

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF SATURN (0 hr U.T.) - 2021
 (Compiled by: Jeffrey D. Beish, A.L.P.O.)

Date	Elong	RA	Dec	Ls	B	B'	Phase Globe			Rings		Diameter('')			
							Angle	Eq	Po	Maj	Min	Mag	CMI	CMII	CMIII
yyyy-mmm-dd	o	hh:mm	o	o	o	o						o	o	o	
2021-Jan-01	20.8E	20:15	-20.2	129.7	20.8	20.1	2.0	15.2	13.4	34.4	12.2	0.6	341.4	143.9	186.7
2021-Jan-02	19.9E	20:16	-20.1	129.7	20.7	20.1	1.9	15.2	13.4	34.4	12.2	0.6	105.6	235.8	277.4
2021-Jan-03	19.0E	20:16	-20.1	129.8	20.7	20.1	1.8	15.2	13.3	34.4	12.2	0.6	229.7	327.6	8.0
2021-Jan-04	18.1E	20:17	-20.1	129.8	20.7	20.1	1.8	15.2	13.3	34.4	12.1	0.6	353.9	59.5	98.7
2021-Jan-05	17.2E	20:17	-20.1	129.8	20.6	20.1	1.7	15.2	13.3	34.4	12.1	0.6	118.0	151.3	189.3
2021-Jan-06	16.3E	20:18	-20.0	129.8	20.6	20.1	1.6	15.2	13.3	34.4	12.1	0.6	242.2	243.2	280.0
2021-Jan-07	15.4E	20:18	-20.0	129.9	20.6	20.1	1.5	15.1	13.3	34.3	12.1	0.6	6.4	335.1	10.6
2021-Jan-08	14.5E	20:19	-20.0	129.9	20.5	20.1	1.4	15.1	13.3	34.3	12.0	0.6	130.5	66.9	101.3
2021-Jan-09	13.6E	20:19	-20.0	129.9	20.5	20.1	1.3	15.1	13.3	34.3	12.0	0.6	254.7	158.8	191.9
2021-Jan-10	12.7E	20:20	-19.9	130.0	20.4	20.0	1.2	15.1	13.3	34.3	12.0	0.6	18.9	250.6	282.6
2021-Jan-11	11.8E	20:20	-19.9	130.0	20.4	20.0	1.2	15.1	13.3	34.3	12.0	0.6	143.0	342.5	13.3
2021-Jan-12	10.9E	20:21	-19.9	130.0	20.4	20.0	1.1	15.1	13.3	34.3	11.9	0.6	267.2	74.4	103.9
2021-Jan-13	10.0E	20:21	-19.9	130.1	20.3	20.0	1.0	15.1	13.3	34.3	11.9	0.6	31.4	166.2	194.6
2021-Jan-14	9.1E	20:22	-19.8	130.1	20.3	20.0	0.9	15.1	13.3	34.3	11.9	0.6	155.5	258.1	285.2
2021-Jan-15	8.2E	20:22	-19.8	130.1	20.2	20.0	0.8	15.1	13.3	34.3	11.9	0.6	279.7	350.0	15.9
2021-Jan-16	7.3E	20:23	-19.8	130.1	20.2	20.0	0.7	15.1	13.3	34.3	11.8	0.6	43.9	81.9	106.6
2021-Jan-17	6.4E	20:23	-19.8	130.2	20.2	20.0	0.6	15.1	13.3	34.2	11.8	0.6	168.0	173.7	197.2
2021-Jan-18	5.5E	20:24	-19.7	130.2	20.1	20.0	0.5	15.1	13.3	34.2	11.8	0.6	292.2	265.6	287.9
2021-Jan-19	4.6E	20:24	-19.7	130.2	20.1	20.0	0.5	15.1	13.3	34.2	11.8	0.6	56.4	357.5	18.6
2021-Jan-20	3.7E	20:25	-19.7	130.3	20.0	19.9	0.4	15.1	13.3	34.2	11.7	0.6	180.6	89.3	109.2
2021-Jan-21	2.8E	20:25	-19.7	130.3	20.0	19.9	0.3	15.1	13.3	34.2	11.7	0.6	304.7	181.2	199.9
2021-Jan-22	2.0E	20:26	-19.6	130.3	20.0	19.9	0.2	15.1	13.3	34.2	11.7	0.6	68.9	273.1	290.6
2021-Jan-23	1.1E	20:26	-19.6	130.4	19.9	19.9	0.1	15.1	13.3	34.2	11.7	0.6	193.1	5.0	21.3
2021-Jan-24	0.4E	20:27	-19.6	130.4	19.9	19.9	0.0	15.1	13.3	34.2	11.6	0.6	317.3	96.9	111.9
2021-Jan-25	0.9W	20:27	-19.5	130.4	19.8	19.9	0.1	15.1	13.3	34.2	11.6	0.6	81.5	188.7	202.6
2021-Jan-26	1.7W	20:28	-19.5	130.5	19.8	19.9	0.2	15.1	13.3	34.2	11.6	0.6	205.6	280.6	293.3
2021-Jan-27	2.6W	20:28	-19.5	130.5	19.8	19.9	0.3	15.1	13.3	34.2	11.6	0.6	329.8	12.5	24.0
2021-Jan-28	3.5W	20:29	-19.5	130.5	19.7	19.9	0.3	15.1	13.3	34.2	11.5	0.6	94.0	104.4	114.6
2021-Jan-29	4.4W	20:29	-19.4	130.5	19.7	19.9	0.4	15.1	13.3	34.2	11.5	0.6	218.2	196.3	205.3
2021-Jan-30	5.3W	20:30	-19.4	130.6	19.6	19.9	0.5	15.1	13.3	34.2	11.5	0.6	342.4	288.2	296.0
2021-Jan-31	6.2W	20:30	-19.4	130.6	19.6	19.8	0.6	15.1	13.3	34.2	11.5	0.6	106.6	20.1	26.7

Date	Elong	RA	Dec	Ls	B	B'	Phase Globe			Rings		Diameter('')			
							Angle	Eq	Po	Maj	Min	Mag	CMI	CMII	CMIII
yyyy-mmm-dd	o	hh:mm	o	o	o	o						o	o	o	
2021-Feb-01	7.1W	20:31	-19.4	130.6	19.5	19.8	0.7	15.1	13.3	34.3	11.5	0.6	230.8	112.0	117.4
2021-Feb-02	8.0W	20:31	-19.3	130.7	19.5	19.8	0.8	15.1	13.3	34.3	11.4	0.6	355.0	203.8	208.1
2021-Feb-03	8.9W	20:31	-19.3	130.7	19.5	19.8	0.9	15.1	13.3	34.3	11.4	0.6	119.2	295.7	298.8
2021-Feb-04	9.8W	20:32	-19.3	130.7	19.4	19.8	1.0	15.1	13.3	34.3	11.4	0.6	243.3	27.6	29.4
2021-Feb-05	10.7W	20:32	-19.2	130.8	19.4	19.8	1.0	15.1	13.3	34.3	11.4	0.6	7.5	119.5	120.1
2021-Feb-06	11.5W	20:33	-19.2	130.8	19.3	19.8	1.1	15.1	13.3	34.3	11.4	0.6	131.7	211.4	210.8
2021-Feb-07	12.4W	20:33	-19.2	130.8	19.3	19.8	1.2	15.1	13.3	34.3	11.3	0.6	255.9	303.3	301.5
2021-Feb-08	13.3W	20:34	-19.2	130.8	19.3	19.8	1.3	15.1	13.3	34.3	11.3	0.6	20.1	35.2	32.2
2021-Feb-09	14.2W	20:34	-19.1	130.9	19.2	19.8	1.4	15.1	13.3	34.3	11.3	0.7	144.3	127.1	122.9
2021-Feb-10	15.1W	20:35	-19.1	130.9	19.2	19.7	1.5	15.1	13.3	34.3	11.3	0.7	268.6	219.0	213.6

