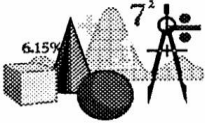




SPARKS

Daytona Section Newsletter
February 2021



SECTION MEETING

**Due to continuing Covid-19 considerations,
Engineering Week at Embry-Riddle will be virtual
Therefore, there will be no Daytona Section Meeting for February**

CHAIR'S REPORT



Hello active and inactive members of the Daytona Section of the IEEE. My name is Shawn Wilkerson, the 2021-2022 Section Chair. During our recent EXCOM meeting, it came to our attention that some of our members may not have been receiving Section communications regarding the activities and events of the Daytona Section. Please accept our apologies for any unintentional exclusion.

There have been several changes and activities within the Section over the last year – with more to come. Some of these changes are due to Covid19, while others are IEEE related.

We are in the process of discovering new features in VTools as well as other collaborative tools. We desire to use these tools to become more accessible and interactive as a Section.

2020 Success Story

The banner activity for the Daytona Section for 2020 was our partnership with the Burns Science and Technology Charter School. Several of our members worked together to inventory, assess, rebuild, upgrade, program, and subsequently install the Section's Small Radio Telescope (SRT) at the school for students and staff to operate. This project has garnered attention from the Florida Council and Region 3 and was primarily funded by outside grants as well as the expertise and financial contributions of several of our members. We are compiling the details for a project summary, to be published soon. Some of the details have appeared on our Facebook Page and website.

2021 Membership Renewal

It is that time of year again. Go to <https://www.ieee.org/membership/renew.html> and renew your annual membership. While you are renewing, make sure your profile is updated with your area of interest, as many people tend to skip this step. We are strategizing effective ways to bring topics of discussion to reach a broader number of our members. One such proposal is to pick an annual theme and have various presentations from multiple disciplines associated with the theme.

Closing

In closing, this is your Section. Hundreds of you, in dozens of disciplines, are members of the Daytona Section of the IEEE. Some are either thinking of a project within our ranks, actively working on a project, or would consider helping a project move forward. We would like to hear from those in these three groups and look forward to the creative and innovative ways they link with one another to accomplish projects. I hope we will see many types of community partnerships happening across the Daytona Section during the coming months by our members.

Shawn

W. Shawn Wilkerson
Chair, IEEE Daytona Section
386 322-7999

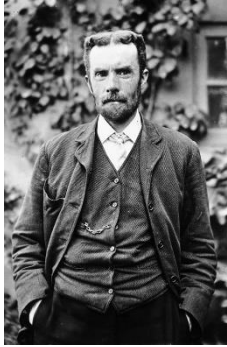
ANOTHER TALE FROM THE OLD PROFESSOR

Oliver!

No, this Tale is not about the 1960 British musical “Oliver!” or the 1968 movie of the same name. That Oliver was Dickens’ Oliver Twist. This Tale is about Oliver Heaviside.

Heaviside was mentioned in an earlier Tale relative to his work on understanding the ionosphere for which the E layer is named the Kennelly-Heaviside layer. He is also a part of the 1981 British musical “Cats” and the 2019 film version where a tribe of junkyard cats vie to be chosen to go to the Heaviside layer, a heaven-like place to be reborn. Grizabella is the chosen cat and is sent on her way as the cast sings “The Journey to the Heaviside Layer” at the end of the show. Why Kennelly was left out of the British musical is unknown. One possibility is Heaviside was British and Kennelly was Irish-American.

Heaviside’s studies of the ionosphere were important, but he contributed much more to science and engineering which may be of greater importance and were generally overlooked for many years that extended to after his death in 1925 at age 74.



Oliver

On January 11th, 1838, in Morristown, NJ, Alfred Vail and Samuel F. B. Morse, made the first public demonstration of their electric telegraph through 3.2km of wire. They discovered that if wire lengths were greater than about 3.2km the system would fail. To combat this problem repeaters at no more than 3.2km apart were used for longer distances. They realized that the resistance of the wire did not explain this limitation on wire length; it had to be something else. They did not understand the nature of transmission lines which could be said of any other electrical engineer or scientist at that time.

