

SOLAR WEATHER

4 JUN 2024

Lewis Thompson
W5IFQ



© Owen J. Murray

Alaska

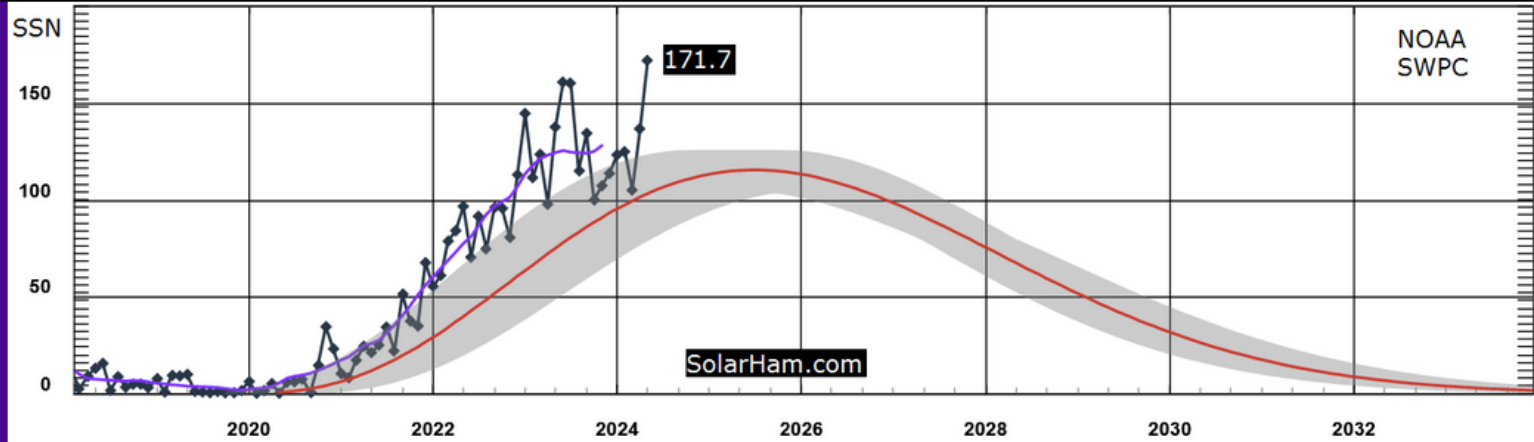
Taken by Owen Murray on May 10,
2024 @ Redmond, Washington

Solar Cycle 25 Progression

(Updated June 2, 2024)

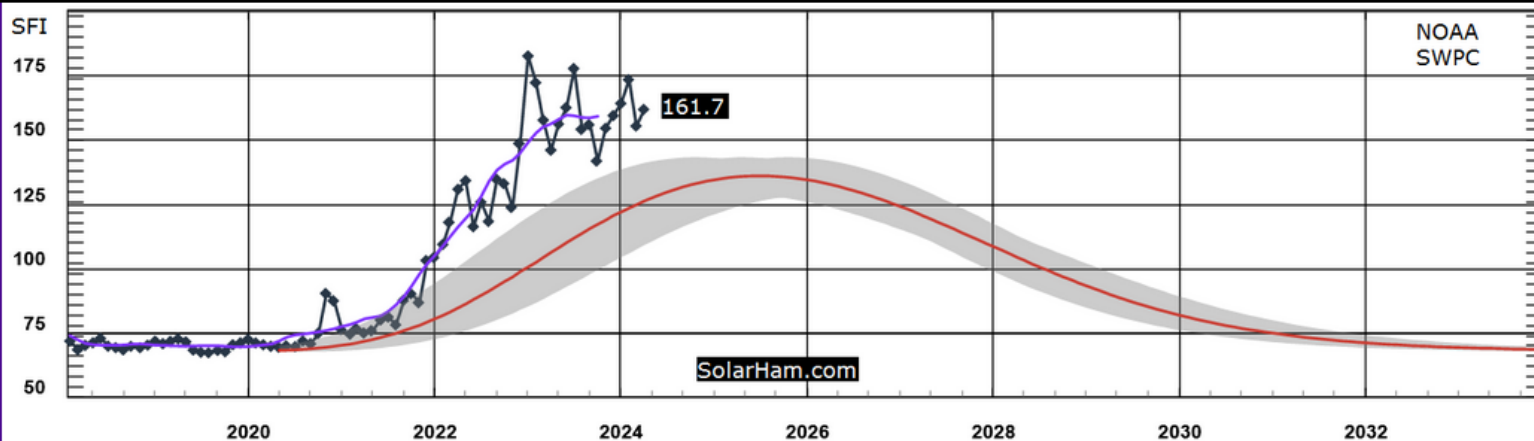
Sunspot Number Progression (May 2024)

Predicted SSN: 103.1 **Actual: 171.7** **Latest Smoothed Predicted SSN (11/2023): 90.6** **Actual: 127.8**



10.7cm Solar Flux Progression (April 2024)

Predicted SFI: 126.1 **Actual: 161.7** **Latest Smoothed Predicted SFI (10/2023): 117.0** **Actual: 159.0**



Present Conditions and Forecast



Solar Indices (June 4 @ 21:05 UTC)

SFI	SSN	AREA
192	208	880
▲ 6	▲ 22	▼ 250

WWV | Flux Data | Last 30 Days

Cycle 25 Progression

Solar Flare Detection

Data provided by NOAA/SWPC GOES-16 X-Ray Flux Click to expand data

Solar Flare Class: X, M, C, B, A

Radio Blackout Level: R5, R3, R1, R0

Current: C2.1

Solar Demon

Solar SOFT

Global D-LAYER Absorption

Current Solar Flare Threat

C-Flare: 99%	M-Flare: 60%
X-Flare: 25%	Proton: 20%

Probability Details

Flare Events (M2+) Past 48 Hours | Event Report | Top Solar Flares

M3.2	M2.8	M4.8	M2.4
3697	3697	3695	3697

3 Day Geomagnetic Forecast

June 4	June 5	June 6
4-5 (G1)	3-4 (G0)	2 (G0)
<i>Max Kp</i>		
M-Lat 25%	M-Lat 10%	M-Lat 01%
H-Lat 60%	H-Lat 45%	H-Lat 20%
<i>Probabilities</i>		

Latest SWPC Forecast (@ 00:30 + 12:30 UTC)

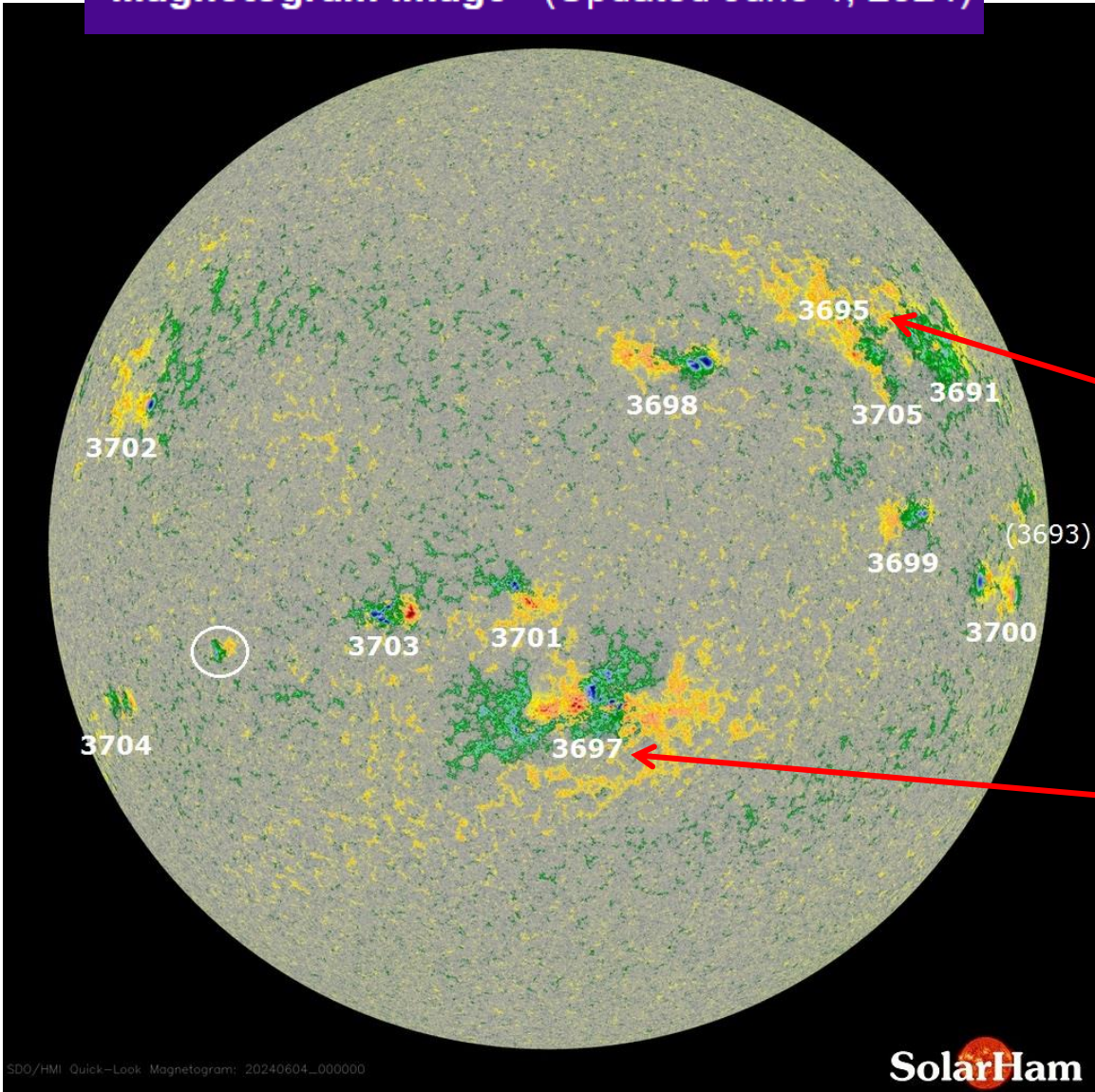
Detailed Forecast

Visible Sunspot Regions | Sunspot Summary | SRS (txt)

