



Georgi Dobrovolski Solar Observatory

NEW ZEALAND

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SUNSPOT RESULTS FOR JANUARY 2004

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 .

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

QC = Quality Count ; QC² = Squared Quality Count .

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

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

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

| DATE | UT* | g | f | WN | p | s | SN | BX | CV | QC | QC ² | Q | S | T | Ref. |
|--------|------|------|-------|-------|------|------|-------|--------|-------|-------|-----------------|------|------|------|--------|
| 01 | 2010 | 3 | 15 | 45 | 6 | 5 | 65 | 315 | 81 | 9 | 29 | 2.0 | 2.0 | 2.0 | 4357-1 |
| 02 | 1945 | 3 | 25 | 55 | 8 | 8 | 88 | 506 | 109 | 13 | 57 | 1.5 | 2.0 | 2.0 | 4358-1 |
| 03 | | | | | | | | | | | | | | | |
| 04 | 2035 | 3 | 28 | 58 | 7 | 11 | 81 | 586 | 86 | 12 | 50 | 2.0 | 3.5 | 2.0 | 4359-1 |
| 05 | | | | | | | | | | | | | | | |
| 06 | | | | | | | | | | | | | | | |
| 07 | 2000 | 4 | 40 | 80 | 8 | 13 | 93 | 692 | 104 | 14 | 52 | 1.5 | 2.0 | 2.0 | 4360-1 |
| 08 | | | | | | | | | | | | | | | |
| 09 | 1950 | 2 | 34 | 54 | 6 | 10 | 70 | 612 | 86 | 8 | 32 | 1.5 | 2.0 | 2.5 | 4361-1 |
| 10 | 2010 | 2 | 27 | 47 | 5 | 7 | 57 | 486 | 77 | 8 | 32 | 1.0 | 2.0 | 2.0 | 4362-1 |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | 1950 | 5 | 28 | 78 | 6 | 10 | 70 | 424 | 62 | 15 | 53 | 2.0 | 2.0 | 2.5 | 4363-2 |
| 16 | | | | | | | | | | | | | | | |
| 17 | 1955 | 3 | 21 | 51 | 6 | 7 | 67 | 794 | 61 | 12 | 48 | 2.0 | 2.5 | 2.5 | 4364-2 |
| 18 | | | | | | | | | | | | | | | |
| 19 | 2035 | 4 | 44 | 84 | 9 | 16 | 106 | 1098 | 96 | 18 | 84 | 1.5 | 2.0 | 2.0 | 4365-2 |
| 20 | | | | | | | | | | | | | | | |
| 21 | 2110 | 4 | 37 | 77 | 12 | 21 | 141 | 858 | 114 | 16 | 64 | 1.0 | 2.0 | 2.0 | 4366-2 |
| 22 | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | |
| 25 | 2030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.0 | 3.0 | 3.0 | 4367-2 |
| 26 | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | |
| TOTALS | — | 33 | 299 | 629 | 73 | 108 | 838 | 6371 | 876 | 125 | 501 | 18.0 | 25.0 | 24.5 | — |
| NOBS | — | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | — |
| MNS | — | 3.00 | 27.18 | 57.18 | 6.64 | 9.82 | 76.18 | 579.18 | 79.64 | 11.36 | 45.55 | 1.64 | 2.27 | 2.23 | — |

MEAN WEIGHT = 0.5001

MEAN CONDITION = 2.0455

TRUNCATED WOLF NUMBER = 55.09

* Stated times approximate Co-ordinated Universal Time / Temps Universel Coordonné (UTC).

Georgi Dobrovolski Solar Observatory

SUNSPOT DISTRIBUTION & INTER-SOL INDICES FOR JANUARY 2004

All observations carried out by HOWARD BARNES .

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

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

IS = Inter-Sol Index .

gr = number of multi-spot groups .

grfp = number of umbræ within penumbræ 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 .

