

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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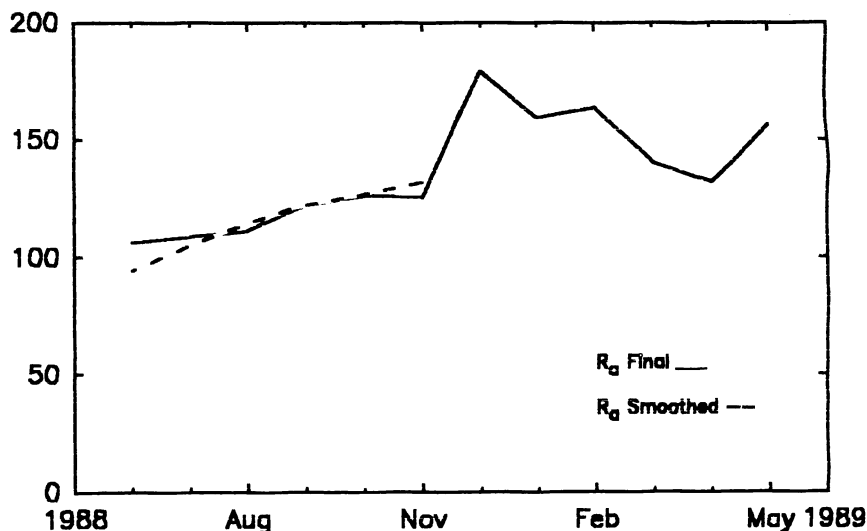


Volume 45 Number 5

May 1989

## American Relative Sunspot Numbers for May

R <sub>a</sub> Final		
1) 109	11) 138	21) 189
2) 121	12) 124	22) 174
3) 98	13) 110	23) 198
4) 109	14) 142	24) 217
5) 108	15) 164	25) 187
6) 129	16) 174	26) 172
7) 160	17) 175	27) 178
8) 178	18) 195	28) 151
9) 153	19) 217	29) 140
10) 149	20) 222	30) 142
		31) 124
Mean = 156.4		



The smoothed mean American Relative Sunspot Number for November 1988 is 132.0. One-hundred-four members of the international network of **American Sunspot Program** collaborators submitted reports for May. Solar activity increased during the month. Two X-level, and forty-five M-level x-ray flares occurred during May. Both X-level events were rated X2/3B and were associated with SESC Region 5470 (N29, L261, EK1 on 4 May). The events occurred on 3 and 5 May and were followed by minor geomagnetic storm conditions. Relative sunspot numbers also increased during May. The current status of cycle 22 is described on page two of this month's Solar Bulletin.

The *estimated* American Sunspot Number for 1-15 June is 216. Flare activity increased considerably during the first half of June. Four X-level, and sixty M-level x-ray events have been recorded during this period. Regions 5521 (S19, L161, EK1 on 5 June), 5528 (N21, L095, FKC on 14 June) and 5533 (S19, L072, FHI on 12 June) were the main flare producers, yielding three X-class and thirty-three M-class events among them. Region 5521 produced two X-level flares, on the 3rd and 5th of June. All three regions attained a *delta* magnetic complexity during their passages. Region 5517 (S18, L196, EAI on 3 June) contributed a third X-level flare on 2 June. The fourth and strongest X-level event, rated X4/3B, was produced by Region 5533 on 15 June. Region 5528 dominated the disk in size, growing to an area of 2340 millionths solar hemisphere (~2.75 billion square-miles) on the 14th.

