

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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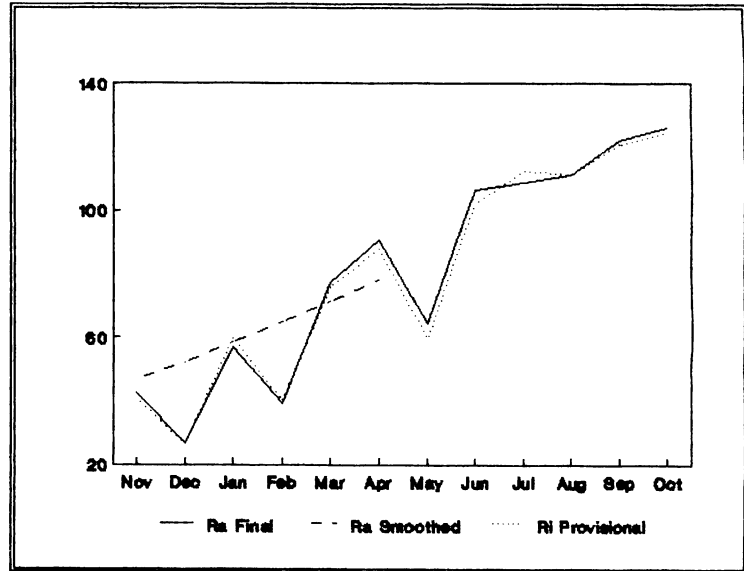
Volume 44 Number 10

October 1988

Relative Sunspot Numbers for October

| R _a Final | | |
|----------------------|---------|---------|
| 1) 117 | 11) 153 | 21) 119 |
| 2) 120 | 12) 160 | 22) 121 |
| 3) 122 | 13) 153 | 23) 113 |
| 4) 128 | 14) 134 | 24) 123 |
| 5) 125 | 15) 121 | 25) 127 |
| | | |
| 6) 120 | 16) 118 | 26) 119 |
| 7) 124 | 17) 120 | 27) 123 |
| 8) 120 | 18) 135 | 28) 118 |
| 9) 122 | 19) 128 | 29) 119 |
| 10) 149 | 20) 133 | 30) 111 |
| | | |
| | | 31) 111 |

Mean = 126.0



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The smoothed mean American Relative Sunspot Number for April 1988 is

equal to 78.1 [computed according to the method of Waldmeier (1961)].

One hundred and four members of the international network of American Sunspot Program contributors submitted reports for October.

Note: The estimated mean American Sunspot Number for 1-20 November is 137.

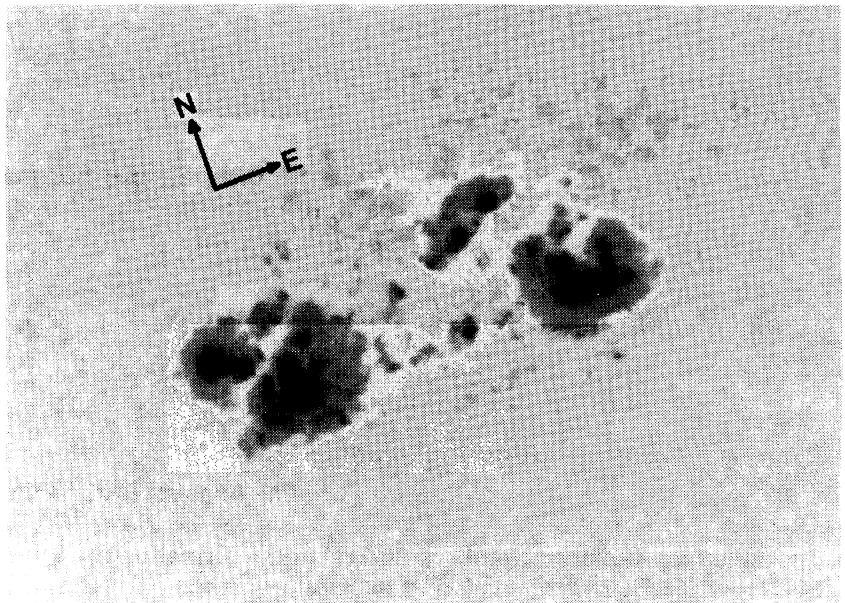
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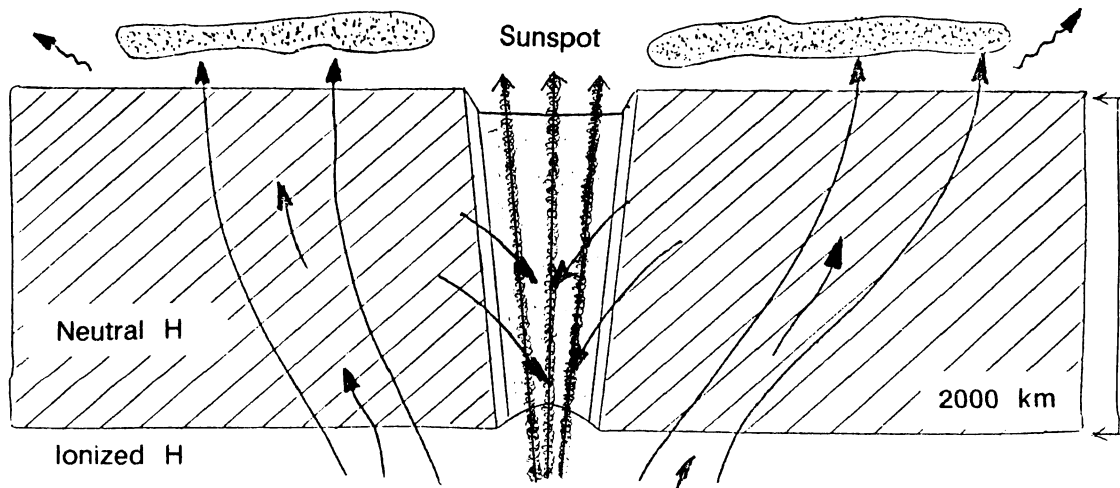
It is the Editor's sad duty to note the passing of longtime observer and good friend, Herbert A. Luft, on 22 October. Mr. Luft made almost daily sunspot observations for over sixty-four years, and was a valued contributor to the American Sunspot Program since its inception in 1944.

