

International Symposium  
On  
**CONVECTIVE HEAT AND MASS TRANSFER  
IN  
SUSTAINABLE ENERGY**

**CONV-09**

April 26 – May 1, 2009, Hammamet, Tunisia

**BOOK of SHORT PAPERS**

**Volume 1**





## Preface

This book contains the short papers from the International Symposium on Convective Heat and Mass Transfer in Sustainable Energy (CONV-09), organized on behalf of the International Centre for Heat and Mass Transfer and held on April 26 – May 1<sup>st</sup>, 2009, in Hammamet, Tunisia.

The objective of this conference is to bring together researchers in a forum to exchange innovative ideas, methods and results, and visions of the future related to the general theme of convective heat and mass transfer.

This meeting is firstly focus on a presentation and discussion of theory, experiments, and applications of convective heat and mass transfer in single phase and two-phase flows. An emphasis is placed on the significant recent advances in convective heat transfer in systems for conversion and/or storage of Solar Energy. The importance of such systems is continuously increasing to a point where their dimensioning and design become dominant factors for energy sustainability. While researchers work overtime to create new technologies and methods of providing energy, it is critical that modern industry and environmental strategies make the most efficient use of energy that is currently available. Furthermore, design of buildings with low consumption energy and heat exchangers for air conditioning is becoming a great challenge for reducing pollution and emission of gases with greenhouse effects. Indeed, because of the obscuration and global warming, scientists predict an increase of about 6 degrees of the global temperature in 2100 if human and industrial activities will continue as they have been done in last decades.

Keynote lectures and papers are covering a wide range of topics related to classical and emerging areas of convective heat and mass transfer applications, including:

- Enhancement of heat exchangers
- Jets and Forced Convection
- Natural and Mixed convections
- Thermo-solutal convection, Mass transfer and pollutant dispersion
- Conversion and Storage of solar energy, Geothermal energy
- Fluid mechanics, Turbulence and wind power
- Phase change, Boiling, condensation, two-phase flows
- Production of Hydrogen and Cooling of fuel cells
- Heat transfer and fluid mechanics in greenhouse and building

I would like to acknowledge the tremendous assistance provided throughout more than two years of planning and preparation by the vice-chairman, Professor Rejeb Ben Maad. I am very grateful to the honorary chairmen Professor Sadik Kakaç and Professor Jacques Padet. The valuable cooperation and assistance of all of them were very helpful for the organization of the meeting.

My special gratitude goes to the General Secretary of ICHMT, Professor Faruk Arinç, and all the staff of ICHMT for their guidance and help. I would give a special thank to Aziz Koyuncuoglu for all his efforts in the realisation of the website and the CD-proceeding of the conference. I am so grateful to the members of the Organizing Committee in both Reims and Tunisia, especially to N. El Wakil, C. Maalouf, M. Hammani and M. Bouterra for their assistance in the preparation of this book.

I am very grateful to the International Scientific Committee, as well as the session chairmen. Great thanks go to the keynote lecturers: H. Muller-Steinhagen, M. El Genk, S. Kakaç, C. Ménézo, R. Cotta, W. Worek, L. Vasiliev, L. Guo and M. Van Genuchten.

I would acknowledge the valuable help of the supporting and sponsoring institutions. Finally my heartfelt thanks to all the authors, who provide the substance to the meeting, and to participants for their attendance and contribution.

Mourad Rebay

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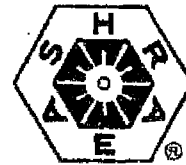
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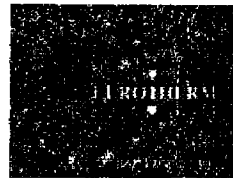
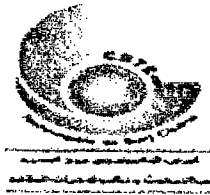
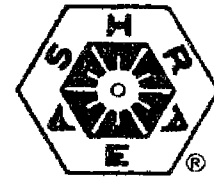
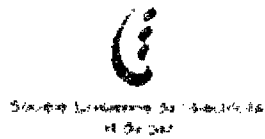
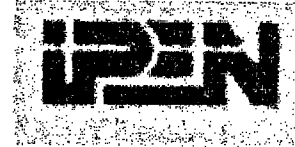
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