2021-Feb-11	16.0W	20:35	-19.1	130.9	19.1	19.7	1.6	15.2	13.3	34.4	11.3	0.7	32.8	310.9	304.3
2021-Feb-12	16.9W	20:36	-19.1	131.0	19.1	19.7	1.6	15.2	13.3	34.4	11.2	0.7	157.0	42.9	35.0
2021-Feb-13	17.8W	20:36	-19.0	131.0	19.1	19.7	1.7	15.2	13.3	34.4	11.2	0.7	281.2	134.8	125.7
2021-Feb-14	18.7W	20:37	-19.0	131.0	19.0	19.7	1.8	15.2	13.4	34.4	11.2	0.7	45.4	226.7	216.4
2021-Feb-15	19.6W	20:37	-19.0	131.1	19.0	19.7	1.9	15.2	13.4	34.4	11.2	0.7	169.6	318.6	307.1
2021-Feb-16	20.5W	20:38	-18.9	131.1	18.9	19.7	2.0	15.2	13.4	34.4	11.2	0.7	293.8	50.5	37.8
2021-Feb-17	21.4W	20:38	-18.9	131.1	18.9	19.7	2.1	15.2	13.4	34.5	11.2	0.7	58.0	142.4	128.5
2021-Feb-18	22.3W	20:39	-18.9	131.2	18.8	19.7	2.2	15.2	13.4	34.5	11.1	0.7	182.3	234.3	219.3
2021-Feb-19	23.2W	20:39	-18.9	131.2	18.8	19.7	2.2	15.2	13.4	34.5	11.1	0.7	306.5	326.2	310.0
2021-Feb-20	24.1W	20:40	-18.8	131.2	18.8	19.6	2.3	15.2	13.4	34.5	11.1	0.7	70.7	58.2	40.7
2021-Feb-21	25.0W	20:40	-18.8	131.2	18.7	19.6	2.4	15.2	13.4	34.5	11.1	0.7	194.9	150.1	131.4
2021-Feb-22	25.9W	20:40	-18.8	131.3	18.7	19.6	2.5	15.2	13.4	34.6	11.1	0.7	319.1	242.0	222.1
2021-Feb-23	26.8W	20:41	-18.7	131.3	18.6	19.6	2.6	15.3	13.4	34.6	11.1	0.7	83.4	333.9	312.8
2021-Feb-24	27.7W	20:41	-18.7	131.3	18.6	19.6	2.6	15.3	13.4	34.6	11.0	0.7	207.6	65.9	43.6
2021-Feb-25	28.6W	20:42	-18.7	131.4	18.6	19.6	2.7	15.3	13.4	34.6	11.0	0.7	331.8	157.8	134.3
2021-Feb-26	29.5W	20:42	-18.7	131.4	18.5	19.6	2.8	15.3	13.5	34.7	11.0	0.7	96.1	249.7	225.0
2021-Feb-27	30.4W	20:43	-18.6	131.4	18.5	19.6	2.9	15.3	13.5	34.7	11.0	0.7	220.3	341.7	315.7
2021-Feb-28	31.3W	20:43	-18.6	131.5	18.5	19.6	3.0	15.3	13.5	34.7	11.0	0.7	344.5	73.6	46.5

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							Angle	Eq	Po	Maj	Min	Mag	o	o		
yyyy-mm-dd	o	hh:mm	o	o	o	o										
2021-Mar-01	32.2W	20:44	-18.6	131.5	18.4	19.6	3.0	15.3	13.5	34.8	11.0	0.7	108.8	165.5	137.2	
2021-Mar-02	33.0W	20:44	-18.6	131.5	18.4	19.6	3.1	15.3	13.5	34.8	11.0	0.7	233.0	257.5	227.9	
2021-Mar-03	33.9W	20:44	-18.5	131.5	18.3	19.5	3.2	15.4	13.5	34.8	11.0	0.7	357.3	349.4	318.6	
2021-Mar-04	34.8W	20:45	-18.5	131.6	18.3	19.5	3.3	15.4	13.5	34.8	10.9	0.7	121.5	81.3	49.4	
2021-Mar-05	35.7W	20:45	-18.5	131.6	18.3	19.5	3.3	15.4	13.5	34.9	10.9	0.7	245.7	173.3	140.1	
2021-Mar-06	36.6W	20:46	-18.5	131.6	18.2	19.5	3.4	15.4	13.5	34.9	10.9	0.7	10.0	265.2	230.9	
2021-Mar-07	37.5W	20:46	-18.4	131.7	18.2	19.5	3.5	15.4	13.6	34.9	10.9	0.7	134.2	357.2	321.6	
2021-Mar-08	38.4W	20:47	-18.4	131.7	18.2	19.5	3.5	15.4	13.6	35.0	10.9	0.7	258.5	89.1	52.3	
2021-Mar-09	39.3W	20:47	-18.4	131.7	18.1	19.5	3.6	15.4	13.6	35.0	10.9	0.7	22.7	181.1	143.1	
2021-Mar-10	40.2W	20:47	-18.4	131.8	18.1	19.5	3.7	15.5	13.6	35.0	10.9	0.7	147.0	273.0	233.8	
2021-Mar-11	41.1W	20:48	-18.3	131.8	18.0	19.5	3.8	15.5	13.6	35.1	10.9	0.7	271.2	5.0	324.6	
2021-Mar-12	42.0W	20:48	-18.3	131.8	18.0	19.5	3.8	15.5	13.6	35.1	10.9	0.7	35.5	96.9	55.3	
2021-Mar-13	42.9W	20:49	-18.3	131.9	18.0	19.4	3.9	15.5	13.6	35.1	10.8	0.7	159.8	188.9	146.1	
2021-Mar-14	43.8W	20:49	-18.3	131.9	17.9	19.4	4.0	15.5	13.7	35.2	10.8	0.7	284.0	280.9	236.8	
2021-Mar-15	44.7W	20:49	-18.2	131.9	17.9	19.4	4.0	15.5	13.7	35.2	10.8	0.7	48.3	12.8	327.6	
2021-Mar-16	45.6W	20:50	-18.2	131.9	17.9	19.4	4.1	15.6	13.7	35.3	10.8	0.8	172.5	104.8	58.3	
2021-Mar-17	46.5W	20:50	-18.2	132.0	17.8	19.4	4.2	15.6	13.7	35.3	10.8	0.8	296.8	196.7	149.1	
2021-Mar-18	47.4W	20:51	-18.2	132.0	17.8	19.4	4.2	15.6	13.7	35.3	10.8	0.8	61.1	288.7	239.9	
2021-Mar-19	48.3W	20:51	-18.1	132.0	17.8	19.4	4.3	15.6	13.7	35.4	10.8	0.8	185.4	20.7	330.6	
2021-Mar-20	49.2W	20:51	-18.1	132.1	17.7	19.4	4.3	15.6	13.7	35.4	10.8	0.8	309.6	112.6	61.4	
2021-Mar-21	50.1W	20:52	-18.1	132.1	17.7	19.4	4.4	15.6	13.8	35.5	10.8	0.8	73.9	204.6	152.1	
2021-Mar-22	51.1W	20:52	-18.1	132.1	17.7	19.4	4.5	15.7	13.8	35.5	10.8	0.8	198.2	296.6	242.9	
2021-Mar-23	52.0W	20:52	-18.0	132.2	17.6	19.3	4.5	15.7	13.8	35.6	10.8	0.8	322.5	28.6	333.7	
2021-Mar-24	52.9W	20:53	-18.0	132.2	17.6	19.3	4.6	15.7	13.8	35.6	10.8	0.8	86.7	120.5	64.5	
2021-Mar-25	53.8W	20:53	-18.0	132.2	17.6	19.3	4.6	15.7	13.8	35.6	10.8	0.8	211.0	212.5	155.2	
2021-Mar-26	54.7W	20:53	-18.0	132.3	17.5	19.3	4.7	15.7	13.9	35.7	10.8	0.8	335.3	304.5	246.0	
2021-Mar-27	55.6W	20:54	-18.0	132.3	17.5	19.3	4.7	15.8	13.9	35.7	10.8	0.8	99.6	36.5	336.8	
2021-Mar-28	56.5W	20:54	-17.9	132.3	17.5	19.3	4.8	15.8	13.9	35.8	10.7	0.8	223.9	128.5	67.6	
2021-Mar-29	57.4W	20:54	-17.9	132.3	17.4	19.3	4.8	15.8	13.9	35.8	10.7	0.8	348.2	220.5	158.3	

2021-Mar-30	58.3W	20:55	-17.9	132.4	17.4	19.3	4.9	15.8	13.9	35.9	10.7	0.8	112.4	312.4	249.1
2021-Mar-31	59.2W	20:55	-17.9	132.4	17.4	19.3	4.9	15.8	13.9	35.9	10.7	0.8	236.7	44.4	339.9

