# EEVC NEWSLETTER

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Now affiliated with EAA

## PAUL H. KYDD, Ph.D., 2005 EEVC CLUB MEMBER OF THE YEAR

**Oliver Perry**

The Eastern Electric Vehicle Club is pleased to announce that club member Paul Kydd has been chosen as our "Club Member of the Year!" Paul joins a select list of those in our current membership who from time to time have gone beyond that of an average EEVC member. Paul stands out like a Toyota Prius in a GM parking lot. This past year Paul set a new benchmark for EEVC productivity.

*Paul H. Kydd*

We first met Paul several years ago. His claim to fame at that time was his unique and interesting work with electric "wakeless" coaching launches. A coaching launch is basically an easily driven boat with a catamaran hull just large enough to contain a rowing coach who must chase his rowers back and forth on a 2 km course. A coach's launch must accelerate fast enough to catch rowers capable of 14 mph. speeds and yet glide through the water without creating a disruptive wake. The typical coaching vessel is powered by conventional outboard gasoline motors. But a few "electric-only" lakes make an electric powered coaching launch advantageous. Such a boat requires both speed and endurance. Most electric launches, according to Paul, are limited to speeds of only 7 mph. A 14 mph vessel requires eight times the energy. Having experimented with lead acid battery-powered coaching shells, and barely meeting the basic needs of a competitive coach's boat, in 2003 Paul became interested in boosting performance with lithium ion batteries. About that time he also appeared at one of our meetings at the Plymouth Whitemarsh High School. And, as so often is said, "the rest is history!"

After Paul joined the EEVC he quickly became interested in the Cinnaminson High School Electric Car called the Olympian. In late winter or early spring of 2004, Paul dropped by the high school and asked me to

*Paul's electrically driven coaching launch*

show him the vehicle. Before he arrived I was discouraged and quite disheartened over the sad state of affairs of the Olympian's ruined battery pack. The car had sat out behind the school for over seven months totally neglected after its unfortunate accidental overcharge. The battery mishap was in turn followed by a theft of the Zivan battery charger. I had little money and even less motivation for reviving the project until Paul Kydd paid a visit to the school. After Paul's visit I finally got my head back under the hood and began revitalizing the car's energy pack.

Although Paul did not become a major partner in restoring the car for Tour 2004, his influence sparked the revival which led to the last Tour de Sol participation for the Olympian under the Cinnaminson High School banner. A year later, in 2005, after I succeeded in getting Cinnaminson High School to donate the vehicle to Burlington County Institute of Technology (BCIT), Paul played a major role in forming the Burlington County Electech team. (In fact the name Burlington County Electechs was inspired by Paul in a brainstorming session.) The Burlington County Electech team, consisting of EEVC members, Burlington County College (BCC) personnel, and BCIT staff and students, readied and entered the Olympian in the Tour de Sol this past spring.

During the preparation for the 2005 Tour and following the Tour, Paul has worked very hard with Jack Braun, physics professor at BCC, to come up with a method of funding the Burlington County Electech electric and hybrid projects. Paul has met with individuals critically responsible for funding grants on the college level and sought to meet the requirements for procuring such funds. Paul has written to major electric power companies and presented proposals for the funding of specific plug-in hybrid projects. His articulately prepared talks, brochures, and endless typewritten proposals for grant providers have taken days of his time. But even with little immediate promise of great return, Paul has continued to trudge onward toward the goal of procuring the needed funding for a quality plug-in hybrid and related research project.

**Paul Kydd (With Tom Mulnar's Help) Tests and Upgrades the Olympian**

*Paul Kydd (l) and Tom Mulnar of BCIT*

In the past nobody has had time to properly shake down, test, and upgrade the Olympian between Tours. This year Paul assumed responsibility and together with Tom Mulnar of BCIT began some serious work in regard to the car. Paul outfitted the car with some instrumentation to more accurately collect data. The work occurred at the BCIT auto shop under the direction of Tom Mulnar and his students.

In his own words, " The car was really fun to drive when I got used to it."

