Madison Section Newsletter

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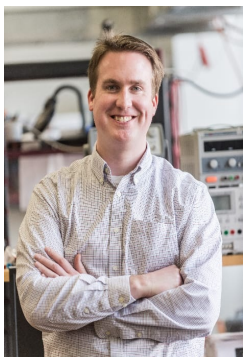
Upcoming Events

December PES-IAS Meeting: "Static Cling to Move the Industrial World"



- Tuesday, December 11th, 5:30-7:00 PM
- Speaker: Dan Ludois, UW-ECE Department
- Location:
  Engineering Hall
  1415 Engineering Drive
  Madison, Wisconsin 53706
- Please Register at the IEEE-Madison event page.

Election:
This is the Kick-Off Meeting for the newly created IEEE-Madison Joint Power & Energy and Industry Application Society (PES-IAS). The meeting will start with an election of the PES-IAS officers (Chair, Vice Chair, Secretary/Treasurer). After the election, Dan will present the technical talk followed by a reception in Union South.

Presentation: Electric moto rs and generators (machines) are essential to our modern way of life. As electric energy consumption steadily increases annually, these ubiquitous workhorses continue to be mass-produced for performing the pumping, heating, cooling, drilling, pressing, cutting, grinding, and moving that occurs every minute of every day. The construction and operation of electric machines is predicated on magnetism, but if it were electrostatics (static cling), what would change?

Bio: Daniel Ludois received his Ph.D. in electrical engineering from the University of Wisconsin–Madison in 2012 and B.S. in Physics from Bradley University in 2006. Dr. Ludois currently serves as assistant professor of electrical and computer engineering in UW–Madison's College of Engineering, associate director of the internationally renowned Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), and is an affiliate of the Wisconsin Energy Institute. Dr. Ludois's research focus has been on broadening the horizons of capacitive coupling via new dielectric materials and high frequency power electronics. Applications include compact wireless power transfer for mobile and rotating equipment, brushless electric machine bearing current mitigation, electrostatic (e-field) machinery, and dual energy cores for integrated inductor-capacitors.

Dr. Ludois's efforts in electrostatic machinery earned him national recognition via a 2015 National Science Foundation CAREER Award and a 2017 Moore Inventor Fellowship. This high-risk-high-reward work focuses on the removal of steel, copper, permanent magnets in electric machines, transitioning entirely to plastic and aluminum for lower cost and ease of manufacturing. Dr. Ludois has published >40 papers and has 16 issued and pending patents collectively. He currently teaches ECE 411 "Introduction to Electric Drives" and ECE 711 "Dynamic s and Control of AC Drives" and advises 6 Ph.D. students.He is also cofounder and chief science officer of C-Motive Technologies, a start-up business dedicated to producing innovative, energy and cost-efficient electrostatic motors.

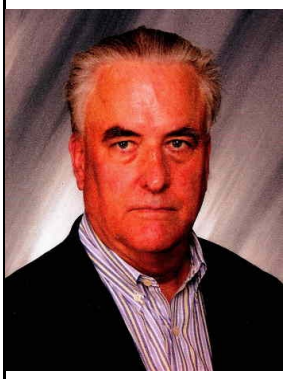
Young Professionals and ECN Meeting: "Sector67 Tour"

- Tuesday, December 11th, 6:00 - 8:30 PM
- Speaker: Chris Meyer, Sector67
- Location:
  Sector67
  56 Cory Street
  Madison, Wisconsin 53704
- Please Register at the IEEE-Madison event page.

Event: This joint meeting of the IEEE-Madison Young Professional and Entrepreneurs and Consultants Network will feature a tour and dinner. Chris Meyer, founder of Sector67, will give a tour of the new facility -- a work in progress. Sector67 now owns the building and has radically expanded the space. The location is just a few blocks from the old location on Madison's East Side near the Goodman Community Center. The new, permanent location, offers a great future for Hackers in Madison.

Social: Following the tour, Pizza and drinks will be served.

- **EMB Meeting: "Population Density Stress is Killing Us Now"**



- Tuesday, December 18th, 11:30 AM -1:00 PM
  - Speaker: Gregg Miklashek, MD (retired)
    - Location:
      Sequoya Library Branch
      Room B
      4340 Tokay Blvd
      Madison, Wisconsin 53711
- Please Register at the IEEE-Madison event page.
- Pizza and Beverage will be served
  Suggested Donation: $5 Members, $10 Guests, Students: FREE

Background:

Human overpopulation and our modern life-style choices are causing physiological changes responsible for our top ten killing “diseases of civilization”. I spent 41 years in active medical practice treating 25,000 patients with 1,000,000 Rx and talk therapy. The majority of my patients suffered from “anxiety” and “depression”, but I became increasingly aware of the direct association of their psychiatric problems with other general medical conditions. Eventually, I came to realize that nearly all psychiatric conditions, and most general medical problems as well, could be ex plained as resulting from our overactive stress response. Our chronically overactive stress response was generating abnormally elevated blood levels of the adrenal stress hormone cortisol, and researches dating back over 100 years indicated a direct connection between these elevated cortisol levels and the comparable diseases of civilization in research animals. But, then, I discovered a parallel line of animal crowding researches dating back to the 1940’s, which also implicated elevated cortisol levels with diseases and deaths associated with population density stress. As the supporting evidence accumulated, I applied this population density stress model to my clinical medical practice and achieved remarkable results.

