



SOLAR WEATHER

2 APR 2024

Lewis Thompson
W5IFQ

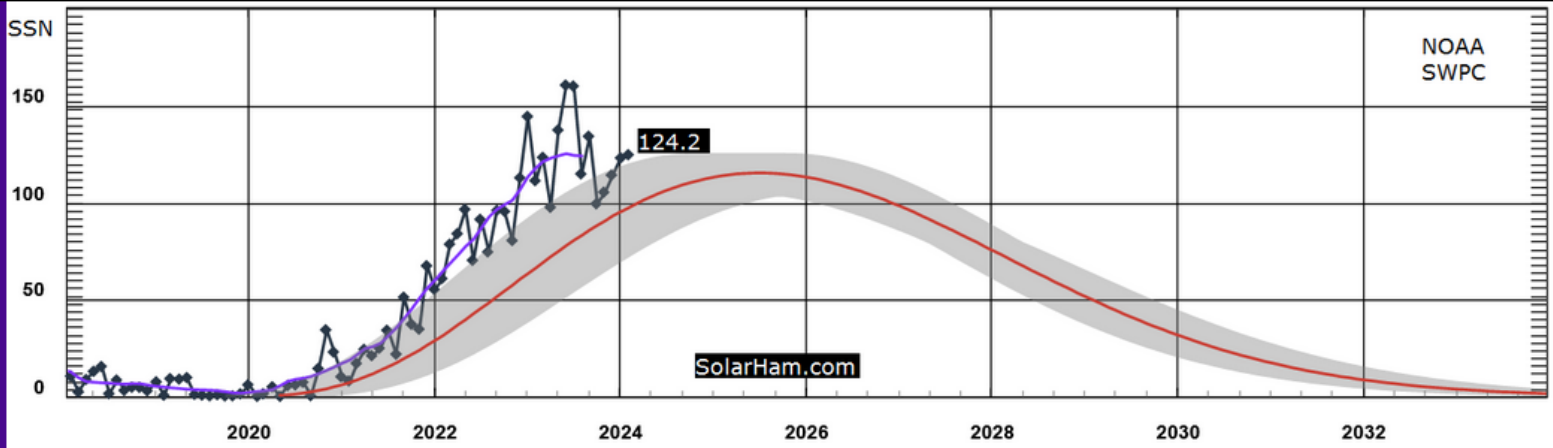
Taken by Yigit Yuksel on April
2, 2024 @ Reine, Norway

Solar Cycle 25 Progression

(Updated March 3, 2024)

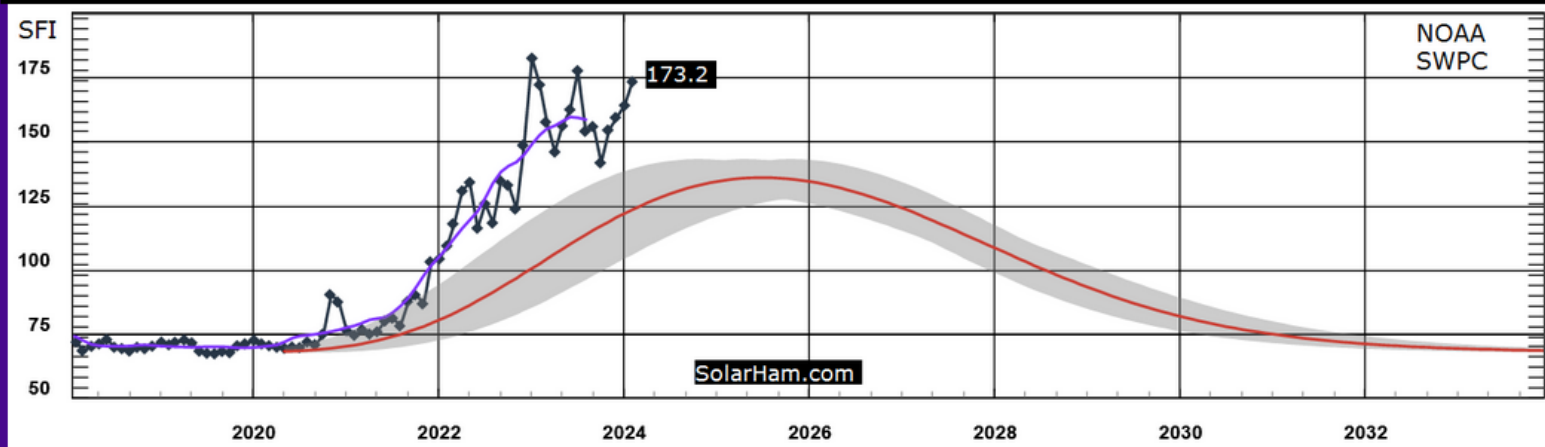
Sunspot Number Progression (February 2024)

Predicted SSN: 97.3 **Actual: 124.7** Latest **Smoothed Predicted SSN (8/2023): 83.1** **Actual: 124.0**

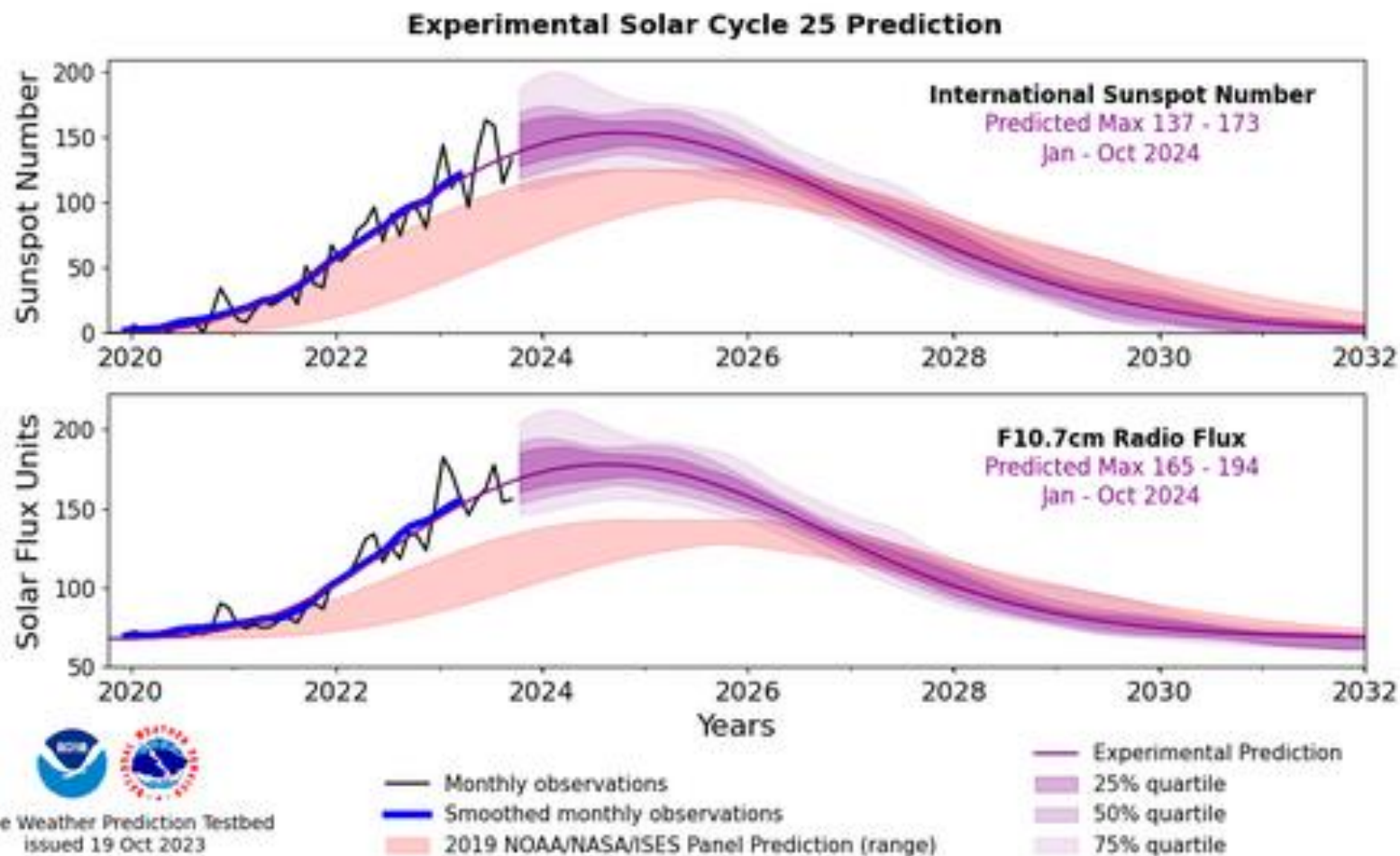


10.7cm Solar Flux Progression (February 2024)