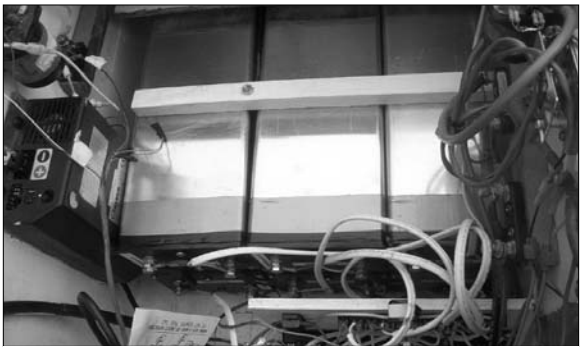
For those who have driven the car you will be pleased to know that Tom and Paul improved the brake vacuum problem and overall braking.

Friday, December 9, 2005 Paul writes, "We have completed our first week of steady running of the Olympian in regular commuter service. Totals: 5 trips, 229 miles, 89.9 kWh electricity used, 9.1 gal of gas saved, 2.55 miles per kWh average."

"The mileage is measured from the watt-hour meter and includes the inefficiency of

the charging process. We are getting pretty good data on the road. It takes about 120 amps at 144 volts to sustain 55 mph. This works out to 3.07 miles per kWh, which is very believable. The charger is 85% efficient. In average service the extreme range with our 20 kWh pack should be about 60 miles, which it is, so the batteries seem to be okay. The charger ends its cycle with a peak up to 15.5 V or more (2.6 volts per cell), so it is equalizing the batteries on every charge. I don't think we need the Powercheqs but we are wasting a lot of energy."

"I guess we can run all winter, except for the worst days."



*The Evolution Li ion battery pack in the coach boat; a version will be installed in the Olympian EV.*

Paul's plans for the Olympian are to remove about 600 pounds of lead acid batteries from the car and replace them with lithium ion batteries. He is in the process converting a lithium ion battery pack from his boat to one suitable for use in the converted Ford Escort (The Olympian). The lead acid batteries left in the Olympian will be used for high current acceleration needs and the lighter lithium ion batteries will enable us to extend the range. The lead acid batteries taken from the Olympian will be temporarily used to test the electrical system in the Cougar, the soon to be finished BCC electric car.

Paul Kydd comes to us with a full career in research and development in energy and environmental related technology. Although you would not detect it from his quiet and unassuming manner, Paul holds an AB Physical Chemistry degree from Princeton University and a PhD in Physical Chemistry from Harvard. Among other things he has owned and operated his own company, served as VP and director of a 165-person research and development center, pioneered in high conversion hydrocracking of shale oil and heavy crudes, won awards for technologically significant products, been recognized for outstanding achievements in projects related to fuels and propellants, been manager of the chemical process branch of GE Corporate R&D, and been a combustion scientist in the GE Laboratory. Paul has produced 46 publications and holds 32 patents. He is the inventor and developer of the PYROXIDIZER for disposal of medical and hazardous wastes.

And to think that a man with such credentials decided to jump under the hood of the electric Ford Escort, improve its performance and take the time to test drive it, is quite amazing indeed! But then again, anyone who likes to chase Ivy League crew members around in a silent electric wakeless boat, should be considered out of the ordinary.

At this point in his life Paul's main ambition is to advance plug-in hybrid technology and help break the carbon bonds that tie us to dependence upon fossil fuels. At this juncture he is anxious to see if the lithium ion battery can be a part of that solution. This past year he has forged full steam ahead in a push for lithium ion battery application for hybrid technology. We are delighted that Paul has chosen to participate in the EEVC and to share his interests with us. Paul's enthusiasm, gifts, background experience, and talents enhance our organization. His efforts with the Olympian and the Burlington County Electech Team have made us proud to select Paul as the number one choice for EEVC Club Member of the Year. Long live Paul Kydd!

## AUTO SHOWS: LOTS OF SHOW, LITTLE WOW

Manufacturers showed some alternate-energy vehicles at the Los Angeles Auto Show, and plan more for the Detroit show, but with the exception of hybrids, most of the interesting ones were concept cars, with few, if any, plans for production. The exceptions, however, are notable. Here's a rundown.

