Space Weather Highlights
03 April - 09 April 2023

SWPC PRF 2484
10 April 2023

Solar activity was at low to moderate levels. Low levels were observed on 03-05, 07, and 09 Apr while moderate levels were observed on 06 and 08 Apr. Region 3272 (S21, L=102, class/area Eai/280 on 09 Apr) was responsible for the majority of the C-class activity since its emergence on 05 Apr. The region also produced M3 and M2/1n flares at 06/0553 UTC and 08/0146 UTC, respectively. Other activity included a CME off the SW limb first observed at 07/1336 UTC that was associated with a filament eruption seen in SDO/AIA 304 imagery beginning at 07/0829 UTC centered near S27W10. Modelling indicated a miss, however a glancing blow could not be ruled out early on 12 Apr.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels throughout the period due to CH HSS influence. The maximum flux was 4,290 pfu observed at 03/1455 UTC.

Geomagnetic field activity ranged from quiet to active levels. The period began with solar wind speed around 528 km/s with total field near 6-7 nT under negative polarity CH HSS influence. By late on 05 Apr, solar wind speed returned to nominal levels until 09/2158 UTC when total field showed a small increase to 8 nT. The geomagnetic field responded with quiet to active levels on 03-04 Apr, quiet to unsettled levels on 05-07 and 09 Apr, and quiet levels on 08 Apr.

Space Weather Outlook
10 April - 06 May 2023

Solar activity is expected to be low with a chance for moderate levels (R1-R2, Minor-Moderate) on 10-25 Apr and again from 02-06 May due to flare potential of Region 3272 and the return of old Region 3256 (S22, L=001) on 12 Apr. Very low to low levels are expected on 26 Apr-01 May.

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 10-11 Apr and again on 23 Apr-06 May due to recurrent CH HSS influence.

Geomagnetic field activity is expected to reach unsettled levels on 10-11 Apr due to CH HSS activity. Unsettled to active levels are expected on 12 Apr due to a combination of HSS influence and a possible glancing blow from the 07 Apr CME. Unsettled to active levels are expected again on 17-18 Apr, 20-22 Apr, and 26 Apr-04 May with G1 (Minor) storming likely on 20, 27, and 30 Apr due to recurrent CH HSS activity.

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
03 April	134	56	420	B5.0	2	0	0	1	0	0	0	0
04 April	136	44	140	B5.0	2	0	0	0	0	0	0	0
05 April	137	37	170	B6.9	10	0	0	0	0	0	0	0
06 April	137	33	170	B7.3	5	1	0	1	0	0	0	0
07 April	136	38	300	B7.5	6	0	0	4	0	0	0	0
08 April	136	49	310	B7.7	11	1	0	9	1	0	0	0
09 April	140	52	330	B9.4	15	0	0	8	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
03 April	5.0e+04	2.1e+04	1.3e+08
04 April	4.3e+04	2.2e+04	8.1e+07
05 April	4.9e+04	2.2e+04	9.2e+07
06 April	6.7e+04	2.2e+04	1.3e+08
07 April	2.6e+04	2.2e+04	3.5e+07
08 April	2.6e+04	2.2e+04	7.7e+07
09 April	8.6e+04	2.3e+04	6.5e+07

