3rd ANNUAL DARC HOLIDAY PIZZA PARTY

WEDNESDAY DECEMBER 18TH MEETING START 7:30PM

50/50 drawing (5 tickets for $3.00 or $1.00 per) and **prizes** !!!!!!!!!!!!!!!!!!!!!!

WE'RE meeting at the WAYNE COUNTY SECOND FLOOR EOC ROOM
Wayne County Public Services Building 7227 Rte 31 Lyons NY 14489

*****->->->->->->WINTER TIME !!!!!!!!!!!!!

BAD WEATHER! WATCH THE CLUB EMAIL FOR MEETING CANCELLATIONS!!!!!!

I have at least all the Pumpkin Patrol DARC members' cell numbers in my cell directory. That would be a good 95% of DARC members. If for some reason you can't get to an email device you may text me on my **cell number** (315-871-8767), beforehand. I will get on the **685** and **745** **repeaters** for **announcements**.

PRESIDENT'S KORNER

HAPPY HOLIDAYS TO YOU ALL! Of course at this time of the year us "hams" are thinking what new stuff will Santa leave under the tree for us. Hi hi. Naturally, it is a great time to be with family and friends. Have a safe holiday!  (Hopefully, no coal in your stocking.)

For the XYL and me it is an anniversary time for us. Anniversary? Well, it is another anniversary. This December 22, Sunday, is the exact day 61 years ago of our "first date!" Four days before this first date, I had finally gotten the courage to ask the XYL to go to our Class of 1964's Senior Prom. She said "yes" to the prom right then. The next day at school, she asked me to out on our "date" the Sunday. That date, as you know by now, was very successful. Hi hi. Well, we've celebrated our "first date" every year since. We figured, if that date didn't go well, the years after together would never have happened.

(Surprise you with another giggle picture at the meeting. Hi hi.)

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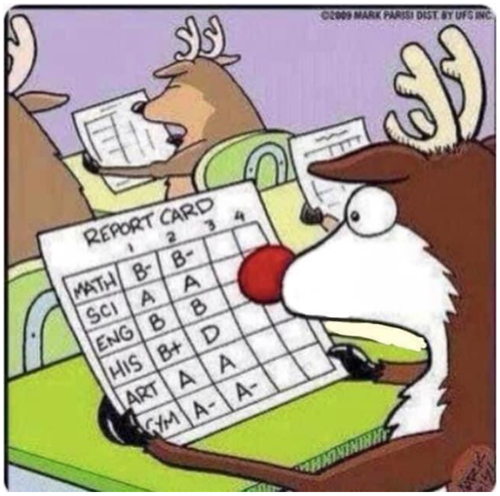


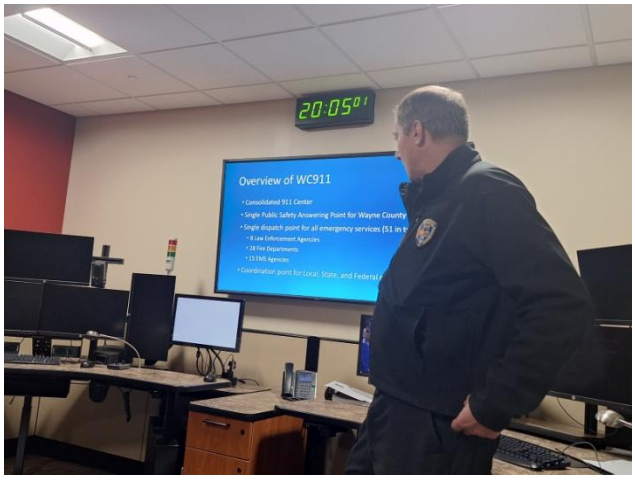
RUDOLPH WENT “**DOWN**” IN HISTORY? (Old social studies teacher here, that is not good. Hi hi.)

