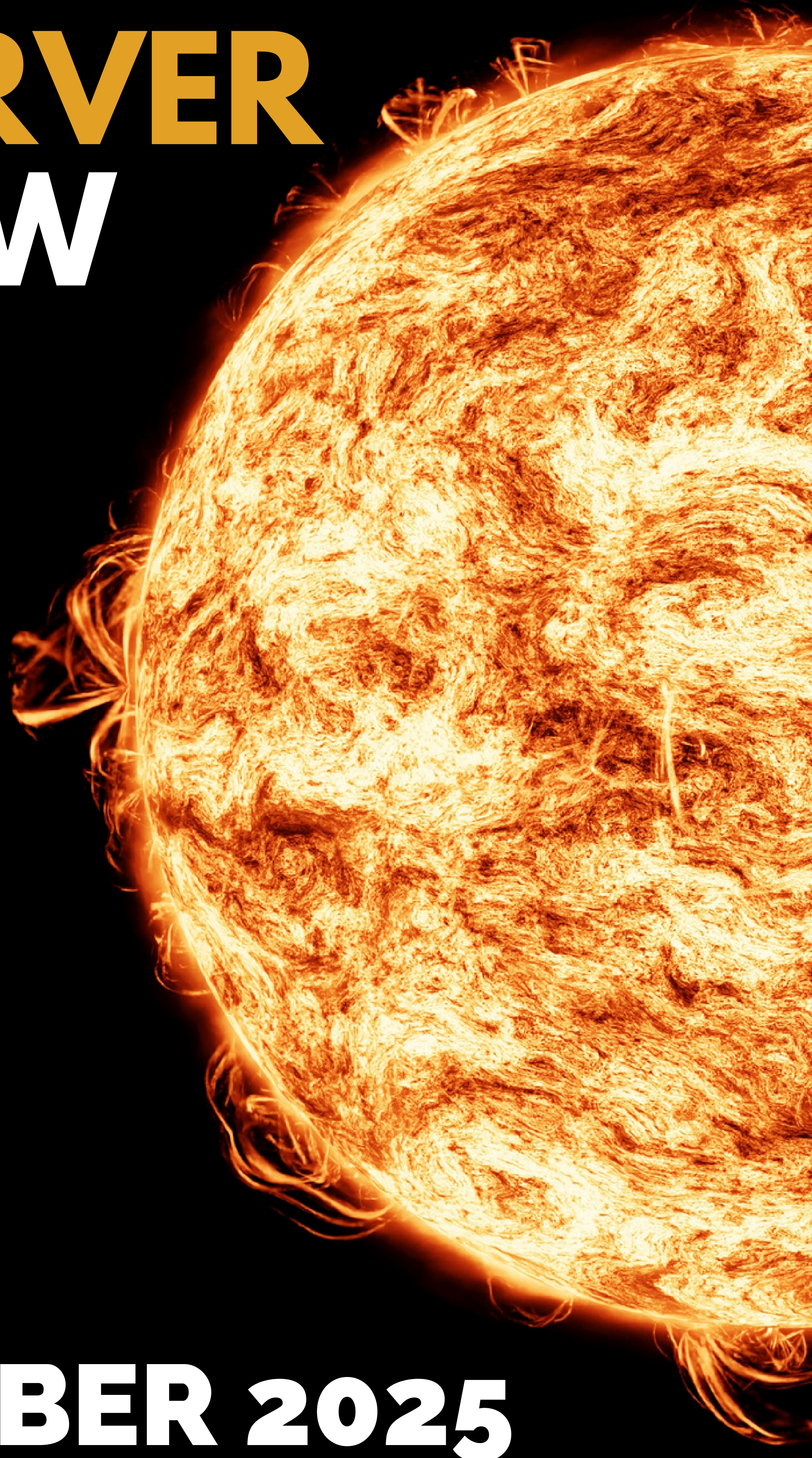
THE OBSERVER REVIEW



SEPTEMBER 2025

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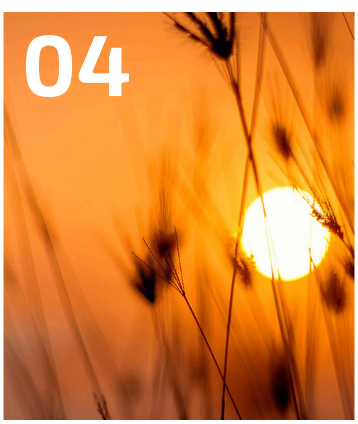

FEATURED ARTICLES

AND MORE!

THE SATELLITE THE SUN KILLED

ARTICLE REFERENCED:
ON GEOSPACE CONDITIONS DURING THE INTELSAT-33E SATELLITE FATAL FAILURE IN OCTOBER 2024

The Intelsat 33e satellite was a primary communications satellite that fractured into dozens of pieces in a major explosive event in October 2024. A new paper is suggesting what many at the time had also hypothesized - that this satellite was taken out by the solar storm that occurred in the days before.

Not only did earth take impact from an unexpectedly powerful geomagnetic event due to coronal mass ejection impact, but the high-energy electron flux in the immediate wake of the event was extreme. The new study suggests that internal charging built-up over the storm and crossed the critical threshold in during the electron event, causing an explosive fracturing of the satellite into at least 57 pieces. As of December, the continued collision of those pieces had increased the number of debris to over 700.

Not only is this the exact type of space weather technological impact that is expected during major storms, offering a reminder of what can happen during major solar events, but this was one of the numerous examples of underwhelming solar wind events causing outsized impacts here at earth. The geomagnetic disruption index during that event was 100x higher than expected, due to the weakening of earth's magnetic field in this ongoing magnetic pole shift, and the extra particle penetration almost certainly played a role in the loss of this satellite.

