

# SAE ARIZONA • NEVADA SECTION

MEETING: Feb. 18

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

## HIGHLIGHTS...

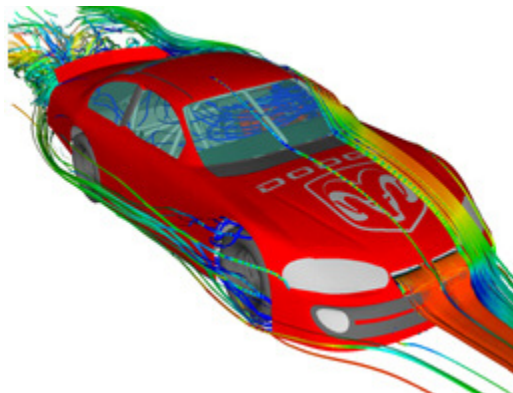


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## Race Car Aerodynamics

by

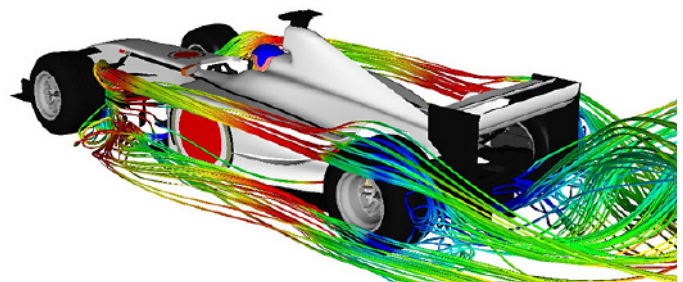
Thomas Ramsay



Race car aerodynamics will be explained by Thomas Ramsay during his presentation.

In the past 30 years, car racing—from stock cars to open wheel, from solar powered to dragsters—has seen an explosion in technology and a subsequent dramatic increase in performance. Along with the advances in engine, suspension, and safety technologies, the impact of aerodynamics on performance has been especially important as speeds have increased. Due to the engine and chassis rules imposed by various sanctioning bodies, aerodynamics has increasingly been seen as an ever more important area to understand and exploit. The lecture will outline three aspects of racing: the car, the track, and the race, focusing mostly on open wheel race cars, where aerodynamics plays a dominant role in reducing lap times.

Engineering, both from The Ohio State University, focusing on flight vehicles design and experimental aerodynamics. Tom is active in AIAA and is currently serving as Chair of the Columbus Section and is also a member of the Fluid Dynamics Technical Committee. Tom is also a member of SAE and belongs to the Vehicle Aerodynamics Forum Committee, Vehicle Configuration Committee, and the Motorsports Engineering Conference Committee.



### February Coffee Talk by Ron Will

Ron Will started designing cars in high school by winning the GM Fisher Body Guild model car contest. This win led him to Detroit and a ten-year career with GM Design Staff, primarily in the Corvette /Camaro Studios. Ron left GM to design his own dream car, the three-wheel Turbo Phantom Sports Car. Next, Ron joined the Subaru Design team in California where he created the Subaru Outback concept. Now he works to encourage car companies to build natural gas powered cars and trucks.

Ron will give a short PowerPoint review of the history of aerodynamics in car design with a few examples from his own career.

Mr. Tom Ramsay is currently a senior engineer at Honda R&D Americas in the Vehicle Research Division, where he is the technical leader of computational fluid dynamics (CFD) for most passenger cars and lighttrucks developed for the North American market. Before working at Honda R&D, Tom worked at Battelle Memorial Institute in the National Security Division where he did anti-armor research, munitions design and development, and counter-explosive and counter-narcotic research.

Tom received BS and MS degrees in Aeronautical

DATE	TIME	LOCATION	COST	With Dinner	Presentation Only
Feb. 18 2010	Social - 6:00 pm Dinner - 6:30 pm Presentation - 7:30 pm	Hilton Phoenix Airport 2435 S. 47th St, Phoenix-85034 480.894.1600			Dinner Pricing: See page 3.

