



SPARKS

Daytona Section Newsletter
April 2023
<https://r3.ieee.org/daytona>



APRIL SECTION MEETING STUDENT PRESENTATIONS

Wednesday April 26th

David O'Malley College of Business, Rooms 115 and 118
Embry-Riddle Aeronautical University
600 Clyde Morris Blvd, Daytona Beach, Florida

Our annual student recognition meeting is happening on April 26, 2023. As is our custom, we will be honoring our Section's Special Award winners from the Tomoka Science and Engineering Fair which was held at the end of January at Stetson University. Afterwards, we will be having presentations and demonstrations from Bethune-Cookman University and the Embry Riddle Aeronautical University project teams. The presentation will be preceded with an Italian Buffet.

The April Section Meeting will be in the David O' Malley College of Business (CoB) at Embry Riddle Aeronautical University (ERAU). The time schedule and room locations are:

- **6:00 pm: Room 115**, Italian Buffet dinner: **Free** for student IEEE members, ERAU and BCU student presenters, Science Fair winners and parents. Buffet cost is \$20 for IEEE members and their guests. No charge for attending just the presentations.
- **6:50 pm: Room 118**, Introducing the IEEE officers, including student officers, and a short business presentation.
- **7:00 pm: Room 118**, Science Fair winners and Student presentations

A University map showing the location of the CoB is provided on page 8 of this newsletter.

RSVPs for the buffet are required to allow us to order the proper amount from the food service. Without an RSVP we may not be able to guarantee your meal. Please respond by Monday April 24th to insure your reservation.

Reservations can be made one of two ways:

- Call Al Jusko at 386-671-3706 or email AGJusko@aol.com give your name and the number of people in your party and indicate if you are attending for both food and presentation or just the presentation. Payment can be made at the door by cash or check made out to IEEE Daytona Section. We will confirm your reservation at the door.
- Go to the rally.co website: <https://rally.co/p/RD5B1gggDhVf>

If you use the rally.co link, please do the following:

- Input the following info in the *Your name...* field: Name, number of people for food and presentation, number of people for presentation only.
- Check the box to the right of *Your name...* and
- Click *Save*.

IEEE student members must show their IEEE student membership card to receive the free buffet.

For questions regarding the presentation or venue, contact Allan Jusko, 386-671-3706 or AGJusko@aol.com As always, all members and guests are welcome to attend.

WOMEN IN ENGINEERING AFFINITY GROUP NEWS

The WIE Affinity Group met on 4/6/2023 to conduct a reorganizational meeting and to discuss the future strategies and activities of the Group. Due to member health issues as well as schedule constraints, the planned ERAU Campus Networking event for April 4 could not take place. Instead, the group will consider staging this event for later this year.

During March, the WIE Affinity Group engaged in promoting a Cybersecurity Research Activity to take place on the ERAU campus during their 2023 summer session. Dr. Laxima Niure Kandel, Professor at ERAU and Vice Chair of the WIE Affinity Group, won a National Science Foundation [NSF] grant along with Dr. M. Ilhan Akbas to conduct cybersecurity research for unmanned aerial vehicles (UAVs.) The investigators are currently accepting applications from eligible undergraduates majoring in Computer Science, Computer Engineering, Electrical Engineering, and other Math or computing-related majors. The Group's EXCOM members promoted the research activity by posting the information online and by reaching out to university and college contacts at their respective alma maters around the country to encourage eligible students to apply.

Furthermore, the group discussed a focus on virtual PR activities that follow closely along the mission and vision of the WIE, e.g., reaching out to IEEE membership through vTools eNotice about upcoming area and virtual activities consistent with the promotion of women engineers and scientists.

Helen B. Hernandez, Ph.D.
Webmaster, IEEE Daytona Section
Secretary/Treasurer, IEEE Daytona WIE Affinity Group

ANOTHER TALE FROM THE OLD PROFESSOR

HELLO SPOTS. IT'S NICE TO SEE YOU AGAIN!

