

# SPARKS

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



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## UPCOMING EVENTS

**Our January Section meeting/presentation will be held on  
Thursday Jan 26, 2023, at 07:00 PM as a Zoom meeting**

Login Information:  
<https://erau.zoom.us/j/7402517688>  
Meeting ID: 740 251 7688

## OUR PRESENTATION

### **MEASURING PHYSIOLOGICAL INTANGIBLES LIKE PILOT DISORIENTATION AND SLEEP QUALITY**

**Topics:** Measuring hypoxia effects on pilot error, Measuring Sleep quality and stopping the deadly cycle of snoring.

**Abstract:** There are many physiological events that currently defy accurate measurement and hence, reduces adequate mitigation. Events like spatial disorientation, especially in flight where it is in the order of 95% fatal, is notoriously difficult to measure. I will discuss our ongoing tests and the importance of the NASA Mars chair that several of ERAU's finest engineering students are returning to former glory. Other events that we study in my Aerospace Physiology lab at ERAU are sleep quality such as what makes one night of sleep restful and another restless. What role does snoring play in sleep quality, and does it go away, and can it lead to the number one killer of Americans today, cardiovascular disease. With these examples, I would like to speak to you about the applied side of physiological assessments, some solutions we've found that will improve mitigation and also to learn what insights you may have to improve our measurements.

## OUR SPEAKER

**John French** is a Professor of Human Factors and Aerospace Physiology at Embry Riddle Aeronautical University. He has over 160 publications in the area of human performance enhancement, sleep deprivation and stress countermeasures.

Dr French received his MS and PhD in Experimental Physiological Psychology at Colorado State University. He received postdoctoral training in the Laboratory of Cerebral Metabolism at Cornell University Medical College. He was the director of the pre-clinical EEG screen for Parke Davis Pharmaceutical Company and a research associate in the Department of Pharmacology at the University of Michigan. Dr French served as a senior Aerospace Physiologist with the US Air Force Research Laboratory at Brooks AFB and participated in sustained operations and acceleration research. Dr French won many honors while with the Air Force including the Dan Berkant award and the DoD Civilian Recognition Medal for work in a combat zone in Gulf War I. While at Brooks AFB, Dr French was part of a team that evaluated astronaut cognitive ability onboard IML-2, a space shuttle mission. Next, he worked in the human simulation industry for Micro Analysis and Design designing biomathematical models of fatigue and other stressors, before coming to Embry-Riddle University. He has been with ERAU for the past 15 years and teaches classes in Physiology, Psychobiology, Neuroscience, Perception and Pharmacology. His current research interests at ERAU concern spatial disorientation, motion and space sickness, sleep improvement and biomathematical models.

Reprints available upon request

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For questions regarding venue or information contact Allan Jusko, Editor  
Call or text 386-846-5372, or email [a.jusko@ieee.org](mailto:a.jusko@ieee.org)

## LIFE MEMBER NEWS

I would like to wish a Happy New Year to all our Daytona Section IEEE Life Members. Ron and I are trying to plan out meetings for our group this year. We have some ideas that we would like to share with you. Any input on other meeting ideas, or comments on what we have proposed, would be GREATLY appreciated.

Please email Marty Oksenhorn ([moksenho@yahoo.com](mailto:moksenho@yahoo.com)) or Ron Gedney ([rgedney@aol.com](mailto:rgedney@aol.com)) with comments or suggestions. As an FYI, Dave Defanti and I will be judging the Tomoka Regional Science and Engineering fair for our section (Special Award Provider). We will have an update in the February Section Newsletter.

Here is what Ron and I will be looking into:

1. Florida Solar Research Center – Cocoa, Florida

Here is a brief description of who they are and what they do (from their website).

“The Florida Solar Energy Center® (FSEC®), is the state’s premier energy research institution. Created by the Florida Legislature in 1975 to advance research, development, and education in solar energy, FSEC’s focus includes renewable energy, energy efficiency, and sustainable transportation research, demonstration, and education.”

2. FPL Solar Energy power generation system, in Samsula. We will be looking into touring a solar energy field run by FPL.

3. Ormond Brewing Company

Located in Ormond beach Florida.

This local company brews and cans craft beer. From their website their canning line looks like a winner of a tour destination. Below is some information from their website.

“Ormond Brewing Company is the first craft brewery in Ormond Beach located in the Railroad District of Ormond Beach. We have eighteen delicious craft brews on tap with our artisan beers produced on site. We source our local ingredients and brew our beer right here in Ormond Beach. We share our passion and commitment to the craft through our brews. In addition to our tasty brews, we offer a red and white wine by the glass and have a list of premium wines offered by the bottle. We are kid and pet friendly!”

4. Tour of the Flagler County Airport

The Flagler County Airport is located in Palm Coast. We will be trying to arrange a tour of the Airport. I would like to focus the tour on the electronics, the control tower as well as the general operation of the airport.

5. Meet with ERAU EE (Undergraduate or Graduate) students  
We would request presentations on some of their key projects and research, and of course lab tours! Students in Mechanical Engineering recently won a robotics contest for example.
6. Tour of the ERAU MicaPlex Research Center.  
Micaplex has recently made headlines due to the number and quality of new jobs they have brought to the area. It is an “incubator” designed to support small businesses and help them get started in our area. They are working on plans now to increase the size of the Micaplex with another building. We might be able to get a tour and talk about how the “incubator” works and see some of the laboratory facilities.
7. A round table discussion is proposed to review and discuss medical patient portals. This will give us an opportunity to discuss our experiences with them.  
There is no standardization among the existing portals, so each one is a learning experience for the patient if he/she wish to ferret out what is available. Some portals present the data in small bits, so you need multiple windows to get information needed. So far, only one (that we know of) provides the doctor's findings and recommendations. Some have wonderful security requirements - some so strict it is tough to even access them. We may be able to get someone knowledgeable in the industry to come talk to us.

