

THE CONSTELLATIONS

CONSTELLATION (<i>Latin name</i>)	GENITIVE CASE ENDING	ENGLISH NAME OR DESCRIPTION	ABBRE- VIA- TION	APPROXIMATE POSITION	
				α	δ
				<i>h</i>	<i>°</i>
Andromeda	Andromedae	Princess of Ethiopia	And	1	+40
Antlia	Antliae	Air pump	Ant	10	-35
Apus	Apodis	Bird of Paradise	Aps	16	-75
Aquarius	Aquarii	Water bearer	Aqr	23	-15
Aquila	Aquilae	Eagle	Aql	20	+5
Ara	Arae	Altar	Ara	17	-55
Aries	Arietis	Ram	Ari	3	+20
Auriga	Aurigae	Charioteer	Aur	6	+40
Boötes	Boötis	Herdsmen	Boo	15	+30
Caelum	Caeli	Graving tool	Cae	5	-40
Camelopardus	Camelopardis	Giraffe	Cam	6	+70
Cancer	Canceri	Crab	Cnc	9	+20
Canes Venatici	Canum Venaticorum	Hunting dogs	CVn	13	+40
Canis Major	Canis Majoris	Big dog	CMa	7	-20
Canis Minor	Canis Minoris	Little dog	CMi	8	+5
Capricornus	Capricorni	Sea goat	Cap	21	-20
Carina*	Carinae	Keel of Argonauts' ship	Car	9	-60
Cassiopeia	Cassiopeiae	Queen of Ethiopia	Cas	1	+60
Centaurus	Centauri	Centaur	Cen	13	-50
Cephus	Cephei	King of Ethiopia	Cep	22	+70
Cetus	Ceti	Sea monster (whale)	Cet	2	-10
Chamaeleon	Chamaeleontis	Chameleon	Cha	11	-80
Circinus	Circini	Compasses	Cir	15	-60
Columba	Columbae	Dove	Col	6	-35
Coma Berenices	Comae Berenices	Berenice's hair	Com	13	+20
Corona Australis	Coronae Australis	Southern crown	CrA	19	-40
Corona Borealis	Coronae Borealis	Northern crown	CrB	16	+30
Corvus	Corvi	Crow	Crv	12	-20
Crater	Crateris	Cup	Crt	11	-15
CruX	Crucis	Cross (southern)	Cru	12	-60
Cygnus	Cygni	Swan	Cyg	21	+40
Delphinus	Delphini	Porpoise	Del	21	+10
Dorado	Doradus	Swordfish	Dor	5	-65
Draco	Draconis	Dragon	Dra	17	+65
Equuleus	Equulei	Little horse	Equ	21	+10
Eridanus	Eridani	River	Eri	3	-20
Fornax	Fornacis	Furnace	For	3	-30
Gemini	Geminorum	Twins	Gem	7	+20
Grus	Gruis	Crane	Gru	22	-45
Herculés	Herculis	Hercules, son of Zeus	Her	17	+30
Horologium	Horologii	Clock	Hor	3	-60
Hydra	Hydrae	Sea serpent	Hya	10	-20
Hydrus	Hydri	Water snake	Hyi	2	-75
Indus	Indi	Indian	Ind	21	-55
Lacerta	Lacertae	Lizard	Lac	22	+45

THE CONSTELLATIONS

(Continued)