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yyyy-mm-dd	o	hh:mm	o	o	o	o	o	o	o	o	o	o	o	o	o
2021-Apr-01	60.1W	20:55	-17.9	132.4	17.4	19.3	5.0	15.9	14.0	36.0	10.7	0.8	1.0	136.4	70.7
2021-Apr-02	61.0W	20:56	-17.8	132.5	17.3	19.2	5.0	15.9	14.0	36.0	10.7	0.8	125.3	228.4	161.5
2021-Apr-03	61.9W	20:56	-17.8	132.5	17.3	19.2	5.1	15.9	14.0	36.1	10.7	0.8	249.6	320.4	252.3
2021-Apr-04	62.8W	20:56	-17.8	132.5	17.3	19.2	5.1	15.9	14.0	36.1	10.7	0.8	13.9	52.4	343.0
2021-Apr-05	63.8W	20:57	-17.8	132.6	17.3	19.2	5.2	16.0	14.0	36.2	10.7	0.8	138.2	144.4	73.8
2021-Apr-06	64.7W	20:57	-17.8	132.6	17.2	19.2	5.2	16.0	14.1	36.2	10.7	0.8	262.5	236.4	164.6
2021-Apr-07	65.6W	20:57	-17.7	132.6	17.2	19.2	5.2	16.0	14.1	36.3	10.7	0.8	26.8	328.4	255.4
2021-Apr-08	66.5W	20:58	-17.7	132.6	17.2	19.2	5.3	16.0	14.1	36.3	10.7	0.8	151.1	60.4	346.2
2021-Apr-09	67.4W	20:58	-17.7	132.7	17.1	19.2	5.3	16.1	14.1	36.4	10.7	0.8	275.4	152.4	77.0
2021-Apr-10	68.3W	20:58	-17.7	132.7	17.1	19.2	5.4	16.1	14.1	36.5	10.7	0.8	39.8	244.4	167.8
2021-Apr-11	69.2W	20:58	-17.7	132.7	17.1	19.2	5.4	16.1	14.2	36.5	10.7	0.8	164.1	336.4	258.6
2021-Apr-12	70.2W	20:59	-17.7	132.8	17.1	19.1	5.4	16.1	14.2	36.6	10.7	0.8	288.4	68.4	349.4
2021-Apr-13	71.1W	20:59	-17.6	132.8	17.1	19.1	5.5	16.2	14.2	36.6	10.7	0.8	52.7	160.5	80.2
2021-Apr-14	72.0W	20:59	-17.6	132.8	17.0	19.1	5.5	16.2	14.2	36.7	10.7	0.8	177.0	252.5	171.0
2021-Apr-15	72.9W	20:59	-17.6	132.9	17.0	19.1	5.5	16.2	14.3	36.7	10.7	0.7	301.3	344.5	261.9
2021-Apr-16	73.8W	21:00	-17.6	132.9	17.0	19.1	5.5	16.2	14.3	36.8	10.8	0.7	65.7	76.5	352.7
2021-Apr-17	74.8W	21:00	-17.6	132.9	17.0	19.1	5.6	16.3	14.3	36.9	10.8	0.7	190.0	168.5	83.5
2021-Apr-18	75.7W	21:00	-17.6	133.0	16.9	19.1	5.6	16.3	14.3	36.9	10.8	0.7	314.3	260.5	174.3
2021-Apr-19	76.6W	21:00	-17.6	133.0	16.9	19.1	5.6	16.3	14.3	37.0	10.8	0.7	78.6	352.6	265.1
2021-Apr-20	77.5W	21:01	-17.5	133.0	16.9	19.1	5.6	16.3	14.4	37.0	10.8	0.7	203.0	84.6	355.9
2021-Apr-21	78.4W	21:01	-17.5	133.0	16.9	19.1	5.7	16.4	14.4	37.1	10.8	0.7	327.3	176.6	86.7
2021-Apr-22	79.4W	21:01	-17.5	133.1	16.9	19.0	5.7	16.4	14.4	37.2	10.8	0.7	91.6	268.6	177.6
2021-Apr-23	80.3W	21:01	-17.5	133.1	16.9	19.0	5.7	16.4	14.4	37.2	10.8	0.7	215.9	0.7	268.4
2021-Apr-24	81.2W	21:01	-17.5	133.1	16.8	19.0	5.7	16.4	14.5	37.3	10.8	0.7	340.3	92.7	359.2
2021-Apr-25	82.2W	21:02	-17.5	133.2	16.8	19.0	5.7	16.5	14.5	37.3	10.8	0.7	104.6	184.7	90.0
2021-Apr-26	83.1W	21:02	-17.5	133.2	16.8	19.0	5.8	16.5	14.5	37.4	10.8	0.7	228.9	276.8	180.9
2021-Apr-27	84.0W	21:02	-17.5	133.2	16.8	19.0	5.8	16.5	14.5	37.5	10.8	0.7	353.3	8.8	271.7
2021-Apr-28	84.9W	21:02	-17.5	133.3	16.8	19.0	5.8	16.5	14.6	37.5	10.8	0.7	117.6	100.8	2.5
2021-Apr-29	85.9W	21:02	-17.5	133.3	16.8	19.0	5.8	16.6	14.6	37.6	10.8	0.7	242.0	192.9	93.4
2021-Apr-30	86.8W	21:02	-17.4	133.3	16.8	19.0	5.8	16.6	14.6	37.6	10.9	0.7	6.3	284.9	184.2

Date	Elong	RA	Dec	Ls	B	B'	Phase Globe			Rings Vis			Diameter('')		
							Angle	Eq	Po	Maj	Min	Mag	CMI	CMII	CMIII
yyyy-mm-dd	o	hh:mm	o	o	o	o	o	o	o	o	o	o	o	o	o
2021-May-01	87.7W	21:03	-17.4	133.4	16.7	19.0	5.8	16.6	14.6	37.7	10.9	0.7	130.7	17.0	275.0
2021-May-02	88.7W	21:03	-17.4	133.4	16.7	18.9	5.8	16.7	14.7	37.8	10.9	0.7	255.0	109.0	5.9
2021-May-03	89.6W	21:03	-17.4	133.4	16.7	18.9	5.8	16.7	14.7	37.8	10.9	0.7	19.4	201.0	96.7
2021-May-04	90.5W	21:03	-17.4	133.4	16.7	18.9	5.8	16.7	14.7	37.9	10.9	0.7	143.7	293.1	187.6
2021-May-05	91.5W	21:03	-17.4	133.5	16.7	18.9	5.8	16.7	14.7	38.0	10.9	0.7	268.1	25.1	278.4
2021-May-06	92.4W	21:03	-17.4	133.5	16.7	18.9	5.8	16.8	14.8	38.0	10.9	0.7	32.4	117.2	9.2
2021-May-07	93.4W	21:03	-17.4	133.5	16.7	18.9	5.8	16.8	14.8	38.1	10.9	0.7	156.8	209.2	100.1
2021-May-08	94.3W	21:03	-17.4	133.6	16.7	18.9	5.8	16.8	14.8	38.2	10.9	0.7	281.1	301.3	190.9
2021-May-09	95.3W	21:03	-17.4	133.6	16.7	18.9	5.8	16.9	14.8	38.2	11.0	0.7	45.5	33.4	281.8
2021-May-10	96.2W	21:04	-17.4	133.6	16.7	18.9	5.8	16.9	14.9	38.3	11.0	0.7	169.8	125.4	12.6
2021-May-11	97.1W	21:04	-17.4	133.7	16.6	18.9	5.8	16.9	14.9	38.3	11.0	0.7	294.2	217.5	103.5

2021-May-12	98.1W	21:04	-17.4	133.7	16.6	18.8	5.8	16.9	14.9	38.4	11.0	0.7	58.6	309.5	194.3
2021-May-13	99.0W	21:04	-17.4	133.7	16.6	18.8	5.7	17.0	14.9	38.5	11.0	0.7	182.9	41.6	285.2
2021-May-14	100.0W	21:04	-17.4	133.7	16.6	18.8	5.7	17.0	15.0	38.5	11.0	0.7	307.3	133.6	16.0
2021-May-15	100.9W	21:04	-17.4	133.8	16.6	18.8	5.7	17.0	15.0	38.6	11.1	0.7	71.6	225.7	106.9
2021-May-16	101.9W	21:04	-17.4	133.8	16.6	18.8	5.7	17.1	15.0	38.7	11.1	0.7	196.0	317.8	197.7
2021-May-17	102.8W	21:04	-17.4	133.8	16.6	18.8	5.7	17.1	15.0	38.7	11.1	0.7	320.4	49.8	288.6
2021-May-18	103.8W	21:04	-17.4	133.9	16.6	18.8	5.7	17.1	15.1	38.8	11.1	0.6	84.7	141.9	19.5
2021-May-19	104.8W	21:04	-17.4	133.9	16.6	18.8	5.6	17.1	15.1	38.9	11.1	0.6	209.1	234.0	110.3
2021-May-20	105.7W	21:04	-17.4	133.9	16.6	18.8	5.6	17.2	15.1	38.9	11.1	0.6	333.5	326.0	201.2
2021-May-21	106.7W	21:04	-17.4	134.0	16.6	18.8	5.6	17.2	15.1	39.0	11.2	0.6	97.9	58.1	292.1
2021-May-22	107.6W	21:04	-17.4	134.0	16.6	18.7	5.6	17.2	15.2	39.1	11.2	0.6	222.2	150.2	22.9
2021-May-23	108.6W	21:04	-17.4	134.0	16.6	18.7	5.5	17.3	15.2	39.1	11.2	0.6	346.6	242.2	113.8
2021-May-24	109.5W	21:04	-17.4	134.1	16.6	18.7	5.5	17.3	15.2	39.2	11.2	0.6	111.0	334.3	204.7
2021-May-25	110.5W	21:04	-17.4	134.1	16.6	18.7	5.5	17.3	15.2	39.3	11.2	0.6	235.4	66.4	295.5
2021-May-26	111.5W	21:04	-17.4	134.1	16.6	18.7	5.4	17.3	15.3	39.3	11.3	0.6	359.7	158.5	26.4
2021-May-27	112.4W	21:04	-17.4	134.1	16.6	18.7	5.4	17.4	15.3	39.4	11.3	0.6	124.1	250.5	117.3
2021-May-28	113.4W	21:04	-17.4	134.2	16.6	18.7	5.4	17.4	15.3	39.4	11.3	0.6	248.5	342.6	208.1
2021-May-29	114.4W	21:04	-17.4	134.2	16.6	18.7	5.3	17.4	15.3	39.5	11.3	0.6	12.9	74.7	299.0
2021-May-30	115.3W	21:04	-17.4	134.2	16.7	18.7	5.3	17.5	15.4	39.6	11.3	0.6	137.3	166.8	29.9
2021-May-31	116.3W	21:04	-17.4	134.3	16.7	18.6	5.2	17.5	15.4	39.6	11.4	0.6	261.7	258.9	120.8

