recent advances and contemporary research on the theory of star formation are explained, as are new observations, specifically from the three great observatories of the Spitzer Space Telescope, the Hubble Space Telescope and the Chandra X-Ray Observatory which all now operate at the same time and make high resolution space based observing in its prime. As indicated by the new title two new chapters have been included on proto-planetary disks and young exoplanets. Many more colour images illustrate attractive old and new topics that have evolved in recent years. The author gives updates in theory, fragmentation, dust, and circumstellar disks and emphasizes and strengthens the targeting of graduate students and young researchers, focusing more on computational approaches in this edition.

Investigating the Earliest Stages of High-mass Star Formation Feb 24 2022

The Left Behind Millennial Jun 30 2022 "Siji, firstly let me congratulate you for producing this gem of succinct and incredibly useful information. This guidebook deserves to be snapped up by everyone contemplating starting a business, and even those who are new to business ownership and management, to check that they have ticked all the boxes appropriately, to optimize their company and for their protection."Margaret McKay, Professional Writer and Editor.THIS IS THE BUSINESS BOOK YOU'VE BEEN SEARCHING FOR!Do you have a gold mine business idea floating around in your head but not sure how to form it into a real business? Do you finally have your business plan written but not sure what the next step is to your success? Entrepreneurship is so rewarding when you have guidance on how to be a successful entrepreneur. However, there are crucial steps during the formation stage of your business that must be taken. These vital steps have a major impact on how successful your business will be going forward. The Left Behind Millennial: Business Formation Simplified, provides a simplified guide with reliable information compiled thru extensive research, professional consultations, and personal experience of the author. Siji has included a thorough compilation based on her journey through entrepreneurship that you will not find in any conventional business start-up book. She has shared tips for your success in this book that are pure GOLD.This book is a workbook and guide ALL IN ONE. It will hold your hand thru the business formation process. Siji Olufunwa has explicitly put together, the 12 most important business formation steps from: -Understanding your product and service niche-Branding-Trademarking-Creating a unique presence in your market industry and much more! You will learn how to think like a business owner making profit gaining decisions during the startup of your venture that will pay off once your business is in full swing. Siji Olufunwa is a passionate entrepreneur. She and her husband, Seun, co-founded two different businesses together, building her expertise in business formation. Her significant entrepreneurial experience is reflected in this explicable book. If you are ready to take a chance on yourself and your business idea, The Left Behind Millennial: Business Formation Simplified is ready to help you successfully form a legit, profit ready business venture. Let's Begin!

Transactions - The Royal Society of Edinburgh Jun 18 2021

Numerical Models of the Early Stages of Planet Formation May 18 2021 In the earliest stages of planet formation micrometer-sized dust grains collide and gradually build up kilometer-sized planetesimals, bodies that are so large that they can attract each other directly by gravity. This is an important landmark on the way to real planets because of the change to gravity-dominated growth. The road from boulders to planetesimals is however poorly known. Boulders have poor sticking properties and spiral into the young star due to the head wind from the slower rotating gas. This work presents the first detailed computer simulations of the motion of dust and boulders in turbulent protoplanetary discs. The turbulent diffusion coefficient of small dust grains is measured to be surprisingly high, whereas larger boulders concentrate by up to two orders of magnitude in transient high pressure regions that arise spontaneously in magnetorotational turbulence. The coupled motion of boulders and gas is found to be linearly unstable to the so-called streaming instability, leading to a turbulent state that is characterised by dense clumps of boulders that shield each other against the head wind of the gas.

*Carbon Dioxide Capture for Storage in Deep Geologic Formations - Results from the CO2 Capture Project Sep 29 2019 Over the past decade, the prospect of climate change resulting from anthropogenic CO2 has become a matter of growing public concern. Not only is the reduction of CO2 emissions extremely important, but keeping the cost at a manageable level is a prime priority for companies and the public, alike. The CO2 capture project (CCP) came together with a common goal in mind: find a technological process to capture CO2 emissions that is relatively low-cost and able be to be expanded to industrial applications. The Carbon Dioxide Capture and Storage Project outlines the research and findings of all the participating companies and associations involved in the CCP. The final results of thousands of hours of research are outlined in the book, showing a successful achievement of the CCP's goals for lower cost CO2 capture technology and furthering the safe, reliable option of geological storage. The Carbon Dioxide Capture and Storage Project is a valuable reference for any scientists, industrialists, government agencies, and companies interested in a safer, more cost-efficient response to the CO2 crisis. *Succeeds in tackling the most important issues at the heart of the CO2 crisis: lower-cost and safer solutions, and making the technology available at an industrial level. *Contains technical papers and findings of all researchers involved in the CO2 capture and storage project (CCP) *Consolidates thousands of hours of research into a concise and valuable reference work, providing up-to-the minute information on CO2 capture and underground storage alternatives.*

