

2023

SKY GUIDE

**DIGITAL SUPPLEMENT
WINDHOEK, NAMIBIA**

**Astronomical Handbook
for Southern Africa**

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Windhoek

Date	Sun				Astron. Twilight		Moon					
	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Jan 01	06:07	12:53	19:39	Sgr	21:05	04:41	15:03	20:49	02:31	09	69.9	Ari
Jan 02	06:08	12:54	19:39	Sgr	21:06	04:42	15:59	21:36	03:09	10	78.7	Ari
Jan 03	06:08	12:54	19:40	Sgr	21:06	04:42	16:54	22:24	03:52	11	86.2	Tau
Jan 04	06:09	12:55	19:40	Sgr	21:06	04:43	17:50	23:15	04:38	12	92.1	Tau
Jan 05	06:10	12:55	19:40	Sgr	21:06	04:44	17:50	--:--	04:38	13	96.5	Tau
Jan 06	06:10	12:55	19:40	Sgr	21:06	04:45	18:44	00:06	05:28	14	99.0	Gem
Jan 07	06:11	12:56	19:40	Sgr	21:06	04:45	19:36	00:58	06:20	15	99.8	Gem
Jan 08	06:12	12:56	19:41	Sgr	21:06	04:46	20:23	01:48	07:14	16	98.9	Cnc
Jan 09	06:13	12:57	19:41	Sgr	21:06	04:47	21:06	02:36	08:08	17	96.2	Cnc
Jan 10	06:13	12:57	19:41	Sgr	21:06	04:48	21:44	03:21	09:01	18	91.8	Leo
Jan 11	06:14	12:58	19:41	Sgr	21:06	04:49	22:19	04:04	09:53	19	86.0	Leo
Jan 12	06:15	12:58	19:41	Sgr	21:06	04:50	22:52	04:46	10:44	20	78.8	Leo
Jan 13	06:15	12:58	19:41	Sgr	21:06	04:50	23:23	05:26	11:34	21	70.4	Vir
Jan 14	06:16	12:59	19:41	Sgr	21:06	04:51	23:54	06:08	12:26	22	61.1	Vir
Jan 15	06:17	12:59	19:41	Sgr	21:06	04:52	00:27	06:51	13:20	23	51.1	Vir
Jan 16	06:17	12:59	19:41	Sgr	21:05	04:53	01:02	07:37	14:18	24	40.7	Vir
Jan 17	06:18	13:00	19:41	Sgr	21:05	04:54	01:41	08:27	15:19	25	30.3	Lib
Jan 18	06:19	13:00	19:41	Sgr	21:05	04:55	02:27	09:24	16:25	26	20.6	Sco
Jan 19	06:20	13:00	19:41	Sgr	21:05	04:56	03:20	10:26	17:34	27	12.1	Oph
Jan 20	06:20	13:01	19:41	Sgr	21:04	04:57	04:22	11:32	18:41	28	05.4	Sgr
Jan 21	06:21	13:01	19:41	Cap	21:04	04:57	05:31	12:39	19:43	29	01.4	Sgr
Jan 22	06:22	13:01	19:40	Cap	21:04	04:58	06:43	13:43	20:37	01	00.2	Cap
Jan 23	06:23	13:02	19:40	Cap	21:03	04:59	07:54	14:42	21:25	02	02.2	Cap
Jan 24	06:23	13:02	19:40	Cap	21:03	05:00	09:01	15:37	22:06	03	07.0	Aqr
Jan 25	06:24	13:02	19:40	Cap	21:03	05:01	10:04	16:27	22:44	04	14.2	Aqr
Jan 26	06:25	13:02	19:40	Cap	21:02	05:02	11:03	17:14	23:19	05	23.1	Psc
Jan 27	06:25	13:02	19:39	Cap	21:02	05:03	12:01	18:00	23:54	06	33.1	Psc
Jan 28	06:26	13:03	19:39	Cap	21:01	05:04	12:57	18:46	00:30	07	43.5	Ari
Jan 29	06:27	13:03	19:39	Cap	21:01	05:05	13:53	19:33	01:09	08	53.8	Ari
Jan 30	06:27	13:03	19:38	Cap	21:00	05:06	14:49	20:21	01:50	09	63.7	Tau
Jan 31	06:28	13:03	19:38	Cap	20:59	05:06	15:45	21:11	02:35	10	72.8	Tau
Feb 01	06:29	13:03	19:38	Cap	20:59	05:07	16:40	22:02	03:24	11	80.9	Tau
Feb 02	06:29	13:03	19:37	Cap	20:58	05:08	17:32	22:53	04:15	12	87.7	Gem
Feb 03	06:30	13:04	19:37	Cap	20:58	05:09	18:20	23:44	05:09	13	93.2	Gem
Feb 04	06:31	13:04	19:36	Cap	20:57	05:10	19:05	00:31	06:03	14	97.1	Gem
Feb 05	06:31	13:04	19:36	Cap	20:56	05:11	19:05	00:33	06:03	15	99.3	Cnc
Feb 06	06:32	13:04	19:35	Cap	20:56	05:12	19:44	01:19	06:57	16	99.8	Leo
Feb 07	06:33	13:04	19:35	Cap	20:55	05:12	20:21	02:03	07:49	17	98.5	Leo
Feb 08	06:33	13:04	19:34	Cap	20:54	05:13	20:54	02:45	08:40	18	95.4	Leo
Feb 09	06:34	13:04	19:34	Cap	20:53	05:14	21:25	03:26	09:31	19	90.6	Vir
Feb 10	06:34	13:04	19:33	Cap	20:53	05:15	21:56	04:07	10:22	20	84.3	Vir
Feb 11	06:35	13:04	19:33	Cap	20:52	05:16	22:28	04:48	11:14	21	76.4	Vir
Feb 12	06:36	13:04	19:32	Cap	20:51	05:16	23:01	05:32	12:09	22	67.3	Vir
Feb 13	06:36	13:04	19:31	Cap	20:50	05:17	23:37	06:20	13:08	23	57.2	Lib
Feb 14	06:37	13:04	19:31	Cap	20:50	05:18	00:19	07:12	14:10	24	46.5	Lib
Feb 15	06:37	13:04	19:30	Cap	20:49	05:19	01:07	08:09	15:15	25	35.7	Sco
Feb 16	06:38	13:04	19:30	Cap	20:48	05:19	02:03	09:11	16:20	26	25.2	Sgr
Feb 17	06:39	13:04	19:29	Aqr	20:47	05:20	03:07	10:16	17:23	27	15.7	Sgr
Feb 18	06:39	13:04	19:28	Aqr	20:46	05:21	04:16	11:21	18:20	28	08.1	Sgr
Feb 19	06:40	13:04	19:27	Aqr	20:45	05:22	05:27	12:22	19:11	29	02.8	Cap
Feb 20	06:40	13:04	19:27	Aqr	20:44	05:22	06:36	13:19	19:56	30	00.3	Aqr

Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Feb 21	06:41	13:04	19:26	Aqr	20:44	05:23	07:43	14:12	20:36	01	00.9	Aqr
Feb 22	06:41	13:03	19:25	Aqr	20:43	05:24	08:45	15:02	21:13	02	04.3	Aqr
Feb 23	06:42	13:03	19:24	Aqr	20:42	05:24	09:46	15:50	21:50	03	10.2	Cet
Feb 24	06:42	13:03	19:24	Aqr	20:41	05:25	10:45	16:38	22:26	04	18.0	Psc
Feb 25	06:43	13:03	19:23	Aqr	20:40	05:26	11:43	17:26	23:05	05	27.0	Ari
Feb 26	06:43	13:03	19:22	Aqr	20:39	05:26	12:41	18:15	23:46	06	36.8	Ari
Feb 27	06:44	13:03	19:21	Aqr	20:38	05:27	13:38	19:05	00:30	07	46.8	Tau
Feb 28	06:44	13:02	19:20	Aqr	20:37	05:27	14:34	19:57	01:18	08	56.6	Tau
Mar 01	06:45	13:02	19:20	Aqr	20:36	05:28	15:27	20:48	02:10	09	66.0	Tau
Mar 02	06:45	13:02	19:19	Aqr	20:35	05:29	16:17	21:39	03:03	10	74.6	Gem
Mar 03	06:45	13:02	19:18	Aqr	20:34	05:29	17:03	22:29	03:57	11	82.3	Gem
Mar 04	06:46	13:02	19:17	Aqr	20:33	05:30	17:44	23:16	04:51	12	88.9	Cnc
Mar 05	06:46	13:01	19:16	Aqr	20:32	05:30	17:44	--:--	04:51	13	94.0	Cnc
Mar 06	06:47	13:01	19:15	Aqr	20:31	05:31	18:21	00:00	05:44	14	97.7	Leo
Mar 07	06:47	13:01	19:14	Aqr	20:30	05:31	18:55	00:43	06:35	15	99.6	Leo
Mar 08	06:48	13:01	19:14	Aqr	20:29	05:32	19:27	01:25	07:27	16	99.7	Leo
Mar 09	06:48	13:01	19:13	Aqr	20:28	05:32	19:59	02:06	08:18	17	97.9	Vir
Mar 10	06:48	13:00	19:12	Aqr	20:27	05:33	20:30	02:48	09:11	18	94.1	Vir
Mar 11	06:49	13:00	19:11	Aqr	20:26	05:33	21:02	03:31	10:05	19	88.5	Vir
Mar 12	06:49	13:00	19:10	Aqr	20:25	05:34	21:38	04:17	11:02	20	81.1	Lib
Mar 13	06:50	12:59	19:09	Psc	20:24	05:34	22:17	05:07	12:02	21	72.2	Lib
Mar 14	06:50	12:59	19:08	Psc	20:23	05:35	23:02	06:02	13:05	22	62.1	Oph
Mar 15	06:50	12:59	19:07	Psc	20:22	05:35	23:54	07:01	14:09	23	51.1	Oph
Mar 16	06:51	12:59	19:06	Psc	20:21	05:36	00:54	08:03	15:11	24	39.9	Sgr
Mar 17	06:51	12:58	19:05	Psc	20:20	05:36	01:59	09:05	16:08	25	28.9	Sgr
Mar 18	06:52	12:58	19:04	Psc	20:19	05:37	03:07	10:06	17:00	26	18.9	Cap
Mar 19	06:52	12:58	19:03	Psc	20:18	05:37	04:15	11:03	17:46	27	10.5	Cap
Mar 20	06:52	12:57	19:02	Psc	20:17	05:37	05:21	11:57	18:27	28	04.4	Aqr
Mar 21	06:53	12:57	19:01	Psc	20:16	05:38	06:25	12:48	19:06	29	00.8	Aqr
Mar 22	06:53	12:57	19:00	Psc	20:15	05:38	07:26	13:37	19:42	01	00.2	Psc
Mar 23	06:53	12:57	18:59	Psc	20:14	05:39	08:27	14:26	20:19	02	02.2	Psc
Mar 24	06:54	12:56	18:59	Psc	20:13	05:39	09:26	15:14	20:57	03	06.7	Ari
Mar 25	06:54	12:56	18:58	Psc	20:12	05:39	10:26	16:04	21:38	04	13.2	Ari
Mar 26	06:54	12:56	18:57	Psc	20:11	05:40	11:25	16:55	22:22	05	21.1	Tau
Mar 27	06:55	12:55	18:56	Psc	20:10	05:40	12:24	17:48	23:10	06	30.0	Tau
Mar 28	06:55	12:55	18:55	Psc	20:09	05:41	13:19	18:40	00:01	07	39.5	Tau
Mar 29	06:56	12:55	18:54	Psc	20:08	05:41	14:11	19:32	00:55	08	49.1	Gem
Mar 30	06:56	12:55	18:53	Psc	20:07	05:41	14:59	20:23	01:49	09	58.6	Gem
Mar 31	06:56	12:54	18:52	Psc	20:06	05:42	15:42	21:11	02:43	10	67.7	Cnc
Apr 01	06:57	12:54	18:51	Psc	20:05	05:42	16:20	21:56	03:36	11	76.2	Cnc
Apr 02	06:57	12:54	18:50	Psc	20:05	05:42	16:55	22:40	04:28	12	83.7	Leo
Apr 03	06:57	12:53	18:49	Psc	20:04	05:43	17:28	23:22	05:20	13	90.2	Leo
Apr 04	06:58	12:53	18:48	Psc	20:03	05:43	17:28	--:--	05:20	14	95.2	Leo
Apr 05	06:58	12:53	18:47	Psc	20:02	05:43	17:59	00:03	06:12	15	98.5	Vir
Apr 06	06:58	12:52	18:46	Psc	20:01	05:44	18:31	00:45	07:04	16	99.9	Vir
Apr 07	06:59	12:52	18:45	Psc	20:00	05:44	19:03	01:28	07:59	17	99.3	Vir
Apr 08	06:59	12:52	18:44	Psc	19:59	05:44	19:38	02:14	08:56	18	96.5	Lib
Apr 09	06:59	12:52	18:44	Psc	19:58	05:45	20:16	03:04	09:56	19	91.5	Lib
Apr 10	07:00	12:51	18:43	Psc	19:57	05:45	21:00	03:57	10:59	20	84.5	Sco
Apr 11	07:00	12:51	18:42	Psc	19:57	05:45	21:50	04:55	12:03	21	75.8	Oph
Apr 12	07:00	12:51	18:41	Psc	19:56	05:45	22:47	05:56	13:05	22	65.6	Sgr
Apr 13	07:01	12:51	18:40	Psc	19:55	05:46	23:50	06:58	14:03	23	54.5	Sgr
Apr 14	07:01	12:50	18:39	Psc	19:54	05:46	00:56	07:58	14:55	24	43.1	Cap

Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Apr 15	07:01	12:50	18:38	Psc	19:53	05:46	02:03	08:55	15:41	25	31.9	Cap
Apr 16	07:02	12:50	18:37	Psc	19:53	05:47	03:07	09:48	16:23	26	21.6	Aqr
Apr 17	07:02	12:50	18:37	Psc	19:52	05:47	04:10	10:38	17:01	27	12.8	Aqr
Apr 18	07:03	12:49	18:36	Psc	19:51	05:47	05:10	11:27	17:37	28	06.1	Psc
Apr 19	07:03	12:49	18:35	Psc	19:50	05:48	06:10	12:14	18:13	29	01.8	Psc
Apr 20	07:03	12:49	18:34	Ari	19:50	05:48	07:09	13:03	18:51	30	00.0	Psc
Apr 21	07:04	12:49	18:33	Ari	19:49	05:48	08:09	13:52	19:30	01	00.8	Ari
Apr 22	07:04	12:48	18:33	Ari	19:48	05:49	09:09	14:43	20:13	02	04.0	Ari
Apr 23	07:05	12:48	18:32	Ari	19:47	05:49	10:09	15:36	21:00	03	09.1	Tau
Apr 24	07:05	12:48	18:31	Ari	19:47	05:49	11:07	16:29	21:51	04	15.8	Tau
Apr 25	07:05	12:48	18:30	Ari	19:46	05:49	12:02	17:23	22:44	05	23.7	Gem
Apr 26	07:06	12:48	18:29	Ari	19:45	05:50	12:52	18:15	23:39	06	32.5	Gem
Apr 27	07:06	12:48	18:29	Ari	19:45	05:50	13:37	19:04	00:33	07	41.7	Gem
Apr 28	07:07	12:47	18:28	Ari	19:44	05:50	14:17	19:50	01:27	08	51.2	Cnc
Apr 29	07:07	12:47	18:27	Ari	19:44	05:51	14:54	20:34	02:19	09	60.6	Leo
Apr 30	07:07	12:47	18:27	Ari	19:43	05:51	15:27	21:16	03:11	10	69.7	Leo
May 01	07:08	12:47	18:26	Ari	19:42	05:51	15:59	21:58	04:02	11	78.1	Leo
May 02	07:08	12:47	18:25	Ari	19:42	05:52	16:30	22:39	04:54	12	85.7	Vir
May 03	07:09	12:47	18:25	Ari	19:41	05:52	17:02	23:22	05:48	13	91.9	Vir
May 04	07:09	12:47	18:24	Ari	19:41	05:52	17:02	--:--	05:48	14	96.6	Vir
May 05	07:09	12:47	18:23	Ari	19:40	05:53	17:35	00:07	06:45	15	99.4	Vir
May 06	07:10	12:46	18:23	Ari	19:40	05:53	18:13	00:56	07:45	16	99.9	Lib
May 07	07:10	12:46	18:22	Ari	19:39	05:53	18:55	01:50	08:48	17	98.0	Sco
May 08	07:11	12:46	18:22	Ari	19:39	05:54	19:44	02:48	09:54	18	93.7	Oph
May 09	07:11	12:46	18:21	Ari	19:38	05:54	20:40	03:49	10:58	19	87.0	Sgr
May 10	07:12	12:46	18:21	Ari	19:38	05:54	21:43	04:52	11:59	20	78.4	Sgr
May 11	07:12	12:46	18:20	Ari	19:38	05:55	22:49	05:53	12:53	21	68.2	Sgr
May 12	07:12	12:46	18:20	Ari	19:37	05:55	23:55	06:51	13:41	22	57.1	Cap
May 13	07:13	12:46	18:19	Ari	19:37	05:55	01:00	07:44	14:23	23	45.6	Aqr
May 14	07:13	12:46	18:19	Ari	19:37	05:56	02:02	08:34	15:01	24	34.4	Aqr
May 15	07:14	12:46	18:18	Tau	19:36	05:56	03:02	09:22	15:37	25	24.0	Aqr
May 16	07:14	12:46	18:18	Tau	19:36	05:56	04:00	10:09	16:12	26	15.1	Cet
May 17	07:15	12:46	18:17	Tau	19:36	05:57	04:58	10:55	16:47	27	08.1	Psc
May 18	07:15	12:46	18:17	Tau	19:35	05:57	05:56	11:43	17:25	28	03.1	Ari
May 19	07:16	12:46	18:17	Tau	19:35	05:57	06:56	12:33	18:06	29	00.5	Ari
May 20	07:16	12:46	18:16	Tau	19:35	05:58	07:55	13:25	18:51	01	00.2	Tau
May 21	07:16	12:46	18:16	Tau	19:35	05:58	08:55	14:18	19:41	02	02.0	Tau
May 22	07:17	12:46	18:16	Tau	19:34	05:58	09:51	15:12	20:33	03	05.8	Tau
May 23	07:17	12:47	18:15	Tau	19:34	05:59	10:44	16:05	21:28	04	11.3	Gem
May 24	07:18	12:47	18:15	Tau	19:34	05:59	11:31	16:56	22:23	05	18.1	Gem
May 25	07:18	12:47	18:15	Tau	19:34	05:59	12:13	17:44	23:17	06	26.1	Cnc
May 26	07:19	12:47	18:15	Tau	19:34	06:00	12:51	18:29	00:10	07	34.8	Cnc
May 27	07:19	12:47	18:15	Tau	19:34	06:00	13:25	19:11	01:01	08	44.0	Leo
May 28	07:20	12:47	18:14	Tau	19:33	06:00	13:57	19:52	01:52	09	53.6	Leo
May 29	07:20	12:47	18:14	Tau	19:33	06:01	14:28	20:33	02:43	10	63.1	Leo
May 30	07:20	12:47	18:14	Tau	19:33	06:01	14:59	21:14	03:35	11	72.3	Vir
May 31	07:21	12:47	18:14	Tau	19:33	06:01	15:32	21:58	04:30	12	80.8	Vir
Jun 01	07:21	12:48	18:14	Tau	19:33	06:02	16:07	22:45	05:29	13	88.3	Vir
Jun 02	07:22	12:48	18:14	Tau	19:33	06:02	16:47	23:37	06:31	14	94.2	Lib
Jun 03	07:22	12:48	18:14	Tau	19:33	06:03	17:34	00:31	07:37	15	98.2	Lib
Jun 04	07:23	12:48	18:13	Tau	19:33	06:03	17:34	00:34	07:37	16	99.9	Sco
Jun 05	07:23	12:48	18:13	Tau	19:33	06:03	18:28	01:36	08:44	17	98.9	Oph
Jun 06	07:23	12:48	18:13	Tau	19:33	06:04	19:30	02:40	09:49	18	95.2	Sgr

Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Jun 07	07:24	12:49	18:13	Tau	19:33	06:04	20:37	03:44	10:47	19	88.9	Sgr
Jun 08	07:24	12:49	18:13	Tau	19:33	06:04	21:45	04:44	11:38	20	80.5	Cap
Jun 09	07:24	12:49	18:13	Tau	19:33	06:04	22:52	05:40	12:22	21	70.4	Cap
Jun 10	07:25	12:49	18:13	Tau	19:33	06:05	23:56	06:32	13:02	22	59.4	Aqr
Jun 11	07:25	12:49	18:13	Tau	19:34	06:05	00:57	07:21	13:38	23	48.0	Aqr
Jun 12	07:25	12:50	18:14	Tau	19:34	06:05	01:55	08:07	14:13	24	36.9	Psc
Jun 13	07:26	12:50	18:14	Tau	19:34	06:06	02:52	08:53	14:48	25	26.7	Psc
Jun 14	07:26	12:50	18:14	Tau	19:34	06:06	03:50	09:39	15:24	26	17.7	Ari
Jun 15	07:26	12:50	18:14	Tau	19:34	06:06	04:47	10:27	16:03	27	10.4	Ari
Jun 16	07:27	12:50	18:14	Tau	19:34	06:07	05:46	11:18	16:46	28	05.0	Tau
Jun 17	07:27	12:51	18:14	Tau	19:34	06:07	06:45	12:10	17:34	29	01.5	Tau
Jun 18	07:27	12:51	18:14	Tau	19:35	06:07	07:42	13:04	18:25	30	00.2	Tau
Jun 19	07:28	12:51	18:14	Tau	19:35	06:07	08:36	13:57	19:19	01	00.8	Gem
Jun 20	07:28	12:51	18:15	Tau	19:35	06:08	09:25	14:49	20:14	02	03.3	Gem
Jun 21	07:28	12:51	18:15	Tau	19:35	06:08	10:10	15:38	21:09	03	07.6	Cnc
Jun 22	07:28	12:52	18:15	Tau	19:35	06:08	10:49	16:24	22:02	04	13.4	Cnc
Jun 23	07:28	12:52	18:15	Gem	19:36	06:08	11:24	17:07	22:54	05	20.4	Leo
Jun 24	07:29	12:52	18:16	Gem	19:36	06:08	11:57	17:48	23:44	06	28.5	Leo
Jun 25	07:29	12:52	18:16	Gem	19:36	06:09	12:27	18:28	00:34	07	37.4	Leo
Jun 26	07:29	12:53	18:16	Gem	19:36	06:09	12:57	19:08	01:25	08	46.9	Vir
Jun 27	07:29	12:53	18:16	Gem	19:37	06:09	13:28	19:50	02:17	09	56.7	Vir
Jun 28	07:29	12:53	18:17	Gem	19:37	06:09	14:02	20:34	03:13	10	66.5	Vir
Jun 29	07:29	12:53	18:17	Gem	19:37	06:09	14:39	21:23	04:13	11	75.9	Vir
Jun 30	07:30	12:53	18:17	Gem	19:37	06:09	15:22	22:17	05:17	12	84.4	Lib
Jul 01	07:30	12:54	18:18	Gem	19:38	06:09	16:12	23:16	06:24	13	91.6	Sco
Jul 02	07:30	12:54	18:18	Gem	19:38	06:10	16:12	--:--	06:24	14	96.8	Oph
Jul 03	07:30	12:54	18:18	Gem	19:38	06:10	17:11	00:21	07:30	15	99.5	Sgr
Jul 04	07:30	12:54	18:19	Gem	19:39	06:10	18:17	01:27	08:33	16	99.4	Sgr
Jul 05	07:30	12:54	18:19	Gem	19:39	06:10	19:27	02:31	09:29	17	96.4	Cap
Jul 06	07:30	12:54	18:19	Gem	19:39	06:10	20:38	03:31	10:17	18	90.7	Cap
Jul 07	07:30	12:55	18:20	Gem	19:40	06:10	21:45	04:26	11:00	19	82.6	Aqr
Jul 08	07:30	12:55	18:20	Gem	19:40	06:10	22:49	05:17	11:38	20	72.8	Aqr
Jul 09	07:30	12:55	18:20	Gem	19:40	06:10	23:49	06:05	12:14	21	62.1	Psc
Jul 10	07:29	12:55	18:21	Gem	19:40	06:10	00:48	06:51	12:49	22	51.0	Psc
Jul 11	07:29	12:55	18:21	Gem	19:41	06:10	01:45	07:38	13:25	23	40.1	Ari
Jul 12	07:29	12:55	18:22	Gem	19:41	06:10	02:43	08:25	14:03	24	30.0	Ari
Jul 13	07:29	12:55	18:22	Gem	19:41	06:10	03:41	09:14	14:45	25	21.0	Tau
Jul 14	07:29	12:56	18:22	Gem	19:42	06:10	04:39	10:06	15:30	26	13.3	Tau
Jul 15	07:29	12:56	18:23	Gem	19:42	06:10	05:36	10:58	16:20	27	07.3	Tau
Jul 16	07:29	12:56	18:23	Gem	19:42	06:09	06:31	11:52	17:13	28	03.1	Gem
Jul 17	07:28	12:56	18:24	Gem	19:43	06:09	07:21	12:44	18:08	29	00.7	Gem
Jul 18	07:28	12:56	18:24	Gem	19:43	06:09	08:07	13:33	19:02	01	00.2	Cnc
Jul 19	07:28	12:56	18:24	Gem	19:43	06:09	08:48	14:20	19:56	02	01.6	Cnc
Jul 20	07:28	12:56	18:25	Gem	19:44	06:09	09:24	15:04	20:48	03	04.7	Leo
Jul 21	07:27	12:56	18:25	Gem	19:44	06:09	09:57	15:46	21:39	04	09.4	Leo
Jul 22	07:27	12:56	18:26	Cnc	19:44	06:08	10:28	16:26	22:28	05	15.5	Leo
Jul 23	07:27	12:56	18:26	Cnc	19:45	06:08	10:58	17:05	23:18	06	23.0	Vir
Jul 24	07:26	12:56	18:27	Cnc	19:45	06:08	11:28	17:46	00:09	07	31.5	Vir
Jul 25	07:26	12:56	18:27	Cnc	19:45	06:08	12:00	18:28	01:02	08	40.9	Vir
Jul 26	07:26	12:56	18:27	Cnc	19:46	06:07	12:34	19:13	01:58	09	50.9	Vir
Jul 27	07:25	12:56	18:28	Cnc	19:46	06:07	13:13	20:03	02:59	10	61.2	Lib
Jul 28	07:25	12:56	18:28	Cnc	19:46	06:07	13:58	20:58	04:03	11	71.3	Lib
Jul 29	07:24	12:56	18:29	Cnc	19:46	06:06	14:52	21:59	05:09	12	80.7	Sco

Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Jul 30	07:24	12:56	18:29	Cnc	19:47	06:06	15:54	23:04	06:13	13	88.9	Sgr
Jul 31	07:23	12:56	18:29	Cnc	19:47	06:06	15:54	--:--	06:13	14	95.1	Sgr
Aug 01	07:23	12:56	18:30	Cnc	19:47	06:05	17:03	00:10	07:13	15	98.9	Sgr
Aug 02	07:22	12:56	18:30	Cnc	19:48	06:05	18:14	01:13	08:06	16	99.7	Cap
Aug 03	07:22	12:56	18:31	Cnc	19:48	06:04	19:25	02:12	08:52	17	97.5	Aqr
Aug 04	07:21	12:56	18:31	Cnc	19:48	06:04	20:32	03:06	09:33	18	92.5	Aqr
Aug 05	07:21	12:56	18:31	Cnc	19:49	06:03	21:36	03:57	10:11	19	85.0	Psc
Aug 06	07:20	12:56	18:32	Cnc	19:49	06:03	22:37	04:46	10:48	20	75.8	Psc
Aug 07	07:19	12:56	18:32	Cnc	19:49	06:02	23:37	05:33	11:24	21	65.5	Psc
Aug 08	07:19	12:56	18:33	Cnc	19:49	06:02	00:36	06:22	12:03	22	54.8	Ari
Aug 09	07:18	12:55	18:33	Cnc	19:50	06:01	01:35	07:11	12:43	23	44.2	Ari
Aug 10	07:17	12:55	18:33	Cnc	19:50	06:01	02:34	08:02	13:28	24	34.2	Tau
Aug 11	07:17	12:55	18:34	Cnc	19:50	06:00	03:32	08:55	14:16	25	25.0	Tau
Aug 12	07:16	12:55	18:34	Leo	19:50	06:00	04:27	09:48	15:08	26	17.0	Gem
Aug 13	07:15	12:55	18:34	Leo	19:51	05:59	05:19	10:40	16:02	27	10.4	Gem
Aug 14	07:15	12:55	18:35	Leo	19:51	05:58	06:06	11:30	16:57	28	05.4	Gem
Aug 15	07:14	12:54	18:35	Leo	19:51	05:58	06:48	12:18	17:51	29	02.0	Cnc
Aug 16	07:13	12:54	18:35	Leo	19:52	05:57	07:25	13:03	18:44	30	00.3	Leo
Aug 17	07:13	12:54	18:36	Leo	19:52	05:57	07:59	13:45	19:35	01	00.5	Leo
Aug 18	07:12	12:54	18:36	Leo	19:52	05:56	08:30	14:25	20:25	02	02.4	Leo
Aug 19	07:11	12:54	18:36	Leo	19:52	05:55	09:00	15:05	21:14	03	06.1	Vir
Aug 20	07:10	12:53	18:37	Leo	19:53	05:54	09:30	15:45	22:04	04	11.4	Vir
Aug 21	07:09	12:53	18:37	Leo	19:53	05:54	10:01	16:25	22:56	05	18.2	Vir
Aug 22	07:09	12:53	18:37	Leo	19:53	05:53	10:33	17:09	23:50	06	26.3	Vir
Aug 23	07:08	12:53	18:38	Leo	19:53	05:52	11:09	17:56	00:47	07	35.6	Lib
Aug 24	07:07	12:52	18:38	Leo	19:54	05:51	11:51	18:47	01:48	08	45.8	Lib
Aug 25	07:06	12:52	18:38	Leo	19:54	05:51	12:40	19:44	02:52	09	56.4	Sco
Aug 26	07:05	12:52	18:39	Leo	19:54	05:50	13:36	20:45	03:55	10	67.0	Oph
Aug 27	07:04	12:52	18:39	Leo	19:54	05:49	14:40	21:49	04:56	11	77.2	Sgr
Aug 28	07:03	12:51	18:39	Leo	19:55	05:48	15:49	22:52	05:51	12	86.2	Sgr
Aug 29	07:02	12:51	18:40	Leo	19:55	05:47	17:00	23:53	06:40	13	93.4	Cap
Aug 30	07:02	12:51	18:40	Leo	19:55	05:47	18:09	00:48	07:24	14	98.1	Cap
Aug 31	07:01	12:50	18:40	Leo	19:55	05:46	18:09	00:50	07:24	15	99.9	Aqr
Sep 01	07:00	12:50	18:41	Leo	19:56	05:45	19:16	01:43	08:04	16	98.6	Aqr
Sep 02	06:59	12:50	18:41	Leo	19:56	05:44	20:20	02:34	08:42	17	94.5	Psc
Sep 03	06:58	12:49	18:41	Leo	19:56	05:43	21:22	03:24	09:20	18	87.9	Psc
Sep 04	06:57	12:49	18:41	Leo	19:56	05:42	22:23	04:13	09:58	19	79.5	Ari
Sep 05	06:56	12:49	18:42	Leo	19:57	05:41	23:24	05:04	10:39	20	69.9	Ari
Sep 06	06:55	12:48	18:42	Leo	19:57	05:40	00:25	05:56	11:23	21	59.7	Tau
Sep 07	06:54	12:48	18:42	Leo	19:57	05:39	01:25	06:49	12:12	22	49.4	Tau
Sep 08	06:53	12:48	18:43	Leo	19:57	05:38	02:22	07:43	13:03	23	39.5	Tau
Sep 09	06:52	12:47	18:43	Leo	19:58	05:37	03:16	08:36	13:57	24	30.2	Gem
Sep 10	06:51	12:47	18:43	Leo	19:58	05:37	04:04	09:27	14:52	25	21.8	Gem
Sep 11	06:50	12:47	18:43	Leo	19:58	05:36	04:47	10:15	15:46	26	14.5	Cnc
Sep 12	06:49	12:46	18:44	Leo	19:58	05:35	05:26	11:01	16:40	27	08.5	Cnc
Sep 13	06:48	12:46	18:44	Leo	19:59	05:34	06:01	11:44	17:31	28	04.0	Leo
Sep 14	06:47	12:46	18:44	Leo	19:59	05:33	06:33	12:25	18:21	29	01.2	Leo
Sep 15	06:46	12:45	18:45	Leo	19:59	05:32	07:03	13:05	19:11	30	00.1	Leo
Sep 16	06:45	12:45	18:45	Leo	20:00	05:31	07:33	13:44	20:01	01	00.8	Vir
Sep 17	06:44	12:45	18:45	Leo	20:00	05:30	08:03	14:25	20:52	02	03.5	Vir
Sep 18	06:43	12:44	18:45	Vir	20:00	05:29	08:35	15:07	21:45	03	07.9	Vir
Sep 19	06:42	12:44	18:46	Vir	20:00	05:28	09:10	15:53	22:41	04	14.1	Lib
Sep 20	06:41	12:43	18:46	Vir	20:01	05:27	09:49	16:42	23:40	05	21.9	Lib

Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Sep 21	06:40	12:43	18:46	Vir	20:01	05:26	10:34	17:36	00:42	06	31.1	Sco
Sep 22	06:39	12:43	18:47	Vir	20:01	05:24	11:27	18:34	01:44	07	41.3	Oph
Sep 23	06:38	12:42	18:47	Vir	20:02	05:23	12:26	19:35	02:44	08	52.2	Sgr
Sep 24	06:37	12:42	18:47	Vir	20:02	05:22	13:31	20:37	03:39	09	63.3	Sgr
Sep 25	06:36	12:42	18:48	Vir	20:02	05:21	14:39	21:37	04:29	10	73.9	Cap
Sep 26	06:35	12:41	18:48	Vir	20:03	05:20	15:47	22:34	05:14	11	83.6	Cap
Sep 27	06:34	12:41	18:48	Vir	20:03	05:19	16:53	23:28	05:55	12	91.5	Aqr
Sep 28	06:33	12:41	18:48	Vir	20:04	05:18	16:53	--:--	05:55	13	97.0	Aqr
Sep 29	06:32	12:40	18:49	Vir	20:04	05:17	17:58	00:19	06:34	14	99.7	Psc
Sep 30	06:31	12:40	18:49	Vir	20:04	05:16	19:01	01:10	07:12	15	99.5	Psc
Oct 01	06:30	12:40	18:49	Vir	20:05	05:15	20:04	02:00	07:50	16	96.5	Ari
Oct 02	06:29	12:39	18:50	Vir	20:05	05:14	21:07	02:51	08:31	17	91.1	Ari
Oct 03	06:28	12:39	18:50	Vir	20:06	05:13	22:09	03:44	09:15	18	83.7	Tau
Oct 04	06:27	12:39	18:50	Vir	20:06	05:12	23:12	04:39	10:03	19	75.1	Tau
Oct 05	06:26	12:38	18:51	Vir	20:06	05:11	00:12	05:34	10:55	20	65.6	Tau
Oct 06	06:25	12:38	18:51	Vir	20:07	05:10	01:09	06:28	11:49	21	55.8	Aur
Oct 07	06:25	12:38	18:51	Vir	20:07	05:09	02:00	07:21	12:44	22	46.0	Gem
Oct 08	06:24	12:38	18:52	Vir	20:08	05:08	02:45	08:11	13:39	23	36.5	Cnc
Oct 09	06:23	12:37	18:52	Vir	20:08	05:07	03:26	08:58	14:33	24	27.7	Cnc
Oct 10	06:22	12:37	18:53	Vir	20:09	05:06	04:02	09:41	15:25	25	19.7	Leo
Oct 11	06:21	12:37	18:53	Vir	20:09	05:05	04:34	10:23	16:16	26	12.7	Leo
Oct 12	06:20	12:36	18:53	Vir	20:10	05:04	05:05	11:03	17:06	27	07.1	Leo
Oct 13	06:19	12:36	18:54	Vir	20:10	05:03	05:35	11:43	17:56	28	02.9	Vir
Oct 14	06:18	12:36	18:54	Vir	20:11	05:02	06:05	12:24	18:47	29	00.6	Vir
Oct 15	06:17	12:36	18:55	Vir	20:11	05:01	06:37	13:06	19:40	01	00.1	Vir
Oct 16	06:16	12:36	18:55	Vir	20:12	05:00	07:11	13:51	20:36	02	01.6	Vir
Oct 17	06:16	12:35	18:55	Vir	20:12	04:59	07:49	14:39	21:35	03	05.2	Lib
Oct 18	06:15	12:35	18:56	Vir	20:13	04:58	08:32	15:32	22:36	04	10.7	Sco
Oct 19	06:14	12:35	18:56	Vir	20:14	04:57	09:23	16:29	23:38	05	18.1	Oph
Oct 20	06:13	12:35	18:57	Vir	20:14	04:56	10:19	17:29	00:38	06	27.1	Sgr
Oct 21	06:12	12:35	18:57	Vir	20:15	04:55	11:21	18:29	01:34	07	37.4	Sgr
Oct 22	06:12	12:34	18:58	Vir	20:15	04:54	12:27	19:28	02:24	08	48.5	Sgr
Oct 23	06:11	12:34	18:58	Vir	20:16	04:53	13:33	20:24	03:09	09	59.8	Cap
Oct 24	06:10	12:34	18:59	Vir	20:17	04:52	14:37	21:17	03:50	10	70.8	Cap
Oct 25	06:09	12:34	18:59	Vir	20:17	04:51	15:41	22:07	04:28	11	80.8	Aqr
Oct 26	06:08	12:34	19:00	Vir	20:18	04:50	16:42	22:57	05:05	12	89.2	Aqr
Oct 27	06:08	12:34	19:00	Vir	20:19	04:49	17:44	23:46	05:42	13	95.4	Cet
Oct 28	06:07	12:34	19:01	Vir	20:19	04:48	18:46	00:35	06:22	14	99.0	Psc
Oct 29	06:06	12:34	19:01	Vir	20:20	04:48	18:46	00:37	06:22	15	100.0	Ari
Oct 30	06:06	12:34	19:02	Vir	20:21	04:47	19:49	01:29	07:04	16	98.3	Ari
Oct 31	06:05	12:33	19:02	Vir	20:21	04:46	20:53	02:24	07:51	17	94.2	Tau
Nov 01	06:04	12:33	19:03	Lib	20:22	04:45	21:56	03:20	08:42	18	88.2	Tau
Nov 02	06:04	12:33	19:03	Lib	20:23	04:44	22:56	04:16	09:37	19	80.7	Aur
Nov 03	06:03	12:33	19:04	Lib	20:24	04:44	23:51	05:11	10:33	20	72.2	Gem
Nov 04	06:03	12:33	19:04	Lib	20:24	04:43	00:39	06:03	11:30	21	63.0	Gem
Nov 05	06:02	12:33	19:05	Lib	20:25	04:42	01:22	06:52	12:24	22	53.6	Cnc
Nov 06	06:02	12:33	19:06	Lib	20:26	04:41	02:00	07:37	13:17	23	44.1	Leo
Nov 07	06:01	12:33	19:06	Lib	20:27	04:41	02:34	08:19	14:09	24	34.9	Leo
Nov 08	06:01	12:34	19:07	Lib	20:28	04:40	03:06	09:00	14:59	25	26.2	Leo
Nov 09	06:00	12:34	19:07	Lib	20:28	04:39	03:36	09:39	15:48	26	18.2	Vir
Nov 10	06:00	12:34	19:08	Lib	20:29	04:39	04:05	10:20	16:39	27	11.4	Vir
Nov 11	05:59	12:34	19:09	Lib	20:30	04:38	04:36	11:01	17:32	28	05.9	Vir
Nov 12	05:59	12:34	19:09	Lib	20:31	04:37	05:09	11:45	18:27	29	02.1	Vir

