

The Perceived Temperature Utci

Buildings allow several kinds of human activity: work, eat, sleep, play, etc., and they have a role in determining quality of life: ugly and uncomfortable buildings can be the worst place to live. The energy performance of buildings has a special role in improving and guaranteeing quality of life because it concerns architectural design, energy cost, consumption and energy poverty, and thermal comfort—both indoor and outdoor. Following a multidisciplinary approach, we present several case studies and articles about the correlation between building and quality of life. The included research highlights the relationship between BEP and quality of life in terms of wellbeing and thermal comfort and household smartness following UE Directive 844/2018, as well as the reduction of energy poverty and the impact of buildings on the environment and global warming. Also in this book is a city-scale study that attempts to evaluate the effect of climate change on building performance and building energy efficiency mapping and, moreover, reports some cases of indoor environment quality as well as thermal comfort in nearly zero energy buildings; finally, detailed scientific literature on energy poverty and outdoor wellbeing quality of life are presented.

Abstract: Application of thermal indices has become very popular over the last three decades. It is mostly aimed at urban areas and is also used in weather forecasting, especially for heat health warning systems. Recent studies also show the relevance of

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thermal indices and their justification for thermal perception. Only twelve out of 165 indices of human thermal perception are classified to be principally suitable for the human biometeorological evaluation of climate for urban and regional planning: this requests that the thermal indices provide an equivalent air temperature of an isothermal reference with minor wind velocity. Furthermore, thermal indices must be traceable to complete human energy budget models consisting of both a controlled passive system (heat transfer between body and environment) and a controlling active system, which provides a positive feedback on temperature deviations from neutral conditions of the body core and skin as it is the case in nature. Seven out of the twelve indices are fully suitable, of which three overlap with the others. Accordingly, the following four indices were selected as appropriate: Universal Thermal Climate Index (UTCI), Perceived Temperature (PTJ), Physiologically Equivalent Temperature (PET), and rational Standard Effective Temperature (SET*)

Biometeorology continues to grow as a discipline. It is increasingly recognised for its importance in providing science of relevance to society and well being of the environment. This book is the first in a new book series on Biometeorology. The purpose of the new series is to communicate the interdisciplinary philosophy and science of biometeorology to as wide an audience as possible, introduce scientists and policy makers to the societal relevance of and recent developments in its s- fields and demonstrate how a biometeorological approach can provide insights to the

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understanding and possible solution of cross-cutting environmental issues. One such cross-cutting environmental issue is climate change. While the literature on the science of climate change, climate change mitigation and the impacts of climate change is voluminous, that on adaptation to climate change is meagre in comparison. The purpose of this book is to partly redress this imbalance by providing insights from a biometeorological perspective. The book acknowledges that society has a long history of adapting to the impacts associated with climatic variability and change but makes the point that climate change poses a real threat to already strained coping systems. Therefore there is a need to realign human use systems with changing climate conditions.

This collection deals with the impacts of climate change, focusing on urban regions and heritage-related scenarios. It assesses the effects of climate change on our cultural and natural heritage, disaster management, adaptation to climate change, and sustainability in building and urban planning. Climate change concerns our cultural and natural heritage, so it is crucial that we address this issue with regard to all of its social, physical and cultural consequences. Far-reaching actions are needed to adapt the natural and historic environment to make it more resilient to climate change and to limit further damage.

This authoritative work provides clinicians, scientists and students with a comprehensive overview of exertional heat illness. Specifically, it addresses the

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prevention, recognition, treatment, and care of the various medical conditions that fall within the realm of exertional heat illness. In doing so, the book also offers a setting-specific (that is, athletics, military, occupational, and road race medicine) discussion of exertional heat illness for the consideration of the varied medical providers working in these settings. Clinicians will benefit from the discussion of the evidence-based best-practice considerations that should be made in the management of exertional heat illness. Scientists will benefit from this text in that it will provide them with a review of the current scientific evidence related to exertional heat illness and the translation of evidence to clinical practice – while also discussing directions for future research. Finally, students -- primarily postgraduate students interested in developing a line of research related to exertional heat illness -- will find this title an indispensable text to familiarize themselves with this fascinating field of study. A major contribution to the literature, *Exertional Heat Illness: A Clinical and Evidence-Based Guide* will be of significant interest to clinicians and scientists at all levels of training and experience, especially professionals in athletic training, emergency medical services, emergency room care, sports medicine and primary care.