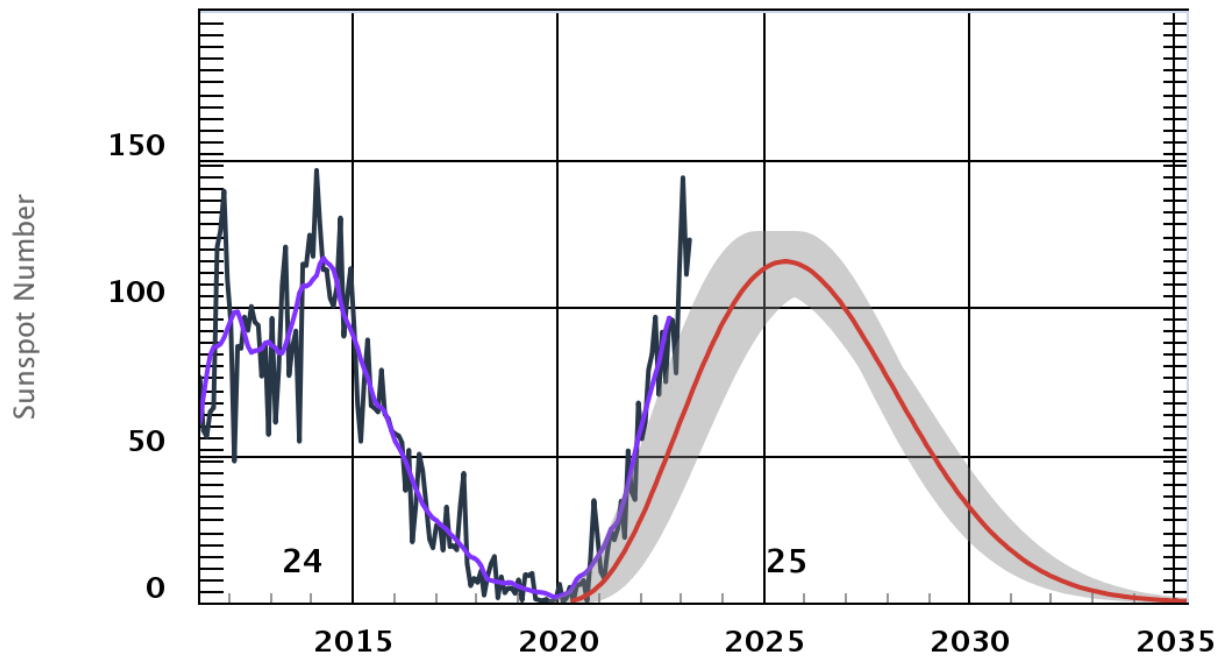
Back in February 2016, my Tale was "Goodbye Spots" lamenting the lack of sunspots. In that Tale I wrote new lyrics to an old prohibition-era song "Alcoholic Blues", renaming it the "Ionospheric Blues". Low or no sunspots makes for poor long-distance ionospheric radio propagation. I am happy to report that the current 11-year solar cycle, 25, has started with a bang.

Back in 2016 when I wrote Goodbye Spots, we were on a rapid decline of sunspots which reached a low of zero spots for several months just about when the Covid-19 pandemic started. This had radio amateurs stuck at home with poor radio propagation and truly miserable. Many amateurs, like me, took down our high frequency, HF, antennas and switched to VHF and UHF frequencies that are less affected by sunspots. A small number of radio amateurs, again like me, achieved long distance communications with the short wavelengths of VHF and UHF, by bouncing signals off the moon. This is called earth-moon-earth or EME.



My 4m dish for 1296MHz EME
144MHz EME

My twelve Yagi array for



Today, the spots are coming back with a vengeance as shown above. The red line is the predicted progress of the current cycle, 25. The grey area is the margin of error. As you can see, the prediction by the folks at the Space Weather Prediction Center, a part of NOAA, is not what is happening. We are only one quarter in to cycle 25 and we have already had peaks which are nearly equal to cycle 24's absolute peak. There is much speculation that cycle 25 will be a strong one. The HF bands, 3 – 30 MHz, are abuzz with strong signals from all over the globe. Even the lowest frequency amateur VHF band, 50MHz, has had long distance openings using wavelengths that are usually line-of-sight. Amateur radio operators are gearing up for an exciting few years of radio propagation.

But a high sunspot count doesn't always bring joy. Solar flares which come from sun spots, are what really shake up the ionosphere. In addition to the electromagnetic radiation from a flare, there are energetic particles, some neutral and some charged, which affect our earth's magnetosphere. Energetic charged particles and magnetic fields interact. If they didn't, there would be no electrical engineering and we would still be using candles and water power.

What happens when a flood of energetic charged particles enters our magnetosphere? It causes a geomagnetic storm. It was a few weeks ago that the earth had a severe storm, the strongest geomagnetic storm in over 20 years. We are not even near the predicted peak of solar cycle 25. It is expected that geomagnetic storms will increase in the next few years as we approach the peak of cycle 25.

Geomagnetic storms affect mostly HF radio waves, but it affects nearly all radio frequencies. This includes the signals used for GPS, as an example. GPS degradation is likely during a strong storm. For enroute aircraft, this is not usually a problem but could be an issue during a precision approach. For this and other reasons, the FAA plans on keeping many of the terrestrial legacy navigation aids up and running with no plans to ever decommission them.

The return of sunspots is happy news for this radio amateur. But I have some unhappy news. Sadly, this is my last “Tale from the Old Professor”. My first Tale appeared in the October 2011 Newsletter, Sparks. I have provided a total of 80 Tales in that 12-year period covering a wide range of subjects. Some were serious and many were humorous.

A lot of things have changed in the past 12 years and that includes changes in the IEEE Daytona Section. I feel that I am not reaching today’s Section members and I have decided to retire the Tales which will open some space in the newsletter for new content.

As for me, I am gearing up for the upcoming stellar radio conditions. (pun intended) I just designed and built a new antenna and tested it with great results. Most likely more antenna construction is in the works, and I am ready for more of the wild radio propagation that has already started.



With these thoughts, I will wish you all a fond adieu and drive off into the spotted sunset.

