

# Fachgruppe Meteorastronomie

Fachgruppe Meteorastronomie (FMA)  
www.meteorastronomie.ch

## Sonnen-Länge $\lambda$ [°] 2019 (J2000)

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01.01.2019	280.000	280.085	280.170	280.255	280.340	280.425	280.510	280.595	280.680	280.765	280.850	280.935
02.01.2019	281.019	281.104	281.189	281.274	281.359	281.444	281.529	281.614	281.699	281.784	281.869	281.954
03.01.2019	282.039	282.124	282.209	282.294	282.379	282.464	282.549	282.634	282.719	282.804	282.889	282.974
04.01.2019	283.059	283.144	283.229	283.314	283.398	283.483	283.568	283.653	283.738	283.823	283.908	283.993
05.01.2019	284.078	284.163	284.248	284.333	284.418	284.503	284.588	284.673	284.758	284.843	284.928	285.013
06.01.2019	285.098	285.183	285.268	285.353	285.438	285.523	285.608	285.693	285.778	285.863	285.948	286.033
07.01.2019	286.118	286.202	286.287	286.372	286.457	286.542	286.627	286.712	286.797	286.882	286.967	287.052
08.01.2019	287.137	287.222	287.307	287.392	287.477	287.562	287.647	287.732	287.817	287.902	287.987	288.072
09.01.2019	288.157	288.242	288.326	288.411	288.496	288.581	288.666	288.751	288.836	288.921	289.006	289.091
10.01.2019	289.176	289.261	289.346	289.431	289.516	289.601	289.686	289.771	289.856	289.940	290.025	290.110
11.01.2019	290.195	290.280	290.365	290.450	290.535	290.620	290.705	290.790	290.875	290.960	291.045	291.129
12.01.2019	291.214	291.299	291.384	291.469	291.554	291.639	291.724	291.809	291.894	291.979	292.064	292.148
13.01.2019	292.233	292.318	292.403	292.488	292.573	292.658	292.743	292.828	292.913	292.998	293.082	293.167
14.01.2019	293.252	293.337	293.422	293.507	293.592	293.677	293.762	293.846	293.931	294.016	294.101	294.186
15.01.2019	294.271	294.356	294.441	294.525	294.610	294.695	294.780	294.865	294.950	295.035	295.120	295.204
16.01.2019	295.289	295.374	295.459	295.544	295.629	295.714	295.798	295.883	295.968	296.053	296.138	296.223
17.01.2019	296.307	296.392	296.477	296.562	296.647	296.732	296.817	296.901	296.986	297.071	297.156	297.241
18.01.2019	297.325	297.410	297.495	297.580	297.665	297.750	297.834	297.919	298.004	298.089	298.174	298.259
19.01.2019	298.343	298.428	298.513	298.598	298.683	298.767	298.852	298.937	299.022	299.107	299.191	299.276
20.01.2019	299.361	299.446	299.531	299.615	299.700	299.785	299.870	299.955	300.039	300.124	300.209	300.294
21.01.2019	300.378	300.463	300.548	300.633	300.718	300.802	300.887	300.972	301.057	301.141	301.226	301.311
22.01.2019	301.396	301.480	301.565	301.650	301.735	301.820	301.904	301.989	302.074	302.159	302.243	302.328
23.01.2019	302.413	302.498	302.582	302.667	302.752	302.837	302.921	303.006	303.091	303.176	303.260	303.345
24.01.2019	303.430	303.514	303.599	303.684	303.769	303.853	303.938	304.023	304.108	304.192	304.277	304.362
25.01.2019	304.447	304.531	304.616	304.701	304.785	304.870	304.955	305.040	305.124	305.209	305.294	305.378
26.01.2019	305.463	305.548	305.633	305.717	305.802	305.887	305.971	306.056	306.141	306.226	306.310	306.395
27.01.2019	306.480	306.564	306.649	306.734	306.818	306.903	306.988	307.072	307.157	307.242	307.327	307.411
28.01.2019	307.496	307.581	307.665	307.750	307.835	307.919	308.004	308.089	308.173	308.258	308.343	308.427
29.01.2019	308.512	308.597	308.681	308.766	308.851	308.935	309.020	309.105	309.189	309.274	309.359	309.443
30.01.2019	309.528	309.613	309.697	309.782	309.867	309.951	310.036	310.121	310.205	310.290	310.375	310.459
31.01.2019	310.544	310.628	310.713	310.798	310.882	310.967	311.052	311.136	311.221	311.305	311.390	311.475
01.02.2019	311.559	311.644	311.729	311.813	311.898	311.982	312.067	312.152	312.236	312.321	312.406	312.490
02.02.2019	312.575	312.659	312.744	312.829	312.913	312.998	313.082	313.167	313.251	313.336	313.421	313.505
03.02.2019	313.590	313.674	313.759	313.844	313.928	314.013	314.097	314.182	314.266	314.351	314.436	314.520
04.02.2019	314.605	314.689	314.774	314.858	314.943	315.027	315.112	315.196	315.281	315.366	315.450	315.535
05.02.2019	315.619	315.704	315.788	315.873	315.957	316.042	316.126	316.211	316.295	316.380	316.464	316.549
06.02.2019	316.633	316.718	316.802	316.887	316.971	317.056	317.140	317.225	317.309	317.394	317.478	317.563
07.02.2019	317.647	317.732	317.816	317.901	317.985	318.070	318.154	318.239	318.323	318.407	318.492	318.576
08.02.2019	318.661	318.745	318.830	318.914	318.998	319.083	319.167	319.252	319.336	319.421	319.505	319.589
09.02.2019	319.674	319.758	319.843	319.927	320.011	320.096	320.180	320.265	320.349	320.433	320.518	320.602
10.02.2019	320.687	320.771	320.855	320.940	321.024	321.108	321.193	321.277	321.361	321.446	321.530	321.614
11.02.2019	321.699	321.783	321.867	321.952	322.036	322.120	322.205	322.289	322.373	322.458	322.542	322.626
12.02.2019	322.711	322.795	322.879	322.963	323.048	323.132	323.216	323.301	323.385	323.469	323.553	323.638