This book contains selected papers presented during the World Renewable Energy Network's 28th anniversary congress at the University of Kingston in London. The forum highlighted the integration of renewables and sustainable buildings as the best means to combat climate change. In-depth chapters written by the world's leading

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experts highlight the most current research and technological breakthroughs and discuss policy, renewable energy technologies and applications in all sectors – for heating and cooling, agricultural applications, water, desalination, industrial applications and for the transport sectors. Presents cutting-edge research in green building and renewable energy from all over the world; Covers the most up-to-date research developments, government policies, business models, best practices and innovations; Contains case studies and examples to enhance practical application of the technologies.

Climate Vulnerability, Volume 1

Klimatem obszarów zurbanizowanych w Polsce zajmuje si? – w ró?nym stopniu – wi?kszo?? klimatologów polskich. Analizowane s? wszystkie aspekty wy?tkowo?ci klimatu miasta, m.in.: bilans radiacyjny i cieplny, temperatura powietrza, pole wiatru, zachmurzenie, opady, zanieczyszczenie powietrza. Zjawisko miejskiej wyspy ciep?a w Warszawie jest monitorowane od pocz?tku XXI wieku przez klimatologów z Instytutu Geografii i Przestrzennego Zagospodarowania PAN dzi?ki sieci 28 punktów sta?ego, automatycznego pomiaru temperatury powietrza. W publikacji przeanalizowano i opisano te? dane z 8 stacji innych operatorów oraz z 11 innych, ju? nieistniej?cych stacji pomiarowych. Ksi??ka Miejska wyspa ciep?a w Warszawie jest pierwsz? tak obszern? monografi? miejskiej wyspy ciep?a (MWC) w Warszawie. Nie obejmuje wp?ywu miasta na elementy klimatu inne ni? temperatura powietrza, jednak o jej

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wyjatkowo?ci ?wiadczy jej interdyscyplinarno?? i kompleksowo?? ujecia. Obok zagadnie? stricte klimatologicznych i zmienno?ci czasowej miejskiej wyspy ciepa, szeroko omówiona zosta?a zale?no?? rozmiaru i intensywno?ci tego zjawiska od czynników urbanistycznych, m.in. u?tkowania i zagospodarowania terenu, udzia?u terenów biologicznie czynnych czy korytarzy wymiany powietrza. Wspó?praca z alergologami z Instytutu Medycyny Pracy w ?odzi zaowocowa?a rozdzia?em po?wi?conym wp?ywowi MWC na jako?? ?ycia i stan zdrowia mieszka?ców oraz wykonan? po raz pierwszy szerok? analiz? alergenowo?ci ro?lin na dwóch osiedlach warszawskich. Omawiane zagadnienia przedstawiono tak?e w kontek?cie zmian klimatu oraz planowanych przemian urbanistycznych. Zaproponowano dzia?ania ograniczaj?ce zjawisko MWC oraz niezb?dne dzia?ania adaptacyjne skierowane m.in. do w?adz miasta, s?u?by zdrowia, urbanistów i architektów, mediów, systemu edukacji oraz organizacji pozarz?dowych. Autorzy maj? nadziej?, ?e publikacja zainteresuje szerokie grono odbiorców od klimatologów przez architektów i urbanistów po osoby tworz?ce system zarz?dzania kryzysowego w mie?cie.

