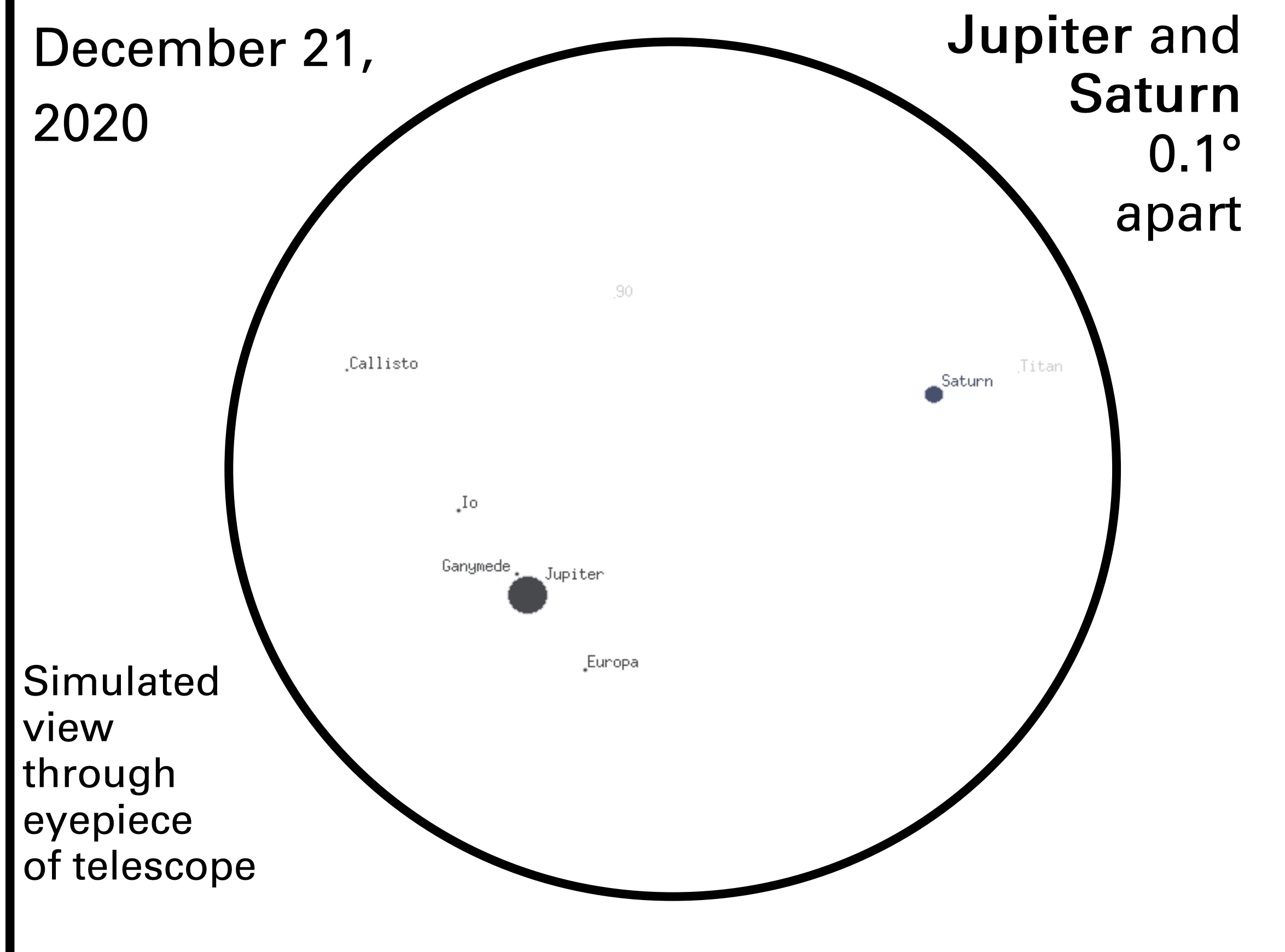


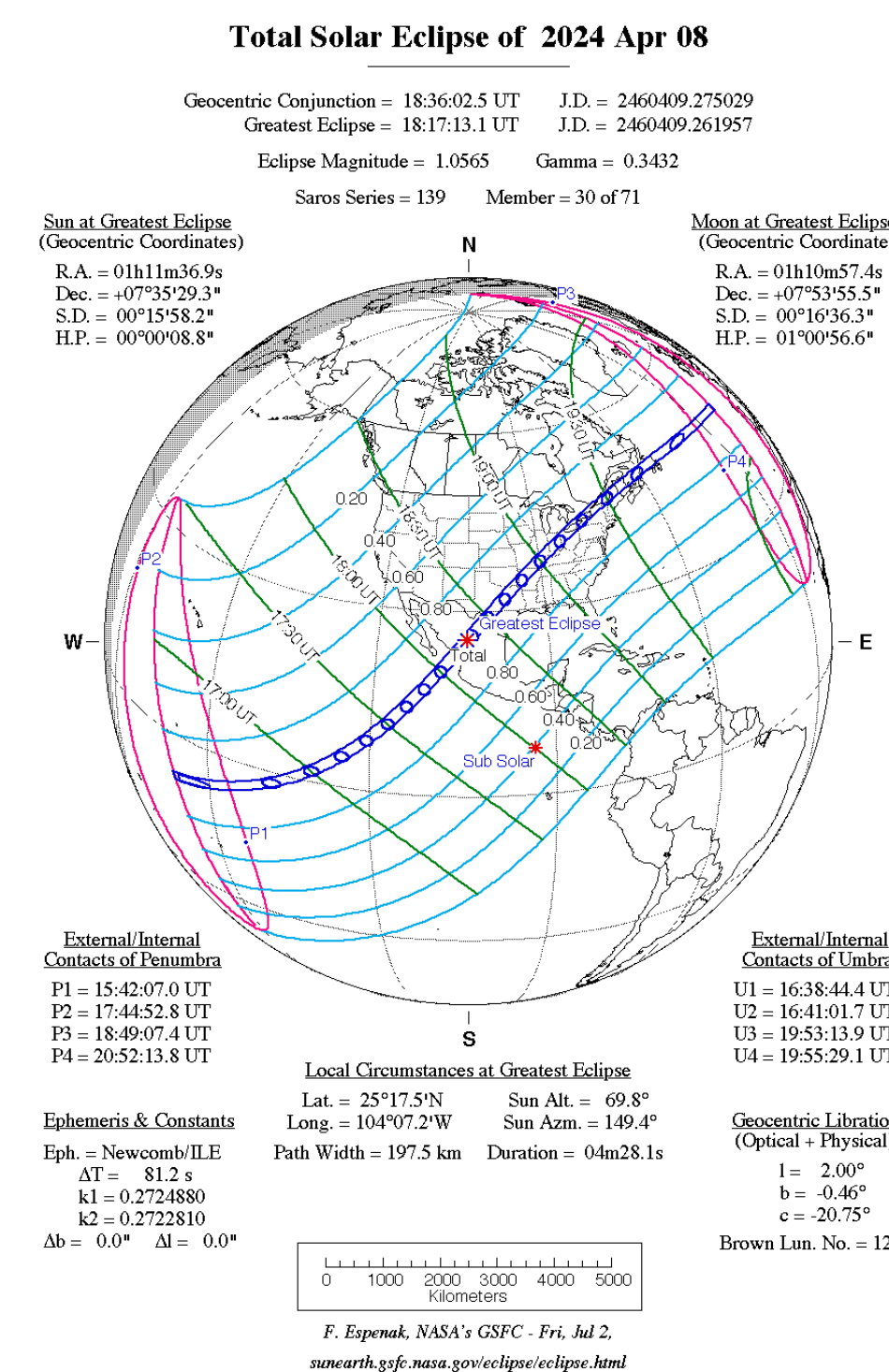
Four Big Astronomical Events You Shouldn't Miss

There are four big astronomical observing events coming up in the next few decades. The purpose of this poster is not to give you lots of details on how to observe, you know how to do that, but to let you know about these events so you can start to plan your observations and tell your friends about them too. This list goes from the year 2020 to 2061. While 2061 might seem a long way off for some of us, it's only 42 years. School aged people today will easily be able to witness it. A typical 3rd grader now will just be about 50 years old when Halley's Comet comes around. Imagine the thrill of seeing it after 42 years of anticipation. So, on with the list.