13.02.2019	323.722	323.806	323.890	323.975	324.059	324.143	324.227	324.312	324.396	324.480	324.564	324.649
14.02.2019	324.733	324.817	324.901	324.985	325.070	325.154	325.238	325.322	325.406	325.491	325.575	325.659
15.02.2019	325.743	325.827	325.912	325.996	326.080	326.164	326.248	326.332	326.417	326.501	326.585	326.669
16.02.2019	326.753	326.837	326.921	327.006	327.090	327.174	327.258	327.342	327.426	327.510	327.594	327.679
17.02.2019	327.763	327.847	327.931	328.015	328.099	328.183	328.267	328.351	328.435	328.519	328.604	328.688
18.02.2019	328.772	328.856	328.940	329.024	329.108	329.192	329.276	329.360	329.444	329.528	329.612	329.696
19.02.2019	329.780	329.864	329.948	330.032	330.116	330.200	330.284	330.368	330.452	330.536	330.620	330.704
20.02.2019	330.788	330.872	330.956	331.040	331.124	331.208	331.292	331.376	331.460	331.544	331.628	331.712
21.02.2019	331.796	331.880	331.964	332.048	332.132	332.216	332.300	332.384	332.468	332.552	332.636	332.719
22.02.2019	332.803	332.887	332.971	333.055	333.139	333.223	333.307	333.391	333.475	333.559	333.642	333.726
23.02.2019	333.810	333.894	333.978	334.062	334.146	334.230	334.314	334.397	334.481	334.565	334.649	334.733
24.02.2019	334.817	334.901	334.984	335.068	335.152	335.236	335.320	335.404	335.488	335.571	335.655	335.739
25.02.2019	335.823	335.907	335.991	336.074	336.158	336.242	336.326	336.410	336.493	336.577	336.661	336.745
26.02.2019	336.829	336.912	336.996	337.080	337.164	337.247	337.331	337.415	337.499	337.583	337.666	337.750
27.02.2019	337.834	337.918	338.001	338.085	338.169	338.253	338.336	338.420	338.504	338.588	338.671	338.755
28.02.2019	338.839	338.923	339.006	339.090	339.174	339.257	339.341	339.425	339.509	339.592	339.676	339.760
01.03.2019	339.843	339.927	340.011	340.094	340.178	340.262	340.345	340.429	340.513	340.596	340.680	340.764

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02.03.2019	340.847	340.931	341.015	341.098	341.182	341.266	341.349	341.433	341.517	341.600	341.684	341.767
03.03.2019	341.851	341.935	342.018	342.102	342.186	342.269	342.353	342.436	342.520	342.604	342.687	342.771
04.03.2019	342.854	342.938	343.021	343.105	343.189	343.272	343.356	343.439	343.523	343.606	343.690	343.774
05.03.2019	343.857	343.941	344.024	344.108	344.191	344.275	344.358	344.442	344.525	344.609	344.692	344.776
06.03.2019	344.859	344.943	345.026	345.110	345.193	345.277	345.360	345.444	345.527	345.611	345.694	345.778
07.03.2019	345.861	345.945	346.028	346.111	346.195	346.278	346.362	346.445	346.529	346.612	346.696	346.779
08.03.2019	346.862	346.946	347.029	347.113	347.196	347.279	347.363	347.446	347.530	347.613	347.696	347.780
09.03.2019	347.863	347.946	348.030	348.113	348.196	348.280	348.363	348.447	348.530	348.613	348.697	348.780
10.03.2019	348.863	348.946	349.030	349.113	349.196	349.280	349.363	349.446	349.530	349.613	349.696	349.779
11.03.2019	349.863	349.946	350.029	350.112	350.196	350.279	350.362	350.445	350.529	350.612	350.695	350.778
12.03.2019	350.862	350.945	351.028	351.111	351.194	351.278	351.361	351.444	351.527	351.610	351.694	351.777
13.03.2019	351.860	351.943	352.026	352.109	352.193	352.276	352.359	352.442	352.525	352.608	352.691	352.775
14.03.2019	352.858	352.941	353.024	353.107	353.190	353.273	353.356	353.439	353.522	353.606	353.689	353.772
15.03.2019	353.855	353.938	354.021	354.104	354.187	354.270	354.353	354.436	354.519	354.602	354.685	354.768
16.03.2019	354.851	354.934	355.017	355.100	355.183	355.266	355.349	355.432	355.515	355.598	355.681	355.764
17.03.2019	355.847	355.930	356.013	356.096	356.179	356.262	356.345	356.428	356.511	356.594	356.676	356.759
18.03.2019	356.842	356.925	357.008	357.091	357.174	357.257	357.340	357.423	357.505	357.588	357.671	357.754
19.03.2019	357.837	357.920	358.003	358.086	358.168	358.251	358.334	358.417	358.500	358.583	358.665	358.748
20.03.2019	358.831	358.914	358.997	359.079	359.162	359.245	359.328	359.411	359.493	359.576	359.659	359.742
21.03.2019	359.824	359.907	359.990	0.073	0.155	0.238	0.321	0.404	0.486	0.569	0.652	0.735
22.03.2019	0.817	0.900	0.983	1.066	1.148	1.231	1.314	1.396	1.479	1.562	1.644	1.727
23.03.2019	1.810	1.892	1.975	2.058	2.140	2.223	2.306	2.388	2.471	2.554	2.636	2.719
24.03.2019	2.802	2.884	2.967	3.049	3.132	3.215	3.297	3.380	3.463	3.545	3.628	3.710
25.03.2019	3.793	3.875	3.958	4.041	4.123	4.206	4.288	4.371	4.453	4.536	4.619	4.701
26.03.2019	4.784	4.866	4.949	5.031	5.114	5.196	5.279	5.361	5.444	5.526	5.609	5.692
27.03.2019	5.774	5.857	5.939	6.022	6.104	6.186	6.269	6.351	6.434	6.516	6.599	6.681
28.03.2019	6.764	6.846	6.929	7.011	7.094	7.176	7.259	7.341	7.423	7.506	7.588	7.671
29.03.2019	7.753	7.836	7.918	8.000	8.083	8.165	8.248	8.330	8.412	8.495	8.577	8.660
30.03.2019	8.742	8.824	8.907	8.989	9.072	9.154	9.236	9.319	9.401	9.483	9.566	9.648
