

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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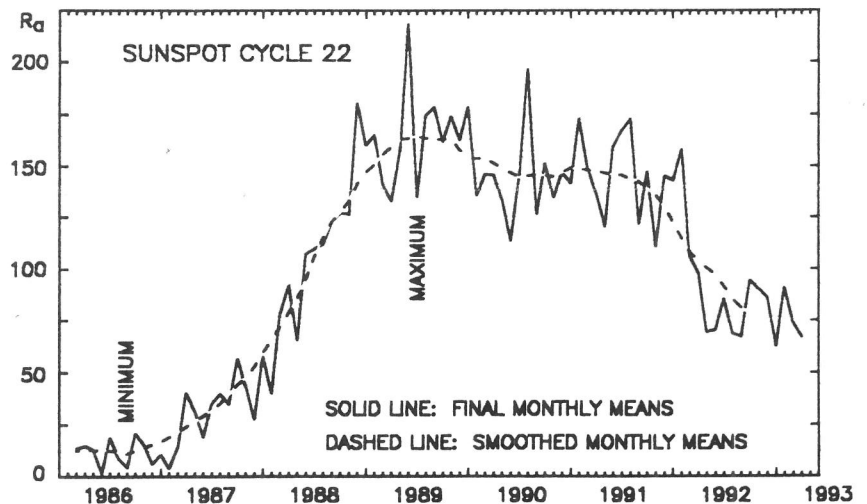
April 1993

American Relative Sunspot Numbers for April

	R _a Final				
1)	70	11)	63	21)	98
2)	64	12)	36	22)	96
3)	85	13)	20	23)	104
4)	67	14)	15	24)	106
5)	79	15)	14	25)	88
6)	92	16)	26	26)	57
7)	82	17)	39	27)	62
8)	91	18)	54	28)	52
9)	90	19)	70	29)	43
10)	78	20)	96	30)	34

Mean: 65.7

Number of reports: 98



April Summary: With one exception, solar activity was low during the first eight days of April. In that instance, activity climbed into the moderate range after a optically uncorrelated class M1.5 flare erupted late on the 7th. Otherwise, a small filament disappeared from the Sun's NE quadrant on the 1st/2nd, and the Sun's Northern Hemisphere was spotless on the 7th.

The geomagnetic field was quiet to unsettled until the 4th when a sudden impulse was recorded (11 nT at Boulder), followed by minor to severe storm conditions at all latitudes. The GOES spacecraft experienced multiple magnetopause crossings as a major geomagnetic storm buffeted the magnetosphere. Field conditions returned to their previous level by the 6th. The source of this activity is somewhat uncertain, although a large coronal hole appears to have played a prominent role.

Activity continued in the low range from the 9th through 17th. No solar flares exceeded class C intensity. An eruptive prominence was observed on the NE limb on the 11th. For the first time since sunspot cycle maximum (July 1989), the Sun's Southern Hemisphere was spotless on the 15th, and again on the 16th.

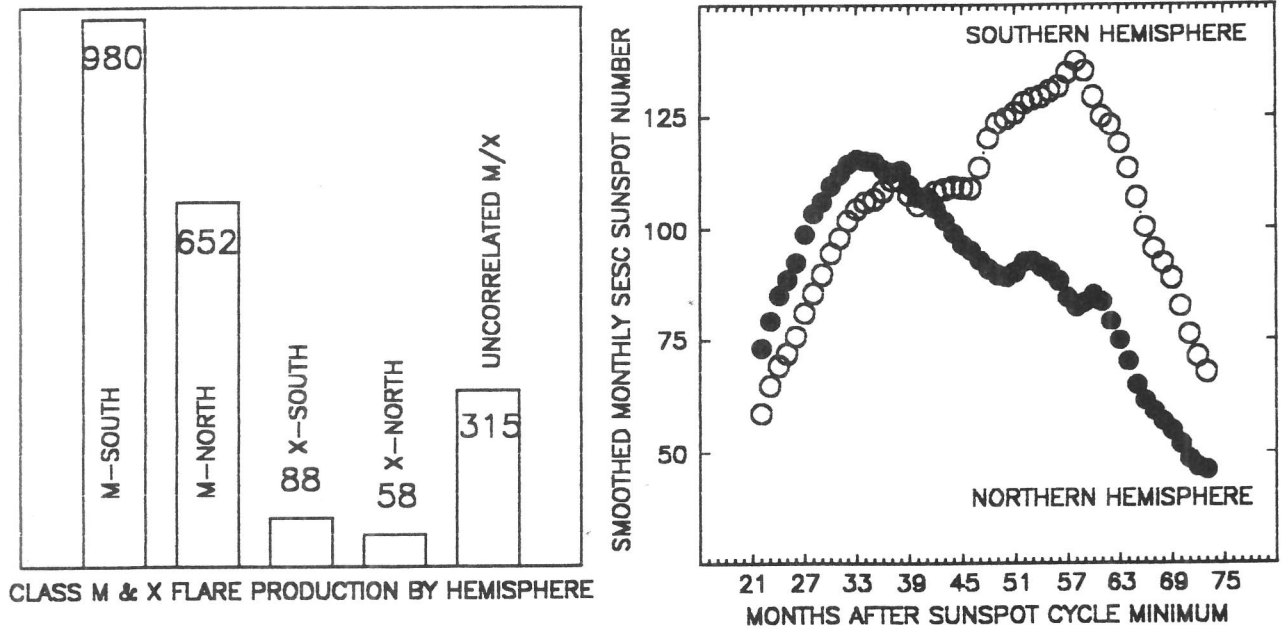
Then on the 18th, NOAA/USAF Region 7477 (N10, L229, DAO) spawned a major flare - rated M8.7/1B - raising the activity level into the high range. Region 7477 followed with a smaller, class M1.5/SB flare on the 22nd. The first of these events contributed to major and severe geomagnetic storm conditions at high latitudes and some disturbance of the mid-latitude field on the 20th/21st. Isolated storming during the several days previous to this occurrence was probably related to coronal hole effects, typical for this cycle phase.

