Space Weather Highlights
22 March - 28 March 2021

SWPC PRF 2378
29 March 2021

Solar activity was at very low levels throughout the highlight period with only B-class flare activity. There was a CME off the NW limb observed in LASCO C2 imagery near 22/0230 UTC. This ejection likely arrived late on 24 Mar and subsequently caused G1 (Minor) storm levels on 25 Mar. No other significant solar activity was observed during the highlight period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 22-26 Mar due to influences from multiple coronal hole high speed streams. Normal to moderate levels were observed on 27-28 Mar.

Geomagnetic field activity reached G1 (Minor) storm levels on 25 Mar due to the likely arrival of the aforementioned CME from 22 Mar. Active levels were observed on 23, 26, and 27 Mar due to influences from recurrent, negative polarity cornal hole high speed streams. Quiet to unsettled levels were observed on 22 and 28 Mar.

Space Weather Outlook
29 March - 24 April 2021

Solar activity is expected to be very low for the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 10-13 and 17-22 Apr due to influences from recurrent coronal hole high speed stream activity. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to be at active to G1 (Minor) storm levels on 29-30 Mar, 08-10 Apr, and 16-17 Apr, all due to recurrent coronal hole high speed stream influences. Quiet to unsettled levels are expected for the remainder of the outlook period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
22 March	80	23	40	A4.8	0	0	0	2	0	0	0	0
23 March	79	26	80	A6.3	0	0	0	0	0	0	0	0
24 March	84	26	40	A4.6	0	0	0	0	0	0	0	0
25 March	79	24	50	A3.3	0	0	0	1	0	0	0	0
26 March	80	24	40	A3.5	0	0	0	0	0	0	0	0
27 March	80	11	30	A3.0	0	0	0	0	0	0	0	0
28 March	75	11	10	A2.4	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2} -day -sr)		Electron Fluence (electrons/cm^2 -day -sr)
	>1 MeV	>10 MeV	>2MeV
22 March	1.1e+05	4.3e+04	1.7e+08
23 March	7.8e+04	4.4e+04	3.0e+08
24 March	5.9e+04	4.4e+04	1.7e+08
25 March	8.2e+04	4.4e+04	2.0e+07
26 March	5.9e+04	4.4e+04	4.2e+07
27 March	5.5e+04	4.4e+04	2.7e+07
28 March	5.5e+04	4.5e+04	7.8e+06

