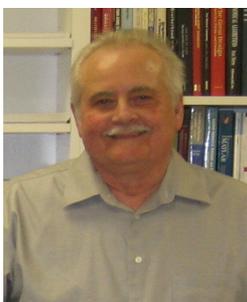


◦ Upcoming Events

▪ November Section Meeting: ♦ "HeliAcc Particle Accelerator "

- Date: Thursday, November 20th, 2014
- Speaker: ♦ Dennis Bahr,



- [Madison Section Newsletter](#)
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 - [November Section Meeting: ♦ "HeliAcc Particle Accelerator "](#)
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PhD, VP of R&D at HelionX, LLC.

- Details: Section Meeting Socialize starting at 11:30.
- Co-hosted by the IEEE-Madison Chapter of ♦ Engineers in Medicine and Biology
- Please Register at the IEEE Madison Section ♦ [events page](#) .
- Location: ♦♦
Engineering Centers Building
Room 1003, Tong Auditorium
1550 Engineering Drive
Madison, Wisconsin 53706
Check for Parking Availability [here](#).

Talk: Dennis will talk about his company (HelionX, LLC) and the table top sized nuclear fusion reactor they are developing. The HeliAcc accelerator produces short high energy pulses of deuterons that are accelerated to a target producing a copious supply of pulsed neutrons. The HeliAcc accelerator can be used as one component of a neutron camera. Security screenings are done using neutron cameras since neutron beams will pass through container walls and highlight the materials inside such as drugs, plastic explosives, and nuclear material. Industry could use the camera to inspect critical items such as turbine blades and mortar shells. The pulses can be triggered on command allowing a neutron camera to take ♦ pictures ♦ even if the object is in motion, thus allowing for more rapid scanning and a higher throughput on production line operations.

Current neutron generators use either radioactive materials or continuous flux accelerators for neutron production. The use of radioactive materials requires specially trained and licensed technicians. Continuous flux accelerators are always producing neutrons when in use thus consuming large amounts of electrical power. The HeliAcc accelerator only generates significant energy when the pulses are produced. The design of our generator is such that it is inexpensive to manufacture and is light weight so that truly portable neutron source can be built. No radioactive material is used in the process and minimal nuclear waste is generated. When the unit is not producing neutrons it is not radioactive and is safe to handle. The unit is small (a few meters long), light weight (less than 250kg), and can be easily transported.

▪ December Workshop: ♦ "Hands-On Drones for Electrical Engineers "



- Date: Saturday, December 6th, 2014
- Instructor: ♦ Thomas Kaminski.
- Details: All day, 8:30AM until 4:30PM
- Co-hosted by the IEEE-UW-Madison Student Branch
- Fee: \$25 IEEE Members, \$10 IEEE Student Members, \$50 Others
- Please Register at the Specific IEEE Madison Section ♦ [event page](#) .
- Location: ♦♦
Engineering Hall
TBD
1415 Engineering Drive
Madison, Wisconsin 53706
Check for Parking Availability [here](#).

Workshop: Participants will learn about required components of Drones and work in small groups to build them, using hand tools for mechanical assembly, wiring, and soldering. The drones will be controlled with OpenPilot Atom and Revolution Flight Controllers, programmed with Open Source software through a groundstation. Participants will learn how to install, configure, and operate

personal computer software used to program, configure, and tune the flight systems. By the end of the day, workshop participants will be able to fly their creations. The Drones built in the Workshop (or more technically, Unmanned Aeronautical Systems or UAVs) will be donated to the UW-Madison Student IEEE Branch for student projects. Advanced systems with cameras, GPS, on-board Linux microcontrollers will also be demonstrated. For more information on the OpenPilot Controllers, visit OpenPilot.org and for an overview of building drones in a student setting see this recorded video presentation at [WN@TL recorded talk](#).

◦ Section News

▪ IEEE-Madison Section Elections

It is time for the Annual IEEE-Madison Section Elections. Around November 11th, you will be receiving an e-mail ballot request. PLEASE do vote -- voting closes on November 30th. To vote, you will have to login with your IEEE Member account. If you have not done so in a while, or have forgotten your password, you can get login information at this [link](#).

▪ Upcoming Talks and Events

November IEEE-Madison Section Meeting: This event, co-sponsored by the Engineers in Medicine and Biology Society, will feature a talk by Dennis Bahr, a long-time member of the IEEE-Madison Section and VP of R&D for HelionX, LLC. In the past, Dennis has lectured on designing and constructing a state-of-the-art Tesla Coil. He demonstrated the device during a past IEEE-Madison Section Meeting. The device produced a spectacular display of electrical sparks and loud crackling noises. The device is now part of the permanent collection at the University of Wisconsin, College of Engineering. His talk this time will discuss the design and construction of a novel, compact particle accelerator for producing neutron flux suitable for a wide range of applications. Dennis has provided a photo of the device shown below.



