

# Fractal Architecture Design For Sustainability

A lavishly photographed book takes readers on a visual tour of twenty-two energy-efficient, environmentally friendly homes and their surrounding landscapes, exploring a rammed earth neighborhood, a two-story Victorian-style straw bale house, and a recycled concrete coastal retreat, among other alternative living spaces. Reprint.

Embracing a biological and evolutionary perspective to explain the human experience of place, *Urban Experience and Design* explores how cognitive science and biometric tools provide an evidence-based foundation for architecture and planning. Aiming to promote the creation of a healthier and happier public realm, this book describes how unconscious responses to stimuli, outside our conscious awareness, direct our experience of the built environment and govern human behavior in our surroundings. This collection contains 15 chapters, including contributions from researchers in the US, the UK, the Netherlands, France and Iran. Addressing topics such as the impact of eye-tracking analysis and seeing beauty and empathy within buildings, *Urban Experience and Design* encourages us to reframe our understanding of design, including the narrative of how modern architecture and planning came to be in the first place. This volume invites students, academics and scholars to see how cognitive science and biometric findings give us remarkable 21st-century metrics for evaluating and improving designs, even before they are built.

Fractal analysis is a method for measuring, analysing and comparing the formal or geometric properties of complex objects. In this book it is used to investigate eighty-five buildings that have been designed by some of the twentieth-century's most respected and celebrated architects. Including designs by Le Corbusier, Eileen Gray, Frank Lloyd Wright, Robert Venturi, Frank Gehry, Peter Eisenman, Richard Meier and Kazuyo Sejima amongst others, this book uses mathematics to analyse arguments and theories about some of the world's most famous designs. Starting with 625 reconstructed architectural plans and elevations, and including more than 200 specially prepared views of famous buildings, this book presents the results of the largest mathematical study ever undertaken into architectural design and the largest single application of fractal analysis presented in any field. The data derived from this study is used to test three overarching hypotheses about social, stylistic and personal trends in design, along with five celebrated arguments about twentieth-century architecture. Through this process the book offers a unique mathematical insight into the history and theory of design.

Throughout history, nature has served as an inspiration for architecture and designers have tried to incorporate the harmonies and patterns of nature into architectural form. Alberti, Charles Renee Macintosh, Frank Lloyd Wright, and Le Courbusier are just a few of the well-known figures who have taken this approach and written on this theme. With the development of fractal geometry--the study of intricate and interesting self-similar mathematical patterns--in the last part of the twentieth century, the quest to replicate nature's creative code took a stunning new turn. Using computers, it is now possible to model and create the organic, self-similar forms of nature in a way never previously realized. In *Fractal Architecture*, architect James Harris presents a definitive, lavishly illustrated guide that explains both the "how" and "why" of incorporating fractal geometry into architectural design.

*Sustainable liveable architecture*

*Designing Buildings for People*

*Water, Design, and Environmental Futures*

*The Handbook of Design for Sustainability*

*Nexus Network Journal 11,2*

*Criteria, Process, and Case Studies for Integrating Site and Region in Landscape Design*

New buildings can be designed to be solar oriented, naturally heated and cooled, naturally lit and ventilated, and made with renewable, sustainable materials—no matter the location or climate. In this comprehensive overview of passive solar design, two of America's solar pioneers give homeowners, architects, designers, and builders the keys to successfully harnessing the sun and maximizing climate resources for heating, cooling, ventilation, and daylighting. Bainbridge and Haggard draw upon examples from their own experiences, as well as those of others, of more than three decades to offer both overarching principles as well as the details and formulas needed to successfully design a more comfortable, healthy, and secure place in which to live, laugh, dance, and be comfortable. Even if the power goes off. *Passive Solar Architecture* also discusses "greener" and more-sustainable building materials and how to use them, and explores the historical roots of green design that have made possible buildings that produce more energy and other resources than they use.

This book informs and educates readers about sustainable development management, approaches and applications in manufacturing processes and presents the trends to the next economic and social paradigm: the Industry 5.0 and Society 5.0. Educational aspects, case studies from various companies, together with the analysis and synthesis of the literature and empirical experiences, define the content of the eleven chapters. Thus, this material could be considered as a starting point and foundation for researchers and practitioners interested in the present state and the evolution of the manufacturing systems. The book offers various points of view regarding the actual digital transformation of the manufacturing system.