Predicted SFI: 123.3 **Actual: 173.3** Latest **Smoothed Predicted SFI (8/2023): 113.5** **Actual: 158.5**



Cycle 25 Prediction...



Present Conditions and Forecast



Solar Indices (Apr. 2 @ 00:35 UTC)

| SFI | SSN | AREA |
|-----|-----|------|
| 125 | 50 | 112 |
| ▼ 9 | — | ▲ 2 |

[WWV](#) | [Flux Data](#) | [Last 30 Days](#)

Cycle 25 Progression

3 Day Geomagnetic Forecast

| Apr 2 | Apr 3 | Apr 4 |
|----------------------|-----------|-----------|
| 2-3 (G0) | 4 (G0) | 4-5 (G1) |
| <i>Max Kp</i> | | |
| M-Lat 05% | M-Lat 05% | M-Lat 20% |
| H-Lat 25% | H-Lat 30% | H-Lat 50% |
| <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 [Click to expand data](#)

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

Radio Blackout Level: R5, R3, R1, R0

X-Rays: **B5.0** (Current)

Solar Demon

Solar SOFT

Global D-LAYER Absorption

Current Solar Flare Threat

| | |
|--------------|--------------|
| C-Flare: 75% | M-Flare: 20% |
| X-Flare: 01% | Proton: 01% |

[Probability Details](#)

Flare Events (M2+) Past 48 Hours

| | |
|-------------|------|
| M3.9 | 3615 |
|-------------|------|

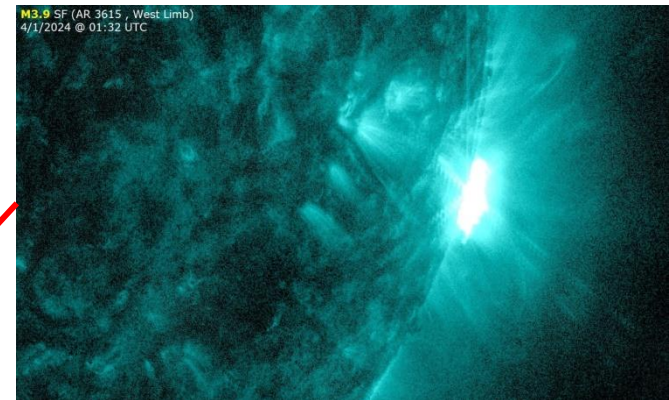
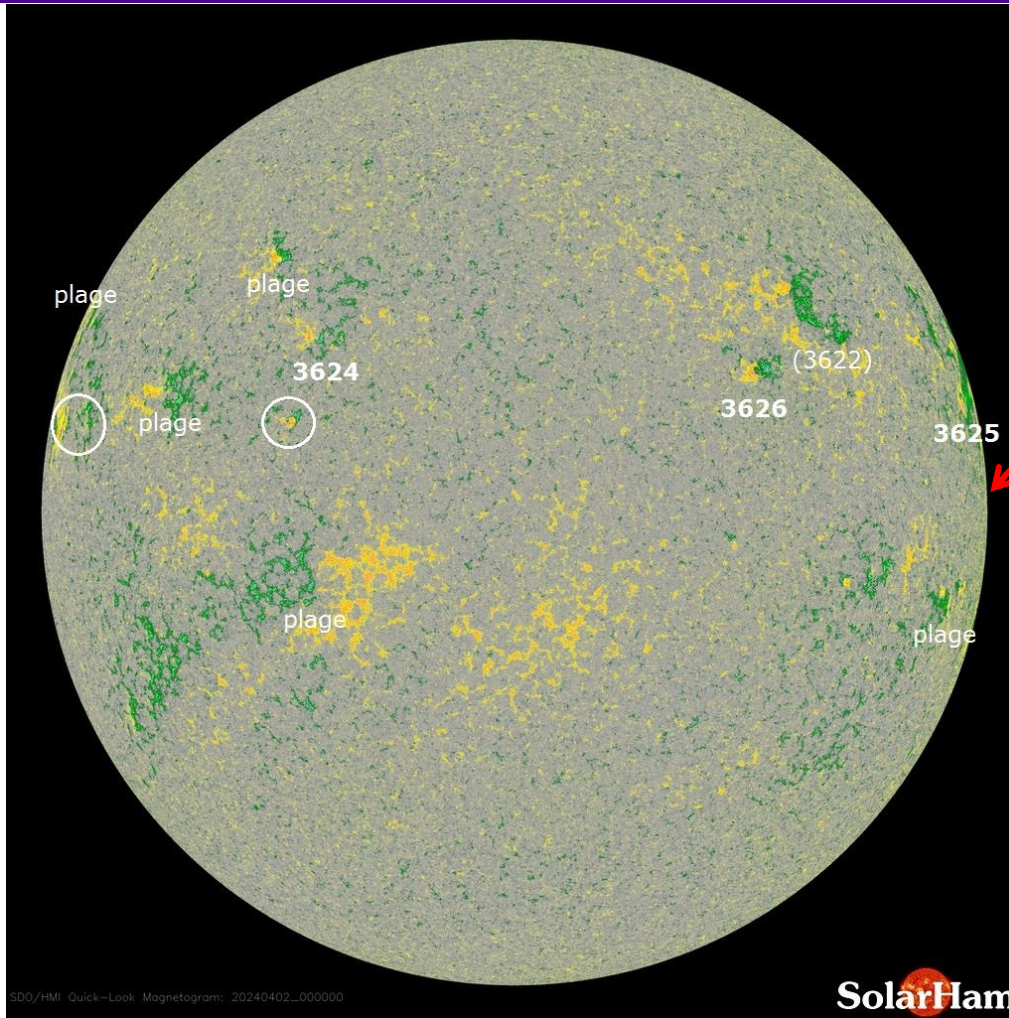
Visible Sunspot Regions | Sunspot Summary | SRS (txt)

