

SEPTEMBER 2003

SAE International

ARIZONA-NEVADA SECTION NEWSLETTER

NEXT MEETING SEPTEMBER 18

HIGHLIGHTS...

- This Month's Presentation...
Stirling Engines, Solar Energy & the Hydrogen Economy
- Message from the Chair

- Recap of Last Meeting
- SAE Student /Faculty Advisor Profile
- New Smart Car Models

- New "Alternative Cars in the 21st Century"
- Newsletters by Email
- Derek Logan to Handle PR

Dinner Presentation...

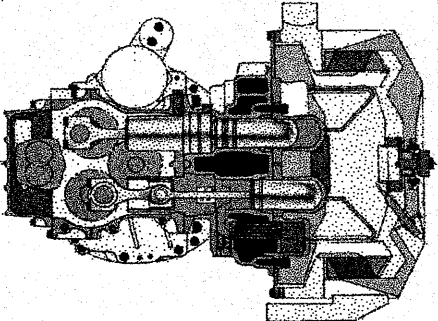
Stirling Engines, Solar Energy & The Hydrogen Economy

Presented by
Steven W. Trimble
Vice President of Engineering
Stirling Energy Systems, Inc.

Stirling Energy

Systems, Inc. is a clean energy development company that is involved in hydrogen, solar, wind, and biogas projects. The company is currently developing 10-KWe and 25-KWe dish-Stirling engine solar-to-electric power systems for both village and utility power. SES currently has demonstration units in South Africa, UNLV, Sandia National Labs, and Fort Huachuca. An improved design will be installed at Arizona Public Service's Solar Research Center in Tempe in January.

The Stirling engine is noted for its high efficiency and its ability to use a wide variety of fuels with low exhaust gas emissions. The presentation will discuss the basic theory of engine operation, test results, and plans for high production. SES also has a contract with the California Energy Commission to develop a Stirling engine that will operate on low-Btu gas from sources such as feedlots and landfills.



Results from this design effort will also be discussed. SES owns the rights to the original McDonnell Douglas dish that was developed in the the 1980s. This dish is being redesigned for low-cost, high-rate production. The dish is also an efficient and renewable method of generating hydrogen from water through either high-temperature electrolysis or high-temperature chemical splitting. These processes will also be discussed during the presentation.

Steven W. Trimble

Steven W. Trimble is past-President of the Arizona Section of SAE. He is currently Vice President of Engineering for Stirling Energy Systems, Inc. Steven has 30 years of experience in the design of power systems for both aerospace and utility power applications. He has been an engineer and project manager at Honeywell, Phoenix Controls, and Texas Instruments. He has also been involved in technical, business and organizational development consulting. Steven has also been a university professor at DeVry Institute of Technology and Ottawa University. He has a B.S. in Engineering, an MBA, and he is currently finishing a Ph.D. in Business Administration with an emphasis on Project Management, Organizational Learning and Sustainable Development.

DATE	TIME	LOCATION	COST
Thursday September 18	Social Dinner Presentation	Holiday Inn (Phoenix Airport) 44th St. & Washington 602-273-7778	Students Members Guests
	- 6:00 pm - 7:00 pm - 8:00 pm		- \$10 - \$18 - \$19
*RSVP by 2:00 pm Monday September 15. Call Robert Q. Riley: 623-872-8010			

Message From the Chair.....

Greetings and welcome to the start of another great year for the SAE Arizona-/Nevada section. I believe you will find the variety of programs and activities planned for this year to be of great interest to you all.



As I write this column, we are still in the throes of the monsoon summer heat. Your Governing Board has been working extremely hard all summer to plan a great slate of presentations for the year ahead. Last year, our section regained momentum and had a successful year under the able leadership of our chairman, Dave Marsh. We aim to capitalize on that momentum this year and bring you a variety of topics that we hope you will find interesting and informative.

Several months ago, SAE International contacted a cross-section of our membership and asked them to complete a survey on what they did and did not like about SAE and specifically, their local section. One item which appeared in several of our member's responses is that they wished we would have some meetings outside of the metro Phoenix area. To that end, we are actively seeking to hold one of monthly meetings in the Tucson area for this year. In addition, we are making contact with the Tucson area members to determine if there is enough interest in establishing an SAE section in southern Arizona. Stay tuned as the year progresses for updates on our efforts.