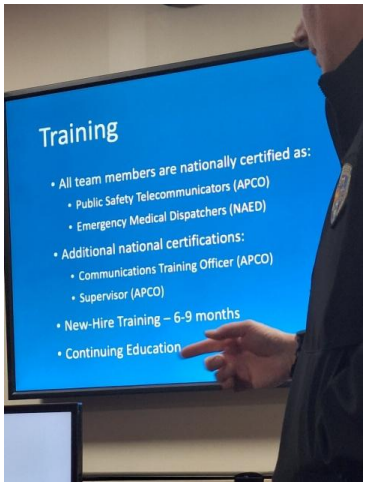
* *

You remember at the last meeting in November, proud Dad, KD2SZT-Andrew, was bragging about his son Aaron was going to the State cross country meet! Well, here is the proud “harmonic” pictured taking 38th in the whole State! (Of course, Dad is not beaming too much is he? Hi hi. Congrats to Meyer family! (I have a sneaky suspicion “gramma” Meyer is grinning a BIG smile, as well. Hi hi.) “**FB, Aaron**!!!!!!”

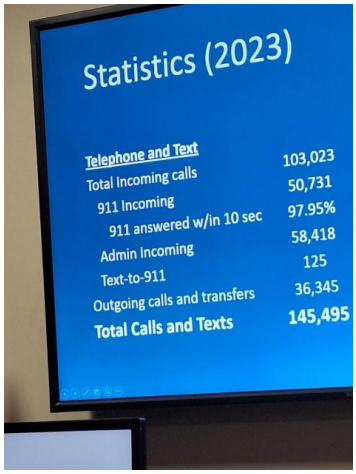
* *

THANK YOU, ANDREW, KD2SZT, FOR THE TOUR THRU THE WAYNE COUNTY 911 CENTER! Last month's program, Andrew did a nice presentation before letting us loose to see the 911 center. You did a nice job, Andrew. That is coming from a career social studies teacher. I was told we have had a tour before but this was my first and first for new members of DARC. (I honestly can't remember missing a DARC meeting. The XYL says I'm not remembering some things. Hi hi.)

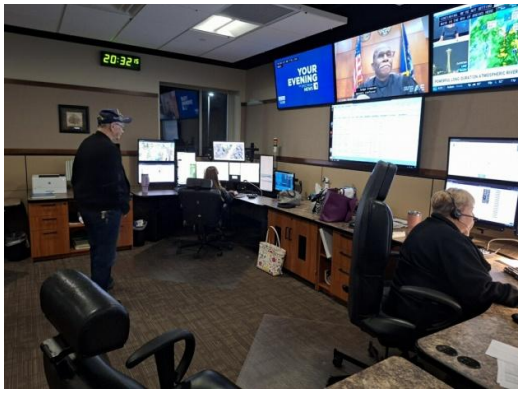




Interesting facts, too.



2023 stats!



Letting us Loose.

Remember, this guy is the world's worst typist and dodo computer op that thinks CW is a miracle. Hi hi.

RACES-ARES DECEMBER 2024

WARECS NETS: **ALL NETS WILL BACK ON THE WA2EMO STARTING DECEMBER 8TH 146.685 (71.9 tone)!!!!!!!!!! The 146,745 (71.9 tone) alternate frequency**

NO WARECS/ONTARIO RACES NETS

December 29/January 5

The 2025 Ginna Drill is scheduled for **Wednesday, June 4, 2025**. This will be a NYS evaluated exercise. As part of the exercise cycle required by FEMA, we are periodically required to have a Hostile Action Based (HAB) exercise. So, basically, the bad guys are going to try to get into the plant deep enough to cause a radiological release. The official FEMA evaluated exercise won't occur until 2026, but I do expect certain elements of the HAB to be exercised on June 4, 2025. Please mark your calendars for this one. Everyone's participation is critical to the success of these exercises. They are great practice for any type of major event that could occur anywhere in the county, and your help is greatly appreciated.

Although we don't know the exact times, you can plan on starting somewhere between 8 and 9 am and finishing some time after lunch. As always, lunch is provided. Thank you again for your participation.

Regards, George Bastedo, CEM Director, Office of Disaster Preparedness

SIARC "HEALTH and WELFARE NET:

STILL GOING STRONG!!!. **Kudos, Tom**! Get aquainted with some of our SIARC friends and the surrounding counties. **Thank you, Tom, for being so patient and sacrificing your time.** Tom's SIARC health and welfare net is oen to all hams that can hit the **146.820 repeater (tone 110.9)**, either mobile or from your QTH. Just listen to Tom's or the NCS's instructions always given first as the net starts like we all know as hams and used to a SOP. So listen for the SOP at the beginning of the net. Only the third Wednesday of the month, the SIARC meeting night, is there no net.