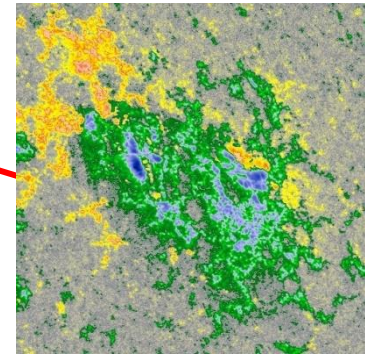
3691	3695	3697	3698	3699	3700	3701	3702	3703	3704
B	B	BGD	B	B	B	B	A	B	B
3705	3706								
B	B								

Solar Flare Activity

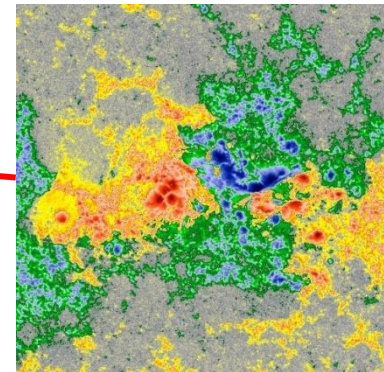
Magnetogram Image (Updated June 4, 2024)



Uses Zeeman effect to measure polarity of magnetic fields

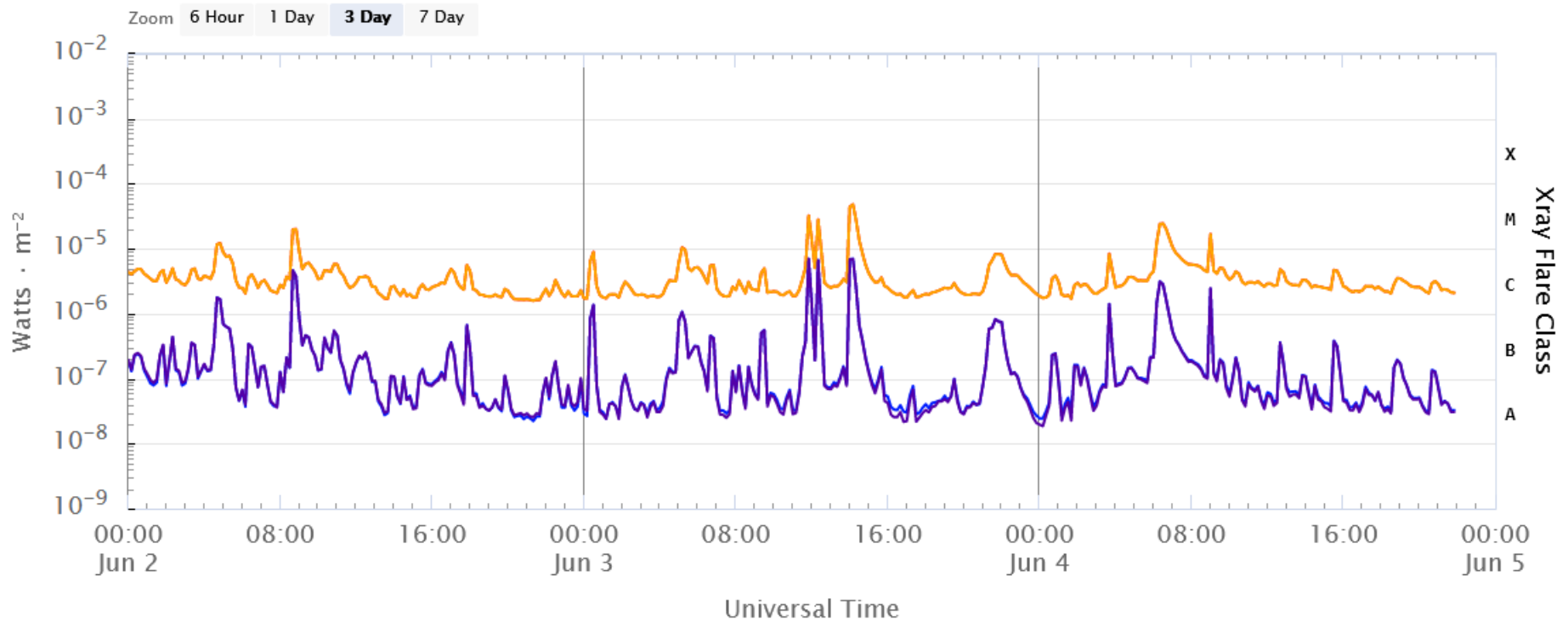


Beta

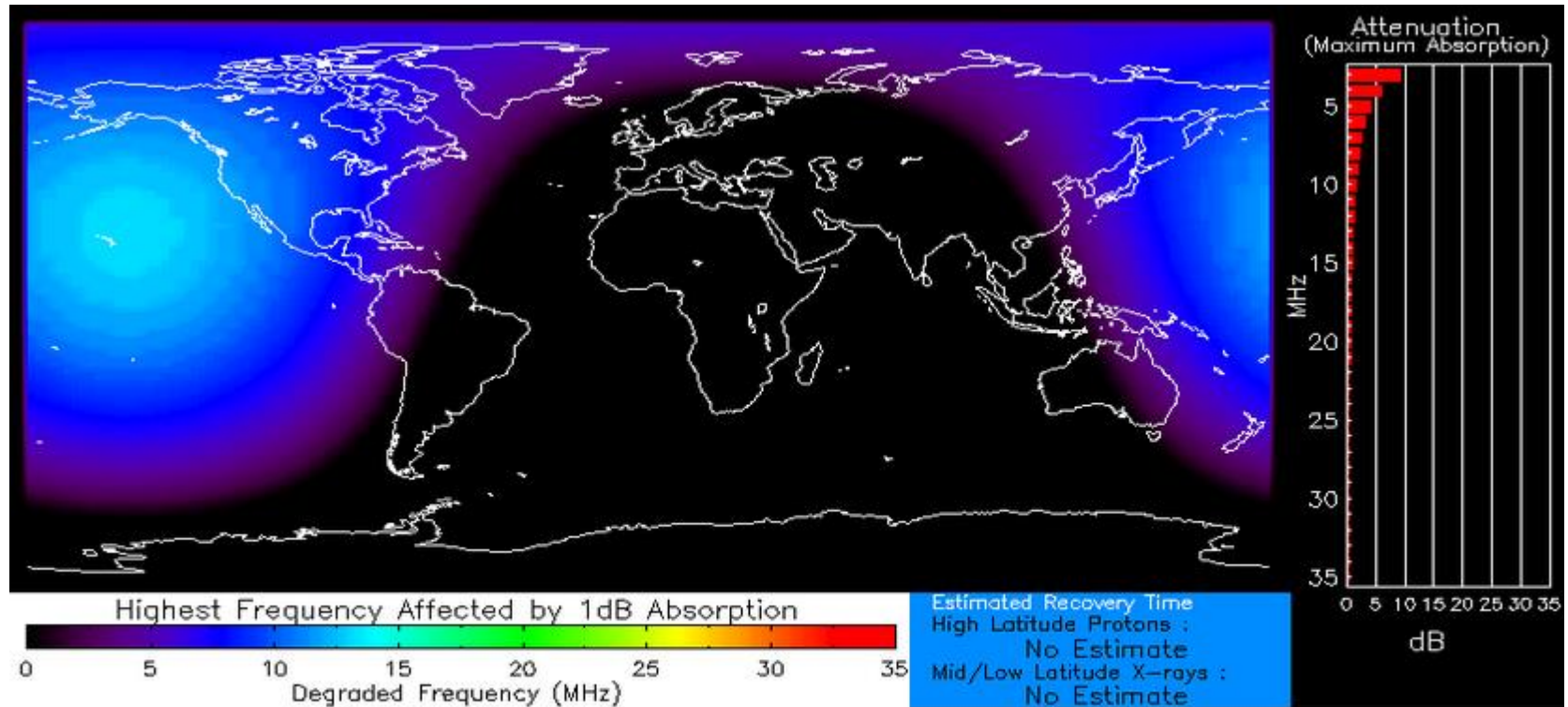


Beta-Gamma Delta

Solar X-Ray Flux: 2 - 4 JUN 2024



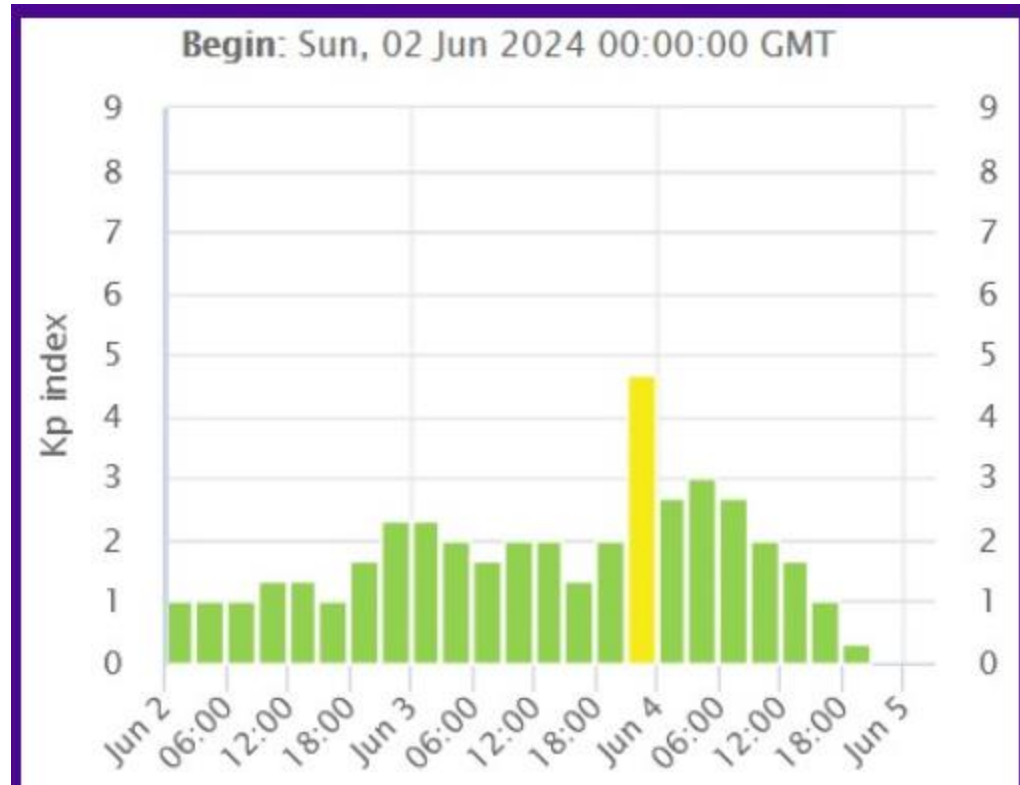
NOAA – D-Region Absorption Predictions



Elevated X-ray flux
Product Valid At : 2024-06-04 21:58 UTC