Date	Elong	RA	Dec	Ls	B	B'	Phase Globe			Diameter('')			CMI	CMII	CMIII
							Angle	Eq	Po	Maj	Min	Mag			
2021-Jun-01	117.3W	21:04	-17.4	134.3	16.7	18.6	5.2	17.5	15.4	39.7	11.4	0.6	26.0	350.9	211.6
2021-Jun-02	118.3W	21:04	-17.4	134.3	16.7	18.6	5.1	17.5	15.4	39.8	11.4	0.6	150.4	83.0	302.5
2021-Jun-03	119.2W	21:04	-17.4	134.4	16.7	18.6	5.1	17.6	15.5	39.8	11.4	0.6	274.8	175.1	33.4
2021-Jun-04	120.2W	21:04	-17.4	134.4	16.7	18.6	5.0	17.6	15.5	39.9	11.5	0.6	39.2	267.2	124.3
2021-Jun-05	121.2W	21:04	-17.4	134.4	16.7	18.6	5.0	17.6	15.5	39.9	11.5	0.6	163.6	359.3	215.1
2021-Jun-06	122.2W	21:04	-17.4	134.5	16.7	18.6	4.9	17.6	15.5	40.0	11.5	0.5	288.0	91.4	306.0
2021-Jun-07	123.1W	21:04	-17.5	134.5	16.7	18.6	4.9	17.7	15.5	40.1	11.5	0.5	52.4	183.5	36.9
2021-Jun-08	124.1W	21:03	-17.5	134.5	16.7	18.6	4.8	17.7	15.6	40.1	11.6	0.5	176.7	275.5	127.8
2021-Jun-09	125.1W	21:03	-17.5	134.5	16.8	18.6	4.8	17.7	15.6	40.2	11.6	0.5	301.1	7.6	218.7
2021-Jun-10	126.1W	21:03	-17.5	134.6	16.8	18.5	4.7	17.7	15.6	40.2	11.6	0.5	65.5	99.7	309.5
2021-Jun-11	127.1W	21:03	-17.5	134.6	16.8	18.5	4.7	17.8	15.6	40.3	11.6	0.5	189.9	191.8	40.4
2021-Jun-12	128.1W	21:03	-17.5	134.6	16.8	18.5	4.6	17.8	15.7	40.4	11.7	0.5	314.3	283.9	131.3
2021-Jun-13	129.0W	21:03	-17.5	134.7	16.8	18.5	4.5	17.8	15.7	40.4	11.7	0.5	78.7	16.0	222.2
2021-Jun-14	130.0W	21:03	-17.5	134.7	16.8	18.5	4.5	17.8	15.7	40.5	11.7	0.5	203.1	108.1	313.1
2021-Jun-15	131.0W	21:03	-17.5	134.7	16.8	18.5	4.4	17.9	15.7	40.5	11.7	0.5	327.5	200.2	44.0
2021-Jun-16	132.0W	21:02	-17.5	134.8	16.9	18.5	4.3	17.9	15.7	40.6	11.8	0.5	91.9	292.3	134.9
2021-Jun-17	133.0W	21:02	-17.6	134.8	16.9	18.5	4.3	17.9	15.8	40.6	11.8	0.5	216.3	24.4	225.7
2021-Jun-18	134.0W	21:02	-17.6	134.8	16.9	18.5	4.2	17.9	15.8	40.7	11.8	0.5	340.7	116.4	316.6
2021-Jun-19	135.0W	21:02	-17.6	134.9	16.9	18.5	4.1	18.0	15.8	40.7	11.8	0.5	105.1	208.5	47.5
2021-Jun-20	136.0W	21:02	-17.6	134.9	16.9	18.4	4.1	18.0	15.8	40.8	11.9	0.5	229.5	300.6	138.4
2021-Jun-21	137.0W	21:02	-17.6	134.9	16.9	18.4	4.0	18.0	15.8	40.8	11.9	0.5	353.9	32.7	229.3
2021-Jun-22	138.0W	21:02	-17.6	134.9	17.0	18.4	3.9	18.0	15.9	40.9	11.9	0.4	118.3	124.8	320.2
2021-Jun-23	139.0W	21:01	-17.6	135.0	17.0	18.4	3.8	18.1	15.9	40.9	12.0	0.4	242.7	216.9	51.1
2021-Jun-24	140.0W	21:01	-17.7	135.0	17.0	18.4	3.8	18.1	15.9	41.0	12.0	0.4	7.1	309.0	142.0
2021-Jun-25	141.0W	21:01	-17.7	135.0	17.0	18.4	3.7	18.1	15.9	41.0	12.0	0.4	131.5	41.1	232.8
2021-Jun-26	142.0W	21:01	-17.7	135.1	17.0	18.4	3.6	18.1	15.9	41.1	12.0	0.4	255.9	133.2	323.7
2021-Jun-27	143.0W	21:01	-17.7	135.1	17.1	18.4	3.5	18.1	16.0	41.1	12.1	0.4	20.3	225.3	54.6

2021-Jun-28	144.0W	21:00	-17.7	135.1	17.1	18.4	3.4	18.2	16.0	41.2	12.1	0.4	144.6	317.4	145.5
2021-Jun-29	145.0W	21:00	-17.7	135.2	17.1	18.3	3.4	18.2	16.0	41.2	12.1	0.4	269.0	49.5	236.4
2021-Jun-30	146.0W	21:00	-17.8	135.2	17.1	18.3	3.3	18.2	16.0	41.3	12.2	0.4	33.4	141.6	327.3

