2023 SKY GUIDE

DIGITAL SUPPLEMENT HARARE, ZIMBABWE

Astronomical Handbook for Southern Africa

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Harare

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2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Jan 01	05:21	11:57	18:34	Sgr	19:56	03:59	13:59	19:51	01:40	09	69.9	Ari
Jan 02	05:21	11:58	18:34	Sgr	19:56	03:59	14:53	20:38	02:21	10	78.7	Ari
Jan 03	05:22	11:58	18:34	Sgr	19:56	04:00	15:47	21:26	03:04	11	86.2	Tau
Jan 04	05:23	11:59	18:35	Sgr	19:57	04:01	16:41	22:17	03:51	12	92.1	Tau
Jan 05	05:23	11:59	18:35	Sgr	19:57	04:01	17:34	23:08	04:42	13	96.5	Tau
Jan 06	05:24	12:00	18:35	Sgr	19:57	04:02	18:26	00:00	05:34	14	99.0	Gem
Jan 07	05:24	12:00	18:35	Sgr	19:57	04:03	18:26	00:00	05:34	15	99.8	Gem
Jan 08	05:25	12:00	18:36	Sgr	19:57	04:03	19:14	00:50	06:27	16	98.9	Cnc
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Feb 06	05:42	12:08	18:33	Сар	19:50	04:25	18:38	00:21	06:06	16	99.8	Leo
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Feb 20	05:49	12:08	18:27	Aqr	19:41	04:34	05:45	12:21	18:53	30	00.3	Aqr
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Feb 26	05:51	12:07	18:23	Aqr	19:37	04:37	11:34	17:17	22:58	06	36.8	Ari
Feb 27	05:51	12:07	18:22	Aqr	19:36	04:37	12:29	18:07	23:43	07	46.8	Tau
Feb 28	05:51	12:07	18:21	Aqr	19:35	04:37	13:24	18:59	00:32	08	56.6	Tau
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Mar 27	05:58	12:00	18:01	Psc	19:13	04:46	11:14	16:50	22:24	06	30.0	Tau
Mar 28	05:58	11:59	18:00	Psc	19:12	04:46	12:09	17:42	23:15	07	39.5	Tau
Mar 29	05:59	11:59	17:59	Psc	19:11	04:46	13:02	18:34	00:08	08	49.1	Gem
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Apr 03	06:00	11:57	17:55	Psc	19:07	04:47	16:27	22:24	04:25	13	90.2	Leo
Apr 04	06:00	11:57	17:54	Psc	19:07	04:47	17:01	23:05	05:14	14	95.2	Leo
Apr 05	06:00	11:57	17:53	Psc	19:06	04:47	17:34	23:47	06:04	15	98.5	Vir
Apr 06	06:00	11:57	17:53	Psc	19:05	04:48	18:09	00:29	06:56	16	99.9	Vir
Apr 07	06:00	11:56	17:52	Psc	19:04	04:48	18:09	00:31	06:56	17	99.3	Vir
Apr 08	06:01	11:56	17:51	Psc	19:04	04:48	18:46	01:16	07:51	18	96.5	Lib
Apr 09	06:01	11:56	17:50	Psc	19:03	04:48	19:26	02:06	08:49	19	91.5	Lib
Apr 10	06:01	11:55	17:50	Psc	19:02	04:48	20:12	02:59	09:50	20	84.5	Sco
Apr 11	06:01	11:55	17:49	Psc	19:02	04:48	21:04	03:57	10:53	21	75.8	Oph
Apr 12	06:01	11:55	17:48	Psc	19:01	04:49	22:01	04:58	11:55	22	65.6	Sgr
Apr 13	06:02	11:55	17:47	Psc	19:00	04:49	23:03	06:00	12:54	23	54.5	Sgr
Apr 14	06:02	11:54	17:47	Psc	19:00	04:49	00:08	07:00	13:48	24	43.1	Сар