There is pressing evidence of phenomena, linked to meteorology and climate, which are modifying their temporal occurrence and which have a very evident impact on the safety and health of populations residing in cities. The urban problem at the beginning of the second set of twenty years of the new century requires a complete rethinking of the way of aggregation of man who, today,

represents a large part of the world population due to increasingly accelerated urbanization processes over time. The human being has become a citizen, and within the city limits, he tries to develop his life expectancy by seizing opportunities from this. This search for well-being, understood as a complete state of man, at once physiological and psychological and social, can be thwarted by an urban structure that is not functionally capable of providing answers. The climate problem exacerbates this problem by strongly stressing the contradictions of living. Science, technology, and politics are today able to give answers if applied wisely in a joint effort, in a unit of language. This book proposes several solutions that can be implemented today, ranging from a full understanding of phenomena to adaptation policies for solving problems. The most pressing invitation is addressed precisely to politics to make cities more resilient and safe. This book is a collective undertaking of all faculty members of the Geography Department, HKBU. It provides readers with a concise and authoritative account of the geography of one of China's most dynamic development regions — Hong Kong, Macau and the Pearl River Delta region. This book is divided thematically into 4 parts. Part I introduces the unique geographical characteristics of the region. Part II focuses on environmental and landscape dynamics and the impacts of rapid economic development on the natural environment since 1978.

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Part III ponders on developmental issues, such as urbanization, industrialization, energy development, transportation, socio-economic development and planning issues. Chapters of this part succinctly analyze these issues in the context of regional development and globalization concerns. Part IV discusses the sustainable future of the region.

This book maps extreme temperature increase under dangerous climate change scenarios in Brazil and their impacts on four key sectors: agriculture, health, biodiversity and energy. The book draws on a careful review of the literature and climate projections, including relative risk estimates. This synthesis summarizes the state-of-the-art knowledge and provides decision-makers with risk analysis tools, to be incorporated in public planning policy, in order to understand climate events which may occur and which may have significant consequences.

Among the places worst hit by climate change are areas of high urban growth in the warm, humid tropics of Asia and Latin America. In these places, the global trend of rapid urbanisation and conditions of local warming compound the effects of climate change. This three-part book explores the unique local climate consequences of urban growth trajectories of tropical cities and provides strategies and design approaches to enhance the quality of life of tropical urban dwellers in the face of urban warming. Part One considers the philosophical basis

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of the climate challenge in this context and investigates tropical urbanism from the viewpoints of urban activity patterns and the notion of 'thermal pleasure'. Part Two explores specific, practical techniques in enhancing ventilation, shading and greenery as well as the challenges in local climate assessment in the tropics. Part Three explores the barriers and future opportunities for climate-sensitive urban planning and presents specific examples of good practice, contextualized within the wider global debate on adapting to climate change. *Urban Climate Challenges in the Tropics* is an indispensable companion for planners, designers, architects and students of all levels. Contents: Introduction (Rohinton Emmanuel) Achieving Thermal Pleasure in Tropical Urban Outdoors (Rohinton Emmanuel) Management of Shading and Public Places (Tzu-Ping Lin) Urban Air Ventilation in High-Density Cities in the Tropics (Edward Ng) Vegetation and Climate-sensitive Public Places (Denise H S Duarte) Urban Thermal Comfort in the Tropics (Erik Johansson) Urban Climate Mapping in the Tropics Narein Perera) Urban Climate Modeling: Challenges in the Tropics (Renganathan Giridharan) Urban Exemplars of Climate-sensitive Design (Patricia Drach) Integration of Climate Knowledge in Urban Design and Planning (Gerald Mills) Readership: Planners, designers, architects and advanced undergraduate and graduate students of architecture or planning and environmental

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management with a focus on the tropics. Key Features: Places the urban climate amelioration debate within the wider climate change debate Focuses specifically on an important and rapidly urbanizing region (the tropics) Provides practical advice to researchers and practitioners dealing with urban sustainability and climate sensitive design in the tropics