RSVP by Monday February 15. [info@saearizona.org](mailto:info@saearizona.org)

## Message From the Chair

Greetings ! We began Year 2010 with the presentation about new vehicle stopping technology. Despite an unusually small turnout, thanks to quite extreme weather conditions that night, we had a quality meeting, an interesting presentation topic, and a good time in general. I would like to thank people who managed to show up, and I hope they enjoyed the event.



Michael Kremer, Section Chair

This month we will continue our journey through a very exciting list of programs for the remainder of the year. In February, we are hosting our friends and colleagues from Phoenix Section of American Institute of Aeronautics and Astronautics. They have arranged for a distinguished speaker, Mr. Thomas Ramsay. He will speak on the subject of race car aerodynamics. I'm sure that the vast majority of our members will find the topic a very worthy one. It seems that our three-year-old initiative to organize a joint event with AIAA is becoming a good tradition, and I hope we will continue these joint meetings in the future.

While it will be interesting to learn about the new developments in vehicle aerodynamics at Honda R&D, there is one more aspect to the upcoming meeting.

Ron Will, our coffer talk speaker, is a car designer who worked on the Camaro, Corvette and Subaru Outback, will offer an alternative perspective on car aerodynamics. I wanted to thank Bill Gest for arranging this, and convey my usual thanks to Governing Board members, as well as all the others who continue to contribute to SAE Arizona/Nevada.

I wanted to share with you that we continue supporting our student Sectionss. During the last Board meeting we have authorized funds for the Mini Baja student team of North Arizona University. We also earmarked additional funds for supporting SAE student activities at the other two State Universities.

A final note: Spring is coming, and very soon it will be time to nominate Section Officers for the next year. Please give us our suggestions. We look forward to passing on these opportunities to other members who would like to participate. Please feel free to share your thoughts for future programs or improvements in our meetings.

Michael Kremer, PE.

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### Recap of January Meeting by Steve Atkins

Last month, we were fortunate to have a presentation by Martin Martinez, President of ESA (Engineering Science



.L-R: Martin Martinez and Mike Kremer.

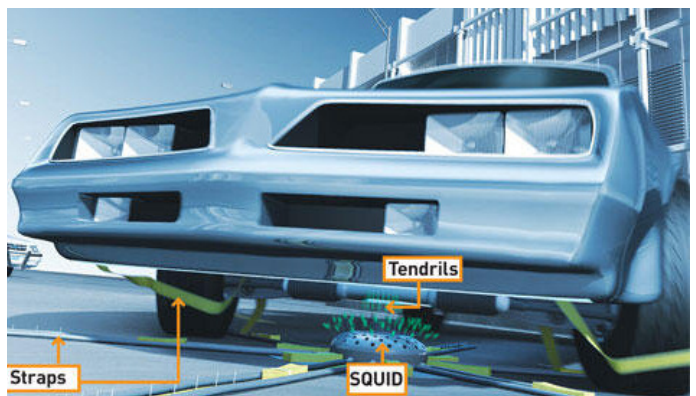
Analysis) based in Tempe, and creator of Safe Quick Undercarriage Immobilization Device, or SQUID. SQUID is a new technology for stopping vehicles in their tracks.

Inspired by Spiderman and a giant creature from the sea, Martín Martínez came up with the idea one evening in late 2005, over beers. Several beers. "Light up a nice El Rey del Mundo cigar, start pouring Guinness, and you can get pretty creative," he explains. He had been watching a car chase on TV, thinking, "I could find a way to stop that guy." He still has the napkin with his squid scrawls.

Fleeing drivers are a common problem for law enforcement. They just won't stop unless persuaded—persuaded by bullets, barriers, spikes, or snares. Each option is risky business. Shooting up a fugitive's car is one possibility. But what if children or hostages are in it? Lay down barriers, and the driver might swerve into a school bus. Spike his tires, and he might fishtail into a van—if the spikes stop him at all. Existing traps, made from elastic, may halt a Hyundai, but they're no match for a Hummer. In addition, officers put themselves at risk of being run down while setting up the traps.

