

# 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 (National Observatory), Athens (Eugenides Planetarium), Beirut, 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), Uccle, Zürich.

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1971	Jan.	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	68	0	1441	—	1290
	2	67	31	—	—	1174
	3	65	36	1055	867	605
	4	69	19	—	—	852
	5	63	14	1506	—	1267
	6	64	11	1887	—	1648
	7	67	0	2253	2052	1832
	8	79	50	2216	2074	1745
	9	89	49	2157	1970	1609
	10	80	46	1812	1949	1438
	11	76	52	1887	—	1381
	12	91	46	1917	—	1296
	13	82	20	1579	1229	1235
	14	78	29	1336	—	809
	15	64	24	1515	—	940
	16	67	15	—	—	1279
	17	76	7	1495	—	1519
	18	102	12	2672	—	2194
	19	109	0	3212	—	—
	20	120	41	3221	—	—
	21	131	68	4113	—	—
	22	125	96	—	—	2886
	23	120	60	3950	—	—
	24	120	52	3285	3211	2760
	25	112	45	2908	3014	—
	26	109	14	2089	2351	—
	27	121	25	2475	—	1988
	28	109	44	2523	2160	—
	29	108	57	2655	2552	2153
	30	95	48	2422	—	2180
	31	103	72	3292	2962	2229
	Mean	91.3	34.9	2329	2199	1596

1971	Feb.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	90	62	3456	--	--
	2	85	44	2894	1753	--
	3	81	45	3286	2857	--
	4	80	17	1865	2290	2355
	5	73	15	2408	3013	2463
	6	78	18	2151	1887	1655
	7	82	17	1775	1395	1123
	8	64	20	1203	726	737
	9	45	14	636	500	463
	10	40	11	--	438	331
	11	62	25	--	296	209
	12	57	13	329	--	171
	13	65	17	414	425	242
	14	64	15	526	--	529
	15	69	25	694	909	617
	16	69	12	805	--	--
	17	71	32	790	1066	894
	18	81	39	1071	1233	1118
	19	96	47	1357	1420	--
	20	97	26	1390	1879	1214
	21	101	20	1527	--	1549
	22	104	48	2035	1814	1557
	23	102	48	1460	1998	1628
	24	101	59	1818	1897	1542
	25	98	53	1814	1694	--
	26	87	23	1660	1833	1676
	27	85	29	1684	1728	1375
	28	84	27	--	1661	1442
	Mean	79.0	29.3	1562	1509	1131

1971	March	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	83	19	--	1513	1210
	2	93	35	1125	--	947
	3	84	32	948	981	686
	4	72	29	482	844	655
	5	63	23	409	648	484
	6	52	16	307	--	360
	7	48	8	--	--	242
	8	44	7	--	--	357
	9	37	16	324	500	394
	10	41	17	440	669	502
	11	49	18	827	859	--
	12	68	38	749	1034	619
	13	76	35	849	1135	805
	14	71	32	--	--	810
	15	72	30	828	1015	657
	16	79	54	604	--	699
	17	79	62	912	918	659
	18	76	37	912	929	788
	19	64	16	832	--	--
	20	53	9	339	600	444
	21	58	16	477	--	356
	22	55	32	534	255	243
	23	51	27	436	348	216
	24	51	32	382	--	258
	25	48	14	461	478	343
	26	50	8	556	--	390
	27	55	20	394	--	538
	28	52	11	328	--	644
	29	49	31	667	811	674
	30	54	31	794	855	683
	31	54	26	816	929	791
	Mean	60.7	25.2	620	806	567

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1971	Apr.	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	58	38	806	—	749
	2	57	36	1025	—	644
	3	59	20	673	765	477
	4	56	7	630	—	417
	5	62	7	408	—	389
	6	58	9	576	534	390
	7	59	0	441	632	404
	8	61	29	577	752	529
	9	47	31	309	—	502
	10	54	28	509	—	389
	11	51	18	434	518	407
	12	85	30	758	—	820
	13	103	21	1320	1708	1227
	14	125	44	1918	2298	1593
	15	123	68	1743	2470	1796
	16	109	59	1851	—	1804
	17	102	59	1575	—	1660
	18	102	79	1394	—	1466
	19	110	56	1691	1967	1469
	20	106	18	1391	—	1149
	21	98	16	844	923	687
	22	82	11	534	710	421
	23	55	7	291	—	145
	24	50	0	85	38	—
	25	48	29	171	445	131
	26	53	42	424	—	169
	27	51	41	524	—	—
	28	49	39	668	831	517
	29	45	37	488	—	453
	30	36	10	529	494	281
	Mean	71.8	29.6	820	1006	753