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Case Studies and Practical Solutions

Green Building Design and Delivery

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Passive Solar Architecture

Congregations, Their Buildings, and Creation Care

1991 Solar World Congress

Unlike the mechanistic buildings it replaces, Eco-Architecture is in harmony with nature, including its immediate environs. Eco-Architecture makes every effort to minimise the use of energy at each stage of the building's life cycle, including that embodied in the extraction and transportation of materials, their fabrication, their assembly into the building and ultimately the ease and value of their recycling when the building's life is over. Featuring papers from the First International Conference on Harmonisation between Architecture and Nature, the text brings together papers of an inter-disciplinary nature, and will be of interest to engineers, planners, physicists, psychologists, sociologists, economists, and other specialists, in addition to architects. Featured topics include: Historical and Philosophical aspects; Ecological and Cultural Sensitivity; Human Comfort and Sick Building Syndrome; Energy Crisis and Building Technologies; Carbon Neutral Design; Alternative Sources of Energy (wind, solar, wave, geothermal etc); Design with Nature; Design with Climate; Siting and Orientation; Re-use of Brownfield Sites; Material Selection; Minimal Transportation Approaches and use of Indigenous Materials; Life Cycle Assessment of Materials; Design by Passive Systems; Conservation and Re-use of Water; Building Operation and Management; Applications in Different Building Types; Regulations and Contracts.

The book on complex systems, sustainability, and innovation explores a broad set of ideas and presents some of the state-of-the-art research in this field concisely in six chapters. In a complex system, it is difficult to know exactly how the individual components contribute to an observed behavior and the extent of each component's contributions. It is the interactions of the individual components that determine the emergent functionalities. This makes it difficult to understand and predict the behavior of complex systems and hence the effects of any innovations in this field. This necessitates for the emergence of a new age of innovations with the main focus on user orientation and sustainability. This book explores some of the complex systems and their dependence on the environment to provide a long-term perspective, aiding innovations and supporting a sustainable society. The intended audience of this book will mainly consist of researchers, research students, and practitioners in the field of complex systems and sustainability. Sustainability has emerged as a central issue for contemporary societies and for the world community as a whole. Furthermore, many of the social and environmental concerns that are embodied in the term 'sustainability' are directly or indirectly related to design. Designers help to define our human made environment - how it is produced, how it is used, and how long it endures. Despite some forty years of development and increased awareness of the critical relationships that exist between design decisions and modes of production, energy use, environmental impacts, the nature of work and human exploitation, design for sustainability is still not widely understood or followed. The Handbook of Design for Sustainability presents a comprehensive, state-of-the-art overview of this crucial subject - its development, its methods, its practices and its potential futures. Bringing together leading international scholars and new researchers to provide a substantive insight into the latest thinking and research within the field, The Handbook covers a breadth of historical and theoretical understandings and includes a series of original essays that explore methods and approaches for designers and design educators. The Handbook presents the first systematic overview of the subject that, in addition to methods and examples, includes historical perspectives, philosophical approaches, business analyses, educational insights and emerging thinking. It is an invaluable resource for design researchers and students as well as design practitioners and private and public sector organizations wishing to develop more sustainable directions.

Today, it is more vital than ever to build, or restore, a sustainable quality in our environment, from small scale interventions to landscape design. Such result can only be achieved by addressing specific theoretical and practical issues, namely how complexity should be conceived in architecture, how nature and architecture should interrelate, how the various disciplinary processes and the subjects who contribute to construction should be managed and mutually integrated.

New Technologies, Development and Application IV

The Palgrave Handbook of Sustainability

The Shape of Green

The Sense of Places, Models and Applications

Architecture and the Urban Environment

Bright Dreams of Passive Energy Design

**'Sustainable Construction' uses the latest US Green Building Council's Leadership in Energy and Environmental Design standard to explain the best practices in building procurement and delivery systems.**

**The Winter 2012 (vol. 14 no. 1) issue of the Nexus Network Journal is dedicated to the theme "Architecture, Systems Research and Computational Sciences". This is an outgrowth of the session by the same name which took place during the eighth international, interdisciplinary conference "Nexus 2010: Relationships between Architecture and Mathematics, held in Porto, Portugal, in June 2010. Today computer science is an integral part of even strictly historical investigations, such as those concerning the construction of vaults, where the computer is used to survey the existing building, analyse the data and draw the ideal solution. What the papers in this issue make especially**

