

Advances in Science, Technology & Innovation  
IEREK Interdisciplinary Series for Sustainable Development

Mohammed Fekry · Mady A. A. Mohamed · Anna Visvizi ·  
Asmaa Ibrahim · Lamiaa F. Ghamri *Editors*

# Mosque Architecture: A Transdisciplinary Debate



 Springer

---

# Advances in Science, Technology & Innovation

## IEREK Interdisciplinary Series for Sustainable Development

### Editorial Board

Anna Laura Pisello, Department of Engineering, University of Perugia, Italy

Dean Hawkes, University of Cambridge, Cambridge, UK

Hocine Bougdah, University for the Creative Arts, Farnham, UK

Federica Rosso, Sapienza University of Rome, Rome, Italy

Hassan Abdalla, University of East London, London, UK

Sofia-Natalia Boemi, Aristotle University of Thessaloniki, Greece

Nabil Mohareb, Faculty of Architecture—Design and Built Environment,  
Beirut Arab University, Beirut, Lebanon

Saleh Mesbah Elkaffas, Arab Academy for Science, Technology and Maritime Transport,  
Cairo, Egypt

Emmanuel Bozonnet, University of La Rochelle, La Rochelle, France

Gloria Pignatta, University of Perugia, Italy

Yasser Mahgoub, Qatar University, Qatar

Luciano De Bonis, University of Molise, Italy

Stella Kostopoulou, Regional and Tourism Development, University of Thessaloniki,  
Thessaloniki, Greece

Biswajeet Pradhan, Faculty of Engineering and IT, University of Technology Sydney,  
Sydney, Australia

Md. Abdul Mannan, Universiti Malaysia Sarawak, Malaysia

Chaham Alalouch, Sultan Qaboos University, Muscat, Oman

Iman O. Gawad, Helwan University, Egypt

Anand Nayyar , Graduate School, Duy Tan University, Da Nang, Vietnam

### Series Editor

Mourad Amer, International Experts for Research Enrichment and Knowledge Exchange  
(IEREK), Cairo, Egypt

**Advances in Science, Technology & Innovation (ASTI)** is a series of peer-reviewed books based on important emerging research that redefines the current disciplinary boundaries in science, technology and innovation (STI) in order to develop integrated concepts for sustainable development. It not only discusses the progress made towards securing more resources, allocating smarter solutions, and rebalancing the relationship between nature and people, but also provides in-depth insights from comprehensive research that addresses the **17 sustainable development goals (SDGs)** as set out by the UN for 2030.

The series draws on the best research papers from various IEREK and other international conferences to promote the creation and development of viable solutions for a **sustainable future and a positive societal** transformation with the help of integrated and innovative science-based approaches. Including interdisciplinary contributions, it presents innovative approaches and highlights how they can best support both economic and sustainable development, through better use of data, more effective institutions, and global, local and individual action, for the welfare of all societies.

The series particularly features conceptual and empirical contributions from various interrelated fields of science, technology and innovation, with an emphasis on digital transformation, that focus on providing practical solutions to **ensure food, water and energy security to achieve the SDGs**. It also presents new case studies offering concrete examples of how to resolve sustainable urbanization and environmental issues in different regions of the world.

The series is intended for professionals in research and teaching, consultancies and industry, and government and international organizations. Published in collaboration with IEREK, the Springer ASTI series will acquaint readers with essential new studies in STI for sustainable development.


**ASTI series has now been accepted for Scopus (September 2020). All content published in this series will start appearing on the Scopus site in early 2021.**

---

Mohammed Fekry • Mady A. A. Mohamed •  
Anna Visvizi • Asmaa Ibrahim •  
Lamiaa F. Ghamri  
Editors


# Mosque Architecture: A Transdisciplinary Debate


*Editors*

Mohammed Fekry   
Department of Architecture  
Effat University  
Jeddah, Saudi Arabia