**Marty Oksenhorn, LSM**  
**Life Member Affinity Group Chair**

## **ANOTHER TALE FROM THE OLD PROFESSOR**

### **The End of an Era**

The last Boeing 747 jumbo jet; a freighter destined for Atlas Air, rolled off the assembly line 8 DEC 2022. That date marked the end of probably the longest production run of any civilian aircraft other than the Cessna 172 which first rolled off the assembly line in 1956. The 172 is still in production in 2023. However, the 172 took a production hiatus from 1986 to 1996 due to excessive insurance costs from product liability suits. Some of the lawsuits brought against Cessna and other light aircraft manufacturers involved 50-year-old aircraft claiming a faulty design which wouldn't have been the case when the aircraft were built. Cessna's liability insurance premium on a new 172 almost doubled the cost of the aircraft and sales plummeted and the production of the 172 was halted. Federal legislation limited the scope of product liability suits in 1996 and the 172 production line immediately came back to life. The 747 was in continuous production for 54 years with some slowdowns in later years. The 747 first took flight 9 FEB 1969 and a total of 1574 were built.

The 747 featured improvements that other aircraft later adopted. It was one of the first aircraft to use high bypass turbofans. High bypass means that much of the air entering the engine did not pass through the “hot section”. The engine produced greater thrust, improved efficiency and therefore reduced its carbon footprint. It was the first “double decker” jet aircraft. (The propeller-powered Boeing 377 introduced in 1947 had two decks.) Some early 747s had a lounge on the upper deck complete with a bar, piano and pianist, a flying piano bar. In my life I have flown over 1 million miles but only a few trips were on a 747. I did have a seat on the upper deck on my last trip to Singapore but, alas, no bar or pianist. I could get drinks delivered to my seat however.

At the time of its introduction, the aircraft was huge, dwarfing all other aircraft of the day. None of Boeing’s assembly buildings were large enough to produce the 747. Boeing constructed a new building in Everett Washington a few miles north of Seattle to assemble the monster which was and remains the largest building by volume in the world.

The 747 was introduced as a passenger aircraft but it wasn’t too long after its introduction that freighter versions were made. The freighters outlived the passenger versions by several years. Hence the last aircraft was a freighter. But the 747 is also known for the other roles it played. Some are shown below.



The Shuttle Carrier Aircraft, SCA    An airborne telescope on a 747 by NASA



The Dream Lifter or Large Cargo Aircraft    A giant airborne LASER



A 747 dropping fire retardant

The familiar Air Force One

Space Center when it landed at the Dryden Flight Research Center in California. It was also used to transport retired Shuttles to museums for display. The SCA is an attest to the 747's strength and power being able to handle the Shuttle's added weight and drag.

Boeing built 4 Dreamlifters. Although used by others, Boeing was the major user of the aircraft; transporting parts for the Boeing 787 Dreamliner which is the genesis of its name, the Dreamlifter.

The Boeing YAL-1A was a multimegawatt chemical laser installed in a 747. The laser occupies nearly all of the interior space of the aircraft. Although the laser is aligned with the longitudinal axis of the aircraft a turret allows the laser to be aimed at targets such as ballistic missiles and aircraft. The YAL-1A never got past the experimental stage having been declared too expensive and impractical.

Three 747s were converted into supertankers for fighting forest fires. In spite of their potential effectiveness, the three saw little service. Two were scrapped while the remaining aircraft was converted back into a freighter.

The last 747 produced is not going to be the last 747 delivered by Boeing to a customer. There are two B747-8s, the latest version of the 747, being outfitted with the necessary equipment to become the next Air Force One. The two aircraft were to be delivered to a Russian airline that went bankrupt leaving Boeing with two brand new, completely finished and flight-tested aircraft sitting in the Mojave Desert "bone yard".

Although no longer in production, the 747 will be flying for a few more decades as freighters and Air Force One. Who knows; maybe it can outlive the B52 bomber that made its debut April 1952 and is still flying.

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



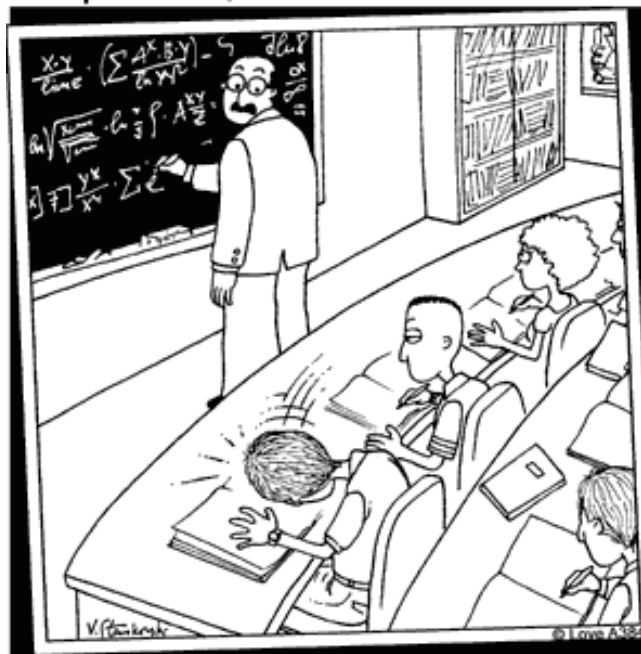
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Snapshots at [jasonlove.com](http://jasonlove.com)



Professor Herman stopped when he heard that unmistakable thud – another brain had imploded.

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