But what if an officer could lay down a road trap in seconds, then activate it from a nearby hiding place? What if—like sea monsters of ancient lore—the trap could reach up from below to ensnare anything from a MINI Cooper to a Ford Expedition? What if this trap were as small as a spare tire, as light as a tire jack, and cost under a grand?

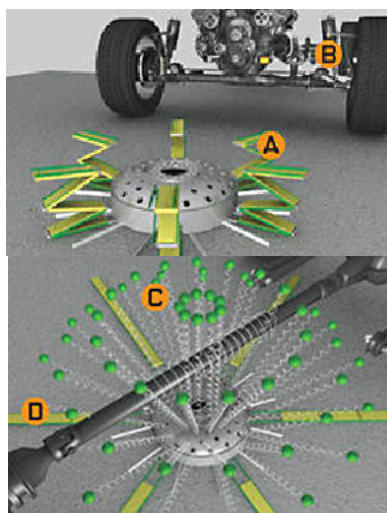
Mr. Martínez, who is 48 years old, runs a small engineering shop, Engineering Science Analysis Corp., from his home in Tempe, Ariz., so he hardly expected his riff on Spider-Man's web to get serious attention from Homeland Security. But as it happened, the government had just put out a call for ideas on stopping "uncooperative vehicles...using nonlethal methods." Mr. Martínez sent in his sketches. Among 29 entries, the Squid stood out -- and Mr. Martínez



To Catch a Suspect The Safe Undercarriage Immobilization Device (SQUID) helps cops stop fugitives without a shoot-out

found himself with \$850,000 in grant money, a team of federal advisers and a chance to bring his invention to life.

Thanks to imaginative design and engineering funded by the Small Business Innovation Research (SBIR) Office of the U. S. Department of Homeland Security's Science and Technology Directorate (S&T), such a trap may soon be stopping brigands. When closed, the current prototype SQUID resembles a 1.5-foot-wide cheese wheel full of holes. When open (deployed), it becomes a mass of tentacles entangling the axles. By stopping the axles instead of the wheels, SQUID may change how fleeing drivers are, quite literally, caught. SQUID ensnares its prey with sticky tendrils. Like Spiderman's webbing, these tendrils stretch to absorb the kinetic energy of their fleeing target.



**Strap:** As the vehicle approaches SQUID, an officer remotely triggers an explosion to unfurl the straps across the road. Small barbs on the straps [A] grab the wheels. Rotation of the wheels wraps the straps around the car's suspension and axles [B]

**Trap:** Infrared sensors in SQUID detect when the car is directly above it and automatically deploy fishing-line-like tendrils, weighted at their ends with rubber balls [C]. The car's rotating components pull the tendrils into a tangle around the



**Tighten:** The tendrils tighten the attached fabric straps around the drive shaft and axles, locking them in place to bring the car to an immediate stop

In the summer of 2008, a SQUID prototype safely stopped a 35 mph pickup truck. That's a good start, but before SQUID can be marketed, law enforcement officers need proof that it has the fiber to stop a 5,000-pound vehicle—about the heft of a Ford F-150 pickup—speeding at 120 miles per hour.

The spidery disc has lured the interest of state and local police as well as federal agencies such as Customs and Border Protection (CBP) and Immigration and Customs Enforcement (ICE). In response to concerns about whether criminals will see the disc, SQUID may be reborn as a centipede—that happens to look like a speed bump, or a manhole cover.

Martínez and Kaczmarek hope their spidery cephalopod will spawn a generation of offspring—in this case, a family of nonlethal stopping devices for land, sea, and air...all based on the same sticky principle, less is more. "If bad guys

need 'inspiration' to comply," says a smiling Martínez, "we'll be glad to inspire them."



