

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

Cooperating Observatories for Sunspot Relative-Numbers: Arcetri, Arosa, Athens (Eugenides Planetarium), Bucarest, Catania, Herstmonceux, Hurbanovo, Istanbul, Kandilli, Kanzelhöhe, Kiev, Kislovodsk, Locarno, Madrid, Manila, Mitaka-Tokyo, Potsdam, Quezon City, Roma-Monte Mario, Roquetas-Tortosa, San Miguel, Santiago de Chile, Skalnaté Pleso, Tashkent, Tokyo (Science Museum), Trieste, Uccle, Zürich.

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1970	Jan.	R	R_C	A_C	A_R	A_Z
	1	115	66	1483	--	1611
	2	83	43	1832	--	--
	3	78	37	--	--	1049
	4	69	22	704	--	--
	5	66	15	486	841	--
	6	57	25	477	--	383
	7	30	10	244	--	220
	8	37	7	121	--	--
	9	59	7	244	--	--
	10	84	11	482	808	--
	11	106	14	752	--	--
	12	138	52	1998	--	1541
	13	145	62	2762	2574	1440
	14	160	90	2464	2529	1597
	15	155	77	2915	--	--
	16	145	64	--	--	--
	17	160	74	2172	--	--
	18	168	96	2137	2423	--
	19	165	94	1993	2173	1639
	20	133	77	1883	1926	--
	21	118	59	2057	--	--
	22	104	20	--	1922	1631
	23	79	13	462	--	1307
	24	73	28	1352	--	--
	25	98	70	1229	1312	1070
	26	123	81	2385	1513	--
	27	130	104	3048	--	2557
	28	156	134	--	2333	2340
	29	154	52	3014	2186	2279
	30	138	69	2565	--	--
	31	131	41	1930	--	--
Mean		111.5	52.1	1600	1878	1476

1970	Feb.	R	R _C	A _C	A _R	A _Z
	1	121	16	911	940	775
	2	96	11	535	507	--
	3	82	31	594	--	--
	4	68	44	297	--	147
	5	72	42	254	--	--
	6	93	48	356	491	353
	7	104	50	908	--	735
	8	102	40	1356	950	--
	9	123	25	1675	--	--
	10	133	89	2550	2088	1626
	11	175	129	3423	--	3186
	12	153	66	3929	2839	--
	13	145	55	3885	--	3117
	14	124	62	3771	--	--
	15	115	32	2267	--	--
	16	139	31	1961	1959	2308
	17	142	48	2582	2419	2509
	18	143	49	3165	--	2280
	19	120	50	3064	2811	--
	20	125	40	2776	2507	2463
	21	128	69	2437	2796	--
	22	132	66	3566	3054	--
	23	164	85	4070	--	3490
	24	166	88	4053	3408	--
	25	173	80	3900	2923	3795
	26	143	81	3408	--	2827
	27	150	51	2962	1734	2406
	28	146	44	2598	--	2185
	Mean	127.8	54.4	2402	2095	2138

1970	Mar.	R	R _C	A _C	A _R	A _Z
	1	137	14	1553	2123	2039
	2	129	23	1613	1978	1486
	3	113	66	1478	--	--
	4	107	29	1262	1751	1652
	5	107	20	1898	--	1687
	6	103	26	2189	--	1836
	7	111	32	2321	2216	1858
	8	118	37	2368	2504	2037
	9	120	78	2417	2392	2045
	10	125	76	1581	1839	1684
	11	103	53	1610	--	1461
	12	88	44	1594	2007	1460
	13	104	32	--	--	1294
	14	84	29	1049	--	--
	15	65	25	778	--	--
	16	48	14	456	--	436
	17	29	19	466	347	290
	18	41	7	588	484	422
	19	48	16	191	612	513
	20	93	23	403	--	--
	21	115	18	986	1269	814
	22	122	23	1484	1401	820
	23	135	50	1671	1545	--
	24	140	73	1997	1547	1067
	25	142	105	1100	--	1002
	26	122	70	1568	--	1276
	27	115	48	1605	--	1251
	28	110	20	1351	--	1050
	29	103	22	1102	--	956
	30	111	42	677	621	685
	31	101	52	758	--	456
	Mean	102.9	38.3	1337	1540	1215

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1970	Apr.	R	R_C	A_C	A_R	A_Z
	1	112	49	1261	916	787
	2	105	32	1428	—	682
	3	121	7	1681	1387	1473
	4	116	30	2423	1983	1895
	5	120	31	3083	2698	—
	6	115	29	3737	—	2586
	7	123	86	3911	2720	3266
	8	147	97	3447	—	—
	9	172	76	4557	—	3750
	10	188	94	4458	—	4006
	11	183	71	5185	4455	4582
	12	163	46	1908	—	3793
	13	141	35	2925	—	3158
	14	124	27	2883	2665	—
	15	106	18	1526	1526	1605
	16	92	17	1701	—	1464
	17	82	25	1506	1658	1474
	18	68	32	1621	907	1198
	19	67	44	947	—	—
	20	65	40	922	—	—
	21	64	52	763	555	556
	22	57	22	—	—	630
	23	67	26	858	1031	764
	24	90	38	711	—	503
	25	93	29	647	—	587
	26	81	10	800	—	526
	27	88	18	747	—	555
	28	106	20	1085	—	713
	29	112	68	1282	—	993
	30	116	81	1793	1472	1579
	Mean	109.5	41.7	2062	1844	1725