The Way to the League of Nations Jun 26 2019

Digest of Sewerage Enabling Acts of the State of California Apr 28 2022

Soviet Astronomy Sep 21 2021

Formations of Colonial Modernity in East Asia Aug 21 2021 The essays in Formations of Colonial Modernity in East Asia challenge the idea that notions of modernity and colonialism are mere imports from the West, and show how colonial modernity has evolved from and into unique forms throughout Asia. Although the modernity of non-European colonies is as indisputable as the colonial core of European modernity, until recently East Asian scholarship has tried to view Asian colonialism through the paradigm of colonial India (for instance), failing to recognize anti-imperialist nationalist impulses within differing Asian countries and regions. Demonstrating an impatience with social science models of knowledge, the contributors show that binary categories focused on during the Cold War are no longer central to the project of history writing. By bringing together articles previously published in the journal positions: east asia cultures critique, editor Tani Barlow has demonstrated how scholars construct identity and history, providing cultural critics with new ways to think about these concepts—in the context of Asia and beyond. Chapters address topics such as the making of imperial subjects in Okinawa, politics and the body social in colonial Hong Kong, and the discourse of decolonization and popular memory in South Korea. This is an invaluable collection for students and scholars of Asian studies, postcolonial studies, and anthropology. Contributors. Charles K. Armstrong, Tani E. Barlow, Fred Y. L. Chiu, Chungmoo Choi, Alan S. Christy, Craig Clunas, James A. Fujii, James L. Hevia, Charles Shiro Inouye, Lydia H. Liu, Miriam Silverberg, Tomiyama Ichiro, Wang Hui

Atomic Habits Nov 11 2020 The #1 New York Times bestseller. Over 4 million copies sold! Tiny Changes, Remarkable Results No matter your goals, Atomic Habits offers a proven framework for improving--every day. James Clear, one of the world's leading experts on habit formation, reveals practical strategies that will teach you exactly how to form good habits, break bad ones, and master the tiny behaviors that lead to remarkable results. If you're having trouble changing your habits, the problem isn't you. The problem is your system. Bad habits repeat themselves again and again not because you don't want to change, but because you have the wrong system for change. You do not rise to the level of your goals. You fall to the level of your systems. Here, you'll get a proven system that can take you to new heights. Clear is known for his ability to distill complex topics into simple behaviors that can be easily applied to daily life and work. Here, he draws on the most proven ideas from biology, psychology, and neuroscience to create an easy-to-understand guide for making good habits inevitable and bad habits impossible. Along the way, readers will be inspired and entertained with true stories from Olympic gold medalists, award-winning artists, business leaders, life-saving physicians, and star comedians who have used the science of small habits to master their craft and vault to the top of their field. Learn how to: make time for new habits (even when life gets crazy); overcome a lack of motivation and willpower; design your environment to make success easier; get back on track when you fall off course; ...and much more. Atomic Habits will reshape the way you think about progress and success, and give you the tools and strategies you need to transform your habits--whether you are a team looking to win a championship, an organization hoping to redefine an industry, or simply an individual who wishes to quit smoking, lose weight, reduce stress, or achieve any other goal.