Anna Visvizi   
Effat University  
Jeddah, Saudi Arabia

Lamiaa F. Ghamri  
Effat University  
Jeddah, Saudi Arabia

Mady A. A. Mohamed   
Effat University  
Jeddah, Saudi Arabia

Asmaa Ibrahim   
Effat University  
Jeddah, Saudi Arabia

ISSN 2522-8714                      ISSN 2522-8722 (electronic)  
Advances in Science, Technology & Innovation  
IEREK Interdisciplinary Series for Sustainable Development  
ISBN 978-3-031-24750-7              ISBN 978-3-031-24751-4 (eBook)  
<https://doi.org/10.1007/978-3-031-24751-4>

© Effat University 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

---

# Conference Organization

**Conference Series:** The 5th Annual Memaryat International Conference. MIC 2021

**Title of the Conference:** Masjid Architecture: Form and Meaning

---

## Conference Chair

Prof. Mohammed Fekry, Architecture Department, Effat University, Jeddah, Saudi Arabia

---

## Steering Committee

### Chair of the Steering Committee

Dr. Haifa Jamal Al-Lail, President, Effat University, Jeddah, Saudi Arabia

### Members of the Steering Committee

Dr. Malak Alnory, Provost of the Effat University, Jeddah, Saudi Arabia

Dr. Mervat Chuman, Dean of Graduate Studies and Scientific Research, Effat University, Jeddah, Saudi Arabia

Dr. Asmaa Ibrahim, Dean of Effat College of Architecture and Design, Effat University, Jeddah, Saudi Arabia

---

## Conference and Exhibition Manager

Dr. Asmaa Ibrahim, Dean of Effat College of Architecture and Design, Effat University, Jeddah, Saudi Arabia

---

## Scientific Committee

### Chair

Prof. Mohammed Fekry, Architecture Department, Effat University, Jeddah, Saudi Arabia

### Members

Prof. Mady A. A. Mohammed, Architecture Department, Effat University, Jeddah, Saudi Arabia

Prof. Mohamed Kashef, Architecture Department, Effat University, Jeddah, Saudi Arabia  
 Prof. Abeer Sami, Architecture Department, Effat University, Jeddah, Saudi Arabia  
 Dr. Haitham Hussein, Architecture Department, Effat University, Jeddah, Saudi Arabia

---

## Organizing Committee

### Chair

Arch. Maya Kamareddine, Architecture Department, Effat University, Jeddah, Saudi Arabia

### Members

Dr. Haitham Hussein, Architecture Department, Effat University, Jeddah, Saudi Arabia  
 Dr. Ahmad Refaat, Architecture Department, Effat University, Jeddah, Saudi Arabia

---

## International Scientific Committee

Dr. Ahmed Refaat, Associate Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Ahmed Shehata, Professor, Umm Al-Qura University, Mecca, Saudi Arabia  
 Dr. Ali A. Alraouf, Professor, Qatar Foundation, Qatar  
 Dr. Ali Gabr, Professor, Cairo University, Cairo, Egypt  
 Dr. Asmaa Ibrahim, Professor, Cairo University, Cairo, Egypt  
 Dr. Emad El-Sherbiny, Professor, Cairo University, Cairo, Egypt  
 Dr. Haitham Hussein, Associate Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Hisham Aref, Professor, MSA University, Cairo, Egypt  
 Dr. Hisham Elkadi, Professor, University of Salford, Salford, UK  
 Dr. Husam Alwaer, Associate Professor, Dundee University, Dundee, UK  
 D. Jemma Chidiac, Associate Professor, Jemma Chidiac Architects, Beirut, Lebanon  
 Dr. Mady A. A. Mohamed, Professor, Effat University, Effat University, Jeddah, Saudi Arabia  
 Dr. Majd Alhomoud, Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Mohamad Kashef, Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Mohamed Fekry, Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Raghad Mofeed, Professor, Cairo University, Cairo, Egypt  
 Dr. Saleh AlHathloul, Professor, King Saud University, Riyadh, Saudi Arabia  
 Dr. Shaaban Taha, Professor, Benha University, Benha, Egypt  
 Dr. Sherif Elattar, Professor, Fayoum University, Fayoum, Egypt  
 Dr. Tarek S. Ragab, Professor, Effat University, Jeddah, Saudi Arabia  
 Dr. Wael Yousef, Professor, Al Azhar University, Cairo, Egypt  
 Dr. Yasser Mujahed, Associate Professor, University of Leicester, Leicester, UK