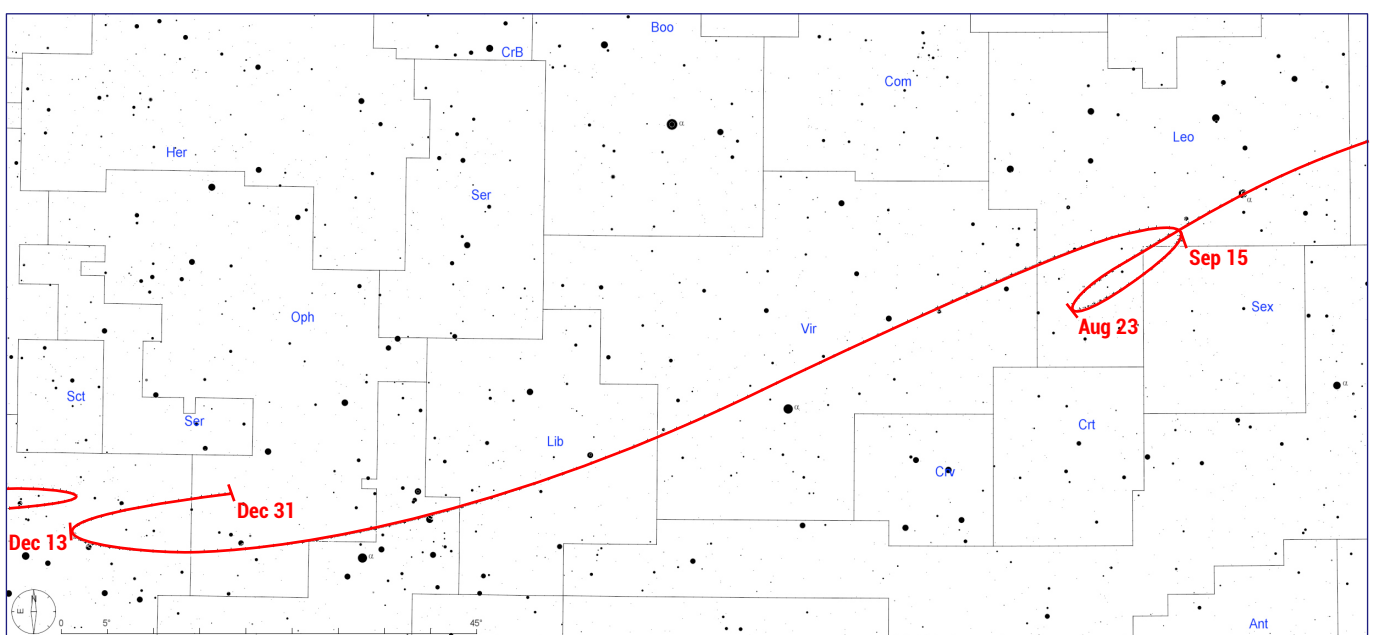
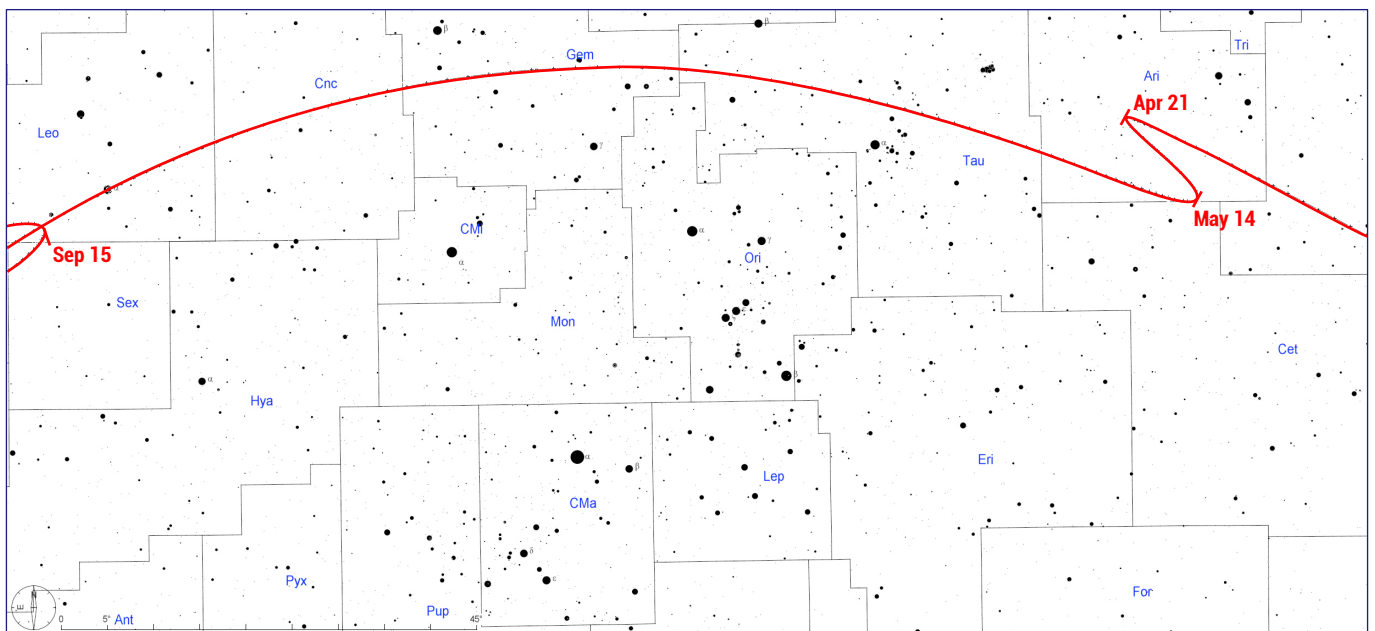
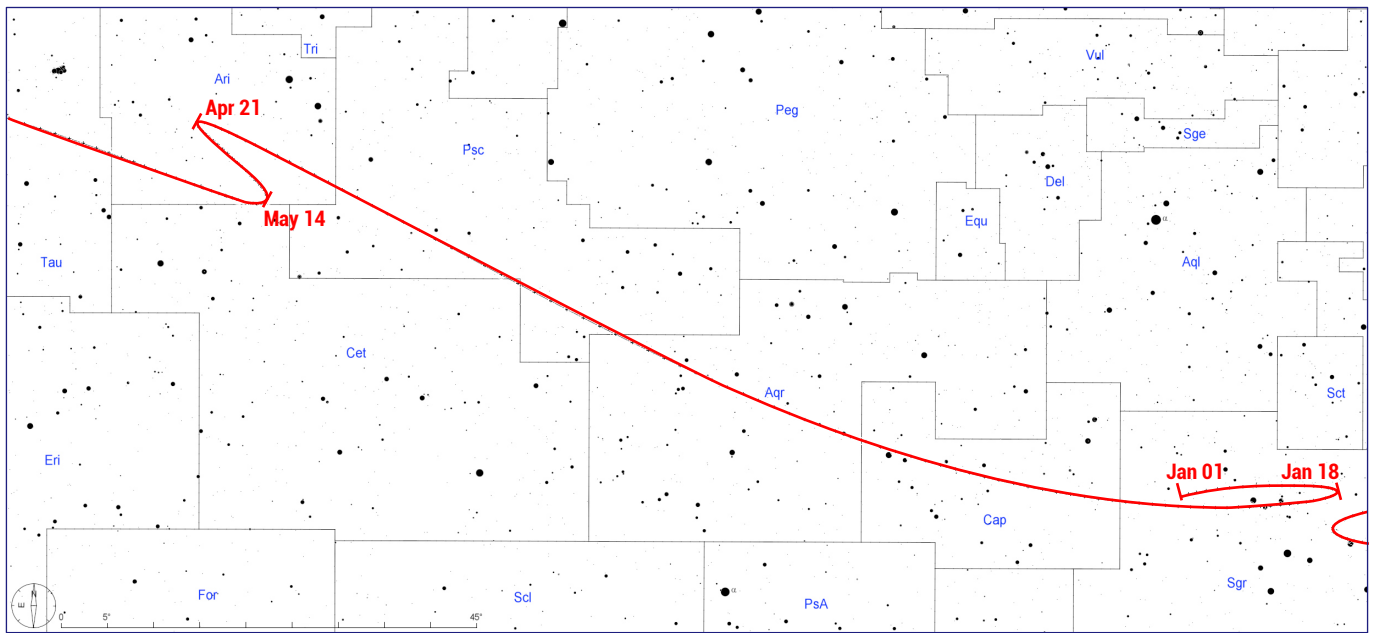
Date	Sun				Astron. Twilight		Moon					
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Nov 13	05:58	12:34	19:10	Lib	20:32	04:37	05:47	12:33	19:25	30	00.2	Lib
Nov 14	05:58	12:34	19:10	Lib	20:33	04:36	06:29	13:26	20:27	01	00.5	Lib
Nov 15	05:58	12:34	19:11	Lib	20:33	04:36	07:18	14:23	21:30	02	03.0	Sco
Nov 16	05:57	12:34	19:12	Lib	20:34	04:35	08:13	15:23	22:32	03	07.9	Oph
Nov 17	05:57	12:35	19:12	Lib	20:35	04:35	09:15	16:24	23:30	04	14.8	Sgr
Nov 18	05:57	12:35	19:13	Lib	20:36	04:34	10:20	17:23	00:22	05	23.6	Sgr
Nov 19	05:57	12:35	19:14	Lib	20:37	04:34	11:25	18:19	01:08	06	33.9	Cap
Nov 20	05:56	12:35	19:14	Lib	20:38	04:33	12:30	19:12	01:49	07	45.0	Cap
Nov 21	05:56	12:36	19:15	Lib	20:39	04:33	13:32	20:02	02:27	08	56.4	Aqr
Nov 22	05:56	12:36	19:16	Lib	20:39	04:33	14:32	20:50	03:03	09	67.5	Aqr
Nov 23	05:56	12:36	19:16	Lib	20:40	04:32	15:31	21:38	03:39	10	77.7	Psc
Nov 24	05:56	12:36	19:17	Sco	20:41	04:32	16:31	22:26	04:16	11	86.4	Psc
Nov 25	05:56	12:37	19:18	Sco	20:42	04:32	17:33	23:17	04:56	12	93.2	Ari
Nov 26	05:55	12:37	19:19	Sco	20:43	04:31	17:33	--:--	04:56	13	97.7	Ari
Nov 27	05:55	12:37	19:19	Sco	20:44	04:31	18:35	00:10	05:41	14	99.8	Tau
Nov 28	05:55	12:38	19:20	Sco	20:45	04:31	19:38	01:05	06:30	15	99.4	Tau
Nov 29	05:55	12:38	19:21	Sco	20:45	04:31	20:40	02:02	07:23	16	96.9	Tau
Nov 30	05:55	12:38	19:21	Sco	20:46	04:31	21:38	02:59	08:20	17	92.4	Gem
Dec 01	05:55	12:39	19:22	Oph	20:47	04:30	22:30	03:53	09:17	18	86.3	Gem
Dec 02	05:55	12:39	19:23	Oph	20:48	04:30	23:16	04:43	10:13	19	79.0	Cnc
Dec 03	05:56	12:39	19:23	Oph	20:49	04:30	23:56	05:30	11:08	20	70.7	Cnc
Dec 04	05:56	12:40	19:24	Oph	20:50	04:30	00:32	06:14	12:00	21	61.7	Leo
Dec 05	05:56	12:40	19:25	Oph	20:50	04:30	01:04	06:55	12:50	22	52.4	Leo
Dec 06	05:56	12:41	19:25	Oph	20:51	04:30	01:35	07:35	13:39	23	43.0	Leo
Dec 07	05:56	12:41	19:26	Oph	20:52	04:30	02:04	08:14	14:29	24	33.8	Vir
Dec 08	05:56	12:41	19:27	Oph	20:53	04:30	02:34	08:54	15:20	25	25.0	Vir
Dec 09	05:57	12:42	19:27	Oph	20:53	04:30	03:06	09:37	16:14	26	16.9	Vir
Dec 10	05:57	12:42	19:28	Oph	20:54	04:31	03:41	10:23	17:11	27	10.1	Lib
Dec 11	05:57	12:43	19:29	Oph	20:55	04:31	04:21	11:14	18:12	28	04.7	Lib
Dec 12	05:57	12:43	19:29	Oph	20:56	04:31	05:08	12:10	19:16	29	01.3	Sco
Dec 13	05:58	12:44	19:30	Oph	20:56	04:31	06:02	13:10	20:20	01	00.1	Oph
Dec 14	05:58	12:44	19:30	Oph	20:57	04:31	07:03	14:13	21:21	02	01.5	Sgr
Dec 15	05:58	12:45	19:31	Oph	20:58	04:32	08:09	15:15	22:17	03	05.5	Sgr
Dec 16	05:59	12:45	19:32	Oph	20:58	04:32	09:17	16:14	23:06	04	11.8	Cap
Dec 17	05:59	12:46	19:32	Oph	20:59	04:32	10:23	17:09	23:49	05	20.3	Cap
Dec 18	06:00	12:46	19:33	Oph	20:59	04:33	11:26	18:00	00:28	06	30.3	Aqr
Dec 19	06:00	12:47	19:33	Sgr	21:00	04:33	12:27	18:48	01:04	07	41.3	Aqr
Dec 20	06:00	12:47	19:34	Sgr	21:01	04:34	13:26	19:35	01:39	08	52.6	Psc
Dec 21	06:01	12:48	19:34	Sgr	21:01	04:34	14:24	20:22	02:15	09	63.7	Psc
Dec 22	06:01	12:48	19:35	Sgr	21:02	04:35	15:24	21:11	02:53	10	74.0	Psc
Dec 23	06:02	12:49	19:35	Sgr	21:02	04:35	16:24	22:01	03:35	11	82.9	Ari
Dec 24	06:02	12:49	19:36	Sgr	21:03	04:36	17:26	22:55	04:21	12	90.2	Ari
Dec 25	06:03	12:50	19:36	Sgr	21:03	04:36	18:27	23:51	05:13	13	95.5	Tau
Dec 26	06:03	12:50	19:37	Sgr	21:03	04:37	19:26	00:45	06:08	14	98.7	Tau
Dec 27	06:04	12:51	19:37	Sgr	21:04	04:37	19:26	00:47	06:08	15	99.8	Aur
Dec 28	06:05	12:51	19:37	Sgr	21:04	04:38	20:20	01:42	07:05	16	98.8	Gem
Dec 29	06:05	12:52	19:38	Sgr	21:04	04:39	21:09	02:35	08:02	17	95.9	Cnc
Dec 30	06:06	12:52	19:38	Sgr	21:05	04:39	21:52	03:23	08:58	18	91.3	Cnc
Dec 31	06:06	12:52	19:39	Sgr	21:05	04:40	22:29	04:08	09:51	19	85.3	Leo

Column headings: Column 1 = Date. Columns 2-5 = local time of Sun rise, culmination, set; and constellation in which the Sun is located. Columns 6-7 = local time of the end and start of astronomical twilight. Columns 8-13 = local time of Moon rise, culmination, set; age of the Moon in days; phase of the Moon expressed as a percentage; and constellation in which the Moon is located.

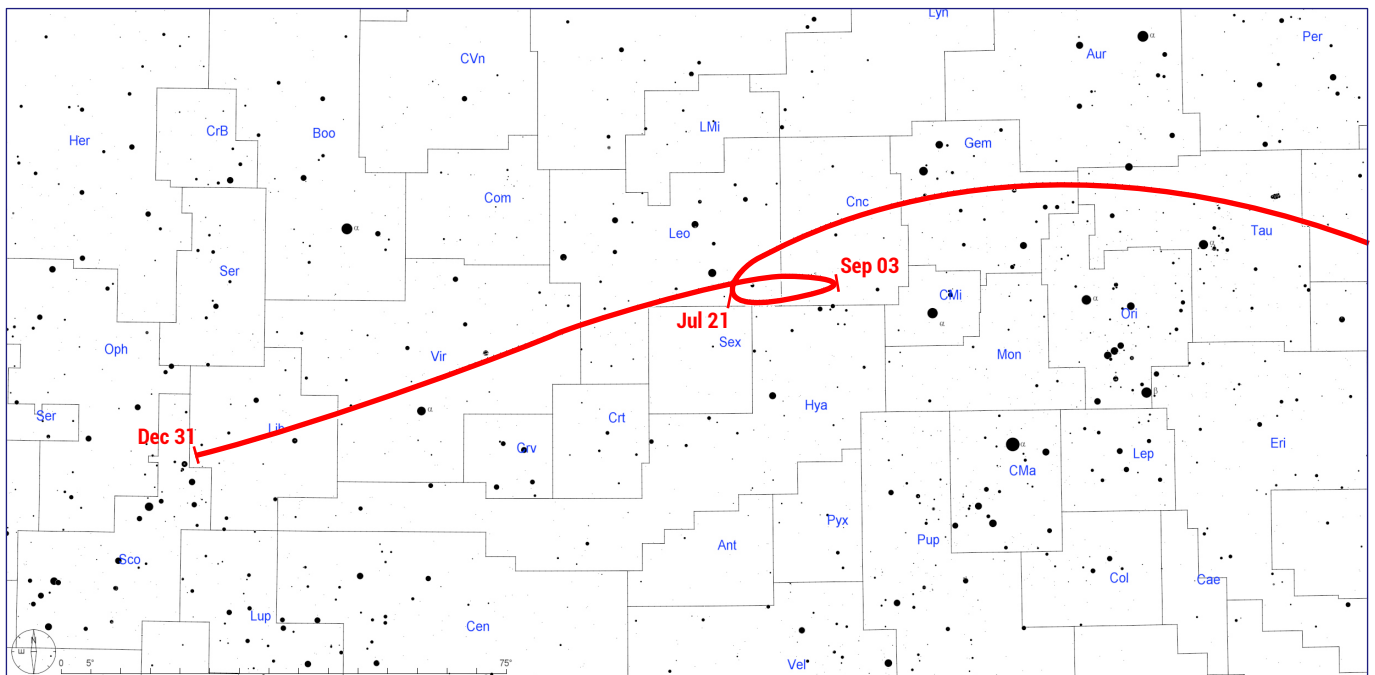
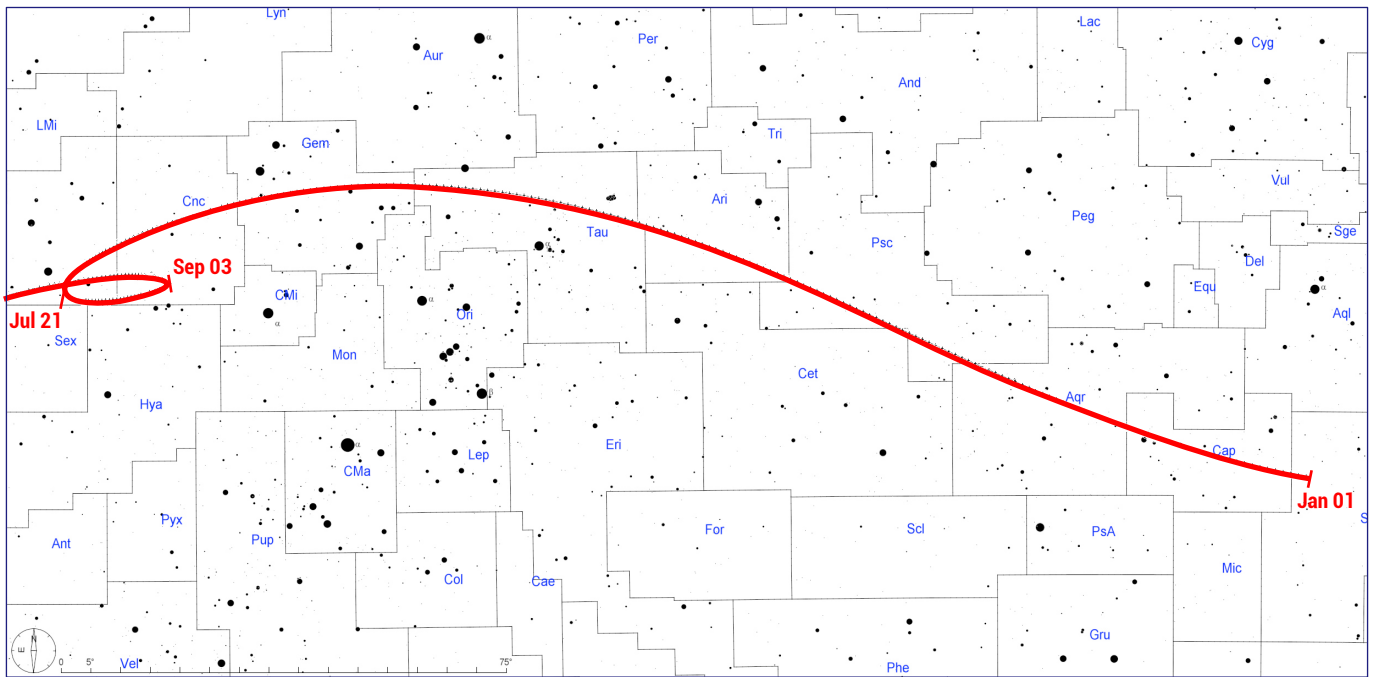
The Moon during 2023