**New GEMs**

In the DaimlerChrysler exhibits at the LA and Detroit shows are new six-passenger

*DaimlerChrysler's GEM neighborhood electric vehicle*

neighborhood electric vehicles and the upgraded 2006 model year line-up. Jan. 24 marks the start of a 15-city tour that begins in San Diego and wraps up in late March in North Carolina. At this point more than 30,000 GEM vehicles are in use across the United States and internationally,

Upgrades to the current GEM line-up include a heavier-duty drive system and 15 new options that enable owners to customize their GEM vehicles to best fit their driving and hauling needs. Pre-orders are being accepted for the all-new six-passenger models, the e6 and e6S, which begin production in April 2006.

**CNG Hondas in L.A.**

*Honda's CNG powered Civic GX*

American Honda Motor Co., Inc., debuted its new compressed natural gas (CNG) powered Civic GX at the L.A. show. The cars are scheduled to go on sale at select Honda dealers throughout California in May. The Civic GX has a new 1.8-liter 4-cylinder engine that delivers an increase of more than 10 percent in horsepower and torque versus previous models.

**Production set for Honda FCX**

*Honda has announced that production of the FCX hydrogen fuel cell car will begin in three or four years.*

Honda has also announced that it will begin production in Japan of its next generation FCX hydrogen powered fuel cell vehicle (FCV) in three to four years. The FCX Concept vehicle, on display at the Detroit show, houses its fuel cell system in a unique, low-floor fuel cell platform.

**Ford shows concept vehicles in Detroit**

Ford showed several energy-conscious concept vehicles at the Detroit show, including the F250 Super Chief, a tri-fuel (gasoline, E85 and hydrogen) truck, which boasts a V-10 engine that puts out 400 lb.-ft. of torque running on hydrogen.

Also on display was the Reflex, a diesel-electric hybrid that delivers up to 65 mpg andt boasts solar panels, a flexible interior made from synthetic and regenerated materials, and inflatable safety belts in the rear.

**Mitsubishi wheel-motor car**

A lithium-ion powered hybrid concept vehicle, the Concept-CT MIEV, featuring four electric wheel motors, was unveiled by Mitsubishi at the Detroit Auto Show. Unlike

today's hybrids, the CT MIEV is designed to run on either the gasoline engine or the electric motor separately.

"It's our version of the next stage of hybrid development," Wayne Killan, vice president-marketing for Mitsubishi, says of the concept car. The CT MIEV is derived from a Mitsubishi Colt, now sold in Japan and potentially aimed at the U.S. market. According to Killan, quoted on December 14, the hybrid could arrive here sometime after 2008, probably "closer to 2010."

An all electric Li-ion version of the Mitsubishi MIEV, built on the Lancer platform, appeared at a Japanese EV rally in late August, and an all-electric Eclipse, using the same or similar Li-Ion batteries, appeared two years earlier at the same event, setting a mileage record of about 450 km.

A new gasoline-powered Mitsubishi Eclipse Spyder is also being shown at this year's Detroit Auto show, but it is the Hybrid CT MIEV concept vehicle that is expected to garner most of the attention. — *Summary prepared by Dave Goldstein, President, EVA/DC and Program Development Associates, Gaithersburg, MD.*

## EAA ELECTIONS

EAA Board elections are here! Ballots must be returned ASAP to be qualified for the final count. New Board members will be confirmed at the National EAA meeting on Saturday February 25, 2006, 10: a.m. - noon PST hosted by the Silicon Valley EAA Chapter. The ballots were distributed late, so National EEVC Members can disregard the 31 December deadline and mail in their ballots, which will be counted up until the International Annual EAA Members Meeting, on 25 Feb 2006.

For the list of candidates and their statements, go to http://www.eaaev.org/CandidateStmts-2005.html.

## A STEAM-AIDED BEEMER?

BMW has announced that it has found a way to improve fuel efficiency by up to 15 percent while generating nearly 14 additional horsepower and up to 15 lb-ft more torque. A heat exchanger fitted to the exhaust system generates steam, which then feeds a small steam engine fitted to the crankshaft.

## NEWS UPDATE

**Hydrogen Mazda RX-8**

An article in *Automotive Industries* by Rob White reports that Mazda plans to begin leasing the RX-8 fuel cell powered car at the beginning of 2006. The car will use a dual-fuel engine technology dubbed RENESIS and would use both gasoline and hydrogen fuels. The rotary powertrain injects hydrogen into the engine directly using an on-board electronic control unit. The car was scheduled for demonstration at the Tokyo Auto Salon 2006.