### Sudden Ionospheric Disturbances Recorded During April

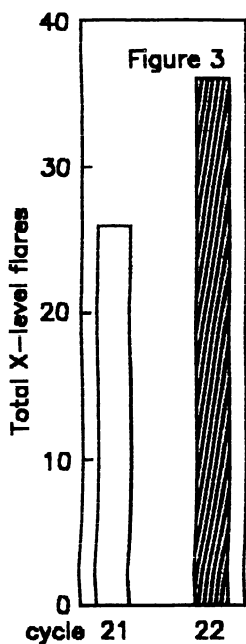
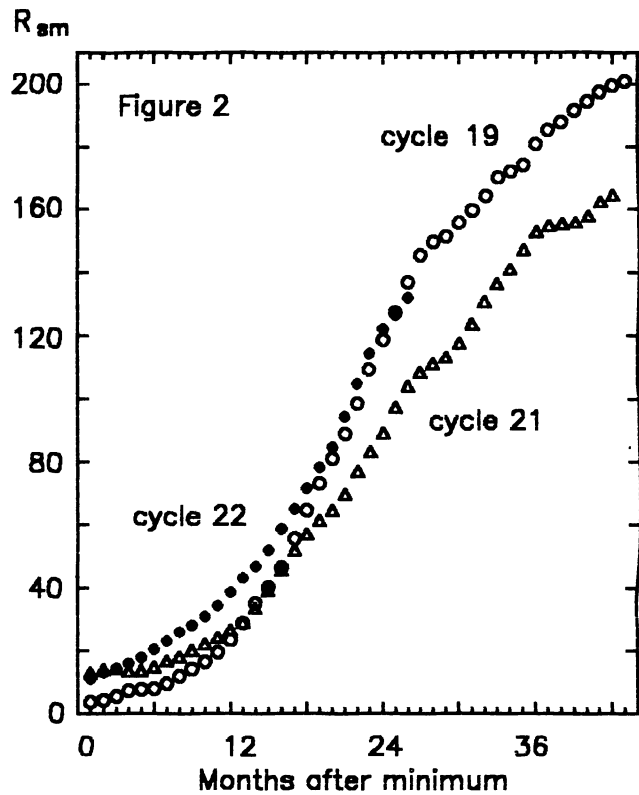
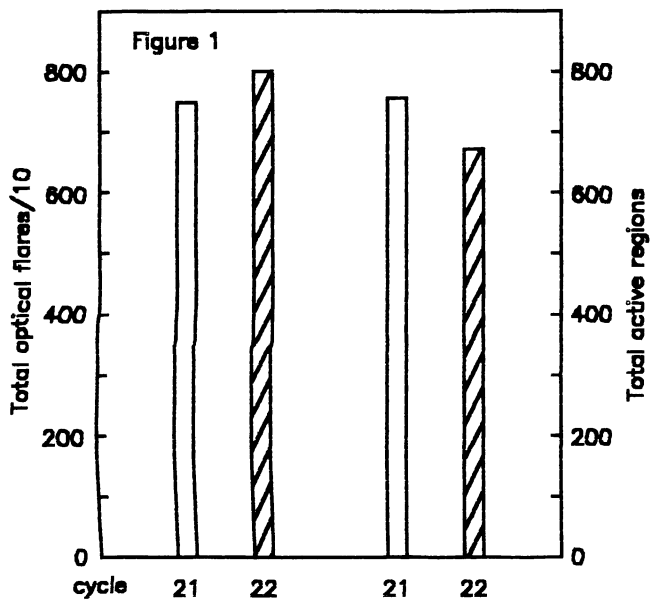
Records were received from A1,3,9,19,26,40,46,49,50,52,59,60,61,62,63.

Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp	Day	Max	Imp
2	15:43	2+	7	15:28	2	13	18:30	2	20	14:15	1+	23	12:50	1-
2	23:28	1	7	19:51	1+	13	20:58	1+	20	15:18	2+	23	21:55	2+
3	15:19	1+	8	17:44	1-	13	21:43	2+	21	04:43	1	24	13:00	1
3	19:31	2	8	18:33	2	17	17:46	1+	21	14:27	2+	24	13:35	1+
3	22:10	2	8	21:25	2	18	21:07	2+	21	17:21	1	25	18:21	1-
5	11:59	2	12	14:08	1	19	20:58	1	22	05:51	1	25	22:04	1+
5	23:10	1+	13	17:45	1-	20	05:31	1+	22	13:01	1	27	17:17	2
7	13:15	2	13	18:06	1	(Def = 5 for all events)		SID Analyst: Bruce R. Wingate						

### Predicted Smoothed Relative Sunspot Numbers<sup>1</sup>

December (141 ± 12); January (144 ± 13); February (148 ± 13); March (155 ± 13); April (162 ± 14); May (168 ± 17).

<sup>1</sup>Solar-Geophysical Data, 536, I, 14.



### The Status of Sunspot Cycle 22

Figure 1. The numbers of solar optical flares and active regions for comparable periods of sunspot cycles 21 and 22. Flare totals for the first thirty months of the ascending branch of each cycle are 7487 and 8012, respectively. The number of active regions for each cycle during the same period is 757 for cycle 21 and 672 for cycle 22.

Figure 2. A comparison of the monthly smoothed relative sunspot number between cycles 19 (the strongest cycle of record) and 21 (second strongest of record) and cycle 22 to-date (November 1988). Because of the recent decrease in sunspot activity which began in mid-April and has now ended, cycle 22 has fallen slightly behind the corresponding values for cycle 19.

Figure 3. The numbers of X-level x-ray solar flares for comparable periods of sunspot cycles 21 and 22. The values represent totals through the thirty-first month of each cycle (i.e., through April 1989 for cycle 22). The totals for cycles 21 and 22 are 26 and 36, respectively.

Figures 1 and 3 have been prepared from similar graphs and information provided in Provisional Report & Forecast of Solar-Geophysical Data, Numbers 711 and 714,.

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