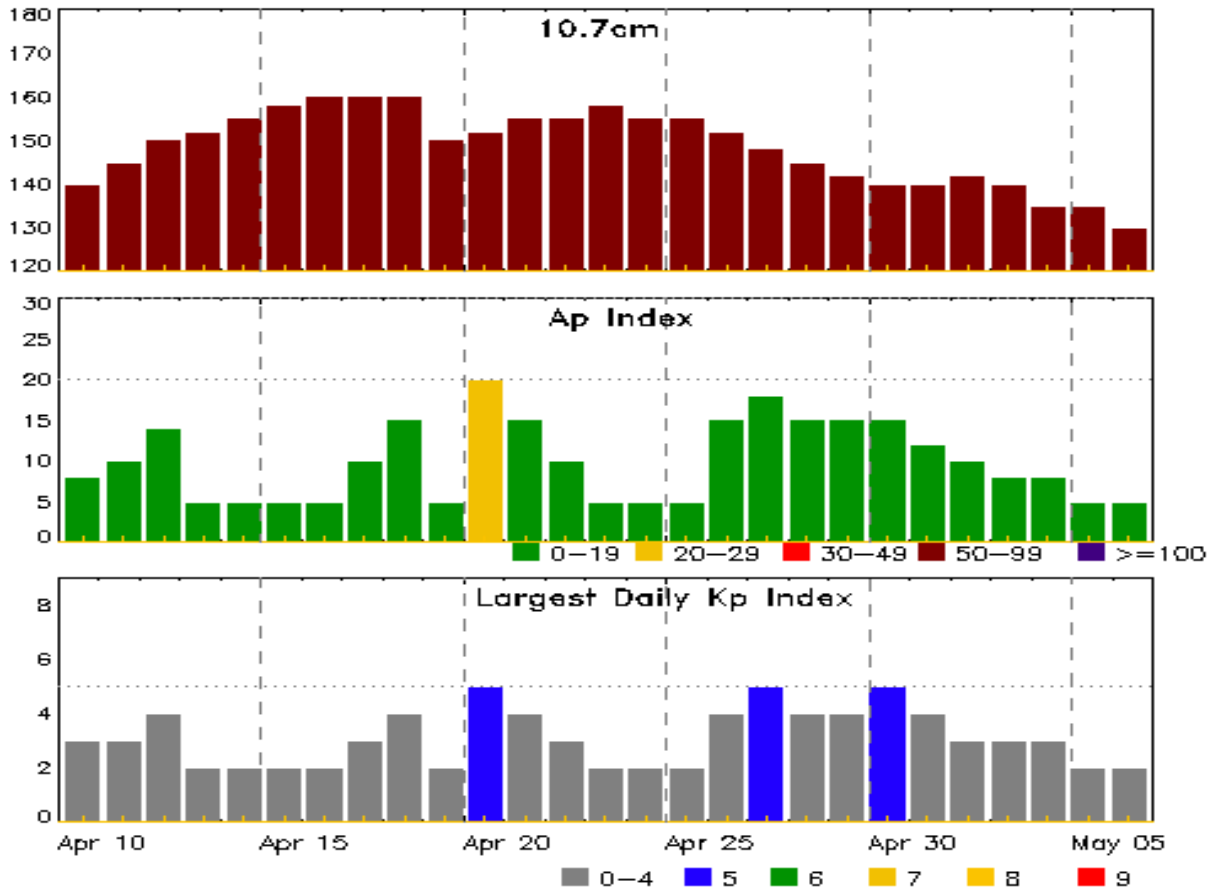
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
03 April	11	3-2-2-2-3-2-3-3	29	2-1-3-5-6-5-3-3	15	4-2-2-3-3-3-4-3
04 April	10	4-3-2-2-2-1-2-2	19	3-3-5-4-4-1-2-2	13	4-4-2-3-2-1-2-3
05 April	9	3-2-2-2-3-2-2-2	23	3-2-3-5-6-3-1-1	11	3-3-2-3-3-2-3-2
06 April	7	2-1-1-3-2-1-3-1	20	2-2-2-6-5-1-1-1	9	2-2-1-3-2-1-3-2
07 April	7	2-2-2-2-3-1-2-1	12	2-3-4-4-3-0-1-0	8	3-3-2-2-2-1-2-2
08 April	5	1-2-1-2-2-2-1-1	5	1-2-3-2-1-1-0-0	6	2-2-1-2-1-1-1-2
09 April	5	2-1-1-1-2-1-1-2	4	1-1-1-2-2-1-1-1	15	3-1-1-1-1-1-1-2

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
03 Apr 0115	WARNING: Geomagnetic K = 4	03/0115 - 1200
03 Apr 0258	ALERT: Geomagnetic K = 4	03/0258
03 Apr 0317	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
03 Apr 0514	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
03 Apr 2024	WARNING: Geomagnetic K = 4	03/2024 - 04/0600
03 Apr 2102	ALERT: Geomagnetic K = 4	03/2059
04 Apr 0555	EXTENDED WARNING: Geomagnetic K = 4	03/2024 - 04/1500
04 Apr 1221	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
05 Apr 0229	WARNING: Geomagnetic K = 4	05/0228 - 0900
05 Apr 1237	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
06 Apr 1026	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
06 Apr 2023	WARNING: Geomagnetic K = 4	06/2022 - 2359
07 Apr 1553	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
08 Apr 1002	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050
09 Apr 1227	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	31/2050

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
10 Apr	140	8	3	24 Apr	155	5	2
11	145	10	3	25	155	5	2
12	150	14	4	26	152	15	4
13	152	5	2	27	148	18	5
14	155	5	2	28	145	15	4
15	158	5	2	29	142	15	4
16	160	5	2	30	140	15	5
17	160	10	3	01 May	140	12	4
18	160	15	4	02	142	10	3
19	150	5	2	03	140	8	3
20	152	20	5	04	135	8	3
21	155	15	4	05	135	5	2
22	155	10	3	06	130	5	2
23	158	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
06 Apr	0536	0553	0604	M3.0	0.030					3272		100	
08 Apr	0138	0146	0150	M2.9	0.010	1N	S21E57			3272			

