No. 133 **International Astronomical Union** January/March 1961

# QUARTERLY BULLETIN ON SOLAR ACTIVITY

**Published by the Eidgen. Sternwarte in Zürich**

with financial support from UNESCO

## I. SUNSPOTS

### Sunspot Relative-Numbers and Sunspot-Areas

Co-operating Observatories for Sunspot Relative-Numbers R: Arcetri, Arosa, Beirut, Belgrad, Bucarest, Catania, Freiburg, Granada, Herstmonceux, Ikoma-Nara, Istanbul, Kanzelhöhe, Karlsruhe, Kiev, Kislovodsk, Locarno, Potsdam, Prag, Quezon-City (Philippines), Roma-Monte Mario, Santiago, Skalnaté Pleso, Sonneberg, Taipei (Weather Bureau), Tashkent, Tokyo, Tortosa, Uccle, Wroclaw, Zürich.

The Sunspot-Areas are based upon measurements made at the Astronomical Observatory Roma-Monte Mario and the Astrophysical Observatory Catania. The true area A ($A_R$ measured at Rome, $A_C$ measured at Catania) of the umbra plus penumbra is expressed in millionths of the visible hemisphere.

| 1961 | January | | | February | | | March | | |
|---|---|---|---|---|---|---|---|---|---|
| | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ |
| 1 | 145 | — | 1430 | 58 | — | 595 | 17 | 96 | 39 |
| 2 | 133 | — | 1013 | 55 | 593 | — | 33 | 150 | 91 |
| 3 | 109 | 2021 | 1265 | 59 | 528 | 304 | 49 | 233 | — |
| 4 | 84 | — | 1114 | 75 | 661 | 637 | 46 | 348 | 116 |
| 5 | 78 | — | 1135 | 65 | 756 | 385 | 34 | 136 | — |
| 6 | 69 | 958 | 822 | 56 | 477 | — | 41 | 167 | 62 |
| 7 | 63 | — | — | 52 | — | 189 | 38 | 176 | 70 |
| 8 | 58 | 753 | — | 55 | 553 | 208 | 49 | — | 240 |
| 9 | 61 | — | 950 | 68 | 611 | 187 | 49 | 211 | 154 |
| 10 | 53 | 606 | 332 | 61 | 489 | — | 33 | 173 | 131 |
| 11 | 43 | — | — | 50 | 344 | 180 | 34 | 184 | 111 |
| 12 | 35 | — | 595 | 35 | — | 134 | 15 | 167 | 75 |
| 13 | 28 | 72 | 71 | 30 | 371 | 165 | 27 | — | 270 |
| 14 | 25 | 90 | — | 26 | 475 | 273 | 46 | 295 | 162 |
| 15 | 27 | — | 57 | 26 | 196 | 167 | 42 | 343 | 157 |
| 16 | 43 | 122 | 105 | 24 | — | 68 | 52 | — | 146 |
| 17 | 53 | 316 | 273 | 39 | — | 204 | 66 | 310 | 166 |
| 18 | 51 | — | 282 | 30 | 104 | 102 | 51 | — | 280 |
| 19 | 50 | 287 | — | 26 | 67 | 66 | 45 | — | 129 |
| 20 | 45 | 221 | 178 | 30 | — | 60 | 39 | 442 | 310 |
| 21 | 50 | — | 247 | 44 | — | 107 | 46 | — | 660 |
| 22 | 44 | — | 217 | 49 | — | 159 | 60 | 915 | 539 |
| 23 | 35 | — | — | 48 | — | 133 | 61 | 893 | 468 |
| 24 | 23 | 27 | 37 | 58 | — | 195 | 76 | 872 | 513 |
| 25 | 27 | — | 334 | 53 | 220 | 143 | 64 | 962 | 784 |
| 26 | 43 | — | 273 | 52 | — | 111 | 63 | 1339 | — |
| 27 | 47 | — | 339 | 42 | 138 | 85 | 88 | 883 | 620 |
| 28 | 62 | — | 569 | 25 | — | 87 | 95 | 1187 | 1045 |
| 29 | 81 | — | 595 | | | | 95 | 1211 | 754 |
| 30 | 65 | 823 | 539 | | | | 97 | 1480 | 745 |
| 31 | 66 | — | 497 | | | | 93 | — | 747 |
| Mean | 57.9 | 525 | 515 | 46.1 | 411 | 198 | 53.0 | 549 | 342 |

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No. 134 **International Astronomical Union** April/June 1961

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The Sunspot-Areas are based upon measurements made at the Astronomical Observatory Roma-Monte Mario and the Astrophysical Observatory Catania. The true area A ($A_R$ measured at Rome, $A_C$ measured at Catania) of the umbra plus penumbra is expressed in millionths of the visible hemisphere.