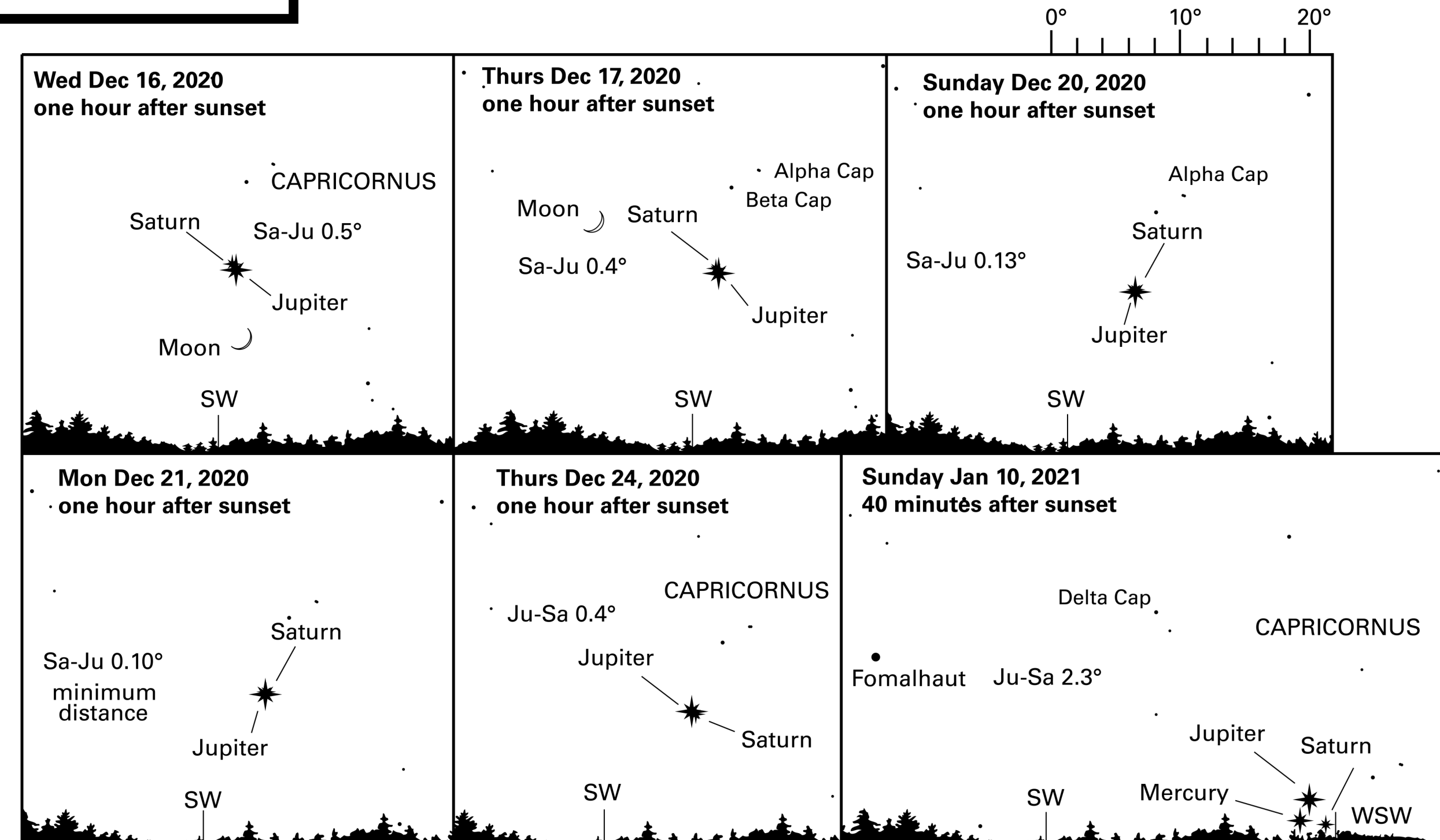
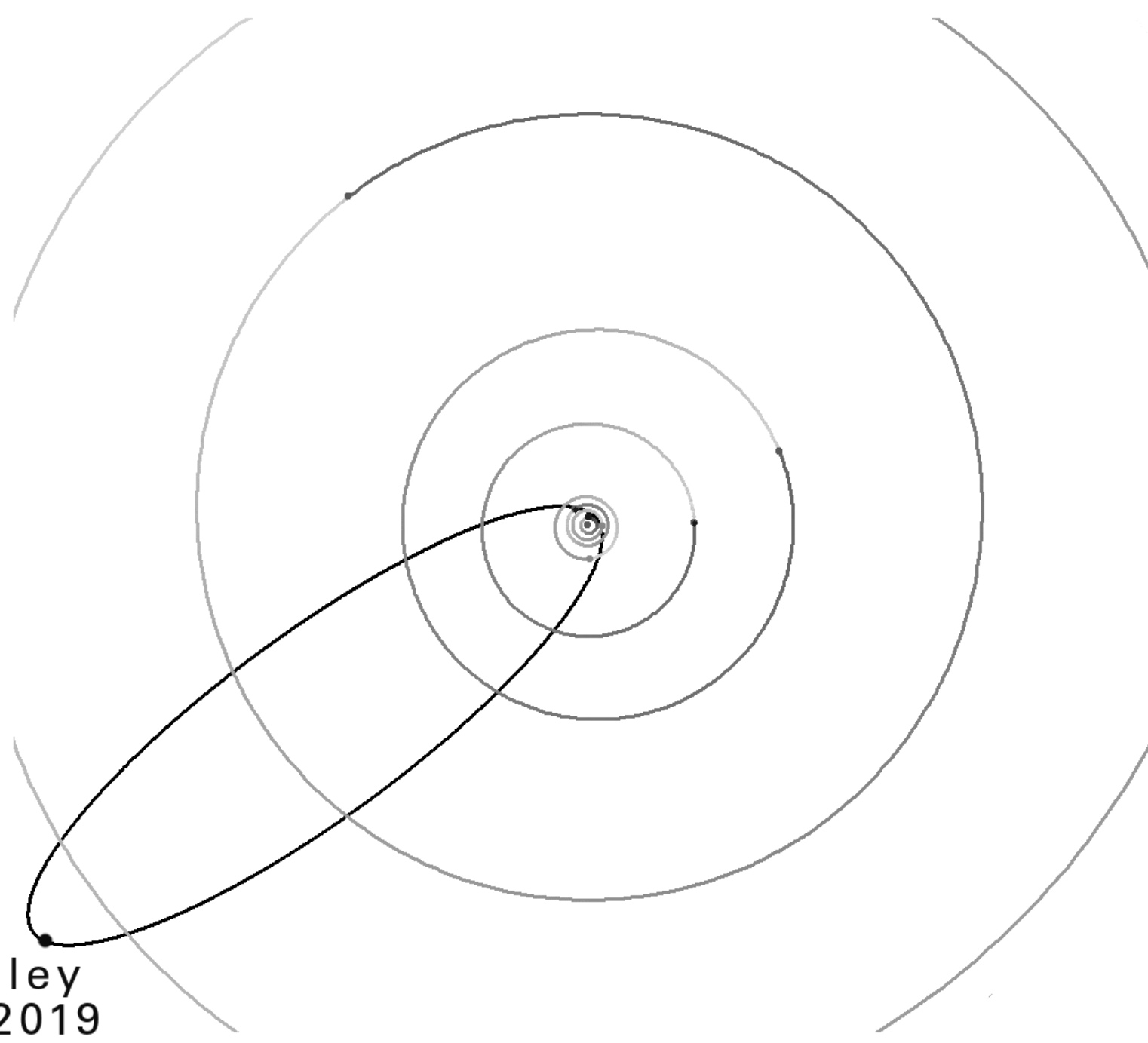
2020 The Great Jupiter Saturn Conjunction
 Jupiter will pass Saturn December 21, 2020. The two planets will be within **one tenth of a degree** of each other. You will be able to see both the rings of Saturn and the Moons of Jupiter in the same field of view in a typical telescope. Jupiter passes Saturn every twenty years, but the last time this happened, we didn't get a good view. Jupiter and Saturn were on the other side of the solar system and the Sun blocked our view. So it's been 40 years since these two gas giants were easily visible together. But they usually don't get this close. Typical Jupiter Saturn conjunctions are a degree apart. The conjunction of 1961 was *two tenths of a degree* apart, the last one that was somewhat comparable.



2024 The Great North American Solar Eclipse
 The Solar Eclipse of **April 2024** goes from Mexico to Newfoundland. The eclipse path is wider than the 2017 eclipse, so expect the sky to be darker than 2017. *After 2024, the next two solar eclipses visible from North America will be August 23, 2044 and August 12, 2045.*



2040 The Great Five Planet Gathering
 On September 8, 2040, all five naked eye planets and the crescent moon will be within a 10° field of view. This is the tightest grouping of all five planets for a long time. In the year 2000, all five were within 20°. You have to go back to the year 1186 for a more compact gathering. I don't know when they will be closer but it will be after the year 2735 since that is as far as the data goes in the paper *"Quintuple Planetary Groupings"* by Salvo De Meis and Jean Meus.