**Hybrid tax credits complex**

*CNNmoney* reports that purchasers of certain hybrids in 2006 will receive a nice tax credit — which is more valuable than a tax deduction, because it comes directly off the tax bill — but the credit is highly variable, and not all fuel-efficient vehicles qualify. "In some cases, though, the credits are large enough to almost entirely make up the additional cost of the hybrid vehicle as compared to a non-hybrid," says the article. Despite being high-mileage vehicles, *CNN* reports, no diesel vehicle qualifies. "The amount of the credit for each vehicle is based on three factors: First, how large is the vehicle? The amount of the credit is based on the vehicle's fuel economy as compared to a similar 2002 model-year vehicle. To get any credits at all, a vehicle must get at least 25 percent better fuel economy than a similar 2002 vehicle. A vehicle could also get a smaller credit if it is estimated to save at least 1200 gallons of fuel over its lifetime. Vehicles also must meet certain emissions standards to qualify for a tax credit."

Representative credits include Prius, $3150; Honda Civic GX (natural gas powered and available only in California), $3600; Ford Escape or Mercury Mariner Hybrid (2WD), $2600; Honda Insight (automatic transmission only), $1450; Chevrolet Silverado hybrid, $250.

## COMING EVENTS

**Hybrid Vehicle Technologies 2006 Symposium**

February 1-2, San Diego, CA. Contact Nancy

Eiben, SAE International, 724-772-8525, naneiben@sae.org.

**Motor & Drive Systems Conference**
February 15-16, Miami. Contact Jeremy Martin at jeremym@infowebcom.com.

**Clean Heavy Duty Vehicle 2006**
Feb 22-24, San Diego, CA. Contact: Susan Romeo or Monica Alcaraz, 626-744-5600, Srromeo@weststart.org or Malcaraz@weststart.org, www.weststart.org.

**Symposium: Hydrogen Internal Combustion Engines**
Feb 22, San Diego, CA. Contact Lawrence Wnuk, 626-744-5600, lwnuk@weststart.org.

**2006 SAE World Congress**
April 3-7, 2006, Detroit, MI. Contact Nancy Lewis or Shawn Andreassi, both of SAE International at 724-772-4068 or pr@sae.org.

**5th EVer EAA Chapters Conference**
May 13-15, Chicago area, hosted by Fox Valley EAA, http://fveaa.org.

**Fuel Cell 2006**
June 6-7, Raleigh/Durham, NC. Contact Marsha Hanrahan, marshah@infowebcom.com.

**Michelin Challenge Bibendum 2006**
June 9-12, Paris. Contact at http://www.challengebibendum.com/challenge/front/affich.jsp?codeRubrique=45&lang=EN, or go to www.www.challengebibendum.com.

**Convergence 2006**
October 16-18, 20, Detroit, MI. Check www.sae.org.

## MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

February 14

March 8

April 12

May 10

June 14

July 12

## ADVERTISEMENTS

***FOR SALE***


1992 Dodge Colt with 18,000 miles. (Yes, you read correctly. There is minimal wear and tear on it.)

First-generation fully electric vehicle, converted for my aunt and uncle, Quakers who have been on the cutting-edge of the EV movement. The car is a fully-functional, fully-approved vehicle for use on all roads, with current PA inspection.

20 hp motor, multi-speed transmission (regular gear shift with no clutch)

Range of 20 miles. Goes up to 40 mph quite comfortably. Goes up to 60 easily, but has little power at higher speed, so highway driving is not recommended.

110-220 V Lester charger, off board. Using 110 takes about 5 hours for full charge Was purchased in 4/95 and has been repaired several times. You need to be able to park it fairly closely to an outlet.

Present Deka batteries were bought 9/03. #8C12 battery.wet (weighs 928 lbs) from East Penn Manufacturing Co. 12 V. six in back, two in front

No air conditioner (removed, since added weight)

Ideal buyer would be interested in tinkering, and in the technical aspects of the workings of a fully electric vehicle.

It is quirky, but any decent mechanic will be able to perform maintenance on most of it. Indeed, we have found that most mechanics have fun with it!

We are asking $2,500.

Interested? Tom Hoopes, Wayne, PA, 610-688-1522, eithercoe@comcast.net.