Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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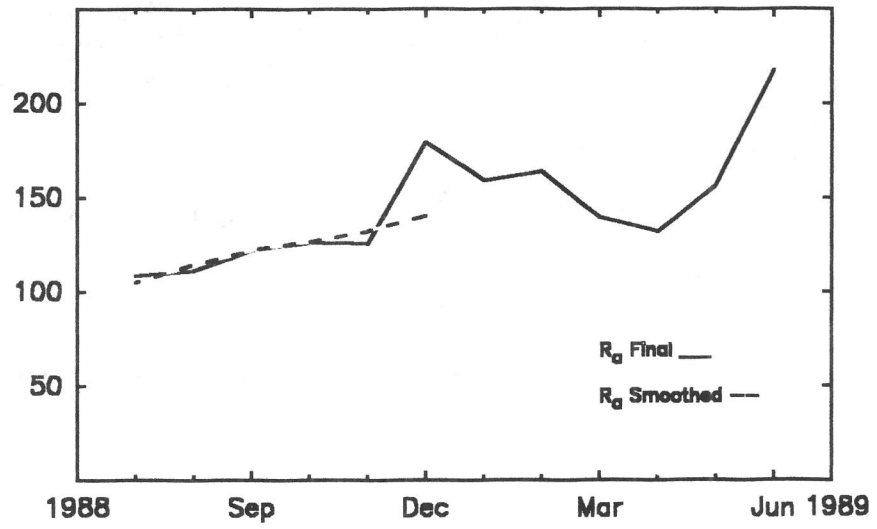
American Relative Sunspot Numbers for June

	R_a Final	
1) 163	11) 238	21) 220
2) 171	12) 232	22) 219
3) 168	13) 280	23) 227
4) 168	14) 274	24) 242
5) 173	15) 295	25) 248
6) 150	16) 288	26) 265
7) 143	17) 257	27) 231
8) 169	18) 244	28) 201
9) 199	19) 252	29) 195
10) 214	20) 244	30) 155

Mean = 217.5



The smoothed-mean American Relative Sunspot Number for December 1988 is 140.4. One-hundred-five members of the international network of **American Sunspot Program** collaborators submitted reports for June. Solar activity increased during the month. On 15 June the Ottawa 10.7 centimeter solar flux reached its highest level thus far during cycle 22: 327 s.f.u. The mean daily relative sunspot number for June also attained its highest value for the current cycle, climbing to 217.5. As many as nineteen separate sunspot groups could be counted on several days, although many were small and magnetically simple. On 14 June, SESC Region 5528 (N21, L095, FKC on 14 June) grew to encompass an area provisionally measured at 2340 millionths solar hemisphere (~2.75 *billion* square-miles). A total of six X-level, and ninety M-level x-ray events were recorded during June. Region 5517 (S18, L197, DAI on 2 June) contributed the first X-class flare, an X1.3/2B event on the 2nd. Region 5521 (S19, L161, EKI on 5 June) yielded the next two events on 3 and 5 June, rated X1.0/1F and X1.0/2B, respectively. On 15 June, Region 5533 (S19, L072, FKO on 15 June) produced the month's strongest event, an X4.1/3B flare, followed by an X3.0/2B event on the 16th. The month's final X-level flare, an X1.6/3B event, occurred on 20 June and was associated with Region 5528. A general decrease in activity began after the 26th.

The *estimated* American Sunspot Number for 1-16 July is *142*. During this period solar activity declined relative to June levels. Only three M-class, and no X-level energetic events had occurred through 16 July. The strongest of these, rated M7.4/1B, was spawned by Region 5575 (N24, L147, DAI on 4 July) early on the 4th. The 10.7 centimeter flux-rate was consistently below 190 s.f.u. during the period, while the x-ray background level fell as low as B7.0.
Note: A portion of this information was obtained from **SESC** PRF, Numbers 718-23, and is considered to be preliminary.

Predicted Smoothed Relative Sunspot Numbers

McNish - Lincoln Method

January 140 (9); February 144 (9); March 151 (10); April 158 (13); May 163 (15); June 169 (20).

Solar-Geophysical Data, Number 537, Part I, 12.