SUN ACTIVITY AND DEATH

ARTICLE REFERENCED:
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HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/PII/S2590162125000425

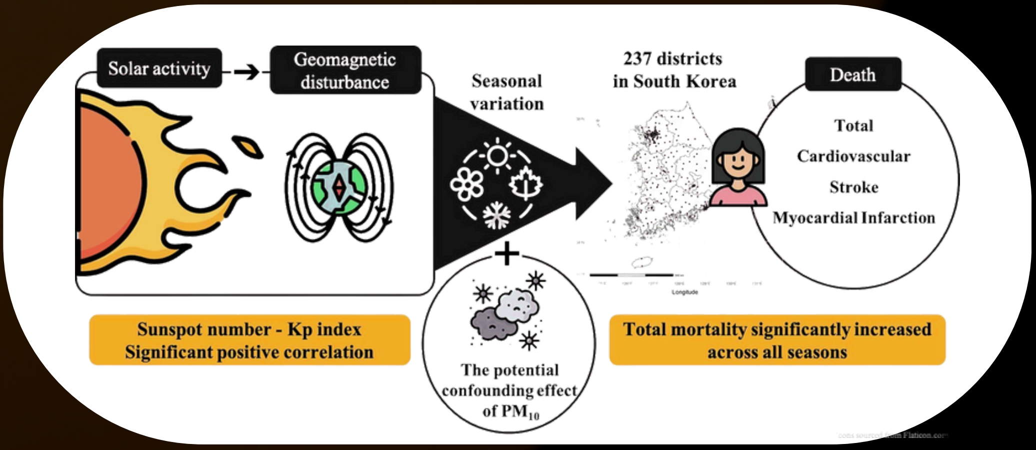
Two major studies, one from South Korea and the other across six cities in the Eastern Mediterranean and Middle East, show consistent links between geomagnetic storms and higher daily mortality. The effects appear strongest in spring and autumn, and they persist even after accounting for pollution and weather.

When solar wind and magnetic particles from the Sun interact with Earth's magnetosphere, they cause brief but intense magnetic fluctuations. These disturbances are strongest during spring and fall due to a seasonal alignment known as the Russell-McPherron effect.

As we know, scientists measure GMDs using the Kp index, which runs from 0 to 9. A higher number reflects more turbulence in Earth's magnetic shield. These changes are invisible to the eye but not to the body.

From 2001 to 2019, a nationwide study in South Korea examined over 4.3 million deaths across 237 districts. It found a clear link between geomagnetic disturbances, measured using the Kp index, and increased mortality. A one standard deviation increase in the Kp index was associated with a 0.33 percent rise in total mortality during the spring and a 0.32 percent rise during the autumn.

The study also found a noticeable increase in deaths from heart disease, stroke, and heart attacks. These associations remained even after adjusting for air pollution and temperature, suggesting that geomagnetic disturbances act as an independent short-term environmental risk factor. The strongest effects occurred not only on the day of a magnetic storm but also several days afterward, pointing to a delayed biological response.

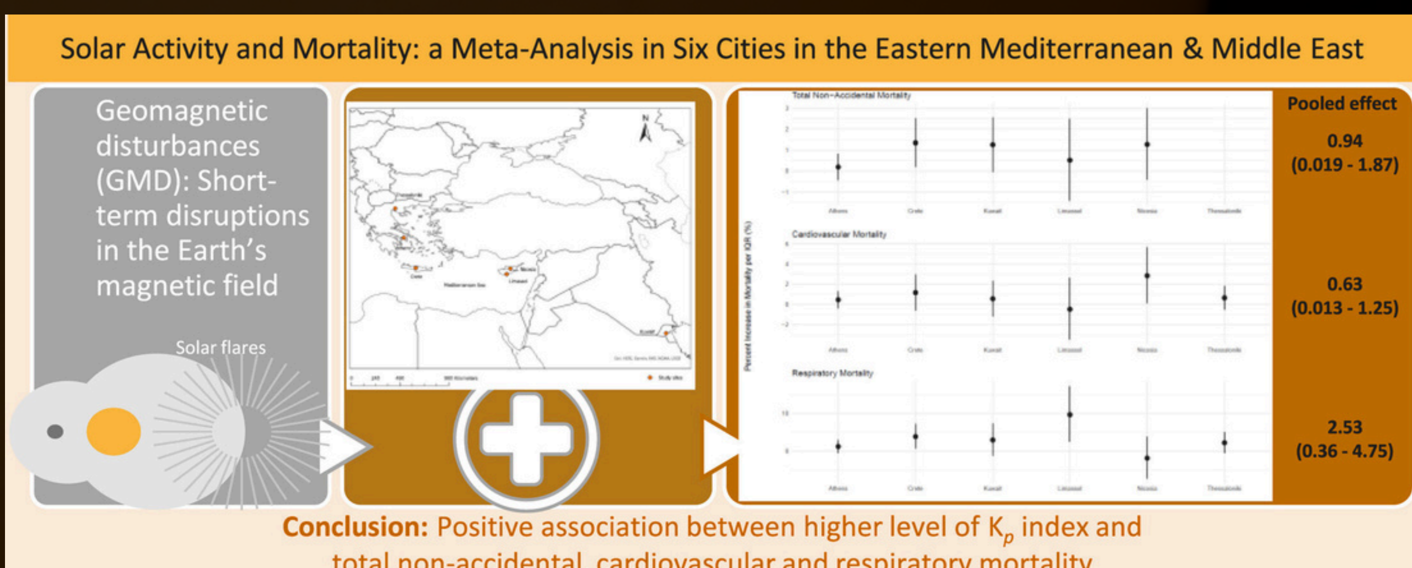


A second study conducted between 1997 and 2019 focused on cities in Greece, Cyprus, and Kuwait and analyzed more than 660,000 deaths. The results showed a 0.94 percent increase in daily all-cause mortality, a 0.63 percent increase in cardiovascular deaths, and a 2.53 percent increase in respiratory deaths on days with elevated geomagnetic activity. These effects were observed across varying climates and cultures, from humid Mediterranean cities to arid desert environments.

While the size of the effect differed between locations, the direction of impact was consistent. The Kp index was the only solar-related variable that showed a reliable association with mortality. Other indicators such as sunspot numbers and the interplanetary magnetic field did not demonstrate the same connection.

Researchers have proposed several mechanisms to explain how this happens. For one, heart rate variability may be disrupted, potentially triggering arrhythmias or even heart attacks in vulnerable individuals. Melatonin levels can drop, leading to increased inflammation and oxidative stress in the body. These storms can also throw off circadian rhythms, weakening immune function and making the respiratory system more susceptible to illness.

Notably, increases in blood pressure have been recorded during geomagnetic storms as well. When combined, these effects can push those with existing cardiovascular or respiratory conditions toward serious health events or even death. Interestingly, the risk appears highest during spring and fall.