Our year begins with a speaker who is well known to all of us - Steve Trimble, a past Chair of our Section. He is former university professor and a successful businessman and Engineer, and is now Vice President of Engineering at Stirling Engine Systems, Inc here in Phoenix.

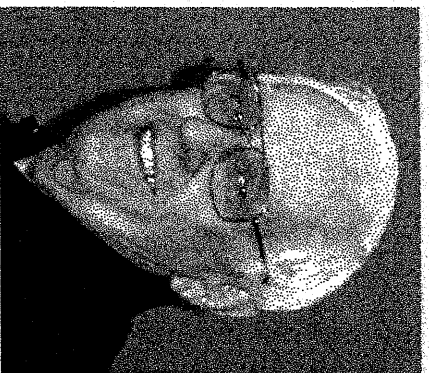
I believe Steve's presentation will be a fine way to start our year. I would especially urge the students from our universities to attend. Steve is a storehouse of information on the development of the alternative power sources that will surely have a big impact on the future you are living into.

Thank you to all of you have helped make plans for the upcoming year. We couldn't have done it without you! I look forward to seeing many of you at our September meeting!

Todd Zuercher

Recap of Last Meeting by Howard Daudet

It is most gratifying to report that the outstanding quality of the presentation at our May Section meeting enabled us to conclude our 2002-2003 Section season with a real bang!



Ward Atkinson

The Arizona SAE Section is most fortunate to count among its members such talented, knowledgeable and experienced people as Ward Atkinson. Ward treated us to an outstanding presentation, eloquently explaining in detail all the important technical aspects of automotive air-conditioning systems. He started with an interesting history of automotive A/C systems to help us understand how it all started, where we have been and how we got to where we are today. He covered the old SO2 ammonia and other less popular systems and the development path that brought us to the modern Freon systems in common use today, including Freon 12, 22, 134, 134A and others. Ward did an excellent job of explaining in very understandable terms the thermodynamic aspects of each system, how they compare, the performance characteristics, and the mechanical design considerations associated with the practical implementation of each.

He went on to explain the need for considerable improvement in the cycle gas characteristics from the standard points of efficiency, safety, and environmental impact. He covered in excellent detail the current work in research and development toward current and future goals being conducted both here in the USA and in Europe and the UK.

Using the latest and best of audio-visual techniques, Ward showed verbally and graphically how systems employing a number of the current choices and future possibilities in cycle gas compounds compare with respect to power requirements versus cooling performance.

It was truly such an outstanding presentation that there is not nearly enough room in this publication to adequately recount it. All we can say is: "If you were not there, you should have been!"

Smart Car Getting Smarter

The super-efficient Smart Car has achieved an almost cult-like popularity in many European cities where parking is limited and fuel costs are high. Due to its success in the marketplace, the company is now in the process of introducing a number of variations on the Smart Car theme.



Smart ForFour four-place car.

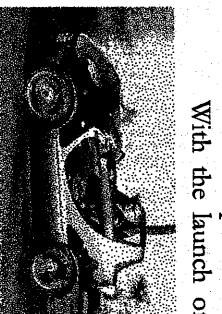
The first pictures of the smart forfour show that the new member of the smart family is giving new impetus and thus offering a smart alternative in the small car segment. Like all smart models, the key product values typical to the brand, such as the Tridion safety cell and the use of two colors, have also been implemented and enriched with new ideas in the four-seater which will go on sale in spring 2004.

Buyers of the 3.75 meter smart will have a choice of three petrol and two diesel variants. The 'inner life' of the smart forfour also offers an innovative space concept, and typical smart solutions which will be available for the first time in the small car segment.



Smart Roadster-Coupe.