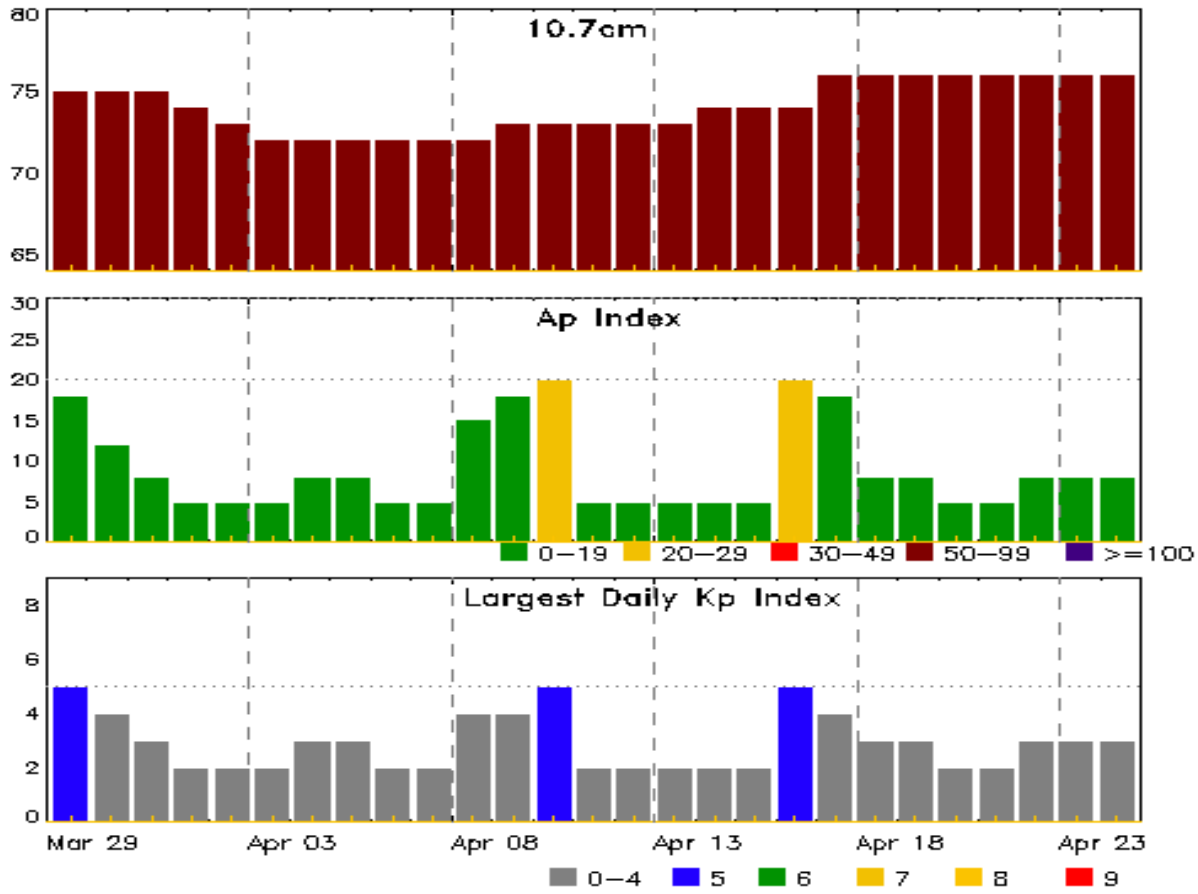
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
22 March	6	2-2-2-1-2-2-1-1	12	3-2-3-4-3-2-1-1	8	3-3-2-2-1-1-1-1
23 March	9	2-3-2-1-2-2-2-3	11	2-3-3-3-3-3-1-1	11	3-4-2-2-2-2-2-3
24 March	11	3-3-3-2-2-1-2-3	17	2-2-3-5-5-0-2-2	11	3-3-3-2-2-1-2-3
25 March	18	5-4-4-2-3-2-1-2	26	3-4-5-3-6-3-2-1	18	5-4-4-2-3-1-1-3
26 March	11	3-3-3-3-2-2-1-2	23	2-3-5-5-5-2-2-1	12	4-3-3-3-1-2-2-2
27 March	7	0-1-0-1-1-2-3-4	4	0-0-1-1-0-1-2-3	9	1-1-1-1-0-1-3-4
28 March	4	3-1-0-1-1-1-1-1	2	2-1-0-1-0-0-0-0	18	3-1-1-1-1-0-1-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
22 Mar 0555	EXTENDED WARNING: Geomagnetic K = 4	21/1415 - 22/1300
22 Mar 0845	ALERT: Electron 2MeV Integral Flux >= 1000pfu	22/0820
23 Mar 0501	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	22/0820
23 Mar 0553	WARNING: Geomagnetic K = 4	23/0555 - 1500
23 Mar 0604	ALERT: Geomagnetic K = 4	23/0600
24 Mar 0650	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	22/0820
24 Mar 1954	WARNING: Geomagnetic Sudden Impulse expected	24/2000 - 2100
24 Mar 2040	SUMMARY: Geomagnetic Sudden Impulse	24/2016
25 Mar 0036	WARNING: Geomagnetic K = 4	25/0036 - 0900
25 Mar 0048	ALERT: Geomagnetic K = 4	25/0048
25 Mar 0053	WARNING: Geomagnetic K = 5	25/0053 - 0600
25 Mar 0157	ALERT: Geomagnetic K = 5	25/0157
25 Mar 1343	WARNING: Geomagnetic K = 4	25/1342 - 2359
25 Mar 1404	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	22/0820
25 Mar 2211	WATCH: Geomagnetic Storm Category G1 predicted	
26 Mar 0149	WARNING: Geomagnetic K = 4	26/0149 - 0900
26 Mar 0151	ALERT: Geomagnetic K = 4	26/0151
26 Mar 1442	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	22/0820
26 Mar 2155	WATCH: Geomagnetic Storm Category G1 predicted	
27 Mar 2348	WARNING: Geomagnetic K = 4	27/2348 - 28/0600
27 Mar 2349	ALERT: Geomagnetic K = 4	27/2349
27 Mar 2351	WARNING: Geomagnetic K = 5	27/2351 - 28/0600