CONSTELLATION (Latin <i>name</i>)	GENITIVE CASE ENDING	ENGLISH NAME OR DESCRIPTION	ABBRE- VIA- TION	APPROXIMATE POSITION	
				α	δ
Leo	Leonis	Lion	Leo	11	+15
Leo Minor	Leonis Minoris	Little lion	LMi	10	+35
Lepus	Leporis	Hare	Lep	6	-20
Libra	Librae	Balance	Lib	15	-15
Lupus	Lupi	Wolf	Lup	15	-45
Lynx	Lyncis	Lynx	Lyn	8	+45
Lyra	Lyrae	Lyre or harp	Lyr	19	+40
Mensa	Mensae	Table Mountain	Men	5	-80
Microscopium	Microscopii	Microscope	Mic	21	-35
Monoceros	Monocerotis	Unicorn	Mon	7	-5
Musca	Muscae	Fly	Mus	12	-70
Norma	Normae	Carpenter's level	Nor	16	-50
Octans	Octantis	Octant	Oct	22	-85
Ophiuchus	Ophiuchi	Holder of serpent	Oph	17	0
Orion	Orionis	Orion, the hunter	Ori	5	+5
Pavo	Pavonis	Peacock	Pav	20	-65
Pegasus	Pegasi	Pegasus, the winged horse	Peg	22	+20
Perseus	Persei	Perseus , hero who saved Andromeda	Per	3	+45
Phoenix	Phoenicis	Phoenix	Phe	1	-50
Pictor	Pictoris	Easel	Pic	6	-55
Pisces	Piscium	Fishes	Psc	1	+15
Piscis Austrinus	Piscis Austrini	Southern fish	PsA	22	-30
Puppis*	Puppis	Stern of the Argonauts' ship	Pup	8	-40
Pyxis* (= <i>Malus</i>)	Pyxidis	Compass on the Argonauts' ship	Pyx	9	-30
Reticulum	Reticuli	Net	Ret	4	-60
Sagitta	Sagittae	Arrow	Sge	20	+10
Sagittarius	Sagittarii	Archer	Sgr	19	-25
Scorpius	Scorpii	Scorpion	Sco	17	-40
Sculptor	Sculptoris	Sculptor's <i>tool</i> ;	Scl	0	-30
Scutum	Scuti	Shield	Sct	19	-10
Serpens	Serpentis	Serpent	Ser	17	
Sextans	Sextantis	Sextant	Sex	10	00
Taurus	Tauri	Bull	Tau	4	+15
Telescopium	Telescopii	Telescope	Tel	19	50
Triangulum	Trianguli	Triangle	Tri	2	+30
Triangulum Australe	Trianguli Australis	Southern triangle	TrA	16	-65
Tucana	Tucanae	Toucan	Tuc	0	-65
Ursa Major	Ursae Majoris	Big bear	UMa	II	+50
Ursa Minor	Ursae Minoris	Little bear	VMi	15	+70
Vela*	Velorum	Sail of the Argonauts' ship	Vel	9	-50
Virgo	Virginis	Virgin	Vir	13	0
Volans	Volantis	Flying fish	Vol	8	-70
Vulpecula	Vulpeculae	Fox	Vul	20	+25

*The four constellations *Carina*, *Puppis*, *Pyxis*, and *Vela* originally formed the single constellation, *Argo Navis*.

ตารางท้ายเล่มที่ 2

The Planets (Physical Data)

Planet	Diameter		Mass (Earth = 1)	Surface Gravity (Earth = 1)	Period of Rotation	Number of Moons
	(in miles)	(Earth = 1)				
Mercury	3,025	0.38	0.06	0.38	58.65 days	0
Venus	7,526	0.95	0.82	0.90	243 days	0
Earth	7,927	1.00	1.00	1.00	23 hrs. 56 min.	1
Mars	4,218	0.53	0.11	0.38	24 hrs. 37 min.	2
Jupiter	88,700	11.19	318.0	2.64	9 hrs. 50 min.	14
Saturn	75,100	9.47	95.2	1.13	10 hrs. 14 min.	10
Uranus	29,200	3.69	14.6	1.07	10 hrs. 49 min.	5
Neptune	31,650	3.50	17.3	1.08	16 hrs.	2
Pluto	3,500?	0.5?	0.1?	0.3?	6.39 days	0

The Planets (Orbital Data)

Planet	Average Distance from the Sun		Orbital Period		Orbital Speed (in miles per second)	Orbital Inclination (in degrees)
	(in AUs)	(in millions of miles)	(in years)	(in days)		
Mercury	0.387	36.0	0.241	88.0	29.7	7.0
Venus	0.723	67.2	0.615	224.7	21.8	3.4
Earth	1.000	92.9	1.000	365.3	18.5	0.0
Mars	1.524	141.5	1.881	687.0	15.0	1.8
Jupiter	5.203	483.4	11.862		8.1	1.3
Saturn	9.539	886.0	29.458		6.0	2.5
Uranus	19.18	1782.0	84.013		4.2	0.8
Neptune	30.06	2792.0	164.793		3.4	1.8
Pluto	39.44	3664.0	247.686		2.9	17.2