Solar activity was low during the remainder of April. A large filament left the solar disk on the 30th; an event accompanied by a long duration class B8 solar flare. The geomagnetic field was at quiet to unsettled disturbance levels. The smoothed American Relative Sunspot Number for October 1992 declined to a value of 77.4.

The estimated mean American Relative Sunspot Number for 1-13 May is 67. Activity has continued at the April level during this interval; just one solar flare has attained class M intensity. Aurorae were frequently observed at high latitude stations between the 8th and 10th. The source of these phenomena is likely a combination of effects from a negative polarity coronal hole and the class M flare. It appears that - after a fairly steep decline during the first portion of 1992 (see [Solar Bulletin](#), 49, 3 and the above graph) - sunspot activity has temporarily stabilized at a distinctly lower plateau. Cycle minimum is currently predicted to occur sometime during 1996.

[A portion of this information was taken from the SELDADS data base.]

Solar Flare/Sunspot Activity by Hemisphere During Cycle 22



Sudden Ionospheric Disturbances (SES) Recorded During March 1993

Records were received from A3,9,40,50,59,61,62,63,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79

Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def
1	1100	1-	5	8	0019	1-	5	15	1338	1	5	21	2058	1	5
1	1653	2+	5	8	0034	1	5	15	1528	2+	4	22	0105	1+	5
1	1907	1-	5	8	1020	1-	4	15	1852	1-	5	22	1407	1+	5
1	2333	1-	5	8	1209	1-	5	15	1910	2	5	22	1448	1-	5
2	1510	2	5	8	1750	1-	5	15	2044	2+	5	22	1620	2	5
2	1820	2+	5	8	2120	1-	5	16	0415	1-	5	22	1745	1-	5
2	2046	1	5	10	0932	1-	5	16	0913	1	5	22	1752	1-	5
2	2114	2+	5	10	0946	1-	5	17	1527	2+	5	22	1953	1+	5
3	0707	1-	5	10	1201	2+	5	17	1806	1+	5	22	2115	1	5
3	1055	1+	5	10	1701	1-	5	18	0115	1	5	23	0140	1+	5
3	1530	1	5	10	1812	1-	5	18	1438	1-	5	23	0806	1-	5
3	1732	1-	5	10	1824	1+	5	18	1521	2+	5	23	1507	1-	5
3	1946	1	5	10	2000	1-	5	18	1722	1-	5	23	1907	1	5
4	0109	2	5	11	0800	1-	5	18	2259	1+	5	23	2352	2	5
4	1017	1-	5	11	1153	1+	5	19	0015	2	5	24	0144	1-	5
4	1035	1-	5	11	1348	1-	5	19	1309	2+	5	24	1457	1	5
4	1225	1+	5	11	1434	2	5	19	2003	1+	5	25	1801	1-	5
4	1517	1-	5	11	1516	1+	5	20	0704	1-	5	25	1920	1-	5
4	1904	1-	5	11	1613	2+	5	20	0744	1	5	25	1931	1-	5
5	0046	1	5	11	1653	2	5	20	1001	2+	5	25	1959	1-	5
5	1124	1-	5	11	1740	1	5	20	1212	1	5	25	2108	1-	5
6	0055	1-	5	11	1916	2	5	20	1436	1	5	28	0820	1-	5
6	1009	1-	5	11	2159	2	5	20	1508	1-	5	28	0836	1-	5
6	1029	1-	5	12	0406	1-	5	20	1658	1-	5	28	1505	1-	5
6	1038	2	5	12	0713	1	5	20	1707	2	5	29	0833	1+	5
6	1245	1-	5	12	1201	1	5	20	1752	2+	5	29	1053	1-	5
6	1900	1-	5	12	1237	1	5	20	1827	1-	4	29	1258	2	5
6	1915	1-	5	12	1820	3	5	20	2147	1	5	29	1716	2+	5
6	2027	3	5	12	1849	2+	5	21	0125	1+	5	30	0102	2+	5
6	2230	1-	5	12	2159	1-	5	21	0339	2+	5	30	1256	1	5
7	1307	1+	5	13	0905	1+	5	21	1049	1-	5	30	2030	2	5
7	1654	1	5	13	1301	1-	5	21	1204	1-	5	30	2059	2	5
7	1830	1-	5	13	1525	2+	5	21	1510	1-	5	30	2230	1	5
7	2028	1	5	13	1759	2	5	21	1711	2	5	31	0610	1-	5
7	2139	1	5	13	1917	1-	5	21	1828	1	5	31	0909	1-	5
7	2246	1	5	14	1444	1-	5								

SID Analysts: J. Ellerbe; S. Hansen; J. Knight; A. Okorogu; A. Stokes; M. Taylor; P. Taylor; B. Wingate

Frequencies recorded (kHz): 19.6; 21.4; 22.3; 23.4; 24.0; 24.8; 28.5; 30.6; 48.5; 51.6; 73.6; 77.15