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
29 Mar	75	18	5	12 Apr	73	5	2
30	75	12	4	13	73	5	2
31	75	8	3	14	74	5	2
01 Apr	74	5	2	15	74	5	2
02	73	5	2	16	74	20	5
03	72	5	2	17	76	18	4
04	72	8	3	18	76	8	3
05	72	8	3	19	76	8	3
06	72	5	2	20	76	5	2
07	72	5	2	21	76	5	2
08	72	15	4	22	76	8	3
09	73	18	4	23	76	8	3
10	73	20	5	24	76	8	3
11	73	5	2				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
22 Mar	0110	0139	0159	B5.6			2810
22 Mar	1517	1517	1521		SF	N20E57	2811
22 Mar	1709	1709	1714		SF	N19E53	2811
22 Mar	1825	1840	1852	B1.5			2811
22 Mar	2033	2040	2044	B1.8			2811
22 Mar	2123	2128	2137	B1.0			2811
23 Mar	1638	1642	1648	B1.2			2811
23 Mar	2031	2034	2039	B1.2			2811
23 Mar	2216	2226	2231	B1.2			2811
24 Mar	0007	0012	0033	B1.1			2811
24 Mar	0401	0407	0412	B1.7			2811
24 Mar	2152	2200	2205	B3.0			2812
25 Mar	1507	1519	1528	B8.3	SF	N21E37	2812
25 Mar	1552	1603	1621	B1.5			2812
25 Mar	1641	1652	1701	B1.8			2810
25 Mar	2142	2149	2156	B1.0			2812
26 Mar	1347	1356	1408	B1.2			2812
27 Mar	2034	2038	2042	B1.2			2812

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2808												
09 Mar	N19E68	37	20	1	Hsx	1	A	1							
10 Mar	N19E55	37	20	1	Hsx	1	A								
11 Mar	N19E42	36	50	2	Hsx	1	A								
12 Mar	N19E32	33	30	8	Cao	5	B								
13 Mar	N19E18	34	10	6	Hax	2	A								
14 Mar	N19E04	35	10	1	Axx	1	A								
15 Mar	N19W04	34	10	3	Axx	1	A								
16 Mar	N19W19	31	10	2	Axx	1	A								
17 Mar	N19W32	31	plage												
18 Mar	N19W46	32	plage												
19 Mar	N19W60	33	plage												
20 Mar	N19W74	34	plage												
21 Mar	N19W88	35	plage												
								1	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 35

			Region 2810												
16 Mar	N17E64	308	30	1	Hrx	2	A								
17 Mar	N18E52	307	50	2	Hax	2	A								
18 Mar	N17E38	307	200	3	Hax	2	A								
19 Mar	N18E26	307	30	2	Hrx	4	A								
20 Mar	N18E13	307	10	2	Axx	2	A								
21 Mar	N18W01	307	plage												
22 Mar	N18W15	308	plage												
23 Mar	N18W29	309	plage												
24 Mar	N18W43	310	plage												
25 Mar	N18W57	311	plage												
26 Mar	N18W71	312	plage												
27 Mar	N18W85	312	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 307

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2811												
21 Mar	N21E58	248	10	1	Bxo	2	B								
22 Mar	N20E47	246	40	6	Bxo	2	B				2				
23 Mar	N19E33	245	50	6	Cao	5	B								
24 Mar	N20E21	245	10	8	Bxo	5	B								
25 Mar	N19E05	248	20	5	Bxo	3	B								
26 Mar	N20W07	248	10	3	Bxo	3	B								
27 Mar	N20W21	248	plage												
28 Mar	N20W34	248	plage												
								0	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 248

			Region 2812												
22 Mar	N21E67	226	0	1	Hrx	1	A								
23 Mar	N21E53	225	30	1	Hsx	1	A								
24 Mar	N21E41	224	30	1	Hsx	1	A								
25 Mar	N21E27	227	30	2	Hsx	1	A				1				
26 Mar	N21E15	226	30	1	Hax	1	A								
27 Mar	N21E01	226	30	1	Hax	1	A								
28 Mar	N21W12	226	10	1	Hrx	1	A								
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 226

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

Published every Monday by the Space Weather Prediction Center.

U.S. Department of Commerce
NOAA / National Weather Service
Space Weather Prediction Center
325 Broadway, Boulder CO 80305

Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

The Weekly has been published continuously since 1951 and is available online since 1997.

https://www.swpc.noaa.gov/products/weekly-highlights-and-27-day-forecast -- Current

ftp://ftp.swpc.noaa.gov/pub/warehouse -- Online archive from 1997

https://www.ngdc.noaa.gov/stp/satellite/goes-r.html -- NCEI GOES data textarchive

https://www.swpc.noaa.gov/products/solar-cycle-progression -- Solar Cycle Progression web site

https://www.swpc.noaa.gov/content/contact-us -- Contact and Copyright information

https://www.swpc.noaa.gov/sites/default/files/images/u2/Usr_guide.pdf -- User Guide