Steps Into God's Grace Oct 03 2022 Are you confused, afraid or suffering? Do you feel burdened by guilt or shame over past or present failures? Do you struggle with painful life circumstances that you feel powerless to control? Do you wonder where God is and why He doesn't seem to help? Do you feel confused about the promise of abundant life and wonder why you're missing out? You are not alone. I began life with many hopes and dreams, yet over time I felt beaten and battered by life circumstances or my poor choices. Confused and overwhelmed, I forced myself to conform my outside to what was expected of me by trying to achieve greater accomplishments, acquire more things and perfect my image. Yet inside, despite all this effort, I was filled with sadness, emptiness, insecurity and loneliness. So began my quest to find hope and peace in my life. Trusting in Jesus Christ as my Lord and Savior, studying the Bible, participating in 12 Step recovery programs and learning to listen and respond to the loving wisdom of the Holy Spirit caused significant changes in my life. I have personally experienced God's healing from shame and guilt of my past and freedom from the need for approval from others. Now that I live with a desperate dependence on God alone, I have peace I never had before. The journey was not easy. I encountered, and continue to encounter, many obstacles. But daily God convinces me that He is my only hope. That is why I'm inviting you to join me and enter into a similar transformational, discipleship journey with God. On this journey we will not just be students who learn more information, but disciples who, empowered by the Holy Spirit, learn the Truth, the Way and the Life. On the journey we will have our thinking challenged, our understanding expanded, our hearts opened and our wounds healed. We will become participants, not spectators, in God's plan and purpose. My prayer for you is that along the way, God will help you recover the truth of who you really are and who He is. I pray also that you will grow in your trust of Him as you come to know His goodness and unfailing love for you. As we take this journey together, I pray you will mysteriously and miraculously experience the healing power of God in your life. I pray you will enter into a love relationship with Him that is more amazing than you ever imagined or hoped for as He redeems, heals and restores you to your true identity and inheritance as His child living in His Kingdom of Grace.

Papers and Discussions Presented Before the [Coal] Division Sep 09 2020

Biogeochemistry and Genomics of Silicification and Silicifiers Jan 02 2020

Soot Formation in Combustion Aug 01 2022 Soot Formation in Combustion represents an up-to-date overview. The contributions trace back to the 1991 Heidelberg symposium entitled "Mechanism and Models of Soot Formation" and have all been reedited by Prof. Bockhorn in close contact with the original authors. The book gives an easy introduction to the field for newcomers, and provides detailed treatments for the specialists. The following list of contents illustrates the topics under review:

The Health Information Exchange Formation Guide Apr 04 2020 Winner of HIMSS 2011 Book of the Year Award! Health Information Exchange is an essential enabler that, when properly implemented, will improve the overall efficiency of the healthcare delivery process, lead directly to improved patient outcomes and be a significant influence on lowering the high costs currently associated with delivering healthcare. This book provides a practical, step-by-step approach to forming an HIE

in your state, region or community. Based on extensive research and the authors' own direct experiences as HIE consultants, this book describes a structured approach to forming an HIE, one that incorporates leading practices that have helped other organizations as they journeyed through the planning and formation stages and then moved on to successful operations. The book includes a high-level overview if HIE, followed by a brief discussion of why it is so important. It then describes the essential steps involved in planning and forming an HIE. The book also includes examples, checklists and resources.