In the ten years since the publication of the second edition of *Human Thermal Environments: The Effects of Hot, Moderate, and Cold Environments on Human Health, Comfort, and Performance*, Third Edition, the world has embraced electronic communications, making international collaboration almost instantaneous and global. However, there is still a need for a compilation of up-to-date information and best practices. Reflecting current changes in theory and applications, this third edition of a bestseller continues to be the standard text for the design of environments for humans to live and work safely, comfortably, and effectively, and for the design of materials that help people cope with their environments. See What's New in the Third Edition: All existing chapters significantly updated Five new chapters Testing and development of clothing Adaptive models Thermal comfort for special populations Thermal comfort for special environments Extreme environments Weather Outdoor environments and climate change Fun runs, cold snaps, and heat waves The book covers hot,

moderate, and cold environments, and defines them in terms of six basic parameters: air temperature, radiant temperature, humidity, air velocity, clothing worn, and the person's activity. It focuses on the principles and practice of human response, which incorporates psychology, physiology, and environmental physics with applied ergonomics. The text then discusses water requirements, computer modeling, computer-aided design, and current standards. A systematic treatment of thermal environments and how they affect humans in real-world applications, the book links the health and engineering aspects of the built environment. It provides you with updated tools, techniques, and methods for the design of products and environments that achieve thermal comfort.

This book constitutes the revised selected papers from the 6th ECML PKDD Workshop on Data Analytics for Renewable Energy Integration, DARE 2018, held in Dublin, Ireland, in September 2018. The 9 papers presented in this volume were carefully reviewed and selected for inclusion in this book and handle topics such as time series forecasting, the detection of faults, cyber security, smart grid and smart cities, technology integration, demand response, and many others. From the beginning of 21st century, there has been an awareness of risk in the environment along with a growing concern for the continuing potential damage caused by hazards. In order to ensure environmental sustainability, a better

understanding of natural disasters and their impacts is essential. It has been recognized that a holistic and integrated approach to environmental hazards needs to be attempted using common methodologies, such as risk analysis, which involves risk management and risk assessment. Indeed, risk management means reducing the threats posed by known hazards, whereas at the same time accepting unmanageable risks and maximizing any related benefits. The risk management framework involves evaluating the importance of a risk, either quantitatively or qualitatively. Risk assessment comprises three steps, namely risk identification (data base, event monitoring, statistical inference), risk estimation (magnitude, frequency, economic costs) and risk evaluation (cost-benefit analysis). Nevertheless, the risk management framework also includes a fourth step, risk governance, i.e. the need for a feedback of all the risk assessment undertakings. There is currently a lack of such feedback which constitutes a serious deficiency in the reduction of environmental hazards. This book emphasises methodological approaches and procedures of the three main components in the study of environmental hazards, namely forecasting - nowcasting (before), monitoring (during) and assessment (after), based on geoinformatic technologies and data and simulation through examples and case studies. These are considered within the risk management framework and, in

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particular, within the three components of risk assessment, namely risk identification, risk estimation and risk evaluation. This approach is a contemporary and innovative procedure and constitutes current research in the field of environmental hazards. Environmental Hazards Methodologies for Risk Assessment and Management covers hydrological hazards (floods, droughts, storms, hail, desertification), biophysical hazards (frost, heat waves, epidemics, forest fires), geological hazards (landslides, snow avalanches), tectonic hazards (earthquakes, volcanoes), and technological hazards. This book provides a text and a resource on environmental hazards for senior undergraduate students, graduate students on all courses related to environmental hazards and risk assessment and management. It is a valuable handbook for researchers and professionals of environmental science, environmental economics and management, and engineering. Editor: Nicolas R. Dalezios, University of Thessaly, Greece

The combination of global warming and urban sprawl is the origin of the most hazardous climate change effect detected at urban level: Urban Heat Island, representing the urban overheating respect to the countryside surrounding the city. This book includes 18 papers representing the state of the art of detection, assessment mitigation and adaption to urban overheating. Advanced methods,

strategies and technologies are here analyzed including relevant issues as: the role of urban materials and fabrics on urban climate and their potential mitigation, the impact of greenery and vegetation to reduce urban temperatures and improve the thermal comfort, the role the urban geometry in the air temperature rise, the use of satellite and ground data to assess and quantify the urban overheating and develop mitigation solutions, calculation methods and application to predict and assess mitigation scenarios. The outcomes of the book are thus relevant for a wide multidisciplinary audience, including: environmental scientists and engineers, architect and urban planners, policy makers and students.