31.03.2019	9.730	9.813	9.895	9.977	10.060	10.142	10.224	10.307	10.389	10.471	10.554	10.636
01.04.2019	10.718	10.801	10.883	10.965	11.047	11.130	11.212	11.294	11.377	11.459	11.541	11.623
02.04.2019	11.706	11.788	11.870	11.952	12.035	12.117	12.199	12.281	12.364	12.446	12.528	12.610
03.04.2019	12.692	12.775	12.857	12.939	13.021	13.103	13.186	13.268	13.350	13.432	13.514	13.597
04.04.2019	13.679	13.761	13.843	13.925	14.007	14.090	14.172	14.254	14.336	14.418	14.500	14.582
05.04.2019	14.665	14.747	14.829	14.911	14.993	15.075	15.157	15.239	15.321	15.403	15.486	15.568
06.04.2019	15.650	15.732	15.814	15.896	15.978	16.060	16.142	16.224	16.306	16.388	16.470	16.552
07.04.2019	16.634	16.716	16.798	16.880	16.962	17.044	17.126	17.208	17.290	17.372	17.454	17.536
08.04.2019	17.618	17.700	17.782	17.864	17.946	18.028	18.110	18.192	18.274	18.356	18.438	18.520
09.04.2019	18.602	18.684	18.766	18.847	18.929	19.011	19.093	19.175	19.257	19.339	19.421	19.503
10.04.2019	19.584	19.666	19.748	19.830	19.912	19.994	20.076	20.157	20.239	20.321	20.403	20.485
11.04.2019	20.567	20.648	20.730	20.812	20.894	20.976	21.057	21.139	21.221	21.303	21.385	21.466
12.04.2019	21.548	21.630	21.712	21.793	21.875	21.957	22.039	22.120	22.202	22.284	22.365	22.447
13.04.2019	22.529	22.611	22.692	22.774	22.856	22.937	23.019	23.101	23.182	23.264	23.346	23.427
14.04.2019	23.509	23.591	23.672	23.754	23.836	23.917	23.999	24.081	24.162	24.244	24.325	24.407
15.04.2019	24.489	24.570	24.652	24.734	24.815	24.897	24.978	25.060	25.141	25.223	25.305	25.386
16.04.2019	25.468	25.549	25.631	25.712	25.794	25.875	25.957	26.038	26.120	26.202	26.283	26.365
17.04.2019	26.446	26.528	26.609	26.691	26.772	26.854	26.935	27.017	27.098	27.179	27.261	27.342
18.04.2019	27.424	27.505	27.587	27.668	27.750	27.831	27.913	27.994	28.075	28.157	28.238	28.320
19.04.2019	28.401	28.482	28.564	28.645	28.727	28.808	28.889	28.971	29.052	29.134	29.215	29.296
20.04.2019	29.378	29.459	29.540	29.622	29.703	29.785	29.866	29.947	30.029	30.110	30.191	30.273
21.04.2019	30.354	30.435	30.516	30.598	30.679	30.760	30.842	30.923	31.004	31.086	31.167	31.248
22.04.2019	31.329	31.411	31.492	31.573	31.655	31.736	31.817	31.898	31.980	32.061	32.142	32.223
23.04.2019	32.305	32.386	32.467	32.548	32.630	32.711	32.792	32.873	32.954	33.036	33.117	33.198
24.04.2019	33.279	33.360	33.442	33.523	33.604	33.685	33.766	33.848	33.929	34.010	34.091	34.172
25.04.2019	34.253	34.335	34.416	34.497	34.578	34.659	34.740	34.822	34.903	34.984	35.065	35.146
26.04.2019	35.227	35.308	35.389	35.471	35.552	35.633	35.714	35.795	35.876	35.957	36.038	36.119
27.04.2019	36.201	36.282	36.363	36.444	36.525	36.606	36.687	36.768	36.849	36.930	37.011	37.092
28.04.2019	37.173	37.254	37.336	37.417	37.498	37.579	37.660	37.741	37.822	37.903	37.984	38.065
29.04.2019	38.146	38.227	38.308	38.389	38.470	38.551	38.632	38.713	38.794	38.875	38.956	39.037
30.04.2019	39.118	39.199	39.280	39.361	39.442	39.523	39.604	39.685	39.766	39.847	39.928	40.009
01.05.2019	40.090	40.170	40.251	40.332	40.413	40.494	40.575	40.656	40.737	40.818	40.899	40.980
02.05.2019	41.061	41.142	41.222	41.303	41.384	41.465	41.546	41.627	41.708	41.789	41.870	41.950
03.05.2019	42.031	42.112	42.193	42.274	42.355	42.436	42.517	42.597	42.678	42.759	42.840	42.921
04.05.2019	43.002	43.082	43.163	43.244	43.325	43.406	43.487	43.567	43.648	43.729	43.810	43.891
05.05.2019	43.971	44.052	44.133	44.214	44.295	44.375	44.456	44.537	44.618	44.698	44.779	44.860
06.05.2019	44.941	45.021	45.102	45.183	45.264	45.344	45.425	45.506	45.587	45.667	45.748	45.829
07.05.2019	45.909	45.990	46.071	46.152	46.232	46.313	46.394	46.474	46.555	46.636	46.716	46.797
08.05.2019	46.878	46.958	47.039	47.120	47.200	47.281	47.362	47.442	47.523	47.604	47.684	47.765

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09.05.2019	47.846	47.926	48.007	48.087	48.168	48.249	48.329	48.410	48.490	48.571	48.652	48.732
10.05.2019	48.813	48.893	48.974	49.055	49.135	49.216	49.296	49.377	49.457	49.538	49.618	49.699
11.05.2019	49.780	49.860	49.941	50.021	50.102	50.182	50.263	50.343	50.424	50.504	50.585	50.665
12.05.2019	50.746	50.826	50.907	50.987	51.068	51.148	51.229	51.309	51.390	51.470	51.551	51.631
13.05.2019	51.711	51.792	51.872	51.953	52.033	52.114	52.194	52.275	52.355	52.435	52.516	52.596
14.05.2019	52.677	52.757	52.837	52.918	52.998	53.079	53.159	53.239	53.320	53.400	53.481	53.561
15.05.2019	53.641	53.722	53.802	53.882	53.963	54.043	54.124	54.204	54.284	54.365	54.445	54.525
16.05.2019	54.606	54.686	54.766	54.847	54.927	55.007	55.088	55.168	55.248	55.328	55.409	55.489
17.05.2019	55.569	55.650	55.730	55.810	55.890	55.971	56.051	56.131	56.212	56.292	56.372	56.452
18.05.2019	56.533	56.613	56.693	56.773	56.854	56.934	57.014	57.094	57.175	57.255	57.335	57.415
19.05.2019	57.496	57.576	57.656	57.736	57.816	57.897	57.977	58.057	58.137	58.217	58.298	58.378