Mysteries in polar orbit – space's oldest working hardware still keeps its secrets

It's never aliens, but it could be underground TV repair techs

Rupert Goodwins Mon 25 Nov 2024 // 09:29 UTC

Opinion The oldest functional off-Earth space hardware? Well, that is a great question for those into pub quizzes, aka bar trivia. 1977's Voyagers hold some impressive records beside those golden discs, just not that one. Any guesses?

Astronomers are still bouncing range-finding lasers off the reflectors left on the Moon by Apollo 11, but fancy mirrors hardly count.

Nope. The best contender is from 1974 and wasn't even launched by NASA or the Soviets. It's still in orbit, still functioning remarkably well, it celebrates its 50th birthday this month, and, lastly, has the suitably prize-winning name of Oscar.

Its full name is AMSAT-OSCAR 7, known to its friends as Oscar 7, and it is remarkable for many reasons – not least of which are two great mysteries that may never be resolved. For a tiny box built on a budget that shames shoestrings for their conspicuous wealth, it pioneered some amazing technologies, got amazingly lucky more than once, and repaired itself after two decades of being dead (perhaps).

Start with the luck. The Oscar in Oscar-7 stands for Orbiting Satellite Carrying Amateur Radio, and it was – is – the seventh of its kind. It cost around $60,000 in 1974 money (see PDF) to build, and as The World Radio News pointed out at the time "was built on evenings and weekends by volunteers, many of whom are involved professionally in the aerospace industry." It added: "A comparable satellite commercially built would cost two million dollars."

The hardware weighs just 28.6 kg, and is an octagon covered in solar cells, about half a meter tall, and with spikes sticking out. Its mission, which was planned for either five or ten years depending on sources, was to relay ham radio signals over an area roughly the size of the continental US, and if you've got a ham radio license you can use it right now, orbit permitting.

To build and launch anything for that kind of coin needed volunteers, exceptionally smart thinking, and donated parts. We may have Arduinos in space in 2024, even if nobody knows why, but 50 years ago it was all custom unobtanium.

So Oscar-7 scored several big pieces of luck: firstly, it was given a rechargeable battery used as a test item for a long-forgotten lunar orbiter, and spare solar cells found in a NASA Earth observation satellite program. The battery was space-rated with a limited number of charging cycles before it died, and most solar cells are also limited life, being degraded by radiation. These ones were designed to go through the Van Allen belt and had an unknown lifetime.

Another great piece of luck was the project team, which was scattered around the world in universities, agencies and companies. Time and resources were donated, cadged or constructively shoehorned into theses, all coordinated without even email, and with some brilliant engineering. The spacecraft had to be in a permanently controlled spin for thermal management and had to be permanently aligned to Earth, but moving parts were out, let alone control jets. Alignment was taken care of by strapping large magnets to align with the Earth's magnetic field, and four antennas made out of cut-up metal tape measures were painted black on one side and white on the other. Arranged as a propeller, the pressure of sunlight would make them act as solar sails, as long as that arrangement also worked for the radio side. It did.

Ah yes, the radio side. With a 1,000 km orbit and a power budget of 12-14 watts - less than a three amp USB charger, the satellite's transmitters had to be exceptionally efficient to have any chance of being usable by ordinary radio hams with ordinary radio ham gear. That design pioneered ideas still in use today in digital mobile comms. Then there were telemetry, control, beacon and data transmission systems, all touched with genius, all deliciously documented in a [PDF] 50th anniversary paper.

Moreover, it all worked. Launched on November 15th, 1974 and activated a few days later, it wired superbly for six years and six months before, cell by cell, the battery failed, shorting out the solar cells and turning off Oscar-7 for good in June 1981. So far, as expected – and then we hit two intertwined mysteries.

The first mystery is unambiguously attested. In 2002, 21 years after the satellite died, a British radio ham picked up telemetry signals proclaiming it had returned to life. One of the shorted cells in the battery had somehow gone open circuit, letting all the power from those fortuitously robust solar cells to flow back into the electronics. Oscar 7 worked again, providing it was in sunlight, and since it's in a polar orbit that rarely dips into eclipse, that's most of the time. The problem? Those kinds of batteries never do that. They stay short circuited. This one didn't, and nobody knows why.