December ECN Meeting: The topic for discussion will be "Software Defined Radio". Radio technology has rapidly evolved with the advent of inexpensive USB connected devices that use a heterodyned front end and a high-rate in-phase and quadrature ADC to capture radio signals. Processing is done on a laptop or microprocessor, leading to a very flexible receiver. Today's smart phones, augmented with an "On-the-go" cable set can use these devices to implement a complete radio sub-system for decoding FM and radio broadcasts over a range from 30MHz to as high as 1800MHz. It is now possible to have your own spectrum analyzer for under \$50. Have you done any work with these devices? Bring your stories to tell!

Hands-on Drones for Electrical Engineers: This one-day workshop will present the theory and practical side of building your own drone. Workshop attendees will work in teams to build, program, test, and fly a quadrotor Unmanned Aeronautical Vehicle (UAV). Tom Kaminski has taught a number of classes in Robotics and Automation and has found that UAVs are an effective learning tool to study the basics of 3D motion control. Attendees will also become familiar with modern brushless DC motor controls, inertial navigation systems, ground-station software and advanced RF systems for control, telemetry, and video transmission. This is the course to take if you are interested in this emerging field. Sign up soon -- space is limited.

▪ Volunteers and Sponsors Needed

SLC: ♦ The UW-Madison IEEE Student Chapter has been selected to plan and host the 2015 Region 4 Student Leadership Conference on the weekend of February 7-8th, 2015. The conference organizers (students!) need sponsors to help pay for the event. If your company is interested in accessing the engineering leaders of tomorrow and supporting the IEEE, please get in touch with Maggie White, Student Conference Organizer via email at mawhite6-at-wisc.edu.

Young Professionals: New Professional members of IEEE, previously called "GOLD" are now called Young Professionals and cover those who have graduated in the last 15 years. The IEEE-Madison Section now has over 140 members who are considered "Young Professionals". Are you interested in getting together with others to plan social, professional, job fair, and mentoring events? Would you like to help organize a Young Professionals Affinity group here in Madison? Please let me know (tjkaminski-at-ieee.org).

Life Members:

I have recently transitioned to "Life Member" (age over 65 and age+years-of-IEEE-service greater than 100), having been a member for 46 years -- no more dues and free Society publications! There are currently 67 Life (and Life Fellow) members of the Madison Section and all it takes is 6 members to petition the IEEE to form a Life Member Affinity group here in Madison with immediate financial benefit of \$1000 for lunches, transportation services and other activities. Look for a solicitation email from me for those interested in helping start this affinity group.

▪ **IEEE-Madison Student UW Project**

The UW-Madison IEEE Student Branch approached the Section for support of a multi-term student project. ♦ We have worked with key student leaders to come up with an interesting and challenging project that also solves a societal need. ♦ Students have decided to use UAVs to help find missing people who wander because of Autism or Dementia. ♦ We have contacted Project Lifesaver International, a non-profit organization that works with public safety organization and individuals with affected loved ones to help locate wanderers. ♦ They have developed a number of devices that can be worn and emit RF pulses that can be tracked up to one mile on the ground and as much as 6 miles in the air. ♦ Many public safety, police, EMT and fire departments do not have the budget to rent a plane or helicopter for the air search. ♦ The students will work to build a device that will meet the needs of Project Lifesaver, carrying UAV-borne radio location equipment for better range and faster searches. The students are also looking for related wildlife tracking applications that use similar radio-location equipment. ♦ For information on Project Lifesaver, see ♦ [Project Lifesaver International](#).

◦ **Regular Meetings**

▪ **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.

▪ **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: Sector67, 2100 Winnebago Street (East Side of Madison)
- Parking: Park in lot or on Winnebago Street.
- Process: Members are encouraged to make introductions, describe endeavors, and make request for: contacts in target companies, needs, resources.
- Contact: For assistance, call Tim Chapman 2 0 6 - 2 5 7 0

◦ **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.

◦ **About IEEE**

The Institute of Electrical and Electronics Engineers or IEEE (read Eye-Triple-E) is an international non-profit, professional organization dedicated to advancing technology innovation and excellence for the betterment of humanity. IEEE and its members inspire a global community through IEEE's highly cited publications, conferences, technology standards, and professional and educational activities. It has the most members of any technical professional organization in the world, with more than 300,000 members in around 150 countries. The IEEE consists of 38 societies, organized around specialized technical fields, with

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IEEE.ORG.

▪ 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 members. The 2014 Officers and Board Members are Tom Kaminski - Chair, Steve Schultheis, Vice Chair, Charles Gervasi - Treasurer, Brandon Zemlo - Secretary, Timothy Chapman - Webmaster, Tom Kaminski - ECN Chair, Members at Large: Mitch Bradt, Clark Johnson, Dennis Bahr, Craig Heilman, 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 results 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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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 via email to [tjkaminski\(at\)ieee.org](mailto:tjkaminski(at)ieee.org).

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