**evident is that information technology has had an impact at a much deeper level as well: architecture itself can now be considered as a manifestation of information and as a complex system. The issue is completed with other research papers, conference reports and book reviews.**

**This book is intended as both an introduction to the discipline for students of landscape architecture, architecture, and planning, and a source of continuing interest for more experienced environmental designers. The book offers various materials for landscape architects and other planning professionals. The book is divided into 4 parts and 17 chapters. Part I "Introduction to the Landscape Architecture Theme" is general reading on landscape architecture. Part II "Art's Replica and Landscape Architecture Model" includes three chapters. This part represents a theoretical and sensitive visual interpretation of landscape architecture. Part III "Sustainable Prototypes of a Contemporary Landscape Architecture" includes four chapters, with sustainability as a concept and guiding thought. Part IV "Landscape Architecture Around the World (Study Cases)" includes 9 chapters with many examples from different geographical practical cases.**

**Visual computing and descriptive geometry are multidisciplinary fields addressing the handling of images, 3D models, and other computer graphics. These ideas are experiencing a revival due to emergent technologies and applications available to developers. Based in traditional forms of design and architecture, these fields are currently experiencing a bounty of new research based on old principles. The Handbook of Research on Visual Computing and Emerging Geometrical Design Tools seeks to add to this knowledge base by considering these technologies from a designer's perspective rather than reiterating the principles of computer science. It combines aspects of geometry and representation with emerging tools for CAD, generation, and visualization while addressing the digital heritage of such fields. This book is an invaluable resource for developers, students of both graphic and computer-generated design, researchers, and designers.**

**Eco-architecture**

**Indicators, Models and Assessment for Industry 5.0**

**Living Homes**

**Design for Sustainability**

**Harmonisation Between Architecture and Nature**

**Greening Spaces for Worship and Ministry**

This book provides a comprehensive overview of the practice of sustainability through a diverse range of case studies spanning across varied fields and areas of expertise. It provides a clear indication as to the contemporary state of sustainability in a time faced by issues such as global climate change, challenges of environmental justice, economic globalization and environmental contamination. The Palgrave Handbook of Sustainability explores three broad themes: Environmental Sustainability, Social Sustainability and Economic Sustainability. The authors critically explore these themes and provide insight into their linkages with one another to demonstrate the substantial efforts currently underway to address the sustainability of our planet. This handbook is an important contribution to the best practises on sustainability, drawn from many different examples across the fields of engineering, geology, anthropology, sociology, biology, chemistry and religion.

What can architects, landscape architects and urban designers do to make urban open spaces, streets and squares, more responsive, lively and safe? Urban Sustainability through Environmental Design answers this question by providing the analytical tools and practical methodologies that can be employed for sustainable solutions to the design and management of urban environments. The book calls into question the capability of 'quick-fix' development solutions to provide the establishment of fixed communities and suggests a more time-conscious and evolutionary approach. This is the first significant book to draw together a pan-European view on sustainable urban design with a specific focus on social sustainability. It presents an innovative approach that focuses on the tools of urban analysis rather than the interventions themselves. With its practical approach and wide-ranging discussion, this book will appeal to all those involved in producing communities and spaces for sustainable living, from students to academics through to decision makers and professional leaders.

Solar architecture exploits the natural energy of the sun to provide comfort in buildings while reducing the demand for bought in energy. This book provides the reader with graphs, diagrams, maps, equations and background information for quick and easy reference.

Our built environments can affect us in many subtle ways. Simply sensing fresh air and natural light or seeing greenery and open space can uplift our mood and improve our wellbeing. But these healthy environments are increasingly difficult to achieve in practice. The vital collaboration between the many people involved in designing and producing buildings is often not achieved. Then there is the pressing need to reduce waste and pollution. Managing these demands is a challenge, especially in a traditional climate of short-term thinking. Designing Buildings for People explores how we can learn from buildings of the past, vernacular architecture and the natural world around us, while still harnessing the opportunities presented by technology, to think creatively, work collaboratively and exercise a transdisciplinary approach. The book features over 200 images, exhibiting the acclaimed work of internationally recognized and research-led designers from the fields of architecture, engineering and management. It is a prime reference work for professionals and students who want to build the sustainable buildings of the future.