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József Iskum, from Budapest, Hungary, generously contributed this fine photograph of SESC Region 5131, taken on 1 September 1988. This sunspot group (EK1 on 31 August) dominated the disk during late August and early September, when it occupied areas of up to 1380 millionths solar hemisphere, and displayed a complex beta-gamma-delta magnetic configuration. However, in spite of its size and complexity, no x-ray events above C-level were associated with the region until two M-class flares occurred as the group approached the western solar limb on 8 September.

Mr. Iskum took the photograph through a 100mm aperture, F/10 refracting telescope, with exposure time of 1/500 second, orange filter, and film speed of 12° DIN. Directions are approximate.





One easily recognizable indication of past and future sunspot activity is provided by the bright photospheric faculae. Our network collaborator from the United States, Thomas G. Compton, has generously provided the figure and following brief explanation for one proposed facular energy transmission process:

The figure above is a schematic representation of one feature of the Schatten-Mayr model¹. It shows that the energy source for faculae may well arise when the Sun's convective energy flux is blocked by a downflow of material around a sunspot. This flux is transported in the form of ionized hydrogen, flowing up flux tubes ("tubes" of magnetically charged gas) which have peeled-off a sunspot group. The enhanced energy provides an uplifted photosphere and the faculae appear as bright cloud or hill-like structures. In this manner, the upflows may increase the lifetimes of sunspots by preventing the buildup of heat beneath them. If a positive imbalance exists between flows in opposite directions, the upflows may also aid the formation of a weak positive correlation between solar constant and sunspot number.

¹Schatten, K.H. et al., 1986, Astrophysical Journal, 311, 460.

R_i Provisional

| | | |
|---------|---------|---------|
| 1) 109 | 11) 148 | 21) 117 |
| 2) 117 | 12) 156 | 22) 109 |
| 3) 129 | 13) 150 | 23) 104 |
| 4) 128 | 14) 131 | 24) 121 |
| 5) 130 | 15) 109 | 25) 124 |
| 6) 131 | 16) 120 | 26) 110 |
| 7) 128 | 17) 125 | 27) 120 |
| 8) 138 | 18) 134 | 28) 119 |
| 9) 112 | 19) 133 | 29) 122 |
| 10) 146 | 20) 119 | 30) 115 |
| | | 31) 111 |

Mean = 124.4

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Predicted Smoothed American Sunspot Numbers

McNish - Lincoln Method²:

May 84; June 90; July 98;

August 106; September 118; October 120.

According to Taylor³:

May 82 (8); June 88 (9); July 95 (9);

August 102 (10); September 108 (11); October 112 (11).

²Solar Geophysical Data, 529, I, 12.

³J.A.A.V.S.O., in press.

Sudden Ionospheric Disturbances Recorded During September

Records were received from: A3,9,19,26,46,49,50,59.

| Day | Max (UT) | Imp | Def | Day | Max (UT) | Imp | Def |
|-----|----------|-----|-----|-----|----------|-----|-----|
| 3 | 13:20 | 1- | 5 | 21 | 14:25 | 1+ | 5 |
| 5 | 14:20 | 1+ | 5 | 22 | 11:24 | 1- | 5 |
| 5 | 18:33 | 2 | 5 | 22 | 14:02 | 1- | 5 |
| 6 | 15:21 | 1- | 5 | 22 | 15:26 | 1- | 5 |
| 7 | 19:50 | 1 | 5 | 22 | 20:05 | 1- | 5 |
| 8 | 12:38 | 2 | 5 | 23 | 17:07 | 2+ | 5 |
| 8 | 18:45 | 2+ | 5 | 24 | 13:26 | 1- | 5 |
| 10 | 15:43 | 2 | 5 | 27 | 16:16 | 2+ | 5 |
| 17 | 14:00 | 1- | 5 | 27 | 18:09 | 1- | 5 |
| 18 | 15:00 | 1 | 5 | 27 | 19:43 | 1- | 5 |
| 19 | 11:05 | 1 | 5 | 28 | 14:34 | 1 | 5 |
| 19 | 17:16 | 1 | 5 | 30 | 19:13 | 2+ | 5 |
| 19 | 21:43 | 1- | 5 | | | | |

SID Analyst: Bruce Wingate

The American Sunspot Numbers and related information are available through the CompuServe Information Service, INFOPLEX, MCI mail, and through domestic and international Telex and Fax. Contact the Editor for details.