This book presents selected papers from the 11th International Symposium on Heating, Ventilation and Air Conditioning (ISHVAC 2019), with a focus on HVAC techniques for improving indoor environment quality and the energy efficiency of heating and cooling systems. Presenting inspiration for implementing more efficient and safer HVAC systems, the book is a valuable resource for academic researchers, engineers in industry, and government regulators. This book will help decision makers model nature-based solutions to the complex problem of sustainable development, locally and globally.

Providing a methodology for evaluating indoor thermal comfort with a focus on children, this book presents an in-depth examination of children's perceptions of comfort. Divided into two sections, it first presents a history of thermal comfort, the human body and environmental parameters, common thermal comfort indexes, and guidelines for creating questionnaires to

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assess children's perceptions of indoor thermal comfort. It then describes their understanding of the concepts of comfort and energy, and the factors that influence that perception. In this context, it takes into account the psychological and pedagogical aspects of thermal comfort judgment, as well as architectural and environmental characteristics and equips readers with the knowledge needed to effectively investigate children's perspectives on environmental ergonomics. The research field of indoor thermal comfort adopts, on the one hand, physical parameter measurements and comfort indexes (e.g. Predicted Mean Vote (PMV) or adaptive comfort), and on the other, an ergonomic assessment in the form of questionnaires. However the latter can offer only limited insights into the issue of comfort, as children often use different terms than adults to convey their experience of thermal comfort. The books aims to address this lack of understanding with regard to children's perceptions of indoor thermal comfort. The book is intended for HVAC engineers and researchers, architects and researchers interested in thermal comfort and the built environment. It also provides a useful resource for environmental psychologists, medical and cognitive researchers.

This book highlights selected papers presented during the bi-annual World Renewable Energy Network's 2019 Med Green Forum. This international forum highlights the importance of growing renewable energy applications in two main sectors: Electricity Generation and Sustainable Building. The papers highlight the most current research and technological breakthroughs illustrating the viability of using renewable energy to satisfy energy needs. Coverage includes a broad range of renewable energy technologies and applications in all sectors – electricity production, heating and cooling, agricultural applications, water desalination, industrial applications, and transport. Presents leading-edge research in green

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building, sustainable architecture, and renewable energy; Covers a broad range of renewable energy technologies and applications in all sectors; Contains case studies and examples to enhance practical application of the technologies presented.

Urban Ecology is a rapidly growing field of academic and practical significance. Urban ecologists have published several conference proceedings and regularly contribute to the ecological, architectural, planning, and geography literature. However, important papers in the field that set the foundation for the discipline and illustrate modern approaches from a variety of perspectives and regions of the world have not been collected in a single, accessible book. Foundations of Urban Ecology does this by reprinting important European and American publications, filling gaps in the published literature with a few, targeted original works, and translating key works originally published in German. This edited volume will provide students and professionals with a rich background in all facets of urban ecology. The editors emphasize the drivers, patterns, processes and effects of human settlement. The papers they synthesize provide readers with a broad understanding of the local and global aspects of settlement through traditional natural and social science lenses. This interdisciplinary vision gives the reader a comprehensive view of the urban ecosystem by introducing drivers, patterns, processes and effects of human settlements and the relationships between humans and other animals, plants, ecosystem processes, and abiotic conditions. The reader learns how human institutions, health, and preferences influence, and are influenced by, the others members of their shared urban ecosystem.

The book presents a state-of-the-art in environmental aerodynamics and the structural design of wind energy support structures, particularly from a modern computational perspective.