20.05.2019	58.458	58.538	58.618	58.699	58.779	58.859	58.939	59.019	59.100	59.180	59.260	59.340
21.05.2019	59.420	59.500	59.581	59.661	59.741	59.821	59.901	59.981	60.061	60.142	60.222	60.302
22.05.2019	60.382	60.462	60.542	60.622	60.703	60.783	60.863	60.943	61.023	61.103	61.183	61.263
23.05.2019	61.343	61.424	61.504	61.584	61.664	61.744	61.824	61.904	61.984	62.064	62.144	62.225
24.05.2019	62.305	62.385	62.465	62.545	62.625	62.705	62.785	62.865	62.945	63.025	63.105	63.185
25.05.2019	63.265	63.346	63.426	63.506	63.586	63.666	63.746	63.826	63.906	63.986	64.066	64.146
26.05.2019	64.226	64.306	64.386	64.466	64.546	64.626	64.706	64.786	64.866	64.946	65.026	65.106
27.05.2019	65.186	65.266	65.346	65.426	65.506	65.586	65.666	65.746	65.827	65.907	65.987	66.067
28.05.2019	66.147	66.226	66.306	66.386	66.466	66.546	66.626	66.706	66.786	66.866	66.946	67.026
29.05.2019	67.106	67.186	67.266	67.346	67.426	67.506	67.586	67.666	67.746	67.826	67.906	67.986
30.05.2019	68.066	68.146	68.226	68.306	68.386	68.466	68.546	68.626	68.706	68.785	68.865	68.945
31.05.2019	69.025	69.105	69.185	69.265	69.345	69.425	69.505	69.585	69.665	69.745	69.825	69.904
01.06.2019	69.984	70.064	70.144	70.224	70.304	70.384	70.464	70.544	70.624	70.703	70.783	70.863
02.06.2019	70.943	71.023	71.103	71.183	71.263	71.343	71.422	71.502	71.582	71.662	71.742	71.822
03.06.2019	71.902	71.982	72.061	72.141	72.221	72.301	72.381	72.461	72.541	72.620	72.700	72.780
04.06.2019	72.860	72.940	73.020	73.099	73.179	73.259	73.339	73.419	73.499	73.578	73.658	73.738
05.06.2019	73.818	73.898	73.978	74.057	74.137	74.217	74.297	74.377	74.456	74.536	74.616	74.696
06.06.2019	74.776	74.855	74.935	75.015	75.095	75.175	75.254	75.334	75.414	75.494	75.573	75.653
07.06.2019	75.733	75.813	75.892	75.972	76.052	76.132	76.212	76.291	76.371	76.451	76.531	76.610
08.06.2019	76.690	76.770	76.849	76.929	77.009	77.089	77.168	77.248	77.328	77.408	77.487	77.567
09.06.2019	77.647	77.726	77.806	77.886	77.966	78.045	78.125	78.205	78.284	78.364	78.444	78.523
10.06.2019	78.603	78.683	78.763	78.842	78.922	79.002	79.081	79.161	79.241	79.320	79.400	79.480
11.06.2019	79.559	79.639	79.719	79.798	79.878	79.958	80.037	80.117	80.197	80.276	80.356	80.435
12.06.2019	80.515	80.595	80.674	80.754	80.834	80.913	80.993	81.073	81.152	81.232	81.311	81.391
13.06.2019	81.471	81.550	81.630	81.709	81.789	81.869	81.948	82.028	82.108	82.187	82.267	82.346
14.06.2019	82.426	82.506	82.585	82.665	82.744	82.824	82.903	82.983	83.063	83.142	83.222	83.301
15.06.2019	83.381	83.461	83.540	83.620	83.699	83.779	83.858	83.938	84.017	84.097	84.177	84.256
16.06.2019	84.336	84.415	84.495	84.574	84.654	84.733	84.813	84.893	84.972	85.052	85.131	85.211
17.06.2019	85.290	85.370	85.449	85.529	85.608	85.688	85.768	85.847	85.927	86.006	86.086	86.165
18.06.2019	86.245	86.324	86.404	86.483	86.563	86.642	86.722	86.801	86.881	86.960	87.040	87.119
19.06.2019	87.199	87.279	87.358	87.438	87.517	87.597	87.676	87.756	87.835	87.915	87.994	88.074
20.06.2019	88.153	88.233	88.312	88.392	88.471	88.551	88.630	88.710	88.789	88.869	88.948	89.028
21.06.2019	89.107	89.187	89.266	89.346	89.425	89.505	89.584	89.664	89.743	89.823	89.902	89.982
22.06.2019	90.061	90.141	90.220	90.300	90.379	90.459	90.538	90.618	90.697	90.777	90.856	90.936
23.06.2019	91.015	91.095	91.174	91.254	91.333	91.412	91.492	91.571	91.651	91.730	91.810	91.889
24.06.2019	91.969	92.048	92.128	92.207	92.287	92.366	92.446	92.525	92.605	92.684	92.764	92.843
25.06.2019	92.923	93.002	93.082	93.161	93.241	93.320	93.400	93.479	93.559	93.638	93.718	93.797
26.06.2019	93.877	93.956	94.036	94.115	94.195	94.274	94.353	94.433	94.512	94.592	94.671	94.751
27.06.2019	94.830	94.910	94.989	95.069	95.148	95.228	95.307	95.387	95.466	95.546	95.625	95.705
28.06.2019	95.784	95.864	95.943	96.023	96.102	96.182	96.261	96.341	96.420	96.500	96.579	96.659
29.06.2019	96.738	96.817	96.897	96.976	97.056	97.135	97.215	97.294	97.374	97.453	97.533	97.612
30.06.2019	97.692	97.771	97.851	97.930	98.010	98.089	98.169	98.248	98.328	98.407	98.487	98.566
01.07.2019	98.646	98.725	98.805	98.884	98.964	99.043	99.123	99.202	99.281	99.361	99.440	99.520
02.07.2019	99.599	99.679	99.758	99.838	99.917	99.997	100.076	100.156	100.235	100.315	100.394	100.474
03.07.2019	100.553	100.633	100.712	100.792	100.871	100.951	101.030	101.109	101.189	101.268	101.348	101.427
04.07.2019	101.507	101.586	101.666	101.745	101.825	101.904	101.984	102.063	102.143	102.222	102.302	102.381
05.07.2019	102.461	102.540	102.619	102.699	102.778	102.858	102.937	103.017	103.096	103.176	103.255	103.335
06.07.2019	103.414	103.494	103.573	103.653	103.732	103.812	103.891	103.970	104.050	104.129	104.209	104.288
07.07.2019	104.368	104.447	104.527	104.606	104.686	104.765	104.845	104.924	105.003	105.083	105.162	105.242