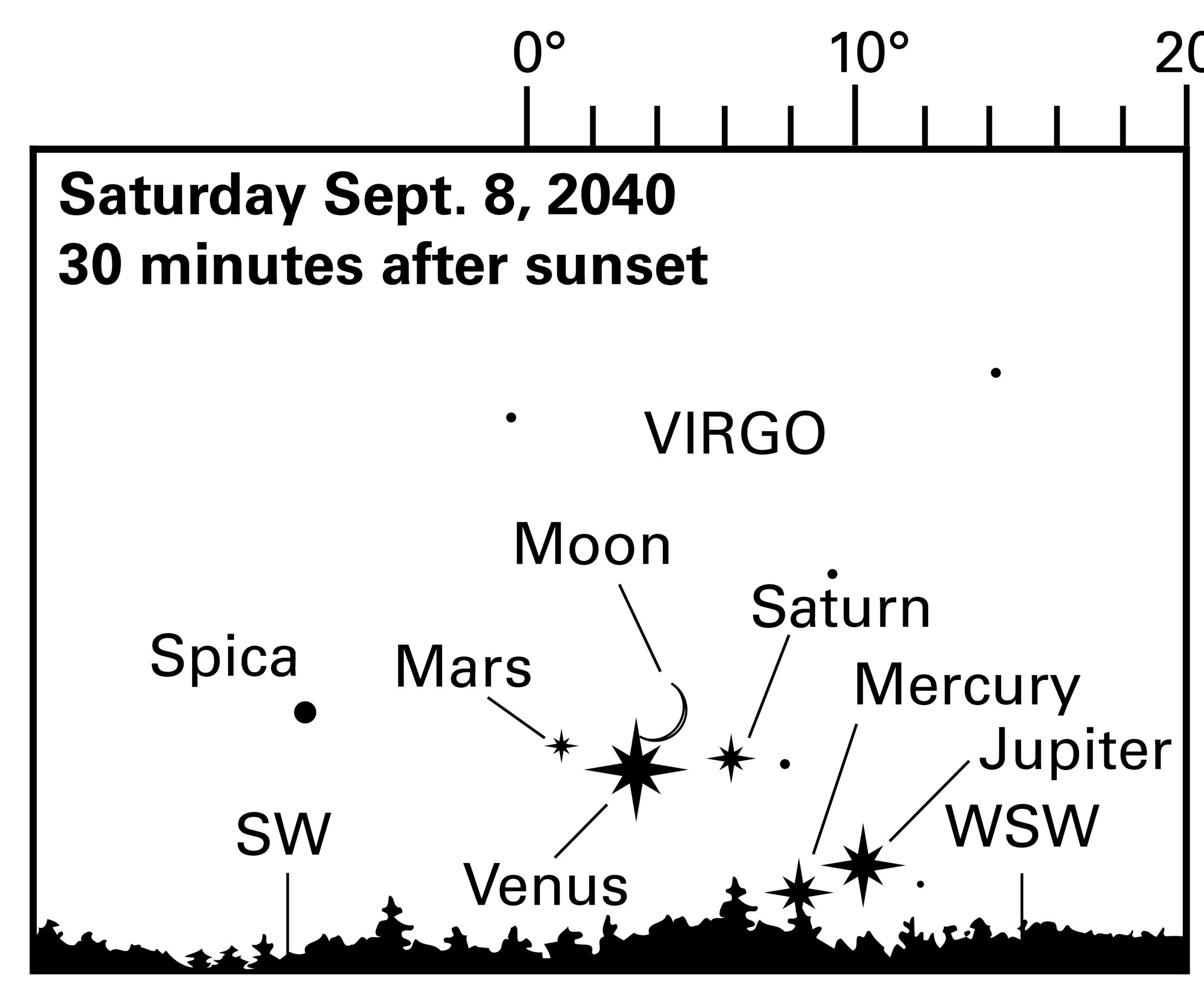
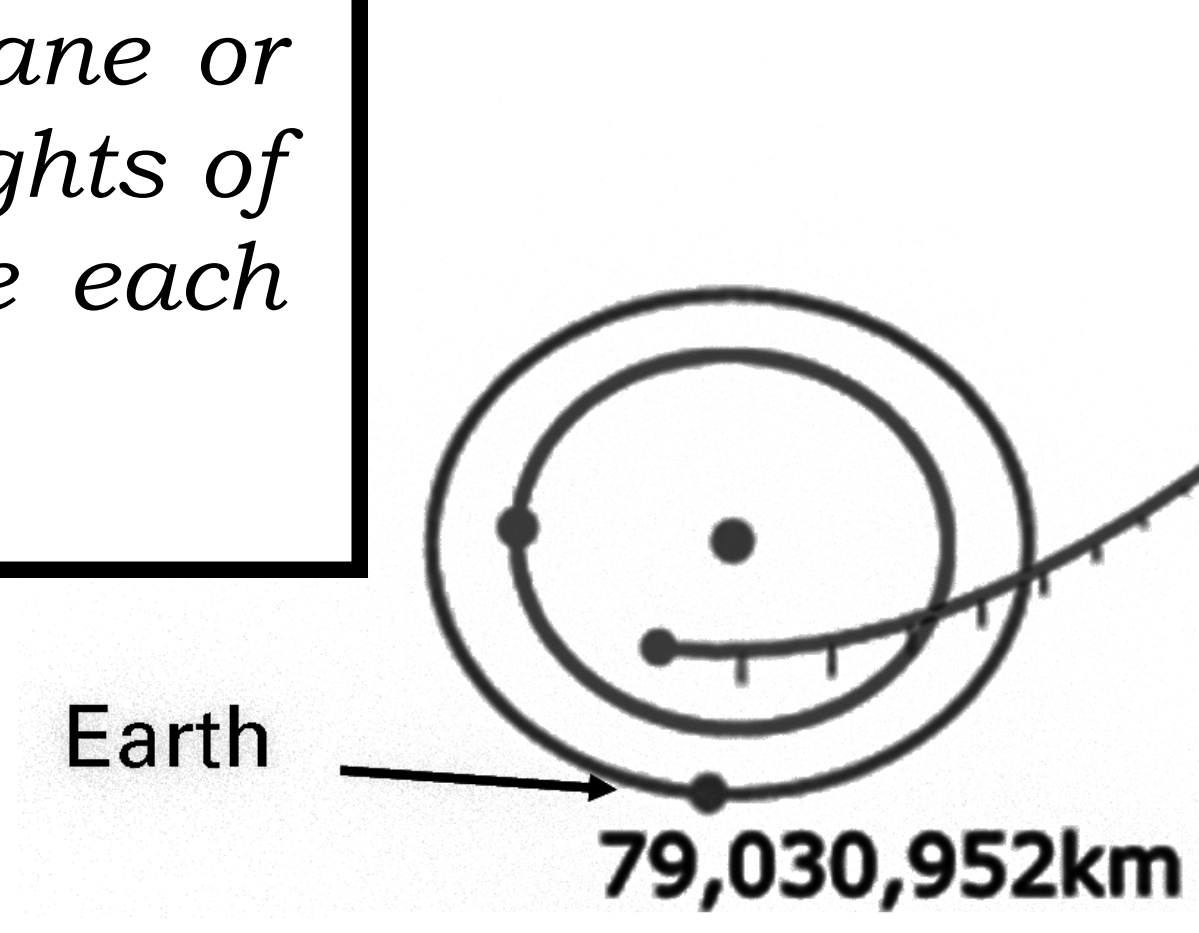
Quintuple planetary groupings

Table 1. Quintuple planetary groupings from the year -3101 to +2735

Date (TDT)	Years elapsed	Separation (°)	Date (TDT)	Years elapsed	Separation (°)
-3101 Feb 18	0	40.00	53 Mar 2	17.55	23.37
-2965 Aug 29	136.53	20.84	53 Mar 9	0.02	22.97
-2867 Dec 27	98.33	18.34	133 Nov 29	60.73	15.25
-2836 May 2	41.34	15.45	193 Dec 6	60.02	23.62
-2806 Feb 21	19.81	22.35	193 Dec 27	0.06	23.05
-2786 Jun 26	40.54	22.04	232 Mar 29	38.28	20.72
-2726 Oct 21	40.32	9.42	272 Jul 30	40.34	15.63
-2666 Dec 26	60.12	17.45	292 Jun 7	19.85	23.77
-2587 Aug 11	78.63	16.56	332 Oct 4	40.33	8.71
-2585 Aug 22	2.03	24.83	334 Oct 15	2.03	23.61
-2429 Dec 10	156.30	21.91	329 Jan 6	194.64	24.69
-2288 Dec 4	140.82	23.64	531 May 28	1.97	23.90
-2249 Jan 4	38.25	14.35	670 Mar 18	138.81	16.38
-2209 May 2	40.32	14.37	710 Jun 26	40.27	5.91
-2189 Feb 26	19.82	16.92	720 Apr 15	19.80	21.28
-2149 Jul 10	40.37	18.69	748 Sep 30	18.46	21.93
-2109 Dec 27	40.39	23.24	808 Dec 18	60.22	23.43
-1972 May 2	19.51	20.52	810 Dec 11	1.96	23.20
-1972 May 25	0.06	22.88	907 Feb 14	96.18	20.52
-1952 Feb 27	19.76	4.33	909 Apr 14	2.16	19.40
-1912 Jul 5	18.05	18.05	947 Jun 15	38.17	20.88