1970	May	R	R _C	A _C	A _R	A _Z
	1	118	67	2527	1794	1935
	2	118	41	2591	1665	—
	3	122	54	2683	—	2160
	4	119	62	2735	2394	2247
	5	113	52	2892	2397	2337
	6	115	54	—	—	1950
	7	98	24	2655	—	2660
	8	87	48	2380	1867	2015
	9	90	50	1972	—	1810
	10	111	36	1698	—	1473
	11	132	43	1755	821	1473
	12	134	20	2061	2022	1765
	13	142	38	2672	1981	2528
	14	145	74	4463	2187	4207
	15	159	87	5252	3501	4600
	16	161	103	6063	3918	3994
	17	169	95	4055	3740	4129
	18	173	92	3727	—	3066
	19	176	76	3425	3148	2804
	20	146	31	—	2976	2320
	21	143	51	1930	2005	1514
	22	125	27	1484	—	1092
	23	106	39	959	950	722
	24	122	46	881	—	508
	25	110	32	1207	1213	918
	26	125	71	1509	1835	1599
	27	126	59	1658	1501	1508
	28	106	37	1436	—	1393
	29	118	46	1917	—	1606
	30	116	28	—	—	1733
	31	127	51	2035	2308	1511
	Mean	127.5	52.7	2522	2211	2119
1970	June	R	R _C	A _C	A _R	A _Z
	1	102	63	1722	—	1271
	2	92	41	1225	—	883
	3	64	32	778	—	625
	4	63	0	519	—	428
	5	59	7	487	—	320
	6	57	0	455	—	381
	7	58	7	418	—	365
	8	61	20	659	—	693
	9	60	23	895	—	898
	10	92	53	1485	1390	1225
	11	122	50	1658	1859	1571
	12	138	58	2109	2598	2073
	13	153	47	3053	2971	2378
	14	165	59	3812	—	3219
	15	168	112	3589	4658	3545
	16	153	101	4325	3965	3402
	17	148	96	4202	3977	3176
	18	134	72	2881	—	2492
	19	105	9	2219	1731	2234
	20	99	37	1791	—	1438
	21	96	41	1504	—	1221
	22	96	35	1293	1209	1238
	23	87	37	1097	944	876
	24	102	52	742	—	621
	25	126	62	926	—	463
	26	127	61	678	712	380
	27	114	48	1023	1043	719
	28	113	46	1505	—	758
	29	124	74	2008	1680	1379
	30	127	56	2295	1704	1994
	Mean	106.8	46.6	1712	2174	1408

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1970	July	R	R_C	A_C	A_R	A_Z
	1	137	68	3434	--	2571
	2	153	90	3589	--	3078
	3	155	56	3681	--	3246
	4	159	70	3837	3049	3422
	5	165	102	3488	3223	3314
	6	161	53	3382	--	2963
	7	125	49	2640	--	2206
	8	115	47	2025	1750	1797
	9	104	20	1526	--	1192
	10	90	17	1103	--	1014
	11	81	18	1087	794	816
	12	74	22	996	926	832
	13	79	21	981	843	715
	14	68	30	732	--	627
	15	61	38	663	418	426
	16	61	29	563	--	--
	17	59	25	318	--	191
	18	56	0	488	531	301
	19	92	25	843	1057	718
	20	92	31	1495	1114	--
	21	120	29	1860	1480	1819
	22	122	62	2348	--	2038
	23	106	59	2482	--	1994
	24	110	53	2348	--	2029
	25	122	38	2644	--	2170
	26	138	84	2789	--	1913
	27	153	86	3290	--	2325
	28	146	93	3372	--	2374
	29	153	98	2749	--	2123
	30	122	72	2396	--	1702
	31	108	67	1706	1065	1262
Mean		112.5	50.1	2099	1354	1765

1970	Aug.	R	R _C	A _C	A _R	A _Z
	1	77	37	1187	--	837
	2	68	31	827	--	581
	3	64	29	467	--	327
	4	59	19	710	--	461
	5	65	25	949	1028	775
	6	68	22	976	--	765
	7	72	51	1310	1339	969
	8	82	57	1467	--	1038
	9	76	54	1934	1897	--
	10	71	71	1849	--	1318
	11	75	56	1505	1454	1269
	12	73	37	1367	--	1007
	13	92	48	1829	1747	1365
	14	94	7	1855	--	1696
	15	108	40	1825	--	1159
	16	100	17	1834	--	1729
	17	99	19	2151	--	1894
	18	108	46	2126	--	1567
	19	113	32	1669	--	1232
	20	117	51	1548	1456	--
	21	117	67	1717	--	1692
	22	108	82	1654	1687	1328
	23	101	61	1957	--	1587
	24	116	37	1812	--	--
	25	114	44	1514	1616	1095
	26	109	45	1544	1263	981
	27	91	38	1321	1118	843
	28	101	63	1245	--	786
	29	114	51	1335	--	916
	30	120	32	1887	--	1347
	31	111	20	2116	1851	1705
	Mean	93.0	41.6	1532	1496	1152