Normal Proton Background
NOAA/SWPC Boulder, CO USA

Earth's Geomagnetic Activity



Geomagnetic Conditions: 4 JUN 2024

Solar wind:

$B_z = 2 \text{ nT}$

speed = 437 km/sec

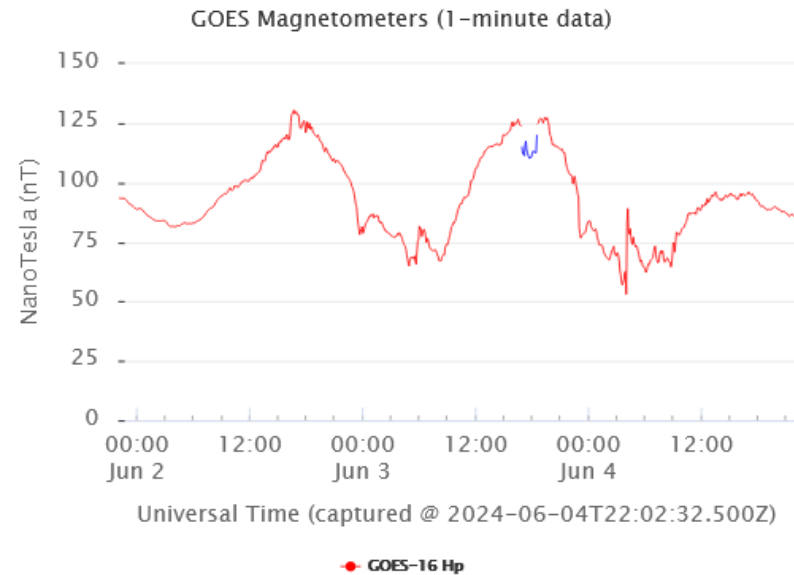
density = 1.31 protons/cm³

(From – NOAA DSCOVR
In L1, Lagrange Point)

$Dst = -16 \text{ nT}$ (Ring Field)

(From – Data Analysis Center
For Geomagnetism and Space
Magnetism – Kyoto University)

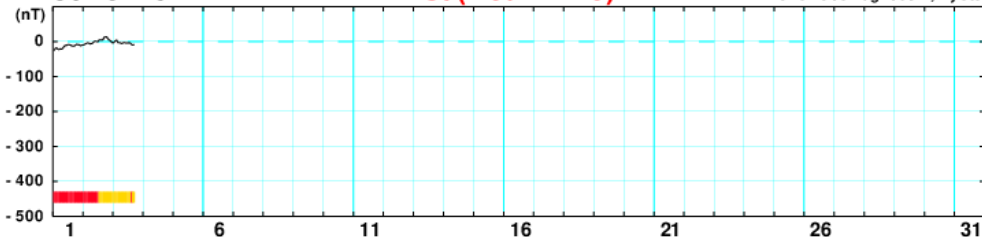
GOES HP



June 2024

Dst (Real-Time)

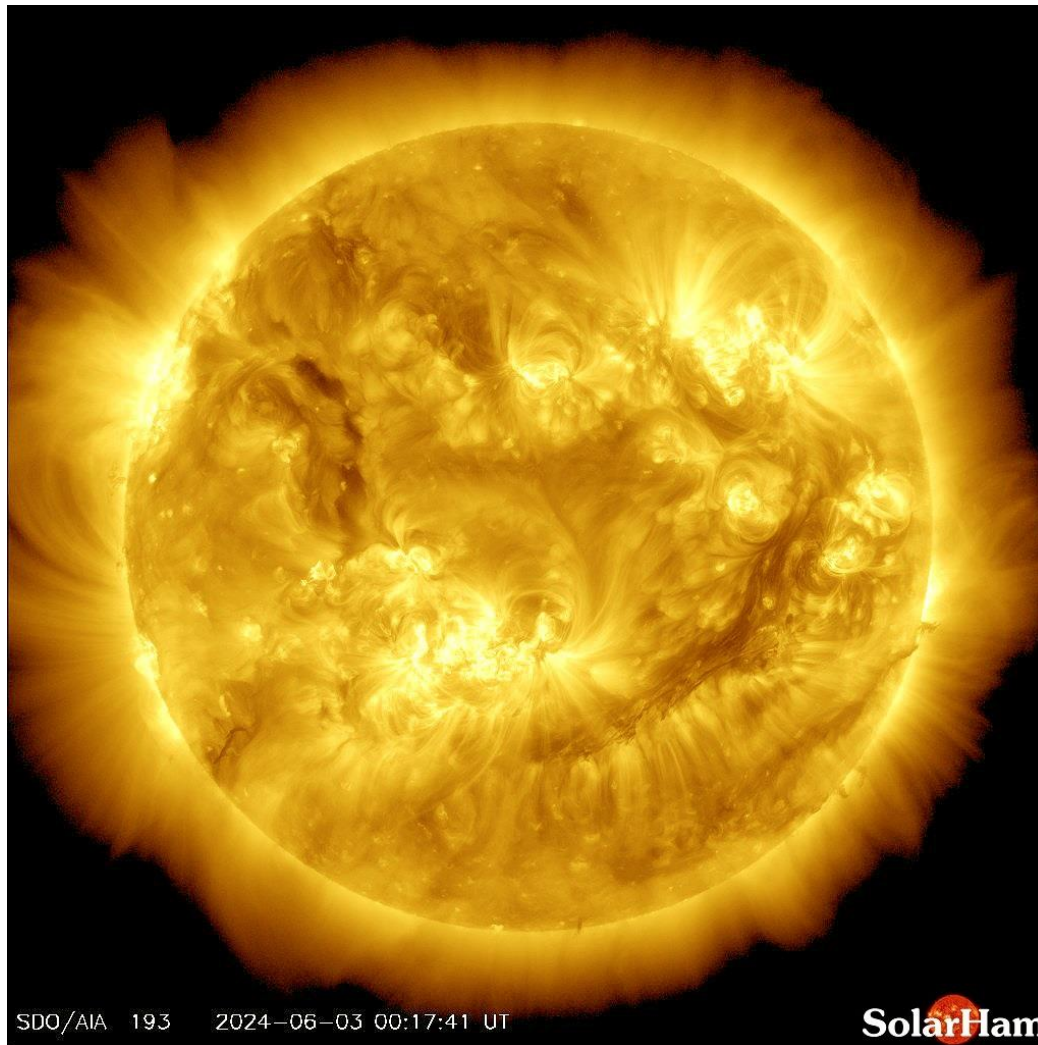
WDC for Geomagnetism, Kyoto



[Created at 2024-06-03 16:30UT]

