

# SAE ARIZONA•NEVADA SECTION

MEETING: May. 20

Section Web Site: [www.saearizona.org](http://www.saearizona.org) - Sign up for your newsletter on our website.

## HIGHLIGHTS...

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- AWIM Presentation
- College-Level Student projects
- Message from Chair
- Recap of April Meeting
- Meeting Location Map
- Automotive Refrigerant and System Efficiency Symposium
- Meeting Schedule

## AWIM Presentation for May meeting

by  
Don Robins



Don Robins will give an update meeting about 'A World In Motion', a SAE sponsored program to get Elementary and Junior High students excited about math and science. The curriculum joins teachers, students, and engineers in exploring physical science. Volunteers provide technical assistance and serve as role models to students who may not have considered pursuing a career in the science or engineering. Volunteers work with students one day a week for about six weeks. We had 37 volunteer engineers this school year. Most are retired GM engineers, but we also have engineers from Motorola, TI, Boeing, Honeywell, Microchip, and others. This school year we impacted 775 students in 7 schools in the Phoenix area.

Since its beginning in 1990, there are now AWIM programs in all 50 states. The AWIM in AZ program was started three years ago by GM working with the GM Retirees Club of Arizona.

The SAE AZ-NV Section has been very supportive of the AWIM program and this will be the third year that junior high students will share their AWIM experiences with our members.

Student AWIM teams from Southwest Elementary School from the Roosevelt School District in Phoenix and from Canyon State Academy in Queen Creek talk about their AWIM experience and demonstrate their Motorized Toys.

Don Robins

Don Robins is a retired General Motors Engineering Executive who now lives in Arizona. He is a member of the SAE Arizona Section Board of Directors and is the SAE AWIM Phoenix Area Coordinator. Don started the AWIM program in Arizona 3 years ago with help from GM and the GM Retirees Club of Arizona. Don was recognized by SAE and GM in 2007 as the 'AWIM Rookie of the Year', and in 2009 received the 'Bill Agnew Award for Outstanding A World In Motion Volunteers' from SAE International. SAE only gives out one of these awards each year.



Don also tutors math at the Gila Crossing Community School on the Gila River Indian Reservation

### College-Level Student Projects

As last year, we will cap the year with a review of projects from Student SAE Sections that we support. We support student Sections at three Arizona universities. Student projects range from Super-Mileage vehicles to experimental aircraft, to Baja competition vehicles. These projects provide practical application for the engineering knowledge learned in the classroom.

Classroom studies tend to be cerebral and academic. There's nothing like hands-on application to make the academic information meaningful. When students apply their knowledge, its value becomes real. Students will give us an overview of their various design & build projects.

DATE	TIME	LOCATION	COST	With Dinner	Presentation Only	
May 20 2010	Social	- 6:00 pm	<b>Hilton Phoenix Airport</b>	Members	- \$22	\$10
	Dinner	- 6:30 pm	2435 S. 47th St, Phoenix-85034	Guests	- \$27	\$10
	Presentation	- 7:30 pm	480.894.1600	Students	- \$12	no charge
<b>RSVP by Monday May 17</b>			<b><a href="mailto:info@saearizona.org">info@saearizona.org</a></b>			

## Message From the Chair

And just like that, the party is almost over. We are approaching this year's last meeting and shortly after I will be fading into a sunset and Steve Atkins will become our Section Chair. Of course, I will still be actively involved helping Steve and other Board members to plan the next year events; however I feel that now is a good time to revisit what we planned to accomplish this year.



Michael Kremer, Section Chair

One of the major themes discussed last fall was the section sustainability. We devised (thank you Ron Weary) and distributed an extensive survey to our fellow members that should help us understand better what Section activities our member value the most and how we can sustain and further grow the membership. The survey just went out last week, so please look in your e-mail (might be in spam folder depending on your computer settings)) and fill it out. We will start implementing the findings next year.

Speaking about general content of our regular meetings, and judging by sporadic feedback, it seems that we had a good quality program overall but some room for improvement still exists. We will continue working towards attracting speakers from the leading technology companies – these meetings appear to generate most interest and the highest turnout. I want to specifically thank Derek Logan, Bill Gest, Don Robins and Hal Heule who collectively have sponsored majority of our guest speakers this year.