The second mystery or theory also says Oscar-7 came back to life, only this time claiming the revival happened mere months after it went to sleep in the summer of 1981. In December of that year, the Polish Communist Party declared martial law in that country due to widespread protests by the Solidarity organization. This included confiscating all two-way radio equipment and aggressively controlling the telephone system. In response, a network of scientists, engineers and technicians in universities and television repair shops started building clandestine equipment and used it to organize protests and strikes across regions, until martial law was rescinded in 1983. It was one of the big triggers for the collapse of the Soviet Union, and is well documented. So, what to make of claims (Polish) that the clandestine radio network somehow "reactivated" Oscar-7 and used it within Poland and to communicate with the West?

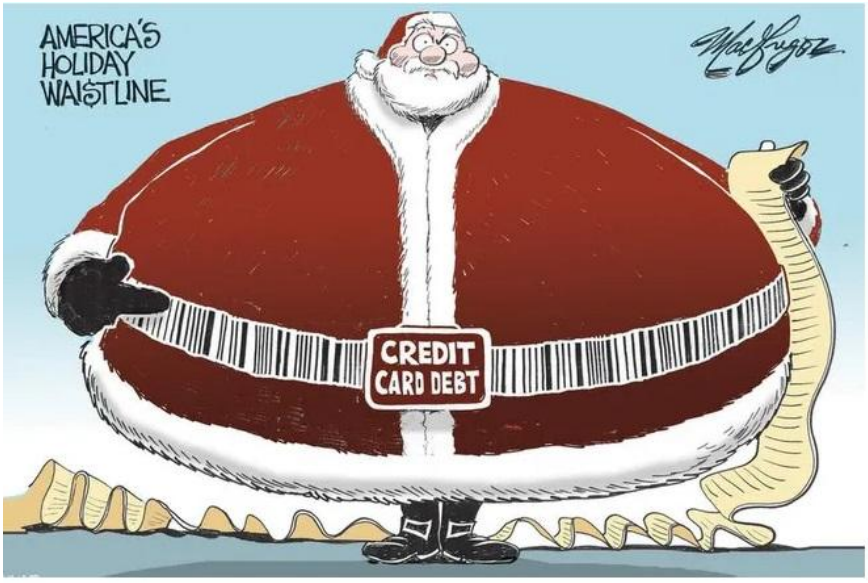
- Antarctic researchers send an SOS to the world: Who wrote this message in a bottle?
- ESA's Mars Express continues to avoid retirement home
- First of ESA's Cluster satellites prepares for fiery finale over South Pacific
- US Military enlists radio hams to simulate fight with THE SUN

On the one hand, it made sense to use the kit if you could. Uplinks to ham satellites can be highly portable and much more difficult to detect and locate than terrestrial transmission that is powerful enough to cover a country directly. Reception can be very discreet, and it would be politically difficult to jam an international amateur radio satellite that serves all of Europe. If you could, you certainly would,

and the reports are clear that the authorities knew it was happening and were very unhappy. On the other hand, it's incredibly unlikely that a working Oscar-7 would go unnoticed by the rest of the world. Tens of thousands of contacts had been made before the satellite went to sleep in 1981, and by the time it did, Oscar-8 had been launched – so there were plenty of hams still using the satellite frequencies.

That, perhaps, is the best explanation, that the underground were using Oscar-8 – and the Oscar-7 story was deliberately or accidentally elided with it, or clandestine satcomms was a story too good to not pass on, no matter what its origins. More research is definitely needed. It's highly unlikely any amount of research will reveal the magic of the seemingly "self-repairing" power system. It's no mystery that damn fine, committed, passionate engineering had to be behind a system that appears to be able to sleep in orbit for more than two decades and then wake up as if nothing had happened. Laptop designers, please note. ®