From – GOES 16
In geostationary orbit

Coronal Holes – 4 JUN 2024



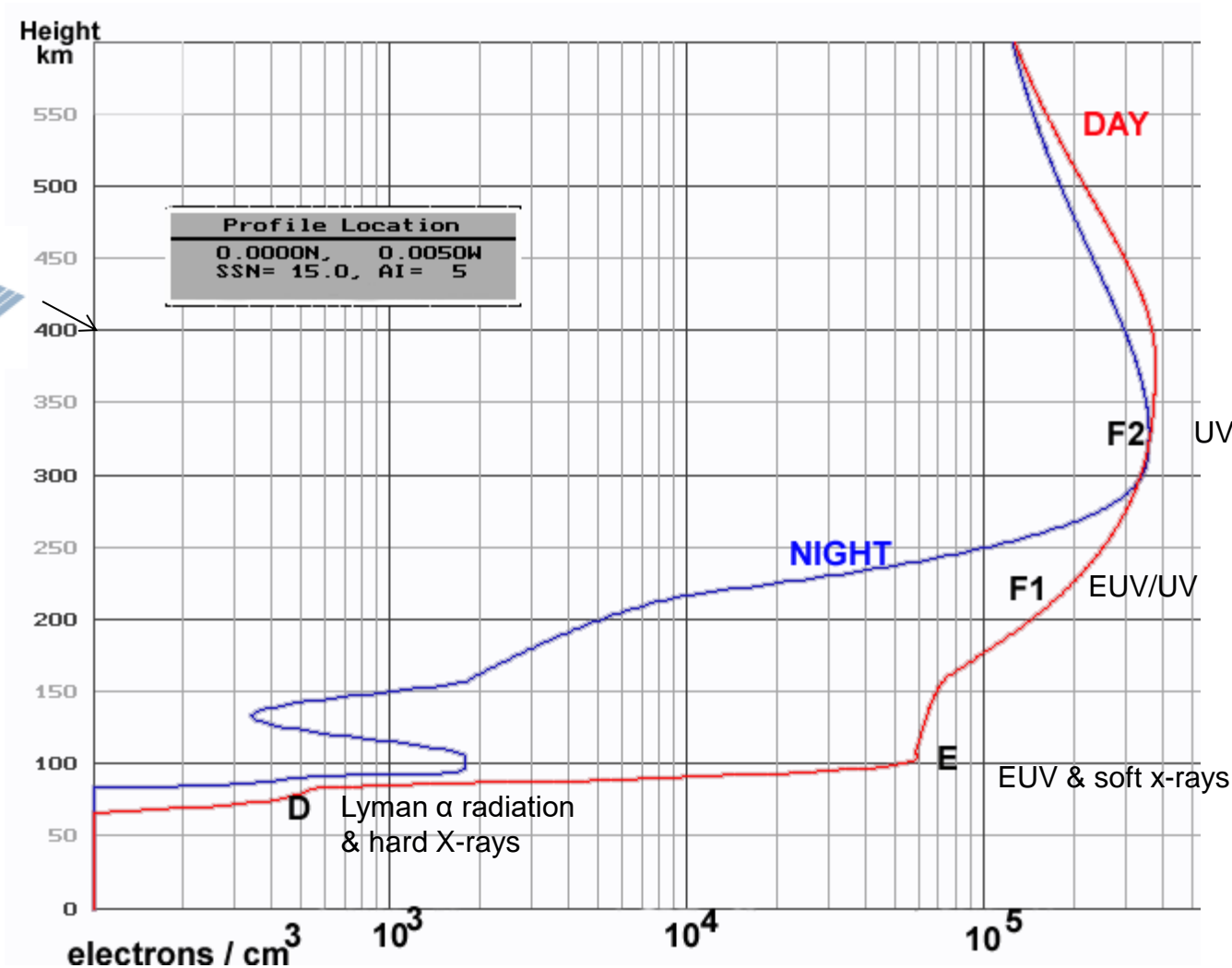
Analysis

There are currently no large coronal holes facing Earth.

Ionospheric Conditions



Gravity
↓



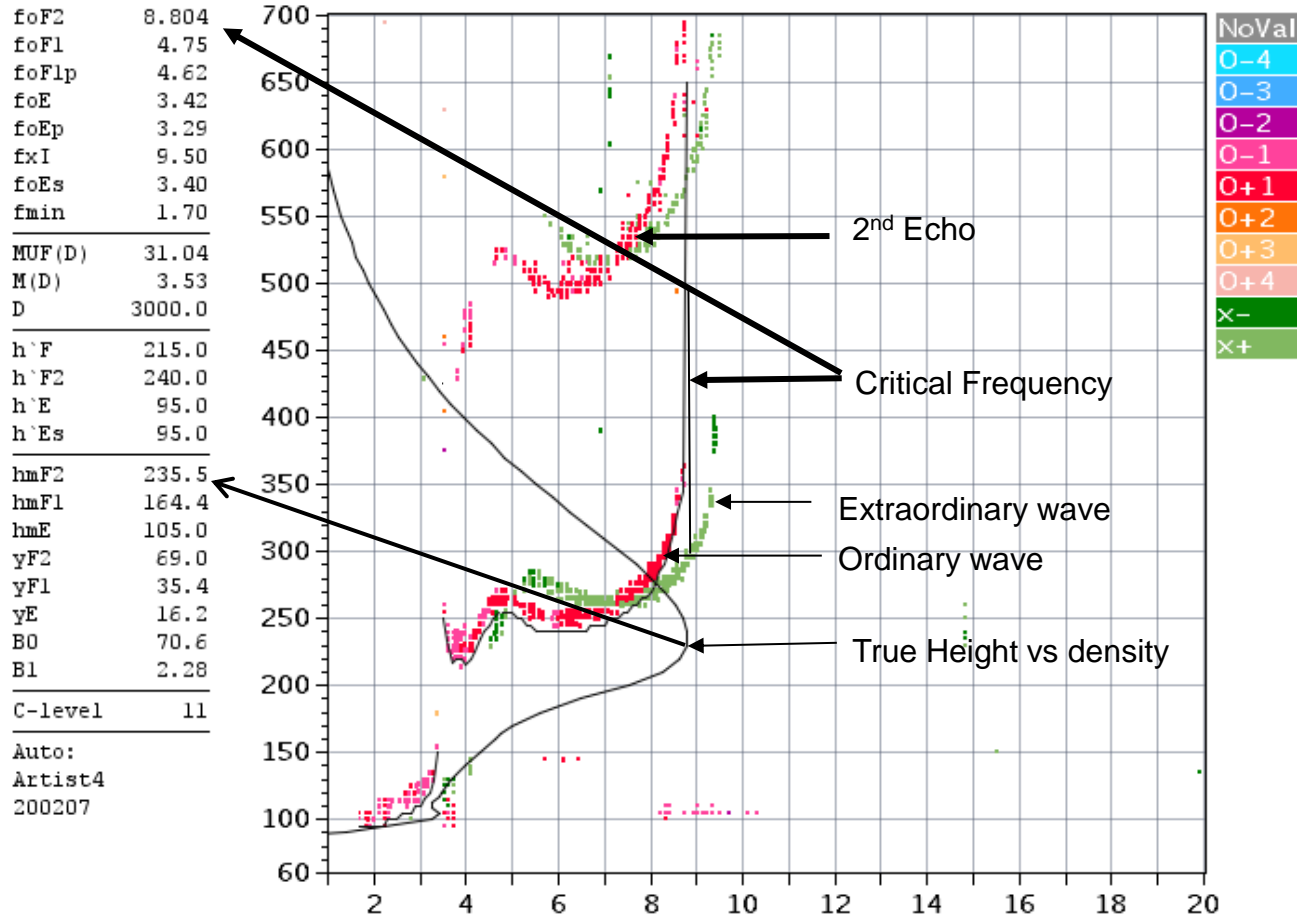
Solar Radiation
↓

Monoatomic oxygen

Ionogram Interpretation



Statio YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
 Austin 2013 Jan03 003 185505 MMM 1 045 100 32+ A1



foF2	8.804
foF1	4.75
foF1p	4.62
foE	3.42
foEp	3.29
fxI	9.50
foEs	3.40
fmin	1.70
<hr/>	
MUF(D)	31.04
M(D)	3.53
D	3000.0
<hr/>	
h`F	215.0
h`F2	240.0
h`E	95.0
h`Es	95.0
<hr/>	
hmF2	235.5
hmF1	164.4
hmE	105.0
yF2	69.0
yF1	35.4
yE	16.2
B0	70.6
B1	2.28
<hr/>	
C-level	11
<hr/>	
Auto:	
Artist4	
200207	

D 100 200 400 600 800 1000 1500 3000 [km] ← Oblique propagation MUF Chart
 MUF 9.4 9.5 10.0 10.8 12.0 13.7 18.5 31.0 [MHz] i.e. 31 MHz to 3000 km

Austin Ionosonde – 4 JUN (1705 CDT)



Statio YYYY DAY DDD HHMMSS P1 FFS S AXN PPS IGA PS
 Austin 2024 Jun04 156 220005 MMM 1 045 100 32+ A1

foF2 8.350
 foF1 5.75
 foF1p 4.90
 foE 3.62
 foEp 3.38
 fxI 9.90
 foEs 3.60
 fmin 1.10