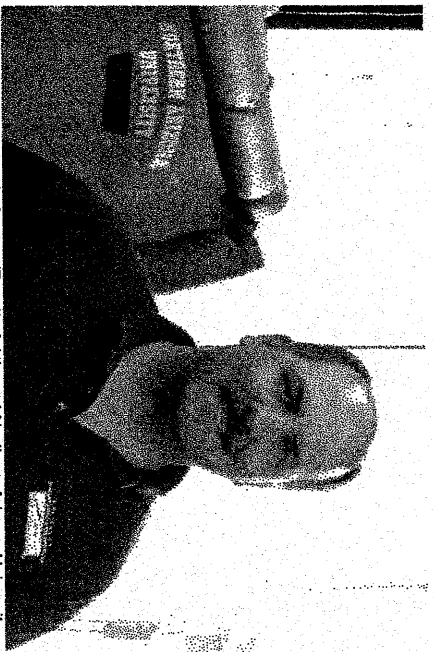
The features of the smart forfour are both emotive and functional. This five-door car has an individual profile, offering driving pleasure with a sporty touch. Despite its compact dimensions, there is space for all the safety features typical to smart. With the smart forfour the smart designers and developers have developed an independent car with a strong character for the small car segment, which is a new interpretation of the standards set by the city-coupe, smart cabrio, smart crossblade, smart roadster and smart roadster-coupe.



Smart Crossblade.

With the launch of the smart roadster and smart roadster-coupe in April 2003 the segment of the compact and purist roadster is being revived, which has not existed in this form since the 50s and 60s of the last century. With an engine output of 60 kW and a weight of just 790 kg, at 13.2 kg per kW (9.6 kg per bhp) the roadster offers a low power/weight ratio which has a positive effect on the handling.

SAE Student Faculty Advisor Profile: NAU's John T. Tester, PhD



Dr. John Tester is SAE's Student/Faculty Advisor at Northern Arizona University.

John T. Tester, Ph.D., is Associate Professor of Mechanical Engineering at NAU, and also our new Student/Faculty Advisor there.

Dr. Tester joined NAU program in 2000. Having over eleven years of engineering experience in both military and commercial environments, he returned to academia to earn a PhD from Virginia Tech in 1999. He teaches in the NAU "Design4Practice" curriculum, as well as in CAD/CAM and manufacturing areas. His professional interests include rapid prototyping, manufacturing, CAD and the application of these topics to renewable energy technologies. He is the advisor for both NAU's SAE student chapter and ASME student chapters. His personal interests include American muscle car restoration and hiking.

Second Edition of "Alternative Cars in the 21st Century" Due for Publication

SAE will soon publish the Second Edition of "Alternative Cars in the 21st Century." This book, written by our newsletter Editor, Robert Q. Riley, was first published in 1994, and was one of SAE's top-selling books for 1995.

Developments in automotive technology have progressed so rapidly since the book was first published that a Second Edition became necessary. "Alternative Cars in the 21st Century" has been significantly updated and expanded, and now includes a chapter on intelligent vehicle systems and a Forward by Dr. Paul MacCreedy. Bob will give us a coffee-talk this season.



Electronic Newsletter... Get Your Newsletter by Email

Beginning this year, we will make a gradual transition to an electronic newsletter. Members who subscribe will receive a monthly email containing a link to the newsletter. Simply click on it to receive your newsletter in living color. Benefits include a full color newsletter, quicker delivery, and a newsletter that is available on your computer where it cannot be lost or eaten by the dog. The advantage for the Section is the ability to deliver a better product at a much lower cost. Roughly \$3000 of our annual budget now goes to the expense of printing and mailing newsletters. Details on how to subscribe will appear in upcoming issues.

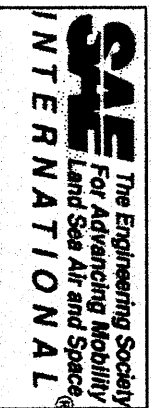
Derek Logan to Handle Section Media Relations

Derek Logan has returned to our Section and will be in charge of promotion and media relations. So we can expect to see a boost in attendance and membership. Derek is past Chair of our Section, and one of the few members from this Section to be on the Board of Directors of SAE International. Congratulations, and welcome back Derek!

Meeting Schedule

September 18	- Stirling & Solar Energy, and the Hydrogen Economy
October 16	- Engineering Simulation Tools
November 20	- Patent Law: Protecting Your Ideas
December	- NO MEETING
January 15	- Advances in Road Surfaces Technology
February 10	- Retractable Hardtop Technology
March 18	- Aerospace Professionals Roundtable (tentative)
April 15	- Program to be determined
May 20	- Program to be determined

Todd Zuercher Chair 480-441-1595	Kevin Willson Vice Chair 602-997-7593	Dave Vasquez Secretary idave@asu.edu	John Lester Treasurer 480-733-6532	Robert Riley Newsletter Editor 623-872-8010
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