| | | |
|-------------|-------------|-------------|
| 3624 | 3625 | 3626 |
| A | B | B |

Solar Flare Activity

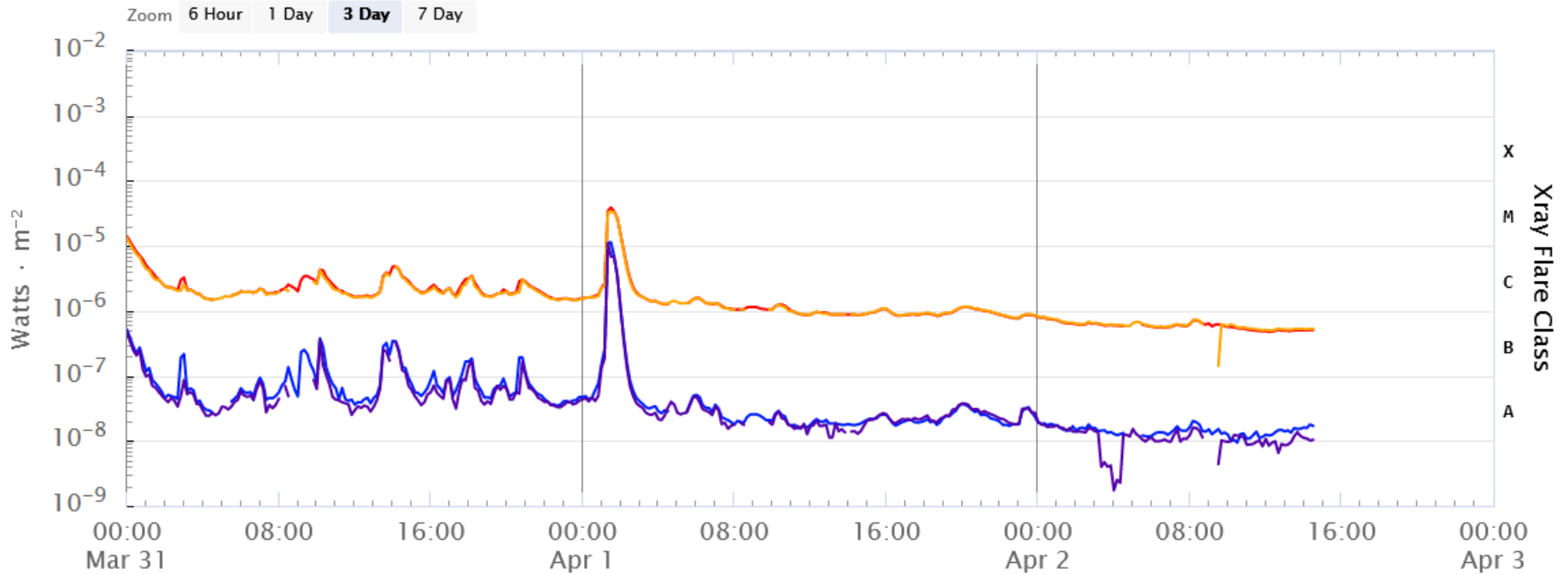
Magnetogram Image (Updated April 2, 2024)