Planning and Designing Sustainable and Resilient Landscapes

Sustainable Site Design

Prática e reflexão

Sustainable Architecture and Design

Arquitetura Contemporânea e Automação

Eco-architecture III

**The changing manufacturing environment requires more responsive and adaptable manufacturing systems. The theme of the 5th International Conference on Changeable, Agile, Reconfigurable and Virtual production (CARV2013) is "Enabling Manufacturing Competitiveness and Economic Sustainability. Leading edge research and best implementation practices and experiences, which address these important issues and challenges, are presented. The proceedings include advances in manufacturing systems design, planning, evaluation, control and evolving paradigms such as mass customization, personalization, changeability, re-configurability and flexibility. New and important concepts such as the dynamic product families and platforms, co-evolution of products and systems, and methods for enhancing manufacturing systems' economic sustainability and prolonging their life to produce more than one product generation are treated. Enablers of change in manufacturing systems, production volume and capability, scalability and managing the volatility of markets, competition among global enterprises**

and the increasing complexity of products, manufacturing systems and management strategies are discussed. Industry challenges and future directions for research and development needed to help both practitioners and academicians are presented. About the Editor Prof. Dr.-Ing. Michael F. Zaeh, born in 1963, has been and is Professor for and Manufacturing Technology since 2002 and, together with Prof. Dr.-Ing. Gunther Reinhart, Head of the Institute for Machine Tools and Industrial Management (iwb) at the Technische Universitaet Muenchen (TUM). After studying general mechanical engineering, he was doctoral candidate under Prof. Dr.-Ing. Joachim Milberg at TUM from 1990 until 1993 and received his doctorate in 1993. From 1994 to 1995, he was department leader under Prof. Dr.-Ing. Gunther Reinhart. From 1996 to 2002, he worked for a machine tool manufacturer in several positions, most recently as a member of the extended management. Prof. Dr.-Ing. Michael F. Zaeh is an associated member of the CIRP and member of acatech, WGP and WLP. His current researches include among others Joining and Cutting Technologies like Laser Cutting and Welding as well as Friction Stir Welding, Structural Behaviour and Energy Efficiency of Machine Tools and Manufacturing Processes like Additive Manufacturing.

"A organização deste livro celebra os dez anos de existência do LAPAC (Laboratório de Automação e Prototipagem para Arquitetura e Construção) da Unicamp, concebido pela professora Gabriela Celani e gerido por ela e sua extensa equipe de orientandos, representada na co-organização desta publicação por Maycon Sedrez. Não devemos entender, no entanto, que a palavra laboratório deva ser interpretada como se desse significado, meramente, às instalações físicas nas quais se desenvolvem atividades de pesquisa, o que, em se tratando do campo da arquitetura e do urbanismo no Brasil, não seria menor. Neste caso, trata-se de algo maior, da junção fecunda e retroalimentadora entre labor, conhecimento e experimentação em seu melhor modo de conexão: a articulação entre teoria e prática com o objetivo de tensionar o conhecimento para além do perímetro do senso comum. Para além da eficiência do uso das tecnologias digitais de projeto e construção (em qualquer dos seus níveis, energético, estrutural, ambiental, espacial, formal, etc.) que ora se enfatiza, as pesquisas aqui reunidas se afirmam por partilharem um território comum, o do projeto de tecnologias para projetos. Em consonância com esta questão, o que se apresenta em Arquitetura e Automação não é a abstração de soluções projetuais sem arquitetos, resultantes de ações realizadas automaticamente por computadores autônomos, mas a investigação de situações em que o pensar e o fazer arquitetura são potencializados por pares, arquitetos—aparatos tecnológicos." David Sperling Estes tópicos são extremamente atuais e não há intenção de esgotar o assunto com esta publicação; o propósito é celebrar os 10 anos do LAPAC (Laboratório de Automação e Prototipagem para Arquitetura e Construção) da Unicamp e apresentar novos caminhos para os arquitetos brasileiros avançarem em suas pesquisas.

Does going green change the face of design or only its content? The first book to outline principles for the aesthetics of sustainable design, *The Shape of Green* argues that beauty is inherent to sustainability, for how things look and feel is as important as how they're made. In addition to examining what makes something attractive or emotionally pleasing, Hosey connects these questions with practical design challenges. Can the shape of a car make it more aerodynamic and more attractive at the same time? Could buildings be constructed of porous materials that simultaneously clean the air and soothe the skin? Can cities become verdant, productive landscapes instead of wastelands of concrete? Drawing from a wealth of scientific research, Hosey demonstrates that form and image can enhance conservation, comfort, and community at every scale of design, from products to buildings to cities. Fully embracing the principles of ecology could revolutionize every aspect of design, in substance and in style. Aesthetic attraction isn't a superficial concern — it's an environmental imperative. Beauty could save the planet.