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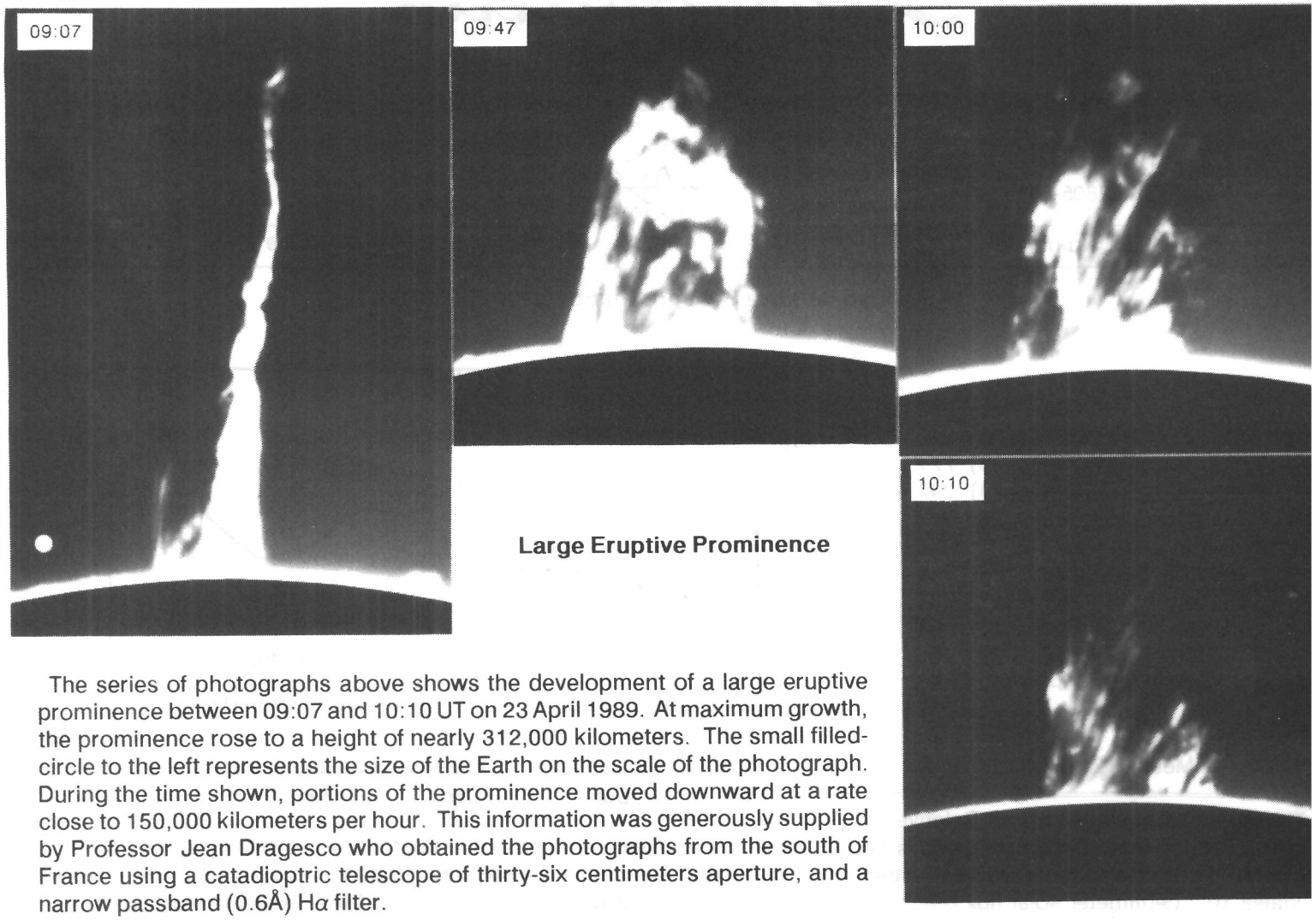
(**Note:** Network collaborators should utilize these reporting facilities whenever possible.)



Large Eruptive Prominence

The series of photographs above shows the development of a large eruptive prominence between 09:07 and 10:10 UT on 23 April 1989. At maximum growth, the prominence rose to a height of nearly 312,000 kilometers. The small filled-circle to the left represents the size of the Earth on the scale of the photograph. During the time shown, portions of the prominence moved downward at a rate close to 150,000 kilometers per hour. This information was generously supplied by Professor Jean Dragesco who obtained the photographs from the south of France using a catadioptric telescope of thirty-six centimeters aperture, and a narrow passband (0.6Å) Hα filter.

Sudden Ionospheric Disturbances Recorded During May

Records were received from A1,3,9,19,26,40,46,49,50,52,59,60,61,62,63,64.

Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp
1	19:44	1+	4	19:17	2	12	12:30	1	21	22:51	1	25	15:33	1
1	20:49	1	4	20:32	2+	12	13:05	1+	22	15:32	2	25	15:58	2+
1	21:28	2	4	22:26	2	12	14:15	1-	22	18:53	1+	26	18:55	1+
1	22:03	1+	5	05:32	2+	12	15:26	2	22	19:38	1+	26	20:58	2
2	14:06	2+	5	07:30	3+	13	15:00	1-	23	07:15	1	26	22:30	2+
2	16:15	2+	5	17:23	1-	14	07:00	1	23	07:35	1-	28	12:30	2+
2	18:52	2+	6	05:33	2+	14	16:49	2	23	08:10	2+	28	15:59	1-
3	15:48	1	6	15:00	2+	18	18:14	1-	23	13:00	2	28	22:15	2+
3	17:32	1-	6	17:02	2	19	14:49	1-	23	14:54	2+	28	23:02	1
3	19:40	2+	6	19:39	2	19	16:57	1	23	17:30	1+	29	13:28	2+
3	21:02	2+	7	07:45	2+	20	11:34	2	23	18:26	1-	29	18:33	2
4	04:23	2	7	17:58	1	20	13:13	1	23	20:04	2	30	07:30	2+
4	08:23	2	7	19:15	1-	20	15:01	1-	23	21:15	2+	30	13:16	2+
4	11:16	2	7	21:18	1+	21	15:15	1	24	13:52	2+	30	17:35	1+
4	15:20	1+	9	17:02	3	21	17:43	1	24	15:07	1	30	19:15	1+
4	16:19	2	10	04:31	2+	21	18:01	2	24	19:35	2+	30	19:34	2
4	17:30	2	11	08:00	2	21	18:56	2	24	21:45	2+	31	19:38	1
4	18:45	1-	11	17:45	1-									

Def = 5 for all events. **SID Analyst:** Bruce R. Wingate