



GEORGI DOBROVOLSKI SOLAR OBSERVATORY

NEW ZEALAND

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SUNSPOT RESULTS FOR MAY 2001

All observations carried out by HOWARD BARNES .

Telescope : 76 mm refractor (f.l. 910 mm) k considered as 1 .

Observed by PROJECTION . Full disc diameter = 145 mm approx .

Q = Quietness [ie. steadiness] refer to Kiepenheuer scale .

S = Sharpness [ie. clarity] refer to Kiepenheuer scale .

T = Transparency where 1 = excellent , 5 = worthless .

WN = Wolf Number ; SN = Pettisindex ; BX = Beckindex ; CV = Classification Value .

| DATE | UT | g | f | WN | p | s | SN | BX | CV | Q | S | T | Ref. |
|----------|------|------|-------|--------|-------|-------|--------|--------|--------|------|------|------|------|
| 01 | | | | | | | | | | | | | |
| 02 | | | | | | | | | | | | | |
| 03 | | | | | | | | | | | | | |
| 04 | | | | | | | | | | | | | |
| 05 | 2150 | 8 | 56 | 136 | 16 | 23 | 183 | 1587 | 110 | 1.5 | 1.5 | 2.0 | 3919 |
| 06 | 2100 | 6 | 29 | 89 | 10 | 14 | 114 | 994 | 124 | 1.5 | 1.5 | 2.0 | 3920 |
| 07 | 2105 | 5 | 19 | 69 | 5 | 12 | 62 | 358 | 57 | 1.5 | 2.0 | 2.0 | 3921 |
| 08 | 2110 | 5 | 16 | 66 | 5 | 7 | 57 | 292 | 53 | 2.0 | 2.5 | 2.5 | 3922 |
| 09 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| 15 | 2105 | 6 | 47 | 107 | 15 | 16 | 166 | 1312 | 132 | 2.0 | 2.5 | 2.5 | 3923 |
| 16 | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | 2100 | 7 | 43 | 113 | 13 | 18 | 148 | 887 | 116 | 1.5 | 1.5 | 2.0 | 3924 |
| 19 | 2055 | 7 | 29 | 99 | 10 | 10 | 110 | 512 | 95 | 2.0 | 2.0 | 2.0 | 3925 |
| 20 | 2125 | 6 | 29 | 89 | 14 | 10 | 150 | 658 | 154 | 1.5 | 2.0 | 2.5 | 3926 |
| 21 | | | | | | | | | | | | | |
| 22 | 2120 | 12 | 49 | 169 | 19 | 16 | 206 | 1329 | 174 | 2.0 | 2.5 | 2.5 | 3927 |
| 23 | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | |
| 25 | 2240 | 8 | 46 | 126 | 14 | 22 | 162 | 867 | 143 | 2.0 | 3.0 | 3.0 | 3928 |
| 26 | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 31 | 2115 | 6 | 18 | 78 | 9 | 7 | 97 | 302 | 96 | 1.0 | 2.0 | 1.5 | 3929 |
| Σ | — | 76 | 381 | 1141 | 130 | 155 | 1455 | 9098 | 1254 | 18.5 | 23.0 | 24.5 | — |
| NOBS | — | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | — |
| MNS | — | 6.91 | 34.64 | 103.73 | 11.82 | 14.09 | 132.27 | 827.09 | 114.00 | 1.68 | 2.09 | 2.23 | — |

MEAN CONDITION = 2.0000 TRUNCATED WOLF NUMBER = 92.55 QUALITY COUNT = 20.45 SQUARED QUALITY COUNT = 72.64



GEORGI DOBROVOLSKI SOLAR OBSERVATORY

SUNSPOT DISTRIBUTION & INTER-SOL INDICES FOR MAY 2001

All observations carried out by HOWARD BARNES .

Telescope : 76 mm refractor (f . l . 910 mm) .

Observed by PROJECTION . Full disc diameter = 145 mm approx .

Q = Quietness [ie. steadiness] refer to Kiepenheuer scale .

S = Sharpness [ie. clarity] refer to Kiepenheuer scale .

T = Transparency where 1 = excellent , 5 = worthless .

