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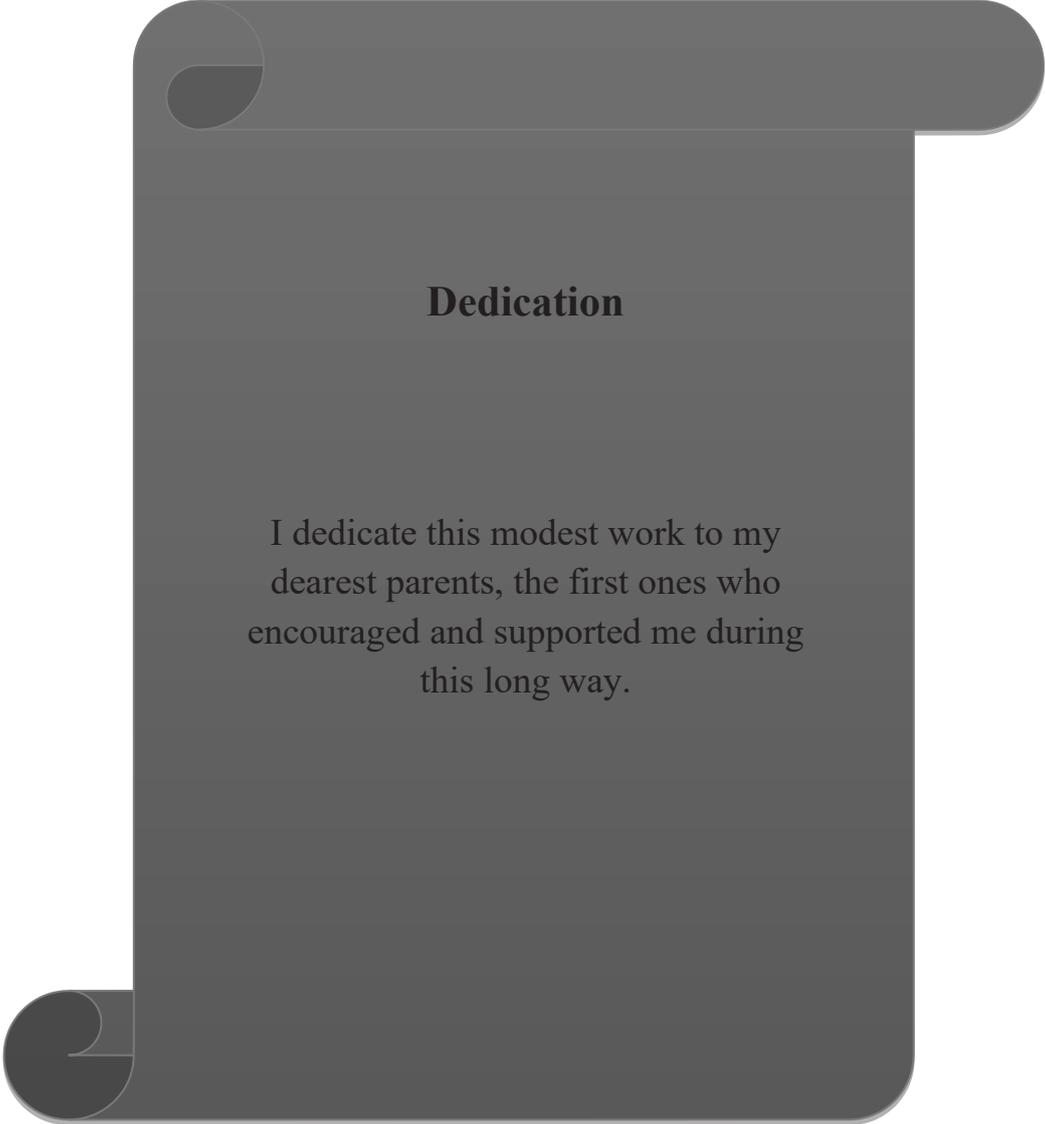
{Architecture is a wonderful expression  
of the discovery process. It's like a  
scientist who doesn't know the answer,  
but knows the path to it. That's what  
drives me: the joy of the path, the  
discovery."}

Glenn Murcutt Architect, winner  
of the 2002 Pritzker Architecture  
Prize

**Strategies For**  
**Creating High-**  
**Performance**  
**Building Envelopes**



***...A My BENACHIR Nouhaila***



## **Dedication**

I dedicate this modest work to my  
dearest parents, the first ones who  
encouraged and supported me during  
this long way.