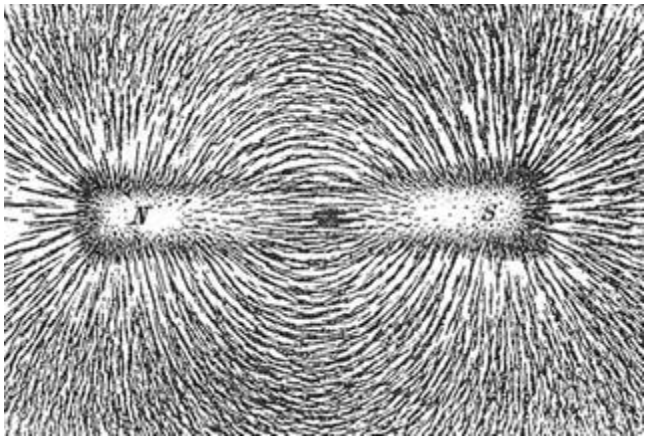
[EDITOR'S NOTE: Thanks, George (Bastedo), for emailing this article to use. See! There are members who read these articles and help contribute interesting articles.]



How true.

Where did the universe's magnetic fields come from? News By Paul Sutter

Magnetic fields are everywhere in the universe. But where do they come from?



How the universe got its large magnetic fields has remained one of the stickiest outstanding problems in astrophysics. Now, researchers have proposed a novel solution: a giant "dust battery" operating when the first stars appeared.

Magnetic fields are everywhere in the universe. Of course, there's Earth's magnetic field, which deflects dangerous cosmic radiation, wiggles our compasses, and guides flocks of migrating birds. But other planets and stars have magnetic fields, too, and the magnetic fields of Jupiter and the sun are more powerful than Earth's.

Even the entire Milky Way galaxy has its own magnetic field. It's about a million times weaker than Earth's, but it stretches across tens of thousands of light-years, spanning the entire galaxy. Astronomers know of even larger magnetic fields, some of which fill entire galaxy clusters that can reach a few million light-years across.

So where do these gigantic magnetic fields come from? Even though they are relatively weak, they are incredibly large. So whatever created them must have come from suitably energetic, large-scale sources. Over the decades, astronomers have proposed a number of mechanisms, most of which rely on a dynamo process that takes weak "seed" fields and amplifies them to their present-day values.

But that just pushes the goalpost back even further. Where do the weak seed fields come from in the first place?

In a paper submitted to The Astrophysical Journal in October, researchers proposed a novel solution. Their scenario starts in the cosmic dawn, when the universe was only a few hundred million years old

and the first stars and galaxies were beginning to shine. After those first stars died, they left behind bits of heavier elements, which found each other in interstellar space to become the first grains of dust.

These dust grains were generally electrically charged through bombardment with radiation and friction with each other. When the second generation of stars lit up, their intense light shone through all the gas and dust surrounding them. If these stars were powerful enough, their radiation could literally push on the dust grains, causing them to move through the rest of the gas. These moving, electrically charged dust grains would create a weak-but-wide-scale electrical current, like a copper wire 1,000 light-years across.

Because the filtering of radiation through the interstellar gas wouldn't be perfectly uniform, the moving dust grains would tend to dump in some spots and disperse in others. This would create differences in the amount of electrical current from place to place, which, through the laws of electromagnetism, would naturally give rise to a magnetic field.

Related Stories:

—Wrinkles left over from the Big Bang may have magnetized the universe

—A massive space rock impact may have kick-started Earth's magnetic field

—How stars' magnetic fields could impact the chance for life on orbiting planets

In the new study, the researchers found that this magnetic field would be incredibly weak — roughly a billionth the strength of Earth's magnetic field. But it would be large enough that other astrophysical processes, like mixing and dynamo amplification, could latch on to that seed field and generate the magnetic fields we see today.

This is only a hypothesis, however. The researchers concluded their work with a recipe to include this mechanism in simulations of the evolution of galaxies and their magnetic fields. That is a crucial step in comparing the full magnetic fields predicted by this theory with the ones we see in the actual universe. We can't rewind the clock to see what the universe's magnetic fields were like long ago, but we can use ideas like this to attempt to reconstruct the past.

Join our Space Forums to keep talking space on the latest missions, night sky and more! And if you have a news tip, correction or comment, let us know at: community@space.com.