Jan 07	Mantis Full Moon (01:10)	Jul 03	Meerkat Full SuperMoon (13:39)
Jan 15	Last Quarter Moon	Jul 10	Last Quarter Moon
Jan 21	New Moon (22:56)	Jul 17	New Moon (20:33)
Jan 28	First Quarter Moon	Jul 26	First Quarter Moon
Feb 05	Dassie Full Moon (20:31)	Aug 01	Peace Full Supermoon (20:32)
Feb 13	Last Quarter Moon	Aug 08	Last Quarter Moon
Feb 20	New Moon (09:09)	Aug 16	New Moon (11:39)
Feb 27	First Quarter Moon	Aug 24	First Quarter Moon
Mar 07	Harvest Full Moon (14:43)	Aug 31	Dusty Blue Full SuperMoon (03:35)
Mar 15	Last Quarter Moon	Sep 07	Last Quarter Moon
Mar 21	New Moon (19:27)	Sep 15	New Moon (03:40)
Mar 29	First Quarter Moon	Sep 22	First Quarter Moon
Apr 06	Diamond Full Moon (06:37)	Sep 29	Spring Full Moon (11:58)
Apr 13	Last Quarter Moon	Oct 06	Last Quarter Moon
Apr 20	New Moon (06:16, annular total eclipse)	Oct 14	New Moon (19:55, annular eclipse)
Apr 27	First Quarter Moon	Oct 22	First Quarter Moon
May 05	Frost Full Moon (19:37, eclipse)	Oct 28	Whale Full Moon (22:24, umbral eclipse)
May 12	Last Quarter Moon	Nov 05	Last Quarter Moon
May 19	New Moon (17:56)	Nov 13	New Moon (11:27)
May 27	First Quarter Moon	Nov 20	First Quarter Moon
Jun 04	Sisters Full Moon (05:44)	Nov 27	Milk Full Moon (11:17)
Jun 10	Last Quarter Moon	Dec 05	Last Quarter Moon
Jun 18	New Moon (06:39)	Dec 13	New Moon (01:32)
Jun 26	First Quarter Moon	Dec 19	First Quarter Moon
		Dec 27	Springbok Full Moon (02:34)