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

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

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

| DATE | UT | IS | gr | grfp | grf | efp | ef | Q | S | T | Ref. |
|--------|------|-------|------|-------|------|------|------|------|------|------|--------|
| 01 | 2010 | 16 | 1 | 8 | 5 | 2 | 0 | 2.0 | 2.0 | 2.0 | 4357-1 |
| 02 | 1945 | 28 | 3 | 17 | 8 | 0 | 0 | 1.5 | 2.0 | 2.0 | 4358-1 |
| 03 | | | | | | | | | | | |
| 04 | 2035 | 31 | 3 | 17 | 11 | 0 | 0 | 2.0 | 3.5 | 2.0 | 4359-1 |
| 05 | | | | | | | | | | | |
| 06 | | | | | | | | | | | |
| 07 | 2000 | 44 | 4 | 27 | 13 | 0 | 0 | 1.5 | 2.0 | 2.0 | 4360-1 |
| 08 | | | | | | | | | | | |
| 09 | 1950 | 36 | 2 | 24 | 10 | 0 | 0 | 1.5 | 2.0 | 2.5 | 4361-1 |
| 10 | 2010 | 29 | 2 | 20 | 7 | 0 | 0 | 1.0 | 2.0 | 2.0 | 4362-1 |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | 1950 | 32 | 4 | 17 | 10 | 0 | 1 | 2.0 | 2.0 | 2.5 | 4363-2 |
| 16 | | | | | | | | | | | |
| 17 | 1955 | 24 | 3 | 14 | 7 | 0 | 0 | 2.0 | 2.5 | 2.5 | 4364-2 |
| 18 | | | | | | | | | | | |
| 19 | 2035 | 48 | 4 | 28 | 16 | 0 | 0 | 1.5 | 2.0 | 2.0 | 4365-2 |
| 20 | | | | | | | | | | | |
| 21 | 2110 | 41 | 4 | 16 | 21 | 0 | 0 | 1.0 | 2.0 | 2.0 | 4366-2 |
| 22 | | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | 2030 | 0 | 0 | 0 | 0 | 0 | 0 | 2.0 | 3.0 | 3.0 | 4367-2 |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | | | | | | | | | | | |
| TOTALS | — | 329 | 30 | 188 | 108 | 2 | 1 | 18.0 | 25.0 | 24.5 | — |
| NOBS | — | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | — |
| MNS | — | 29.91 | 2.73 | 17.09 | 9.82 | 0.18 | 0.09 | 1.64 | 2.27 | 2.23 | — |

Georgi Dobrovolski Solar Observatory

SUNSPOT CENSUS BY CLASSIFICATION FOR

JANUARY 2004

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 | 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 02 | 1945 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6/11 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03 | | | | | | | | | | | | | | | | | | | |
| 04 | 2035 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 9 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05 | | | | | | | | | | | | | | | | | | | |
| 06 | | | | | | | | | | | | | | | | | | | |
| 07 | 2000 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 2/9/27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08 | | | | | | | | | | | | | | | | | | | |
| 09 | 1950 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 9/25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8/19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | |
| 15 | 1950 | 1 | 1 | 0 | 0 | 3 | 2/4/9 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | | | | | | | | | | | | | | | | | | | |
| 17 | 1955 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3/5 | 0 | 0 | 0 | 0 | 1 | 13 | 0 | 0 | 0 | 0 |
| 18 | | | | | | | | | | | | | | | | | | | |
| 19 | 2035 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6/10/11 | 0 | 0 | 1 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | | | | | | | | | | | | | | | | | | | |
| 21 | 2110 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7/10/14 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 |
| 22 | | | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | |
| 25 | 2030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | | | | | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | | | | | |
| TOTALS | — | 1 | 1 | 1 | 2 | 4 | 18 | 19 | 204 | 3 | 36 | 1 | 17 | 2 | 19 | 1 | 1 | 1 | 1 |
| REGIONAL PERCENTAGES | | | | | | | | | | | | | | | | | | | |
| A | B | C | D | E | F | G | H | J | SIGMAg | | | | | | | | | | |
| 3.0 | 3.0 | 12.1 | 57.6 | 9.1 | 3.0 | 6.1 | 3.0 | 3.0 | 33 | | | | | | | | | | |
| NOBS = 11 | | | | $\overline{p/g}$ mean = 2.2950 | | | | | | $\overline{f/g}$ mean = 9.6017 | | | | | | | | | |
| | | | | $\overline{p/g}$ mean = 2.2121 | | | | | | $\overline{f/g}$ mean = 9.0606 | | | | | | | | | |
| GROUP COMPLEXITY INDEX (GCI) = 11.2727 | | | | | | | | | | | | | | | | | | | |