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

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

Date		S	un		Astron.	Twilight			Мо	on		
2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Sep 21	05:44	11:47	17:51	Vir	19:03	04:32	09:47	16:38	23:32	06	31.1	Sco
Sep 22	05:43	11:47	17:51	Vir	19:03	04:31	10:40	17:36	00:33	07	41.3	Oph
Sep 23	05:42	11:47	17:51	Vir	19:03	04:30	11:40	18:37	01:34	08	52.2	Sgr
Sep 24	05:42	11:46	17:51	Vir	19:04	04:29	12:44	19:39	02:31	09	63.3	Sgr
Sep 25	05:41	11:46	17:51	Vir	19:04	04:28	13:50	20:39	03:23	10	73.9	Сар
Sep 26	05:40	11:45	17:51	Vir	19:04	04:27	14:56	21:36	04:11	11	83.6	Сар
Sep 27	05:39	11:45	17:52	Vir	19:04	04:26	16:00	22:30	04:55	12	91.5	Aqr
Sep 28	05:38	11:45	17:52	Vir	19:04	04:26	17:01	23:21	05:36	13	97.0	Aqr
Sep 29	05:37	11:44	17:52	Vir	19:05	04:25	17:01	:	05:36	14	99.7	Psc
Sep 30	05:36	11:44	17:52	Vir	19:05	04:24	18:02	00:12	06:17	15	99.5	Psc
Oct 01	05:36	11:44	17:52	Vir	19:05	04:23	19:02	01:02	06:58	16	96.5	Ari
Oct 02	05:35	11:43	17:52	Vir	19:05	04:22	20:02	01:54	07:41	17	91.1	Ari
Oct 03	05:34	11:43	17:53	Vir	19:06	04:21	21:02	02:46	08:27	18	83.7	Tau
Oct 04	05:33	11:43	17:53	Vir	19:06	04:20	22:03	03:41	09:16	19	75.1	Tau
Oct 05	05:32	11:43	17:53	Vir	19:06	04:19	23:02	04:36	10:09	20	65.6	Tau
Oct 06	05:32	11:42	17:53	Vir	19:06	04:18	23:58	05:30	11:03	21	55.8	Aur
Oct 07	05:31	11:42	17:53	Vir	19:07	04:18	00:50	06:23	11:58	22	46.0	Gem
Oct 08	05:30	11:42	17:54	Vir	19:07	04:17	01:37	07:13	12:52	23	36.5	Cnc
Oct 09	05:29	11:41	17:54	Vir	19:07	04:16	02:19	08:00	13:44	24	27.7	Cnc
Oct 10	05:28	11:41	17:54	Vir	19:08	04:15	02:57	08:44	14:34	25	19.7	Leo
Oct 11	05:28	11:41	17:54	Vir	19:08	04:14	03:32	09:26	15:22	26	12.7	Leo
Oct 12	05:27	11:41	17:55	Vir	19:08	04:13	04:05	10:06	16:10	27	07.1	Leo
Oct 13	05:26	11:40	17:55	Vir	19:09	04:12	04:37	10:46	16:58	28	02.9	Vir
Oct 14	05:25	11:40	17:55	Vir	19:09	04:12	05:10	11:26	17:47	29	00.6	Vir
Oct 15	05:25	11:40	17:55	Vir	19:09	04:11	05:43	12:08	18:37	01	00.1	Vir
Oct 16	05:24	11:40	17:56	Vir	19:10	04:10	06:20	12:53	19:31	02	01.6	Vir
Oct 17	05:23	11:39	17:56	Vir	19:10	04:09	07:00	13:41	20:27	03	05.2	Lib
Oct 18	05:23	11:39	17:56	Vir	19:11	04:08	07:45	14:34	21:26	04	10.7	Sco
Oct 19	05:22	11:39 11:39	17:56	Vir	19:11	04:07	08:36	15:31	22:27	05	18.1	Oph
Oct 20	05:21		17:57	Vir	19:11	04:07	09:33	16:30	23:27	06	27.1	Sgr
Oct 21	05:21 05:20	11:39 11:39	17:57	Vir	19:12 19:12	04:06 04:05	10:35 11:39	17:31 18:30	00:25	07	37.4	Sgr
Oct 22	05:20	11:39	17:57 17:58	Vir Vir	19:12	04:05	12:43	19:26	01:17 02:05	08	48.5	Sgr
Oct 23 Oct 24	05:19	11:38	17:58	Vir	19:13	04:04	13:45	20:19	02:05	09 10	59.8 70.8	Cap
Oct 24	05:19	11:38	17:58	Vir	19:13	04:04	14:45	20.19	02:48	11	80.8	Cap
Oct 25	05:17	11:38	17:59	Vir	19:14	04:03	15:45	21:59	03:29	12	89.2	Aqr Aqr
Oct 20	05:17	11:38	17:59	Vir	19:14	04:02	16:43	22:48	04:49	12	95.4	Cet
Oct 27	05:16	11:38	18:00	Vir	19:15	04:01	17:43	23:39	05:31	14	99.0	Psc
Oct 20	05:16	11:38	18:00	Vir	19:16	04:00	18:43	00:29	06:15	15	100.0	Ari
Oct 30	05:15	11:38	18:00	Vir	19:16	03:59	18:43	00:31	06:15	16	98.3	Ari
Oct 31	05:15	11:38	18:01	Vir	19:17	03:59	19:45	01:26	07:04	17	94.2	Tau
Nov 01	05:14	11:38	18:01	Lib	19:18	03:58	20:46	02:22	07:56	18	88.2	Tau
Nov 02	05:14	11:38	18:02	Lib	19:18	03:57	21:45	03:19	08:51	19	80.7	Aur
Nov 02	05:13	11:37	18:02	Lib	19:19	03:57	22:40	04:13	09:47	20	72.2	Gem
Nov 04	05:13	11:37	18:02	Lib	19:19	03:56	23:30	05:05	10:42	21	63.0	Gem
Nov 05	05:12	11:38	18:03	Lib	19:20	03:55	00:15	05:54	11:36	22	53.6	Cnc
Nov 06	05:12	11:38	18:03	Lib	19:21	03:55	00:55	06:39	12:27	23	44.1	Leo
Nov 07	05:12	11:38	18:04	Lib	19:21	03:54	01:31	07:22	13:16	24	34.9	Leo
Nov 08	05:11	11:38	18:04	Lib	19:22	03:54	02:05	08:02	14:04	25	26.2	Leo
Nov 09	05:11	11:38	18:05	Lib	19:22	03:53	02:37	08:42	14:51	26	18.2	Vir
Nov 10	05:11	11:38	18:05	Lib	19:23	03:53	03:09	09:22	15:39	27	11.4	Vir
Nov 11	05:10	11:38	18:06	Lib	19:24	03:52	03:42	10:04	16:29	28	05.9	Vir
Nov 12	05:10	11:38	18:06	Lib	19:25	03:52	04:18	10:48	17:22	29	02.1	Vir
NUV IZ	03.10	11.30	10.00	LID	19.20	03.32	04.10	10.40	11.22	29	UZ. I	VII

