

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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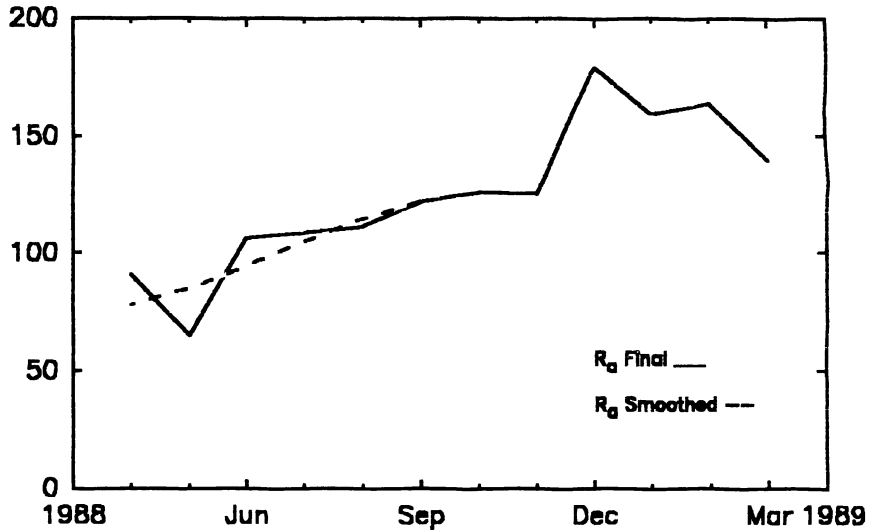


Volume 45 Number 3

March 1989

American Relative Sunspot Numbers for March

	R _a Final		
1) 135	11) 161	21) 150	
2) 125	12) 158	22) 152	
3) 113	13) 179	23) 171	
4) 99	14) 185	24) 146	
5) 92	15) 201	25) 136	
6) 112	16) 191	26) 127	
7) 99	17) 193	27) 107	
8) 118	18) 183	28) 94	
9) 143	19) 162	29) 96	
10) 160	20) 164	30) 79	
	31) 102		
Mean = 139.8			



The smoothed mean American Relative Sunspot Number for September 1988 is 122.2. One-hundred five members of the international network of **American Sunspot Program** contributors submitted reports for March. The major solar flare activity which occurred during March is summarized on page two of this month's Solar Bulletin.

The *estimated* American Sunspot Number for 1-12 April is 140. Region 5395 rotated back onto the visible disk on 2 April as spotless plage, and remained so until a few faint spots appeared between 6-8 April. However, the region has produced two M-level events thus far, both on 2 April. Northern Region 5441 (N36, L235, EKO on 9 April) produced an X3/4B flare early on 9 April followed by a proton event which began on the 11th. This complex region was composed of three abutted/stacked sunspot groups. Region 5441 had begun to decay and simplify magnetically by the end of the period.

Sudden Ionospheric Disturbances Recorded During February

Records were received from A1,3,9,19,26,40,46,49,50,52,59,60,61.

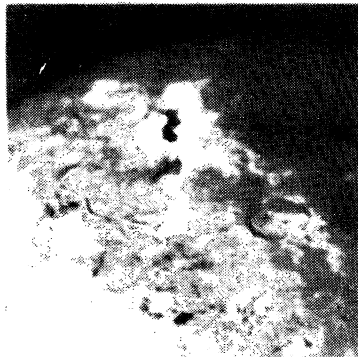
Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp
1	07:44	1	6	09:13	2+	11	16:25	1+	18	07:47	2+	22	17:17	1-
1	08:12	2	6	14:33	2	13	16:32	1+	18	15:45	1-	22	17:48	2+
1	13:25	2+	6	15:42	1	13	18:25	2+	18	18:45	1	23	17:20	2
1	16:18	2	6	16:47	2	14	05:00	2+	19	14:02	2+	23	19:49	2
1	17:43	1	6	18:03	1-	14	06:04	1-	19	21:17	2+	23	21:12	1
1	19:02	1-	6	19:20	2+	14	06:36	1-	20	14:00	2+	24	08:31	1+
2	08:31	1-	6	21:26	2+	14	07:10	1+	21	09:13	2	24	14:23	2+
2	17:28	2+	7	14:45	1+	14	14:20	1-	21	14:00	1+	24	15:46	1-
2	20:32	1-	7	15:08	1-	14	15:31	1	21	15:02	1+	24	16:02	2
3	14:30	2+	7	16:41	2	15	08:54	2	21	16:03	1+	24	20:15	2
3	18:30	2+	8	06:21	1+	15	13:45	1-	21	17:00	1	24	21:13	1+
4	04:27	1+	8	09:49	1+	15	14:28	1	21	17:43	1	24	23:02	1+
4	05:38	2	8	11:15	2	15	18:53	1-	21	18:04	1-	25	14:05	1-
4	06:25	2	8	15:13	2+	15	19:10	2	21	18:20	1+	25	15:16	1
4	08:11	2	8	17:15	2	16	03:45	2	21	21:13	1	25	19:26	1+
4	10:01	3+	8	20:15	2	16	04:25	2	21	21:58	1+	26	16:58	2
5	05:08	2	9	13:00	2+	16	16:33	2+	22	08:02	1	28	15:24	1
5	18:59	1-	9	19:32	1	16	22:04	2	22	13:02	1-	28	16:47	1
5	19:19	2	10	04:30	3	17	17:32	2+	22	14:44	1	28	17:07	1+
5	21:05	1+	10	20:34	2	17	22:20	2+	22	16:00	2	28	18:15	2+
6	08:14	1+	11	15:01	1-									