08.07.2019	105.321	105.401	105.480	105.560	105.639	105.719	105.798	105.877	105.957	106.036	106.116	106.195
09.07.2019	106.275	106.354	106.434	106.513	106.593	106.672	106.751	106.831	106.910	106.990	107.069	107.149
10.07.2019	107.228	107.308	107.387	107.467	107.546	107.625	107.705	107.784	107.864	107.943	108.023	108.102
11.07.2019	108.182	108.261	108.340	108.420	108.499	108.579	108.658	108.738	108.817	108.897	108.976	109.055
12.07.2019	109.135	109.214	109.294	109.373	109.453	109.532	109.612	109.691	109.770	109.850	109.929	110.009
13.07.2019	110.088	110.168	110.247	110.327	110.406	110.485	110.565	110.644	110.724	110.803	110.883	110.962
14.07.2019	111.042	111.121	111.200	111.280	111.359	111.439	111.518	111.598	111.677	111.757	111.836	111.915
15.07.2019	111.995	112.074	112.154	112.233	112.313	112.392	112.472	112.551	112.630	112.710	112.789	112.869

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16.07.2019	112.948	113.028	113.107	113.187	113.266	113.346	113.425	113.504	113.584	113.663	113.743	113.822
17.07.2019	113.902	113.981	114.061	114.140	114.220	114.299	114.379	114.458	114.537	114.617	114.696	114.776
18.07.2019	114.855	114.935	115.014	115.094	115.173	115.253	115.332	115.412	115.491	115.571	115.650	115.730
19.07.2019	115.809	115.889	115.968	116.047	116.127	116.206	116.286	116.365	116.445	116.524	116.604	116.683
20.07.2019	116.763	116.842	116.922	117.001	117.081	117.160	117.240	117.319	117.399	117.478	117.558	117.637
21.07.2019	117.717	117.796	117.876	117.955	118.035	118.114	118.194	118.273	118.353	118.433	118.512	118.592
22.07.2019	118.671	118.751	118.830	118.910	118.989	119.069	119.148	119.228	119.307	119.387	119.466	119.546
23.07.2019	119.625	119.705	119.785	119.864	119.944	120.023	120.103	120.182	120.262	120.341	120.421	120.501
24.07.2019	120.580	120.660	120.739	120.819	120.898	120.978	121.058	121.137	121.217	121.296	121.376	121.455
25.07.2019	121.535	121.615	121.694	121.774	121.853	121.933	122.013	122.092	122.172	122.251	122.331	122.411
26.07.2019	122.490	122.570	122.649	122.729	122.809	122.888	122.968	123.047	123.127	123.207	123.286	123.366
27.07.2019	123.446	123.525	123.605	123.684	123.764	123.844	123.923	124.003	124.083	124.162	124.242	124.322
28.07.2019	124.401	124.481	124.561	124.640	124.720	124.800	124.879	124.959	125.038	125.118	125.198	125.277
29.07.2019	125.357	125.437	125.516	125.596	125.676	125.756	125.835	125.915	125.995	126.074	126.154	126.234
30.07.2019	126.313	126.393	126.473	126.552	126.632	126.712	126.791	126.871	126.951	127.031	127.110	127.190
31.07.2019	127.270	127.349	127.429	127.509	127.589	127.668	127.748	127.828	127.907	127.987	128.067	128.147
01.08.2019	128.226	128.306	128.386	128.466	128.545	128.625	128.705	128.785	128.864	128.944	129.024	129.104
02.08.2019	129.183	129.263	129.343	129.423	129.502	129.582	129.662	129.742	129.821	129.901	129.981	130.061
03.08.2019	130.140	130.220	130.300	130.380	130.459	130.539	130.619	130.699	130.779	130.858	130.938	131.018
04.08.2019	131.098	131.177	131.257	131.337	131.417	131.497	131.576	131.656	131.736	131.816	131.896	131.975
05.08.2019	132.055	132.135	132.215	132.295	132.374	132.454	132.534	132.614	132.694	132.773	132.853	132.933
06.08.2019	133.013	133.093	133.173	133.252	133.332	133.412	133.492	133.572	133.652	133.731	133.811	133.891
07.08.2019	133.971	134.051	134.131	134.210	134.290	134.370	134.450	134.530	134.610	134.689	134.769	134.849
08.08.2019	134.929	135.009	135.089	135.169	135.248	135.328	135.408	135.488	135.568	135.648	135.728	135.807
09.08.2019	135.887	135.967	136.047	136.127	136.207	136.287	136.367	136.446	136.526	136.606	136.686	136.766
10.08.2019	136.846	136.926	137.006	137.086	137.165	137.245	137.325	137.405	137.485	137.565	137.645	137.725
11.08.2019	137.805	137.885	137.964	138.044	138.124	138.204	138.284	138.364	138.444	138.524	138.604	138.684
12.08.2019	138.764	138.844	138.924	139.003	139.083	139.163	139.243	139.323	139.403	139.483	139.563	139.643
13.08.2019	139.723	139.803	139.883	139.963	140.043	140.123	140.203	140.283	140.363	140.443	140.523	140.603
14.08.2019	140.682	140.762	140.842	140.922	141.002	141.082	141.162	141.242	141.322	141.402	141.482	141.562
15.08.2019	141.642	141.722	141.802	141.882	141.962	142.042	142.122	142.202	142.282	142.362	142.442	142.522
16.08.2019	142.603	142.683	142.763	142.843	142.923	143.003	143.083	143.163	143.243	143.323	143.403	143.483
17.08.2019	143.563	143.643	143.723	143.803	143.883	143.963	144.043	144.124	144.204	144.284	144.364	144.444
18.08.2019	144.524	144.604	144.684	144.764	144.844	144.924	145.005	145.085	145.165	145.245	145.325	145.405
19.08.2019	145.485	145.565	145.646	145.726	145.806	145.886	145.966	146.046	146.126	146.207	146.287	146.367
20.08.2019	146.447	146.527	146.607	146.687	146.768	146.848	146.928	147.008	147.088	147.169	147.249	147.329
21.08.2019	147.409	147.489	147.570	147.650	147.730	147.810	147.890	147.971	148.051	148.131	148.211	148.292