-1812 Dec 19	100.46	17.12	967 Apr 14	19.83	20.17
-1733 Jul 18	78.58	15.94	1007 Aug 14	40.33	20.41
-1534 Mar 8	108.64	21.84	1088 Apr 15	80.67	19.75
-1476 May 11	58.18	20.13	1108 Feb 14	19.83	17.34
-1474 May 17	2.02	19.33	1186 Sep 17	78.86	8.86
-1436 Sep 12	38.32	14.16	1284 Dec 25	98.27	17.18
-1434 Sep 11	2.00	23.76	1483 Oct 23	198.83	21.13
-1295 Jun 16	138.76	17.50	1524 Feb 19	40.33	10.51
-1197 Nov 4	98.38	10.37	1560 Jun 21	40.34	18.60
-1098 Jan 17	98.20	19.79	1584 May 1	19.83	17.29
-1098 Feb 19	0.09	21.48	1624 Aug 26	40.32	15.76
-1038 May 29	40.27	6.45	1662 Dec 6	38.28	23.69
-1038 Mar 17	19.80	18.37	1821 Apr 6	158.33	19.03
-960 Nov 13	78.67	21.50	1821 Apr 7	0.05	17.09
-958 Nov 15	2.00	13.24	1821 Apr 30	0.06	19.70
-821 Jul 12	136.65	23.71	1962 Feb 5	140.77	15.81
-819 Sep 9	2.16	21.94	2000 May 17	38.28	19.47
-801 Mar 24	173.54	23.59	2040 Sep 8	40.31	9.31
-761 Jul 25	40.34	23.93	2060 Jul 10	19.84	22.95
-660 Jun 11	100.47	17.62	2100 Nov 11	40.34	16.46
-582 Aug 7	78.57	18.31	2297 Jul 15	196.67	13.65
-582 Aug 23	0.04	16.39	2299 Jul 20	2.01	23.25
-481 Feb 1	100.44	21.39	2337 Nov 7	38.30	20.16
-481 May 23	40.30	17.26	2438 Apr 27	100.47	19.13
-285 Oct 1	156.36	20.70	2478 Aug 6	40.28	14.94
-244 Jun 24	40.31	20.43	2518 Nov 18	38.28	22.13