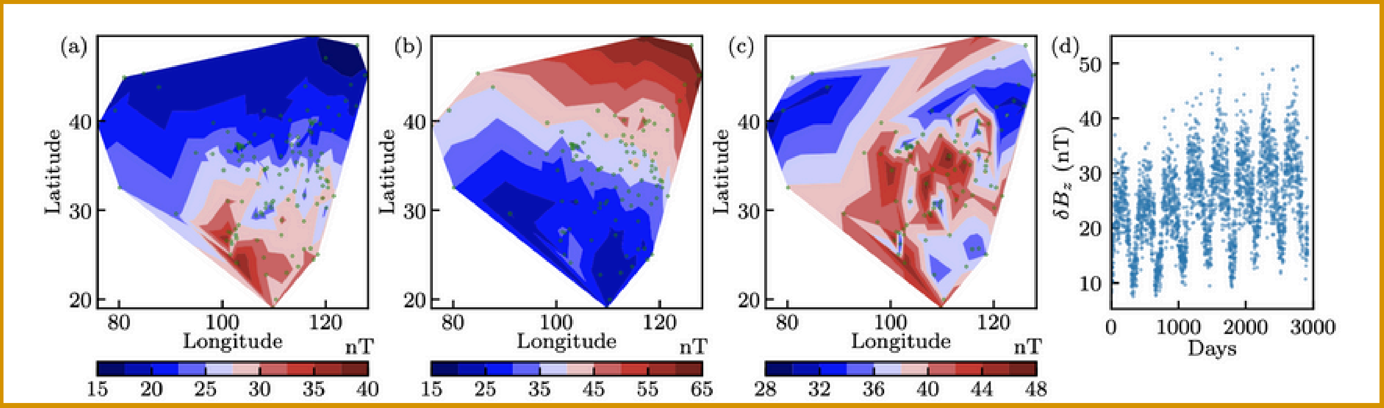


SOLAR FORCING OF EARTHQUAKES

ARTICLE REFERENCED:
TURBULENCE IN THE GEOMAGNETIC FIELD AT EARTH SURFACE
RESPONSE OF SEISMICITY OF NORTHERN CALIFORNIA GEOTHERMAL FIELDS TO SHARP VARIATIONS OF THE GEOMAGNETIC FIELD

A study by Zhao and colleagues (2025) analyzed data from nearly 100 magnetic observatories across China, tracking the vertical component of Earth's geomagnetic field (δBz) over an eight-year span. The researchers applied methods from turbulence theory, which is usually used to describe chaotic fluid motion, to Earth's near-surface magnetic fluctuations. They found turbulence-like signatures in both space and time, suggesting the geomagnetic field behaves as a medium capable of cascading energy across scales.

Most importantly, the team identified strong correlations between peaks in δBz and the timing of large earthquakes with magnitudes greater than or equal to 6.0. About 90 percent of major quakes coincided with peak fluctuations in δBz, implying that solar energy injected into the magnetosphere may cascade down through turbulence to Earth's surface, where it interacts with the crust. The researchers propose an "energy cascade" mechanism in which solar storms deliver large-scale energy, turbulence transfers it downward through smaller scales, and localized stress conditions in the lithosphere allow this energy to contribute to seismic triggering.



"Daily variation of vertical geomagnetic field δBz. (a) 8-year mean δBz contour over China. (b) δBz contour on 16 July 2012. (c) δBz contour on 5 April 2010. Green points indicate observatory locations. (d) Time series of daily δBz averaged across all stations (8-year period)."

While turbulence provides the framework, another study focuses on a more direct observational link. Researchers examined seismicity in three geothermal fields of Northern California (Long Valley, Coso, and The Geysers) during sharp geomagnetic field changes measured at the Fresno observatory between 1991 and 2024. These “geomagnetic pulses” were defined as rapid X-component shifts exceeding 50 nT per minute.

The results revealed a statistically significant increase in earthquakes within 2 to 10 days after such geomagnetic pulses. This effect was strongest in geothermal fields, regions where fluids, high heat flow, and fractured rock make the crust especially sensitive to external perturbations. A smaller but detectable increase in seismic activity was also observed across broader Northern California.

The delay suggests that geomagnetic disturbances may act as triggers, influencing pore-fluid pressures or electrokinetic processes in the crust, eventually leading to fault slips.

This work highlights that not all regions respond equally. Areas with high fluid content and active tectonics appear more vulnerable to solar-driven geomagnetic effects, offering insight into why some places show strong correlations between solar storms and earthquakes while others do not.

TAKEN TOGETHER, THE TWO STUDIES OUTLINE A CHAIN OF INFLUENCE:

SOLAR ACTIVITY

Flares and coronal mass ejections inject vast amounts of energy into Earth’s magnetosphere.

GEOMAGNETIC DISTURBANCES

This energy manifests as turbulence and sharp geomagnetic variations at Earth’s surface.

ENERGY TRANSFER

Turbulence cascades the energy across scales, amplifying fluctuations in the vertical geomagnetic field (δB_z).

CRUSTAL RESPONSE

In regions under stress, especially fluid-rich geothermal fields, these disturbances can alter pore pressure or induce electrokinetic currents, tipping faults toward rupture.

PRE-EARTHQUAKE SIGNALS

ARTICLE REFERENCED:
HTTPS://EGUSPHERE.COPERNICUS.ORG/PREPRINTS/2025/EGUSPHERE-2025-3192/
HTTPS://WWW.SCIENCEDIRECT.COM/SCIENCE/ARTICLE/ABS/PII/S0273117725009019

A study on A Theory of Earthquake Prediction approaches the problem from the mechanics of rock failure. But, by applying Voight's equation, originally used for material failure, the researchers show how earthquake timing, magnitude, and even location can theoretically be inferred. Beyond strain, the study highlights that anomalous geoelectric and geochemical signals also emerge before earthquakes. Interestingly, their analysis shows that geoelectric anomalies often share the same precursor time as strain, while geochemical changes appear closer to the event.

This layered approach suggests a cascade of signals—mechanical, electrical, and chemical; all tied to the countdown of a fault preparing to rupture.

While ground-based observations for earthquake signals give a local view, satellites now provide a global lens. A recent study using the European Space Agency's Swarm-B satellite examined over three years of electron density data to detect seismo-ionospheric perturbations.

Out of nearly 200,000 detected plasma disturbances, more than 54,000 were statistically linked with earthquakes of magnitude 5.0 and above.

The results point to a consistent temporal pattern: anomalies cluster most strongly about five days before large earthquakes. Spatially, they rarely sit directly above the epicenter. Instead, they tend to shift hundreds of kilometers away, with the displacement depending on latitude.

For higher-latitude earthquakes, disturbances cluster within 600 km of the epicenter, while for lower-latitude events they can appear nearly 900 km away.