This book contains most of the papers presented in the Eco-Architecture 2010 conference, which was the third edition of the International Conference on Harmonisation between Architecture and Nature. Previous editions, that were very successful were held previously in the New Forest, UK, in 2006 and the Algarve, Portugal in 2008 and demonstrated the importance of a forum like this to discuss the characteristics and challenges of such architectural vision. Eco-Architecture implies a new approach to the design process intended to harmonise its products with nature. This involves ideas such as minimum use of energy at each stage of the building process, taking into account the amount required during the extraction and transportation of materials, their fabrication, assembly, building erection, maintenance and eventual future recycling. Presentations in the conference were related to topics like building technologies, design by passive systems, design with nature, ecological and cultural sensitivity, life cycle assessment, quantifying sustainability in architecture, resources and rehabilitation, and issues from education, research and practice. Case studies from different places around the world were also presented.

*Urban Sustainability Through Environmental Design*

*Fractal Architecture*

*Contemporary Perspectives on Improving the Public Realm*

*Heating, Cooling, Ventilation, Daylighting and More Using Natural Flows*

*Approaches to Time-People-Place Responsive Urban Spaces*

*Architecture and Mathematics*

**This book deals with planning issues in landscape architecture, which start at the evaluation of the existing fabric of society, its history and memory, approached and conserved through photography, film and scenographic installations, a way in which the archetypes can be investigated, be it industrial derelict sites or already green spaces and cultural landscapes. It provides approaches to intervention, through rehabilitation and upgrade, eventually in participative manner. To such evaluation and promotion a couple of disciplines can contribute such as history of art, geography and communication science and of course (landscape) architecture. The field of landscape architecture reunites points of view from such different disciplines with a view to an active approach a contemporary intervention or conservation. The book presents case studies from several European countries (Romania, Germany, Austria, Italy, Portugal) mostly for large landscape in the outskirts of the cities and in the parks.**

Le Corbusier famously said, "A house is a machine for living in." We now confront the litany of environmental challenges associated with the legacy of the architectural machine: a changing climate, massive species die-off, diminished air and water quality, and resource scarcities. Brook Muller offers an alternative: water-centric urban design that fosters sustainability, equity, and architectural creativity. Inspired by the vernacular, such as the levadas of Madeira Island and both the arid and drenched places of the American West, Muller articulates a "hydro-logical" philosophy in which architects and planners begin by conceptualizing interactions between existing waterways and the spaces they intend to develop. From these interactions—and the new technologies and approaches enabling them—aesthetic, spatial, and experiential opportunities follow. Not content merely to work around sensitive ecology, Muller argues for genuinely climate-adapted urban landscapes in which buildings act as ecological infrastructure that actually improve watersheds while delivering functionality and beauty for diverse communities. Rich in images and practical examples, *Blue Architecture* will change the way we think about our designed world.

This edited collection gathers contributions from a diverse range of renowned scholars and professionals to uncover the unique relationship between passive architectural systems and activism. Focusing on the pioneering work of the influential American chemist and inventor, Harold R. Hay (1909-2009), and the environmental awareness events that took hold in the United States during the 1960s and 1970s, the book assembles essays which closely examine Hay's contribution to architecture and the work of those who directly and tangentially were affected by it. The book also offers insights into the role of passive energy design today. Appealing to researchers, architects and students interested in architecture and design technology, *Activism in Architecture* explores the role of passive environmental inventions as an active agent in shaping socio-political debates.