Uses Zeeman effect to measure polarity of magnetic fields

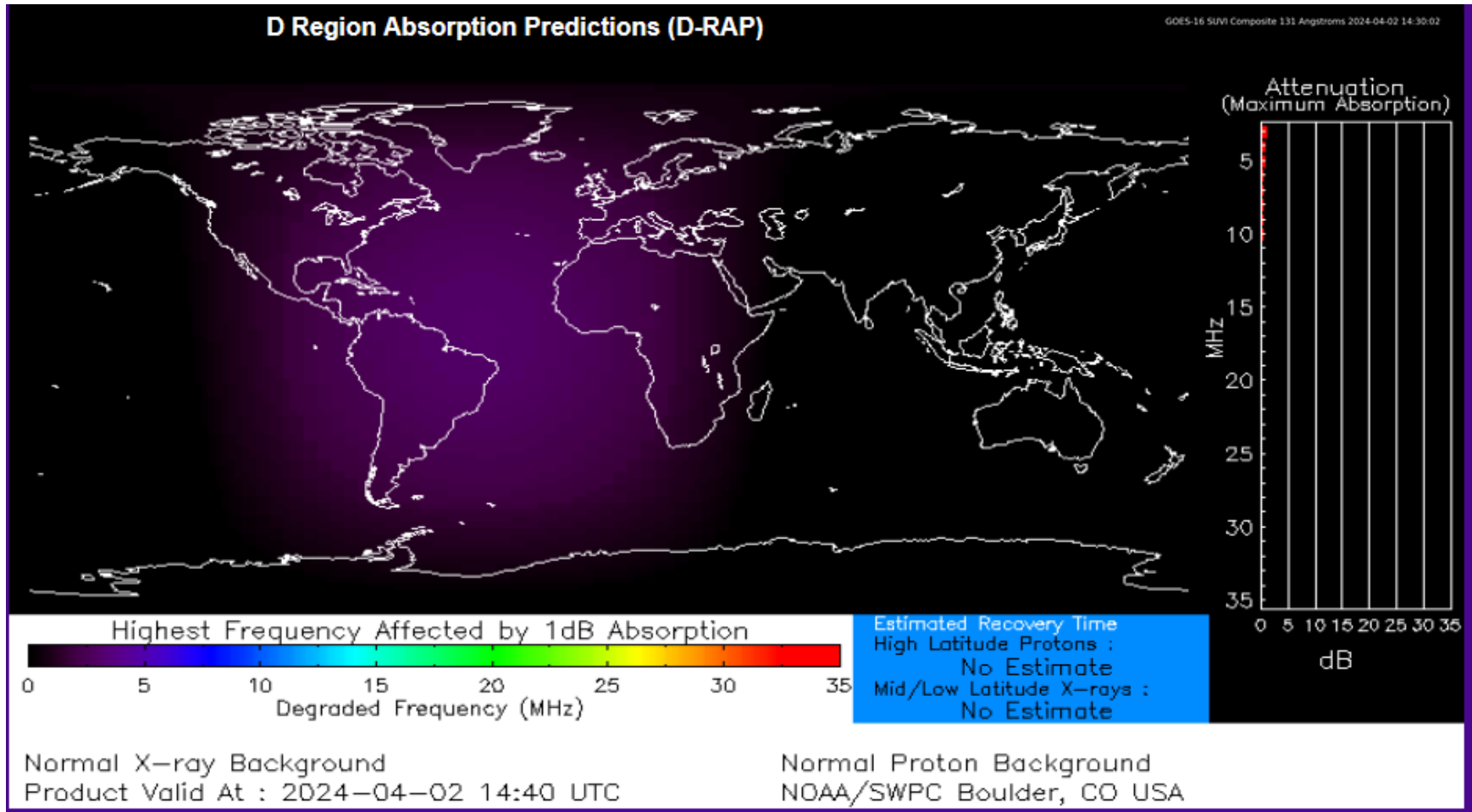


Solar X-Ray Flux: 31 MAR – 2 APR 2024

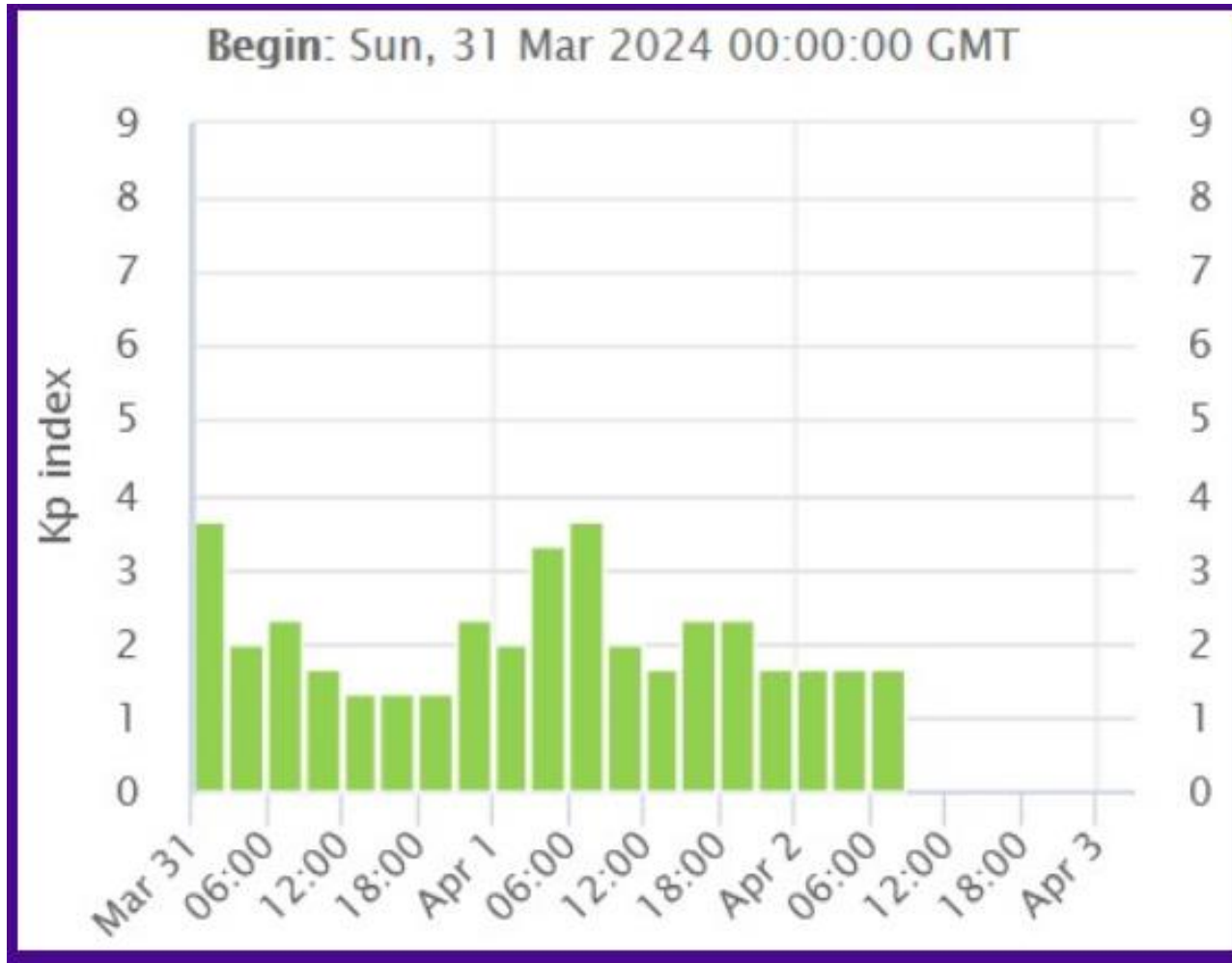
GOES X-Ray Flux (1-minute data)



NOAA – D-Region Absorption Predictions



Earth's Geomagnetic Activity



Geomagnetic Conditions: 2 APR 2024

Solar wind:

$B_z = 3 \text{ nT}$

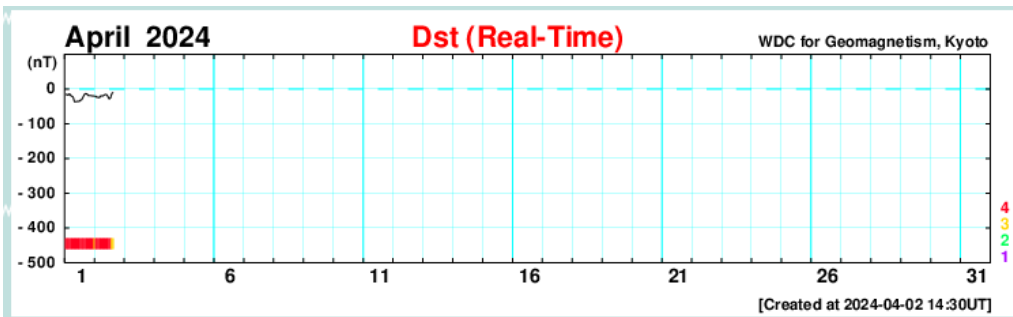
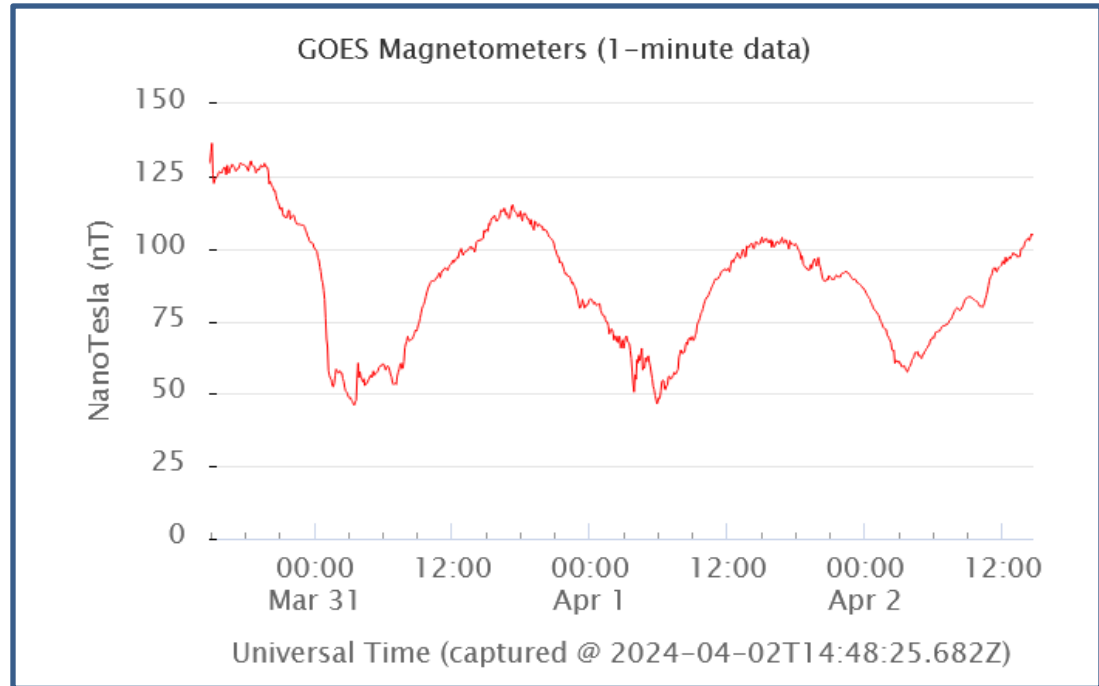
speed = 440 km/sec

density = 7.27 protons/cm³

(From – NOAA DSCOVR
In L1, Lagrange Point)