p.ex.2 Feb 01 2020

Development of in situ methods for process monitoring and control and characterization of Cu-Zn-Sn-S based thin films Oct 30 2019 In recent years, kesterite Cu2ZnSnS4 (CZTS) has become an interesting alternative to copper indium gallium (di)selenide (CIGS) due to its non-toxic and earth abundant constituents. A variety of methods is being used to fabricate kesterite thin films, such as coevaporation, sputtering, electrodeposition, spray pyrolysis and others. Most of them include an annealing step to stimulate elemental mixing and interdiffusion. Although conversion efficiencies of kesterite solar cells have increased among different research groups, the record value of 12.6% set by IBM in 2014 has not been broken yet. Therefore, experimental and theoretical studies are needed to predict the effect of the secondary phases and detrimental defects on the electronical properties of the CZTS based solar devices. The work presented here studies non-destructive techniques for in situ process control and monitoring. With the aim to detect phases and phase transitions to optimize crucial processing steps such as pre-annealing of metal precursors, high temperature annealing and vacuum deposition of Cu-Sn-Zn-S based thin films. The research consists of three parts in which Raman spectroscopy, X-ray diffraction (XRD) and reflectometry are used to explore this objective. In the first part Raman spectroscopy is investigated as an in situ monitoring technique during high temperature annealing of thin films. It investigates whether the occurrence of CZTS can be monitored when it is created from annealing a Mo/CTS/ZnS layered thin film. CuS, SnS, ZnS and CTS (Cu-Sn-S) films are prepared by physical vapor deposition. The Raman scattering intensity was compared to investigate whether their specific vibrational modes can be distinguished from each other at room temperature. Then, the CTS film is annealed between 50 and 550 °C in order to investigate whether CTS vibrational modes can be identified at elevated temperatures and to see which transitions take place within the thin film. Also, a CZTS reference film is annealed between 50 and 550 °C for reference purposes. The temperature dependence of the main CZTS modes is examined to investigate whether it can be used for in situ temperature control. Finally, a ZnS layer is deposited on the unannealed CTS film to obtain a Mo/CTS/ZnS layered film. This film is used to study the conversion of CTS/ZnS into CZTS at elevated temperatures. It was found that Raman spectroscopy can successfully be used to monitor formation of CZTS by identifying its main vibrational mode during the annealing process. The intensity of the CTS modes reduces at elevated temperatures. At 450 °C, the main CZTS mode at 338 cm-1 can be clearly identified. The second part also focuses on high temperature annealing. However, in this part the focus lies on annealing of the metal precursor films. It is explored whether specific alloys benefit or hinder the formation of secondary phases during formation of the CZTS absorber films. Also, to what extent this influences solar cell performance. In situ XRD was investigated for in situ monitoring of the pre-annealing process. Cu-poor metal precursor films are prepared by sputtering deposition. The precursors are annealed at 150 °C, 200 °C, 300 °C and 450 °C in a three zone tube furnace. The effect on the structural properties is analysed by XRD to study the formation mechanism of alloys. The precursor films are then sulfurized in a three zone tube furnace. The structural properties of the absorber are analysed and correlated with structures in the precursor. It is found that formation of SnS2 in the absorber is proportional to the remaining Sn in the pre-annealed precursor. Also, electron micrographs showed that pre-annealing temperature influences grain growth and surface precipitation of Sn-S and Zn-S. Pre-annealed absorbers at 450 °C did not exhibit these phases on the surface. Solar devices are fabricated from the absorber films and best performing devices were obtained from pre-annealed absorbers at 450 °C. They showed absence of Sn and SnS2 in, respectively, the precursor and absorber. It could be concluded that SnS2 phases are detrimental to device efficiency and that SnS2 XRD peak intensity follows an inverse proportionality with device efficiency. The third part explores