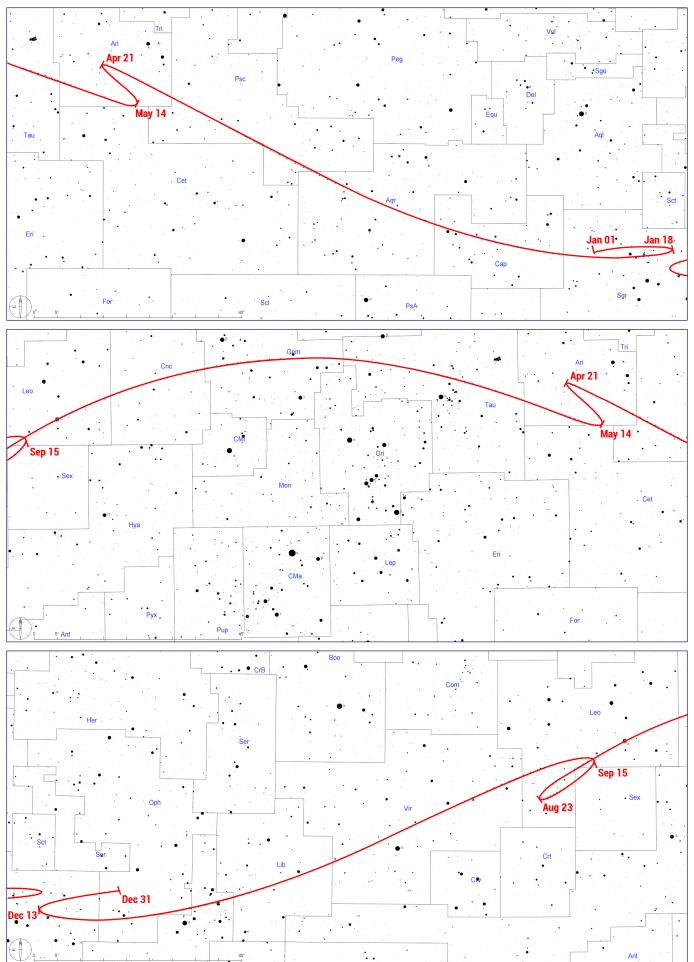
2023 rise culm. set one not at fise culm. set age phase Nor 14 05:09 11:38 18:07 Lib 19:25 03:51 04:57 11:35 18:18 30 00.2 Nor 16 05:09 11:38 18:08 Lib 19:27 03:50 07:27 14:24 21:20 03 07.9 Nor 16 05:09 11:39 18:00 Lib 19:28 03:50 07:27 14:24 21:20 04 14:8 Nor 18 05:09 11:39 18:10 Lib 19:29 03:50 08:29 15:25 22:20 04 14:8 Nor 19 05:08 11:40 18:11 Lib 19:20 03:49 11:38 18:14 00:46 07:4 45:64 Nor 23 05:08 11:40 18:12 Lib 19:32 03:48 17:32 21:28 03:24 11:8 04:53 13:97.7	Date		S	Sun		Astron.	Twilight			Мо	on		
Nov 13 05:10 11:38 18:07 Lib 19:26 03:51 06:51 12:28 19:18 01 00.2 Nov 14 05:09 11:38 18:07 Lib 19:26 03:51 06:31 12:28 19:18 01 00.5 Nov 15 05:09 11:39 18:08 Lib 19:27 03:50 06:27 14:24 21:22 03 07:9 Nov 18 05:09 11:39 18:08 Lib 19:29 03:60 06:29 15:25 22:20 04 14:8 Nov 18 05:09 11:39 18:10 Lib 19:29 03:49 11:38 18:14 06:6 33.9 Nov 20 05:08 11:40 18:11 Lib 19:30 03:49 11:32 13:43 14:45 12:9 12:37 19:40 01:27 05:8 14:4 18:12 Lib 19:32 03:48 16:32 22:19 04:06 12 93:2 Nov 20 <th>2023</th> <th>rise</th> <th>culm.</th> <th>set</th> <th>con</th> <th>ends</th> <th>starts</th> <th>rise</th> <th>culm.</th> <th>set</th> <th>age</th> <th>phase</th> <th>con</th>	2023	rise	culm.	set	con	ends	starts	rise	culm.	set	age	phase	con
Nov 14 05:09 11:38 18:07 Lib 19:26 03:51 06:41 12:28 19:18 01 00.5 Nov 16 05:09 11:39 18:08 Lib 19:27 03:51 06:31 13:24 20:20 03 07.9 Nov 16 05:09 11:39 18:06 Lib 19:28 03:50 09:29 15:25 22:20 04 14:8 Nov 18 05:08 11:39 18:10 Lib 19:29 03:49 17:36 18:14 00:20 06 33.9 Nov 20 05:08 11:40 18:12 Lib 19:32 03:48 13:35 19:52 02:24 10 77.7 Nov 20 05:08 11:40 18:12 Lib 19:34 03:48 16:28 22:19 04:63 12 93.2 Nov 26 05:08 11:41 18:15 Sco 19:36 03:47 12:29 04:53 14 99.8 Nov 26											-	-	Lib
Nov 15 05:09 11:38 18:08 Lib 19:27 03:51 06:31 13:24 20:20 02 03 07 Nov 16 05:09 11:39 18:09 Lib 19:27 03:50 07:27 14:24 21:22 04 14.8 Nov 18 05:09 11:39 18:10 Lib 19:29 03:49 10:36 17:21 0:002 06 33:3 Nov 20 05:08 11:40 18:11 Lib 19:31 03:49 11:38 18:14 0:46 07 45:0 Nov 21 05:08 11:40 18:12 Lib 19:32 0:3:48 13:32 10:40 11:8 8:4 Nov 23 05:08 11:41 18:14 Scc 19:33 0:3:48 17:28 2:2:19 0:4:53 13 97.7 Nov 23 05:08 11:41 18:14 Scc 19:35 0:3:48 17:28 0:4:33 13 97.7		05:09	11:38	18:07	Lib	19:26	03:51	05:41	12:28	19:18			Lib