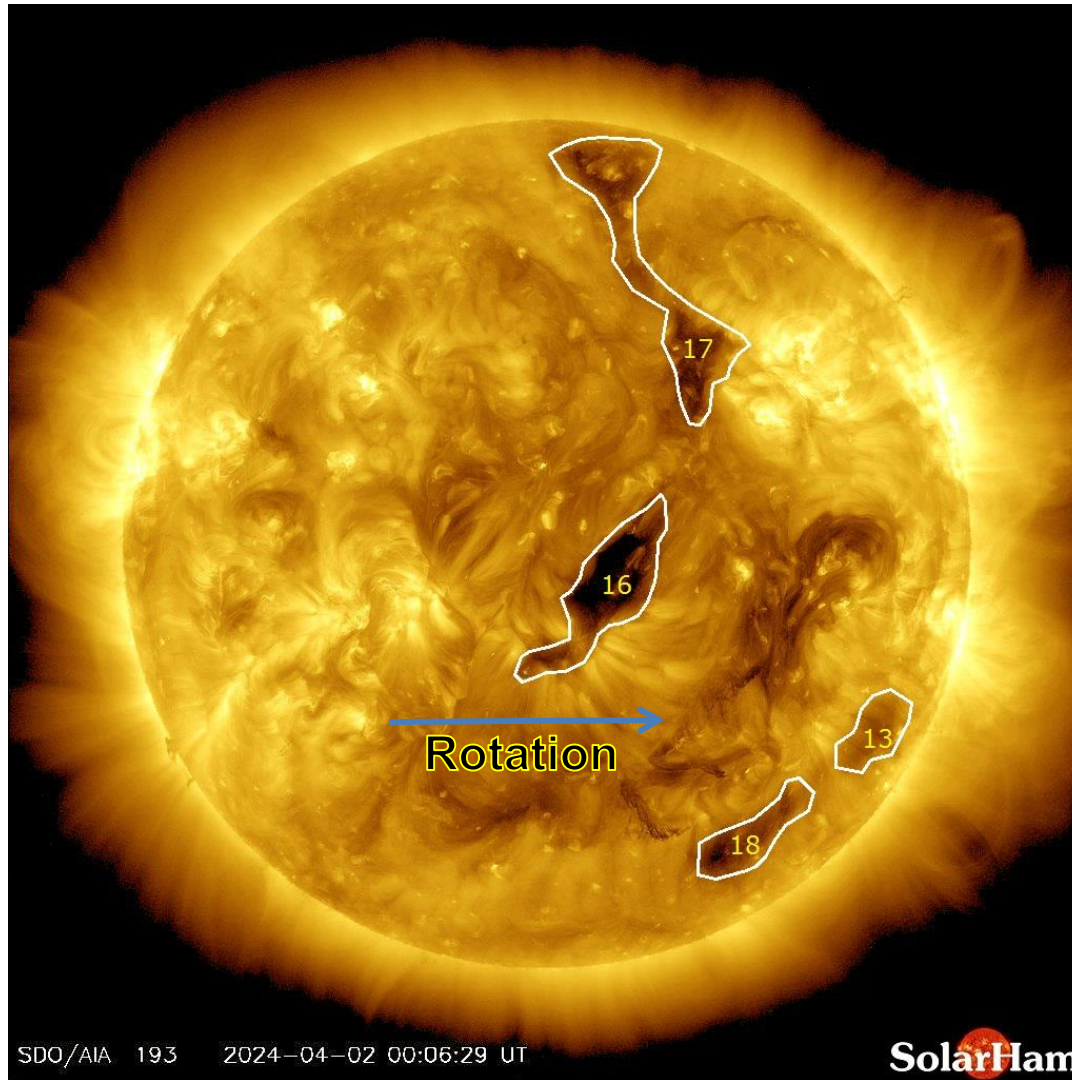
Dst = -10 nT (Ring Field)

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



From – GOES 16
In geostationary orbit

Coronal Holes – 2 APR 2024



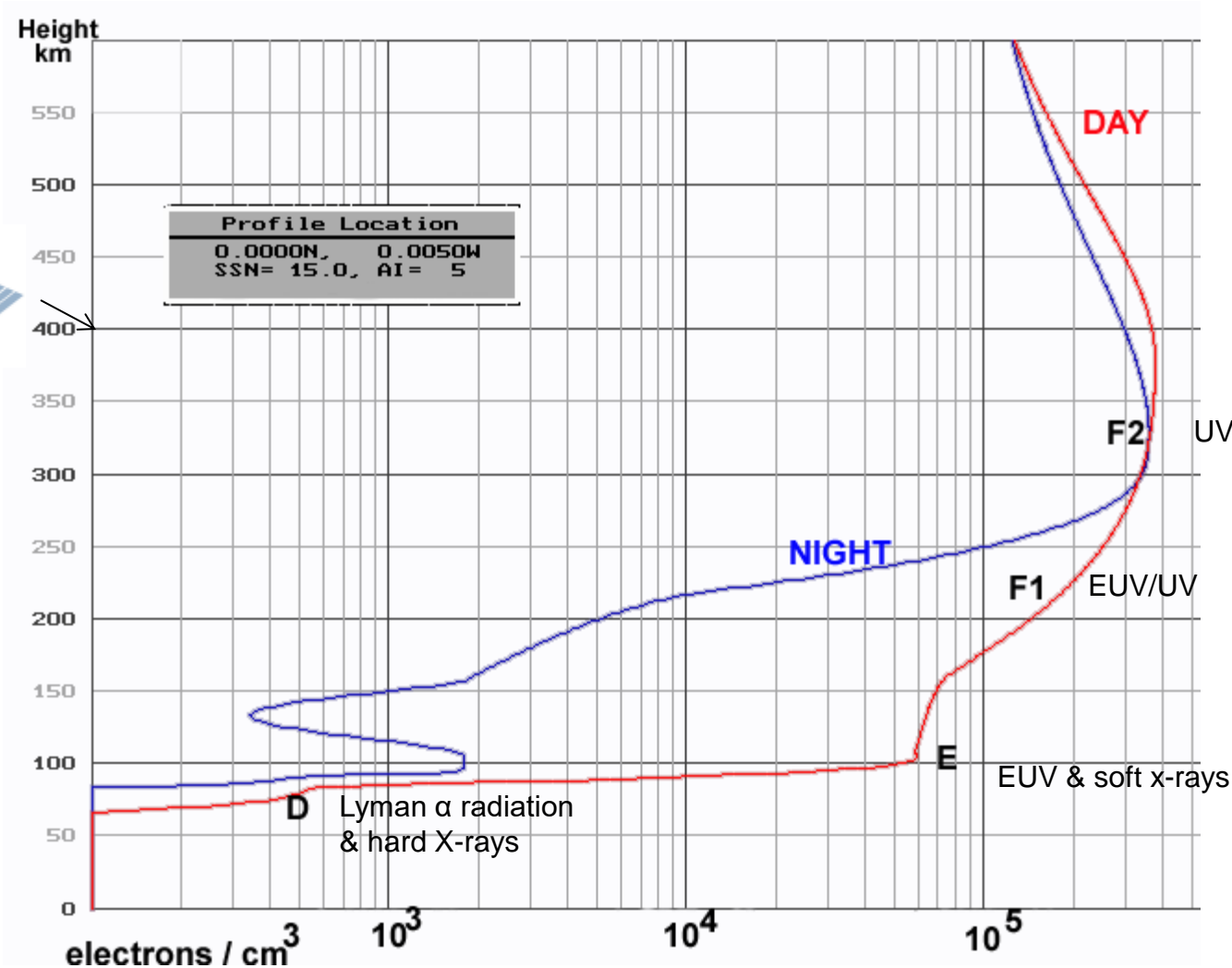
Analysis

A number of small coronal holes are now facing Earth. A solar wind stream flowing from these zones is expected to reach Earth by April 4th.