1971	May	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	47	11	482	—	214
	2	49	20	—	—	291
	3	54	16	455	426	347
	4	61	0	592	824	644
	5	66	34	1329	1242	925
	6	66	49	1681	1784	1712
	7	72	55	2591	2276	2309
	8	70	58	2772	2397	2330
	9	69	16	1972	2196	1725
	10	73	15	1548	1583	1465
	11	71	11	1028	—	911
	12	74	11	765	765	709
	13	78	41	475	—	404
	14	78	34	791	709	366
	15	76	53	726	761	377
	16	74	41	679	566	384
	17	65	40	574	542	278
	18	56	15	371	317	237
	19	48	13	339	341	220
	20	45	0	234	226	163
	21	43	9	158	151	85
	22	35	9	143	119	37
	23	20	14	63	22	5
	24	20	0	32	—	14
	25	27	7	254	310	237
	26	36	15	456	589	501
	27	49	49	848	—	688
	28	64	24	1405	1106	1061
	29	67	31	1022	961	834
	30	68	33	975	875	648
	31	63	11	847	643	—
	Mean	57.5	23.7	854	869	671

1971	June	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	49	16	709	—	534
	2	61	15	596	525	414
	3	60	15	637	452	352
	4	55	13	435	—	372
	5	43	34	631	521	441
	6	28	28	461	494	—
	7	29	29	599	—	—
	8	38	38	435	558	473
	9	28	10	456	532	395
	10	24	9	419	366	346
	11	26	9	297	278	273
	12	30	12	318	303	225
	13	23	14	149	168	85
	14	32	17	84	204	45
	15	20	12	90	92	20
	16	36	12	52	—	18
	17	40	12	99	—	82
	18	40	10	63	—	70
	19	28	13	79	—	37
	20	35	7	111	172	52
	21	35	7	153	150	45
	22	38	0	186	255	68
	23	49	27	96	—	37
	24	58	43	302	—	75
	25	69	39	673	540	258
	26	88	38	688	498	379
	27	103	49	536	923	373
	28	106	32	763	1209	685
	29	110	34	1803	1651	1165
	30	112	36	2660	—	1873
	Mean	49.8	21.0	486	495	328

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1971	July	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	95	34	2910	2286	2225
	2	97	71	2809	1884	2040
	3	98	89	2052	2210	1845
	4	95	69	2464	2107	2115
	5	84	28	2459	—	2067
	6	79	7	1341	—	1493
	7	74	7	1421	1385	999
	8	68	0	945	—	714
	9	58	29	551	633	325
	10	45	27	382	—	163
	11	48	26	509	786	269
	12	58	36	631	655	364
	13	54	10	1186	1236	833
	14	61	20	1393	—	974
	15	82	29	1582	1575	1282
	16	93	48	1798	—	1282
	17	87	48	1568	1653	1235
	18	78	46	1207	1526	1140
	19	104	81	1474	1422	909
	20	91	75	1707	1489	988
	21	97	58	1070	1091	849
	22	116	63	1108	1210	711
	23	83	40	1018	1030	684
	24	112	30	1250	1498	905
	25	112	34	1247	845	1017
	26	84	42	1526	1217	958
	27	75	14	1214	—	773
	28	72	19	953	881	671
	29	70	34	833	723	605
	30	72	25	795	673	624
	31	69	48	759	620	483
Mean		81.0	38.3	1360	1276	1017

1971	Aug.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	72	40	642	554	469
	2	61	24	514	484	332
	3	58	16	414	362	248
	4	48	10	371	364	274
	5	45	7	468	381	272
	6	38	0	487	452	385
	7	44	8	604	564	454
	8	58	41	700	—	737
	9	62	51	1156	1170	965
	10	64	36	965	—	991
	11	62	31	816	857	673
	12	60	25	589	634	506
	13	59	14	423	470	313
	14	58	16	351	290	265
	15	52	21	488	—	250
	16	49	26	488	—	269
	17	52	16	407	—	346
	18	63	24	1027	1101	717
	19	65	16	1855	1749	1628
	20	84	32	2968	—	2980
	21	102	24	3742	3390	3559
	22	100	85	4278	3236	3184
	23	108	85	3684	3684	3347
	24	97	77	3800	—	3297
	25	91	66	3540	2803	3149
	26	82	9	2682	2277	2369
	27	57	11	1992	—	1711
	28	40	16	1081	—	1092
	29	29	0	658	558	535
	30	21	0	255	175	183
	31	21	0	138	95	73
	Mean	61.4	26.7	1341	1166	1148