IS = Inter-Sol Index .

gr = number of multi-spot groups .

grfp = number of umbrae within penumbrae within the groups (gr) .

grf = number of non-penumbral spots within the groups (gr) .

efp = number of single penumbral spots :

ef = number of single non-penumbral spots .

| DATE | UT | IS | gr | grfp | grf | efp | ef | Q | S | T | Ref. |
|----------|------|-------|------|-------|-------|------|------|------|------|------|------|
| 01 | | | | | | | | | | | |
| 02 | | | | | | | | | | | |
| 03 | | | | | | | | | | | |
| 04 | | | | | | | | | | | |
| 05 | 2150 | 61 | 5 | 30 | 23 | 3 | 0 | 1.5 | 1.5 | 2.0 | 3919 |
| 06 | 2100 | 34 | 5 | 14 | 14 | 1 | 0 | 1.5 | 1.5 | 2.0 | 3920 |
| 07 | 2105 | 23 | 4 | 7 | 11 | 0 | 1 | 1.5 | 2.0 | 2.0 | 3921 |
| 08 | 2110 | 20 | 4 | 9 | 6 | 0 | 1 | 2.0 | 2.5 | 2.5 | 3922 |
| 09 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | 2105 | 51 | 4 | 30 | 15 | 1 | 1 | 2.0 | 2.5 | 2.5 | 3923 |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | 2100 | 47 | 4 | 24 | 16 | 1 | 2 | 1.5 | 1.5 | 2.0 | 3924 |
| 19 | 2055 | 32 | 3 | 17 | 8 | 2 | 2 | 2.0 | 2.0 | 2.0 | 3925 |
| 20 | 2125 | 33 | 4 | 17 | 10 | 2 | 0 | 1.5 | 2.0 | 2.5 | 3926 |
| 21 | | | | | | | | | | | |
| 22 | 2120 | 56 | 7 | 29 | 15 | 4 | 1 | 2.0 | 2.5 | 2.5 | 3927 |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | 2240 | 51 | 5 | 22 | 21 | 2 | 1 | 2.0 | 3.0 | 3.0 | 3928 |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | 2115 | 22 | 4 | 9 | 7 | 2 | 0 | 1.0 | 2.0 | 1.5 | 3929 |
| Σ | — | 430 | 49 | 208 | 146 | 18 | 9 | 18.5 | 23.0 | 24.5 | — |
| NOBS | — | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | — |
| MNS | — | 39.09 | 4.45 | 18.91 | 13.27 | 1.64 | 0.82 | 1.68 | 2.09 | 2.23 | — |



GEORGI DOBROVOLSKI SOLAR OBSERVATORY

SUNSPOT CENSUS BY CLASSIFICATION FOR MAY 2001

All observations carried out by HOWARD BARNES .
 Telescope : 76 mm refractor (f . l . 910 mm) .
 Observed by PROJECTION . Full disc diameter = 145 mm approx .
 IF 2 OR MORE REGIONS ARE OF THE SAME CLASSIFICATION , THEN SUNSPOT COUNTS
 ARE SEPARATED BY SOLIDI (/) .

| DATE | UT | A | | B | | C | | D | | E | | F | | G | | H | | J | |
|---------------|------|---|-----|---|-----|----|-------|----|-------|---|----|---|----|---|----|---|---|----|---------|
| | | g | f | g | f | g | f | g | f | g | f | g | f | g | f | g | f | g | f |
| 01 | | | | | | | | | | | | | | | | | | | |
| 02 | | | | | | | | | | | | | | | | | | | |
| 03 | | | | | | | | | | | | | | | | | | | |
| 04 | | | | | | | | | | | | | | | | | | | |
| 05 | 2150 | 0 | 0 | 0 | 0 | 2 | 5/5 | 0 | 0 | 1 | 14 | 1 | 27 | 0 | 0 | 0 | 0 | 4 | 1/1/1/2 |
| 06 | 2100 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 18 | 1 | 2 | 1 | 3 | 2 | 1/2 |
| 07 | 2105 | 1 | 1 | 0 | 0 | 3 | 2/5/6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 |
| 08 | 2110 | 1 | 1 | 0 | 0 | 3 | 2/4/5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 |
| 09 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | |
| 15 | 2105 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 4/5 | 1 | 17 | 1 | 19 | 0 | 0 | 0 | 0 | 1 | 1 |
| 16 | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | |
| 18 | 2100 | 2 | 1/1 | 0 | 0 | 0 | 0 | 2 | 8/18 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1/2 |
| 19 | 2055 | 2 | 1/1 | 0 | 0 | 1 | 2 | 2 | 11/12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1/1 |
| 20 | 2125 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2/5/6 | 1 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1/1 |
| 21 | | | | | | | | | | | | | | | | | | | |
| 22 | 2120 | 1 | 1 | 2 | 2/2 | 1 | 3 | 2 | 4/7 | 0 | 0 | 1 | 23 | 0 | 0 | 0 | 0 | 5 | 4x1 / 3 |
| 23 | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | |
| 25 | 2240 | 1 | 1 | 0 | 0 | 3 | 2/3/4 | 1 | 19 | 1 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1/1 |
| 26 | | | | | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | |
| 31 | 2115 | 0 | 0 | 0 | 0 | 2 | 2/4 | 2 | 4/6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1/1 |
| TOTALS | — | 9 | 9 | 2 | 4 | 16 | 57 | 14 | 111 | 5 | 72 | 4 | 87 | 3 | 11 | 1 | 3 | 22 | 27 |