1970	Sept.	R	R _C	A _C	A _R	A _Z
	1	98	20	2045	1970	1822
	2	104	42	2394	--	2100
	3	110	75	2476	2960	2387
	4	115	78	3009	3033	2738
	5	120	62	3006	3163	2758
	6	133	31	3483	3359	2815
	7	136	60	2877	--	2736
	8	125	48	2719	2114	1860
	9	116	44	2085	1797	1852
	10	103	51	1607	1241	959
	11	82	22	1058	875	731
	12	76	17	820	528	352
	13	73	34	647	--	220
	14	76	37	551	536	235
	15	75	26	457	389	192
	16	68	21	809	516	141
	17	65	25	737	522	94
	18	75	0	863	--	254
	19	98	26	838	1080	369
	20	114	55	--	--	997
	21	129	50	1610	1706	1004
	22	109	59	1589	1711	1140
	23	104	40	1754	--	1085
	24	129	25	1841	--	1470
	25	114	47	1568	--	1392
	26	107	44	1797	1855	1664
	27	87	39	1737	1842	1609
	28	85	65	1575	1724	1396
	29	81	41	1410	--	1189
	30	77	45	969	993	995
	Mean	99.5	41.0	1667	1615	1285

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1970 Oct.	R	R_C	A_C	A_R	A_Z
1	63	33	1071	—	752
2	57	13	716	640	454
3	43	13	748	—	493
4	55	19	509	—	—
5	75	34	1003	971	980
6	53	31	870	—	688
7	72	37	939	—	638
8	76	44	1145	—	847
9	78	0	1558	—	1063
10	79	40	1453	1491	1013
11	75	48	1426	1766	992
12	80	39	971	—	549
13	84	31	887	1125	551
14	87	33	1050	1237	713
15	87	49	1128	—	751
16	94	61	—	—	717
17	84	59	1023	—	672
18	76	65	1146	1371	750
19	83	37	—	1272	764
20	70	44	1093	1132	—
21	69	17	1225	—	956
22	73	23	1065	—	—
23	89	26	1394	1477	—
24	100	13	2078	1660	1595
25	111	36	2411	—	2004
26	117	66	3488	2760	2881
27	142	71	3616	4003	3040
28	131	98	2725	3248	2188
29	139	89	2814	—	1933
30	126	68	2471	2661	1919
31	117	41	1942	2019	1533
Mean	86.6	41.2	1516	1802	1164

1970	Nov.	R	R _C	A _C	A _R	A _Z
	1	86	15	1421	—	—
	2	82	22	1059	—	858
	3	80	29	922	807	660
	4	78	21	857	892	487
	5	67	21	763	—	—
	6	89	62	806	—	340
	7	86	58	—	—	—
	8	69	26	440	—	110
	9	77	29	360	—	131
	10	78	10	461	—	191
	11	97	25	748	—	539
	12	89	16	1511	—	1104
	13	105	54	2209	—	—
	14	117	60	3965	3505	—
	15	125	94	5488	—	5405
	16	133	105	5427	4232	—
	17	135	82	4956	4847	4043
	18	135	95	4761	5053	3302
	19	132	57	4175	—	—
	20	128	51	2736	2373	2111
	21	119	0	1812	—	—
	22	105	38	1568	—	1177
	23	96	31	838	—	—
	24	77	36	986	1038	829
	25	62	37	875	953	662
	26	65	29	842	943	710
	27	74	33	1027	—	797
	28	89	20	1193	1334	1042
	29	78	9	1229	—	—
	30	103	10	1686	—	—
	Mean	95.2	39.2	1901	2362	1289

1970	Dec.	R	R _C	A _C	A _R	A _Z
	1	91	14	1570	—	1375
	2	78	39	1457	1567	—
	3	78	62	1527	1797	1455
	4	76	58	1334	1527	—
	5	88	58	1814	—	1277
	6	90	38	1590	1731	1512
	7	91	20	2078	—	—
	8	100	32	1743	—	1250
	9	96	26	—	1808	1267
	10	110	52	—	1982	1348
	11	120	50	2254	2176	1493
	12	110	79	1754	—	1254
	13	90	54	1828	—	977
	14	85	35	—	—	1271
	15	84	29	1229	—	994
	16	68	7	1612	—	1134
	17	63	7	1690	—	1264
	18	79	51	1982	—	1422
	19	95	61	—	1996	1438
	20	104	70	—	1669	1326
	21	101	41	2448	2217	1599
	22	97	36	2142	—	1552
	23	85	31	1612	1304	1271
	24	66	24	1051	—	575
	25	75	24	987	—	312
	26	64	34	572	316	235
	27	53	7	—	—	—
	28	50	26	700	593	—
	29	59	43	821	—	—
	30	74	23	—	1060	1074
	31	68	29	1706	—	—
	Mean	83.5	37.4	1563	1553	1195