

ADVANCED ENERGY SYSTEMS DIVISION

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CHAIR'S MESSAGE Dr. Kaufui Vincent Wong



I joined the ASME as a young Ph.D. graduate when I was outside the USA. It has been more than thirty years that I have had this treasured

membership in the ASME and for many years now, I have been a life Fellow grade member. After many years of active involvement in a variety of activities within ASME I now have the honor and pleasure of chairing the Advanced Energy Systems Division. Our division has moved from having about 1900 primary members back in 2007 to about 2250 in 2009. Noting the downturn in the economy this is truly a remarkable feat. We owe this all to the tireless effort put forward by those AESD members, who participate very actively at all levels: reviewers, session chairs and co-chairs, symposium chairs, technical committees chairs, up to the division's executive members. Without their cheerful and faithful labor the division activities would not exist.

Our division is increasing its participation in renewable energy technologies, each year providing more forums for its members to present leading edge research in these types of energy systems. Our AESD is traditionally a strong participant and supporter of the annual international mechanical engineering congress and expositions, or IMECE's, and will continue to do so in the foreseeable future. Currently our division is collaborating with other ASME divisions to organize joint conferences. Our division also makes every effort to reach engineers and scientists of industry, as well as to international researchers. Each year the total number of papers from international researchers and industry reach a respectable percentage of the total participation in technical sessions. Our division also sponsors several conferences held in countries around the world (like ESDA and the ECOS conferences). We also participate actively in Energy Sustainability conferences that normally take place in summer.

I started the Advanced Energy Forum in March 2009 under the umbrella of ASME Peerlink. Everyone who is interested in

INSIDE

- Chairs message and AESD Awards...2
- Conference Activities.....3
- Technical Committee Reports 3-4
- Calls for Papers..... 5-6
- Publication Opportunities7
- Contact Information.....8

advanced energy systems and issues are strongly urged to sign up and join the community, members and non-members of ASME alike. We have currently over 120 community members, and the number is increasing each week. We are a professional social networking community and everyone is encouraged to blog about relevant topics in the Advanced Energy Forum. In this time of energy importance, with energy independence one of many popular topics, we are expecting substantial growth in our informal but knowledge-intensive forum. Please feed your thoughts, experiences, opinions regarding energy issues and practices into the forum; I am your representative and liaison to the very influential ASME Energy Committee that spearheads energy policies.

Continued on page 2

AESD DIVISION AWARDS AND KEY NOTE LECTURE

The AES Division recognizes the contributions of its members, researchers and educators in Advanced Energy Systems at the IMECE. The contributions from these individuals are in fact outstanding and are one of the major reasons for the continued advancement of energy related technology.

AES division has instituted several awards at various levels. At the Society level, in association with the Solar

Energy division, the Frank Kreith Energy Award has been dedicated for significant contributions to a secure energy future, emphasizing on innovations in conservation and/or renewable energy. This year, the award has been presented to Dr. Robert H. Socolow, for pioneering contributions in energy research, particularly energy conservation, renewable energy and technologies to reduce CO2 emissions, which have influenced worldwide energy and environmental policy. Dr.

Socolow will be the first speaker for the Advanced Energy Systems Division Reception, to be held from 17:00 – 19:00. The topic to be addressed by Professor Socolow is "Technology, Policy, and Values for Living in a Greenhouse". The second guest invited by AES is Mr. Michael Tinkleman, Director of Research, ASME. He will be addressing the "Energy Grand Challenge Program and Where We Go from Here"

I would like to congratulate Michael Ellis and Wilson Chiu for injecting more energy into the Fuel Cell Technical Committee. I would like to recognize the efforts of our previous executive committee, under the leadership of Shiva Prasad. Their hard work and dedication enabled the division activities to be carried out smoothly.

We would like to invite all mechanical engineers (from industry, academia and government) who are related to the

fields of energy, fuel cells, power generation, transmission and distribution, storage, hydrogen technologies, renewable energy technologies, wind, water energy sources, etc. to become involved in our activities. Please look at our division's directory and feel free to contact the technical committee chair of those areas of your interest, or contact me directly and I will make every effort to involve you in the activities of the Advanced Energy Systems Division.

I also welcome proposals from current and prospective members of the division to start new technical committees or new activities in their field of interest and expertise. Finally, it is with heartfelt gratitude that I thank all the members of our executive and technical committees who are always generous in contributing their time, expertise and ideas for carrying out the functions of the AESD.

NEW FELLOWS

This year, two members from the AES Executive Committee have been recognized by ASME AS Fellows, Michael Ellis and Mansour Zenouzi. The AES division congratulates these two members for that honor.



