

Solar Energy Division Newsletter

Jeff H. Morehouse & Roy E. Hogan, Editors

Summer 2001

Chair's Message



James E. Pacheco

Hello fellow Solar Energy Division members! I am honored to serve as the ASME Solar Energy Division Executive Committee Chair this year. There are many exciting activities going in the

Division and I welcome your participation.

I'd like to share my vision of the Division with you. I strongly believe in the purpose of the Division to promote the art, science, and practice of mechanical engineering in the field of solar energy, to foster research, development and publication of information within the scope of the Solar Energy Division's activities, and to recognize and recommend suitable recognition for engineering achievements in the field of solar energy. This vision is realized through the dedicated service of volunteers who do the bulk of the effort: plan conferences, solicit candidates for awards, carry out reviews for the Journal and conference publications, organize student events like the Solar Splash, and make all the activities of the Division possible. I'd like to highlight a few of the activities the Division is doing.

Solar 2002 - Sunrise on the Reliable Energy Economy. This joint conference is presented by twelve professional organizations, industry, and government agencies. The theme of the conference is to build a

reliable energy basis using solar energy for a sustainable economy. It will be held June 14-19, 2002 in Reno, NV. The call for papers is included in this newsletter.

Graduate Student Award. This is a new award for the Solar Energy Division, initiated in 2000, to recognize outstanding research in the area of solar energy of a graduate student for work completed toward the student's advanced degree. The winner last year was Gary Rosengarten (University of New South Wales), runner-up Joshua Plaisted (University of Wisconsin). This year's winner is James McLeskey, Jr. (University of Virginia) and the runner-up is Wei Liu (University of Minnesota). (See following article.)

Solar Splash. The solar splash is an annual collegiate solar boat regatta that focuses on practical educational experience and teamwork. The Solar Splash will be held in Buffalo, NY, June 20-24, 2001. (See page 4.)

New Editor of the Journal of Solar Energy Engineering. After 10 years of dedicated service to the JSEE, Bob Reid passed the reins of editor to Jane H. Davidson. Jane has implemented some new changes to the journal, recruited new associate editors and put together a special issue on solar chemistry.

Wind Energy Symposium. The Wind Energy Committee holds their annual symposium at the American Aeronautics Association. The Wind Energy Symposium was held January 8-11, 2001 in Reno, NV as part of the American Institute of Aeronautics and Astronautics conference.

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2nd Annual Graduate Student Awards

To encourage student participation in solar energy research, the Solar Energy Division sponsors a Graduate Student Award each year. We are pleased to recognize the 2001 winner of the \$1000 stipend as Mr. James T. McLeskey, Jr, studying at the University of Virginia. Ms. Wei Liu, University of Minnesota, is the runner-up. Formal presentation of their awards occurred at the Solar Forum Conference held April 21-25 in Washington, D.C. Also, each student presented a technical paper on their research during the regular sessions at the conference.

More information about this award can be found at www.asme.org/divisions/solar/announce.htm.

Opportunities for Involvement

Active volunteers are essential for the operations of the Solar Energy Division. As you can see, there are many opportunities for your participation in the Division. We will welcome your participation. Consider becoming active in a Technical Committee or assisting with one of the other activities, such as Solar Splash. It's a great time to get involved in YOUR Solar Energy Division! Contact any of the Division officers or Technical Committee Chairs for more information.

Chair's Message

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Forty-two papers on wind energy were presented. Next year's Wind Energy Symposium will be held January 14-17, 2002 in Reno, NV. Contact the Program Chair Herbert J. Sutherland at 505-844-2037, email hjsuthe@sandia.gov for more information on the 2002 symposium.

Heritage Site Confirmation. The University of Florida Solar Energy Conversion Laboratory has been successfully nominated as a Mechanical Engineering Heritage Site because of its significant work representing a pioneering role in the application of solar power within mechanical engineering. The sponsoring Gator Section of Region XI will prepare a commemorative brochure and hold a ceremony at which the ASME president will present a bronze plaque.

John I. Yellott Award. Frank Kreith was awarded this highest honor award from the Solar Energy Division for his demonstrated outstanding leadership for a sustained period of time, for his established reputation for performing high-quality solar energy research, and for his significant contributions to solar engineering.