															Diameter('')		
Date	Elong	RA	Dec	Ls	B	B'	Phase	Globe	Rings			Vis	CMI	CMII	CMIII		
yyyy-mm-dd	o	hh:mm	o	o	o	o	Angle	Eq	Po	Maj	Min	Mag	o	o	o		
2021-Jul-01	147.0W	21:00	-17.8	135.2	17.2	18.3	3.2	18.2	16.0	41.3	12.2	0.4	157.8	233.7	58.2		
2021-Jul-02	148.0W	20:59	-17.8	135.2	17.2	18.3	3.1	18.2	16.0	41.3	12.2	0.4	282.2	325.8	149.1		
2021-Jul-03	149.0W	20:59	-17.8	135.3	17.2	18.3	3.0	18.3	16.1	41.4	12.2	0.4	46.6	57.9	240.0		
2021-Jul-04	150.0W	20:59	-17.8	135.3	17.2	18.3	2.9	18.3	16.1	41.4	12.3	0.4	171.0	150.0	330.8		
2021-Jul-05	151.1W	20:59	-17.9	135.3	17.3	18.3	2.8	18.3	16.1	41.5	12.3	0.4	295.4	242.1	61.7		
2021-Jul-06	152.1W	20:59	-17.9	135.4	17.3	18.3	2.7	18.3	16.1	41.5	12.3	0.4	59.8	334.2	152.6		
2021-Jul-07	153.1W	20:58	-17.9	135.4	17.3	18.3	2.6	18.3	16.1	41.5	12.4	0.3	184.2	66.3	243.5		
2021-Jul-08	154.1W	20:58	-17.9	135.4	17.3	18.3	2.6	18.3	16.1	41.6	12.4	0.3	308.6	158.3	334.4		
2021-Jul-09	155.1W	20:58	-17.9	135.5	17.4	18.2	2.5	18.3	16.1	41.6	12.4	0.3	73.0	250.4	65.3		
2021-Jul-10	156.1W	20:58	-17.9	135.5	17.4	18.2	2.4	18.4	16.2	41.6	12.4	0.3	197.4	342.5	156.2		
2021-Jul-11	157.2W	20:57	-18.0	135.5	17.4	18.2	2.3	18.4	16.2	41.7	12.5	0.3	321.8	74.6	247.1		
2021-Jul-12	158.2W	20:57	-18.0	135.6	17.4	18.2	2.2	18.4	16.2	41.7	12.5	0.3	86.2	166.7	337.9		
2021-Jul-13	159.2W	20:57	-18.0	135.6	17.5	18.2	2.1	18.4	16.2	41.7	12.5	0.3	210.6	258.8	68.8		
2021-Jul-14	160.2W	20:56	-18.0	135.6	17.5	18.2	2.0	18.4	16.2	41.8	12.6	0.3	335.0	350.9	159.7		
2021-Jul-15	161.2W	20:56	-18.0	135.6	17.5	18.2	1.9	18.4	16.2	41.8	12.6	0.3	99.4	83.0	250.6		
2021-Jul-16	162.3W	20:56	-18.1	135.7	17.6	18.2	1.8	18.4	16.2	41.8	12.6	0.3	223.8	175.1	341.5		
2021-Jul-17	163.3W	20:56	-18.1	135.7	17.6	18.2	1.7	18.4	16.2	41.8	12.6	0.3	348.2	267.2	72.4		
2021-Jul-18	164.3W	20:55	-18.1	135.7	17.6	18.2	1.6	18.5	16.2	41.8	12.7	0.3	112.5	359.3	163.3		
2021-Jul-19	165.3W	20:55	-18.1	135.8	17.6	18.1	1.5	18.5	16.2	41.9	12.7	0.3	236.9	91.3	254.1		
2021-Jul-20	166.4W	20:55	-18.2	135.8	17.7	18.1	1.4	18.5	16.3	41.9	12.7	0.3	1.3	183.4	345.0		
2021-Jul-21	167.4W	20:55	-18.2	135.8	17.7	18.1	1.3	18.5	16.3	41.9	12.7	0.3	125.7	275.5	75.9		
2021-Jul-22	168.4W	20:54	-18.2	135.9	17.7	18.1	1.2	18.5	16.3	41.9	12.8	0.2	250.1	7.6	166.8		
2021-Jul-23	169.4W	20:54	-18.2	135.9	17.8	18.1	1.1	18.5	16.3	41.9	12.8	0.2	14.5	99.7	257.7		
2021-Jul-24	170.4W	20:54	-18.2	135.9	17.8	18.1	1.0	18.5	16.3	42.0	12.8	0.2	138.9	191.8	348.5		
2021-Jul-25	171.5W	20:53	-18.3	136.0	17.8	18.1	0.9	18.5	16.3	42.0	12.8	0.2	263.2	283.9	79.4		
2021-Jul-26	172.5W	20:53	-18.3	136.0	17.8	18.1	0.8	18.5	16.3	42.0	12.9	0.2	27.6	15.9	170.3		
2021-Jul-27	173.5W	20:53	-18.3	136.0	17.9	18.1	0.7	18.5	16.3	42.0	12.9	0.2	152.0	108.0	261.2		
2021-Jul-28	174.5W	20:52	-18.3	136.0	17.9	18.0	0.6	18.5	16.3	42.0	12.9	0.2	276.4	200.1	352.0		
2021-Jul-29	175.6W	20:52	-18.3	136.1	17.9	18.0	0.5	18.5	16.3	42.0	12.9	0.2	40.8	292.2	82.9		
2021-Jul-30	176.6W	20:52	-18.4	136.1	18.0	18.0	0.4	18.5	16.3	42.0	13.0	0.2	165.1	24.3	173.8		
2021-Jul-31	177.6W	20:52	-18.4	136.1	18.0	18.0	0.2	18.5	16.3	42.0	13.0	0.2	289.5	116.3	264.6		

															Diameter('')		
Date	Elong	RA	Dec	Ls	B	B'	Phase	Globe	Rings			Vis	CMI	CMII	CMIII		
yyyy-mm-dd	o	hh:mm	o	o	o	o	Angle	Eq	Po	Maj	Min	Mag	o	o	o		
2021-Aug-01	178.5W	20:51	-18.4	136.2	18.0	18.0	0.2	18.5	16.3	42.0	13.0	0.2	53.9	208.4	355.5		
2021-Aug-02	179.2W	20:51	-18.4	136.2	18.1	18.0	0.1	18.5	16.3	42.0	13.0	0.2	178.3	300.5	86.4		
2021-Aug-03	178.9E	20:51	-18.5	136.2	18.1	18.0	0.1	18.5	16.3	42.0	13.0	0.2	302.6	32.5	177.2		
2021-Aug-04	178.0E	20:50	-18.5	136.3	18.1	18.0	0.2	18.5	16.3	42.0	13.1	0.2	67.0	124.6	268.1		
2021-Aug-05	177.1E	20:50	-18.5	136.3	18.1	18.0	0.3	18.5	16.3	42.0	13.1	0.2	191.4	216.7	359.0		
2021-Aug-06	176.1E	20:50	-18.5	136.3	18.2	18.0	0.4	18.5	16.3	42.0	13.1	0.2	315.7	308.8	89.8		
2021-Aug-07	175.0E	20:49	-18.5	136.4	18.2	17.9	0.5	18.5	16.3	42.0	13.1	0.2	80.1	40.8	180.7		
2021-Aug-08	174.0E	20:49	-18.6	136.4	18.2	17.9	0.6	18.5	16.3	42.0	13.1	0.2	204.5	132.9	271.5		
2021-Aug-09	173.0E	20:49	-18.6	136.4	18.3	17.9	0.7	18.5	16.3	42.0	13.2	0.2	328.8	224.9	2.4		

2021-Aug-10	172.0E	20:49	-18.6	136.4	18.3	17.9	0.8	18.5	16.3	42.0	13.2	0.2	93.2	317.0	93.3
2021-Aug-11	170.9E	20:48	-18.6	136.5	18.3	17.9	0.9	18.5	16.3	42.0	13.2	0.2	217.6	49.1	184.1
2021-Aug-12	169.9E	20:48	-18.6	136.5	18.3	17.9	1.0	18.5	16.3	41.9	13.2	0.2	341.9	141.1	275.0
2021-Aug-13	168.9E	20:48	-18.7	136.5	18.4	17.9	1.1	18.5	16.3	41.9	13.2	0.2	106.3	233.2	5.8
2021-Aug-14	167.8E	20:47	-18.7	136.6	18.4	17.9	1.2	18.5	16.3	41.9	13.2	0.2	230.6	325.2	96.7
2021-Aug-15	166.8E	20:47	-18.7	136.6	18.4	17.9	1.3	18.5	16.3	41.9	13.3	0.2	355.0	57.3	187.5
2021-Aug-16	165.8E	20:47	-18.7	136.6	18.5	17.8	1.4	18.5	16.3	41.9	13.3	0.2	119.3	149.3	278.4
2021-Aug-17	164.8E	20:47	-18.7	136.7	18.5	17.8	1.5	18.5	16.2	41.9	13.3	0.2	243.7	241.4	9.2
2021-Aug-18	163.7E	20:46	-18.8	136.7	18.5	17.8	1.6	18.5	16.2	41.8	13.3	0.2	8.0	333.4	100.0
2021-Aug-19	162.7E	20:46	-18.8	136.7	18.5	17.8	1.7	18.4	16.2	41.8	13.3	0.2	132.4	65.5	190.9
2021-Aug-20	161.7E	20:46	-18.8	136.8	18.6	17.8	1.8	18.4	16.2	41.8	13.3	0.3	256.7	157.5	281.7
2021-Aug-21	160.6E	20:45	-18.8	136.8	18.6	17.8	1.9	18.4	16.2	41.8	13.3	0.3	21.0	249.6	12.5
2021-Aug-22	159.6E	20:45	-18.8	136.8	18.6	17.8	2.0	18.4	16.2	41.7	13.3	0.3	145.4	341.6	103.4
2021-Aug-23	158.6E	20:45	-18.9	136.8	18.6	17.8	2.1	18.4	16.2	41.7	13.3	0.3	269.7	73.6	194.2
2021-Aug-24	157.5E	20:45	-18.9	136.9	18.7	17.8	2.2	18.4	16.2	41.7	13.3	0.3	34.0	165.7	285.0
2021-Aug-25	156.5E	20:44	-18.9	136.9	18.7	17.7	2.3	18.4	16.2	41.7	13.4	0.3	158.4	257.7	15.9
2021-Aug-26	155.5E	20:44	-18.9	136.9	18.7	17.7	2.4	18.4	16.2	41.6	13.4	0.3	282.7	349.7	106.7
2021-Aug-27	154.5E	20:44	-18.9	137.0	18.7	17.7	2.5	18.3	16.1	41.6	13.4	0.3	47.0	81.8	197.5
2021-Aug-28	153.4E	20:44	-18.9	137.0	18.8	17.7	2.6	18.3	16.1	41.6	13.4	0.3	171.4	173.8	288.3
2021-Aug-29	152.4E	20:43	-19.0	137.0	18.8	17.7	2.7	18.3	16.1	41.5	13.4	0.3	295.7	265.8	19.2
2021-Aug-30	151.4E	20:43	-19.0	137.1	18.8	17.7	2.8	18.3	16.1	41.5	13.4	0.3	60.0	357.8	110.0
2021-Aug-31	150.4E	20:43	-19.0	137.1	18.8	17.7	2.9	18.3	16.1	41.5	13.4	0.3	184.3	89.9	200.8