-204 May 30	40.35	21.10	2675 Mar 27	158.33	16.44
-184 Mar 25	19.82	6.74	2675 Apr 10	0.04	18.25
-144 Jul 27	40.34	9.96	2715 Jul 26	40.29	16.61
-46 Nov 28	98.34	9.38	2735 May 27	19.84	22.86
35 Aug 14	80.71	22.59			

2061 Halley's Comet
 The return of Halley's Comet in 2061 will be **Spectacular!** If your impression of Halley's Comet was the 1986 perihelion, get that idea out of your head. 1986 was about the worst view we've ever had of the comet. It pretty much stayed on the other side of the solar system the whole visit. The next time, it's going to be at perihelion around the same time as its closest approach to Earth. In 2061, it will have a magnitude of -0.3 compared with +2.1 for 1986.

To quote Bob Victor, "Halley passes perihelion, inferior conjunction (nearly between Earth and Sun), and closest approach to Earth, all on July 28-29. In its inclined orbit, the Comet will then be north of, or "above" the plane or Earth's orbit and so will appear some 21° north of the Sun. On the nights of July 25-28, from latitude 40° N, the comet will even be seen twice each night, low in NW at dusk, and low in NE at dawn."



So, get ready for these observing events. Let's all keep ourselves and our friends **"in the know"** about these celestial happenings.