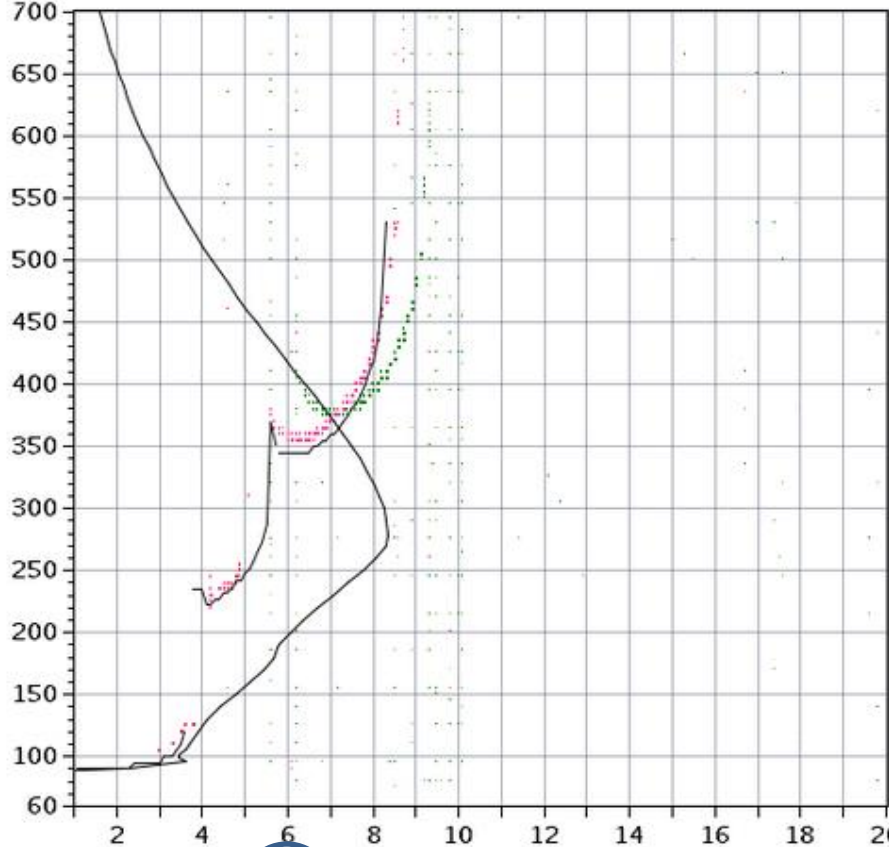
MUF(D) 24.11
 M(D) 2.90
 D 3000.0

h'F 222.0
 h'F2 345.0
 h'E 90.0
 h'Es 90.0

hmF2 277.9
 hmF1 188.3
 hmE 95.6
 yF2 81.5
 yF1 64.5
 yE 7.1
 B0 136.5
 B1 1.26

C-level 11

Auto:
 Artist4.5
 200311



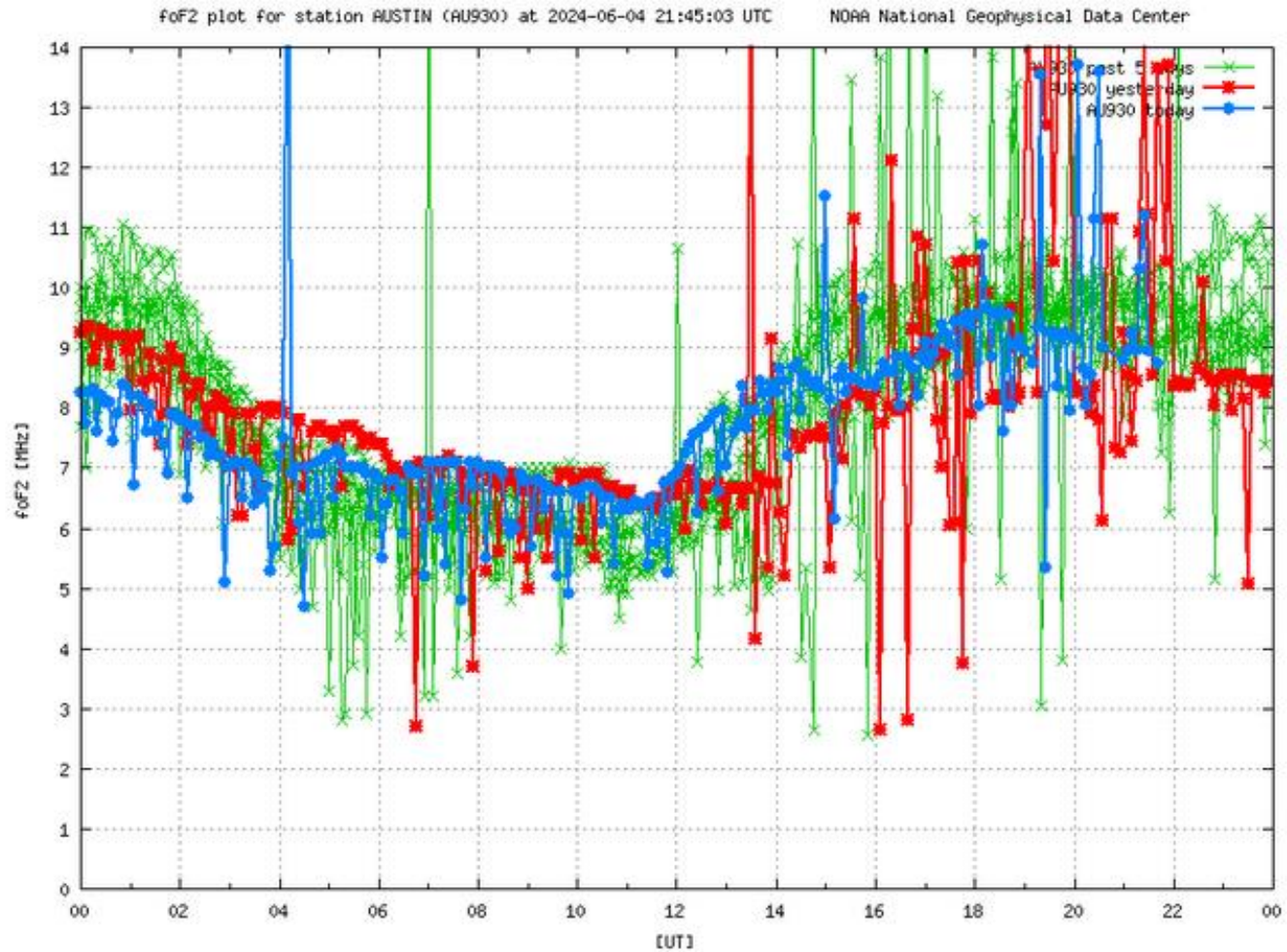
NoVal
 O-4
 O-3
 O-2
 O-1
 O+1
 O+2
 O+3
 O+4
 X-
 X+

D 100 200 400 600 800 1000 1500 3000 [km]
 MUF 8.9 9.0 9.4 10.0 10.8 12.0 15.4 24.1 [MHz]

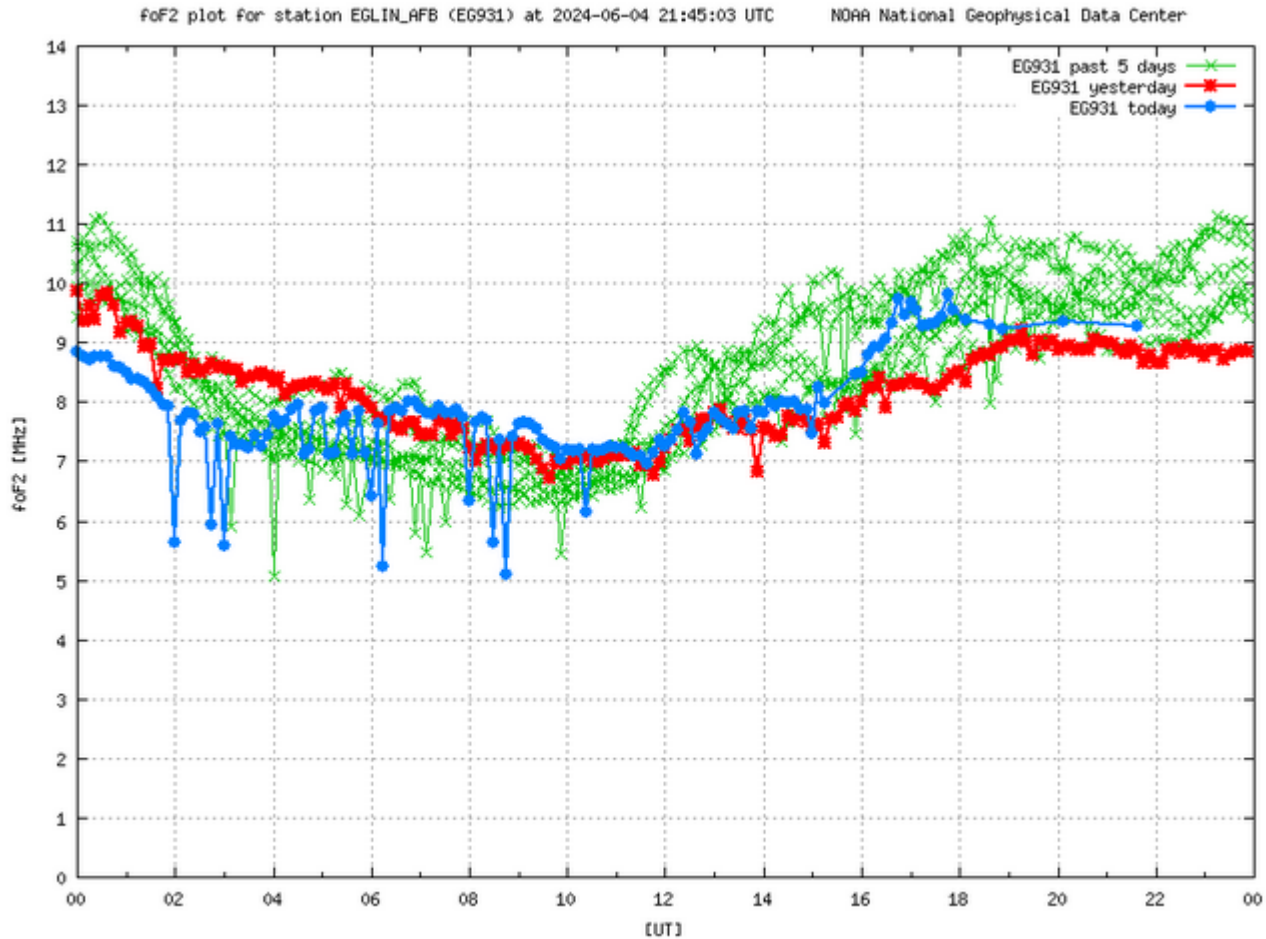
AU930_2024156220005.MMM / 1904x120h 100 kHz 0 km / 063-256 AU930 130 / 30.4 N 262.3 E