Nov 16 05:09 11:39 18:08 Lib 19:27 03:50 07:27 14:24 21:22 03 07:9 Nov 17 05:09 11:39 18:10 Lib 19:28 03:50 08:29 15:25 22:10 04 14.86 Nov 18 05:08 11:39 18:10 Lib 19:29 03:49 10:36 17:21 00:02 06: 33.9 Nov 20 05:08 11:40 18:11 Lib 19:30 03:49 11:35 18:14 00:46 07 45:64 Nov 21 05:08 11:40 18:12 Lib 19:32 03:48 13:25 20:24 10 77.7 Nov 24 05:08 11:41 18:14 Sco 19:34 03:48 17:28 22:12 04:53 13 97.7 Nov 25 05:08 11:41 18:15 Sco 19:36 03:47 17:28 04:53 15 99.4 Nov 25 05:08		05:09	11:38	18:08	Lib	19:27	03:51	06:31	13:24	20:20			Sco
Nov 17 05:09 11:39 18:09 Lib 19:28 03:50 08:29 15:25 22:20 0.4 14.8 Nov 18 05:09 11:39 18:10 Lib 19:29 03:60 09:33 16:25 23:14 05 23:6 Nov 20 05:08 11:39 18:11 Lib 19:30 03:49 11:38 18:14 00:46 07 45:0 Nov 21 05:08 11:40 18:11 Lib 19:32 03:49 11:35 19:52 02:05 09 67:5 Nov 22 05:08 11:40 18:12 Lib 19:32 03:48 14:32 20:40 02:44 10 77.7 Nov 25 05:08 11:41 18:14 Sco 19:35 03:44 17:28 -2:19 04:06 12 93:2 Nov 26 05:08 11:42 18:15 Sco 19:36 03:47 12:20 04:53 14 99.8 Nov 29							03:50						Oph
Nov 18 05:09 11:39 18:10 Lib 19:29 03:50 09:33 16:25 23:14 055 23:6 Nov 19 05:08 11:39 18:10 Lib 19:29 03:49 10:36 17:21 00:02 06:33:9 Nov 20 05:08 11:40 18:11 Lib 19:31 03:49 12:37 19:04 01:27 08 56.4 Nov 22 05:08 11:40 18:12 Lib 19:32 03:48 13:32 02:04 02:44 10 77.7 Nov 23 05:08 11:41 18:14 Sco 19:33 03:48 15:29 21:28 03:24 11 86:4 Nov 24 05:08 11:41 18:15 Sco 19:35 03:48 17:28 23:12 04:53 13 93:2 Nov 28 05:08 11:42 18:16 Sco 19:37 03:47 12:28 03:44 17:2 04:03 16:59 16:5 94<		05:09	11:39	18:09	Lib	19:28	03:50	08:29	15:25	22:20			Sgr
Nov 19 05:08 11:39 18:10 Lib 19:29 03:49 10:36 17:21 00:02 06 33.9 Nov 20 05:08 11:30 18:11 Lib 19:30 03:49 11:38 18:14 00:46 07 45.0 Nov 21 05:08 11:40 18:11 Lib 19:32 03:48 13:35 19:52 02:05 09 67.5 Nov 23 05:08 11:40 18:12 Lib 19:32 03:48 16:22 21:24 03:24 10 77.7 Nov 26 05:08 11:41 18:15 Sco 19:35 03:44 17:28 -: 04:53 14 99.4 Nov 29 05:08 11:42 18:15 Sco 19:36 03:47 18:29 00:07 05:43 15 99.4 Nov 29 05:08 11:42 18:17 Oph 19:38 03:47 21:21 02:55 08:30 18 86.3		05:09					03:50						Sgr
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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