Snared bad-guy drive shaft

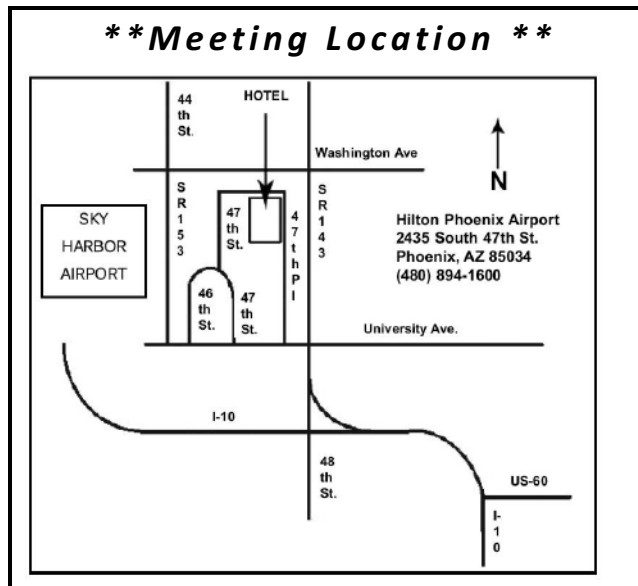
### *In Memory*

Don Miner passed away on Tuesday, Feb 2nd after a bout with pancreatic cancer.

Don was an active member of the SAE AZ-NV Section. He was a devoted AWIM volunteer in many schools, tutored math at the Gila Crossing Community, and he was a great friend to all who knew him. He will be greatly missed.

Don's wife, Jan, can be reached at 520.423.9245. Her address is 41975 West Ellington Lane, Maricopa, AZ 85138.

Sincerely, Don Robins



#### **Dinner Pricing:**

Members: \$22

First Guest of Members: \$22

Students/Educators: \$15

Non-Members: \$25

At the Door: \$30

Presentation Only: Free!

## Arizona State Jobs Created by Tower Automotive

One company's decision to open a new solar manufacturing plant will help to create Arizona state jobs.

Gov. Jan Brewer recently announced that Tower Automotive plans to build its solar component manufacturing plant in the Phoenix metro area, a move that will create up to 200 new jobs.

"This is a significant win for Arizona in that it advances our competitive position in the global market and further establishes Arizona's foothold in the solar industry," Brewer said. "My goal is to land the top solar manufacturers in the world; creating jobs that put Arizonans back to work and help Arizona families get back on their feet."

Once Tower Automotive locates to Arizona, it will be eligible under the new Renewable Energy Tax Incentive program, which provides refundable tax credits and property tax reductions for manufacturers.

"Tower Automotive is excited to bring our technology and expertise to the Southwestern United States through the establishment of manufacturing operations in the metro Phoenix area," Bill Pumphrey, President of the Americas for Tower Automotive, said.

"Through the support of our customer, Stirling Energy Systems, and the State of Arizona, both of which made this possible, we are confident that this is the start of exciting growth opportunities for our company, our colleagues and the communities we support," he continued.

Tower Automotive is one of the largest independent global suppliers of automotive metal structural components and assemblies. The company is building the new plant in an effort to diversify its product line to manufacture parts for Stirling Energy Systems, which will be used to generate grid-quality solar electric power.

"We're pleased that Tower Automotive, one of our full service supplier partners, will be joining us in Arizona

with a state-of-the-art high tech facility to manufacture components for our SunCatcher™ technology," Steve Cowman, CEO for Stirling Energy Systems, said.

"We commend Governor Brewer and congratulate the State of Arizona for their efforts in securing Tower Automotive's location to Arizona," he added.

Tower Automotive currently operates about 40 manufacturing and product development facilities in 13 countries throughout North America, South America, Europe and Asia.

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## Upcoming SAE Events, Conferences, and Symposia

### Exhaust Flow Performance and Pressure Drop of Exhaust Components and Systems Seminar

When: March 12, 2010

Where: Troy, Michigan, USA

### **New!** Selective Catalytic Reduction for Diesel Engines Seminar

When: March 15-16, 2010

Where: Troy, Michigan, USA

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

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## ARIZONA-NEVADA SECTION: Meeting Schedule

February 18	- Race Car Aerodynamics
March 18	- Ford TopicTBD
April 15	- Nissan EV
May 20	- Student SAE Competition Vehicles Exhibit; AWIM Student and Teacher Presentation

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## For Your Real Estate Needs



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Realtor**

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