Overall, I'm glad that our section continues to be in working order with many people helping. We continue to enjoy the service of Robert and Galiya Riley who make and edit our newsletter. It requires hours of dedicated service and they have done a fantastic job for many years. Our website is fully operational and up-to-date thanks to continuous effort of Dave Vasquez, and Josh Rudin has been doing a great job arranging things with Hilton.

Now on the upcoming meeting: the most casual meeting of the year. As a year before, we have invited university students and AWIM school students to join us for dinner and share some of their competition projects experiences. We do not plan a formal presentation, rather a series of short talks by the students. This should allow us time to vote on the next year elected Board members. Our election committee nominated Steve Atkins to be Section Chair, Sri Bhashyam as Section Vice-Chair and John Lester as Treasurer.

Michael Kremer, PE

## Recap of April Meeting by Steve Atkins

Our April meeting featured Mr. Barry Koval, a Nissan Senior Project Engineer working out of the Nissan Technical Center in Stanfield Arizona. Barry gave a presentation of the Nissan Leaf, a pure electric vehicle due to be released, in limited quantities in December of 2010.



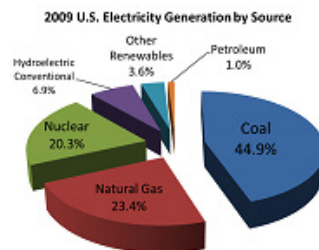
L-R:: Mike Kramer: Craig Pike (Coffee talk speaker from Nissan) and Barry Koval Main speaker from Nissan .

The leaf is a pure EV, that is, there is no engine to charge the batteries or contribute to powering the vehicle like a hybrid vehicle (e.g. Chevy Volt, Toyota Prius, Honda Insight, etc.) The Leaf has truly cut the link to petroleum fuel. The leaf is powered by a 24 Kilowatt-hour (KWh) battery that is



recharged by plugging the car into the grid – either from a 110 Volt outlet or a 240 VAC charging dock. Thus the energy used to power the Leaf is domestically generated from coal, natural gas, nuclear, hydro, or renewable, depending on your local electricity provider. Only 1% of our electricity comes from burning petroleum, which is used sporadically as a last option peaking/standby power due to its high cost.

The 24 KWh Lithium-ion battery powers a 107 Horsepower (80 KW) motor with 207 ft-lbs of torque. And unlike an internal combustion engine, the full torque is available from a standstill up to the rated motor power (remember that power = torque times speed). Acceleration figures were not given, but the top speed is about 90 mph. Driving range is said to be 100 miles as measured on the LA-4 driving cycle with the air condition-





er off; at highway speeds range is estimated to be 75 miles.

The batteries are expected to last 5 to 10 years, though battery capacity may be down to 70% after 5 years. A new set of batteries is expected to cost about \$10,000. The batteries are not swappable, they must be re-charged in the vehicle or replaced when the vehicle owner is no longer satisfied with the vehicle range.

There are three charging options for the Leaf. A 110 Volt AC onboard charger allows for “opportunity charging” form a standard 110 Volt outlet. As the name implies, opportunity charging is meant to add a few miles to the battery’s range when the opportunity presents itself, however a completely depleted battery can be fully recharged in 16-20 hours using the 110 Volt



charger.

charger.

But the Leaf is designed to be recharged overnight from a single phase 240 Volt source. While the car carries the charger onboard, a special, weatherproof charging dock must be purchased and installed at the vehicle owner’s residence. The charging dock is estimated to cost \$2200 installed and is eligible for a \$1000 tax credit. With the 240 Volt charger, a depleted battery can be brought to full charge in about 8 hours (at an average cost of \$2.75).

Finally, there is a quick charge option that needs an external three phase 480 Volt charger. This charger can bring a depleted battery to 80% charge in 30 minutes. Because of its expense (\$45,000) this charger is expected to be used commercially.

Because the batteries sit under the seats, the car is spacious -- a 4-door sedan with a



large trunk and room for 5 adults. Technical features include regenerative braking, ABS, traction control, stability control, tire pressure monitoring, independent front suspension using MacPherson struts and a torsion beam rear.