New ASME Fellow. Jeff Morehouse was presented with the grade of Fellow from the ASME for his outstanding dedicated service to the Solar Energy Division. Jeff Morehouse served on the Executive Committee, participates in several Division activities, and is actively involved with the Solar Splash.

Best Paper Awards. Every year the Division recognizes authors who submit outstanding papers to the annual conference. At Forum 2001, four best paper awards were presented: "Solar-Hybrid Gas Turbine-Based Power Tower Systems (REFOS)" by Reiner Buck, Thomas Bräuning, Thorsten Denk, Markus Pfänder, Peter Schwarzbözl, Felix Tellez; "Measured Performance of Building Integrated Photovoltaic Panels" by A. Hunter Fannery, Brian P. Dougherty, and Mark W. Davis; "The Thermal Penalty of an Immersed Heat Exchanger in Integral Collector Storage System" by Saurabh Arora, Jane Davidson, Susan Mantell, and Jay Burch; and "Ground-Coupled Heat and Moisture Transfer from Buildings: Part 1 - Analysis and Modeling" by Michael P. Deru and Alan T. Kirkpatrick.

If you have any recommendations to improve the Division service to our members, please share them with me by sending me an email at jepache@sandia.gov. I hope each of you will be able to participate in one of the several activities the division sponsors.

James E. Pacheco
Solar Energy Division Chair

Journal of Solar Energy Engineering

The *JSEE*, sponsored by the Solar Energy Division, is recognized as one of the leading archival journals in the area of renewable energy and energy conservation. We publish four issues per year that include technical papers as well as discussions of policy and regulatory issues that affect renewable energy technologies and their implementation.

The February issue of the Journal of Solar Energy Engineering ushers in a new year that hopefully will find renewable energy with an increased role in meeting global energy needs and reducing the environmental impact of the use of fossil fuels. There will be several changes in the Editorial Staff of the Journal this year and an exciting new forum for authors to publish on-going work.

The Journal has traditionally published original technical articles and briefs in all areas of renewable energy and energy conservation. We will continue to publish high quality technical papers, which are the backbone of the Journal. Our primary objective is to maintain and to enhance the quality and reputation of the Journal for both authors and readers. Two new forums for publication have been added.

To address the broader scope of renewable energy, a new Discussion section was introduced in the February 2000 issue. The *Discussion* section of each issue includes papers that are of current interest, but are not necessarily of archival value. Papers on energy policy, the impact of alternate technologies on the environment and energy consumption, and R&D initiatives are welcome. These papers are reviewed in less than two months and published within 6 months.

In the February 2001 issue, we introduced another exciting format for publishing technical achievements in solar energy. *Solar Scenery* features photographs or graphical displays of research results and significant new solar installations or research facilities. Our goal is to provide authors an opportunity to showcase their work before a full paper has been written. Submittals will be reviewed within three weeks and will be published in the next available issue. The technical content of the photo should be explained in an extended caption (usually less than 200 words). Submittals should either include new scientific information or a technical description of new facilities or installations. The "photos" can be either actual photos or graphical information (numerical or experimental data) or a combination.

We will continue to highlight special topics and extended reviews of relevant technology. The May 2001 Special Issue is devoted to Solar Thermochemical Processes. This issue showcases research underway in Australia, France, Germany, Israel, Portugal, Switzerland, and the US. Profes-

sor Emeritus Edward Fletcher of the University of Minnesota is guest editor and Dr. Daniel Blake is the Associate Editor.

The Editorial Board welcomes five new Associate Editors joining us this year.

- **Fundamentals and Theory - Dr. Karen Den Braven**, is a Professor of Mechanical Engineering at the University of Idaho. Her research interests include theoretical and experimental research on the thermodynamics and heat transfer of ground-coupled (geothermal) heat pumps.
- **Solar Chemistry - Dr. Aldo Steinfeld**, Head of the Solar Process Technology Group at the Paul Scherrer Institute in Switzerland, is leader in research on solar thermal chemical processes.
- **Solar Thermal Power - Dr. Robert Pitz-Paal** is Head of the Solar Thermal Branch at the German DLR research institute in Kohn. He is recognized in Europe and in the US as one of the world's leading experts on solar power production and coordinates the international activities in solar thermal technologies through the International Energy Agency's PACES program.
- **Solar Collectors - Dr. Abraham Kribus**, Senior Scientist at the Weizmann Institute of Science in Israel, is internationally known for his work in industrial applications of concentrated solar thermal energy and concentrating collectors.
- **Testing and Measurements - Dr. Howard A. Walker**, Senior Engineer at the National Renewable Energy Laboratory in Golden Colorado, is currently the Task Leader for the Federal Energy Management Program (FEMP) Design Assistance.