| 1961 | April | | | May | | | June | | |
|---|---|---|---|---|---|---|---|---|---|
| | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ |
| 1 | 87 | 574 | 541 | 102 | 960 | 492 | 30 | — | 166 |
| 2 | 60 | — | 319 | 84 | 990 | 484 | 42 | 192 | 130 |
| 3 | 55 | 676 | 448 | 72 | — | 586 | 48 | — | 159 |
| 4 | 73 | 636 | 433 | 55 | 689 | 296 | 62 | — | 237 |
| 5 | 86 | 806 | 428 | 42 | 281 | 418 | 55 | 323 | — |
| 6 | 82 | 961 | 590 | 39 | 160 | 742 | 49 | — | 138 |
| 7 | 64 | 805 | 506 | 37 | 224 | 265 | 40 | — | 98 |
| 8 | 66 | 631 | 431 | 31 | 244 | 191 | 45 | — | 103 |
| 9 | 49 | 464 | — | 44 | — | 192 | 58 | 758 | 370 |
| 10 | 48 | — | 156 | 46 | — | 205 | 77 | — | 739 |
| 11 | 47 | — | — | 45 | 301 | 131 | 82 | — | 567 |
| 12 | 42 | — | 357 | 56 | 355 | 171 | 72 | 2084 | 997 |
| 13 | 40 | 378 | 235 | 52 | 278 | 308 | 75 | 1632 | 942 |
| 14 | 41 | — | 301 | 46 | 312 | 220 | 80 | 1485 | 1004 |
| 15 | 53 | — | 221 | 38 | 305 | 187 | 123 | — | 1130 |
| 16 | 60 | 498 | — | 31 | — | 139 | 128 | 1665 | 1178 |
| 17 | 78 | — | 445 | 23 | 246 | 187 | 128 | 1573 | 1152 |
| 18 | 72 | 695 | 344 | 44 | 251 | 119 | 128 | 1617 | 1015 |
| 19 | 65 | 662 | 413 | 47 | — | 112 | 112 | 1738 | 1096 |
| 20 | 56 | 520 | 291 | 59 | 492 | 228 | 116 | 1819 | 972 |
| 21 | 52 | — | 232 | 66 | 705 | 563 | 128 | 1834 | 1171 |
| 22 | 38 | — | — | 71 | 733 | 498 | 123 | 1639 | 679 |
| 23 | 36 | — | 342 | 74 | 777 | 620 | 96 | 1391 | 800 |
| 24 | 36 | — | 837 | 78 | 496 | 206 | 87 | 1416 | 731 |
| 25 | 48 | 835 | 812 | 72 | 498 | 230 | 70 | 1003 | 824 |
| 26 | 60 | — | 544 | 47 | 287 | 191 | 56 | — | 489 |
| 27 | 82 | 961 | 828 | 41 | — | — | 51 | 254 | 583 |
| 28 | 74 | 1008 | 845 | 38 | 191 | 111 | 38 | 301 | 215 |
| 29 | 92 | — | 602 | 36 | — | 73 | 59 | 449 | 156 |
| 30 | 99 | — | 645 | 41 | — | 111 | 63 | 1148 | 537 |
| 31 | | | | 24 | 203 | 120 | | | |
| Mean | 61.4 | 694 | 467 | 51.0 | 434 | 280 | 77.4 | 1216 | 634 |

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The Sunspot-Areas are based upon measurements made at the Astronomical Observatory Roma - Monte Mario and the Astrophysical Observatory Catania. The true area A ($A_R$ measured at Rome, $A_C$ measured at Catania) of the umbra plus penumbra is expressed in millionths of the visible hemisphere.

| 1961 | July | | | August | | | September | | |
|---|---|---|---|---|---|---|---|---|---|
| | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ |
| 1 | 60 | 1136 | 723 | 39 | 151 | 74 | 51 | 1366 | 1203 |
| 2 | 65 | 1565 | 1038 | 17 | 109 | 24 | 53 | 1382 | 826 |
| 3 | 68 | 1734 | 1406 | 24 | 95 | 55 | 54 | -- | 778 |
| 4 | 63 | 1424 | 1092 | 23 | 0 | 35 | 55 | 1021 | 763 |
| 5 | 44 | 471 | 346 | 14 | 0 | 7 | 55 | -- | 632 |
| 6 | 55 | -- | 476 | 13 | 0 | 0 | 57 | -- | 569 |
| 7 | 57 | 845 | 464 | 14 | 0 | 0 | 51 | 726 | 397 |
| 8 | 60 | 735 | 492 | 37 | 433 | 580 | 33 | 599 | 440 |
| 9 | 65 | 1091 | 518 | 59 | 617 | 560 | 45 | 1937 | 1461 |
| 10 | 73 | 2400 | 1284 | 84 | 858 | 802 | 57 | 1596 | 1253 |
| 11 | 85 | 2593 | 1366 | 109 | 947 | 653 | 54 | 1497 | 1011 |
| 12 | 96 | -- | 1132 | 103 | 950 | 492 | 62 | 1478 | 1028 |
| 13 | 86 | 1886 | 1089 | 103 | 909 | 606 | 82 | 1509 | 973 |
| 14 | 113 | 1900 | 1169 | 104 | 701 | 636 | 109 | 1676 | 879 |
| 15 | 107 | 1707 | 930 | 108 | 758 | 532 | 114 | 1467 | 876 |
| 16 | 99 | -- | 900 | 98 | 682 | 329 | 102 | 1609 | 1062 |
| 17 | 92 | -- | 799 | 85 | 587 | 305 | 84 | 1211 | 607 |
| 18 | 82 | 1066 | 510 | 71 | 455 | 180 | 73 | 882 | 547 |
| 19 | 86 | 2059 | 828 | 72 | 388 | 223 | 70 | 845 | 409 |
| 20 | 85 | -- | 1426 | 52 | -- | 155 | 46 | 698 | 475 |
| 21 | 85 | 1026 | 660 | 45 | 261 | 229 | 41 | 738 | 155 |
| 22 | 75 | 809 | 565 | 39 | 38 | 32 | 40 | 209 | 190 |
| 23 | 81 | 709 | 488 | 33 | 52 | 33 | 43 | 322 | 177 |
| 24 | 78 | 569 | 463 | 37 | 115 | 36 | 74 | 389 | 289 |
| 25 | 63 | -- | 217 | 49 | -- | 134 | 83 | 698 | 295 |
| 26 | 62 | 478 | 247 | 45 | 380 | 175 | 74 | 634 | 465 |
| 27 | 53 | 748 | 566 | 54 | -- | 297 | 67 | 655 | 562 |
| 28 | 42 | -- | 185 | 36 | 552 | 383 | 69 | 799 | 535 |
| 29 | 32 | 531 | 244 | 54 | 745 | 787 | 58 | 479 | 418 |
| 30 | 30 | 390 | 330 | 58 | 1635 | 916 | 52 | 492 | 323 |
| 31 | 34 | 296 | 465 | 54 | 1845 | 1059 | | | |
| Mean | 70.2 | 1174 | 723 | 55.9 | 509 | 333 | 63.6 | 997 | 653 |