Ion2Png v. 1.0.11

foF2 Trend – Austin Ionosonde



foF2 Trend – Eglin Ionosonde



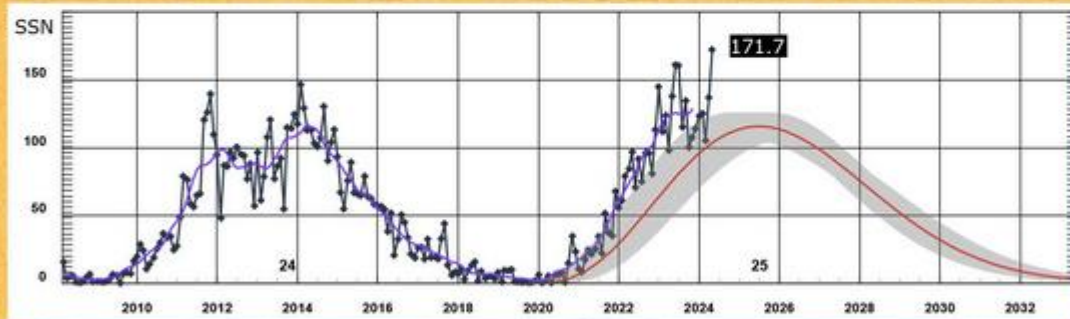
Notable Recent Events

Reaching New Highs

June 2, 2024 @ 10:00 UTC

It goes without saying that May 2024 was a great month on the Sun. Large sunspots and large solar flares dominated our attention. We also reached a new high for both the solar flux index and sunspot number count for solar cycle 25. The sunspot number average for May 2024 is 171.7. This is the highest count since September 2002 during cycle 23. The solar flux index average for last month is 187.7, also a new high for the current solar cycle.

May Sunspot Number Average
Highest count since September 2002



CME Event – 10-12 May 2024

SolarHam – 10 MAY 1913Z

Solar Indices (May 10 @ 00:35 UTC)

SFI	SSN	AREA
233	170	1680
▲ 6	▲ 28	▼ 210

WWV | Flux Data | Last 30 Days

Cycle 25 Progression

3 Day Geomagnetic Forecast

May 10	May 11	May 12
8 (G4)	8 (G4)	6 (G2)
<i>Max Kp</i>		
M-Lat 55%	M-Lat 50%	M-Lat 40%
H-Lat 95%	H-Lat 90%	H-Lat 80%
<i>Probabilities</i>		

Latest SWPC Forecast (@ 00:30 + 12:30 UTC)

Detailed Forecast

Solar Flare Detection

Data provided by NOAA/SWPC GOES-16 X-Ray Flux * temporary graphic Click to expand data

Solar Flare Class: X, M, C, B, A

Radio Blackout Level: R5, R3, R1, R0

Current: M1.7

Solar Demon

Solar SOFT

Global D-LAYER Absorption

Current Solar Flare Threat

C-Flare: 99%	M-Flare: 95%
X-Flare: 75%	Proton: 99%

Probability Details

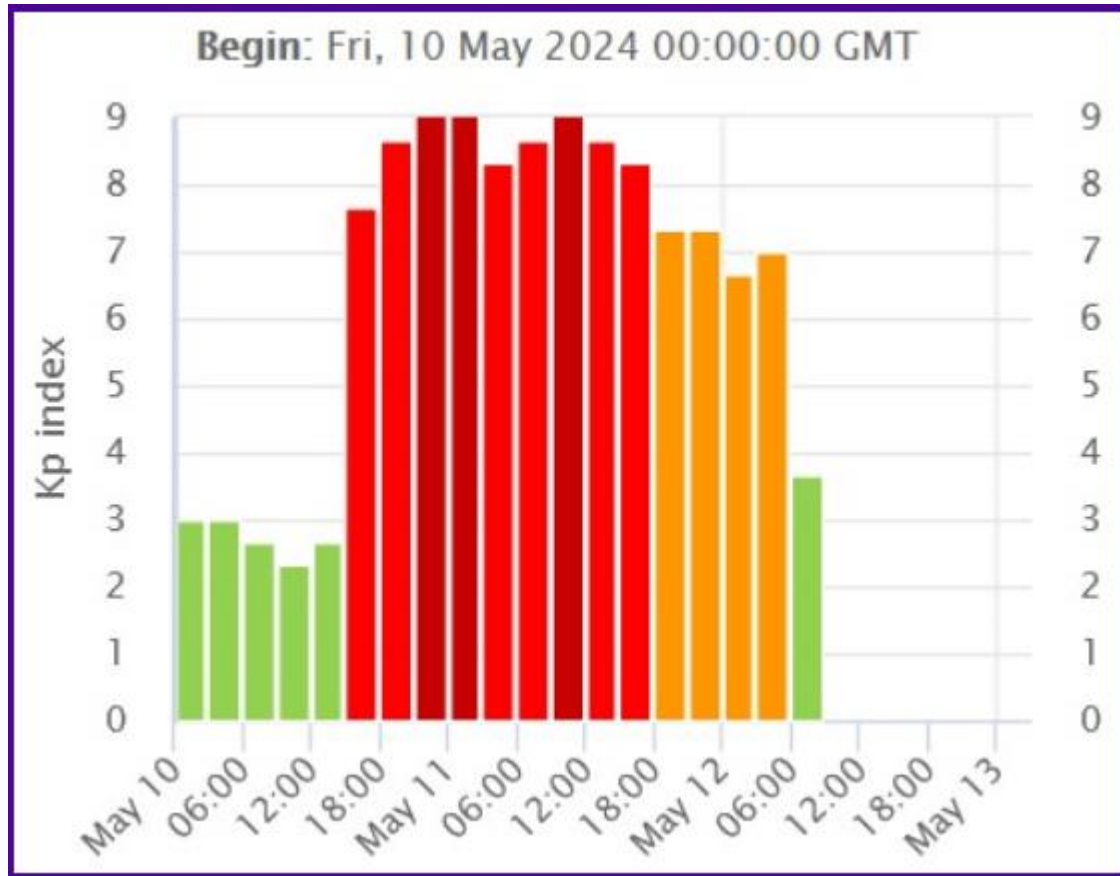
Flare Events (M2+) Past 48 Hours | Event Report | Top Solar Flares

M2.9	X1.0	M4.0	M4.5	X2.2	M3.7	X1.1	X3.9	M5.9
3663	3664	3664	3664	3664	3664	3664	3664	3664

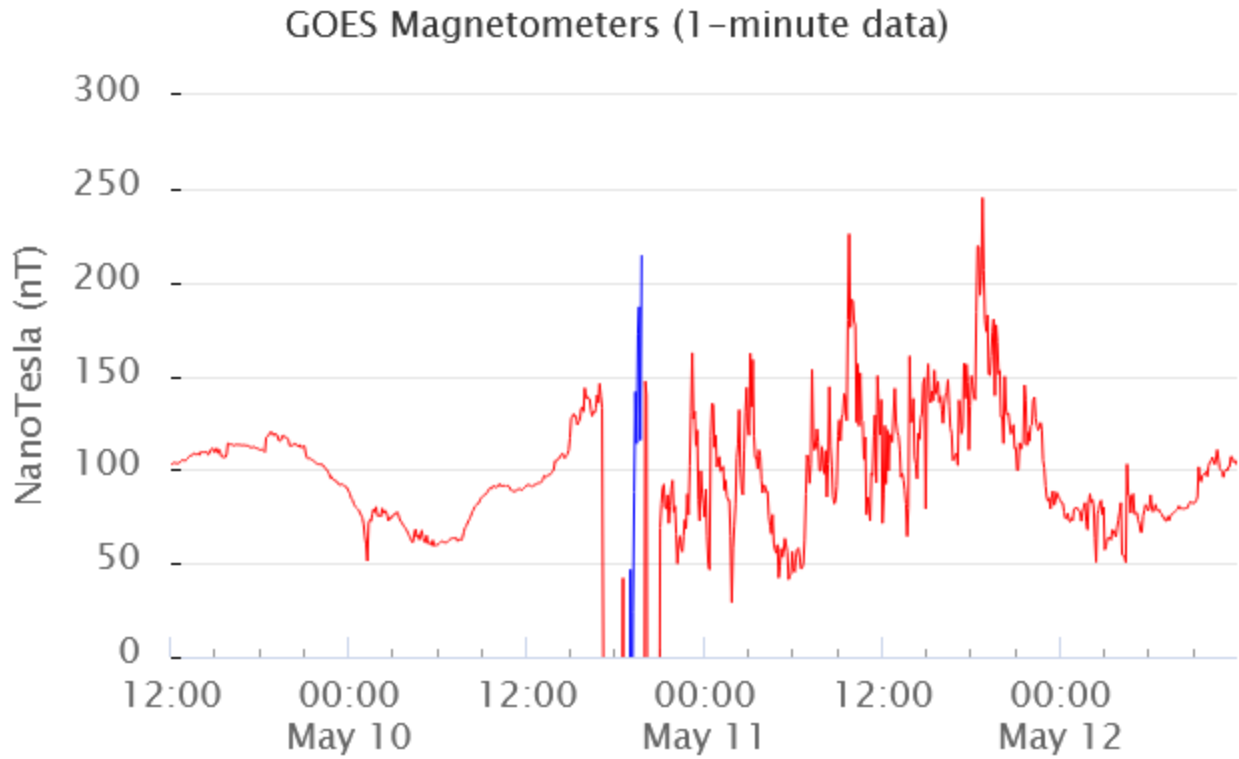
Visible Sunspot Regions | Sunspot Summary | SRS (txt)