REGIONAL PERCENTAGES

| A | B | C | D | E | F | G | H | J | Σg |
|------|-----|------|------|-----|-----|-----|-----|------|----|
| 11.8 | 2.6 | 21.1 | 18.4 | 6.6 | 5.3 | 3.9 | 1.3 | 28.9 | 76 |

NOBS = 11 $\overline{p/g}$ mean = 1.6926 $\overline{f/g}$ mean = 4.9654
 $\overline{p/g}$ mean = 1.7105 $\overline{f/g}$ mean = 5.0132

GROUP COMPLEXITY INDEX (GCI) = 6.7237



**SMOOTHED RESULTS OF OBSERVED VALUES FOR THE
LAST 12 MONTHS (OBTAINABLE)
USING THE WALDMEIER & BARNES-13 METHODS.**

DATA BELOW ARE PRELIMINARY. FINAL VALUES WILL BE PUBLISHED IN THE GDSO ANNUAL REPORTS.

WALDMEIER METHOD

| MONTH | $g(S^W)$ | $WN(S^W)$ | $SN(S^W)$ | $BX(S^W)$ | $CV(S^W)$ | $QC(S^W)$ | $IS(S^W)$ |
|---------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1999 DECEMBER | 7.81 | 133.42 | 148.92 | 1300.7 | 151.72 | 24.69 | 60.78 |
| 2000 JANUARY | 7.96 | 137.71 | 155.60 | 1401.8 | 155.56 | 25.37 | 63.72 |
| FEBRUARY | 8.30 | 143.82 | 163.09 | 1471.6 | 160.19 | 26.42 | 66.58 |
| MARCH | 8.54 | 147.85 | 167.88 | 1509.9 | 163.94 | 27.14 | 68.45 |
| APRIL | 8.57 | 149.39 | 170.40 | 1536.9 | 164.86 | 27.34 | 69.76 |
| MAY | 8.56 | 147.98 | 168.20 | 1480.2 | 163.14 | 27.22 | 68.48 |
| JUNE | 8.61 | 147.41 | 167.16 | 1426.8 | 162.43 | 27.23 | 67.47 |
| JULY | 8.72 | 149.15 | 170.05 | 1428.6 | 164.50 | 27.62 | 68.21 |
| AUGUST | 8.70 | 149.18 | 171.29 | 1439.2 | 164.10 | 27.62 | 68.46 |
| SEPTEMBER | 8.54 | 146.69 | 169.59 | 1429.2 | 158.97 | 27.13 | 67.36 |
| OCTOBER | 8.39 | 142.73 | 165.93 | 1381.5 | 153.81 | 26.46 | 64.80 |
| NOVEMBER | 8.24 | 138.20 | 162.24 | 1314.1 | 149.88 | 25.83 | 61.64 |

BARNES-13 METHOD

| MONTH | $g(S^{B13})$ | $WN(S^{B13})$ | $SN(S^{B13})$ | $BX(S^{B13})$ | $CV(S^{B13})$ | $QC(S^{B13})$ | $IS(S^{B13})$ |
|---------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1999 DECEMBER | 7.51 | 128.40 | 144.02 | 1265.1 | 146.76 | 23.80 | 58.61 |
| 2000 JANUARY | 7.84 | 134.68 | 150.78 | 1334.7 | 153.59 | 24.94 | 61.82 |
| FEBRUARY | 8.32 | 143.47 | 160.74 | 1430.8 | 162.77 | 26.51 | 66.17 |
| MARCH | 8.74 | 151.55 | 170.20 | 1528.6 | 170.71 | 27.91 | 70.35 |
| APRIL | 8.98 | 156.55 | 176.40 | 1596.0 | 174.14 | 28.70 | 73.08 |
| MAY | 9.10 | 158.32 | 179.10 | 1610.4 | 174.12 | 28.98 | 73.78 |
| JUNE | 9.13 | 158.60 | 180.80 | 1607.8 | 172.97 | 29.04 | 73.73 |
| JULY | 9.06 | 157.01 | 180.52 | 1583.1 | 170.08 | 28.77 | 72.84 |
| AUGUST | 8.81 | 151.85 | 175.57 | 1506.4 | 163.56 | 27.89 | 70.06 |
| SEPTEMBER | 8.46 | 144.68 | 168.12 | 1401.5 | 155.14 | 26.70 | 66.17 |
| OCTOBER | 8.16 | 138.10 | 161.29 | 1299.4 | 148.64 | 25.68 | 62.37 |
| NOVEMBER | 7.94 | 132.78 | 155.82 | 1213.8 | 144.21 | 24.92 | 59.09 |

ERRATUM: MEAN CONDITION FOR MARCH 2001 SHOULD READ 2.0583 .