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Examples include real-life applications dealing with pollutant dispersion in the building environment, pedestrian-level winds, comfort levels, relevant legislation and remedial measures. Design methodologies for wind energy structures include reliability assessment and code frameworks.

Spatial Estimation of Thermal Indices in Urban Areas--basics of the Skyhelios Model

This book presents the findings of a three-year study on urban heat in Doha, Qatar, and discusses guidelines and strategies for planning agencies to consider in the context of moderating temperatures to provide pedestrians with greater access to outdoor spaces and greater choice in modes of transport. If modifying urban form can reduce extreme temperatures in one of the hottest places on the planet, then perhaps other communities can learn how to create livable cities during a time of rapid changes to the climate. In fact, despite the periods of extreme heat, strategic planning and management of urban areas can improve residents' and visitors' ability to live, work, and move throughout the city comfortably. Doha, Qatar, a city with one of the most extreme climates on earth, has undergone rapid development over the past 40 years. Although cities in the Middle East are expanding at three times the international average (UN Report, 2012), the rapid population and physical growth remain largely unexamined, particularly in terms of the unique conditions, qualities, and characteristics that give rise to these emerging centres. Speed, quality, and extent of urbanization impact neighbourhood-scale environmental conditions, and this book provides evidence that urban forms and materials can help to mediate temporal variation in microclimates and that landscape modifications can potentially reduce temperatures and increase accessibility to outdoor environments. By applying the lessons in this book,

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communities around the world can better adapt to the increasing frequency, duration and intensity of extreme heat.

Comprising specially selected papers, this book refers to all aspects of urban environment and provides solutions that lead towards sustainability. These research studies include contributions that have been made from a diverse range of researchers, resulting in a variety of topics and experiences. Urban areas face a number of challenges related to reducing pollution, improving main transportation and infrastructure systems and these challenges can contribute to the development of social and economic imbalances and require the development of new solutions. The challenge is to manage human activities, pursuing welfare and prosperity in the urban environment, whilst considering the relationships between the parts and their connections with the living world. The dynamics of its networks (flows of energy matter, people, goods, information and other resources) are fundamental for an understanding of the evolving nature of today's cities. Large cities represent a productive ground for architects, engineers, city planners, social and political scientists able to conceive new ideas and time them according to technological advances and human requirements. The multidisciplinary components of urban planning, the challenges presented by the increasing size of cities, the amount of resources required and the complexity of modern society are all addressed.

This book constitutes selected papers of the 18th International Conference on

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Computer-Aided Architectural Design Futures, CAAD Futures 2019, held in Daejeon, Republic of Korea, in June 2019. The 34 revised full papers presented were carefully reviewed and selected from 194 submissions. The papers are organized in topical sections on theory, methodology and practice of architectural and interior design; support systems for design decisions; tools, methods and implementation of urban design; rethinking space and spatial behavior; fabrication and materialization; and shape studies.

An authoritative volume focusing on multidisciplinary methods to estimate the impacts of climate-related extreme events to society. As the intensity and frequency of extreme events related to climate change continue to increase, there is an urgent need for clear and cohesive analysis that integrates both climatological and socioeconomic impacts. *Extreme Events and Climate Change* provides a timely, multidisciplinary examination of the impacts of extreme weather under a warming climate. Offering wide-ranging coverage of the methods and analysis that relate changes in extreme events to their societal impacts, this volume helps readers understand and overcome the methodological challenges associated with extreme event analysis. Contributions from leading experts from across disciplines describe the theoretical requirements for analyzing the complex interactions between meteorological phenomena and the resulting outcomes, discuss new approaches for analyzing the impacts of extreme events on society, and illustrate how empirical and theoretical concepts merge to form a

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unified plan that enables informed decision making. Throughout the text, innovative frameworks allow readers to find solutions to the modeling and statistical challenges encountered when analyzing extreme events. Designed for researchers and policy makers alike, this important resource: Discusses topics central to understanding how extreme weather changes as the climate warms Provides coverage of analysis methods that relate changes in extreme events to their societal impacts Reviews significant theoretical and modeling advances in the physical aspects of climate science Presents a comprehensive view of state of the science, including new ways of using data from different sources Extreme Events and Climate Change: A Multidisciplinary Approach is an indispensable volume for students, researchers, scientists, and practitioners in fields such as hazard and risk analysis, climate change, atmospheric and ocean sciences, hydrology, geography, agricultural science, and environmental and space science.