reflectometry as a method to monitor a growing film during thermal evaporation in a physical vapor deposition (PVD) system. A set of six CZTS absorbers is examined by ex situ Raman spectroscopy and reflectometry to study the influence of secondary phases CuS and ZnS on reflection spectra. Composition strongly influences reflection spectra and CuS leaves a characteristic dip in the reflection spectrum at about 600 nm. An integration method was used to analyze this phenomenon quantitatively. Subsequently, a reflectometry setup is designed, developed and integrated in the PVD system. Four different CZTS co-evaporated and multi-layered films are deposited. Structural, morphological and vibrational properties are investigated. The reflection spectra are monitored during deposition and time-dependent reflection spectra are analyzed for characteristic aspects related to properties such as thickness, band gap and phase formation. CuS could not be detected in the films by the integration method due to the superposition of the CuS dip with developing interference fringes during film growth. However, in multilayered CTS/ZnS film it is found that the onset of ZnS deposition can be detected by increased reflection intensity due to reduced surface roughness. Additionally, the shifting onset of the interference fringes to lower photon energies can be used as a characteristic fingerprint during the deposition process. In conclusion, this work showed that Raman spectroscopy, XRD and reflectometry could be successfully implemented for in situ process control and monitoring of high temperature annealing and vacuum deposition of Cu-Sn-Zn-S based precursors and absorbers. The application of these in situ techniques can lead to the optimization of thin film material properties and solar cells. As such, this study has paved the way for further improvement of Cu-Sn-Zn-S based precursors and thin film absorbers. Innerhalb der letzten Jahre hat sich Kesterit Cu2ZnSnS4 (CZTS) aufgrund seiner ungiftigen Bestandteile und deren hoher Verfügbarkeit zu einer interessanten Alternative zu Kupfer Indium Gallium (di-)Selenid (CIGS) entwickelt. Zur Herstellung von Kesterit Dünnschichten wird eine Vielzahl von Methoden verwendet wie Ko-Verdampfung, Sputtern, Elektrodeposition, Spray Pyrolyse und andere. Die meisten davon beinhalten einen Temper-Schritt um die Durchmischung und Interdiffusion der Elemente zu stimulieren. Obwohl der Wirkungsgrad der Kernterit Solarzellen von verschiedenen Forschungsgruppen erhöht wurde, ist der Rekordwert von IBM von 12,6 % noch nicht gebrochen worden. Daher werden experimentelle und theoretische Studien benötigt, die den Einfluss von Fremdphasen und schädlichen Defekten auf die elektronischen Eigenschaften der CZTS Solarzellen vorhersagen. Die vorliegende Arbeit untersucht zerstörungsfreie Methoden für die in situ Prozesskontrolle und -überwachung. Dabei ist das Ziel, entscheidende Prozessschritte wie das Vortempern der Metall-Vorläufer sowie das Hochtemperatur-Tempern und die Vakuum-Abscheidung von Cu-Sn-Zn-S basierten Schichten zu optimieren. Die Untersuchung besteht aus drei Teilen, in denen Raman-Spektroskopie, Röntgendiffraktion (XRD) und Reflektometrie benutzt werden um dieses Ziel zu erreichen. Im ersten Teil wird die Ramanspektroskopie als in situ Methode zur Überwachung des Hochtemperatur-Temperns von Dünnschichten betrachtet. Es wird untersucht, ob das Entstehen von CZTS beim Tempern von gestapelten Mo/CTS/ZnS Dünnschichten beobachtet werden kann. CuS, SnS, ZnS und CTS (Cu-Sn-S) Schichten werden durch physikalische Gasabscheidung hergestellt. Die Intensität der Raman Streuung wurde vergleichen um zu untersuchen, ob die spezifischen Vibrations-Moden bei Raumtemperatur voneinander unterschieden werden können. Dann werden die CTS Schichten zwischen 50 °C und 550 °C getempert um zu untersuchen, ob die CTS Vibrations-Moden bei höheren Temperaturen identifiziert werden können und um festzustellen, welche Übergänge innerhalb der Schicht auftreten. Außerdem wurde eine CZTS Referenzschicht zwischen 50 °C und 550 °C für Referenzzwecke getempert worden. Die Temperaturabhängigkeit der CZTS Haupt-Moden werden betrachtet, um zu untersuche, ob sie für die in situ Temperaturüberwachung verwendet werden können. Abschließend wurde eine ZnS Schicht auf einem nicht getemperten CTS Film abgeschieden, um eine gestapelte Mo/CTS/ZnS Schicht zu erhalten. Diese