(Def = 5 for all events)

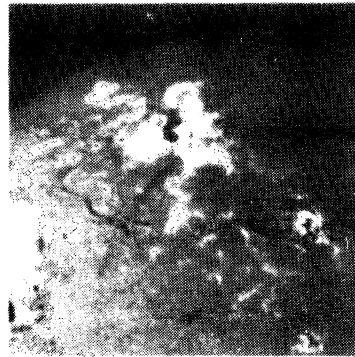
SID Analyst: Bruce R. Wingate

Major Solar Flare and Mass Ejection

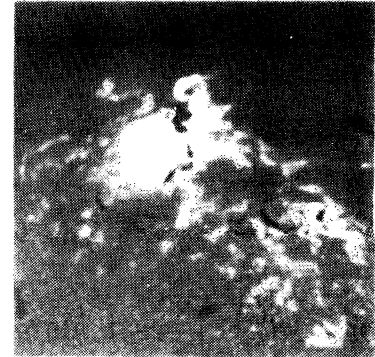
9 March 1989



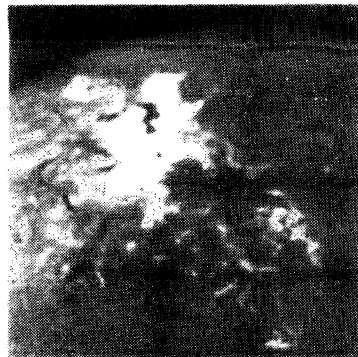
15 16 UT



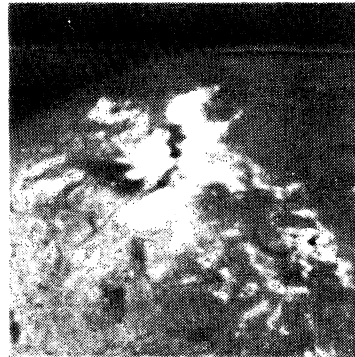
15 23 UT



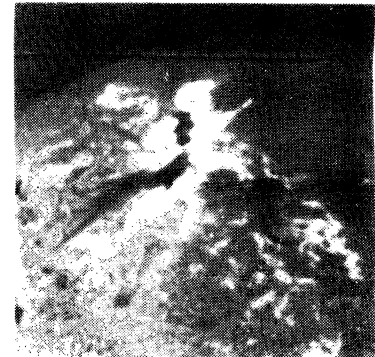
15 32 UT



15 40 UT



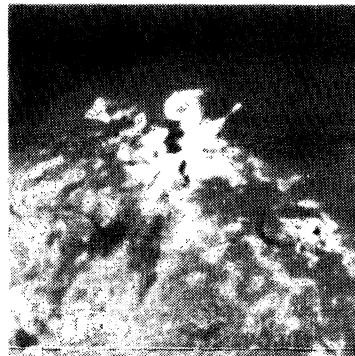
15 47 UT



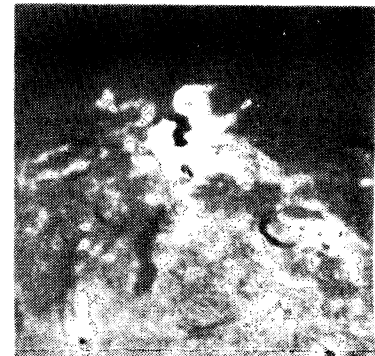
15 55 UT



16 05 UT



16 19 UT



16 32 UT

This flare and its associated mass ejection were photographed in the red spectrum line of atomic hydrogen between 15:16 and 16:32 Universal Time on 9 March. The activity seen here is one example of several large flares that produced major geophysical effects including communications outages, aurorae and enhanced levels of radiation in space, during 6-20 March. The flare is seen at maximum intensity (X4/4B) in the frame recorded at 15:32 UT, and is followed by a huge spray-like ejection of dark material more than 125,000 miles in length (frame at 15:55 UT). The photograph was taken at the National Solar Observatory, Sacramento Peak. (Photograph and information courtesy of D.F. Neidig and T. Compton.)

Northern Region 5395 (N34, L257, FKC on 17 March) which produced this event, was also responsible for ten additional X-level X-ray flares during March: an event estimated at X15 (the GOES satellite detector became saturated at the X12 level) on the 6th; an X1 on the 7th; a second X4 on the 10th; two X1 flares on the 11th; an X1 on the 13th; an X1 on the 14th; X3 and X1 events on the 16th; and an X6 on the 17th (visible in white-light). Forty-eight M-level events were also associated with Region 5395. The region passed over the western limb on 19 March, and returned 2 April as Region 5440, an area of spotless *plage*. Northern Region 5409 (N18, L140, EK1 on 22 March) also produced an X-level event, an X1 on the 23rd. Solar activity between 6 and 20 March was the highest in 20 to 30 years.