SATELLITES OF THE PLANETS

PLANET	SATELLITE	DISCOVERED BY	MEAN DISTANCE FROM PLANET (km)	SIDEREAL PERIOD (Days)	ORBITAL ECCENTRICITY	DIAMETER OF SATELLITE* (km)	MASS† (Planet = 1)	APPROXIMATE MAGNITUDE AT OPPOSITION	
Earth	Moon	—	384,404	27.322	0.055	3476	0.0123	-12.5	
Mars	Phobos	A. Hall (1877)	9,380	0.319	0.021	25	(2.7×10^{-8})	+12	
	Deimos	A. Hall (1877)	23,500	1.262	0.003	13	(4.8×10^{-8})	13	
Jupiter‡	XIV	Voyager II (1979)	129,000	0.297	0	<40	(10^{-14})	12-19	
	V Almalthea	Barnard (1892)	181,300	0.498	0.003	240	(2×10^{-10})	13	
	I Io	Galileo (1610)	421,600	1.769	0.030	3640	(4.7×10^{-5})	5	
	II Europa	Galileo (1610)	670,900	3.551	0.000	3130	(2.5×10^{-5})	6	
	III Ganymede	Galileo (1610)	1,070,000	7.155	0.002	5270	(7.8×10^{-5})	5	
	IV Callisto	Galileo (1610)	1,880,000	16.689	0.008	4840	(5.6×10^{-5})	6	
	VI Himalia	Perrine (1904)	11,470,000	250.57	0.158	(170)	(8×10^{-10})	14	
	VII Elara	Perrine (1905)	11,800,000	259.65	0.207	(40)	(4×10^{-10})	18	
	X Lysithea	Nicholson (1938)	11,850,000	263.55	0.130	(10)	(1×10^{-10})	19	
	XIII Leda	Kowal (1974)	11,110,000	239.2	0.147	(8)	(5×10^{-10})	20	
	XII Aranke	Nicholson (1951)	21,200,000	631.1	0.169	(10)	(7×10^{-10})	18	
	XI Carme	Nicholson (1938)	22,600,000	692.5	0.207	(15)	(2×10^{-10})	19	
Saturn§	VIII Pasiphae	Melotte (1908)	23,500,000	738.9	0.378	(25)	(8×10^{-10})	17	
	IX Sinope	Nicholson (1914)	23,700,000	758	0.275	(15)	(2×10^{-10})	18	
	Mimas	W. Herschel (1789)	185,500	0.942	0.020	390	(6.6×10^{-8})	13	
Uranus	Enceladus	W. Herschel (1789)	237,900	1.370	0.004	500	(1.3×10^{-7})	12	
	Tethys	Cassini (1684)	294,700	1.888	0.000	1050	(1.1×10^{-6})	10	
	Dione	Cassini (1684)	377,400	2.737	0.002	1120	(1.8×10^{-6})	10	
	Rhea	Cassini (1672)	526,700	4.518	0.001	1530	(4×10^{-6})	10	
	Titan	Huygens (1655)	1,222,000	15.945	0.029	5120	(2.3×10^{-4})	8	
	Hyperion	Bond (1848)	1,481,000	21.277	0.104	310	(2×10^{-7})	14	
	Iapetus	Cassini (1671)	3,560,000	79.331	0.028	1440	(3.3×10^{-6})	11	
	Phoebe	W. Pickering (1898)	12,930,000	550.45	0.163	40	(7×10^{-10})	16	
	Neptune	Miranda	Kuiper (1948)	123,000	1.414	0	(200)	(1×10^{-6})	17
		Ariel	Lassell (1851)	191,700	2.520	0.003	(600)	(1.5×10^{-5})	14
Umbriel		Lassell (1851)	267,000	4.144	0.004	(400)	(6×10^{-6})	15	
Titania		W. Herschel (1787)	438,000	8.706	0.002	(1000)	(5×10^{-5})	14	
Oberon		W. Herschel (1787)	585,960	13.463	0.001	(900)	(3×10^{-5})	14	
Pluto	Triton	Lassell (1846)	353,400	5.877	0.000	6000	(3×10^{-3})	13	
	Nereid	Kuiper (1949)	5,560,000	359.881	0.749	(500)	(10^{-6})	19	
Pluto	Charon	Christy (1978)	17,000	6.387	0	(1200)	(0.1)	17	