22.08.2019	148.372	148.452	148.532	148.612	148.693	148.773	148.853	148.933	149.014	149.094	149.174	149.255
23.08.2019	149.335	149.415	149.495	149.576	149.656	149.736	149.817	149.897	149.977	150.057	150.138	150.218
24.08.2019	150.298	150.379	150.459	150.539	150.620	150.700	150.780	150.861	150.941	151.021	151.102	151.182
25.08.2019	151.262	151.343	151.423	151.504	151.584	151.664	151.745	151.825	151.905	151.986	152.066	152.147
26.08.2019	152.227	152.307	152.388	152.468	152.549	152.629	152.709	152.790	152.870	152.951	153.031	153.112
27.08.2019	153.192	153.272	153.353	153.433	153.514	153.594	153.675	153.755	153.836	153.916	153.997	154.077
28.08.2019	154.157	154.238	154.318	154.399	154.479	154.560	154.640	154.721	154.801	154.882	154.962	155.043
29.08.2019	155.123	155.204	155.284	155.365	155.446	155.526	155.607	155.687	155.768	155.848	155.929	156.009
30.08.2019	156.090	156.170	156.251	156.332	156.412	156.493	156.573	156.654	156.734	156.815	156.896	156.976
31.08.2019	157.057	157.137	157.218	157.298	157.379	157.460	157.540	157.621	157.702	157.782	157.863	157.943
01.09.2019	158.024	158.105	158.185	158.266	158.347	158.427	158.508	158.588	158.669	158.750	158.830	158.911
02.09.2019	158.992	159.072	159.153	159.234	159.314	159.395	159.476	159.556	159.637	159.718	159.798	159.879
03.09.2019	159.960	160.041	160.121	160.202	160.283	160.363	160.444	160.525	160.606	160.686	160.767	160.848
04.09.2019	160.928	161.009	161.090	161.171	161.251	161.332	161.413	161.494	161.574	161.655	161.736	161.817
05.09.2019	161.897	161.978	162.059	162.140	162.220	162.301	162.382	162.463	162.544	162.624	162.705	162.786
06.09.2019	162.867	162.948	163.028	163.109	163.190	163.271	163.352	163.432	163.513	163.594	163.675	163.756
07.09.2019	163.836	163.917	163.998	164.079	164.160	164.241	164.321	164.402	164.483	164.564	164.645	164.726
08.09.2019	164.807	164.887	164.968	165.049	165.130	165.211	165.292	165.373	165.454	165.534	165.615	165.696
09.09.2019	165.777	165.858	165.939	166.020	166.101	166.182	166.263	166.344	166.424	166.505	166.586	166.667
10.09.2019	166.748	166.829	166.910	166.991	167.072	167.153	167.234	167.315	167.396	167.477	167.558	167.639
11.09.2019	167.720	167.801	167.881	167.962	168.043	168.124	168.205	168.286	168.367	168.448	168.529	168.610
12.09.2019	168.691	168.772	168.853	168.934	169.015	169.096	169.178	169.259	169.340	169.421	169.502	169.583
13.09.2019	169.664	169.745	169.826	169.907	169.988	170.069	170.150	170.231	170.312	170.393	170.474	170.555
14.09.2019	170.637	170.718	170.799	170.880	170.961	171.042	171.123	171.204	171.285	171.367	171.448	171.529
15.09.2019	171.610	171.691	171.772	171.853	171.934	172.016	172.097	172.178	172.259	172.340	172.421	172.503
16.09.2019	172.584	172.665	172.746	172.827	172.908	172.990	173.071	173.152	173.233	173.314	173.396	173.477
17.09.2019	173.558	173.639	173.721	173.802	173.883	173.964	174.046	174.127	174.208	174.289	174.371	174.452
18.09.2019	174.533	174.614	174.696	174.777	174.858	174.940	175.021	175.102	175.183	175.265	175.346	175.427
19.09.2019	175.509	175.590	175.671	175.753	175.834	175.915	175.997	176.078	176.159	176.241	176.322	176.403
20.09.2019	176.485	176.566	176.648	176.729	176.810	176.892	176.973	177.055	177.136	177.217	177.299	177.380
21.09.2019	177.462	177.543	177.624	177.706	177.787	177.869	177.950	178.032	178.113	178.195	178.276	178.358

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22.09.2019	178.439	178.521	178.602	178.683	178.765	178.846	178.928	179.009	179.091	179.172	179.254	179.336
23.09.2019	179.417	179.499	179.580	179.662	179.743	179.825	179.906	179.988	180.069	180.151	180.233	180.314
24.09.2019	180.396	180.477	180.559	180.640	180.722	180.804	180.885	180.967	181.048	181.130	181.212	181.293
25.09.2019	181.375	181.457	181.538	181.620	181.702	181.783	181.865	181.946	182.028	182.110	182.191	182.273
26.09.2019	182.355	182.437	182.518	182.600	182.682	182.763	182.845	182.927	183.008	183.090	183.172	183.254
27.09.2019	183.335	183.417	183.499	183.581	183.662	183.744	183.826	183.908	183.989	184.071	184.153	184.235
28.09.2019	184.316	184.398	184.480	184.562	184.644	184.725	184.807	184.889	184.971	185.053	185.134	185.216
29.09.2019	185.298	185.380	185.462	185.544	185.625	185.707	185.789	185.871	185.953	186.035	186.116	186.198
30.09.2019	186.280	186.362	186.444	186.526	186.608	186.690	186.772	186.853	186.935	187.017	187.099	187.181
01.10.2019	187.263	187.345	187.427	187.509	187.591	187.673	187.755	187.836	187.918	188.000	188.082	188.164
02.10.2019	188.246	188.328	188.410	188.492	188.574	188.656	188.738	188.820	188.902	188.984	189.066	189.148
03.10.2019	189.230	189.312	189.394	189.476	189.558	189.640	189.722	189.804	189.886	189.968	190.050	190.132
04.10.2019	190.214	190.296	190.378	190.460	190.543	190.625	190.707	190.789	190.871	190.953	191.035	191.117
