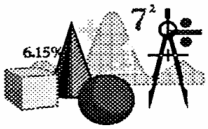
IEEE

SPARKS

IEEE Daytona Section Newsletter
January 2010



FROM THE HIGH CHAIR

Welcome back and I hope your holiday season was an enjoyable and safe one. Many of us make resolutions for the New Year, and one of mine concerns the Daytona Section. For my resolution to be successful, it will involve you. Our meeting attendance remains disappointing. We have had in my view interesting and stimulating speakers, we have kept the meetings in the same place at the same time (no confusion there), so it must be something else. Please let Thomas Yang or me know what it will take for you to attend (maybe you want to present a topic).

At the December section meeting Tracy Wichmann presented a very interesting and informative topic about Speech Recognition. We all learned a lot and enjoyed the evening. Also at that meeting, we held the election of officers for 2010. There are no changes from 2009, but to be in conformance with our bylaws we had to obtain a waiver for the treasurer and secretary positions. No officer can hold their position for more than two consecutive years according to our rules.

Dr. Kent Davey will present at the next meeting on January 28, about magnetic gears. This will be an interesting topic with a technology useful for windmills and ships.

The month of November was a busy period for meetings. The Life Members met at Tel-Tron Technologies on November 10. Tel-Tron presented a comprehensive discussion of their alarm business. Our thanks to Mr. Rick Dawson for his time and effort.

The Computer Society chapter met on November 19, at Embry Riddle with Dr. Richard Stansbury and Mr. Jonathon Marolf speaking about IDEA: The Intelligent Driving Efficiency Assistant and EcoCAR, a college-level competition primarily sponsored by General Motors and the U.S. Department of Energy in an effort to gain awareness and propose solutions to the growing energy crisis.

The Small Radio Telescope (SRT) team completed the network from the planetarium to the museum auditorium. Dr. Barott of ERAU is working with the team to allow potential remote access.

Please renew your IEEE membership if you haven't done so.

Finally I give my appreciation and thanks to Dr. Jane Owen, who has served the section well in multiple capacities over the past several years. She was the section chair in 2005-2006 and most recently chair for our Media and PACE activities. She has relinquished her chairs and we have three new chairpersons (Dr. Hugh Ward, Dr. William Barott and Jeanette Barott).

Roger Grubic

JANUARY PROGRAM
MAGNETIC GEAR DRIVES

Propulsion drives for ships and submarines, windmills, and ocean floor turbines are all characterized by high torque and low speed. The conversion of mechanical energy to electrical or vice versa is characterized by large electromechanical volumes at low rotation speeds. Gears are a convenient way to convert the slow speed, high torque side to a high speed, low torque counterpart. A magnetic gearbox has the following advantages over mechanical gearboxes:

- no lubrication
- overload protected
- reduced mechanical fatigue
- no mechanical contact losses
- no mechanical contact acoustic noise
- potential for very high efficiency (only a little core loss and bearing loss)
- high torque per volume ratio - considerably higher than a standard motor or generator

Clever topologies allow the magnetic gear to compete with a mechanical gear. The right topologies allow approximately ½ of the magnetic teeth to engage with their mate at any one time. Such an engagement is impossible with mechanical gears.

OUR SPEAKER

Dr. Kent Davey is an independent consultant in electromechanics and electromagnetic, and an adjunct Professor with the School of Physics, University of Houston. He is a Fellow with the Institute of Electrical and Electronic Engineers and Editor of IEEE Transactions on Magnetics. He specializes in the interaction of electric and magnetic fields with matter and in the numerical computation of electric and magnetic fields. He was formerly Senior Research Scientist with the Center of Electromechanics, University of Texas, Austin. Before that he was the Chief Research Scientist for American Maglev, and a tenured Associate Professor in Electrical Engineering at Georgia Institute of Technology. He has 93 refereed journal papers with IEEE and another 90 conference publications.