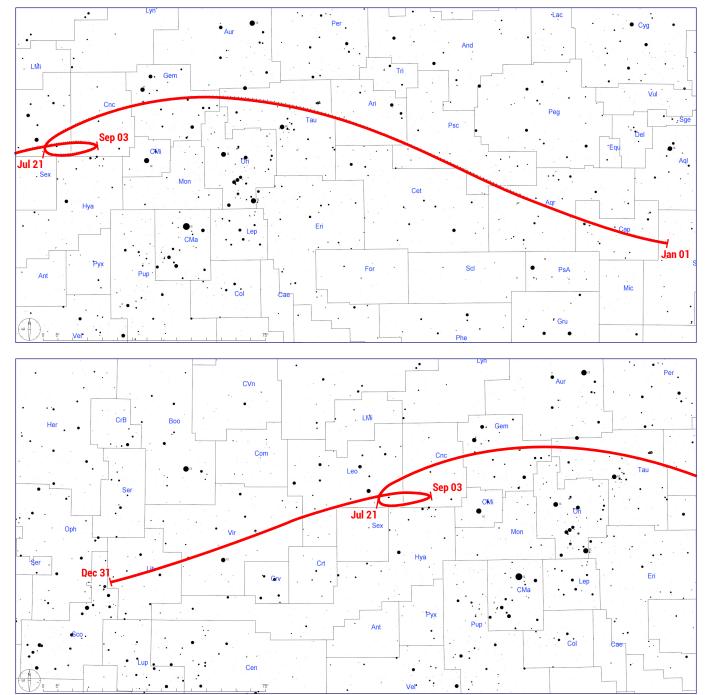
Jan 07	Mantis Full Moon (01:10)	Jul 03	Meerkat Full SuperMoon (13:39)
Jan 15	Last Quarter Moon	Jul 10	Last Quarter Moon
Jan 21	New Moon (22:56)	Jul 17	New Moon (20:33)
Jan 28	First Quarter Moon	Jul 26	First Quarter Moon
Feb 05	Dassie Full Moon (20:31)	Aug 01	Peace Full Supermoon (20:32)
Feb 13	Last Quarter 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