---

## Preface

The **Annual Memaryat International Conference (MIC)** is an academic event organized annually by the Effat College of Architecture and Design, Effat University. The objective of the MIC conference series is to encourage inter- and multi-disciplinary reflection on topics relating to architecture and design in the modern world. Considering the cultural, environmental, and societal specificity of the region, the MIC conference series aims at placing this uniqueness of experiences and needs in a broader international perspective to foster constructive dialogue. Against this backdrop the objective of the 5th Annual Memaryat International Conference (MIC 2021), titled *Masjid Architecture: Form and Meaning*, held online on February 23–24, 2021, was to encourage research and reflection on the past, the present, and the future of the Mosque architecture.

The Mosque (Masjid) is the center of spiritual, moral, and cultural life in Muslim societies. Though maintaining its overarching spatial, visual, and physical characteristics over the centuries, the mosque design has undergone various transformations that underline its centrality and adaptability to the evolution of the Muslim society. In this view, the Mosque, and so the Mosque architecture, serves as the evidence of resilience and sustainability inherent in Muslim culture and heritage. The Mosque has been and continues to represent the defining and unifying pillar of the Muslim communities locally and around the globe.

The 5th Annual Memaryat International Conference (MIC 2021) organized in collaboration with the *Abdullatif Al Fozan Award for Mosque Architecture*, served as a venue to present and discuss research as well as to exchange experiences and visions relating to the Mosque architecture and development. In this way, MIC 2021 fostered constructive dialogues on Mosque design philosophy, spatial characteristics, visual dimensions, communal locational choices, and building technologies. MIC 2021 served as a place of dialogue and critical reflection for architects, designers, engineers, academics, scholars, and theorists from all around the world. What brought them together was the need to discuss and potentially develop contemporary design solutions and future visions for the Mosque, the most deeply rooted, and an enduring, institution of Islam.

The 5th Annual Memaryat International Conference (MIC 2021) sought to encourage research and debate related, but not limited, to the following topics:

- Experience and Research on Masjid Architecture
- Experience and Research on Planning and Urban Design for Masjid
- Technology in Designing and Constructing the Masjid
- Environmental Design of the Masjid
- Operation and Maintenance for the Masjid
- Practical insights and lessons to be shared.

The quality of the academic discussion during MIC 2021 was supervised by the MIC 2021 Steering and Academic Committees, whereas the delivery of the conference was supervised by the Organizing Committee. A great number of papers were submitted to the initial call for papers. Of these, based on the submissions' quality, only a fraction was selected to be



presented at the conference. Of these papers, following an arduous review process, 16 have been included in this book. These papers, i.e., the chapters included in this book, serve as a proof that there is a great need to reflect on the Mosque architecture as it offers invaluable insights into, on the one hand, the Muslim society and its evolution, and on the other hand, on cutting-edge solutions pertaining to architecture and design. As the Mosque architecture mirrors the specificity of the region, of the culture, and of the society, it offers invaluable lessons on how issues and challenges were addressed in the past, and how these experiences can be utilized today and in the future. The Organizers of the Conference, including the Chair, the Steering Committee, the Program Committee, and the Academic Committee, remain grateful to the broader community of academics and practitioners who responded to the initial call for papers, who joined the conference, and who published in this book. A special “thank you” is extended to Dr. Haifa Jamal Al-Lail, the President of the Effat University for her continuous encouragement and support throughout the organization of MIC 2021, as well as for the inspiration she shares. The organizers would also like to thank the entire ASTI team for their guidance and assistance throughout the process.