An extensive medical scientific literature dating back to the beginning of the 20th century, had demonstrated the connection between our overactive stress response and elevated cortisol lev els with many diseases: hyperthyroidism (Graves disease), atherosclerosis and heart disease, obesity and diabetes, cancers, immune system suppression and increased risk of infection, high blood pressure, kidney disease, peptic ulcers, heart attack and stroke, etc.: “the diseases of civilization”.

Presentation:

In this talk, Dr. Miklashek will present his findings and outline a course of action to deal with the stress-related problems.

Bio:

Dr. Miklashek am a 72 year old retired neuropsychitrist who was born in Topeka, Kansas but raised in my parents' home state of Ohio. He attended Wittenberg University in Springfield, Ohio, receiving a B.A. in chemistry, with a minor in biology. He then entered Medical School at the University of Wisconsin in Madison, Wisconsin, after a summer fellowship in cancer researc h.He graduated in 1972, completing psychiatry residency training in 1974. He held several academic positions and and treated 25,000 patients in several different practice locations, concluding in West Michigan in 2012. Dr. Miklashek says: "I have always had a keen interest in medical science, as well as all aspects of human history and prehistory. I am now retired and living in a small town in southwestern Wisconsin, where I can finally relax, hike in the forest, and enjoy the beautiful sunrises and sunsets. The internet gives me access to all the many wonders that modern science continues to uncover, but I can turn it off and take a walk whenever my body tells me I've been sitting too long, like right now, for instance! Keep smiling, I do!"

Section News

- **Madison Section Officer Elections :** By now, you should have re ceived an official Election Notice. The first message was garbled, To vote, please log into the IEEE Account by clicking on the "Sign In" tab in the upper right at this IEEE Web Page. If you do not have an IEEE Account, you may create one by clicking on this IEEE Link. Once you have logged into the IEEE account under your name, open a new tab and access the OU Voting page here. Please select one candidate for each position (Chair, Vice Chair, S ecretary, Treasurer) or specify a write-in candidate. For the Members At Large, please vote for 4 members, or write-in up to 4 members.

  PLEASE VOTE! The Volunteers who have agreed to run in this election need your support and encouragement.

- **Joint Power and Energy Society/Industry Application Society Chapter Kick-Off Meeting:** The IEEE-Madison Section has formed of a joint PES/IAS Chapter and it will hold its first official election at the December 11th Meeting. PES-IAS Members from the Madison Section will be asked for a voice/hand vote at the start of the meeting followed by the technical presentation. The Madison PES-IAS Chapter was formed utilizing a group of nine volunteers who contributed to defining the activities, planning events, developing the By Laws for the Chapter, and by selecting an initial slate of officers. The PES-IAS By Laws can be viewed at this link.

- **Review of the November Section Meeting:** Living in the Internet of Things (Review by CJ Gervasi) Dr. Camp from Indiana University spoke to our Section at an evening meeting. She described how putting network-connected processors in household devices creates new security risks. An example is a network-connected light bulb whose settings could be configured to overheat and cause a fire. Another example is a refrigerator that connects to Google Calendar but stores the Google password unencrypted. Many IoT devices have a 15-year use life. This is a challenge because security methods become outdated quickly. “Cryptography is not like diamonds,” Dr. Camp explains, “It does n’t have inherent strength, only situational strength.” She says we need developer tools that make it easy to implement security and ideally hard not omit security. Many people are aware of exploitation of children online, but there are only one or two cases of that a year. People are less aware of malware and ransomware, which are much more common threats.

  In addition to vulnerability to attacks, Camp discussed the philosophy of devices meeting user expectations. She calls it Least Regret, Least Surprise. Users should not be surprised by something a connected device does. It’s fine if a map app shows its location. It’s not good if a flashlight or game tracks location without telling the user. Camp talked about some egregious vulnerabilities she found in her research. One was a stuffed animal with cameras and microphones connected to the internet. It was marketed to military service members as a way to exchan ge messages with their kids. There was no authentication system to keep attackers from connecting to the toy and spying or impersonating someone. The FTC took this product off the market. Camp is working with the manufacturer of another toy with similar, but less severe, vulnerabilities that is still on the market. She is helping the manufacturer come up with a firmware upgrade that fixes the vulnerability without highlighting to users the fact that vulnerability existed before.

