

SAE ARIZONA • NEVADA SECTION

MEETING: Oct. 20

Section Web Site: www.saearizona.org - Sign up for your newsletter on our website.

HIGHLIGHTS...



- **Synthetic Gasoline**
- **About Dr. Robert Falco**
- **Message from the Chair**
- **Recap of September Meeting**
- **GM's New Collision Avoidance**
- **Upcoming SAE Events**
- **Discussion of Tucson Sub-Section**
- **Meeting Schedule**

"Synthetic Gasoline from Bio-Wastes and Solar Energy"

by **Bob Falco**

The need to transition to non-petroleum based liquid fuels grows, both because of the economic penalty that oil will continue to impose, and because of the build-up of greenhouse gases its use results in. The transition needs to be on a large scale. The needed alternatives to petroleum-based fuels should preferably be obtained from domestically available resources that can be increasingly composed of a high percentage of renewables. The new fuel must be produced as green as possible, and burn as green as liquid fuel can. To date, solutions that are economically viable, and environmentally friendly, have not been found. However, by concentrating solar energy to greater than 1100 C we can do this. We propose a drop-in solution that meets these goals. It is essentially synthetic gasoline. During the process, the feedstock will gain 30% additional energy from the sun, as it undergoes conversion in solar ovens. The process itself

recalls to recycle carbon dioxide! To get the ball rolling on a large scale, we propose to initially use natural gas and carbon dioxide as the feedstock. But because natural gas is primarily methane, and since methane can also be made renewably by anaerobic digestion of biomass wastes (resulting in what is called biogas), as cities and farms install

anaerobic digesters, biogas should be increasingly used as the feedstock, making the process more and more renewable. As an example of scale, the manure from ten cows can provide 680 gals/year of gasoline - more than the average American driver uses. Driving with this gasoline would be overall carbon negative, no sulfur, and lower NOx. Using the proposed synthetic gasoline requires no modifications to existing engines, or modifications in our current fuel delivery infrastructure. It does not require burning of any of the feedstock. It does not threaten our food supply and addresses a major waste problem. It can free us from using imported oil, and would be a major job creator.

Dr. Robert Falco

*Institute for Energy Resourcefulness and
SABRE LLC (Solar Augmented Biomass Renewable Energy)*

Dr. Robert Falco holds BS and MS Degrees in Aeronautical Engineering from the Polytechnic University. At Princeton he earned a PhD in Aerospace and Applied Mechanics and went on to do 4.5 years of Post Doctoral research work at Cambridge University, then the world center for fluid turbulence. Robert joined the Mechanical Engineering Department of Michigan State University, where he became full professor and established the Turbulence Structure Laboratory, doing research and teaching for 19 years on energy transfer in fluids. Robert also has been a consultant for National Laboratories such as LANL, LLNL and NASA, as well as AFOSR, ONR, DOE, and some of the leading Aerospace Companies such as Boeing, and automobile companies such as Ford.



DATE	TIME	LOCATION	COST With Dinner	Presentation Only
Oct. 20	Social	- 6:00 pm	Members - \$23	\$10
	Dinner	- 6:30 pm	Guests - \$27	\$10
	Presentation	- 7:30 pm	Students - \$12	no charge
Hotel - 480.894.1600			Payable by cash or check	
RSVP by Monday Oct 17 info@saearizona.org				

Message From the Chair

Welcome back to the 2011/2012 season for SAE Arizona/Nevada Section. We had an interesting meeting with Jason Lipscomb from Bombardier. He presented a great technical presentation on the Phoenix Sky Train. See the September recap for more details. We had Wade Gyllenhaal, the President of the ASU SAE Student Section present for our Coffee Talk. Wade has some great vision for the ASU Section. Ward Atkins presented on a Refrigerant Symposium that happened this month. It was a nice meeting. For our October Meeting, Bob Falco will present on the topic of "Synthetic Gasoline from Bio-wastes and Solar Energy". We look forward to seeing you there. Our speaker calendar is filling up and we are down to finding one more speaker for this spring. Toyota has committed to presenting in March or April 2012. I am working at pinning them down for a particular month. We have a list of fine speakers for this season. Come and join us for some great topics and networking.

We are still looking for a member to serve as the Secretary for our Board. We are anxious to fill that remaining slot. I will buy your dinner at an upcoming AZ SAE Dinner Meeting if you can step up and serve in that position or recommend a member that will fill the position. This is conditional on the Board approving the candidate. I look forward to hearing from you.

In November, Matthew M. Miller and Rick Rachner from the SAE Foundation will be attending our dinner meeting. John Lester will be presenting a check from our Arizona/Nevada Section to the SAE Foundation. If you would like to contribute additional donations to this great foundation, please contact John Lester at johnlester@sprintmail.com.

Can you believe that they are selling Fiat automobiles in the US again? No, not Fiats with a Chrysler badge, but actual Fiats automobiles. After a 30-year absence, the Fiat 500 will be sold through Chrysler dealers and some new Fiat dealers. Some of the Fiat 500's will be manufactured here in the states. Time will tell on how the public receives them.