Georgi Dobrovolski Solar Observatory

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 | $g(S^w)$ | $WN(S^w)$ | $SN(S^w)$ | $BX(S^w)$ | $CV(S^w)$ | $QC(S^w)$ | $IS(S^w)$ |
|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 2002 AUGUST | 8.26 | 135.98 | 172.48 | 1261.2 | 158.58 | 25.99 | 59.16 |
| SEPTEMBER | 7.97 | 130.68 | 165.10 | 1197.0 | 153.84 | 24.94 | 56.49 |
| OCTOBER | 7.67 | 125.50 | 158.44 | 1141.3 | 149.33 | 23.91 | 54.09 |
| NOVEMBER | 7.24 | 118.58 | 149.12 | 1070.6 | 141.32 | 22.49 | 51.12 |
| DECEMBER | 6.87 | 113.99 | 143.55 | 1054.5 | 134.37 | 21.39 | 50.07 |
| 2003 JANUARY | 6.70 | 111.33 | 139.67 | 1025.9 | 130.98 | 20.89 | 49.03 |
| FEBRUARY | 6.53 | 106.90 | 133.21 | 945.1 | 126.45 | 20.28 | 46.09 |
| MARCH | 6.16 | 99.23 | 122.66 | 846.7 | 117.87 | 19.05 | 41.83 |
| APRIL | 5.74 | 92.23 | 112.48 | 790.1 | 110.05 | 17.81 | 38.75 |
| MAY | 5.42 | 87.47 | 105.66 | 754.5 | 103.31 | 16.84 | 37.04 |
| JUNE | 5.20 | 83.92 | 100.90 | 711.4 | 98.43 | 16.12 | 35.52 |
| JULY | 4.95 | 80.94 | 98.45 | 709.6 | 96.87 | 15.55 | 34.95 |

BARNES-13 METHOD

| MONTH | $g(S^{B13})$ | $WN(S^{B13})$ | $SN(S^{B13})$ | $BX(S^{B13})$ | $CV(S^{B13})$ | $QC(S^{B13})$ | $IS(S^{B13})$ |
|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 2002 AUGUST | 8.43 | 143.01 | 183.85 | 1415.2 | 168.42 | 26.78 | 64.62 |
| SEPTEMBER | 8.13 | 137.03 | 175.09 | 1329.4 | 161.27 | 25.65 | 61.34 |
| OCTOBER | 7.75 | 128.96 | 163.61 | 1214.9 | 152.05 | 24.25 | 56.83 |
| NOVEMBER | 7.29 | 119.51 | 150.09 | 1080.1 | 140.95 | 22.64 | 51.58 |
| DECEMBER | 6.88 | 110.96 | 137.75 | 957.8 | 130.18 | 21.17 | 46.90 |
| 2003 JANUARY | 6.54 | 103.97 | 127.63 | 856.1 | 121.91 | 19.99 | 43.03 |
| FEBRUARY | 6.23 | 98.09 | 119.76 | 784.5 | 115.93 | 18.98 | 40.04 |
| MARCH | 5.92 | 93.26 | 113.82 | 746.3 | 111.23 | 18.09 | 38.13 |
| APRIL | 5.66 | 90.19 | 110.04 | 745.1 | 107.96 | 17.43 | 37.52 |
| MAY | 5.46 | 88.68 | 108.35 | 769.9 | 105.72 | 16.96 | 37.93 |
| JUNE | 5.29 | 87.55 | 107.34 | 794.9 | 104.28 | 16.62 | 38.39 |
| JULY | 5.09 | 85.57 | 105.39 | 806.7 | 102.56 | 16.21 | 38.27 |