  One of the most serious vulnerabilities she discussed was with voting machines. One machine she examined was so easy to break into that her colleague was able to get access to its database of voters and votes in just minutes. She says the need for better voting is a non-partisan issue. Many citizens think electronic voting is more secure than paper, but computer security experts disagree. We train poll workers to fight fraud in the fo rm misplaced ballots, but there is no way we can train them to provide electronic security.

- **Review of November LMAG Meeting:** The November LMAG event was a presentation by Lennon Rodgers and Tom Zinnen about the UW Grandparents University program. The speakers described the program and their contributions to the program. The speakers discussed the program objectives and methods with each other and with the presentation attendees. In addition, Lennon Rodgers described his objectives for the Grainger Design Innovation Lab.

Upcoming Meetings

- **Follow us on Facebook**: https://www.facebook.com/IEEEMadison
- **IEEE-Madison PES-IAS Kickoff Meeting:** We are excited about the topic of the first general meeting of the newly formed Chapter of a joint Power & Energy Society along with the Industry Applications Society. Dr. Dan Ludois will talk about new technology utilizing electrostatics for electrical to mechanical energy conversion instead of the traditional magnetic fields. His talk will cover both the use of this technology for both motive forces and for the mechanical to electrical generation. Please plan to attend. Following the technical talk, there will be a reception at Union South where you can meet with other PES-IAS members to discuss the new Chapter goals and to meet the Chapter Officers.
- **YP-ECN Joint Meeting:** Sector67 has a new home on the East Side of Madison. The founder and chief architect of the new facility, Chris Meyer will give us a tour of the evolving site. Sector67 has been the home of many small startups in Madison and offers faciliti es for members from young children to seasoned engineers. I am always amazed at the people I meet there and the breadth of projects hosted at Sector67. This is also an opportunity to meet other IEEE Young Professionals and potential Entrepreneurs and Consultants. Oh, did I mention free pizza and beverage (including the fermented kind!)?

- **Stress got you down?**: The coming holiday and end-of-the-year season is loaded with opportunities for increased stress. Dr. Gregg Miklashek has written a book entitled "Stress R Us: An Essay on What's Killing Us, Why, and What We Can Do about It". He will discuss how stress is literally killing us now and what we can do about it. The talk is a noon time talk at the Sequoya Branch of the Madison Public Library and is hosted by the IEEE-Madison Chapter of the Engineers in Biology and Medicine Society.

Regular Meetings

- < h3>Section Meetings The third Thursday of January through May, and September through December is reserved for a meeting to provide recent research, developments, trends and/or innovations in one of our membership's technical areas.

- **Life Member Affinity Group**

  The first Thursday of January, March, May, September and November is reserved for a meeting on a topic selected from a broad range including such areas as technology, science, history, culture and leisure.

- **IEEE-MSN-ECN Networking Meetings**

  - Purpose: Presentations, Discussions, networking
  - Date: First Thursday of even-numbered months
  - Time: 11:45 AM to 1:00 PM
  - Location: Varies
  - Process: Members are encouraged to make introductions, describe endeavors, and make request for: contacts in target companies, needs, re sources.

Membership 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 via email at cj(at)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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Madison IEEE Section

The IEEE-Madison Section of the IEEE is a section in Region 4 of the IEEE-USA organized to serve IEEE members in the Madison, WI area with over 600 m embers. The 2017 Officers and Board Members are Tom Kaminski - Chair, Nate Toth - Vice Chair, Charles Gervasi - Treasurer, Steve Schultheis - Secretary, Nate Toth - Webmaster, Tom Kaminski - ECN Chair, Dennis Bahr - Engineering in Medicine and Biology Chapter Chair, Chuck Cowie - Life Member Affinity Group Chair, San Rotter - Life Member Affinity Group Vice Chair, Scott Olsen - Membership Development Chair, Members at Large: Clark Johnson, Craig Heilman, Dennis Bahr, Sandy Rotter.

Job Openings

Check out WIEES.com for electrical engineering jobs in Madison and the surrounding region. This site is maintained as a service for electrical engineers. Jobs are displayed starting with the most recent postings first. You can filter result s by location and job type. If you are hiring an electrical engineer in our area, for full-time or contract work, you can post the job in the *Contact Us* section on the WIEES.com site.

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Contact Us

The IEEE-Madison Section has a number of volunteer positions open if you are interested in helping out. Please direct any questions or comments to Tom Kaminski (Newsletter Editor) via email to tjkaminski(at)ieee.org.

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