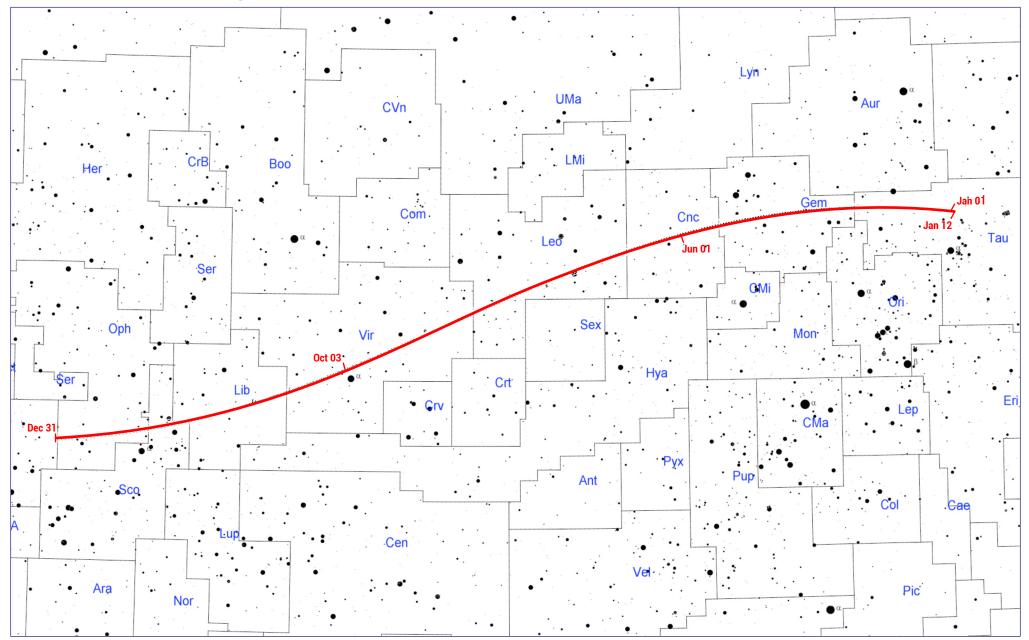


PLANETS

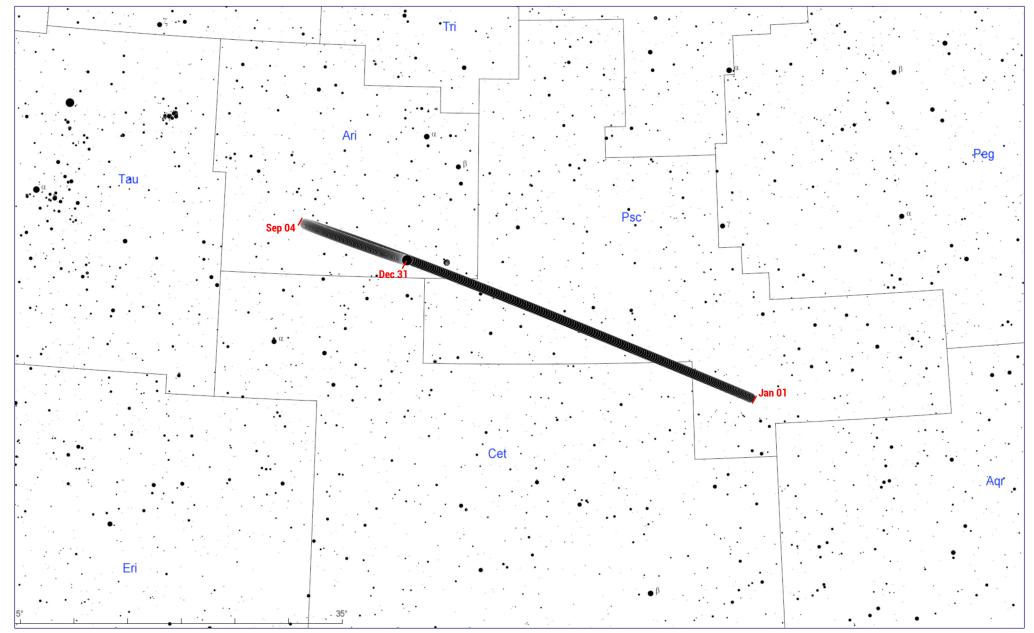
Path of Venus during 2023



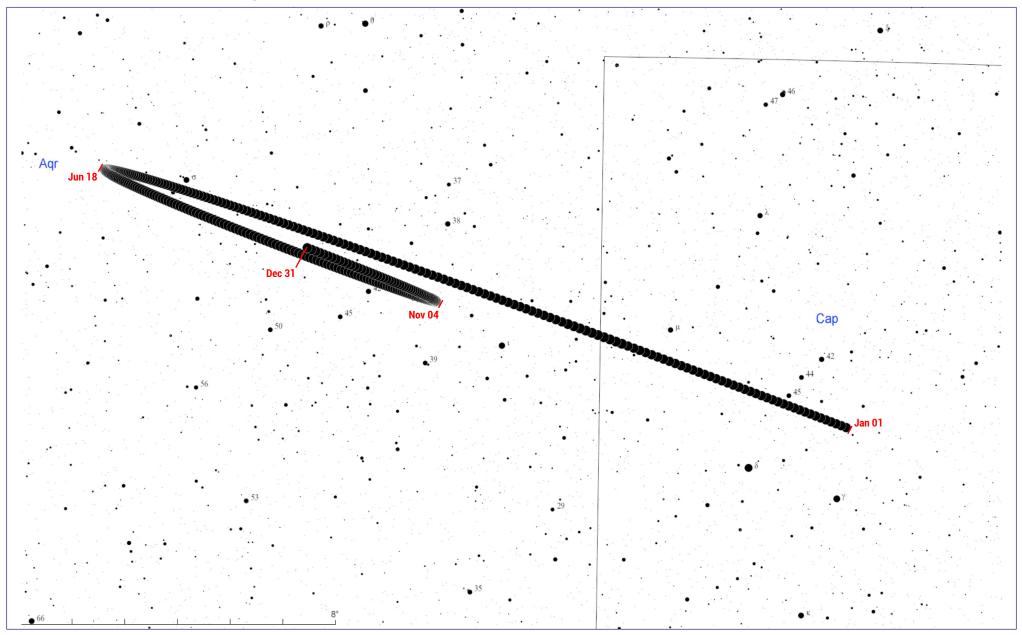
Path of Mars during 2023



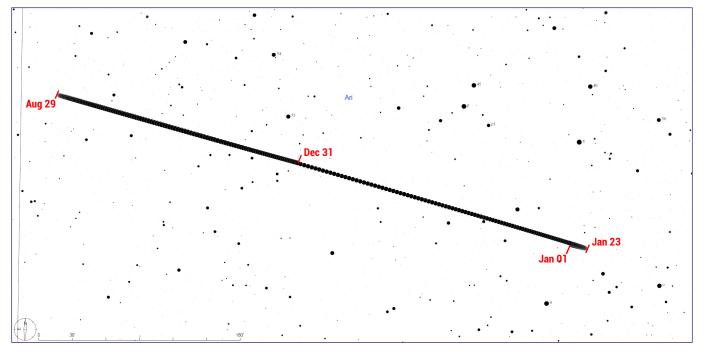
Path of Jupiter during 2023



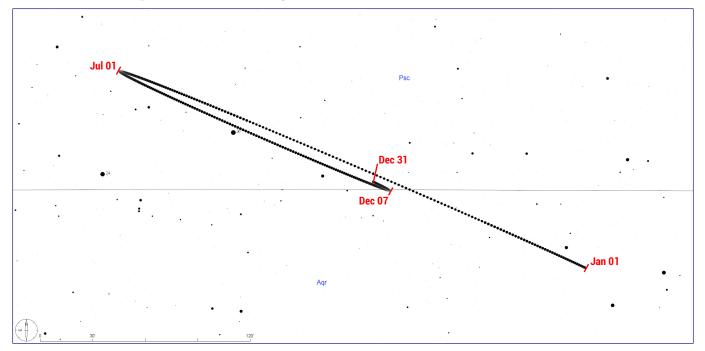
Path of Saturn during 2023



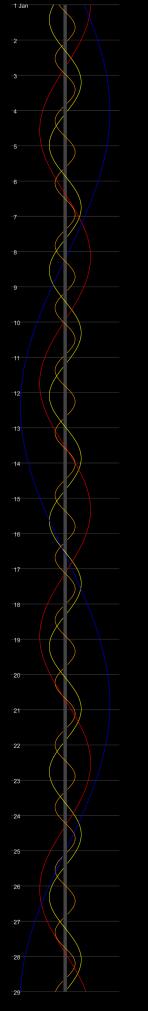
Path of Uranus during 2023

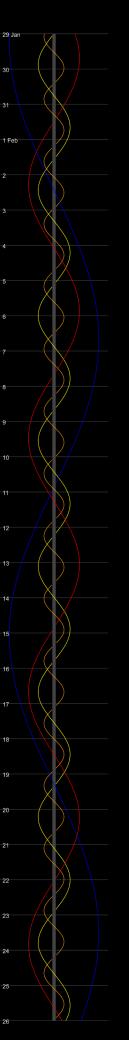


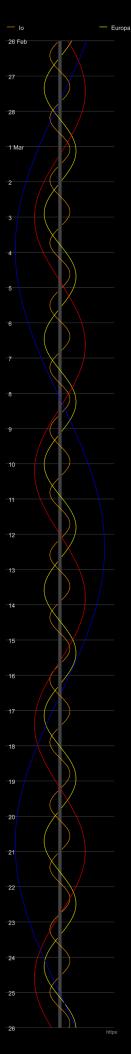
Path of Neptune during 2023