05.10.2019	191.199	191.281	191.363	191.445	191.527	191.610	191.692	191.774	191.856	191.938	192.020	192.102
06.10.2019	192.184	192.267	192.349	192.431	192.513	192.595	192.677	192.759	192.842	192.924	193.006	193.088
07.10.2019	193.170	193.252	193.334	193.417	193.499	193.581	193.663	193.745	193.828	193.910	193.992	194.074
08.10.2019	194.156	194.239	194.321	194.403	194.485	194.567	194.650	194.732	194.814	194.896	194.979	195.061
09.10.2019	195.143	195.225	195.308	195.390	195.472	195.554	195.637	195.719	195.801	195.884	195.966	196.048
10.10.2019	196.130	196.213	196.295	196.377	196.460	196.542	196.624	196.707	196.789	196.871	196.953	197.036
11.10.2019	197.118	197.200	197.283	197.365	197.448	197.530	197.612	197.695	197.777	197.859	197.942	198.024
12.10.2019	198.106	198.189	198.271	198.354	198.436	198.518	198.601	198.683	198.766	198.848	198.930	199.013
13.10.2019	199.095	199.178	199.260	199.343	199.425	199.507	199.590	199.672	199.755	199.837	199.920	200.002
14.10.2019	200.085	200.167	200.250	200.332	200.415	200.497	200.579	200.662	200.744	200.827	200.910	200.992
15.10.2019	201.075	201.157	201.240	201.322	201.405	201.487	201.570	201.652	201.735	201.817	201.900	201.982
16.10.2019	202.065	202.148	202.230	202.313	202.395	202.478	202.561	202.643	202.726	202.808	202.891	202.974
17.10.2019	203.056	203.139	203.221	203.304	203.387	203.469	203.552	203.635	203.717	203.800	203.883	203.965
18.10.2019	204.048	204.131	204.213	204.296	204.379	204.461	204.544	204.627	204.709	204.792	204.875	204.958
19.10.2019	205.040	205.123	205.206	205.288	205.371	205.454	205.537	205.619	205.702	205.785	205.868	205.951
20.10.2019	206.033	206.116	206.199	206.282	206.364	206.447	206.530	206.613	206.696	206.778	206.861	206.944
21.10.2019	207.027	207.110	207.193	207.275	207.358	207.441	207.524	207.607	207.690	207.773	207.855	207.938
22.10.2019	208.021	208.104	208.187	208.270	208.353	208.436	208.519	208.601	208.684	208.767	208.850	208.933
23.10.2019	209.016	209.099	209.182	209.265	209.348	209.431	209.514	209.597	209.680	209.763	209.846	209.929
24.10.2019	210.012	210.095	210.178	210.261	210.344	210.427	210.510	210.593	210.676	210.759	210.842	210.925
25.10.2019	211.008	211.091	211.174	211.257	211.340	211.423	211.506	211.589	211.672	211.755	211.838	211.922
26.10.2019	212.005	212.088	212.171	212.254	212.337	212.420	212.503	212.586	212.669	212.753	212.836	212.919
27.10.2019	213.002	213.085	213.168	213.251	213.335	213.418	213.501	213.584	213.667	213.750	213.834	213.917
28.10.2019	214.000	214.083	214.166	214.249	214.333	214.416	214.499	214.582	214.665	214.749	214.832	214.915
29.10.2019	214.998	215.082	215.165	215.248	215.331	215.415	215.498	215.581	215.664	215.748	215.831	215.914
30.10.2019	215.997	216.081	216.164	216.247	216.330	216.414	216.497	216.580	216.664	216.747	216.830	216.914
31.10.2019	216.997	217.080	217.164	217.247	217.330	217.413	217.497	217.580	217.663	217.747	217.830	217.914
01.11.2019	217.997	218.080	218.164	218.247	218.330	218.414	218.497	218.580	218.664	218.747	218.831	218.914
02.11.2019	218.997	219.081	219.164	219.248	219.331	219.414	219.498	219.581	219.665	219.748	219.831	219.915
03.11.2019	219.998	220.082	220.165	220.249	220.332	220.415	220.499	220.582	220.666	220.749	220.833	220.916
04.11.2019	221.000	221.083	221.167	221.250	221.334	221.417	221.501	221.584	221.668	221.751	221.834	221.918
05.11.2019	222.001	222.085	222.168	222.252	222.336	222.419	222.503	222.586	222.670	222.753	222.837	222.920
06.11.2019	223.004	223.087	223.171	223.254	223.338	223.421	223.505	223.589	223.672	223.756	223.839	223.923
07.11.2019	224.006	224.090	224.174	224.257	224.341	224.424	224.508	224.591	224.675	224.759	224.842	224.926
08.11.2019	225.009	225.093	225.177	225.260	225.344	225.428	225.511	225.595	225.678	225.762	225.846	225.929
09.11.2019	226.013	226.097	226.180	226.264	226.348	226.431	226.515	226.599	226.682	226.766	226.850	226.933
10.11.2019	227.017	227.101	227.184	227.268	227.352	227.435	227.519	227.603	227.687	227.770	227.854	227.938
11.11.2019	228.021	228.105	228.189	228.273	228.356	228.440	228.524	228.608	228.691	228.775	228.859	228.942
12.11.2019	229.026	229.110	229.194	229.278	229.361	229.445	229.529	229.613	229.696	229.780	229.864	229.948
13.11.2019	230.032	230.115	230.199	230.283	230.367	230.451	230.534	230.618	230.702	230.786	230.870	230.954
14.11.2019	231.037	231.121	231.205	231.289	231.373	231.457	231.540	231.624	231.708	231.792	231.876	231.960
15.11.2019	232.044	232.128	232.211	232.295	232.379	232.463	232.547	232.631	232.715	232.799	232.883	232.967
16.11.2019	233.050	233.134	233.218	233.302	233.386	233.470	233.554	233.638	233.722	233.806	233.890	233.974
17.11.2019	234.058	234.142	234.226	234.310	234.394	234.478	234.562	234.646	234.730	234.814	234.898	234.982