# Dedication

## **Thanks**

"Praise be to GOD, lord and master of the universes".

I would like to express my thanks to a whole world of people who have made this study possible and who have contributed to its elaboration in any form.

I address myself to GOD, the almighty, to thank him for having given me the courage, the support, the patience to carry out this work.



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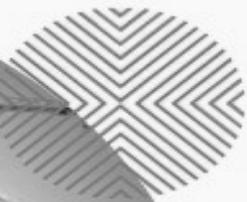


THÈSE PRÉSENTÉE EN VUE DE L'OBTENTION DU  
DIPLOME DE DOCTORAT EN PHYSIQUE  
INGÉNIERIE :

# SCIENCES POUR L'INGÉNIEUR



By: Benachir Nouhaila  
Soutenue publiquement le : 2023



**Scientific**

**production**

# Publication

**Publication**

Benachir Nouhaila (2022). Paper ID APEN-MIT-2022\_7337 JOURNAL Applied Energy Symposium:Journal. Improving the energy performance of the building envelope using phase change materials.

Benachir Nouhaila 2022 Paper ID APEN-MIT-2022\_8017 Applied Energy Symposium:Effect of solar ventilation on thermal improvement and energy efficiency of buildings using phase change materials.

Benachir Nouhaila Journal of Pharmaceutical Negative Results | Volume 13 | Special Issue 1 | 2022: Role of solar mechanical ventilation and phase change materials on thermal comfort and electrical energy of building envelope.

Benachir Nouhaila Benachir , J Nucl Ene Sci Power Generat Technol 2022, 11:9 August 29, 2022, manuscript no. JNPGT-22-73579; Publisher's Date of Assignment: August 31, 2022, pre QC no. JNPGT-22-73579 (PQ); Date of Revision: September 14, 2022, QC no. JNPGT-22-73579; Revision date: September 21, 2022, manuscript no. JNPGT-22-73579 (R); Publication date: September 28, 2022, DOI: 10. 4172/2325-9809.1000292 Nuclear Journal Energy Science & Poou Genrestion Ttechnologie.

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Received November 24, 2022, revised December 12, 2022, accepted  
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ENVELOPE BASED ON PHASE-CHANGE MATERIALS (PCM).

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(IJEAP) Vol. 2, No. 3, September 2022. ISSN : 2737-8071. Simulation of  
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Revised November 20, 2022 Accepted January 11, 2022. Int J Eng & App  
Phy, Vol. 2, No. 3, September 2022.

## **International Communications :**

Benachir Nouhaila The organizing committee of the 2022 MIT Applied  
Energy A+B Symposium, which is organized by the International Journal of  
Applied Energy and the Massachusetts Institute of Technology (MIT)2022.  
MIT Applied Energy A+B Symposium July 5-8, 2022. Effect of solar  
ventilation on thermal improvement and energy efficiency of buildings using  
phase-change materials.

Benachir Nouhaila (2022) The organizing committee of the MIT Applied

Energy A+B Symposium 2022, which is organized by the International Journal of Applied Energy and the Massachusetts Institute of Technology (MIT)2022. MIT Applied Energy A+B Symposium July 6-8, 2022. Improving the energy performance of building envelopes using phase-change materials.

Benachir Nouhaila (2021) Project with Schneider Electric: PAWA PLANT: A PLANT-BASED CELL GREENHOUSE SYSTEM Application of Aloe Vera-derive.

Benachir Nouhaila (2022 ) 41st World Conference on Applied Science, Engineering and Technology (WCASET 2022) August 24 & 25, 2022. The role of solar mechanical ventilation and phase-change materials on thermal comfort and electrical energy in building envelopes.

BOOK 41st World Conference on Applied Science, Engineering & Technology (WCASET 2022) 24th & 25th August 2022. The role of solar mechanical ventilation and phase-change materials on thermal comfort and electrical energy in building envelopes.

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