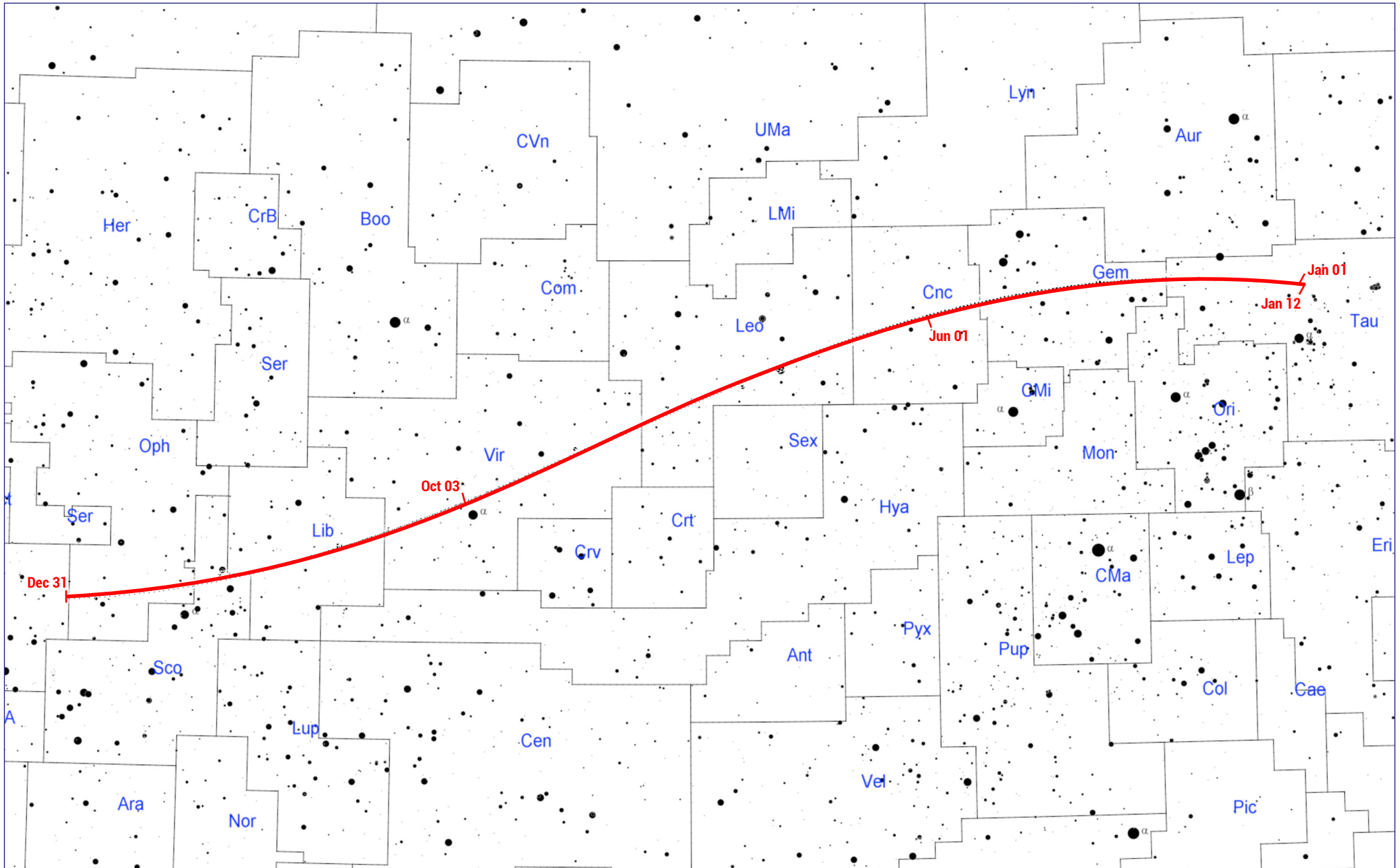
Path of Mercury during 2023



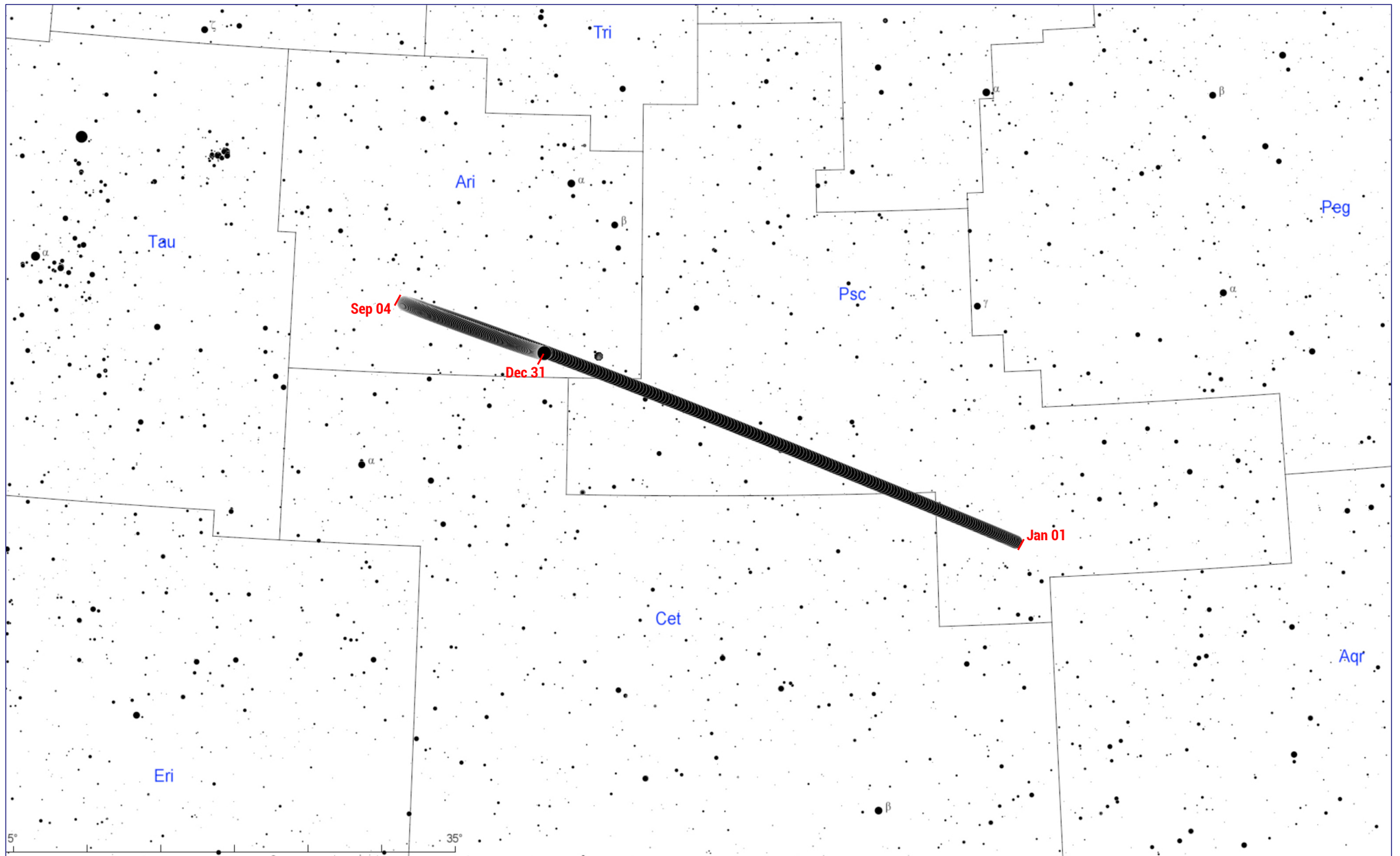
Path of Venus during 2023



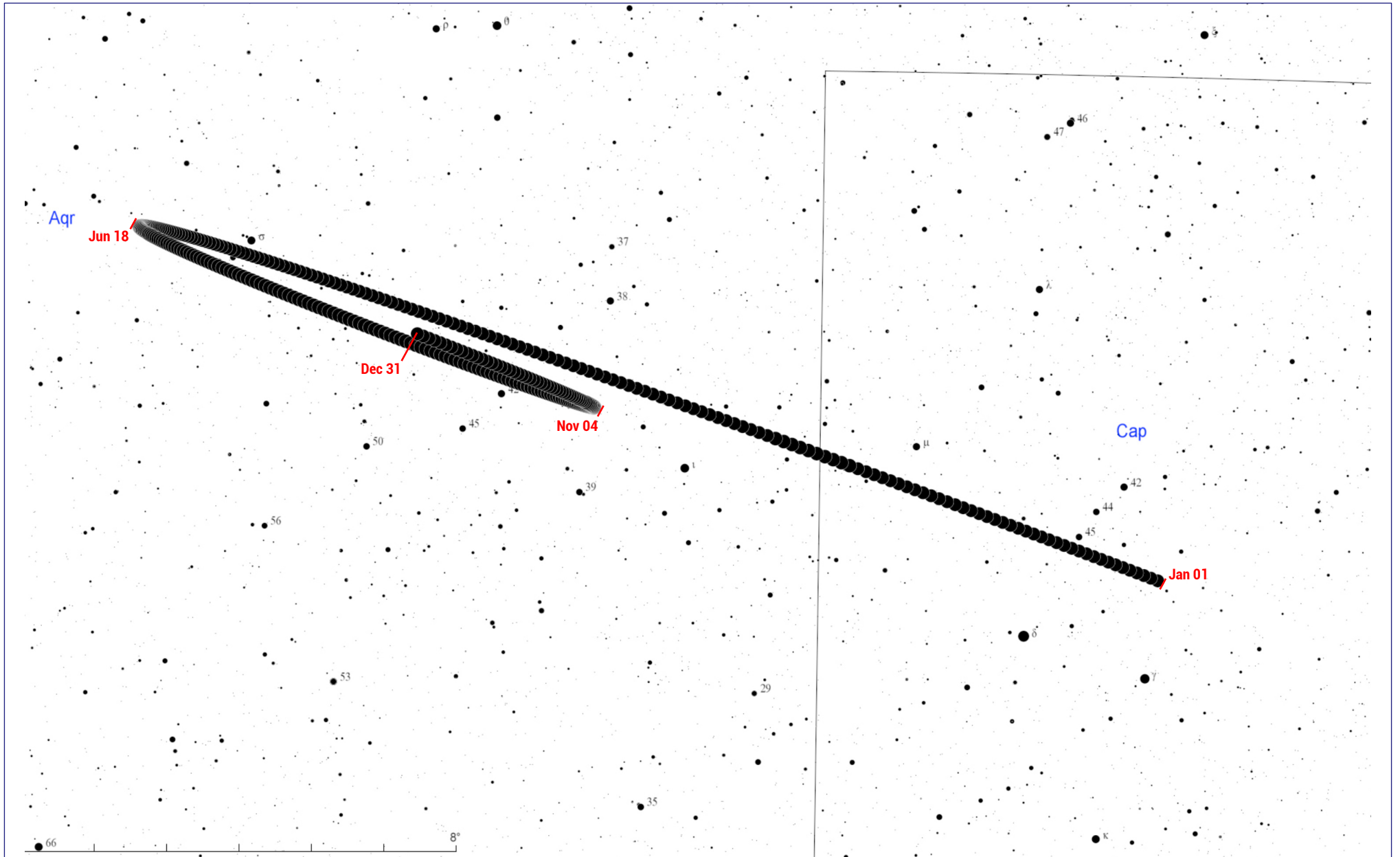
Path of Mars during 2023



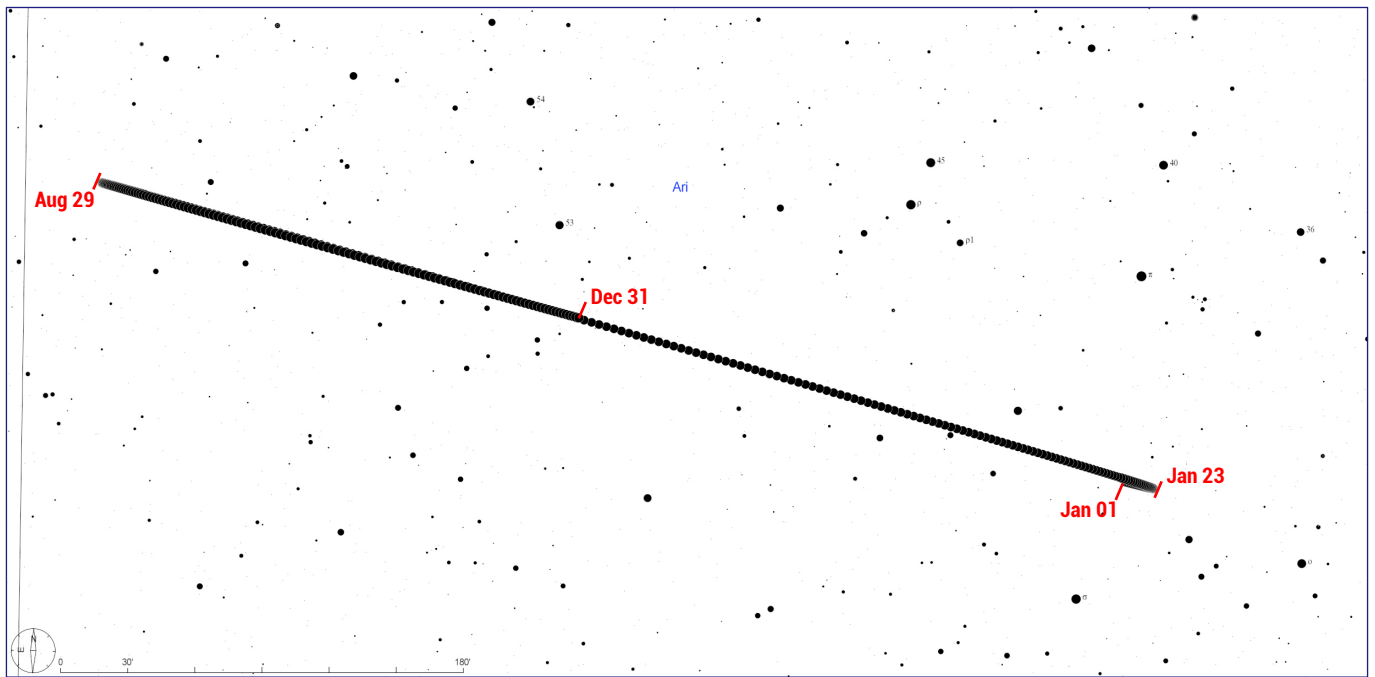
Path of Jupiter during 2023



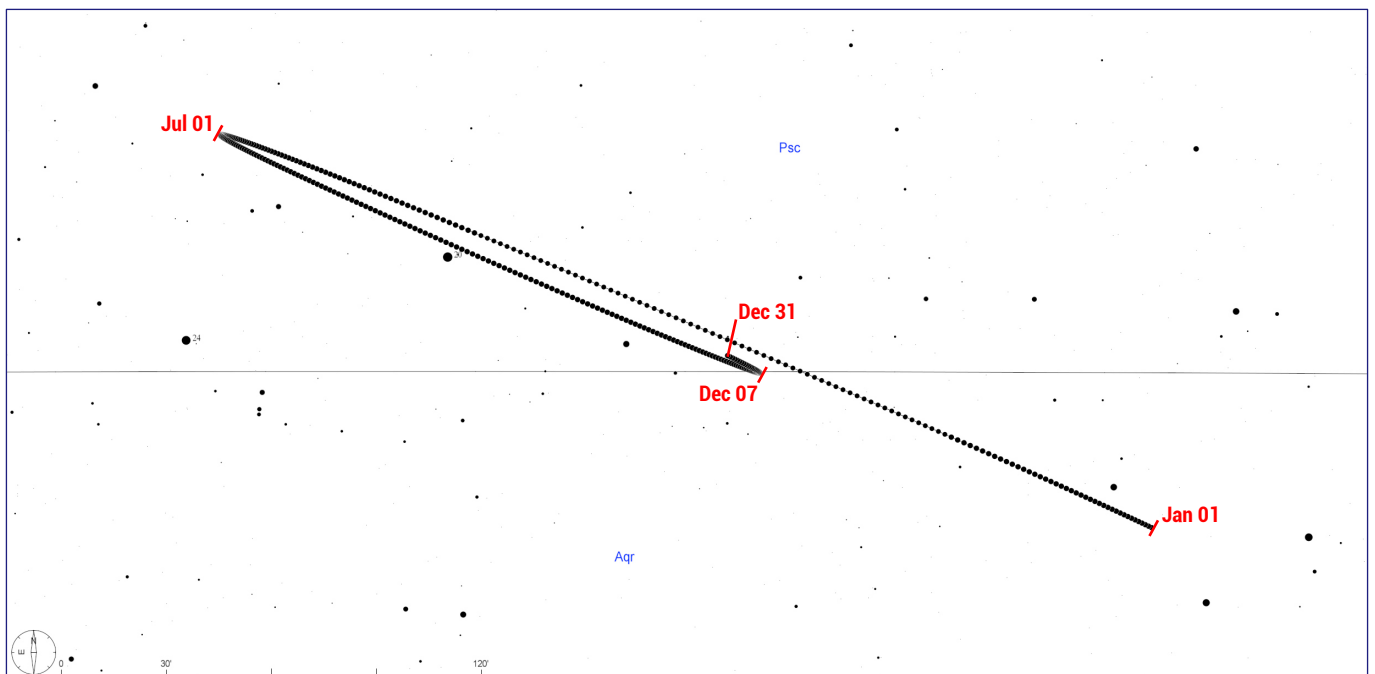
Path of Saturn during 2023



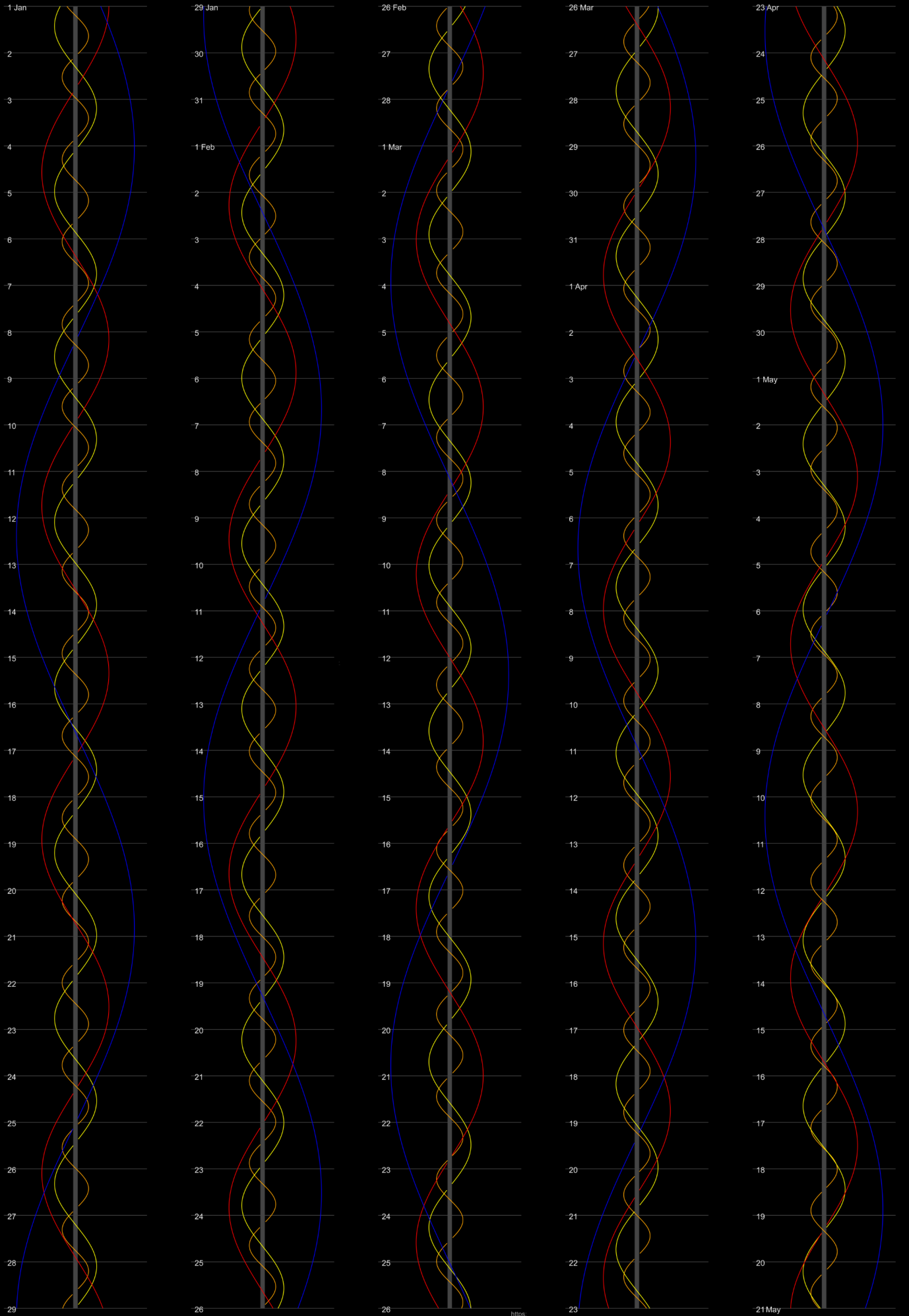
Path of Uranus during 2023



Path of Neptune during 2023

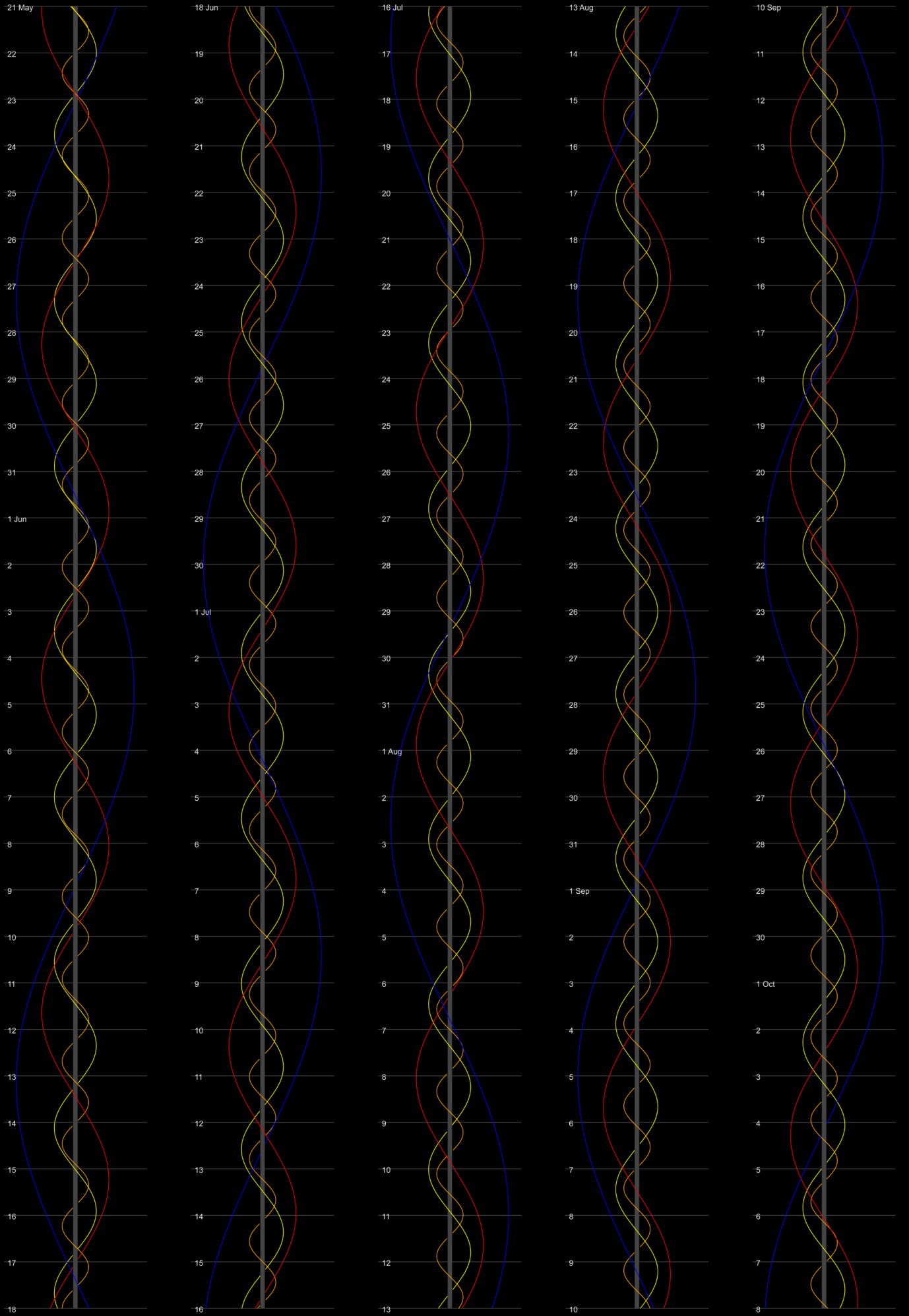


Jupiter's moons during 2023

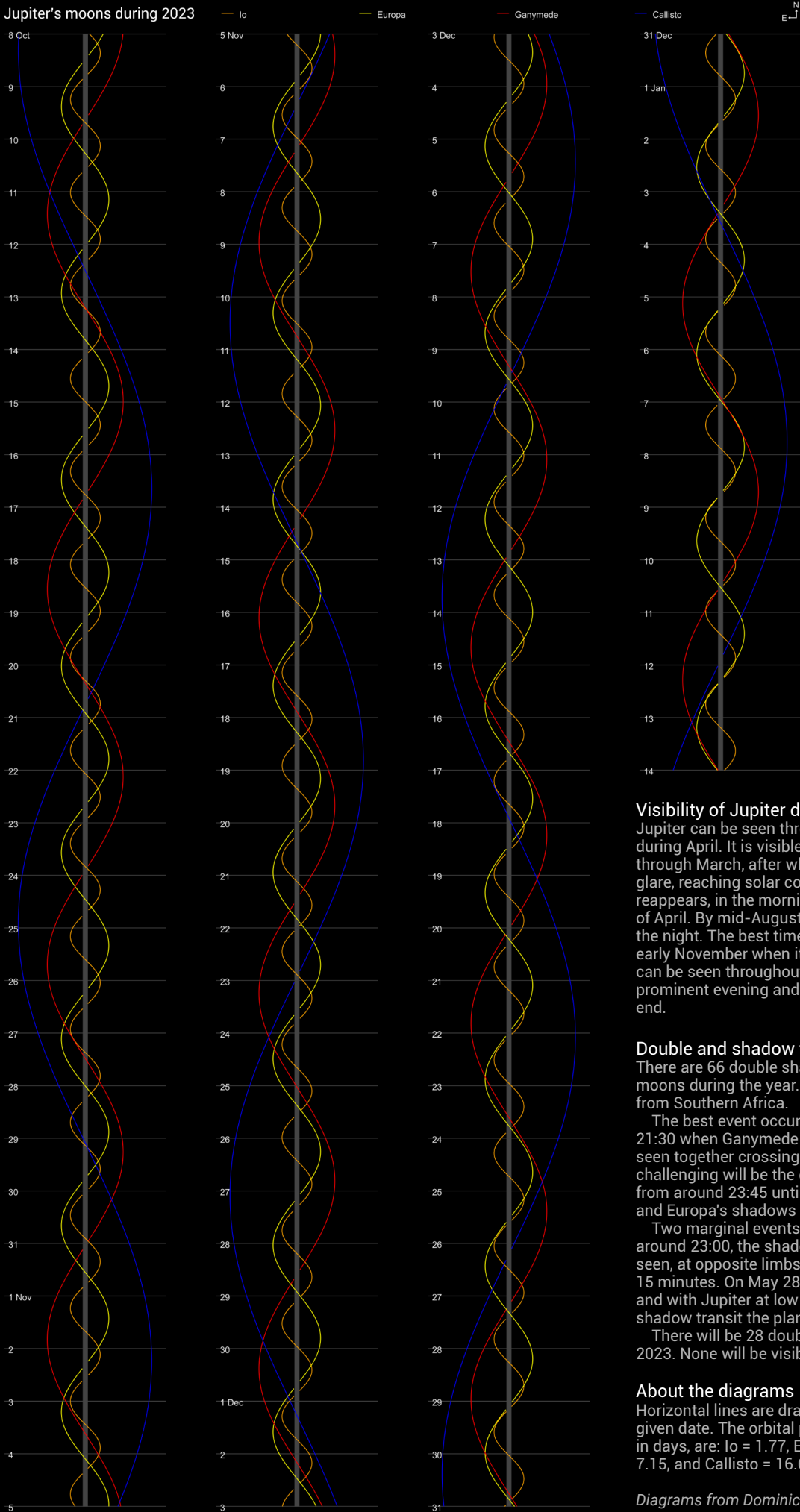


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Jupiter's moons during 2023



Jupiter's moons during 2023



Visibility of Jupiter during 2023

Jupiter can be seen throughout the year except during April. It is visible at dusk from January through March, after which it slips into the solar glare, reaching solar conjunction on Apr 12. Jupiter reappears, in the morning sky, during the second half of April. By mid-August it is visible for more than half the night. The best time to see Jupiter this year is in early November when it is at opposition (Nov 03) and can be seen throughout the night. Jupiter remains a prominent evening and late-night object until year's end.

Double and shadow transits during 2023

There are 66 double shadow transits of Galilean moons during the year. Only 4 will be observable from Southern Africa.

The best event occurs on 2023 Dec 23 around 21:30 when Ganymede and Europa's shadows can be seen together crossing the Jovian disc. More challenging will be the event on 2023 Dec 30, when from around 23:45 until past midnight to Ganymede and Europa's shadows are visible.

Two marginal events occur in May. On May 06 at around 23:00, the shadows of Europa and Io can be seen, at opposite limbs of the planet, for only about 15 minutes. On May 28 around 04:45, near sunrise and with Jupiter at low altitude, Europa and Io's shadow transit the planet.

There will be 28 double transits of moons during 2023. None will be visible from Southern Africa.

About the diagrams

Horizontal lines are drawn at midnight (UTC) for the given date. The orbital periods of the Galilean moons, in days, are: Io = 1.77, Europa = 3.55, Ganymede = 7.15, and Callisto = 16.69.

Diagrams from Dominic Ford <https://in-the-sky.org>