Date	Elong	RA	Dec	Ls	B	B'	Phase Globe		Diameter('')			CMI	CMII	CMIII	
							Angle	Eq	Po	Maj	Min				Mag
yyyy-mm-dd	o	hh:mm	o	o	o	o	o	o	o	o	o	o	o	o	o
2021-Sep-01	149.3E	20:43	-19.0	137.1	18.9	17.7	3.0	18.3	16.1	41.4	13.4	0.3	308.6	181.9	291.6
2021-Sep-02	148.3E	20:42	-19.0	137.2	18.9	17.7	3.1	18.3	16.1	41.4	13.4	0.3	73.0	273.9	22.4
2021-Sep-03	147.3E	20:42	-19.0	137.2	18.9	17.7	3.1	18.2	16.0	41.3	13.4	0.3	197.3	5.9	113.2
2021-Sep-04	146.3E	20:42	-19.1	137.2	18.9	17.6	3.2	18.2	16.0	41.3	13.4	0.3	321.6	97.9	204.0
2021-Sep-05	145.2E	20:42	-19.1	137.2	19.0	17.6	3.3	18.2	16.0	41.3	13.4	0.3	85.9	189.9	294.8
2021-Sep-06	144.2E	20:41	-19.1	137.3	19.0	17.6	3.4	18.2	16.0	41.2	13.4	0.3	210.2	281.9	25.6
2021-Sep-07	143.2E	20:41	-19.1	137.3	19.0	17.6	3.5	18.2	16.0	41.2	13.4	0.3	334.5	13.9	116.4
2021-Sep-08	142.2E	20:41	-19.1	137.3	19.0	17.6	3.6	18.1	16.0	41.1	13.4	0.4	98.8	105.9	207.2
2021-Sep-09	141.1E	20:41	-19.1	137.4	19.0	17.6	3.6	18.1	15.9	41.1	13.4	0.4	223.1	197.9	298.0
2021-Sep-10	140.1E	20:41	-19.1	137.4	19.0	17.6	3.7	18.1	15.9	41.0	13.4	0.4	347.4	289.9	28.8
2021-Sep-11	139.1E	20:40	-19.2	137.4	19.1	17.6	3.8	18.1	15.9	41.0	13.4	0.4	111.7	21.9	119.6
2021-Sep-12	138.1E	20:40	-19.2	137.5	19.1	17.6	3.9	18.1	15.9	40.9	13.4	0.4	236.0	113.9	210.4
2021-Sep-13	137.1E	20:40	-19.2	137.5	19.1	17.5	4.0	18.0	15.9	40.9	13.4	0.4	0.3	205.9	301.2
2021-Sep-14	136.1E	20:40	-19.2	137.5	19.1	17.5	4.0	18.0	15.8	40.8	13.4	0.4	124.6	297.9	32.0
2021-Sep-15	135.0E	20:40	-19.2	137.6	19.1	17.5	4.1	18.0	15.8	40.8	13.4	0.4	248.8	29.9	122.7
2021-Sep-16	134.0E	20:40	-19.2	137.6	19.1	17.5	4.2	18.0	15.8	40.7	13.4	0.4	13.1	121.9	213.5
2021-Sep-17	133.0E	20:39	-19.2	137.6	19.2	17.5	4.2	17.9	15.8	40.7	13.4	0.4	137.4	213.9	304.3
2021-Sep-18	132.0E	20:39	-19.2	137.6	19.2	17.5	4.3	17.9	15.8	40.6	13.3	0.4	261.7	305.8	35.1
2021-Sep-19	131.0E	20:39	-19.2	137.7	19.2	17.5	4.4	17.9	15.7	40.6	13.3	0.4	26.0	37.8	125.8
2021-Sep-20	130.0E	20:39	-19.2	137.7	19.2	17.5	4.4	17.9	15.7	40.5	13.3	0.4	150.2	129.8	216.6
2021-Sep-21	129.0E	20:39	-19.3	137.7	19.2	17.5	4.5	17.8	15.7	40.5	13.3	0.4	274.5	221.8	307.4
2021-Sep-22	128.0E	20:39	-19.3	137.8	19.2	17.4	4.6	17.8	15.7	40.4	13.3	0.4	38.8	313.7	38.1
2021-Sep-23	126.9E	20:39	-19.3	137.8	19.2	17.4	4.6	17.8	15.7	40.3	13.3	0.4	163.0	45.7	128.9
2021-Sep-24	125.9E	20:38	-19.3	137.8	19.2	17.4	4.7	17.8	15.6	40.3	13.3	0.4	287.3	137.7	219.7
2021-Sep-25	124.9E	20:38	-19.3	137.9	19.3	17.4	4.7	17.7	15.6	40.2	13.3	0.4	51.6	229.6	310.4

2021-Sep-26	123.9E	20:38	-19.3	137.9	19.3	17.4	4.8	17.7	15.6	40.2	13.3	0.4	175.8	321.6	41.2
2021-Sep-27	122.9E	20:38	-19.3	137.9	19.3	17.4	4.9	17.7	15.6	40.1	13.2	0.5	300.1	53.6	131.9
2021-Sep-28	121.9E	20:38	-19.3	137.9	19.3	17.4	4.9	17.7	15.5	40.1	13.2	0.5	64.3	145.5	222.7
2021-Sep-29	120.9E	20:38	-19.3	138.0	19.3	17.4	5.0	17.6	15.5	40.0	13.2	0.5	188.6	237.5	313.4
2021-Sep-30	119.9E	20:38	-19.3	138.0	19.3	17.4	5.0	17.6	15.5	39.9	13.2	0.5	312.8	329.4	44.2