Until we meet again:

Dr. Al Helfrick, a.k.a. The Old Professor

VOLUNTEERS NEEDED

Since I moved to New Smyrna Beach 20 years ago and joined the Daytona Section, I have seen many talented volunteers supporting the Section. Over the years there were several volunteers who stood out for consistent and enduring contributions.

Tracy Weichmann went through all the chairs, sometimes more than once, and was instrumental in securing the Halifax Yacht Club as a venue for our meetings. Tracy passed away in 2019.

Charlie Husbands was instrumental in securing the Small Radio Telescope for the Section and managed the SRT project for many years. He also went through the various Chairs and managed the Section web site. Medical problems are preventing Charlie from continuing his service.

Roger Grubic also went through the officers' Chairs and was a contributor to both Section meetings and the Life Members Affinity Group. Roger has moved out of the area to be closer to relatives.

Al Jusko has also been through the Chairs and has been our Newsletter Editor for many years. He also organizes the dinners for our meetings, is a key supporter of the SRT project, the Life Members Affinity Group, and manages our Tomoka Science Fair participation for our Section's Special Awards for the Science Fair.

Fortunately, the Section has also received a lot of support from the Electrical Engineering and Computer Science Department (EECS) at ERAU. Dr. Tim Wilson, Dr. Keith Garfield, Dr. Al Helfrick and Dr. Jianhua Liu have been strong participants for many years. But I see in this newsletter that Dr. Helfrick is cutting back on his activities.

The April meeting will be my last as Secretary as we will be moving to a continuing care facility in North Carolina where we will be closer to relatives. My wife and I are thankful that we have been able to participate in the IEEE events and have enjoyed time with our many IEEE friends.

I know that Dr. Liu – a strong supporter of the SRT and all Section activities – will continue to receive the support of existing volunteers. But the Section badly needs new volunteers to replace those leaving and to join in and support/create Section programs.

Any IEEE member of the Daytona Section is eligible to hold a volunteer position. We would welcome your ideas and participation helping our Section's continuing support of students, our future Engineering and Computer Science leaders, as well as our working professionals.

Ron Gedney, Life Fellow
Secretary, Daytona Section

PE CORNER

YOU RENEWED YOUR LICENSE; NOW WHAT?

Professional Engineer license renewal in Florida is now done for another cycle. Hopefully, you have completed your continuing education requirements and renewed your license. Now what? If you are like many of us, you won't think about continuing education for another 20 or so months and then rush to get your hours done before the next renewal deadline. What are you going to do with all that spare time until then? Let me make a couple of suggestions.

1. You can earn double the hours by presenting a technical seminar to your peers under IEEE's continuing education program. Every one of us has an area of expertise. Sharing your knowledge with others provides personal satisfaction, as well as earning hours toward your next license renewal. Talk to me or any IEEE officer about topics that you can present and earn some hours.

2. Lend your spare time to IEEE as an officer or volunteer. Get involved! You'll help yourself, your peers, and IEEE as a whole. You can earn four Continuing Education Hours (CEHs) each renewal cycle for servicing as a professional society officer.
3. Mentoring a young engineer, or an engineer intern, is a very rewarding way to give back to the profession. There are many ways in which you can help our younger peers to advance in their careers. For example, you can encourage new engineers just out of school to take the FE (EIT) exam now while the information is still somewhat fresh. Few of us knew early in our careers where our path would ultimately lead. Those just starting out may not know at this early point in their careers whether they'll need to have a PE license someday or not. We all know that if you don't take the FE exam shortly after graduation, it's a pretty monumental task for most engineers to "re-learn" enough of what they learned in college to pass the test. Just the thought of studying all of that material in order to pass can be daunting. A recent change to the licensure rules has "uncoupled" the experience requirement from registering to take the Principles and Practices exam (the PE exam). This change may benefit some new engineers in completing the exam and experience requirements for professional licensure.

Those are just a few suggestions of the endless opportunities that we all have to give back to the industry. I hope that you are able to avail yourself of some of these in the near future.

Whether you are a PE looking to attain required CEHs, or an engineer looking to learn something new or keep current with the latest trends in the profession, IEEE has seminars that will meet your needs. Sign up now!

Art Nordlinger, PE, Life Senior Member

DAYTONA SECTION SOCIAL MEDIA INFORMATION

Website: <https://r3.ieee.org/daytona>

Facebook: <https://www.facebook.com/daytonaieee/>

Instagram: @IEEEDaytona

Twitter: @IEEEDaytona

LinkedIn: <https://www.linkedin.com/company/ieee-daytona-section>

ERAU DAYTONA BEACH CAMPUS MAP



The College of Business (CoB) is Building 321, labeled with a red circle.

Parking lots Armstrong and Falcon, which are allocated to the northwest of the CoB building, color coded in blue, can be used for parking.

2023 DAYTONA SECTION OFFICERS

Chair – Dr. Jianhua Liu, 386-226-7713 liu620@erau.edu

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Secretary – Ron Gedney, LF, 386-847-8094 rgedney@aol.com

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Student Activities Chair – Open

Daytona Section WIE Affinity Group

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