3664	3666	3667	3670	3671	3672
BGD	A	A	A	A	B

Kp



GOES HP

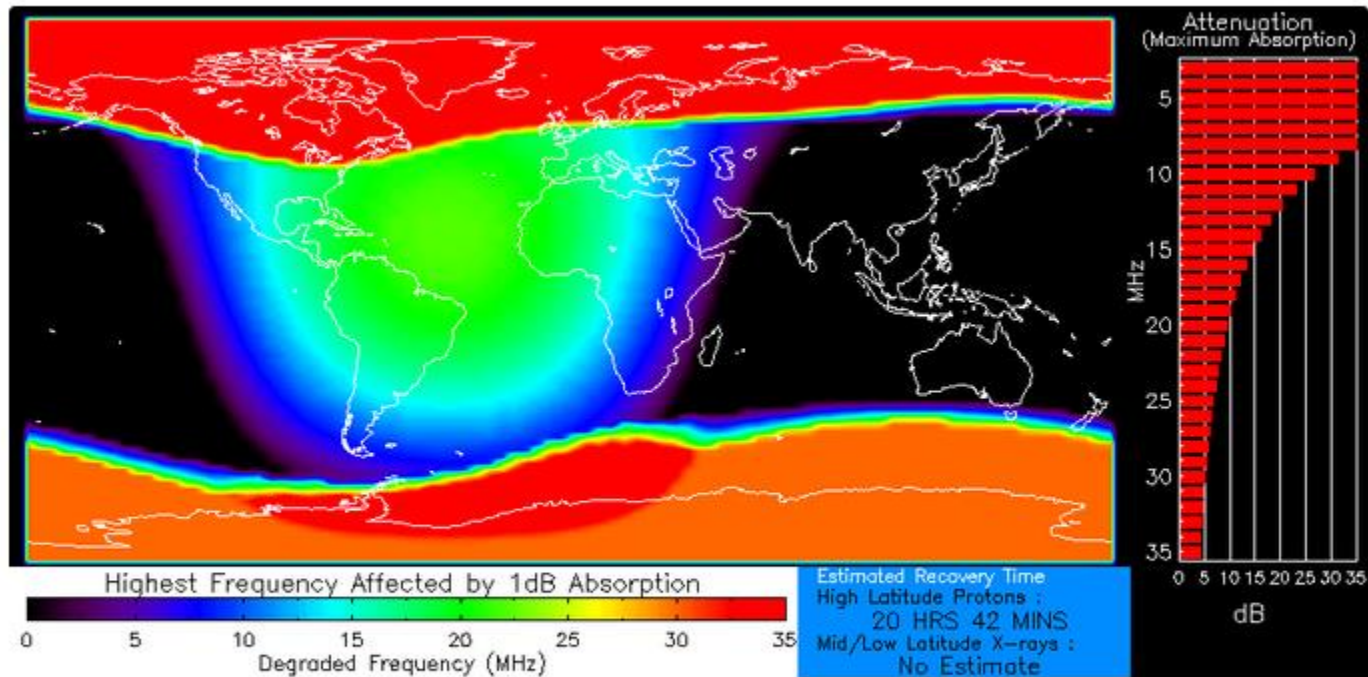


Universal Time (captured @ 2024-05-12T12:06:09.062Z)

● GOES-16 Hp

2024-05-12T12:06:09.062Z

UNUSUAL D-REGION ABSORPTION PATTERNS

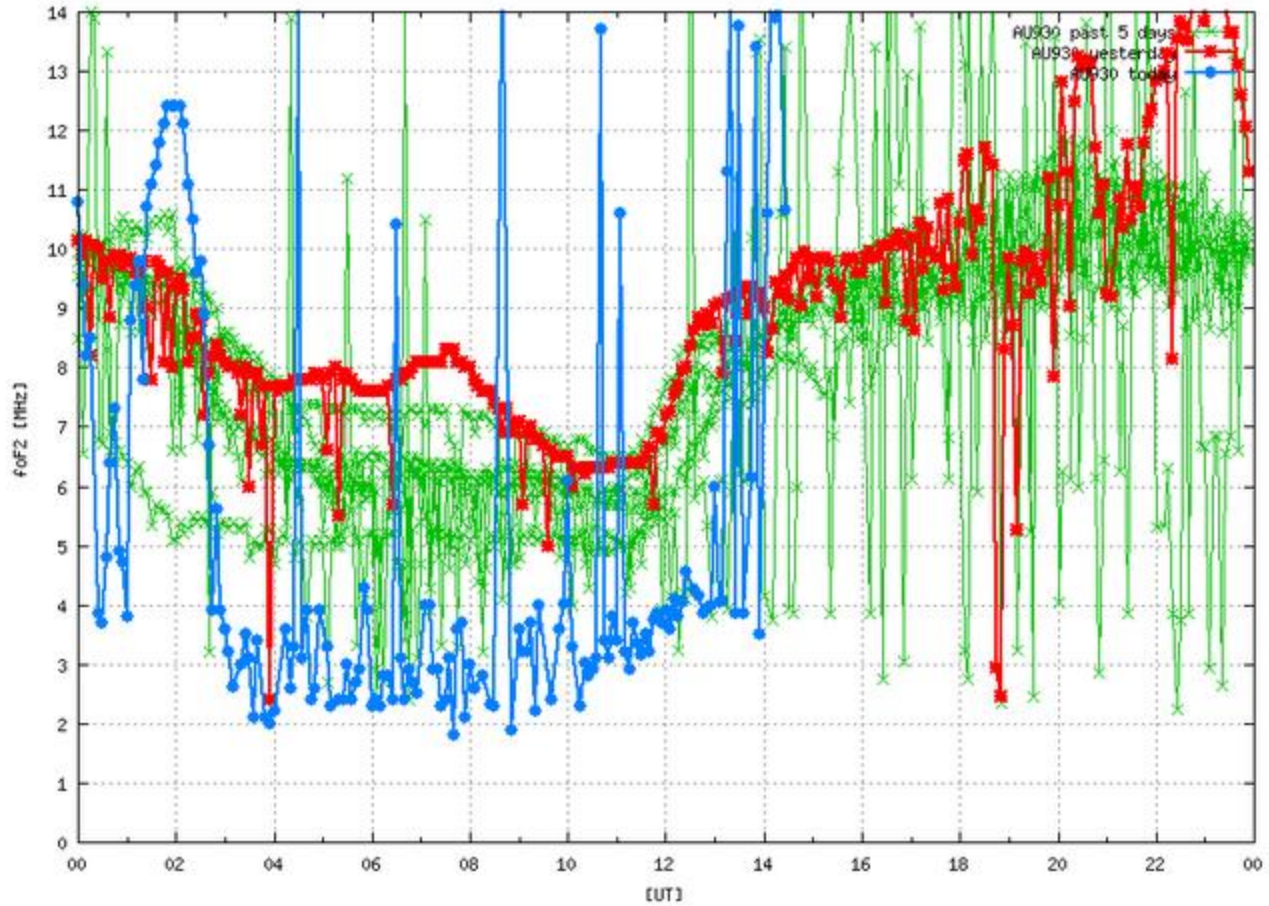


Elevated X-ray flux
Product Valid At : 2024-05-11 14:42 UTC

Moderate Proton Flux
NOAA/SWPC Boulder, CO USA

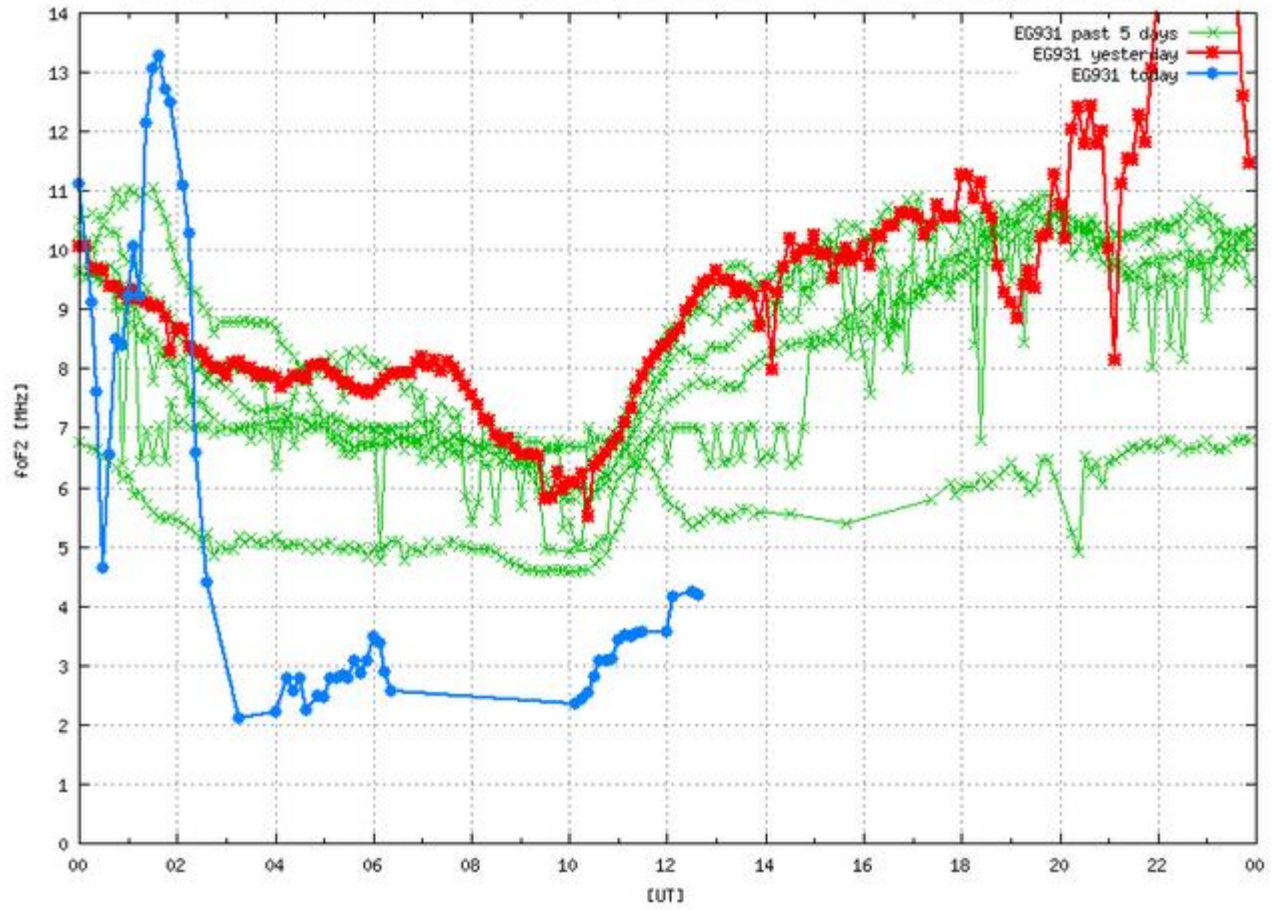
foF2 plot for station AUSTIN (AUS30) at 2024-05-11 14:30:01 UTC

