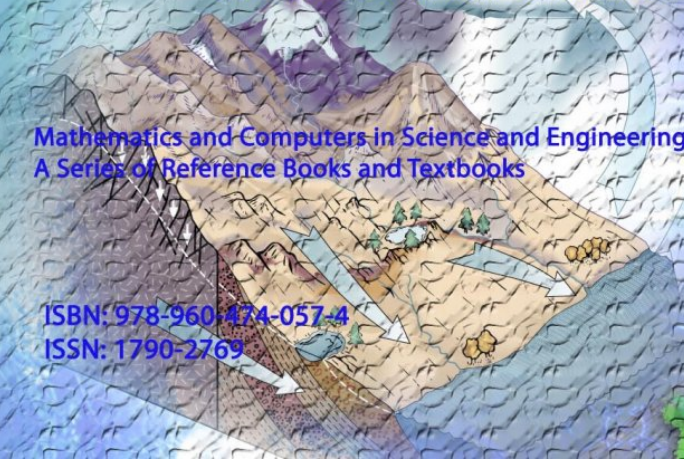
RECENT ADVANCES in WATER RESOURCES, HYDRAULICS & HYDROLOGY

Cambridge, UK, February 24-26, 2009

Proceedings of the 4th IASME / WSEAS International Conference on WATER RESOURCES, HYDRAULICS & HYDROLOGY (WHH'09)



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Preface

This year the 4th IASME / WSEAS International Conference on WATER RESOURCES, HYDRAULICS & HYDROLOGY (WHH '09) was held in the University of Cambridge as in 2008. The Conference remains faithful to its original idea of providing a platform to discuss theoretical and applicative aspects of water resources management, water quality, water pollution control, large river engineering and management, computational hydraulics etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

During this last year we witnessed the growth of the European Union interest in water resources, hydraulics & hydrology. This is an additional proof that they are seen not only as an exciting research area but also as technologies that may solve current European citizens' concerns with several practical problems.

For a discipline which is central to research and also to industry, and which generates interests not only among academicians but also among large companies and government departments and agencies, it is important to look at the market and at its movements.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture

Using Exergy to Enhance Ecological and Environmental Understanding and Stewardship

Professor Marc A. Rosen
Founding Dean
Faculty of Engineering and Applied Science
University of Ontario Institute of Technology
Oshawa, Ontario, CANADA
also: President-Elect, Engineering Institute of Canada
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Abstract: In efforts to understand ecological systems and environmental impact, techniques can be used which combine thermodynamics with environmental and ecological disciplines. Most such assessments consider thermodynamics in terms of energy, but it is believed by many that ecological and environmental factors are better understood using the thermodynamic quantity exergy. One rationale for this statement is that exergy, but not energy, is often a measure of the potential for ecological and environmental impact.
Here, a summary is presented of existing analysis techniques which integrate exergy and ecological and environmental factors, including exergy-based ecological indicators, exergy-based life cycle analysis and environomics. The goals of most such analysis techniques include improving our understanding of the impact on ecological systems and the environment of processes and the determination of appropriate ecological and environmental improvement measures. Several examples are considered, including the application of exergy to water-based ecosystems for understanding, predicting and improving their health. Thermodynamic, ecological and environmental data are examined, and show that correlations exist between exergy and environmental and ecological parameters. The existence of such correlations likely implies that exergy factors into environmental improvement and ecological stewardship.

Brief Biography of the Speaker: Dr. Marc A. Rosen is a Professor of Mechanical Engineering at the University of Ontario Institute of Technology in Oshawa, Canada, where he served as founding Dean of the Faculty of Engineering and Applied Science from 2002 to 2008. Dr. Rosen became President of the Engineering Institute of Canada in 2008. He was President of the Canadian Society for Mechanical Engineering from 2002 to 2004, and is a registered Professional Engineer in Ontario.
With over 60 research grants and contracts and 500 technical publications, Dr. Rosen is an active teacher and researcher in thermodynamics, energy technology (including cogeneration, district energy, thermal storage and renewable energy), and the environmental impact of energy and industrial systems. Much of his research has been carried out for industry.
Dr. Rosen has worked for such organizations as Imatra Power Company in Finland, Argonne National Laboratory near Chicago, and the Institute for Hydrogen Systems near Toronto. He was also a professor in the Department of Mechanical, Aerospace and Industrial Engineering at Ryerson University in Toronto, Canada for 16 years. While there, Dr. Rosen served as department Chair and Director of the School of Aerospace Engineering.
Dr. Rosen has received numerous awards and honours, including an Award of Excellence in Research and Technology Development from the Ontario Ministry of Environment and Energy, the Engineering Institute of Canada's Smith Medal for achievement in the development of Canada, and the Canadian Society for Mechanical Engineering's Angus Medal for outstanding contributions to the management and practice of mechanical engineering. He is a Fellow of the Engineering Institute of Canada, the Canadian Academy of Engineering, the Canadian Society for Mechanical Engineering, the American Society of Mechanical Engineers and the International Energy Foundation.

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