These new Associate Editors join an impressive group of experts, many who are serving their second three-year term. We acknowledge the valuable contributions and hard work of the Associate Editors whose terms are complete. I would like to personally thank these "retiring" Associate Editors who have made my first year as Editor easier: Dr. Daniel Blake, Dr. Roy Hogan, Dr. Allan Kirkpatrick, Dr. Tom Mancini, and Dr. Stan Kleis. Dr. Mancini and Professor Kirkpatrick both served the maximum six years.

I encourage you to submit your work to the Journal. We are committed to providing timely reviews of your submittals. The time from submittal to publication should be no longer than six months. An expedited dual review process is available for authors who submit papers to ASME conferences sponsored or co-sponsored by the Solar Energy Division.

Jane Davidson
Editor

Solar Splash 2000 Results

At the invitation of the University of New Orleans, we decided that a change of venue might be good for the 7th annual Solar Splash. Unlike the unpredictable weather of Milwaukee, the South proved to be warm and dry with "lots" of wind, an "interesting" combination for boating!

After Technical Inspections on June 7th, and with the swim test behind all of the skippers, one of the first teams to watch closely was the 1998 Champion from the University of South Carolina. The first two challenges each team faces are a 70 meter straight line Qualifying Sprint and negotiating a Maneuverability course in their full solar configuration. South Carolina managed each course in the fastest time; everyone was duly impressed.

Next came the Solar Slalom. This is a combination of speed and maneuverability. As with all events, South Carolina left the starting line from a standing start and when they started to make their first turn, the rudder broke off. This is the only event that does not allow multiple attempts so they received 0 points. This one failure turned out to be pivotal since it made it a "horse race" of the whole competition! Now, the door was open and the newcomers wasted no time. After qualifying second, the University of Arkansas won the Slalom followed by Geneva College.

Our hosts, the University of New Orleans won the Sprint, but this didn't distance them from their close rivals since



Kansas State University, using boat sign #99, passes the College of New Jersey at one of the corner marks. One of the two safety patrol boats can be seen in the background. A team of judges does lap counting in the same manner used for the Indy 500 for many years.

the point differential is based on the margin of victory, which proved to be small. The real test comes in the Endurance Event where each team goes as far as possible in four hours on roughly equal parts of stored solar energy and direct sun. This event clearly showed the overall improvement of the teams as nearly all had very good distance. With a rudder borrowed from the Coast Guard Academy, South Carolina had a very strong showing over New Orleans, and allowed them to "squeak" out the victory!

Final standings for the top 5 places were:

	Points
University of South Carolina	834
University of New Orleans	825
U.S. Coast Guard Academy	808
University of Arkansas	727
Geneva College	669

Sportsmanship has always been a key aspect of the Splash and this was apparent again when UMass-Dartmouth loaned Coast Guard it's solar panels for the Endurance after the USCG panels proved inadequate. Also, the loan of the rudder to South Carolina by the Coast Guard was instrumental in determining the final standings. Although wind was a bit troublesome for some of the teams, it also added an element of reality. Solar Splash is not just an academic exercise; it takes place in the real world with very real challenges.



A large paddock area is created using a 60' x 90' tent. Power is provided and each team has an assigned 10' x 30' area that is their 'home' for the five days of Solar Splash. The veteran teams come well prepared. Some have their own trailers with mini-workshops. Most have come to realize that there is more to success than just boat preparation, it is attention to all the details.

IECEC 2001

The 36th Intersociety Energy Conversion Engineering Conference (IECEC) will be held at the beautiful Westin Hotel in Savannah, Georgia, July 29-August 2, 2001. The IECEC is sponsored by 6 professional societies, ASME, AIAA, IEEE, ANS, AIChE, and SAE. ASME's Solar Energy Division and Advanced Energy Division are the sponsoring societies for this year's conference. IECEC brings together energy professionals from all over the world to make technical presentations in energy conversion, advanced energy and power systems, energy storage, and current R&D in the energy area. Over 300 technical papers and 400 attendees are expected to attend. Come join us in Savannah and support the SED. For more information, contact the General Program Chair, William D. Turner, (979) 862-8480, wdt5451@esl.tamu.edu or see the conference web page at www.asme.org/conf/iecec01.