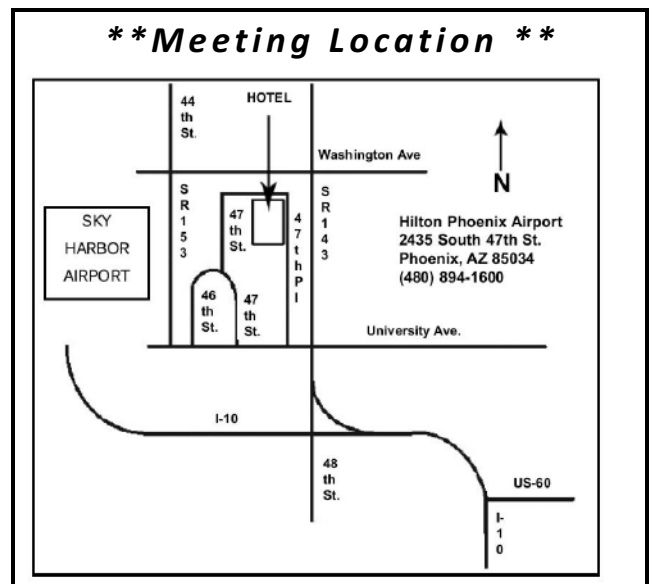
A particularly nice feature is the ability to pre-heat or pre-cool the vehicle by programming the air conditioner or heater, while the vehicle is still plugged in, using your cell phone.

Additional features can be found at: <http://www.edmunds.com/nissan/leaf/2011/featuresandspecs.html>

and also

<http://www.nissanusa.com/leaf-electric-car/index#/leaf-electric-car/index>

The MSRP for the Leaf is \$32,780 but this price can be reduced by a \$7,500 Federal tax credit. Certain states (like California) may have additional rebates or incentives. The vehicle can be leased for three years for \$349/mo with \$1,999 due on signing.



**SAE 2010 Automotive Refrigerant and System Efficiency Symposium**



Over a decade ago, the mobile air conditioning (MAC) industry first gathered to discuss and demonstrate various systems and refrigerants with concerns about the emissions of man-made greenhouse gases (GHG). Now that regulatory issues are upon the industry, and the candidate refrigerants have been narrowed down, the focus has shifted to refrigerant emissions and system efficiency.

The SAE 2010 Automotive Refrigerant and System Efficiency Symposium will gather industry leaders to discuss activities and progress made in addressing the impact of future MAC systems on the environment, including:

- Future refrigerant systems including: component designs, refrigerant system control strategy, performance, efficiency, reliability, system servicing and consumer acceptance.
- Maintaining occupant comfort during vehicle idle, engine shut-off, conditions.
- Controls for mobile air conditioning systems including efficiency and performance for minimum energy requirements vehicle idle, engine shut-off, conditions.
- Heating and cooling systems components (heat exchangers, A/C hoses, seals, compressor designs and new lubricants, and reliability, durability and safety issues).
- New service equipment and procedures for servicing, including system charging and leak detection technologies.
- Refrigerant system technologies that can reduce the fuel economy impact of A/C systems in real customer driving.
- Risk analysis related to refrigerant.
- Systems for heating and cooling of batteries for

hybrid electric vehicles.

- Safety mitigation technologies for new refrigerant systems.

To Register:

Online:

[www.sae.org/arss](http://www.sae.org/arss)

Phone:

1-877-606-7323 (U.S. & Canada only)

1-724-776-4970

Fax: 1-724-776-0790

Email: [CustomerService@sae.org](mailto:CustomerService@sae.org)



Visit [www.sae.org/arss](http://www.sae.org/arss) for the latest event information.

**Upcoming SAE Events, Conferences, and Symposia**

**SAE Automotive Refrigerant and System Efficiency Symposium**

When: July 13-15, 2010

Where: Xona Suites, Scottsdale, Arizona, USA

**Aerospace Manufacturing and Automated Fastening Conference & Exhibition**

When: September 28-30

Where: 2010, Wichita, Kansas USA

For event and registration details, please visit the page at: <http://www.sae.org/events/>

**Meeting Schedule**

May 20	- Student SAE Competition Vehicles Exhibit & AWIM Student/Teacher Presentation
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