

# 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, Athen, Beirut, Bucarest, Catania, Herstmonceux, Ikoma-Nara, Istanbul, Kanzelhöhe, Karlsruhe, Kiev, Kislovodsk, Locarno, Madrid, Manila, Potsdam, Prag, Quezon-City, Roma-Monte Mario, Skalnaté Pleso, Taipei, Tashkent, Tokyo, Tortosa, Uccle, Wrocław, 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.

1964	January			February			March		
	R	$A_R$	$A_C$	R	$A_R$	$A_C$	R	$A_R$	$A_C$
1	0	0	—	0	0	0	27	—	94
2	14	—	28	0	0	0	8	0	2
3	8	0	6	0	0	0	13	—	—
4	7	0	—	0	0	0	7	0	—
5	13	—	—	0	0	0	7	0	0
6	17	75	—	0	0	0	0	0	0
7	20	95	31	10	0	—	15	3	—
8	16	16	—	13	—	—	9	—	7
9	13	11	32	18	70	—	8	3	—
10	15	0	27	9	81	11	0	—	0
11	19	22	41	7	0	0	14	21	49
12	20	16	36	0	0	0	23	—	107
13	27	52	59	0	0	2	40	—	85
14	24	—	62	8	—	0	32	133	84
15	22	61	58	13	—	45	29	—	119
16	16	35	42	17	64	62	28	—	144
17	20	—	—	21	—	55	20	182	157
18	7	20	—	15	35	28	8	142	92
19	14	200	70	13	—	28	10	152	82
20	11	223	81	23	101	84	11	—	102
21	11	216	108	39	118	132	20	146	84
22	11	190	—	42	192	151	32	227	209
23	11	153	101	54	—	—	30	294	205
24	18	167	111	44	246	196	27	302	204
25	17	139	88	36	—	121	23	268	227
26	10	—	60	34	128	—	20	—	107
27	9	119	50	34	262	223	16	—	—
28	24	275	—	34	258	222	14	—	102
29	27	—	265	28	256	123	7	—	9
30	22	925	244	—	—	—	7	—	4
31	11	0	56	—	—	—	7	—	2
Mean	15.3	120	75	17.7	82	62	16.5	117	88

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1964	April			May			June		
	R	$A_R$	$A_C$	R	$A_R$	$A_C$	R	$A_R$	$A_C$
1	10	0	5	7	0	0	8	26	21
2	0	0	0	0	0	0	8	16	16
3	13	—	0	0	0	3	8	19	15
4	0	—	3	10	18	5	8	18	13
5	10	0	5	14	35	32	0	0	0
6	11	17	22	11	32	32	0	0	0
7	15	26	22	11	25	32	14	0	0
8	13	21	16	10	17	34	0	0	0
9	10	20	9	7	16	18	7	—	0
10	9	18	12	7	—	10	7	0	0
11	8	—	—	7	0	0	14	0	0
12	7	0	—	0	0	0	22	—	26
13	7	—	6	0	0	0	12	51	17
14	7	0	4	9	0	0	18	—	69
15	7	0	2	17	11	6	24	209	101
16	7	0	11	17	33	—	23	92	78
17	13	—	5	23	37	73	13	50	29
18	7	0	3	11	29	17	22	104	57
19	0	0	0	9	19	3	24	116	72
20	9	23	10	7	—	5	19	100	47
21	19	51	86	7	0	3	9	—	6
22	17	48	86	18	35	5	0	0	0
23	16	30	22	13	—	30	0	0	0
24	23	21	90	11	19	25	0	0	0
25	12	19	72	11	15	22	0	—	0
26	7	16	8	14	0	0	0	0	0
27	0	0	0	8	45	47	0	—	0
28	0	0	0	8	—	48	0	—	0
29	0	—	0	8	46	44	7	46	9
30	0	—	0	9	41	39	7	34	14
31				9	—	36			
Mean	8.6	13	18	9.5	18	19	9.1	38	20

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1964	July			August			September		
	R	$A_R$	$A_C$	R	$A_R$	$A_C$	R	$A_R$	$A_C$
1	7	24	10	9	49	31	7	45	18
2	0	0	0	20	98	81	8	28	16
3	0	0	0	17	—	46	8	20	11
4	8	0	0	9	—	9	0	0	0
5	10	—	28	8	0	9	0	0	0
6	8	—	7	7	0	0	0	0	0
7	7	0	0	7	—	0	7	0	0
8	0	0	0	0	0	0	20	83	35
9	0	0	0	0	0	0	12	61	30
10	0	0	0	7	0	0	11	67	33
11	0	—	0	8	16	37	11	66	42
12	0	0	0	21	54	35	20	—	123
13	0	0	0	23	—	207	18	164	60
14	10	60	24	36	—	231	11	—	48
15	12	69	79	30	—	289	0	0	0
16	11	54	24	30	80	345	0	—	0
17	9	—	10	19	41	37	0	0	0
18	8	—	3	9	23	18	0	0	0
19	0	0	0	8	—	35	0	0	0
20	0	0	0	7	—	22	0	0	0
21	0	0	0	7	—	26	0	0	0
22	0	0	0	0	0	19	0	0	0
23	0	0	0	0	0	0	0	0	0
24	0	0	3	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	—	0	0	0
27	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	—	0
29	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	7	0	0
31	7	20	3	7	—	0			
Mean	3.1	9	6	9.3	17	49	4.7	21	14

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1964	October			November			December		
	R	$A_R$	$A_C$	R	$A_R$	$A_C$	R	$A_R$	$A_C$
1	17	—	28	9	—	20	0	0	0
2	12	30	34	8	—	10	0	0	0
3	0	—	0	8	19	8	0	0	0
4	0	0	0	0	—	0	0	0	0
5	0	0	0	0	—	0	7	0	0
6	14	139	70	7	0	0	0	0	0
7	20	162	121	7	—	0	0	0	0
8	16	—	110	7	—	—	8	0	0
9	11	98	77	0	—	0	7	0	0
10	0	—	28	0	—	0	10	0	42
11	0	—	0	0	0	0	12	0	85
12	0	0	0	9	64	15	16	76	62
13	0	0	0	7	—	18	10	66	60
14	0	0	0	17	64	33	17	34	38
15	0	0	0	8	—	14	10	—	—
16	0	0	0	16	80	72	17	—	—
17	0	0	0	15	70	62	27	—	41
18	12	53	12	19	115	87	28	—	—
19	11	61	34	12	122	81	30	—	341
20	10	33	19	19	—	79	29	—	294
21	0	0	0	21	—	37	23	236	291
22	0	0	0	8	—	20	26	220	283
23	0	0	0	0	0	0	16	185	192
24	7	—	0	8	0	0	18	170	—
25	8	—	0	9	0	6	19	—	150
26	7	—	0	0	—	0	14	—	128
27	9	50	0	0	—	0	19	—	151
28	0	—	0	7	—	25	28	—	212
29	9	—	0	0	—	5	38	—	149
30	16	—	3	0	—	—	21	422	86
31	9	21	—				19	140	82
Mean	6.1	32	18	7.4	45	21	15.1	77	100