Solar Splash 2001 heads for Buffalo

In 1901, the Pan American Exposition was held in Buffalo, New York with the theme, "The Future of Electricity". It was a demonstration of "Long Distance Power Transmission" from Niagara Falls, a mere 15 miles away.

Recently, private citizens, the City, and Erie County executives all agreed that bringing Solar Splash to the 100th Anniversary of "Pan Am" would be a wonderful way to celebrate the progress made and to give kids in Western New York State a look into their future. The celebration will make the 8th annual World Championship of solar/electric boating a major highlight of the summer of 2001.

The Splash will remain a 5-day competition, June 20-24 but that will be one of the few similarities. Youth education has always been a theme, but on a very limited scale. This year, approximately 14,000 teachers will be receiving a flier about the Splash, in January, distributed through the Buffalo Museum of Science.

In spring, 500 Science teachers will get a poster in their classrooms through the school system and plans are underway to have a boat on display in the museum, starting in May.

Support has been outstanding from Mayor Masiello, Erie County, the Greater Buffalo Convention & Visitors Bureau, Buffalo Yacht Club and numerous other organizations in the area. It is apparent that there is huge interest in making the 2001 Event a great success.

One of the very exciting geographic features of the area is Hoyt Lake in Delaware Park where the Event will take place. The only remaining building from the "Pan Am" is now the Buffalo & Erie County Historical Society that overlooks the lake. During a final site survey trip in early November, representatives of Advanced Energy Competitions, the Splash organizers, found the lake to be ideal. Size, water depth, orientation, protection from wind are all outstanding features.

Delaware Park is centrally located in the city and easily accessible by road. Also overlooking the lake is the Albright-Knox Art Gallery. All of these components, along with Buffalo being the "Sunshine Capital of the Northeast" attract many people to the park daily.

Everything is shaping up to make the experience an outstanding one for students from:

University of South Carolina - Columbia
U. S. Coast Guard Academy - New London, CT
University of Arkansas - Fayetteville
Geneva College - Beaver Falls, PA
College of New Jersey - Ewing
Louisiana State University, Baton Rouge
Grand Valley State University - Grand Rapids, MI
Columbia University, New York City
State University of New York - Stony Brook
The Park School - Baltimore, MD
Kansas State University - Salina
Marquette University - Milwaukee, WI
Cedarville College - Ohio
Univ. of California at Santa Barbara
École Technologie Supérieure - Montréal
Rice University - Houston, Texas
University of Buffalo
National Taiwan University - Taipei

With this years rookie teams, a total of 58 educational institutions have participated in one or more of the 8 Solar Splash's, beginning in 1994. Many have competed in multiple years.

Since inception, the SED has been a primary sponsor for Solar Splash. Past Chairs Bob Reid and Jeff Morehouse have made huge contributions in time and energy to help perpetuate the hands-on learning experience. Many other members of the Division have assisted with judging of Technical Reports and sponsorship to help sustain this cross-disciplinary experience. Many thanks to you all.

For more information, visit our web site, www.solarsplash.com. To reach headquarters, e-mail us at ssplash@earthlink.net or call (520) 773-0230.

CALL FOR PAPERS

Solar 2002

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June 16-21, 2002

Reno, Nevada

The American Society of Mechanical Engineers' Solar Energy Division, the American Solar Energy Society, and the American Institute of Architects Committee on the Environment, along with the Interstate Renewable Energy Council and The Solar Rating and Certification Corporation will host the 2002 conference. The Solar 2002 conference is to be held in Reno, Nevada. The conference will include technical papers presented in stand-up presentations, keynote lectures, panel discussions, open forum sessions as well as social events. Papers submitted to ASME would be peer reviewed following standard ASME procedures.

Papers are solicited for sessions in all areas of renewable and advanced energy systems research and development. These would include, but are not limited to: solar ponds, ocean thermal energy, heat pumps, cogeneration, photovoltaics, solar space applications, geothermal systems, Stirling engines, superconductivity, synfuels, energy storage, building energy conservation, hydrogen technologies, bioconversion, fuel cells, efficiency standards, chillers, component simulation, economic analyses, and fundamentals and theory.