Ionospheric Conditions



Gravity
↓



Solar Radiation
↓

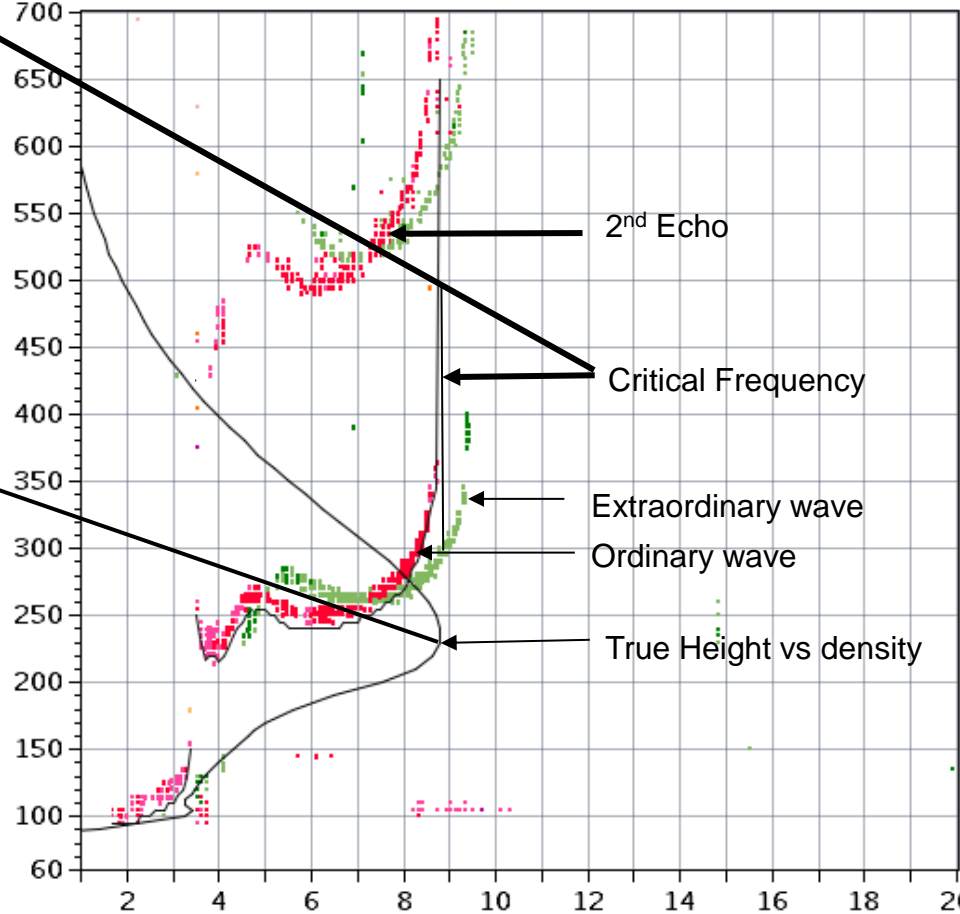
Monoatomic oxygen

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 – 2 APR (0950 CDT)



Statio YYYY DAY DDD HHMMSS P1 FFS S AXH PPS IGA PS
 Austin 2024 Apr02 093 145005 MMM 1 045 100 32+ A1

foF2 8.950
 foF1 6.55
 foFlp 4.64
 foE 3.02
 foEp 3.15
 fxI 10.10
 foEs 3.00
 fmin 1.60

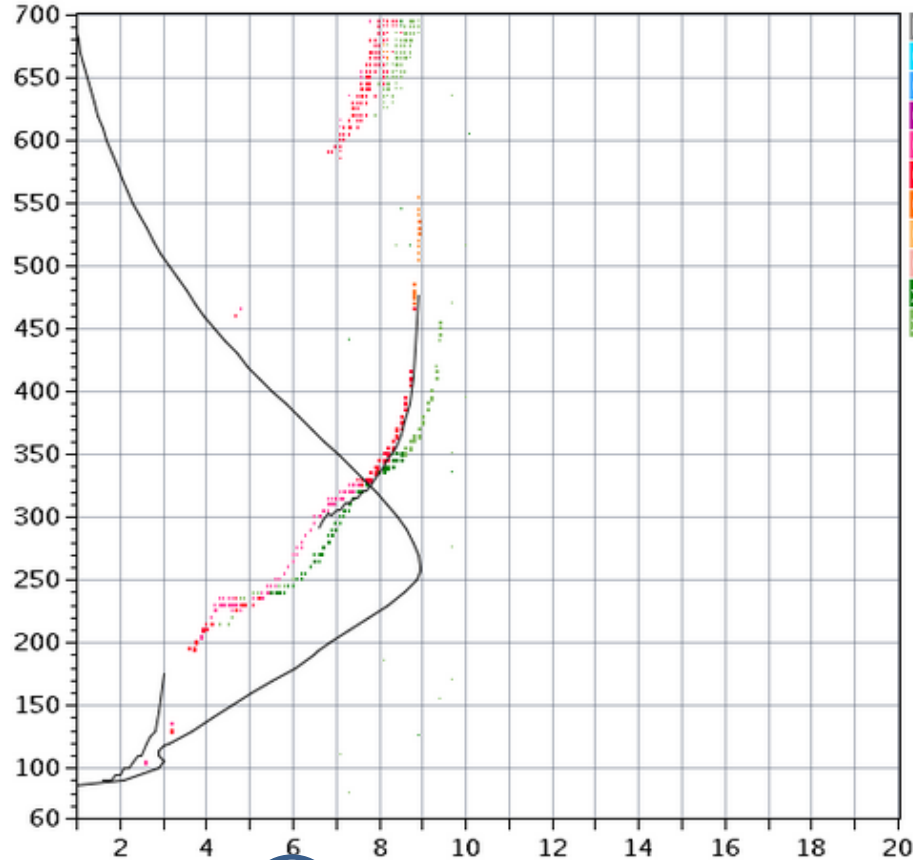
MUF(D) 27.80
 M(D) 3.12
 D 3000.0

h'F 292.5
 h'F2 297.5
 h'E 90.0
 h'Es 90.0

hmF2 257.3
 hmF1 193.4
 hmE 105.7
 yF2 68.7
 yF1 2.9
 yE 21.4
 BO 102.6
 B1 1.50

C-level 41

Auto:
 Artist4.5
 200311

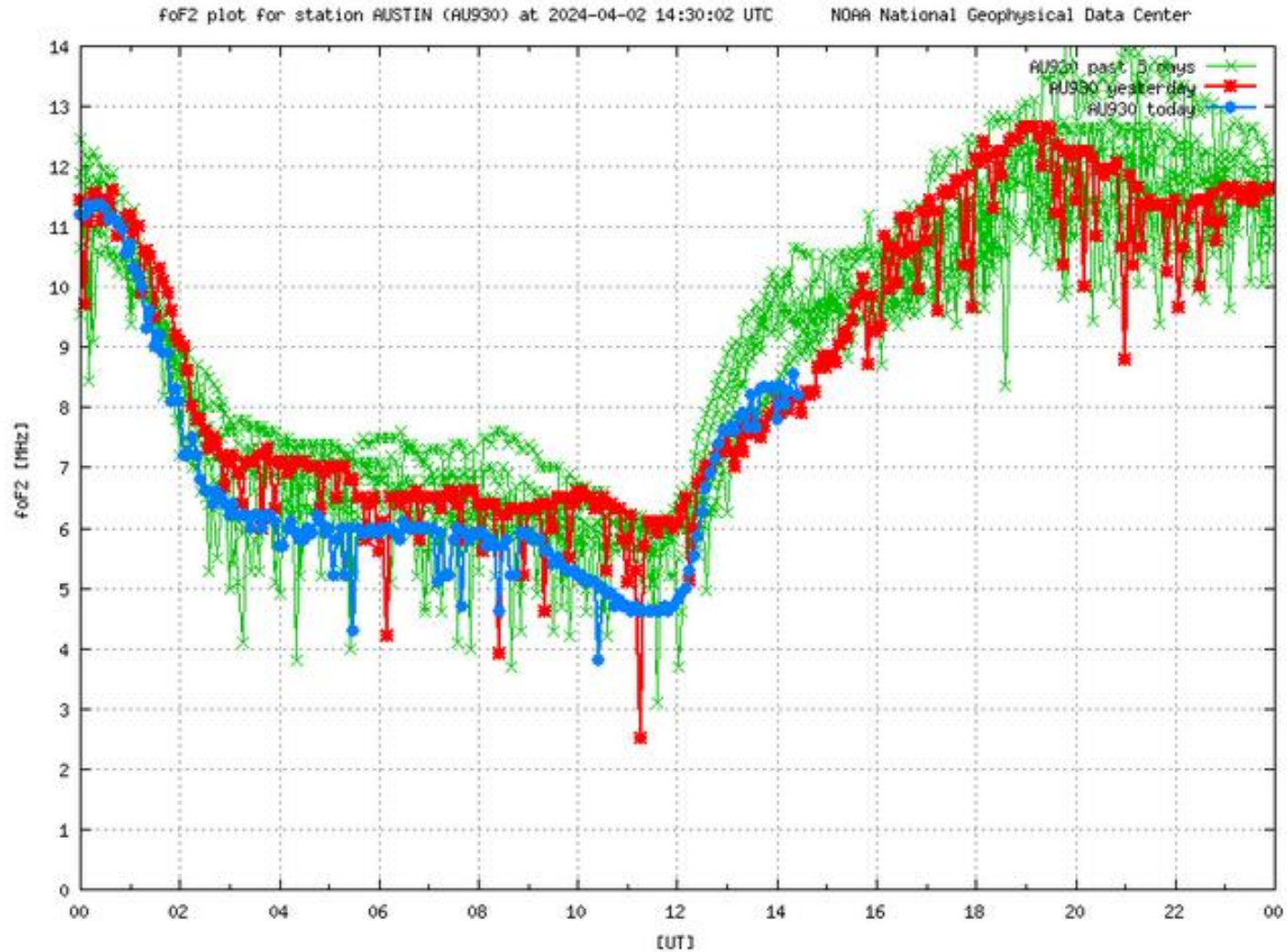


D 100 200 400 600 800 1000 1500 3000 [km]
 MUF 9.6 9.7 10.1 10.8 11.7 13.2 17.3 27.8 [MHz]