Date	Elong	RA	Dec	Ls	B	B'	Phase		Globe	Diameter('')			CMI	CMII	CMIII
							Angle	Eq		Rings	Vis	Mag			
yyyy-mm-dd	o	hh:mm	o	o	o	o			Po	Maj	Min	Mag	o	o	o
2021-Oct-01	118.9E	20:38	-19.3	138.0	19.3	17.3	5.1	17.6	15.5	39.9	13.2	0.5	77.1	61.4	134.9
2021-Oct-02	117.9E	20:38	-19.3	138.1	19.3	17.3	5.1	17.6	15.4	39.8	13.2	0.5	201.3	153.3	225.6
2021-Oct-03	116.9E	20:38	-19.3	138.1	19.3	17.3	5.2	17.5	15.4	39.7	13.1	0.5	325.6	245.3	316.4
2021-Oct-04	115.9E	20:38	-19.3	138.1	19.3	17.3	5.2	17.5	15.4	39.7	13.1	0.5	89.8	337.2	47.1
2021-Oct-05	114.9E	20:38	-19.3	138.2	19.3	17.3	5.2	17.5	15.4	39.6	13.1	0.5	214.0	69.1	137.9
2021-Oct-06	113.9E	20:38	-19.3	138.2	19.3	17.3	5.3	17.4	15.3	39.6	13.1	0.5	338.3	161.1	228.6
2021-Oct-07	112.9E	20:38	-19.3	138.2	19.3	17.3	5.3	17.4	15.3	39.5	13.1	0.5	102.5	253.0	319.3
2021-Oct-08	111.9E	20:38	-19.3	138.3	19.3	17.3	5.4	17.4	15.3	39.4	13.1	0.5	226.7	344.9	50.0
2021-Oct-09	111.0E	20:38	-19.3	138.3	19.3	17.3	5.4	17.4	15.3	39.4	13.0	0.5	351.0	76.9	140.8
2021-Oct-10	110.0E	20:37	-19.3	138.3	19.3	17.2	5.4	17.3	15.3	39.3	13.0	0.5	115.2	168.8	231.5
2021-Oct-11	109.0E	20:37	-19.3	138.3	19.3	17.2	5.5	17.3	15.2	39.2	13.0	0.5	239.4	260.7	322.2
2021-Oct-12	108.0E	20:37	-19.3	138.4	19.3	17.2	5.5	17.3	15.2	39.2	13.0	0.5	3.6	352.7	52.9
2021-Oct-13	107.0E	20:37	-19.3	138.4	19.3	17.2	5.5	17.2	15.2	39.1	12.9	0.5	127.9	84.6	143.7
2021-Oct-14	106.0E	20:38	-19.3	138.4	19.3	17.2	5.5	17.2	15.2	39.0	12.9	0.5	252.1	176.5	234.4
2021-Oct-15	105.0E	20:38	-19.3	138.5	19.3	17.2	5.6	17.2	15.1	39.0	12.9	0.5	16.3	268.4	325.1
2021-Oct-16	104.0E	20:38	-19.3	138.5	19.3	17.2	5.6	17.2	15.1	38.9	12.9	0.5	140.5	0.3	55.8
2021-Oct-17	103.1E	20:38	-19.3	138.5	19.3	17.2	5.6	17.1	15.1	38.9	12.9	0.6	264.7	92.3	146.5
2021-Oct-18	102.1E	20:38	-19.3	138.6	19.3	17.2	5.6	17.1	15.0	38.8	12.8	0.6	28.9	184.2	237.2
2021-Oct-19	101.1E	20:38	-19.3	138.6	19.3	17.2	5.6	17.1	15.0	38.7	12.8	0.6	153.1	276.1	327.9
2021-Oct-20	100.1E	20:38	-19.3	138.6	19.3	17.1	5.7	17.0	15.0	38.7	12.8	0.6	277.3	8.0	58.6
2021-Oct-21	99.1E	20:38	-19.3	138.7	19.3	17.1	5.7	17.0	15.0	38.6	12.8	0.6	41.5	99.9	149.3
2021-Oct-22	98.2E	20:38	-19.3	138.7	19.3	17.1	5.7	17.0	14.9	38.5	12.7	0.6	165.7	191.8	240.0
2021-Oct-23	97.2E	20:38	-19.3	138.7	19.3	17.1	5.7	17.0	14.9	38.5	12.7	0.6	289.9	283.7	330.7
2021-Oct-24	96.2E	20:38	-19.3	138.7	19.3	17.1	5.7	16.9	14.9	38.4	12.7	0.6	54.1	15.6	61.4
2021-Oct-25	95.2E	20:38	-19.3	138.8	19.3	17.1	5.7	16.9	14.9	38.3	12.7	0.6	178.3	107.5	152.1
2021-Oct-26	94.3E	20:38	-19.3	138.8	19.3	17.1	5.7	16.9	14.8	38.3	12.6	0.6	302.5	199.4	242.8
2021-Oct-27	93.3E	20:38	-19.3	138.8	19.3	17.1	5.7	16.8	14.8	38.2	12.6	0.6	66.7	291.3	333.5
2021-Oct-28	92.3E	20:38	-19.3	138.9	19.2	17.1	5.7	16.8	14.8	38.1	12.6	0.6	190.9	23.2	64.2
2021-Oct-29	91.4E	20:39	-19.3	138.9	19.2	17.0	5.7	16.8	14.8	38.1	12.5	0.6	315.1	115.1	154.9
2021-Oct-30	90.4E	20:39	-19.3	138.9	19.2	17.0	5.7	16.8	14.7	38.0	12.5	0.6	79.3	207.0	245.6
2021-Oct-31	89.4E	20:39	-19.3	139.0	19.2	17.0	5.7	16.7	14.7	37.9	12.5	0.6	203.5	298.9	336.2

Date	Elong	RA	Dec	Ls	B	B'	Phase		Globe	Diameter('')			CMI	CMII	CMIII
							Angle	Eq		Rings	Vis	Mag			
yyyy-mm-dd	o	hh:mm	o	o	o	o			Po	Maj	Min	Mag	o	o	o
2021-Nov-01	88.5E	20:39	-19.2	139.0	19.2	17.0	5.7	16.7	14.7	37.9	12.5	0.6	327.7	30.8	66.9
2021-Nov-02	87.5E	20:39	-19.2	139.0	19.2	17.0	5.7	16.7	14.7	37.8	12.4	0.6	91.9	122.7	157.6
2021-Nov-03	86.5E	20:39	-19.2	139.1	19.2	17.0	5.7	16.7	14.7	37.8	12.4	0.6	216.0	214.5	248.3
2021-Nov-04	85.6E	20:39	-19.2	139.1	19.2	17.0	5.7	16.6	14.6	37.7	12.4	0.6	340.2	306.4	339.0
2021-Nov-05	84.6E	20:40	-19.2	139.1	19.1	17.0	5.7	16.6	14.6	37.6	12.3	0.6	104.4	38.3	69.6
2021-Nov-06	83.6E	20:40	-19.2	139.1	19.1	17.0	5.7	16.6	14.6	37.6	12.3	0.6	228.6	130.2	160.3
2021-Nov-07	82.7E	20:40	-19.2	139.2	19.1	16.9	5.7	16.5	14.6	37.5	12.3	0.6	352.8	222.1	251.0

2021-Nov-08	81.7E	20:40	-19.2	139.2	19.1	16.9	5.7	16.5	14.5	37.4	12.3	0.6	116.9	313.9	341.7
2021-Nov-09	80.8E	20:40	-19.2	139.2	19.1	16.9	5.7	16.5	14.5	37.4	12.2	0.6	241.1	45.8	72.3
2021-Nov-10	79.8E	20:41	-19.2	139.3	19.1	16.9	5.6	16.5	14.5	37.3	12.2	0.6	5.3	137.7	163.0
2021-Nov-11	78.9E	20:41	-19.1	139.3	19.0	16.9	5.6	16.4	14.5	37.3	12.2	0.7	129.5	229.6	253.7
2021-Nov-12	77.9E	20:41	-19.1	139.3	19.0	16.9	5.6	16.4	14.4	37.2	12.1	0.7	253.6	321.4	344.3
2021-Nov-13	77.0E	20:41	-19.1	139.4	19.0	16.9	5.6	16.4	14.4	37.1	12.1	0.7	17.8	53.3	75.0
2021-Nov-14	76.0E	20:41	-19.1	139.4	19.0	16.9	5.5	16.4	14.4	37.1	12.1	0.7	142.0	145.2	165.7
2021-Nov-15	75.1E	20:42	-19.1	139.4	19.0	16.9	5.5	16.3	14.4	37.0	12.0	0.7	266.1	237.1	256.3
2021-Nov-16	74.1E	20:42	-19.1	139.5	18.9	16.8	5.5	16.3	14.3	37.0	12.0	0.7	30.3	328.9	347.0
2021-Nov-17	73.2E	20:42	-19.1	139.5	18.9	16.8	5.5	16.3	14.3	36.9	12.0	0.7	154.5	60.8	77.7
2021-Nov-18	72.2E	20:42	-19.0	139.5	18.9	16.8	5.4	16.3	14.3	36.9	11.9	0.7	278.6	152.7	168.3
2021-Nov-19	71.3E	20:43	-19.0	139.6	18.9	16.8	5.4	16.2	14.3	36.8	11.9	0.7	42.8	244.5	259.0
2021-Nov-20	70.3E	20:43	-19.0	139.6	18.8	16.8	5.4	16.2	14.3	36.7	11.9	0.7	166.9	336.4	349.6
2021-Nov-21	69.4E	20:43	-19.0	139.6	18.8	16.8	5.3	16.2	14.2	36.7	11.8	0.7	291.1	68.3	80.3
2021-Nov-22	68.4E	20:43	-19.0	139.6	18.8	16.8	5.3	16.2	14.2	36.6	11.8	0.7	55.3	160.1	170.9
2021-Nov-23	67.5E	20:44	-19.0	139.7	18.8	16.8	5.3	16.1	14.2	36.6	11.8	0.7	179.4	252.0	261.6
2021-Nov-24	66.5E	20:44	-18.9	139.7	18.7	16.8	5.2	16.1	14.2	36.5	11.7	0.7	303.6	343.8	352.3
2021-Nov-25	65.6E	20:44	-18.9	139.7	18.7	16.7	5.2	16.1	14.1	36.5	11.7	0.7	67.7	75.7	82.9
2021-Nov-26	64.7E	20:45	-18.9	139.8	18.7	16.7	5.2	16.1	14.1	36.4	11.7	0.7	191.9	167.6	173.6
2021-Nov-27	63.7E	20:45	-18.9	139.8	18.7	16.7	5.1	16.0	14.1	36.4	11.6	0.7	316.1	259.4	264.2
2021-Nov-28	62.8E	20:45	-18.9	139.8	18.6	16.7	5.1	16.0	14.1	36.3	11.6	0.7	80.2	351.3	354.9
2021-Nov-29	61.8E	20:45	-18.8	139.9	18.6	16.7	5.0	16.0	14.1	36.3	11.6	0.7	204.4	83.1	85.5
2021-Nov-30	60.9E	20:46	-18.8	139.9	18.6	16.7	5.0	16.0	14.0	36.2	11.5	0.7	328.5	175.0	176.2