Enter Oliver Heaviside; who modelled the transmission line as distributed resistance, inductance and line-to-line capacitance and created what is known as the “telegrapher’s equations”. Heaviside’s equations showed that the failure of the telegraph due to line length was not because of signal loss which could be explained by excessive resistance, but signal distortion. Heaviside showed that transmission lines had a “characteristic impedance” and by impedance matching transmission lines with what are called “loading coils”, much greater distances could be achieved.

Heaviside relied, in part, on Maxwell’s equations in developing the telegrapher’s equations which he found cumbersome. He set about simplifying the equations using vector calculus. Today the common four-equation representation of Maxwell’s original 20 equations was developed by Heaviside.

In addition to the E layer of the ionosphere bearing Heaviside’s name, a function we all know, the unit step function, is known as the Heaviside function. ($H=Heaviside(x)$) Heaviside made heavy use of the unit step function with his operational calculus developing the telegraph equations. (I had to get that in somewhere in this Tale.) Another mathematical tool attributed to Heaviside is the “Heaviside Cover Up Method” used for separating a fractional algebraic equation into partial fractions.

In addition to the unit step function being named after Heaviside, he is responsible for a number of terms used in electricity today. They include: admittance, conductance, impedance, permeability, reluctance and a few others.

And which prestigious university can make claim to Heaviside’s genius? None. His “formal” education ended when he was 16 years old. He is high on the list of the world’s most accomplished autodidacts. (You might want to look that one up.)

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

PE CORNER

You Renewed Your License; Now What?

The deadline has passed for license renewal in Florida. 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 suggests.

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. 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. And 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.

Art Nordlinger, PE, Senior Member

DAYTONA SECTION SHIRTS



We are pleased to offer Daytona Section polo shirts for our Section members. The shirts are embroidered with the IEEE Logo and DAYTONA SECTION on the left and your name and grade, if desired, on the right. The shirt is a high quality 5 oz, 65/35 poly/cotton pique in Royal Blue with white embroidery. Available in S - 2XL in men's as well as ladies' sizes. Price is \$30, including tax, for S-XL size's, 2XL size is \$3 additional.

For more information or to order shirts contact: Allan Jusko 386-671-3706 or a.jusko@ieee.org

FUTURE MEETING DATES:

Planned 2021 meetings, depending on the coronavirus situation at the time:

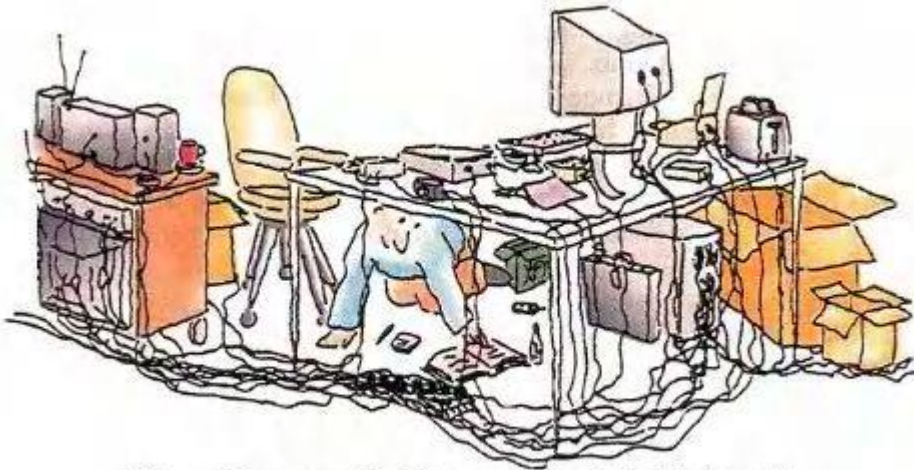
Spring semester: Mar 25, Apr 22

Fall semester: Sep 23, Oct 28, Dec 2

EDITORS NOTES

Visit our Daytona Section website: <https://ewh.ieee.org/r3/daytona/>

ENGINEERING HUMOR



"Now, if you can find the power switch, flip it on."

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