AU920_2024093145005.MMM / 1904x120h 100 km 3.0 km / 063-256 AU920 130 / 30.4 H 262.3 E

Ion2Png v. 1.2.11

foF2 Trend – Austin Ionosonde



Notable Recent Event

Major Space Weather Event (X-Flare) + Halo CME

March 23, 2024 @ 01:40 UTC (UPDATED)

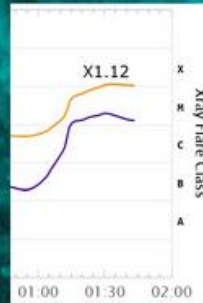
Two sunspot regions (AR 3614 and 3615) just produced solar flares at nearly the same time. The collective X1.1 X-Ray event peaked at 01:33 UTC (Mar 23). The event around AR 3614 appears to be the brighter of the two and coronal dimming originating from 3614 is clearly evident meaning a coronal mass ejection (CME) will be likely. More to follow regarding this major space weather event.

Click [HERE](#) for video of the event.

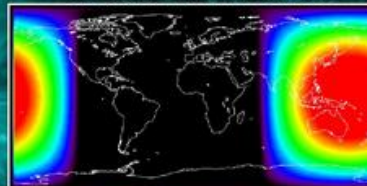
Combined X1.1 Solar Flare
(AR 3614 lead + 3615)
3/23/2024 @ 01:33 UTC