THIS BEHAVIOR SUPPORTS THE CONCEPT OF LITHOSPHERE–ATMOSPHERE–IONOSPHERE (LAI) COUPLING. STRESS AND STRAIN DEEP IN THE CRUST MAY GENERATE CURRENTS OR ACOUSTIC–GRAVITY WAVES THAT TRAVEL UPWARD, WHERE THEY DISTORT THE IONOSPHERE ALONG MAGNETIC FIELD LINES.

SOLAR FORCING OF CLIMATE & WEATHER

ARTICLE REFERENCED:
HTTPS://LINK.SPRINGER.COM/ARTICLE/10.1007/S11430-024-1626-Y
HTTPS://LINK.SPRINGER.COM/ARTICLE/10.1007/S11207-025-02521-0
HTTPS://LINK.SPRINGER.COM/ARTICLE/10.1007/S11430-025-1644-0

The Sun is more than our distant star that lights our days. Its subtle rhythms, measured in cycles ranging from years to centuries, leave signatures on Earth's climate, ecosystems, and even the chemistry of the air and water. Three recent research efforts bring this picture into sharper focus: high-resolution peatland records in China, a solar dynamo synchronization model linking planetary motion to solar cycles, and isotope-enabled climate simulations of the East Asian monsoon.

Together, they reveal how solar variability resonates through Earth's climate system, altering weather patterns, monsoon strength, and the capacity of natural landscapes to lock away carbon.

Peatlands in northeastern China and on the eastern Tibetan Plateau preserve one of the longest and most sensitive climate records in the world. A new decadal-resolution study of ash-free bulk density (AFBD) in peat layers uncovered repeating cycles at 1000, 710, 500, 350, 210, and 130 years.

These intervals align with well-known solar cycles such as the Suess-de Vries at 210 years and the Gleissberg at 130 years.

The study found that peat density and carbon storage moved in anti-phase with total solar irradiance. When solar activity increased, peat bulk density decreased, suggesting that solar-driven climate changes affected local hydrology and vegetation in ways that reduced carbon burial.

THE CONNECTION WAS FURTHER REINFORCED BY STRONG CORRELATIONS WITH THE ASIAN SUMMER MONSOON (ASM). SOLAR VARIATIONS APPEARED TO MODULATE MONSOON INTENSITY, WHICH IN TURN SHAPED PEATLAND GROWTH.

WHERE DO THESE SOLAR CYCLES COME FROM?

A second study explored the Sun's internal dynamo through a synchronization model that links planetary tidal forces to solar magnetic oscillations. Venus, Earth, and Jupiter, through their combined gravitational pulls, are thought to excite magneto-Rossby waves in the solar tachocline. The interplay of these waves gives rise to resonant cycles including the familiar 11-year Schwabe cycle, as well as longer cycles like the Suess-de Vries at 210 years and Gleissberg at 90 to 130 years.

What makes this work compelling is its connection to Earth systems. The model explains quasi-biennial oscillations of about 1.7 to 2 years observed in both solar activity and atmospheric circulation, and even ties in biological data such as 5.5-year phase jumps in North Atlantic algae growth. These correspondences suggest that solar activity is not random but part of a synchronized planetary rhythm with cascading effects on Earth's oceans and climate.

While the peatlands provide century-scale perspective, a third study focused on decadal changes in the East Asian monsoon. Using isotope-enabled climate modeling (iCESM-LME) and proxy comparisons, researchers identified a robust 11-year solar cycle embedded in precipitation oxygen isotopes (δ18Op). Unlike raw rainfall data, which often shows patchy wet, dry patterns, δ18Op captured a coherent regional response across the monsoon domain.

The mechanism traced back to solar forcing. Higher solar irradiance triggered a La Niña-like cooling of the equatorial Pacific, which strengthened the Walker Circulation. This shifted moisture sources toward the equatorial Pacific, leaving a distinct isotopic fingerprint across the monsoon region. The result demonstrates how even small variations in solar energy can reorganize ocean-atmosphere interactions on decadal scales, shaping rainfall patterns that sustain billions of people.

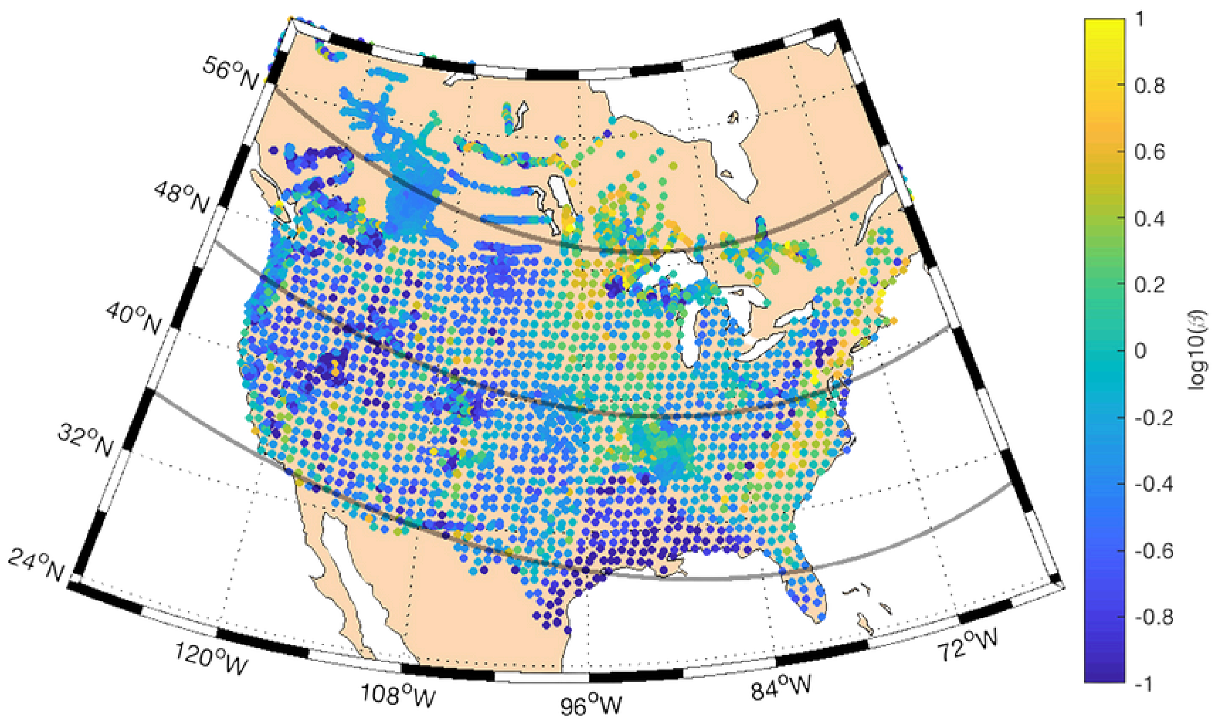
STRONGER MONSOONS AND WETTER PEATLANDS DURING SOLAR MINIMA MAY ENHANCE CARBON STORAGE, CREATING FEEDBACKS THAT MODULATE ATMOSPHERIC CO_2. SOLAR MAXIMA CAN SHIFT RAINFALL PATTERNS AND WEAKEN NATURAL CARBON SINKS.

