

## Reverse Electrowetting: A new approach to high-power harvesting of mechanical energy

Date: **Thursday, March 15, 2012**

Time: 6:00pm - 7:00pm

Speaker: Tom Krupenkin, Professor Mechanical Engineering

Agenda: Informal networking will begin at 5:30pm.

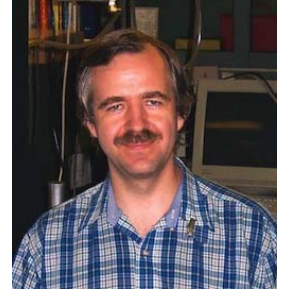
Presentation will begin at 6:00pm.

Location: 1610 Engineering Hall, UW-Madison College of Engineering

Take North Randall Street to Engineering Drive to Parking Lot 17

Menu: Meal provided: \$5 for IEEE members, \$10 for non-members, **free for students.**

RSVP: Deadline: March 12. Go to [https://meetings.vtools.ieee.org/meeting\\_view/list\\_meeting/11249](https://meetings.vtools.ieee.org/meeting_view/list_meeting/11249) to register. Please send questions or difficulties to Mark Vincent at [mvincent@ecw.org](mailto:mvincent@ecw.org).



*Non-member guests are always welcome!*

### Abstract

Over the last decade electrical batteries have emerged as a critical bottleneck in portable electronics development. High-power mechanical energy harvesting can potentially provide a valuable alternative to the use of batteries, but until now, its adoption has been hampered by the lack of an efficient mechanical-to-electrical energy conversion technology. In this talk a novel mechanical-to-electrical energy conversion method is discussed. This method is uniquely suited for high-power energy harvesting from a wide variety of previously inaccessible environmental mechanical energy sources, including human locomotion. The method is based on reverse electrowetting (REWOD) - a novel microfluidic phenomenon. Electrical energy generation is achieved through the interaction of arrays of moving microscopic liquid droplets with novel nanometer-thick multilayer dielectric films.

### Biography

Tom Krupenkin is Associate Professor, Nanotechnology Cluster and Mechanical Engineering, University of Wisconsin-Madison, Madison, Wisconsin. He received a Ph.D. in materials science from Moscow Institute for Physics and Engineering, Moscow, Russia in 1992, and a Ph.D in physics from Case Western Reserve University, Cleveland, Ohio in 1996. He holds over 50 US and international patents and has authored over 35 publications. His current research is focused on physics and chemistry of nanostructured surfaces, NEMS/MEMS devices, and physics of liquid-solid interfaces. He has received numerous professional awards and distinctions including the American Chemical Society Industrial Innovation Award (2007) for his work on tunable nanostructured surfaces; the Excellence in Research Award (2005) and the Energy Storage Enabling Technology of the Year Award (2006) for his work in Nanomembrane Battery; and the Emerging Technologies Award for his work in Microfluidics in Photonics (2003). His research has consistently attracted substantial media attention including pieces in *New York Times*, *Scientific American*, *ABC News*, *Nature Materials*, *Physics Today*, *Science News*, and *New Scientist*.

### IEEE Entrepreneurs & Consultants Network, Madison Networking Meeting

Date: **Thursday, April 5, 2012**

Time: 12:00pm to 1:00pm

Purpose: Presentation, topic TBD.

Location: Madison Area Technical College (MATC **West Campus**)

302 S. Gammon Road (Across from West Towne Mall)

Madison, WI 53717 ... Telephone: 608-246-6100

Parking: Open parking, so come early to get a closer spot.

Process: Members are encouraged to make introductions, describe endeavors, and make request

for: contacts in target companies, needs, resources. Bring your elevator speech and rolodex!

RSVP: Tim Chapman ([PrettyGoodGUIs@TrueNym.NET](mailto:PrettyGoodGUIs@TrueNym.NET))



**Vol. 15, No. 3**

*Serving IEEE Members of South Central Wisconsin*

**March 2012**

## **SECTION Meetings**

The third Thursday of Jan.-May and Sep.-Dec. is reserved for a meeting to provide recent research, developments, trends and/or innovations in one of our membership's technical areas.

## **NETWORKING Meetings**

The first Thursday of every other month is reserved for a meeting to provide networking opportunities for members who are consultants or entrepreneurs. Bring your elevator speech and rolodex!

## **Section Meeting Schedule for 2012**

(schedule subject to change)



**January 19**, EU e-Freight Software Initiative

**February 16**, Patent Law

**March 15**, Reverse Electrowetting  
by Tom Krupenkin, at UW Engineering Hall

**April 27**, Network Coding, Distinguished  
Lecture, by Abdelhak Zoubir, at Promega

**May 17**, Electricity Nanogenerators  
by Jerry Meyerhoff, at Promega

**May 24**, Annual Wind Farm Tour  
busses start/end at UW Engineering Hall

**June 21**, TBD

**September 20**, TBD

**October 18**, International Trademarks  
by Richard Abegglen, at Promega

**November 15**, TBD

**December 20**, TBD

## **Networking Meeting Schedule for 2012**

(schedule subject to change)

**February 2**, TBD

**April 5**, TBD

**June 7**, TBD

**August 2**, TBD

**October 4**, TBD

**December 6**, TBD

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#### Selection of Officers

At the December monthly meeting, the IEEE Madison Section conducted its annual officer elections prior to the presentation:

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## IEEE Membership Level Upgrades

Those interested in upgrading their IEEE membership level should send their resumes or other information showing five years of significant performance in an IEEE-designated field to Charles J Gervasi ([cj@cgervasi.com](mailto:cj@cgervasi.com)). Madison Section Board will attempt to find Senior IEEE members knowledgeable in the applicant's area of practice who may be able to provide references. You are invited to attend the informal networking portion of the monthly Section meetings (starting at 11:30am) to meet the Section Board members and discuss intentions.

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Published 9 times per year (Jan.-May & Sep.- Dec.) by the Madison, Wisconsin Section of the Institute of Electrical and Electronic Engineers (IEEE), for its members in South-Central Wisconsin.

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For more information, contact Mitch Bradt at 608-263-1085 or [bradt@wisc.edu](mailto:bradt@wisc.edu).

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