Michael W. Ellis, PhD. Michael Ellis has focused on teaching and research in the thermal sciences and on professional leadership. He is a leader in the development of the thermal sciences curriculum at Virginia Tech and is an award winning teacher. His research has improved the understanding of water transport in fuel cell electrodes and has helped to

establish experimental techniques for characterizing electrode water transport properties. He has contributed to the development of a viscoelastic framework for understanding durability in PEM fuel cells and has helped to develop analytical tools for assessing fuel cell cogeneration for buildings. Dr. Ellis has served the profession through a variety of leadership roles in ASME including chairing international symposia and conferences. Ph.D. (1996), Georgia Tech.

Mansour Zenouzi, PhD. Mansour Zenouzi is a Professor of Electromechanical Engineering at Wentworth Institute of Technology. His major research contributions are in the fields of computational Heat Transfer and Thermodynamics Modeling and

Analysis of Hybrid Cogeneration Systems. Zenouzi is a registered Professional Engineer, TAC of ABET



evaluator, member of ASHARE and the Executive Committee of the Advanced Energy Systems Division of ASME. Currently he is a general chair of ASME 4th International

Conference on Energy Sustainability, and Energy Track Organizer of IMECE 2009. He received his BSME (1976) from Iran University of Science and Technology, MSME (1981) from Tufts University. Ph.D. (1990) Northeastern University.

AESD CONFERENCE ACTIVITIES

Advanced Energy Systems Division sponsors and organizes Track 7 at the ASME International Mechanical Engineering Congress & Exposition for the 2009 Congress at Lake Buena Vista. This excellent track on Energy Systems: Analysis, Thermodynamics & Sustainability covering 16 topics, spanning various aspects of fundamental and applied sciences. It has approximately 60 – 70 presentations scheduled, as well as poster session. The symposia topics are listed on a separate page at the end.

The AES division, continuing its collaboration with the Solar Energy Division, joint efforts for the third

Energy Sustainability Conference, held in San Francisco. This conference was co-located with the ASME 2009 Summer Heat Transfer Conference (HT09) and the InterPACK 09 Conference. Dr. B. G. Shiva Prasad, our AES past chair, was the AES Conference General Chair. Dr. Mansour Zenouzi, one of the new ASME Fellows from our division, was the AES technical program chair.

There was a significant increase in participation and attendance this year with a total of about 254 papers, coming under the tracks organized by the Advanced Energy Systems Division. The fourth International conference on

energy sustainability will be held at Phoenix in May 17 – 22, 2010. The detailed topics are listed in the call for papers given in a separate page.

For IMECE 2009, **Dr. Mike Tinkleman** will be our featured speaker, and he will be presenting "Energy Grand Challenge." The reception will be held **Tuesday November 17, from 17:00 to 19:00 at Northern Hemisphere A1-A2/Ballroom Level.**

The AESD Executive Committee will meet **Tuesday November 17, from 20:00 to 22:00 at Atlantic Hall A, Room 3/Ground Level.**

Direct Conversion and Thermal Power Thermal Management

The Direct Thermal Power Conversion and Thermal Management Technical Committee promotes research and development in thermal management of energy both at the device and at the factory level. As energy becomes the main constraint for autonomy, production, and economic operation of machines, industries, and facilities, this technical committee provides an opportunity to exchange and foster new ideas, technologies, and methodologies that improve energy efficiency and thermal systems economic operation. It is also open to thermal management in addition to its current focus on direct power production. The committee participates in IMECE, ES and other special conferences related to advanced energy system. **The committee will meet in Lake Buena Vista, at the IMECE 09. The time and date will be published in the conference committee meeting program.**

Heat Pumps

The Heat Pump Technical Committee (HPTC) has maintained an active role in disseminating the latest developments in all theoretical and applications aspects of heating and cooling technologies, which have been changing rapidly in recent years. Recent national and global emphasis on energy efficiency and the environmental

impact of heating and cooling technologies has provided exciting opportunities for heating and cooling research and development. New developments include advanced electric and heat-activated chillers and heat pumps; combined cooling, heating, and power technologies; new environmentally friendly refrigerants and working fluids including corrosion inhibitors; heat and mass transfer issues in heat pump components; heat exchanger materials and designs; compressor design; simulation; and integration and implementation issues.