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
03 Apr	0031	0037	0039		SF	S22W03	3270
03 Apr	0847	0952	1005	C2.5			
03 Apr	2217	2220	2224	B8.7			3270
03 Apr	2242	2247	2252	B8.0			3270
03 Apr	2349	2353	2357	C2.8			3270
04 Apr	0228	0249	0303	C1.7			3270
04 Apr	0303	0308	0317	C2.1			
04 Apr	1324	1334	1347	B8.4			3270
05 Apr	0517	0522	0547	C1.1			
05 Apr	0959	1020	1032	C1.3			
05 Apr	1203	1217	1233	C1.8			
05 Apr	1536	1543	1557	C0.9			3272
05 Apr	1707	1711	1715	C1.0			3272
05 Apr	1741	1752	1801	C1.7			3272
05 Apr	1801	1809	1813	C1.4			3270
05 Apr	1857	1901	1911	C1.2			3272
05 Apr	2112	2119	2123	C1.4			3272
05 Apr	2202	2206	2214	C1.2			3272
06 Apr	0112	0123	0130	C2.4			3272
06 Apr	0448	0454	0458	C1.5			3272
06 Apr	0536	0553	0604	M3.0			3272
06 Apr	1246	1255	1300	C1.1			3272
06 Apr	1300	1303	1307	C1.5			3272
06 Apr	1321	1400	1429	C3.9			
06 Apr	1924	1924	1930		SF	S22E34	
07 Apr	0235	0249	0300	C1.3			3270
07 Apr	0542	0544	0552		SF	S22E28	
07 Apr	0621	0627	0647	C1.4			3272
07 Apr	1627	1637	1641	C1.1			3272

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
07 Apr	2014	2022	2027	C1.7			3272
07 Apr	2033	2042	2046	C2.5	SF	S18E62	3272
07 Apr	2218	2220	2223		SF	S18E58	3272
07 Apr	2324	2334	2350	C5.8	SN	S18E62	3272
08 Apr	0138	0146	0150	M2.9	1N	S21E57	3272
08 Apr	0432	0443	0449	C5.3	SF	S21E57	3272
08 Apr	1024	1030	1034	C1.1			3272
08 Apr	1114	1119	1123	C3.2			3272
08 Apr	1320	1325	1329	C1.2	SF	S23E53	3272
08 Apr	1339	1339	1346		SF	S28W26	3269
08 Apr	1406	1414	1418	C1.4	SF	S23E53	3272
08 Apr	1420	1420	1424		SF	S20E52	3272
08 Apr	1425	1426	1428		SF	S23E52	3272
08 Apr	1722	1728	1732	C1.5			
08 Apr	1837	1849	1916	C1.9	SF	S22E50	3272
08 Apr	1916	1921	1925	C2.0			3272
08 Apr	1937	1940	1944	C1.9	SF	S23E50	3272
08 Apr	2153	2158	2202	C1.3	SF	S22E49	3272
08 Apr	2247	2301	2326	C1.4			3272
09 Apr	0125	0136	0151	C1.4			3272
09 Apr	0214	0229	0254	C1.8			3272
09 Apr	0254	0304	0315	C1.6			3272
09 Apr	0551	0608	0624	C9.0	SF	S18E47	3272
09 Apr	0733	0738	0753	C1.7			
09 Apr	0753	0756	0800	C1.6			
09 Apr	1445	1453	1501	C3.2	SF	S19E42	3272
09 Apr	1507	1508	1518		SF	S20E47	3272
09 Apr	1614	1628	1632	C2.4	SF	N10E31	3273
09 Apr	1632	1635	1639	C2.8			
09 Apr	1813	1827	1836	C3.5	SF	S22E42	3272
09 Apr	1829	1838	1903	C3.7	SF	S22E42	3272
09 Apr	1916	1923	1929	C2.0	SF	N10E30	3273
09 Apr	2032	2039	2052	C1.5	SF	S25E42	3272
09 Apr	2101	2119	2128	C2.7			
09 Apr	2128	2134	2138	C2.4			

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 3262												
22 Mar	S19E72	306	180	2	Hsx	1	A	1							
23 Mar	S18E56	308	130	2	Cao	2	B								
24 Mar	S19E43	309	130	3	Hax	2	A								
25 Mar	S19E30	308	130	2	Hsx	1	A				1				
26 Mar	S19E17	308	130	2	Hsx	1	A	2			2				
27 Mar	S20E06	306	60	3	Hsx	3	A								
28 Mar	S19W08	307	100	2	Hsx	1	A								
29 Mar	S19W20	306	60	3	Hsx	4	A								
30 Mar	S19W34	306	70	4	Hax	4	A	1				1			
31 Mar	S19W47	306	120	2	Hax	2	A				1				
01 Apr	S19W61	307	80	2	Hax	2	A								
02 Apr	S18W74	307	60	1	Hax	2	A								
03 Apr	S16W86	305	150	1	Hax	1	A								
								4	0	0	4	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 306