Paul Sutter Space.com Contributor

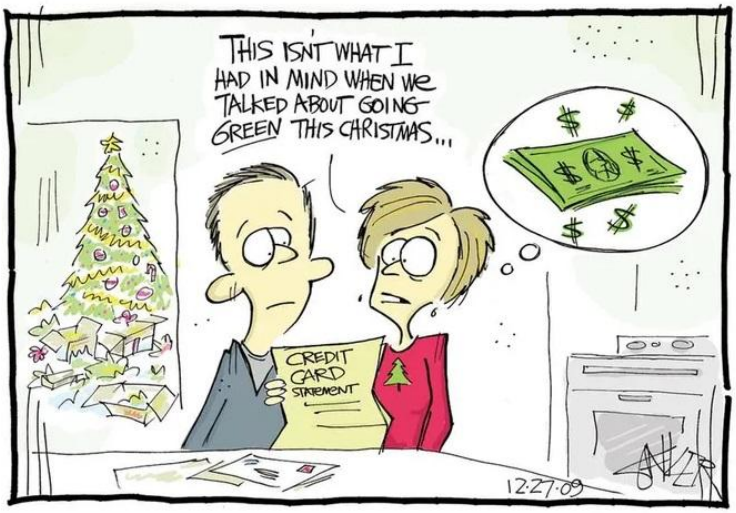
Paul M. Sutter is an astrophysicist at **SUNY Stony Brook** and the Flatiron Institute in New York City. Paul received his PhD in Physics from the University of Illinois at Urbana-Champaign in 2011, and spent three years at the Paris Institute of Astrophysics, followed by a research fellowship in Trieste, Italy, His research focuses on many diverse topics, from the emptiest regions of the universe to the earliest moments of the Big Bang to the hunt for the first stars. As an "Agent to the Stars," Paul has passionately engaged the public in science outreach for several years. He is the host of the popular "Ask a Spaceman!" podcast, author of "Your Place in the Universe" and "How to Die in Space" and he frequently appears on TV — including on The Weather Channel, for which he serves as Official Space Specialist.

From the Editor: If George can find good articles for the newsletter, why not you? All of us members are doing something. You're not have a boring life as me. Eric, W2EEH, who is on the WARECS net often, sent me a cartoon which (If my brain remembers.), I'll put it in the January newsletter. If ii is an interest to you, it is an interest to DARC members. So!!!! **Do it, please**!

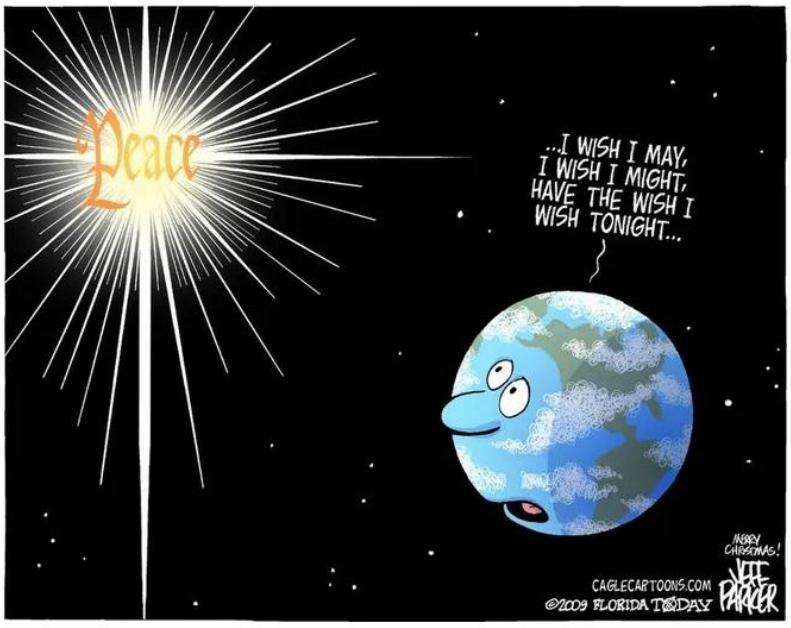
"You'll be visited by the ghosts of TV Christmas specials. "

Hi hi.

Ouch.



DON'T FORGET THE DARC **PIZZA PARTY**!



New Years eve Day 1966! Hi hi.

From the Editor!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!