The HPTC strives to help move the development of heating and cooling technologies from theoretical concepts to applications, with contributions from industry, academia and government agencies. The HPTC organizes technical sessions at the IMECE to bring together researchers working on these technologies. At the IMECE 2008, the committee organized two technical sessions and a jointly chaired panel session with the Fluid Engineering Division. **The committee will be meeting in Lake Buena Vista, at the IMECE 2009, Tuesday, November 17, from 19:00 to 20:00. Atlantic Hall A, Room 7/Ground Level.**

Systems Analysis and Fuel Cells

The activities of the Systems Analysis Committee (SATC) were recently expanded to include the following:

design and application of fuel cells, cogeneration, hydrogen technologies, environmental impact of energy systems, application of micro- and nanotechnologies in energy systems, and realistic optimization of complex energy systems. These activities reflect the committee's continuing work in the areas of fundamental thermodynamics, system design, analysis, and optimization; and also the application of these concepts in some of the most interesting and promising areas of research and technology development. Last year, at the IMECE 2008 Symposium on Thermodynamics and the Design, Analysis, and Improvement of Energy Systems had 16 sessions with a total of 65 papers. Researchers and practitioners are invited. **The committee will be meeting in Lake Buena Vista, at the IMECE 2009, Tuesday, November 17, from 19:00 to 20:00. Suite 8110/Eighth Floor**

Energy Systems Miniaturization

The primary objectives of this committee are to increase its membership (from academia, industry and government labs) and to sponsor sessions at the IMECE. **The committee will meet in Lake Buena Vista, at the IMECE 09. The time and date will be published in the conference committee meeting program.**

AES DIVISION ACTIVITIES AT THE 2009 ASME INTERNATIONAL MECHANICAL ENGINEERING CONGRESS AND EXPOSITION NOVEMBER 13 – 19, 2009 LAKE BUENA VISTA, FL

The AES Division is sponsoring track 7 as well as some other sessions at IMECE 2009 on a variety of energy related topics. The papers scheduled in these sessions included numerous contributions from outside the U.S. and from industry, demonstrating the wide-ranging and global appeal of the technical topics being addressed by the AES

Division. Sessions include:

- 7-1 Fundamentals of Thermodynamics and Thermo economics
- 7-2 Design and Analysis of Complex Energy Conversion Systems
 - 7-3 Energy Systems and the Environment
 - 7-4 Alternative Energy and Sustainable Energy Systems
 - 7-5 Heat Pumps and Combined Heat and Power Systems
 - 7-6 Low and High Temperature Fuel Cell Systems Analysis
 - 7-7 Hydrogen Energy Technologies
 - 7-8 Low/Zero Emission Power Plants
- 7-9 Education in Thermodynamics, Energy Systems, and Sustainability
- 7-10 Energy Systems Miniaturization
- 7-11 Direct Energy Conversion
- 7-12 Posters

The conference program is available at <http://www.asmeconferences.org/Congress09/TechnicalProgramOverview.cfm>

ASME 4th International Conference on Energy Sustainability
A joint event between the ASME Solar Energy Division, and the
ASME Advanced Energy Systems Division
May 19-22, 2010
Phoenix Convention Center and Hyatt Hotel, Phoenix, Arizona
Co-located with ASES Solar 2010 Conference

INVITATION

We invite researchers, engineers, scientists, architects, consultants, and policy-makers in universities, industries, research laboratories, and government establishments to participate in this exciting event meant as a forum for exchange of innovative ideas, leading edge concepts, new technologies and devices, ongoing R&D efforts, prototype and demonstration projects, commercialization technologies and projects, and visions of the future related to the general theme of Energy Sustainability. The conference will consist of plenary talks, invited talks, panel discussions, workshops, tutorials, technical sessions, poster presentations, and exhibitions. The conference provides a unique opportunity for communication and collaboration between academia, industry and planners in the areas of Solar Energy, Energy Efficiency, Renewable Energy and Advanced Energy Technologies. The Conference will feature a special track for students interested in solar and energy efficiency consisting of technical and poster sessions, networking, and a job fair.

Papers accepted for publication in the ASME Energy Sustainability Conference Proceedings will be assessed for recommendation for publication in the ASME Journal of Solar Energy Engineering or the ASME Journal of Energy Resources Technology. Abstracts are invited in any relevant policy and technology areas including the following:

LIST OF TOPICAL AREAS

- Policy, Education, and Legal Aspects of Energy
- Climate Control and the Environment
- Biofuels
- Fuel Cells and Hydrogen Energy Technologies
- Exergy applications: Sustainability, Renewable Energy
- Combined Energy Cycles, CHP and CCHP
- Solar Thermochemistry
- Energy Systems: Design, Integration, Implementation
- Thermoeconomic Analysis
- Renewable and Alternative Energy Technologies
- Solar Heating and Cooling
- Sustainable cities and communities
- Advances in Solar Buildings and Conservation
- Low/Zero Emission Power Plants & Carbon Sequestration
- Transportation Energy Systems
- Micro and Nano Technologies in Energy Systems
- Low/Zero Energy Buildings
- Photovoltaics
- Concentrating Solar Power
- Advances in Solar Thermal Storage
- Geothermal Energy, Ocean Energy & other Emerging Technologies
- Wind Energy Systems and Technologies
- Water Desalination & Distillation Systems

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