Schicht wird verwendet, um die Umwandlung von CTS/ZnS zu CZTS bei erhöhten Temperaturen zu untersuchen. Es wurde festgestellt, dass Raman Spektroskopie erfolgreich verwendet werden kann, um die Bildung von CZTS zu überwachen, indem die Haupt-Vibrations-Moden während des Temperns identifiziert werden. Die Intensität der CTS Moden verringert sich bei höheren Temperaturen. Bei 450 °C kann die CZTS Hauptmode bei 338 cm-1 klar identifiziert werden. Der zweite Teil konzentriert sich ebenfalls auf das Hochtemperatur-Tempern. In diesem Teil liegt der Fokus allerdings auf dem Tempern der Metal-Vorläufer-Schichten. Es wird erforscht, ob bestimmte Legierungen die Entstehung von Fremdphasen während der Entstehung der CZTS Absorberschichten begünstigen oder hemmen und welchen Einfluss dies auf die Leistung der Solarzelle hat. In situ XRD wird verwendet, um die Prozesse des Vortemperns zu überwachen. Kupfer arme Metall-Vorläufer-Schichten werden durch Sputtern aufgetragen. Die Vorläufer werden bei 150 °C, 200 °C, 300 °C und 450 °C in einem Drei-Zonen-Röhren-Ofen getempert. Die Auswirkungen auf die strukturellen Eigenschaften werden mit XRD analysiert, um den Entstehungsmechanismus der Legierungen zu untersuchen. Die Vorläuferschichten werden dann in einem Drei-Zonen-Röhren-Ofen sulfurisiert. Die strukturellen Eigenschaften des Absorbers werden analysiert und mit der Struktur der Vorläufer korreliert. Es wurde festgestellt, dass die Entstehung von SnS2 im Absorber proportional zum verbleibenden Sn im vorgetemperten Vorläufer ist. Außerdem zeigen Bilder des Rasterelektronenmikroskops, dass die Temperatur des Vortemperns das Kornwachstum und das Abschieden von Sn-S und Zn-S an der Oberfläche beeinflusst. Bei 450 °C vorgetemperte Absorber weisen keine dieser Phasen an der Oberfläche auf. Solarzellen werden aus diesen Absorber-Schichten hergestellt und die besten Zellen entstanden aus den bei 450 °C vorgetemperten Absorbern. Bei diesen traten Sn und SnS2 weder im Vorläufer noch im Absorber auf. Es konnte geschlussfolgert werden, dass SnS2 Phasen schädlich für den Wirkungsgrad der Zellen sind und dass die Intensität der SnS2 XRD Peaks invers proportional zum Wirkungsgrad der Zellen ist. Der dritte Teil erforscht die Reflektometrie als Methode zur Überwachung des Schichtwachstums während des thermischen Verdampfens in einer Anlage zur physikalischen Gasabscheidung (PVD). Ein Satz aus sechs CZTS Absorbern wird mittels ex situ Raman-Spektroskopie und Reflektometrie vermessen, um den Einfluss der Fremdphasen CuS und ZnS auf die Reflexionsspektren zu untersuchen. Die Zusammensetzung beeinflusst die Reflexionsspektren stark und CuS hinterlässt eine charakteristische Senkung bei 600 nm im Reflexionsspektrum. Eine Integrationsmethode wurde verwendet um dieses Phänomen quantitativ zu analysieren. Anschließend wurde ein Reflektometrieaufbau entworfen, entwickelt und in die PVD-Anlage integriert. Vier verschiedene CZTS koverdampfte und Mehrschicht-Filme wurden abgeschieden. Strukturelle, morphologische und Vibrationseigenschaften werden untersucht. Die Reflexionsspektren werden während des Abscheidens aufgenommen und zeitabhängige Reflexionsspektren werden auf charakteristische Aspekte im Zusammenhang mit Eigenschaften wie Dicke, Bandlücke und Entstehung von Phasen untersucht. CuS konnte in den Schichten mit der Integrations-Methode wegen der Überlagerung der CuS Senkung mit dem entstehenden Interferenzmuster nicht detektiert werden. Allerdings wurde in gestapelten CTS/ZnS Schichten beobachtet werden, dass der Beginn der ZnS Abscheidung durch eine ansteigende Intensität der Reflektion aufgrund der verringerten Oberflächenrauigkeit detektiert werden kann. Zusätzlich kann die Verschiebung des Startpunkts der Interferenzen zu niedrigeren Photonenenergien als charakteristischer Fingerabdruck während des Abscheidungsprozesses verwendet werden. Zusammenfassend zeigt diese Arbeit, dass Raman-Spektroskopie, XRD und Reflektrometrie erfolgreich als in situ Prozesskontrolle und –überwachung bei Hochtemperatur-Tempern und Vakuum-Abscheidung von Cu-Sn-Zn-S basierten Vorläufern und Absorbern realisiert werden konnten. Die Anwendung dieser in situ Techniken kann zu einer Optimierung der Eigenschaften von Dünnschicht-Materialien und von Solarzellen führen. Als solche hat diese Untersuchung den Weg für weitere Verbesserung von Cu-Sn-Zn-S basierte Vorläufer und Dünnschicht-Absorber geebnet.