Urban heat islands are a new type of microclimatic phenomenon that causes a significant increase in the temperature of cities compared to surrounding areas. The phenomenon has been enforced by the current trend towards climate change. Although experts consider urban heat islands an urgent European Union public health concern, there are too few policies that address it. The EU carried out a project to learn more about this phenomenon through pilot initiatives. The pilots included feasibility studies and strategies for appropriately altering planning rules and governance to tackle the

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problem of urban heat islands. The pilots were carried out in eight metropolitan areas: Bologna/Modena, Budapest, Ljubljana, Lodz, Prague, Stuttgart, Venice/Padova, and Vienna. The feasibility studies carried out in these pilot areas focused on the specific morphology of EU urban areas, which are often characterised by the presence of historical old towns.

Abstract: Thermal perception and stress for humans can be best estimated based on appropriate indices. Sophisticated thermal indices, e.g., the Perceived Temperature (PT), the Universal Thermal Climate Index (UTCI), or the Physiologically Equivalent Temperature (PET) do require the meteorological input parameters air temperature (T_a), vapour pressure (VP), wind speed (v), as well as the different short- and longtime radiation fluxes summarized as the mean radiant temperature (T_{mrt}). However, in complex urban environments, especially v and T_{mrt} are highly volatile in space. They can, thus, only be estimated by micro-scale models. One easy way to apply the model for the determination of thermal indices within urban environments is the advanced SkyHelios model. It is designed to estimate sky view factor (SVF), sunshine duration, global radiation, wind speed, wind direction, T_{mrt} considering reflections, as well as the three thermal indices PT, UTCI, and PET spatially and temporarily resolved with low computation time

This book introduces the UTCI (Universal Thermal Climate Index) and summarises progress in this area. The UTCI (Universal Thermal Climate Index) was developed as

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part of the European COST Action Program and first announced to the scientific community in 2009. Since then a decade has followed of applicability tests and research results as well as knowledge gained from applying the UTCI in human adaptation and thermal perception. These findings are of interest to researchers in the interdisciplinary areas of biometeorology, climatology and urban planning. The book summarizes this progress, discussing the limitations found and provides pointers to future developments. It also discusses UTCI applications in the areas of human biometeorology and urban planning including possibilities of using UTCI and similar indices in climate-responsive urban planning. The book's message is illustrated with many case studies from the real world. Chapter 10 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com. The book focusses on atmospheric processes, which directly affect human environments within the lowest 100–1000 meters of the atmosphere over regions of only a few kilometres in extent. The book is the translation into English of the third edition of the German book “Applied Meteorology – Micrometeorological Methods”. It presents, with selected examples, the basics of micrometeorology applied to disciplines such as biometeorology, agrometeorology, hydrometeorology, technical meteorology, environmental meteorology, and biogeosciences. The important issues discussed in this book are the transport processes and fluxes between the atmosphere and the underlying surface. Vegetated and heterogeneous surfaces are special subjects. The

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author covers the areas of theory, measurement techniques, experimental methods, and modelling all in ways that can be used independently in teaching, research, or practical applications.