*A diameter of a satellite given in parentheses is estimated from the amount of sunlight it reflects.

†A mass of a satellite given in parentheses is estimated from its size and an assumed density.

‡Does not include two satellites discovered by Voyager;

§Does not include at least seven satellites discovered by Voyager;

Orbital data from *The Astronomical Almanac* (U. S. Naval Observatory).

Other data compiled from various sources.

ตารางท้ายเล่มที่ 4

TOTAL SOLAR ECLIPSES FROM 1952 THROUGH 2030

DATE	DURATION OF TOTALITY (min)	WHERE VISIBLE
1952 Feb. 25	3.0	Africa, Asia
1954 June 30	2.5	North-Central U.S. (Great Lakes), Canada, Scandinavia, U.S.S.R., Central Asia
1955 June 20	7.2	Southeast Asia
1958 Oct. 12	5.2	Pacific, Chile, Argentina
1959 Oct. 2	3.0	Northern and Central Africa
1961 Feb. 15	2.6	Southern Europe
1962 Feb. 5	4.1	Indonesia
1963 July 20	1.7	Japan, Alaska, Canada, Maine
1965 May 30	5.3	Pacific Ocean, Peru
1966 Nov. 12	1.9	South America
1970 March 7	3.3	Mexico, Florida, parts of U.S. Atlantic coastline
1972 July 10	2.7	Alaska, Northern Canada
1973 June 30	7.2	Atlantic Ocean, Africa
1974 June 20	5.3	Indian Ocean, Australia
1976 Oct. 23	4.9	Africa, Indian Ocean, Australia
1977 Oct. 12	2.8	Northern South America
1979 Feb. 26	2.7	Northwest U.S., Canada
1980 Feb. 16	4.3	Central Africa, India
1981 July 31	2.2	Siberia
1983 June 11	5.4	Indonesia
1984 Nov. 22	2.1	Indonesia, South America
1987 March 29	0.3	Central Africa
1988 March 18	4.0	Philippines, Indonesia
1990 July 22	2.6	Finland, Arctic Regions
1991 July 11	7.1	Hawaii, Central America, Brazil
1992 June 30	5.4	South Atlantic
1994 Nov. 3	4.6	South America
1995 Oct. 24	2.4	South Asia
1997 March 9	2.8	Siberia, Arctic
1998 Feb. 26	4.4	Central America
1999 Aug. 11	2.6	Central Europe, Central Asia
2001 June 21	4.9	Southern Africa
2002 Dec. 4	2.1	South Africa, Australia
2003 Nov. 23	2.0	Antarctica
2005 April 8	0.7	South Pacific Ocean
2006 March 29	4.1	Africa, Asia Minor, U.S.S.R.
2008 Aug. 1	2.4	Arctic Ocean, Siberia, China
2009 July 22	6.6	India, China, South Pacific
2010 July 11	5.3	South Pacific Ocean
2012 Nov. 13	4.0	Northern Australia, South Pacific
2013 Nov. 3	1.7	Atlantic Ocean, Central Africa
2015 March 20	4.1	North Atlantic, Arctic Ocean

TOTAL SOLAR ECLIPSES FROM 1952 THROUGH 2030 (Continued)