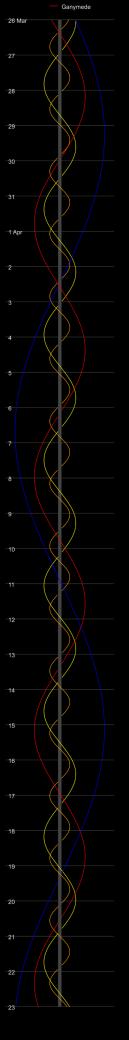


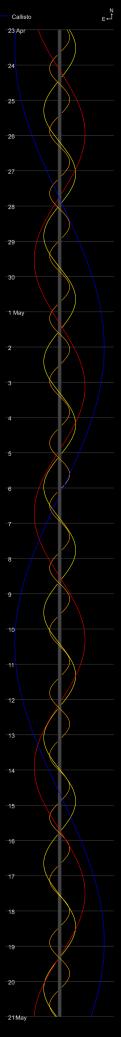






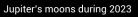


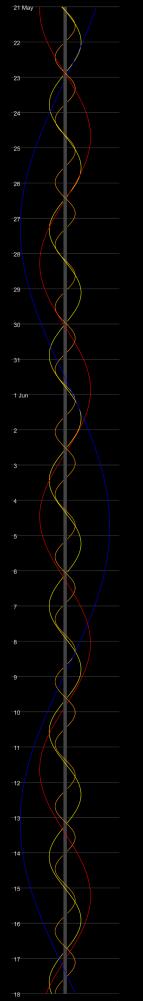


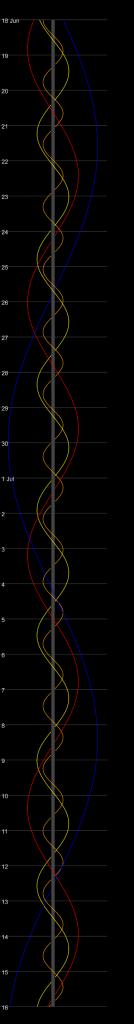


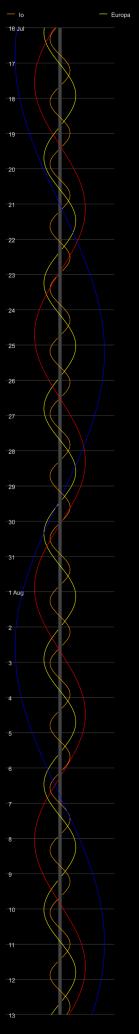
15 - SKY GUIDE SUPPLEMENT 2023

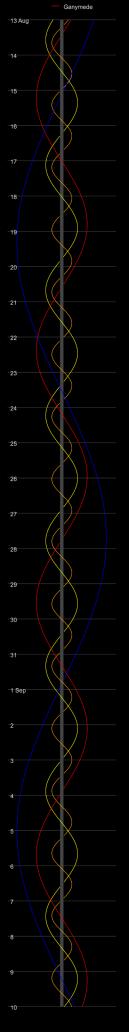
MOONS OF JUPITER

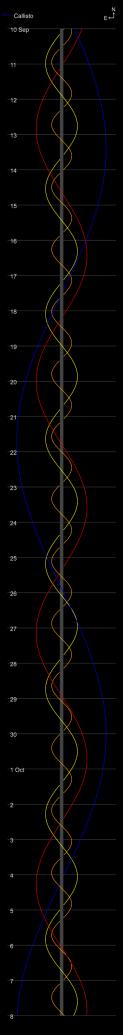






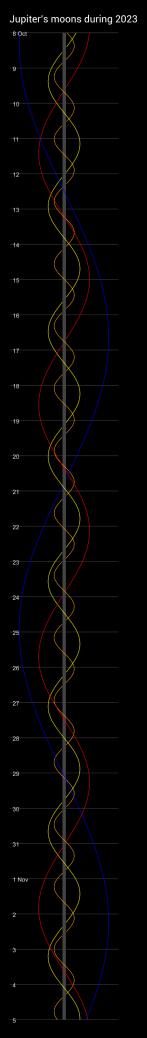






16 - SKY GUIDE SUPPLEMENT 2023

MOONS OF JUPITER