APPALACHIAN AND MID-WEST SOLAR RISK

BY: BEN DAVIDSON

ARTICLE REFERENCED:
A NOVEL APPROACH FOR GEOELECTRIC FIELD RESPONSE SCALING FACTORS USED IN GEOMAGNETIC STORM HAZARD ASSESSMENTS

For the last several years, every time there has been a significant solar storm we have analyzed the geo-electric action induced by the storm. Many observers notice the same thing, there appears to be heightened activity along the Appalachian mountains and in the upper midwest - they are always showing higher level of disruption. new study has not only confirmed this phenomenon, but leans towards the hypotheses most-offered for that effect. Local geology and infrastructure is the factor at play here. This was not wholly unexpected after magnetotelluric surveys found these areas to be vulnerable by nature, and their high density infrastructure makes them an easy target for electrodynamic activity. What this means is that in the likely scenario that a large solar storm is able to take out power regionally, these areas of the upper midwest and Appalachia are the most likely to lose power first in the continental United States.

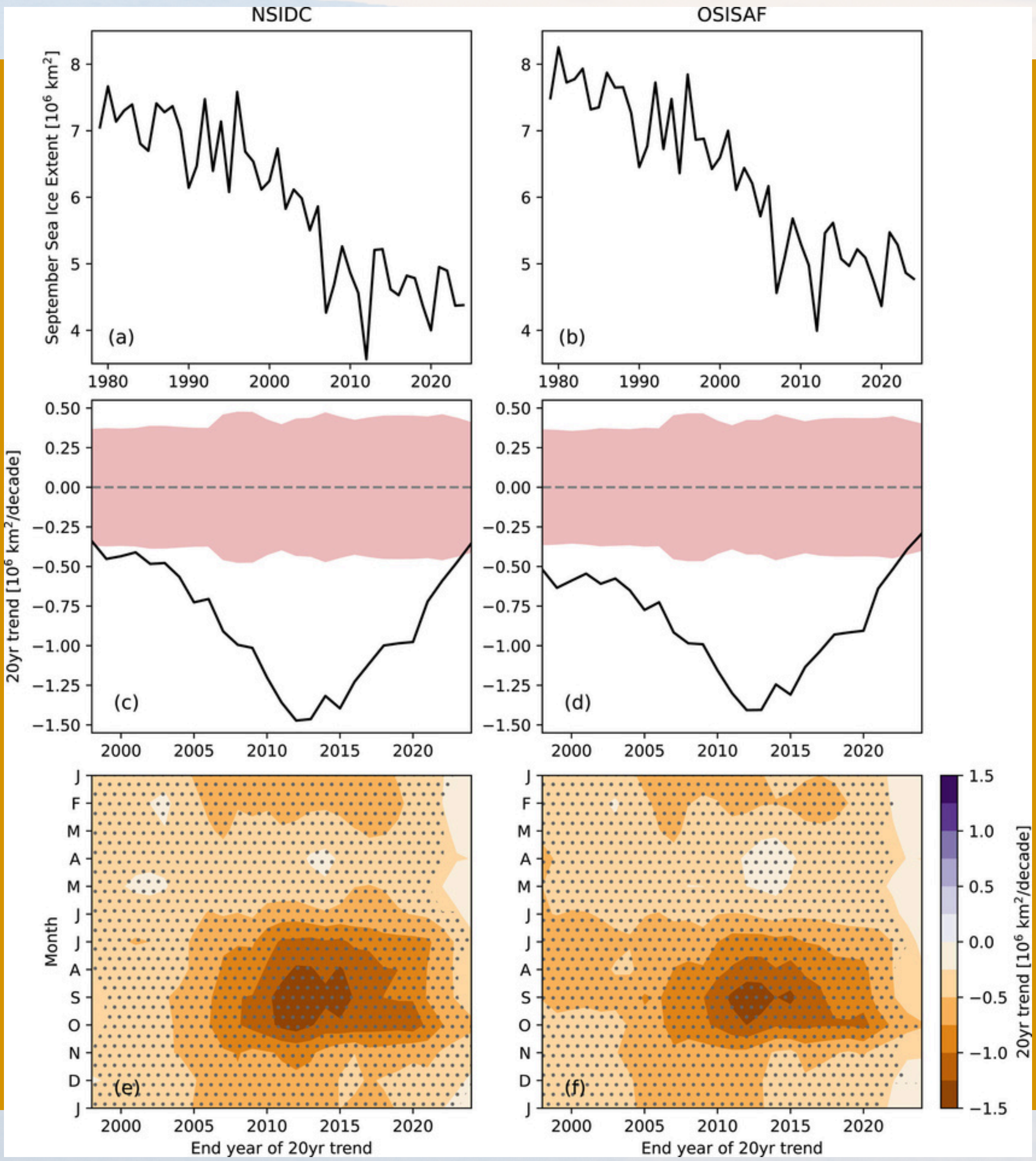


"Beta scaling factors (see Appendix A) computed using the latest 3D magnetotelluric (MT) transfer functions available via the IRIS database. Ottawa Geophysical Observatory observations for the storm of 12–14 March, 1989 are used for the geomagnetic field time series. Color-coding indicates the beta value at individual MT survey locations. The three gray lines indicate contours of 60, 50, and 40° of geomagnetic latitude, respectively. Alpha scaling factor falls from 1 to 0.1 across the band of 60–40° of geomagnetic latitude."