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No. 136 **International Astronomical Union** October/Dezember 1961

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| 1961 | October | | | November | | | December | | |
|---|---|---|---|---|---|---|---|---|---|
| | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ | R | $A_R$ | $A_C$ |
| 1 | 45 | -- | 213 | 0 | 0 | 0 | 82 | 364 | 160 |
| 2 | 47 | 337 | 137 | 0 | 0 | 0 | 80 | 467 | 192 |
| 3 | 58 | 272 | 181 | 0 | 0 | 2 | 77 | -- | 305 |
| 4 | 55 | -- | 220 | 10 | -- | 2 | 67 | -- | 361 |
| 5 | 48 | 316 | 171 | 19 | 105 | 27 | 55 | -- | 274 |
| 6 | 45 | 375 | 202 | 25 | 236 | 98 | 38 | 383 | 268 |
| 7 | 43 | -- | 165 | 48 | 492 | 221 | 31 | -- | 217 |
| 8 | 46 | 236 | 192 | 54 | 588 | 282 | 31 | 413 | 138 |
| 9 | 47 | 212 | 92 | 76 | 1005 | 491 | 31 | 361 | 174 |
| 10 | 53 | 551 | 388 | 67 | 491 | 315 | 14 | -- | 224 |
| 11 | 58 | 798 | 329 | 53 | 623 | 321 | 0 | -- | 0 |
| 12 | 76 | 743 | 311 | 50 | -- | -- | 0 | -- | 0 |
| 13 | 47 | 697 | 248 | 49 | 573 | 310 | 0 | 0 | 0 |
| 14 | 44 | 722 | 242 | 48 | -- | -- | 10 | 21 | 13 |
| 15 | 53 | 697 | 343 | 47 | -- | 238 | 8 | 6 | 6 |
| 16 | 46 | 548 | 339 | 31 | -- | -- | 7 | 0 | 0 |
| 17 | 39 | 637 | 239 | 11 | 155 | 67 | 7 | 0 | -- |
| 18 | 44 | -- | 128 | 17 | 118 | 57 | 10 | 0 | 12 |
| 19 | 52 | 473 | 295 | 10 | 122 | 48 | 13 | -- | 10 |
| 20 | 38 | 389 | 296 | 15 | 114 | -- | 21 | 299 | -- |
| 21 | 47 | -- | 307 | 26 | 178 | -- | 21 | 713 | 337 |
| 22 | 33 | 395 | 203 | 24 | -- | 134 | 47 | 702 | 569 |
| 23 | 16 | 0 | -- | 13 | -- | 99 | 56 | -- | 338 |
| 24 | 17 | 41 | 24 | 18 | -- | -- | 77 | -- | -- |
| 25 | 16 | 80 | 26 | 29 | 226 | 170 | 94 | -- | -- |
| 26 | 13 | 38 | 3 | 36 | -- | 175 | 80 | -- | 519 |
| 27 | 8 | 0 | 0 | 37 | -- | 95 | 70 | -- | 359 |
| 28 | 8 | 57 | 23 | 38 | 317 | 133 | 74 | -- | -- |
| 29 | 9 | 49 | 13 | 53 | -- | 163 | 55 | 549 | 304 |
| 30 | 9 | 27 | 17 | 75 | 462 | 183 | 45 | -- | 237 |
| 31 | 8 | -- | 24 | | | | 38 | -- | 200 |
| Mean | 37.7 | 348 | 179 | 32.6 | 306 | 151 | 40.0 | 285 | 201 |

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