*Sustainable Nanoscale Engineering: From Materials Design to Chemical Processing* presents the latest on the design of nanoscale materials and their applications in sustainable chemical production processes. The newest achievements of materials science, in particular nanomaterials, opened new opportunities for chemical engineers to design more efficient, safe, compact and environmentally benign processes. These materials include metal-organic frameworks, graphene, membranes, imprinted polymers, polymers of intrinsic microporosity, nanoparticles, and nanofilms, to name a few. Topics discussed include gas separation, CO2 sequestration, continuous processes, waste valorization, catalytic processes, bioengineering, pharmaceutical manufacturing, supercritical CO2 technology, sustainable energy, molecular imprinting, graphene, nature inspired chemical engineering, desalination, and more. Describes new, efficient and environmentally accepted processes for nanomaterials design Includes a large array of materials, such as metal-organic frameworks, graphene, imprinted polymers, and more Explores the contribution of these materials in the development of sustainable chemical processes

*Proceedings of the 5th International Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV 2013)*, Munich, Germany, October 6th-9th, 2013

*Organic Design Philosophy in Theory and Practice*

*From Materials Design to Chemical Processing*

*Sustainability and Innovation in Manufacturing Enterprises*

*Nexus Network Journal 14,1*

*Urban Experience and Design*

*Sustainability in Architecture and Urban Design* will help you understand the nature of the sustainability problem and show you how to implement your design for a sustainable future. Organized in six parts, the problem, the environment, the residential scale, the commercial scale, the urban scale, and energy sources, the book presents essential information in context, so that you get the full picture. Hundreds of drawings, sketches, charts, and diagrams illustrate points author Carl Bovill makes in his clear and direct style, which communicates the basics in a concise way. You'll learn: -About environmental economics -How sustainable architectural design relates to ecology -How fractal geometry can lead to a new understanding of the structure of the world around us -How to design energy efficient houses and commercial buildings -How to design and live in our cities to lower energy use per person -About LEED points at all scales A glossary and reading lists encourage you to explore the topics further. *Greening Spaces for Worship and Ministry* is a comprehensive guide. The book provides a rationale, strategies, and resources for fulfilling environmental stewardship through the land and buildings of Christian and Jewish congregations. New construction, renovation, and historic preservation projects are addressed. Site development, material choices, energy generation and consumption, water use, interior air quality, green cleaning programs, and beauty are discussed. Ten congregations from across the United States and Canada are featured as examples of excellence in creation care in and through their built environments.

It's widely accepted that our environment is in crisis. Less widely recognized is that three quarters of environmental damage is due to cities – the places where most of us live. As this powerful new book elucidates, global sustainability is therefore directly dependent on urban design. In *Living Architecture, Living Cities* Christopher Day and Julie Gwilliam move beyond the current emphasis on technological change. They argue that eco-technology allows us to continue broadly as before and only defers the impending disaster. In reality, most negative environmental impacts are due to how we live and the things we buy. Such personal choices often result from dissatisfaction with our surroundings. As perceived environment has a direct effect on attitudes and motivations, improving this can achieve more sustainable lifestyles more effectively than drastic building change – with its notorious performance-gap limitations. As it's in places that our inner feelings and material reality interact, perceived environment is place-based. Ultimately, however, as the root cause of unsustainability is attitude, real change requires moving from the current focus on buildings and technology to an emphasis on the non-material. Featuring over 400 high quality illustrations, this is essential reading for anyone who believes in the value and power of good design. Christopher Day's philosophy will

continue to inspire students with an interest in sustainable architecture, urban planning and related fields.

Sustainable Site Design introduces the core concepts of sustainability as applied to landscape architecture. Focusing on site-scale design, this book provides a regional framework for integrating sustainable practices throughout the design process. From landscape analysis to program and design development, each design phase is illustrated with detailed case studies covering a broad range of innovative built landscape architectural projects.

Complex Systems, Sustainability and Innovation

Blue Architecture

Sustainability in Architecture and Urban Design

Die fraktale Geometrie der Natur

Sustainable architecture and complex design

Activism in Architecture

*The title of this issue of the Nexus Network Journal, "Architecture, Mathematics and Structure," is deliberately ambiguous. At first glance, it might seem to indicate the relationship between what buildings look like and how they stand up. This is indeed one aspect of what we are concerned with here. But on a deeper level, the fundamental concept of structure is what connects architecture to mathematics. Both architecture and mathematics are highly structured formal systems expressed through a symbolic language. For architecture, the generating structure might be geometrical, musical, modular, or fractal. Once we understand the nature of the structure underlying the design, we are able to "read" the meaning inherent in the architectural forms. The papers in this issue all explore themes of structure in different ways.*

Sustainable Construction

Sustainable Nanoscale Engineering

Living Architecture, Living Cities

A Sourcebook of Integrated Ecological Solutions

Proceedings of the Biennial Congress of the International Solar Energy Society, Denver, Colorado, USA, 19-23 August 1991

Soul-Nourishing Sustainability