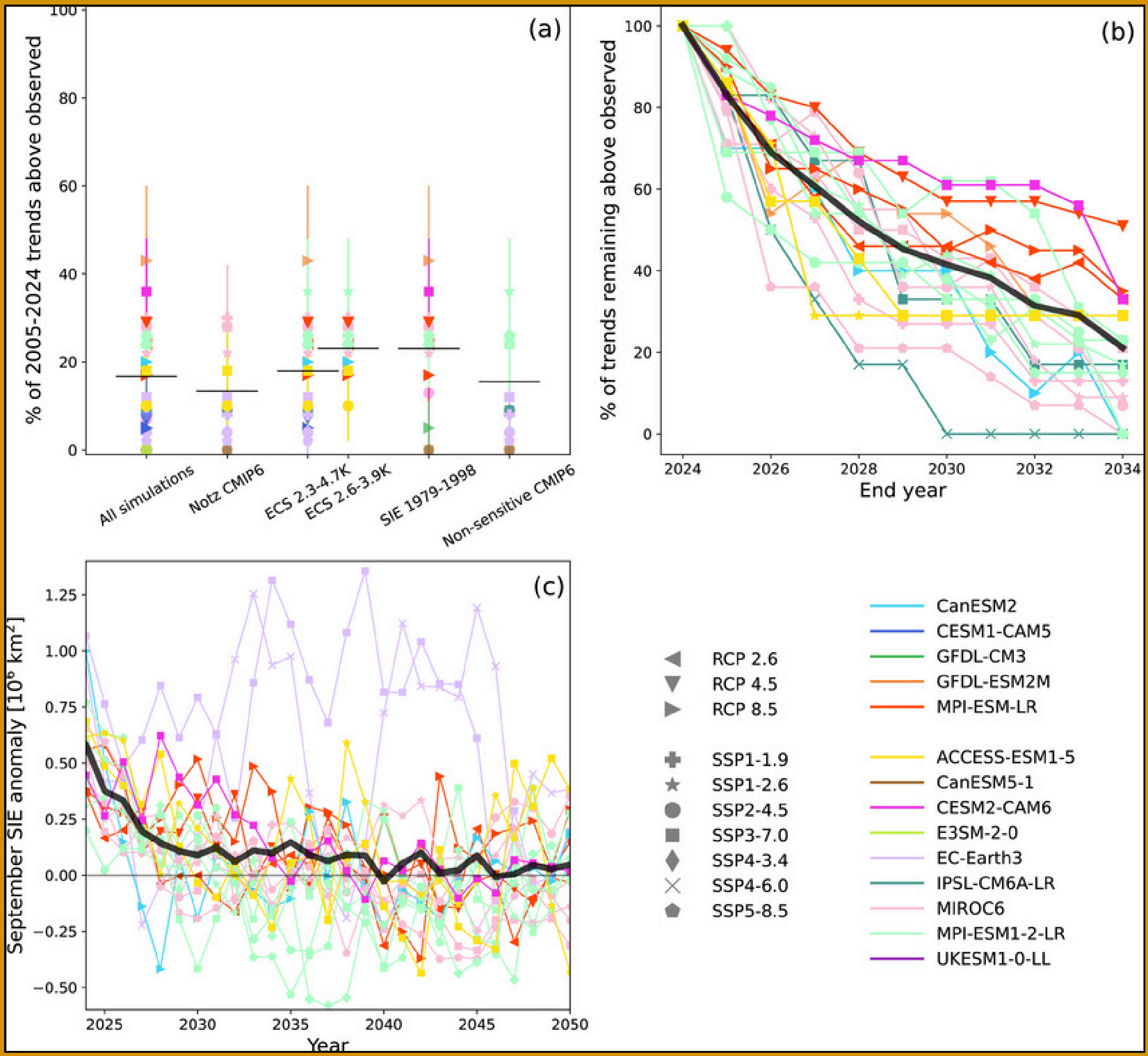
ARCTIC ICE LOSS IS SLOWING

ARTICLE REFERENCED:
MINIMAL ARCTIC SEA ICE LOSS IN THE LAST 20 YEARS, CONSISTENT WITH INTERNAL CLIMATE VARIABILITY

Data from multiple observational records show that since 2005, September sea ice area has not declined significantly. The trend is near flat, and much weaker than the sharp losses seen in the late 20th and early 21st centuries. Importantly, this slowdown is not limited to summer. When scientists examine each month of the year, the same pattern appears: Arctic sea ice extent has been holding steady across the seasonal cycle.



"Observed September sea ice extent] 1979–2024, (c, d) 20 year-trends of September sea ice extent /decade] with varying end year from 1998 to 2024, in which the red shaded envelope shows the bounds inside which a linear trend is not statistically significant according to a t-test at 95% confidence and (e, f) the 20 year-trends of sea ice extent with varying end years but for each month of the year, with stippling showing statistically significant declines at a 95% confidence level. The left column (a, c, e) shows the NSIDC sea index (Fetterer et al., 2017) and the right column (b, d, f) shows the OSISAF sea ice index"



"The percentage of ensemble members [%] for each ensemble that have 2005–2024 September sea ice extent trends more positive than the observed value. The uncertainty estimate is calculated by Monte Carlo simulation with replacement. Each symbol represents a different forcing scenario."

Why would this slowdown occur? As we known, large-scale modeling projects such as CMIP5 and CMIP6 provide an answer. In these simulations, extended pauses in sea ice decline appear regularly. They occur when long-term background trends combine with natural fluctuations in the ocean and atmosphere. In some model runs, these fluctuations even cancel out the loss signal for decades at a time, producing periods of stability or even slight recovery.

By studying the ensemble members of models that reproduce a pause similar to the one now observed, scientists find that such slowdowns can persist another five to 10 years.

The leading explanation for the current slowdown lies in natural variability. Long-term oscillations in the Atlantic and Pacific Oceans strongly influence sea ice conditions. Changes in atmospheric circulation, ocean heat transport, and ice-thickness feedbacks can amplify or dampen ice loss depending on the phase of these cycles.