BRAIN TEASER CHALLENGE SOLUTION
NOVEMBER 2009 BUTCH SHADWELL

Harvesting hydrogen from the sea was the subject. “We all know that deuterium is found in much higher concentrations in the sea than in the atmosphere. Perhaps the heavier molecules find it harder to make the transition from liquid to gas phase on the surface, so most of the evaporation is of the lighter isotopes. So the problem today is - how big a container do I need to hold 1 mole of H2 at STP?”

In this problem, fact that the gas is deuterium is not relevant at STP. The answer is approximately the same for a mole of any gaseous compound. Remember pV=nRT, where n is the number of moles of the gas in question and R is a proportionality constant that varies depending on the units selected for the other three variables. For p in atmospheres, V in liters, and T in degrees Kelvin, R = 0.0821 L atm/K mol. Since p and n equal 1, V = R * T or V = 0.0821 * 273, or 22.39 liters. But I bet you already knew that.

BRAIN TEASER CHALLENGE
JANUARY 2009 BUTCH SHADWELL

Little Schlomo had nothing on his mind as he rolled the wheel down Pearl Street with his stick. The sound this perfect circle made as it rumbled along, drew his thoughts away from here and now. It was 1889, and for a ten year old in New York, life was lived in the street, and things were hard. Uncle Lenny, who had been living with his family for as long as he could remember, was sure his ship would come in any day now. Even though he knew it was rubbish, sometimes Schlomo would enjoy listening as his uncle would

explain his latest get rich quick scheme. It was on a Tuesday, as he heard his Uncle Lenny describe his new electric light business. As you know, light bulbs were pretty expensive, about a dollar a piece, and they didn't really last that long. Lenny's idea was to sell folks lower voltage light bulbs which were a little cheaper and would last a little longer. He planned on buying transformers to reduce the voltage. What turn ratio did he need to run 25 volt bulbs? Hope you remember your electrifying history.

Reply to Butch Shadwell at b.shadwell@ieee.org (email), 904-223-4510 (fax), 904-223-4465 (v), 3308 Queen Palm Dr., Jacksonville, FL 32250-2328. (http://www.shadtechserv.com) The names of correct respondents may be mentioned in the solution column.

EDITORS NOTES

The **SPARKS** newsletter is also available on our website. The website address is shown in the Section information box to the right.

Our neighboring Sections in Melbourne and Orlando also sponsor activities and meetings that also may be of interest to our members. We encourage you to visit their websites.

Region 3 website
http://www.ewh.ieee.org/reg/3/

Melbourne Section website
www.ieeemelbourne.org

Orlando Section website
www.ieee.org/orlando

FUTURE MEETING DATES
Meeting dates for the spring session are: February 25th, March 25th and April 29th.

2010 SECTION OFFICERS

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The website address for the Daytona Section is:
http://www.ieee.org/go/daytona

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JANUARY MEETING

Thursday January 28th at the Halifax River Yacht Club
331 South Beach Street, Daytona Beach, Florida 32114
Just south of the Fire Station at the corner of Beach and Orange

AGENDA
6:30 PM Cocktails
7:00 PM Dinner
8:00 PM Program

OUR SPEAKER – Dr. Kent Davey

TOPIC – Magnetic Gear Drives

It's Chinese night! Please call with your menu selection. All items are $18.00 each

Beef Stir Fry {Entrees served with Fried Rice, Asian
Chicken Stir Fry {Vegetables, Roll and Butter, Garden Salad,
Teriyaki Glazed Salmon {Coffee/Tea

A Veggie plate is available upon request for $10

Please contact the secretary with your dinner selections or for program information. Dinner selection's must be in by Wednesday morning so the club has time to order and prepare

Allan Jusko Secretary 386-671-3706 a.jusko@ieee.org

IMPORTANT: If you make dinner reservations and are unable to attend, call at least 24 hours prior to the meeting to cancel. The Section is charged for all dinners ordered.