Fall is coming with below 100-degree temperatures and I am excited about this opportunity to serve as your Chair for the 2011/2012 season. I'll see you at the next dinner meeting.

Larry Wilson Chair SAE Arizona - Nevada Section



Larry Wilson - Chairman

Recap of September Meeting by Bob Holso

Thanks to Bill Gest, we were fortunate enough to have Jason Liscomb, APM Vehicle Systems Manager for Bombardier Transportation speak to us about the Phoenix Sky Train – the new automated people mover (APM) under construction at Phoenix Sky Harbor airport. If you've been to Sky Harbor airport in the past several months, particularly in the area of Terminal 4, you've most likely seen the building activity that is occurring; largely above the road surface, high in the sky.

The new APM system is intended to reduce vehicular congestion around the airport terminal area and move travellers in a much more efficient manner than current operations. Today, an army of buses shuttle workers and travellers from parking lots surrounding the airport to and from their terminal destinations.

There are essentially three stages to the project. The first stage, scheduled for completion in early 2013, will connect the Light Rail system to an APM platform at 44th Street and Washington and a platform at the East Economy Parking Lot with a final connection to Terminal 4. The second stage will extend the route a half mile to Terminal 3. This stage is anticipated to be operational by 2015. Project cost for the first two stages are estimated at \$1.5 billion.

A third, and currently unfunded stage, will extend the APM past Terminal 2 to the Rental Car Center at 16th Street and Buckeye. This portion of the project would be finished in 2020.

The Phoenix Sky Train will be a driverless system which will provide increased safety by eliminating the risk for human error. It will run 24/7 with the ability to add and reduce the number of cars based on customer volume. Phase one will have a total of 18 cars when operational. Each car will be monitored from a computer control center. They will be equipped with visual surveillance cameras, public address capabilities, internal and emergency telephones, and several other redundant control systems for communications and safety. Each car will have a capacity of 56 passengers and generally run in groups of three, for a total of approximately 160 passengers per trip. Estimates are that 16,000 passengers using the APM will be transported each day at Sky Harbor.

The cars are 40 feet in length and weigh about 30,000 pounds. Each car will be equipped with two 4.1 ton air conditioning units. They will use a combination of dynamic and friction braking to control stops. All of the operational equipment for the cars is neatly packaged below floor level. This includes HVAC units, motors, batteries, compressors, brake resistors, bogies/suspension systems and the power collection system.

It is anticipated that the Phoenix Sky Train cars will operate (given normal maintenance) for at least twenty five (25) years in passenger service without compromising safety

ond – searching for shapes characteristic of vehicles. Detected vehicles are then checked over successive frames for changes in size for calculating time-to-collision. The system also uses speed, directional change, and how the accelerator and brake pedal have been applied to determine when to alert the driver.

The image processor also looks for lane markings to provide lane departure alerts. If the vehicle drifts out of the lane without a turn signal, the lamp switches to flashing amber and is augmented by warning beeps.

The GM camera-based forward collision alert system is listed at the Safercar.gov website as a result of passing three track tests required by the NHTSA's New Car Assessment Program.

Upcoming SAE Events, Conferences, and Symposia

SAE 2011 AeroTech Congress & Exhibition

When: October 18-21, 2011

Where: Toulouse, France

SAE 2011 Light-Duty Diesel Emissions Control Symposium

When: November 2-3, 2011

Where: Ann Arbor, Michigan, USA

SAE 2011 Electronic Systems for Vehicle Propulsion Symposium - For Improved Engine and Powertrain Performance

(co-located with SAE 2011 Intelligent Vehicle Systems Symposium - Advancing the Connected Mobility Experience)

When: November 8-9, 2011

Where: Troy, Michigan, USA

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DISCUSSION OF TUCSON SUB-SECTION

Tucson Connection Exploratory Committee SAE Arizona-Nevada Section

Dr. Parviz Nikravesh
David Vasquez

Curt Pedersen
Ron Weary

A small Exploratory Committee, including Tucson members, has been meeting to gauge the interest of Tucson area members in having SAE events planned locally. A brief survey was emailed to 100 members, 30 student members and 170 individuals with past interests in SAE. Pending favorable feedback and support from Tucson members, a subgroup of the Arizona-Nevada Section could evolve offering local events that would be closer for members to attend.

If you are interested in being part of the "Tucson Connection" and did not reply to the initial survey, please e-mail Dave Vasquez at info@saeazizona.org.

Arizona-Nevada Meeting Schedule

- October 20, 2011	Synthetic Gasoline from Bio-wastes and Solar Energy
- November 17, 2011	Brent Hendrickson, Chief Engineer of GM's new small diesel
- January 19, 2012	Chris Long, the Orbital VP
- February 16, 2012	TBD
- March 15, 2012	TBD
- April 19, 2012	TBD
- May 17, 2012	AWIM & University Students



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