Protein Amyloid Aggregation Feb 12 2021 This detailed volume focuses on methods for the characterization of aggregation processes that lead to the formation of amyloid fibrils and amyloid oligomers which feature in the etiology of a variety of human disorders collectively known as amyloidoses. The scope of the collection includes techniques for visualizing early steps on the amyloid formation pathway, methods for capturing and characterizing oligomeric, potentially toxic, intermediates, strategies for preparing and characterizing mature amyloid fibrils and approaches for understanding templating and transmission of amyloid aggregates. Written in the highly successful Methods in Molecular Biology series format, the chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Protein Amyloid Aggregation: Methods and Protocols serves as an ideal guide for biochemists and biophysicists with an interest in elucidating the mechanisms of protein amyloid formation, as well as chemists, pharmacologists and clinicians with an interest in leveraging an understanding of such mechanisms for the purpose of therapeutic development.

Discovering the Brain Jan 14 2021 The brain ... There is no other part of the human anatomy that is so intriguing. How does it develop and function and why does it sometimes, tragically, degenerate? The answers are complex. In Discovering the Brain, science writer Sandra Ackerman cuts through the complexity to bring this vital topic to the public. The 1990s were declared the "Decade of the Brain" by former President Bush, and the neuroscience community responded with a host of new investigations and conferences. Discovering the Brain is based on the Institute of Medicine conference, Decade of the Brain: Frontiers in Neuroscience and Brain Research. Discovering the Brain is a "field guide" to the brainâ€"an easy-to-read discussion of the brain's physical structure and where functions such as language and music appreciation lie. Ackerman examines: How electrical and chemical signals are conveyed in the brain. The mechanisms by which we see, hear, think, and pay attentionâ€"and how a "gut feeling" actually originates in the brain. Learning and memory retention, including parallels to computer memory and what they might tell us about our own mental capacity. Development of the brain throughout the life span, with a look at the aging brain. Ackerman provides an enlightening chapter on the connection between the brain's physical condition and various mental disorders and notes what progress can realistically be made toward the prevention and treatment of stroke and other ailments. Finally, she explores the potential for major advances during the "Decade of the Brain," with a look at medical imaging techniquesâ€"what various technologies can and cannot tell usâ€"and how the public and private sectors can contribute to continued advances in neuroscience. This highly readable volume will provide the public and policymakersâ€"and many scientists as wellâ€"with a helpful guide to understanding the many discoveries that are sure to be announced throughout the "Decade of the Brain."

So It Is With Us Nov 23 2021 The 12 steps are a powerful tool to bring anyone into a deeper, more meaningful and authentic relationship with God. Who of us, at one time or another, hasn't wanted to be closer to God, to be used by Him in a more powerful way, and to achieve victory over the sins that ensnare us? What the steps offer us as Christians is a simple set of tools to apply Christ's teaching to our lives. So It Is With Us is a simple and effective guide for anyone who wants a deeper and more effective relationship with God. The 12 steps have been modified by David Ray, a lawyer and theologian who took the 12 steps to recover from his own addiction.

Practical Modelling of Dynamic Decision Making Jun 06 2020 This book presents TDF (Tactics Development Framework), a practical methodology for eliciting and engineering models of expert decision-making in dynamic domains. The authors apply the BDI (Beliefs, Desires, Intentions) paradigm to the elicitation and modelling of dynamic decision making expertise, including team behaviour, and map it to a diagrammatic representation that is intuitive to domain experts. The book will be of value to researchers and practitioners engaged in dynamic decision making.

Seasonal Modulation of Stages of Memory Formation Apr 16 2021

Evolution of Sleep Mar 28 2022

Physics, Formation and Evolution of Rotating Stars Dec 25 2021 Rotation is ubiquitous at each step of stellar evolution, from star formation to the final stages, and it affects the course of evolution, the timescales and nucleosynthesis. Stellar rotation is also an essential prerequisite for the occurrence of Gamma-Ray Bursts. In this book the author thoroughly examines the basic mechanical and thermal effects of rotation, their influence on mass loss by stellar winds, the effects of differential rotation and its associated instabilities, the relation with magnetic fields and the evolution of the internal and surface rotation. Further, he discusses the numerous observational signatures of rotational effects obtained from spectroscopy and interferometric observations, as well as from chemical abundance determinations, helioseismology and asteroseismology, etc. On an introductory level, this book presents in a didactical way the basic concepts of stellar structure and evolution in "track 1" chapters. The other more specialized chapters form an advanced course on the graduate level and will further serve as a valuable reference work for professional astrophysicists.