1971	Sept.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	22	0	75	54	32
	2	19	12	53	64	15
	3	26	17	111	182	79
	4	29	29	138	271	210
	5	42	35	365	347	118
	6	71	26	605	857	545
	7	74	25	725	1003	688
	8	59	16	800	942	657
	9	47	13	455	—	230
	10	22	0	52	—	19
	11	16	0	80	—	45
	12	27	11	127	80	98
	13	45	13	313	—	124
	14	60	22	514	510	278
	15	72	8	704	—	569
	16	64	8	921	—	479
	17	80	29	741	—	634
	18	85	59	608	—	551
	19	73	47	848	679	394
	20	60	52	630	—	374
	21	62	20	625	—	311
	22	69	8	531	543	251
	23	61	8	250	—	133
	24	36	0	476	318	223
	25	30	21	594	—	461
	26	26	17	594	557	577
	27	40	16	1018	—	676
	28	56	10	1283	—	1243
	29	62	25	1696	—	1398
	30	70	24	1859	1499	1548
	Mean	50.2	19.0	593	527	432

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1971	Oct.	$R$	$R_C$	$A_C$	$A_R$	$A_Z$
	1	63	25	--	1465	1480
	2	58	58	1421	--	1175
	3	48	39	1124	--	1163
	4	37	16	842	--	868
	5	52	22	875	770	773
	6	42	34	694	726	529
	7	43	7	487	456	399
	8	44	18	408	--	328
	9	40	15	371	290	215
	10	37	16	154	--	94
	11	26	8	85	102	22
	12	35	15	122	--	33
	13	33	26	73	128	29
	14	30	23	106	80	--
	15	21	7	91	64	17
	16	24	8	85	143	--
	17	28	11	329	--	275
	18	39	7	859	843	634
	19	42	0	--	1337	1353
	20	66	40	2109	1916	1829
	21	73	57	2889	2482	2575
	22	74	66	3306	2756	2716
	23	78	63	3423	3072	3025
	24	81	23	2858	3538	3309
	25	87	19	3684	3095	2689
	26	82	25	2776	2452	2041
	27	79	28	1729	--	1408
	28	69	40	--	1066	--
	29	62	35	1141	955	902
	30	52	34	1192	962	893
	31	59	30	1335	--	852
Mean		51.7	26.3	1235	1304	1130

1971	Nov.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	73	29	1263	1090	910
	2	69	15	1271	1217	1122
	3	62	0	1319	1303	1008
	4	66	13	1283	1301	1153
	5	69	48	1309	1665	1141
	6	64	48	1230	--	888
	7	53	53	890	--	648
	8	58	52	704	660	--
	9	56	29	526	--	--
	10	49	21	471	--	--
	11	45	9	303	--	--
	12	46	8	265	--	116
	13	42	20	195	--	122
	14	30	7	505	--	342
	15	28	8	652	477	500
	16	26	8	726	668	643
	17	42	7	847	749	672
	18	45	29	1097	--	858
	19	48	25	1351	--	--
	20	50	29	1219	1035	--
	21	62	11	812	--	--
	22	74	14	1293	--	--
	23	78	16	1803	1616	--
	24	86	16	1823	1447	1258
	25	87	22	1962	1416	1242
	26	97	87	--	--	1249
	27	102	83	--	--	1050
	28	106	77	1478	--	--
	29	99	28	2020	1530	--
	30	84	9	1478	--	621
	Mean	63.2	27.4	1075	1155	818

1971	Dec.	R	R <sub>C</sub>	A <sub>C</sub>	A <sub>R</sub>	A <sub>Z</sub>
	1	63	0	923	--	431
	2	65	9	775	--	332
	3	55	14	552	440	375
	4	41	7	806	586	521
	5	59	33	--	--	939
	6	82	51	1787	--	1283
	7	84	47	1639	--	--
	8	86	58	1351	--	--
	9	100	38	--	--	1169
	10	101	37	--	--	--
	11	102	52	1573	1435	--
	12	98	32	1544	1534	1059
	13	86	47	1702	--	1285
	14	84	38	1633	--	1166
	15	89	44	1446	--	947
	16	89	48	1226	--	956
	17	111	55	1440	1299	1020
	18	117	48	2083	--	1380
	19	108	41	2048	--	1469
	20	102	33	2001	--	1827
	21	89	25	1940	--	--
	22	88	58	1866	--	1840
	23	88	62	1824	--	1200
	24	91	76	1321	--	1134
	25	88	54	1050	--	931
	26	76	30	938	--	--
	27	75	11	967	--	464
	28	65	10	640	--	287
	29	60	16	--	--	--
	30	54	19	573	--	--
	31	52	15	600	--	--
	Mean	82.2	35.7	1343	1059	1001