Jeddah, Saudi Arabia

Mohammed Fekry  
Mady A. A. Mohamed  
Anna Visvizi  
Asmaa Ibrahim  
Lamiaa F. Ghamri

---

# Contents

<b>Contextualizing the Discussion on Mosque Architecture in Today's World</b> . . . . .	1
Mohammed Fekry, Mady A. A. Mohamed, Asmaa Ibrahim, Anna Visvizi, and Lamiaa F. Ghamri	
<b>Trends and Developments in Contemporary Mosque Architecture</b>	
<b>Modern Trends in Mosques Architecture</b> . . . . .	9
Sherif Mahmoud and Abobakr Al-Sakkaf	
<b>Financing Mosque Maintenance in Muslim-Minority Communities</b> . . . . .	15
Hafis Bello	
<b>Meaning Behind the Inspiration from Nature in Mosque Design: The Old and The New</b> . . . . .	23
Nhal Abdelwahab Amer	
<b>The Mosques and the Society</b>	
<b>A Cross-Sectoral Analysis of the Identity Conflict in the Arab Primate Cities: The Case of the Jeddah Mosques</b> . . . . .	39
Tarek S. Ragab and Mohammed Fekry	
<b>Encouraging Social Inclusivity Across Faiths: The Case of Mosques and Churches in Kuala Lumpur</b> . . . . .	51
Mohd Tajuddin Mohd Rasdi, Teoh Chee Keong, and Intan Liana	
<b>Advances in Mosques' Design and Architecture</b>	
<b>Changes in Mosques' Architecture Design Between Functionalism and Symbolism</b> . . . . .	63
Engy M. Farrag	
<b>Indoor Thermal Comfort: The Case of Masjid Tuanku Mizan Zainal Abidin (Putrajaya, Malaysia)</b> . . . . .	73
Siti Salwana Bt Mohd Nawayai and Zuraini Bt Denan	
<b>The Impact of Revival of Traditional Lighting Techniques in Modern and Contemporary Mosque Design</b> . . . . .	85
Dalia Hossam Eldin Ismail Labib Mohamed	
<b>Mitigating the Contradiction of the Climatically Best Orientation and the Qibla Direction of Mosques</b> . . . . .	95
Mady A. A. Mohamed and Nourhan Ahmed	
<b>Lighting the Mosques: The Needs and the Applications</b> . . . . .	109
Mady A. A. Mohamed, Mayar Madani, and Nermin Nabil	

---

<b>Beauty and Order in Contemporary Work of Abdel Wahed El Wakil. The Case of Jeddah Mosques</b> .....	117
Haitham Samir, Sondos Khouja, Aliya Khan, and Ruba Tulimat	
<b>The Influence of Mosques on the Urban Fabric</b>	
<b>A Novel Approach to the Optimization of the Spatial Distribution of Mosques</b> .....	133
Samer El-Zahab and Abobakr Al-Sakkaf	
<b>The Role of Placemaking in Elevating the Spiritual Experience: The Case of Masjid Al-Haram in Makkah</b> .....	141
Majd Alnafie and Mohammed Fekry	
<b>Urbanism of the Neighborhood Mosque</b> .....	157
Dena E. Gholam and Mohammed Fekry	
<b>Pattern and Form Language as Constituents of the Mosque Architecture</b> .....	167
Haitham Samir, Ghaidaa Amir, Jouanah Hamza, and Lian Alshoaibi	

## Copyright information

---

© 2023 Effat University

## About this paper

---



Check for updates

### Cite this paper

Nawayai, S.S.B.M., Denan, Z.B. (2023). Indoor Thermal Comfort: The Case of Masjid Tuanku Mizan Zainal Abidin (Putrajaya, Malaysia). In: Fekry, M., Mohamed, M.A., Visvizi, A., Ibrahim, A., Ghamri, L.F. (eds) Mosque Architecture: A Transdisciplinary Debate. Advances in Science, Technology & Innovation. Springer, Cham. [https://doi.org/10.1007/978-3-031-24751-4\\_9](https://doi.org/10.1007/978-3-031-24751-4_9)

Download citation

[.RIS](#) [.ENW](#) [.BIB](#)

DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-3-031-24751-4_9">https://doi.org/10.1007/978-3-031-24751-4_9</a>	29 June 2023	Springer, Cham
Print ISBN	Online ISBN	eBook Packages
978-3-031-24750-7	978-3-031-24751-4	<a href="#">Earth and Environmental Science</a>
		<a href="#">Earth and Environmental Science (R0)</a>

## Publish with us

---

[Policies and ethics](#)