AR 3614



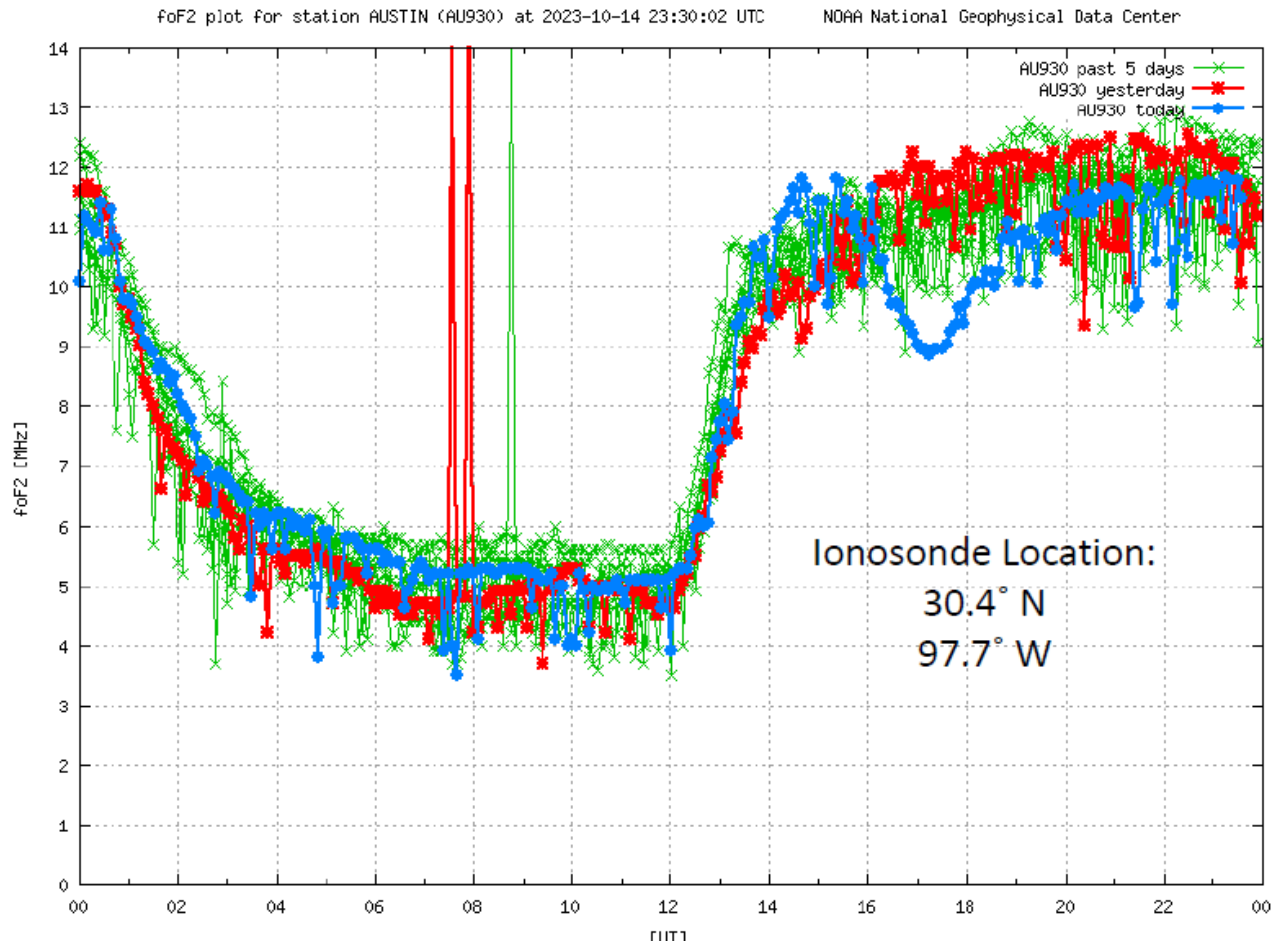
AR 3615



SDO/AIA/SolarHam.com

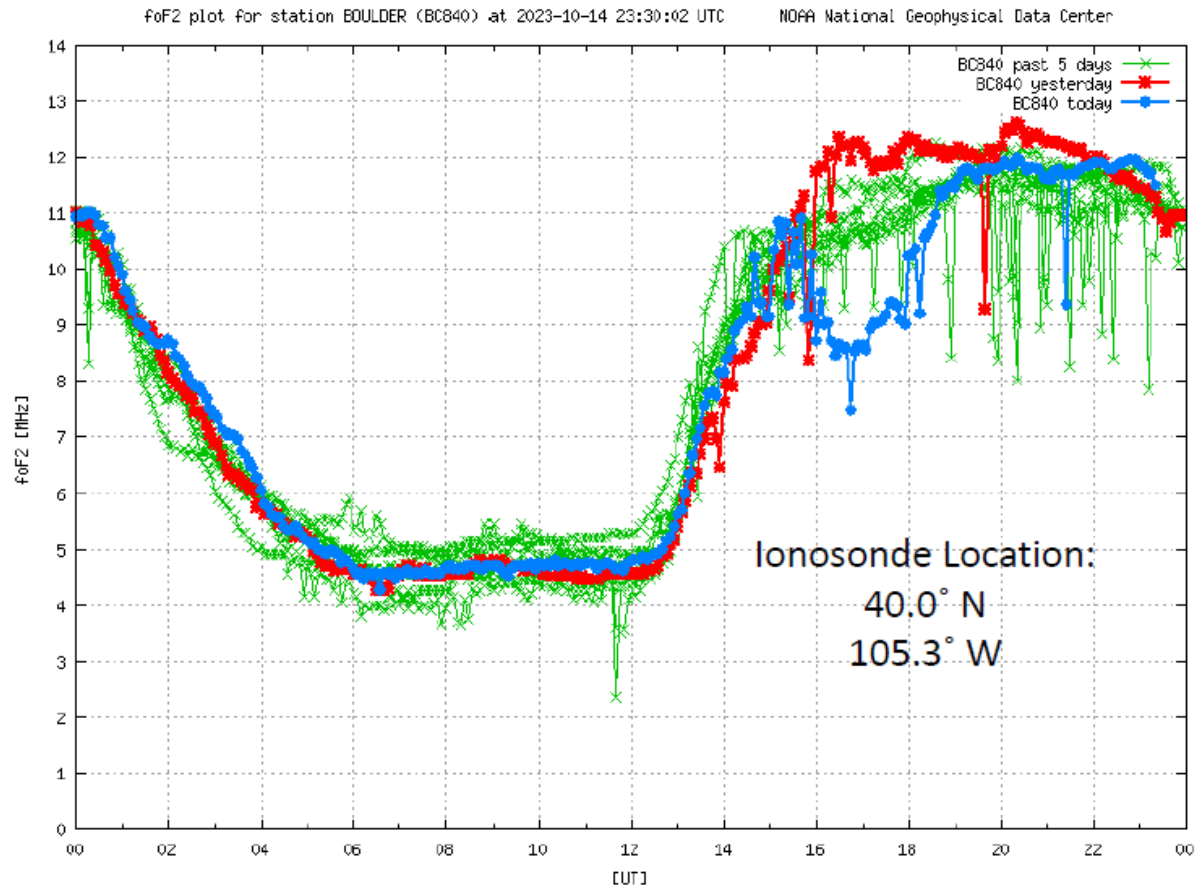
Annular Eclipse Results

Austin Ionosonde – foF2 Trend

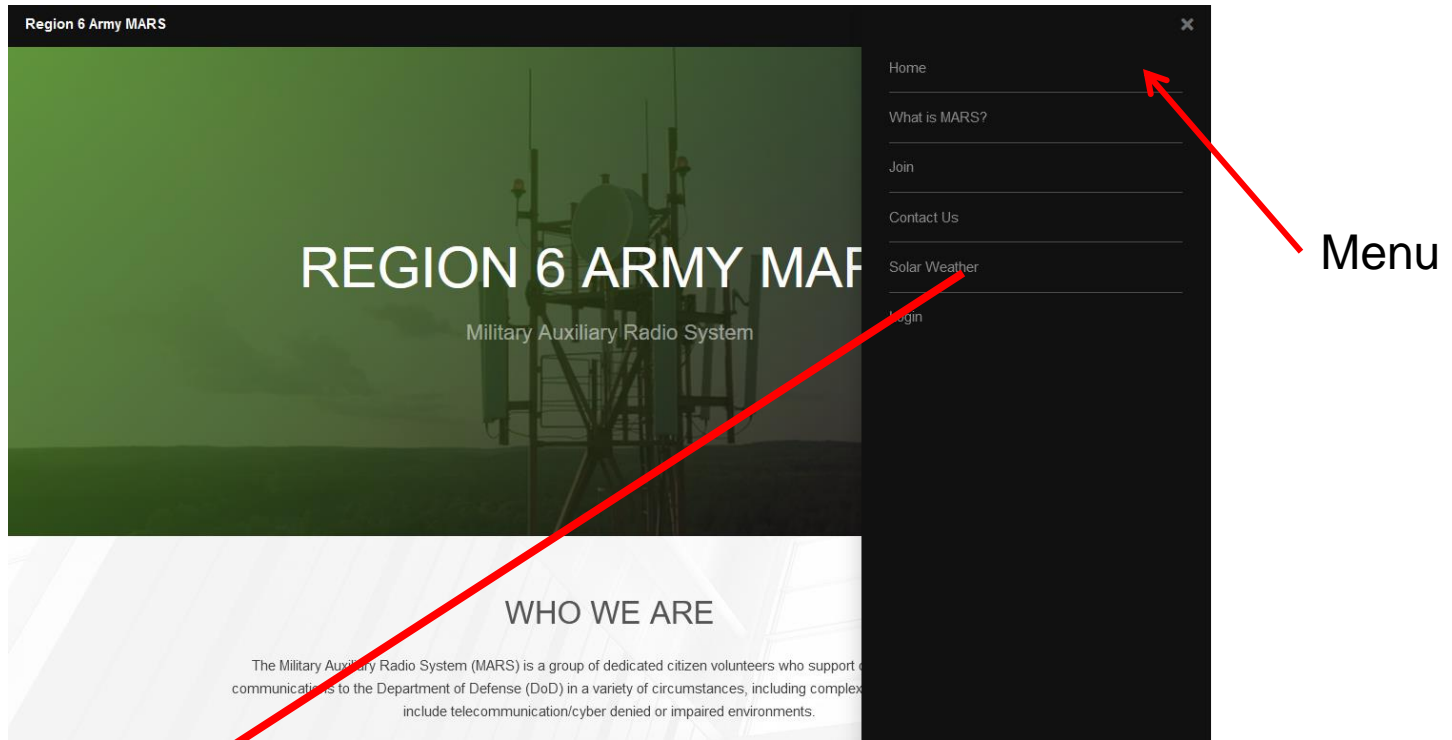


Annular Eclipse Results

Boulder Ionosonde – foF2 Trend



Solar Weather Data



Solar Weather

Other Solar Weather Links of Interest

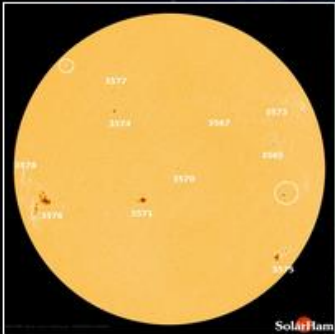
All Ionosondes

- • [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.

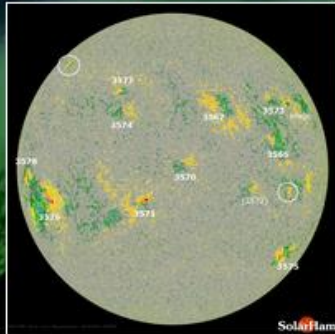
Space Weather for February 6, 2024

[Help Center + FAQ](#)

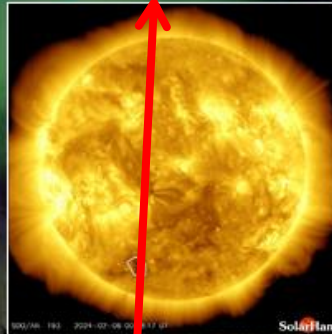
UTC Time 13:45:49 Tuesday



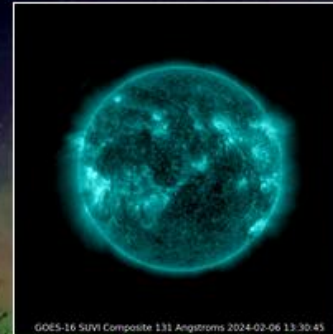
HMI Intensity
Latest | Movie | HARP



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](#) >

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

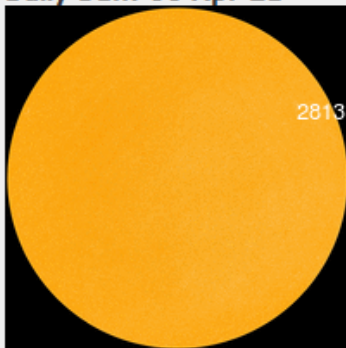
Solar wind

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?

Lewis Thompson

W5IFQ@att.net

512-587-9944