Surface Science Reports Aug 28 2019

Step by step Jul 20 2021

The Physics of Galaxy Formation Dec 01 2019 This thesis addresses two of the central processes which underpin the formation of galaxies: the formation of stars and the injection of energy into the interstellar medium from supernovae, called feedback. In her work Claudia Lagos has completely overhauled the treatment of these processes in simulations of galaxy formation. Her thesis makes two major breakthroughs, and represents the first major steps forward in these areas in more than a decade. Her work has enabled, for the first time, predictions to be made which can be compared against new observations which probe the neutral gas content of galaxies, opening up a completely novel way to constrain the models. The treatment of feedback from supernovae, and how this removes material from the interstellar medium, is also likely to have a lasting impact on the field. Claudia Lagos Ph.D. thesis was nominated by the Institute for Computational Cosmology at Durham University as an outstanding Ph.D. thesis 2012.

Osteogenesis and Bone Regeneration May 30 2022 Osteogenesis is a core component of the skeletal system and depends on the well-coordinated proliferation and differentiation of osteogenic cells. Multiple signaling pathways and transcriptional factors tightly regulate the process of osteogenesis. Any abnormities in bone formation could cause severe disorders such as osteogenesis imperfecta and osteoporosis. Bone regeneration, a complex and well-orchestrated physiological process of osteogenesis, remains a medical challenge in the field of orthopedics and maxillofacial surgery. This book provides an overview of the current developments in osteogenesis and bone regeneration, including molecular and cellular mechanisms, physical therapies (low-level laser, distraction osteogenesis), biological therapies (mesenchymal stem cells, stem cell derived exosomes, inflammatory factor, Chinese medicine), as well as tissue engineering approaches promoting bone regeneration by targeting osteogenesis.

Electrochemical Phase Formation and Growth Nov 04 2022 Electrochemical processes and methods are basic to many important scientific disciplines, materials science and nanotechnology being only two keywords. For the first time in more than twenty years this volume presents a critical survey of the foundations, methodology and applications of electrochemical phase formation and growth processes. Written by a team of three internationally renowned authors, it is an invaluable source of information for all scientists concerned with electrocrystallization of metals or the in-situ characterization of electron-conducting surfaces. Not only the numerous illustrations (partly in colour) but also the vast number of references covering the literature up to and including 1995 make this volume indispensable for every laboratory working in electrochemical or materials science.

The First Cell Jul 28 2019 This book introduces a fresh perspective on the conditions for the genesis of the first cell. An important possible environment of the prehistoric Earth has long been overlooked as a host to the perfect biochemical conditions for this process. The first complexes of continental crust on the early Earth must have already contained systems of interconnected cracks and cavities, which were filled with volatiles like water, carbon dioxide and nitrogen. This book offers insights into how these conditions may have provided the ideal physical and chemical setting for the formation of protocells and early stages of life. The authors support their hypothesis with a number of astonishing findings from laboratory experiments focusing on a variety of organic compounds, and on the formation of key cellular ingredients and of primitive cell-like structures. Moreover, they discuss the principles of prebiotic evolution regarding the aspects of order and complexity. Guiding readers through various stages of hypotheses and re-created evolutionary processes, the book is enriched with personal remarks and experiences throughout, reflecting the authors' personal quest to solve the mystery surrounding the first cell.

Geological Society of America Bulletin May 06 2020 Vols. 1-44 include Proceedings of the annual meeting, 1889-1933, later published separately.

Silver Soldering Simplified Mar 16 2021 Popular jewelry designer and instructor Scott David Plumlee shows readers how to create 24 intricate-looking earrings, bracelets, and necklaces at home with a new quick and easy soldering technique. An

innovative new material is turning traditional soldering upside down. Scott David Plumlee, author of Handcrafting Chain and Bead Jewelry, teaches jewelry makers how to use a revolutionary new soldering paste and a small hand-held butane torch to create a range of seemingly complex but easily doable chain and bead designs at their kitchen table--no elaborate, expensive studio required. Scott's ingenious methods, clear instruction, and inspiring designs will give any aspiring jewelry maker the confidence to master this formerly intimidating technique.