Date	Elong	RA	Dec	Ls	B	B'	Phase		Globe	Rings		Vis	Diameter('')		
							Angle	Eq		Po	Maj		Min	Mag	CMI
yyyy-mm-dd	o	hh:mm	o	o	o	o						o	o	o	
2021-Dec-01	60.0E	20:46	-18.8	139.9	18.6	16.7	4.9	15.9	14.0	36.2	11.5	0.7	92.7	266.9	266.8
2021-Dec-02	59.0E	20:46	-18.8	140.0	18.5	16.7	4.9	15.9	14.0	36.1	11.5	0.7	216.8	358.7	357.5
2021-Dec-03	58.1E	20:47	-18.8	140.0	18.5	16.7	4.8	15.9	14.0	36.1	11.4	0.7	341.0	90.6	88.1
2021-Dec-04	57.2E	20:47	-18.7	140.0	18.5	16.6	4.8	15.9	14.0	36.0	11.4	0.7	105.1	182.4	178.8
2021-Dec-05	56.2E	20:47	-18.7	140.0	18.4	16.6	4.7	15.9	14.0	36.0	11.4	0.7	229.3	274.3	269.4
2021-Dec-06	55.3E	20:48	-18.7	140.1	18.4	16.6	4.7	15.8	13.9	35.9	11.3	0.7	353.4	6.1	0.1
2021-Dec-07	54.4E	20:48	-18.7	140.1	18.4	16.6	4.6	15.8	13.9	35.9	11.3	0.7	117.6	98.0	90.7
2021-Dec-08	53.4E	20:48	-18.6	140.1	18.3	16.6	4.6	15.8	13.9	35.8	11.3	0.7	241.7	189.8	181.4
2021-Dec-09	52.5E	20:49	-18.6	140.2	18.3	16.6	4.5	15.8	13.9	35.8	11.2	0.7	5.9	281.7	272.0
2021-Dec-10	51.6E	20:49	-18.6	140.2	18.3	16.6	4.5	15.8	13.9	35.7	11.2	0.7	130.0	13.5	2.7
2021-Dec-11	50.7E	20:49	-18.6	140.2	18.2	16.6	4.4	15.7	13.8	35.7	11.2	0.7	254.2	105.4	93.3
2021-Dec-12	49.7E	20:50	-18.6	140.3	18.2	16.6	4.3	15.7	13.8	35.6	11.1	0.7	18.3	197.2	183.9
2021-Dec-13	48.8E	20:50	-18.5	140.3	18.2	16.5	4.3	15.7	13.8	35.6	11.1	0.7	142.5	289.1	274.6
2021-Dec-14	47.9E	20:51	-18.5	140.3	18.1	16.5	4.2	15.7	13.8	35.6	11.1	0.7	266.6	20.9	5.2
2021-Dec-15	47.0E	20:51	-18.5	140.4	18.1	16.5	4.2	15.7	13.8	35.5	11.0	0.7	30.8	112.8	95.9
2021-Dec-16	46.0E	20:51	-18.5	140.4	18.1	16.5	4.1	15.6	13.8	35.5	11.0	0.7	154.9	204.6	186.5
2021-Dec-17	45.1E	20:52	-18.4	140.4	18.0	16.5	4.0	15.6	13.8	35.4	11.0	0.7	279.1	296.5	277.2
2021-Dec-18	44.2E	20:52	-18.4	140.4	18.0	16.5	4.0	15.6	13.7	35.4	10.9	0.7	43.2	28.4	7.8
2021-Dec-19	43.3E	20:53	-18.4	140.5	18.0	16.5	3.9	15.6	13.7	35.4	10.9	0.7	167.4	120.2	98.5
2021-Dec-20	42.4E	20:53	-18.3	140.5	17.9	16.5	3.8	15.6	13.7	35.3	10.9	0.7	291.5	212.1	189.1
2021-Dec-21	41.4E	20:53	-18.3	140.5	17.9	16.4	3.8	15.6	13.7	35.3	10.8	0.7	55.7	303.9	279.8
2021-Dec-22	40.5E	20:54	-18.3	140.6	17.8	16.4	3.7	15.5	13.7	35.3	10.8	0.7	179.8	35.8	10.4
2021-Dec-23	39.6E	20:54	-18.3	140.6	17.8	16.4	3.6	15.5	13.7	35.2	10.8	0.7	304.0	127.6	101.1
2021-Dec-24	38.7E	20:55	-18.2	140.6	17.8	16.4	3.6	15.5	13.7	35.2	10.7	0.7	68.1	219.5	191.7

2021-Dec-25	37.8E	20:55	-18.2	140.7	17.7	16.4	3.5	15.5	13.6	35.1	10.7	0.7	192.3	311.3	282.3
2021-Dec-26	36.9E	20:55	-18.2	140.7	17.7	16.4	3.4	15.5	13.6	35.1	10.7	0.7	316.4	43.2	13.0
2021-Dec-27	35.9E	20:56	-18.2	140.7	17.6	16.4	3.3	15.5	13.6	35.1	10.6	0.7	80.6	135.0	103.6
2021-Dec-28	35.0E	20:56	-18.1	140.8	17.6	16.4	3.3	15.5	13.6	35.1	10.6	0.7	204.7	226.9	194.3
2021-Dec-29	34.1E	20:57	-18.1	140.8	17.6	16.4	3.2	15.4	13.6	35.0	10.6	0.7	328.9	318.7	284.9
2021-Dec-30	33.2E	20:57	-18.1	140.8	17.5	16.3	3.1	15.4	13.6	35.0	10.5	0.7	93.0	50.6	15.6
2021-Dec-31	32.3E	20:58	-18.0	140.8	17.5	16.3	3.0	15.4	13.6	35.0	10.5	0.7	217.2	142.4	106.2

GLOSSARY OF TERMS IN HEADING

- UT Date - Universal Dates starting with January 1st and ending December 31st of each year.
 Elong - Geocentric elongation West (W) or East (E) of the Sun in degrees.
 Phase - The terminator is the line where daylight ends and night begins. The terminator phase Angle - The phase, or defect of illumination, is given in degrees (i) to define how much of the geometrical disk of Saturn is in darkness.
 Vis Mag - Geocentric apparent Visual Magnitude.
 Diameter - Apparent angular diameter (seconds of arc) of the Equatorial (Eq) and Polar (Po) Globe and the Major (Maj) and Minor (Min) axis of the Rings of Saturn.
 B - Sub-Earth point (Planetocentric Declination of Earth) as seen from Earth with respect to Saturn in degrees.
 B' - Sub-Solar point (Planetocentric Declination of Sun) as seen from Sun with respect to Saturn in degrees.
 CM - CMI, CMII, CMIII Planetographic longitude of the central meridians of Saturn (degrees).
 NOTE: The Central Meridian is an imaginary line passing through the planetary poles of rotation and bisecting the planetary disk. This line is used to define what areographic longitudes are present on the disk during an observing session.
 RA - The Geocentric Right Ascension of the center of Saturn in hours and minutes (hh:mm).
 Dec - The Declination of the center of Saturn in degrees.

MOTION OF THE CENTRAL MERIDIAN OF Saturn

The tabulated values for the Central Meridian are listed for 0-hours UT in the Ephemeris
 (Add the values below to the listed Central Meridian)

HR	Sys I			MIN	Sys II			MIN	Sys III		
	DEGREE	DEGREE	DEGREE		DEGREE	DEGREE	DEGREE		DEGREE	DEGREE	DEGREE
1	35.18	33.83	33.78	10	5.86	5.64	5.63	1	0.59	0.56	0.56
2	70.36	67.67	67.57	20	11.73	11.28	11.26	2	1.17	1.13	1.13
3	105.54	101.50	101.35	30	17.59	16.92	16.89	3	1.76	1.69	1.69
4	140.72	135.33	135.13	40	23.45	22.56	22.52	4	2.35	2.26	2.25
5	175.90	169.17	168.92	50	29.32	28.19	28.15	5	2.93	2.82	2.82
6	211.07	203.00	202.70					6	3.52	3.38	3.38
7	246.25	236.83	236.48					7	4.10	3.95	3.94
8	281.43	270.67	270.26					8	4.69	4.51	4.50
9	316.61	304.50	304.05					9	5.28	5.07	5.07
10	351.79	338.33	337.83								

Example: 0h UT CMI = 51.5. At 1413UT CM = 51.5° + 351.79° + 140.72° + 5.86° + 1.76°

$$= 551.63^\circ - 360^\circ = 191.63^\circ$$