18.11.2019	235.066	235.150	235.234	235.318	235.402	235.486	235.570	235.654	235.738	235.822	235.906	235.990
19.11.2019	236.074	236.158	236.242	236.326	236.410	236.494	236.578	236.662	236.746	236.831	236.915	236.999
20.11.2019	237.083	237.167	237.251	237.335	237.419	237.503	237.587	237.672	237.756	237.840	237.924	238.008
21.11.2019	238.092	238.176	238.260	238.345	238.429	238.513	238.597	238.681	238.765	238.849	238.934	239.018
22.11.2019	239.102	239.186	239.270	239.354	239.439	239.523	239.607	239.691	239.775	239.860	239.944	240.028
23.11.2019	240.112	240.196	240.281	240.365	240.449	240.533	240.618	240.702	240.786	240.870	240.955	241.039
24.11.2019	241.123	241.207	241.292	241.376	241.460	241.544	241.629	241.713	241.797	241.881	241.966	242.050
25.11.2019	242.134	242.219	242.303	242.387	242.471	242.556	242.640	242.724	242.809	242.893	242.977	243.062
26.11.2019	243.146	243.230	243.315	243.399	243.483	243.568	243.652	243.736	243.821	243.905	243.989	244.074
27.11.2019	244.158	244.242	244.327	244.411	244.495	244.580	244.664	244.749	244.833	244.917	245.002	245.086
28.11.2019	245.170	245.255	245.339	245.424	245.508	245.592	245.677	245.761	245.846	245.930	246.014	246.099

**Sonnen-Länge  $\lambda$  [°] 2019 (J2000)**

Datum / Zeit	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
29.11.2019	246.183	246.268	246.352	246.436	246.521	246.605	246.690	246.774	246.859	246.943	247.027	247.112
30.11.2019	247.196	247.281	247.365	247.450	247.534	247.618	247.703	247.787	247.872	247.956	248.041	248.125
01.12.2019	248.210	248.294	248.379	248.463	248.548	248.632	248.716	248.801	248.885	248.970	249.054	249.139
02.12.2019	249.223	249.308	249.392	249.477	249.561	249.646	249.730	249.815	249.899	249.984	250.068	250.153
03.12.2019	250.237	250.322	250.406	250.491	250.575	250.660	250.744	250.829	250.913	250.998	251.082	251.167
04.12.2019	251.251	251.336	251.420	251.505	251.590	251.674	251.759	251.843	251.928	252.012	252.097	252.181
05.12.2019	252.266	252.350	252.435	252.519	252.604	252.689	252.773	252.858	252.942	253.027	253.111	253.196
06.12.2019	253.280	253.365	253.450	253.534	253.619	253.703	253.788	253.872	253.957	254.042	254.126	254.211
07.12.2019	254.295	254.380	254.464	254.549	254.634	254.718	254.803	254.887	254.972	255.057	255.141	255.226
08.12.2019	255.310	255.395	255.480	255.564	255.649	255.733	255.818	255.903	255.987	256.072	256.156	256.241
09.12.2019	256.326	256.410	256.495	256.580	256.664	256.749	256.833	256.918	257.003	257.087	257.172	257.257
10.12.2019	257.341	257.426	257.510	257.595	257.680	257.764	257.849	257.934	258.018	258.103	258.188	258.272
11.12.2019	258.357	258.442	258.526	258.611	258.695	258.780	258.865	258.949	259.034	259.119	259.203	259.288
12.12.2019	259.373	259.458	259.542	259.627	259.712	259.796	259.881	259.966	260.050	260.135	260.220	260.304
13.12.2019	260.389	260.474	260.558	260.643	260.728	260.813	260.897	260.982	261.067	261.151	261.236	261.321
14.12.2019	261.405	261.490	261.575	261.660	261.744	261.829	261.914	261.999	262.083	262.168	262.253	262.337
15.12.2019	262.422	262.507	262.592	262.676	262.761	262.846	262.931	263.015	263.100	263.185	263.270	263.354
16.12.2019	263.439	263.524	263.609	263.693	263.778	263.863	263.948	264.032	264.117	264.202	264.287	264.372
17.12.2019	264.456	264.541	264.626	264.711	264.796	264.880	264.965	265.050	265.135	265.219	265.304	265.389
18.12.2019	265.474	265.559	265.643	265.728	265.813	265.898	265.983	266.068	266.152	266.237	266.322	266.407
19.12.2019	266.492	266.576	266.661	266.746	266.831	266.916	267.001	267.085	267.170	267.255	267.340	267.425
20.12.2019	267.510	267.594	267.679	267.764	267.849	267.934	268.019	268.104	268.188	268.273	268.358	268.443
21.12.2019	268.528	268.613	268.698	268.782	268.867	268.952	269.037	269.122	269.207	269.292	269.377	269.461
22.12.2019	269.546	269.631	269.716	269.801	269.886	269.971	270.056	270.140	270.225	270.310	270.395	270.480
23.12.2019	270.565	270.650	270.735	270.820	270.905	270.989	271.074	271.159	271.244	271.329	271.414	271.499
24.12.2019	271.584	271.669	271.754	271.839	271.923	272.008	272.093	272.178	272.263	272.348	272.433	272.518
25.12.2019	272.603	272.688	272.773	272.858	272.943	273.027	273.112	273.197	273.282	273.367	273.452	273.537
26.12.2019	273.622	273.707	273.792	273.877	273.962	274.047	274.132	274.217	274.301	274.386	274.471	274.556
27.12.2019	274.641	274.726	274.811	274.896	274.981	275.066	275.151	275.236	275.321	275.406	275.491	275.576
28.12.2019	275.661	275.746	275.830	275.915	276.000	276.085	276.170	276.255	276.340	276.425	276.510	276.595
29.12.2019	276.680	276.765	276.850	276.935	277.020	277.105	277.190	277.275	277.360	277.445	277.529	277.614
30.12.2019	277.699	277.784	277.869	277.954	278.039	278.124	278.209	278.294	278.379	278.464	278.549	278.634
31.12.2019	278.719	278.804	278.889	278.974	279.059	279.144	279.229	279.313	279.398	279.483	279.568	279.653