Accepted papers will be published in the ASME conference proceedings. In their letter of transmittal, authors can request that their papers also be reviewed for publication in the ASME Journal of Solar Energy Engineering. Papers submitted for joint Journal review should be of permanent interest and of archival value and not exceed nine Journal pages (9000 words). Abstracts of 500 words or less should be submitted by mail or e-mail to the Technical Program Chair below or to one of the program chairs. With the abstract, submit the paper title, three keywords, the author's names, affiliations, and full addresses and the name, address, phone and fax numbers, and e-mail address of the author to whom correspondence should be directed. Abstracts sent to the Technical Program Chair below should also indicate the Technical Committee of interest (Conservation & Solar Buildings, Fundamentals & Theory, Heating and Cooling Applications and Analysis Committee, Solar Chemistry, Solar Ponds and OTEC, Solar Space Applications, Solar Thermal Power, Testing and Measurement, or Wind Energy.)

Abstracts should be sent to:

ASME Solar Energy Division
J Boise Pearson
TD 40
Marshall Space Flight Center, AL 35812
PH: (256) 961-0078
FAX: (256) 544-5926
EMAIL: Boise.Pearson@msfc.nasa.gov

www.asme.org/solar2002



AVAILABLE ONLINE AND IN PRINT!

Journal of Solar Energy Engineering

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PURPOSE AND SCOPE

Along with announcements and notes of interest, the *Journal of Solar Energy Engineering* publishes technical papers and technical briefs on all aspects of solar-derived energy for the generation of mechanical and electrical power, including both active and passive solar applications.

TOPIC AREAS

Energy conversion; industrial process systems; heating and cooling; ocean energy conversion; fundamental processes and theory; collector development and testing; wind energy systems; photovoltaics; system analysis and control; solar design; energy storage; bio-conversions; conservation and solar buildings; solar space applications; and solar ponds.

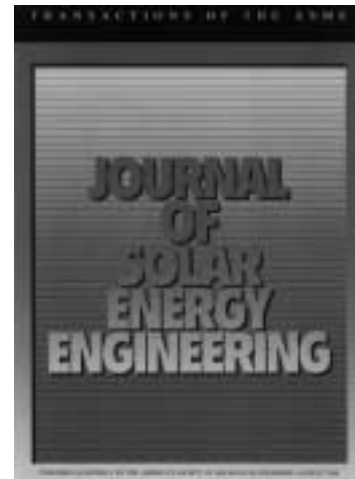
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ASME Solar Energy Division Graduate Student Award

The Solar Energy Division of ASME is pleased to announce the third annual award to be presented to an outstanding graduate student working in an area of solar energy supported by the Solar Energy Division of ASME. Areas of interest include:

- Conservation and Solar Buildings
- Fundamentals and Theory
- Heating and Cooling
- Photovoltaics
- Solar Chemistry
- Solar Ponds and OTEC
- Solar Space Applications
- Solar Thermal Power
- Testing and Measurements
- Wind Energy

The award includes \$1000, a recognition plaque, and registration at the 2002 International Solar Energy Conference.

Eligibility

Applicants must be student members of ASME enrolled as full-time graduate students effective December 1, 2001.

Application Procedure

The completed Application must include three (3) copies of:

- The Application Form
- A Statement of Research
- Official copies of undergraduate and graduate transcripts
- Two (2) letters of recommendation, one from the research advisor

Statement of Research: The Statement of Research is to be written by the student and must represent the student's own thinking. It is to be written using non-specialized terms that are clear and unambiguous, so that someone not intimately familiar with the specific field of research but with a solar energy background can understand the material. The Statement of Research is limited to three pages including figures. (Type size should be no smaller than 12 points and margins no less than one inch.) It should include a brief overview of the research, method of approach, and discussion of potential significance of the results.

Three (3) copies of the application materials should be mailed to the Chair of the Graduate Student Award committee at the following address :

Dr. David Klett
Mechanical Engineering Department
North Carolina A&T State University
Greensboro, NC 27411

Deadline: Applications must be received no later than December 15, 2001.

For more information visit: www.asme.org/divisions/solar/announce.htm