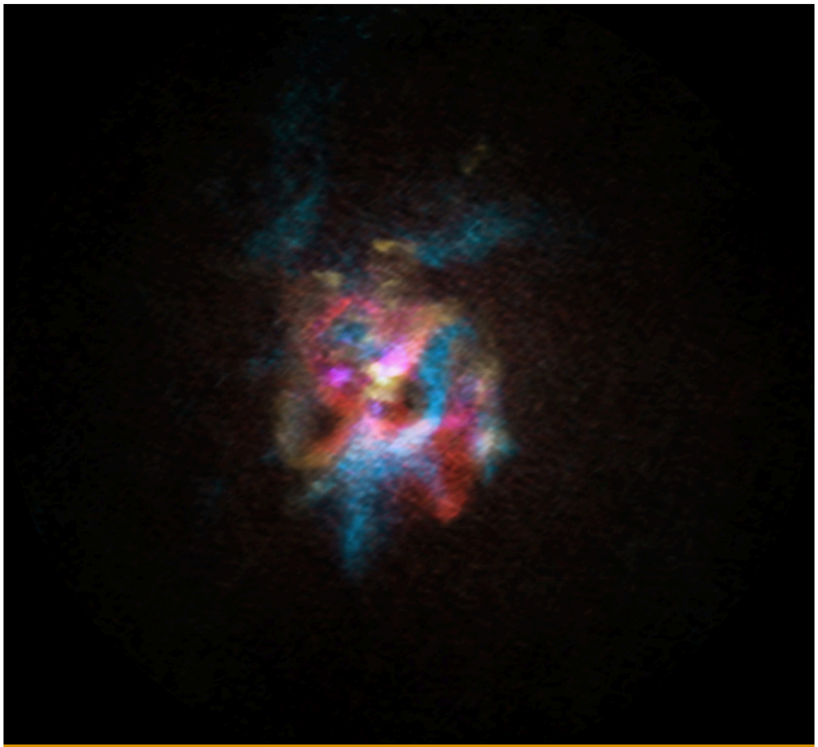
A GIANT STAR DUST-PRODUCTION MICRONOVA

BY: BEN DAVIDSON

ARTICLE REFERENCED:
A UNIQUE SUPERGIANT STAR

A recent story about a star shedding its outer layers is once-again hitting the eye of the observers VERY differently than it hits mainstream astronomers. DFK52 is a supermassive star that they say just shed its outer layers in preparation for an end of life supernova event... at least that's the official story. We believe this is entirely inaccurate.

THis star is very similar to Beteguese, which had a similar dust-production dimming/shedding event not long ago, and which they also speculated was a precursor to a supernova event (which didn't happen). It is highly unlikely we will witness either of these stars supernova anytime soon, and DFK52 is most-likely going to do what Betelguese has done... rebrighten and shine like normal.



"Credit: ALMA(ESO/NAOJ/NRAO)/M. Siebert et al."

SO WHAT HAPPENED HERE?

The same thing that happened on Betelguese - a dust-product micronova event. The primary reason these events are not being referred to in this way is because it destroys the mainstream narrative that only white dwarf stars can micronova - a curiously powerful delusion given the fact that as of early April 2022 they didnt even believe micronovae were real. The truth is that any star can micronova if the conditions are correct, including the sun, and the conditions are becoming more and more favorable due to the galactic current sheet.

ANOTHER NEW TYPE OF NOVA

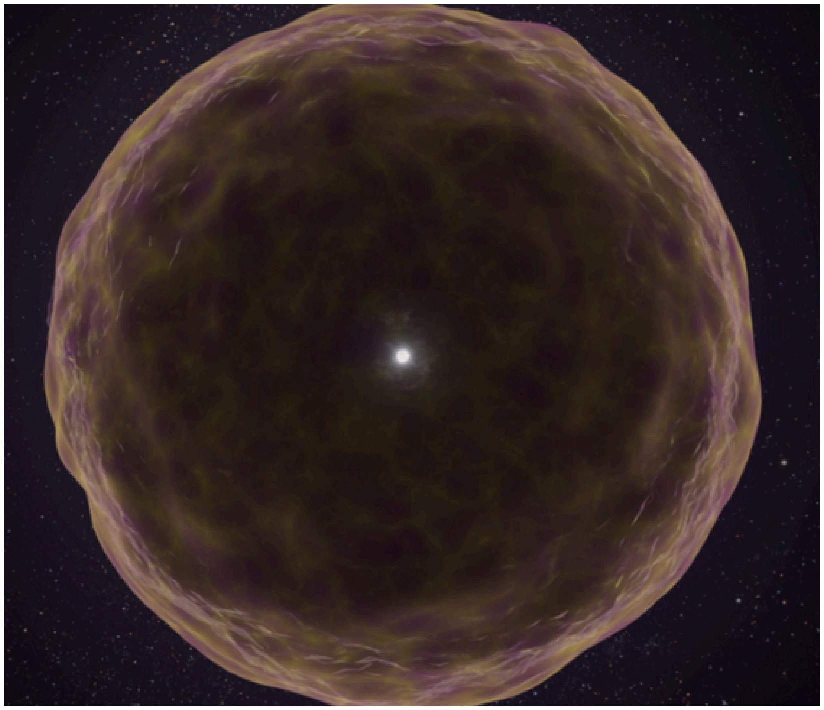
BY: BEN DAVIDSON

ARTICLE REFERENCED:
FIRST-OF-ITS-KIND 'BARE-BONES' SUPERNOVA UPENDS STAR EVOLUTION MODELS

Astronomers discovered SN 2021yfj in September 2021 using a wide-field camera called the Zwicky Transient Facility on Palomar Mountain in California. This supernova, which happened 2.2 billion light-years away in a region where new stars form, stood out because it was incredibly bright. Unlike most supernovae, which show signs of lighter elements like hydrogen and helium, this one had strong signals from heavier elements such as silicon, sulfur, and argon, suggesting the star had lost all its outer layers before exploding.

This "bare-bones" supernova is a brand-new type that challenges what we know about how massive stars die. Stars this big, about 10 to 100 times the sun's mass, have layers like an onion: lighter stuff on the outside from nuclear fusion, getting heavier toward the core. SN 2021yfj shows the star stripped down to its inner layers, likely due to wild instabilities or bursts of energy that blew away the outer parts. This could happen from strong winds, a companion star's pull, or the star basically tearing itself apart. The discovery, published in the journal Nature, means our models of star evolution might be missing some extreme ways stars can end their lives. It gives a rare peek inside a dying star and highlights the need to study more unusual explosions to understand the universe better.