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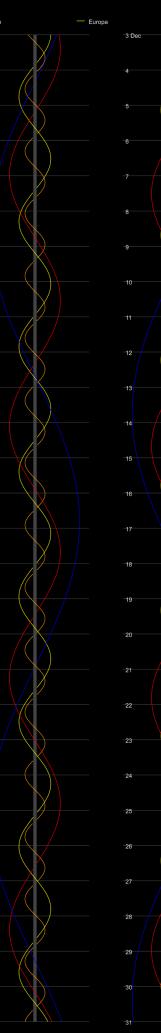
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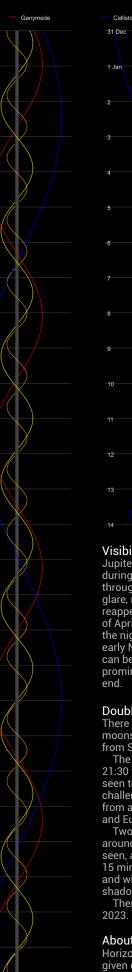
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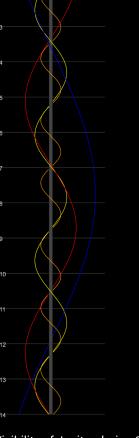
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Visibility of Jupiter during 2023

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

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

MOONS OF JUPITER