NOAA National Geophysical Data Center



FoF2 plot for station EGLIN_AFB (EG931) at 2024-05-11 14:30:01 UTC

NOAA National Geophysical Data Center





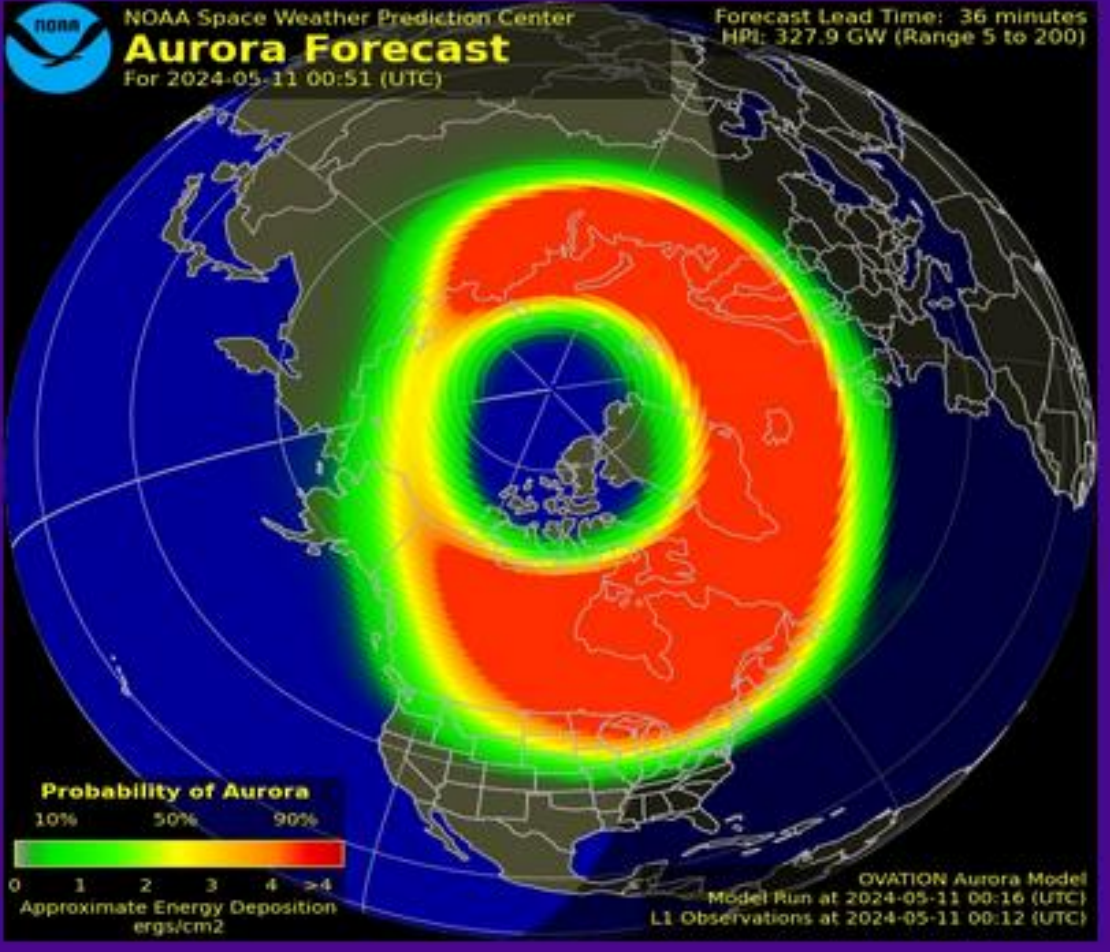
NOAA Space Weather Prediction Center

Aurora Forecast

For 2024-05-11 00:51 (UTC)

Forecast Lead Time: 36 minutes

HPI: 327.9 GW (Range 5 to 200)



Solar Weather Data

The screenshot shows the website for Region 6 Army MARS. The top navigation menu includes: Home, What is MARS?, Join, Contact Us, Solar Weather, and Login. A red arrow points from the text 'Menu' to the navigation menu. Another red arrow points from the text 'Solar Weather' to the 'Solar Weather' menu item. A third red arrow points from the text 'Solar Weather' to the 'WHO WE ARE' section of the page.

Solar Weather

Other Solar Weather Links of Interest

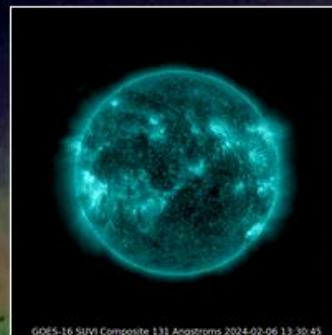
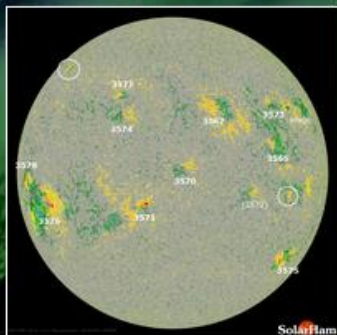
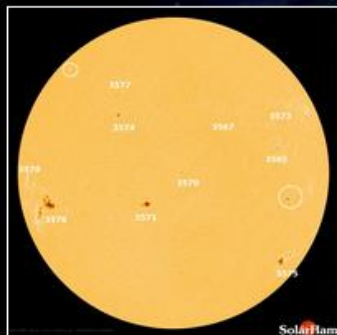
All Ionosondes

- • [DIDBase](#) - Select Station List then EGLIN then year/month/day/time for Ionosonde plot.
- [NOAA Solar Weather](#) - Solar Weather plots of Kp and X-Ray and other solar emissions.
- [Solen Solar Weather](#) - Good general solar forecast from an individual.
- [Solar Ham](#) - SolarHam provides real time solar news, as well as consolidated data from various sources.

Space Weather for February 6, 2024

[Help Center + FAQ](#)

UTC Time 13:45:49 Tuesday



HMI Intensity
Latest | Movie | HARP

HMI Magnetogram
Latest | Movie

Coronal Holes
Analysis | Movie

SUVI 131 (Latest)
Movie

SUVI 304 (Latest)
Movies

Latest Imagery: [SDO](#) | [AIA](#) | [GOES](#) | [GONG](#) | [STEREO](#) | [LASCO](#)

Video: [SDO](#) | [SOHO](#) | [STEREO](#) | [Heliviewer](#) | [YouTube](#)

[Solar Report](#)

[Space Weather Alerts](#) >

[Real Time Solar Wind](#)

[Protons and Electrons](#)

[Satellite Environment](#) >

Note: URL is now
<https://solarham.com/>

See New Addition

Welcome to the SolarHam Help Center

Below you will find an explanation of frequency used terms regarding space weather used on the SolarHam website. Please note that this section is currently being built and will contain more information and answers to frequently asked questions soon.

<https://www.spaceweather.com/>

Current Conditions

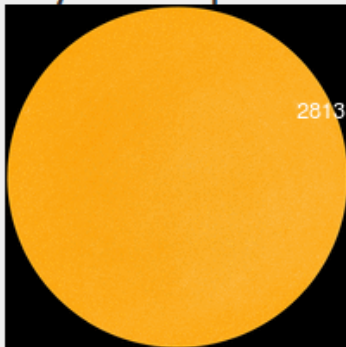
Solar wind

speed: **314.8** km/sec
density: **9.9** protons/cm³
more data: [ACE](#), [DSCOVR](#)
Updated: Today at 1225 UT

X-ray Solar Flares

6-hr max: **A1** 1027 UT Apr06
24-hr: **A1** 1515 UT Apr05
[explanation](#) | [more data](#)
Updated: Today at: 1230 UT

Daily Sun: 06 Apr 21



Sunspot AR2813 is decaying, and poses no threat for strong flares.
Credit: SDO/HMI

FLYING TO THE VOLCANO: Iceland's Geldingadalur volcano has turned into an popular tourist attraction—especially since auroras were sighted [above the glowing lava](#). Early this morning, Tuesday, April 6th, Brian Emfinger saw auroras before he even reached the Reykjanes peninsula:



QUESTIONS?

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