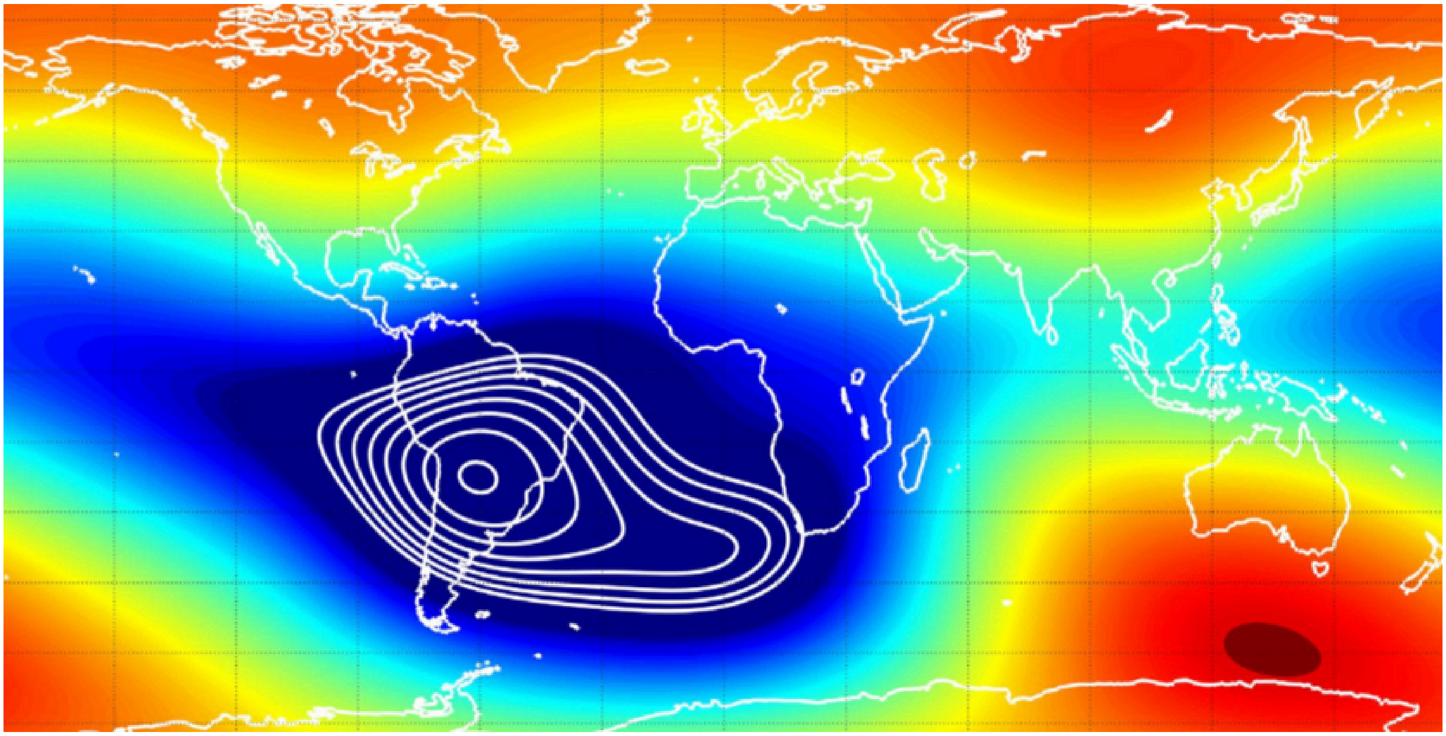
IN SHORT - THEY STILL DON'T KNOW NOVA. THEY ARE STILL FINDING NEW THINGS EVERY TIME THEY LOOK, AND THIS FURTHER SUPPORTS THE CONCEPTS THAT MANY THINGS SAID BY MAINSTREAM ASTRONOMERS ABOUT STELLAR NOVAE ARE SIMPLY WRONG.



SOUTH ATLANTIC ANOMALY ON THE MOVE

BY: BEN DAVIDSON

ARTICLE REFERENCED:
WORLD MAGNETIC MODEL FOR 2025-2030



The South Atlantic Anomaly is the primary weak point in earth's magnetic field. For years it was centered in the southern hemisphere waters off the coast of South America - but it's on the move, and maybe it needs a new name now.

The most recent tracking of the South Atlantic Anomaly shows it is not centered on the continent and is heading northwest deeper into the continent. This is the expected track based on the observers' version of the magnetic pole shift and cause of the anomaly. The weak spot has also deepened, becoming even weaker by the year, which is also a major expectation of the observers' model where the field continues weakening throughout this magnetic pole shift.

It has reached a level where galactic cosmic ray penetration over South America is now significantly higher than anywhere else in the world - even while the solar cosmic ray protons still prefer the polar cusp. The technological, biological and climatological impact of this cosmic ray excess is not yet dangerous, but we can confidently say that it will become dangerous, and will do so here in South America before anywhere else.

MAGNETIC POLE SHIFTS AND EXTINCTIONS

BY: BEN DAVIDSON

ARTICLE REFERENCED:
LIFE ORIGIN AND EVOLUTION MAY BE INFLUENCED BY THE DYNAMICAL COUPLING BETWEEN EARTH'S MAGNETIC FIELD STRENGTH AND ATMOSPHERIC OXYGEN LEVEL

25 IN A ROW.

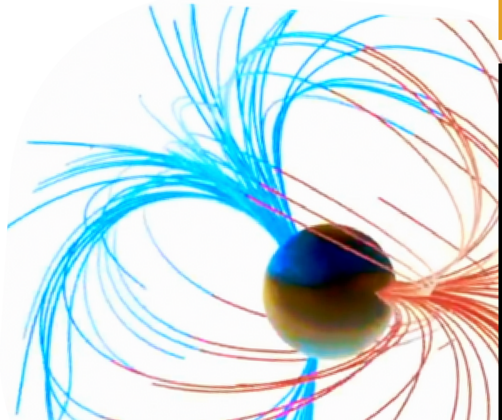
We are not at 25 major studies in a row, which are looking at the biosphere impact of a magnetic pole shift, and concluding that these are major driving forces behind death, extinctions, and the appearance of new species via both radiation mutation and stress-induced adaptive evolution (stress awakens dormant DNA).

Like another recent study, this new one suggests a critical relationship between atmospheric oxygen levels and the magnetic field strength.

THIS DRAMATIC CHEMICAL FORCING COMBINES WITH OZONE DESTRUCTION, CLIMATOLOGICAL IMPACT AND DIRECT RADIATION EXPOSURE TO RENDER THESE MAGNETIC POLE SHIFTS AS SIGNIFICANT LIFE STRESSORS ON OUR PLANET.

While we are still early-enough in the current magnetic pole shift that these more-major types of earth-changes have not yet manifested themselves, they are coming.

THE END-TIMELINE FOR THIS SHIFT REMAINS THE 2040S, BUT THE MORE SIGNIFICANT IMPACT ARE EXPECT TO BEGIN AT LEAST A DECADE EARLIER, WHICH MEANS THAT BY 2030 WE SHOULD CONSIDER OURSELVES "IN THE RED ZONE".



DOCUMENTARY PREMIERE

THE DISASTER CYCLE

NOVEMBER 15 | 6:30 PM
DOORS OPEN 5:30

5:30pm: Doors Open + Light Fare & Seating
6:30pm: Documentary Premiere (prompt start) + Q&A with Ben

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