This book is highly suitable for advanced courses as it introduces state-of-the-art information and the latest research results on diverse problems in the environmental wind engineering field. The topics include indoor natural ventilation, pedestrian wind environment, pollutant dispersion, urban heat island phenomena, urban ventilation, indoor/outdoor thermal comfort, and experimental/numerical techniques to analyze those issues. Winds have a great influence on the outdoor environment, especially in urban areas. Problems that they cause can be attributed to either strong wind or weak wind issues. Strong winds around high-rise buildings can bring about unpleasant, and in some cases dangerous, situations for people in the outdoor environment. On the other hand, weak wind conditions can also cause problems such as air pollution and heat island phenomena in urban areas. Winds enhance urban ventilation and reduce those problems. They also enhance natural ventilation in buildings, which can reduce the energy consumption of mechanical ventilation fans and air conditioners for cooling. Moderate winds improve human thermal comfort in both indoor and outdoor environments in summer. Environmental wind engineering associated with wind tunnel experiments and numerical analysis can contribute to solutions to these issues.

??This book discusses urban microclimate and heat-related risks in urban areas,

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brought on by the combination of global climate change effects and local modification of climate determined by extensive urbanization such as the 'Urban heat island' phenomenon. This matter is relevant to almost all urbanized areas in the world, where the increase of urban population and air temperature is expected to endanger both the overall health of the population and the energy supply for the functioning of urban systems. The book details the inter-relationship between urban morphology, microclimate and building energy performance and presents a multidisciplinary approach that brings together Urban Climatology, Engineering and Architectural knowledge to support the development of reliable models and tools for research and practice. This book is a useful tool for architects and building energy modelers, urban planners and geographers who need a practical guide to realize basic urban microclimate simulation for use in both academic research and planning practice. The contents of the book will highlight the differences between the design and engineering disciplines – strengths and flaws. It will also illustrate examples of interdisciplinary interactions. Any false dichotomies will be revealed and the many non-linear processes borne out of challenging conventions between traditional and new modes of practice will be revealed. Projects based on a body of experience spanning many years will be selected to support experimentation that goes beyond an undisciplined search for originality, innovation and creativity. In addition to writings from Hanif Kara and Daniel Bosia contributions will be sought from specialists in the field

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who have played a role in the operations of P.art® at AKT II – past and present – qualifying them to disseminate and distribute a particular form of ‘knowledge’.

Features work of architectural practices: Adjaye Associates, Foster + Partners, Heatherwick Studio, HOK, Serie Architects, Wilkinson Eyre Architects and Zaha Hadid Architects. In addition to AKT II, it will encompass the work of engineers and engineering consultants such as: Arup, Cecil Balmond, Buckminster Fuller, Buro Happold, Pier Luigi Nervi and Peter Rice.

Consuming over 40% of total primary energy, the built environment is in the centre of worldwide strategies and measures towards a more sustainable future. To provide resilient solutions, a simple optimisation of individual technologies will not be sufficient. In contrast, whole system thinking reveals and exploits connections between parts. Each system interacts with others on different scales (materials, components, buildings, cities) and domains (ecology, economy and social). Whole-system designers optimize the performance of such systems by understanding interconnections and identifying synergies. The more complete the design integration, the better the result. In this book, the reader will find the proceedings of the 2016 Sustainable Built Environment (SBE) Regional Conference in Zurich. Papers have been written by academics and practitioners from all continents to bring forth the latest understanding on systems thinking in the built environment.

This unique volume provides in layman's terms, without sacrificing scientific facts, the

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health hazards and potential dangers of naturally occurring substances that are around us everyday. The comprehensive coverage includes compounds (e.g. arsenic, lead), gases (e.g. hydrogen sulphide, ozone) and all forms of natural radiations (e.g. heat, radon). Readers will find this book both informative and entertaining because facts and important data are introduced and interpreted in the form of history, stories and scientific summaries. Each chapter concludes with a practical guide that readers will find useful. Harmful Naturally Occurring Substance and Radiation, which is fully referenced with up-to-date articles, may be used as a textbook for undergraduates and as an introductory textbook for post-graduates in biochemistry, environmental science, toxicology, medical science, and health care. People interested in personal and public health and earth issues will find this book a thought-provoking and revealing read. The book may also be a source of information for policy makers, public health officials, city planners and environmental engineers.

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