			Region 3264												
24 Mar	N16E70	281	30	2	Hsx	1	A								
25 Mar	N16E56	283	50	2	Hsx	1	A								
26 Mar	N16E44	281	50	2	Hsx	1	A								
27 Mar	N15E32	279	10	1	Hsx	1	A								
28 Mar	N15E18	280	50	1	Hsx	1	A								
29 Mar	N15E05	279	30	3	Hsx	2	A								
30 Mar	N15W06	278	40	1	Hsx	1	A								
31 Mar	N16W19	278	80	2	Hsx	1	A								
01 Apr	N16W33	279	70	2	Hsx	1	A								
02 Apr	N16W46	279	60	1	Hsx	1	A								
03 Apr	N17W60	279	100	1	Hsx	1	A								
04 Apr	N17W74	280	0		Axx	1	A								
05 Apr	N17W88	282	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 279

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 3266												
29 Mar	N08E42	243	20	3	Bxo	4	B								
30 Mar	N09E27	245	10	2	Bxo	2	B								
31 Mar	N09E15	244	10	6	Bxo	5	B								
01 Apr	N09E01	245	plage												
02 Apr	N08W11	244	plage												
03 Apr	N10W25	244	30	4	Cro	3	B								
04 Apr	N10W39	246	plage												
05 Apr	N11W54	247	30	3	Cro	2	B								
06 Apr	N10W67	247	plage												
07 Apr	N09W80	246	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 245

			Region 3267												
29 Mar	S18E46	239	10	1	Axx	1	A								
30 Mar	S17E33	239	plage												
31 Mar	S17E19	240	plage					1							
01 Apr	S17E05	241	plage								1				
02 Apr	S17W08	241	plage												
03 Apr	S17W22	242	plage												
04 Apr	S17W36	243	plage												
05 Apr	S17W50	244	plage												
06 Apr	S17W64	244	plage												
07 Apr	S17W78	245	plage												
								1	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 241

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 3268												
29 Mar	S24E21	264	10	2	Axx	1	A								
30 Mar	S24E09	263	plage												
31 Mar	S24W05	264	plage												
01 Apr	S24W19	265	plage												
02 Apr	S24W33	266	plage												
03 Apr	S24W47	267	plage												
04 Apr	S24W61	268	plage												
05 Apr	S24W75	269	plage												
06 Apr	S24W89	269	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 264

			Region 3269												
02 Apr	S25E42	191	10	1	Axx	2	A								
03 Apr	S25E28	192	plage												
04 Apr	S25E14	193	plage												
05 Apr	S25W00	194	plage												
06 Apr	S25W14	194	plage												
07 Apr	S25W28	195	plage												
08 Apr	S25W41	195	plage								1				
09 Apr	S25W54	195	plage												
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 194

			Region 3270												
02 Apr	S23W04	237	80	6	Dao	9	B	4			6				
03 Apr	S23W18	238	140	8	Dai	11	BGD	1			1				
04 Apr	S23W32	239	140	8	Dsi	11	BG	1							
05 Apr	S23W45	238	140	9	Dai	15	BG	1							
06 Apr	S23W59	238	130	13	Eao	12	BG								
07 Apr	S24W73	239	120	13	Eao	6	B	1							
08 Apr	S24W85	239	80	12	Eao	3	B								
								8	0	0	7	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 237

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 3271												
04 Apr	S17W18	224	0	2	Axx	2	A								
05 Apr	S16W33	226	plage												
06 Apr	S16W47	227	plage												
07 Apr	S16W61	228	plage												
08 Apr	S16W74	228	plage												
09 Apr	S16W87	228	plage												
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 224															
			Region 3272												
05 Apr	S20E86	107	plage					6							
06 Apr	S21E72	107	40	5	Cso	1	B	4	1						
07 Apr	S22E63	104	180	11	Eai	12	BG	5			3				
08 Apr	S21E50	104	230	14	Eai	26	BG	10	1		8	1			
09 Apr	S21E38	102	280	14	Eai	24	BG	8			6				
								33	2	0	17	1	0	0	0
Still on Disk.															
Absolute heliographic longitude: 102															
			Region 3273												
09 Apr	N10E27	113	50	4	Cao	8	B	2			1				
								2	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 113															

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

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