DATE	DURATION OF TOTALITY (min)	WHERE VISIBLE
2016 March 9	4.5	Indonesia, Pacific Ocean
2017 Aug. 21	2.7	Pacific Ocean, U.S.A., Atlantic Ocean
2019 July 2	4.5	South Pacific, South America
2020 Dec. 14	2.2	South Pacific, South America, South Atlantic Ocean
2021 Dec. 4	1.9	Antarctica
2023 April 20	1.3	Indian Ocean, Indonesia
2024 April 8	4.5	South Pacific, Mexico, East U.S.A.
2026 Aug. 12	2.3	Arctic, Greenland, North Atlantic, Spain
2027 Aug. 2	6.4	North Africa, Arabia, Indian Ocean
2028 July 22	5.1	Indian Ocean, Australia, New Zealand
2030 Nov. 25	3.7	South Africa, Indian Ocean, Australia

ตารางท้ายเล่มที่ 5

THE NEAREST STARS

STAR	RIGHT ASCENSION (1950)		DECLINATION (1950)		DISTANCE (pc)	PROPER MOTION	RADIAL VELOCITY (km/s)	SPECTRA OF COMPONENTS			VISUAL MAGNITUDES OF COMPONENTS			ABSOLUTE VISUAL MAGNITUDES OF COMPONENTS			
	h	m	°	'				A	B	C	A	B	C	A	B	C	
Sun								G2V				-26.8			+4.8		
Proxima Centauri*	14	26.3	-62	28	1.31	3.86	-16	M5V				+11.05			+15.4		
α Centauri	14	36.2	-60	38	1.35	3.68	-22	G2V	K0V		-0.01	+1.33			+4.4	+5.7	
Barnard's Star	17	55.4	+4	33	1.81	10.34	-108	M5V			+9.54				+13.2		
Wolf 359	10	54.1	+7	19	2.35	4.70	+13	M8V			+13.53				+16.7		
Lalande 21185	11	00.6	+36	18	2.52	4.78	-84	M2V			+7.50				+10.5		
Luyten 726-8	1	36.4	-18	13	2.60	3.36	+30	M5.5V	M5.5V		+12.45	+12.95			+15.3	+15.8	
Sirius	6	42.9	-16	39	2.65	1.33	-8	A1V	wd		-1.46	+8.68			+1.4	+11.6	
Ross 154	18	46.7	-23	53	2.90	0.72	-4	M4.5V			+10.6				+13.3		
Ross 248	23	39.4	+43	55	3.13	1.58	-81	M6V			+12.29				+14.8		
ϵ Eridani	3	30.6	-9	38	3.28	0.98	+16	K2V			+3.73				+6.1		
Ross 128	11	45.1	+1	6	3.31	1.37	-13	M5V			+11.10				+13.5		
Luyten 789-6	22	35.7	-15	36	3.31	3.26	-60	M6V			+12.18				+14.6		
61 Cygni	21	4.7	+38	30	3.42	5.22	-64	K5V	K7V		+5.22	+6.03			+7.6	+8.4	
ϵ Indi	21	59.6	-57	00	3.44	4.69	-40	K5V			+4.68				+7.0		
τ Ceti	1	41.7	-16	12	3.46	1.92	-16	G8V			+3.50				+5.7		
Procyon	7	36.7	+5	21	3.51	1.25	-3	F5IV-V	wd		+0.37	+10.7			+2.6	+13.0	
BD+59°1915	18	42.2	+59	33	3.52	2.28	+5	M4V	M5V		+8.90	+9.69			+11.2	+11.9	
BD+43°44	0	15.5	+43	44	3.55	2.89	+17	M1V	M6V		+8.07	+11.04			+10.3	+13.3	
CD-36°15693	23	2.6	-36	9	3.58	6.90	+10	M2V			+7.36				+9.6		
G51-15	8	26.9	+26	57	3.66	1.26		MV			+14.8				+17.0		
Luyten 725-32	1	10.1	-17	16	3.79	1.22		M5V			-11.5				+13.6		
BD+5°1668	7	24.7	+5	23	3.79	3.73	+26	M5V			+9.82				+12.0		
CD-39°14192	21	14.3	-39	4	3.85	3.46	+21	M0V			+6.67				+8.8		
Kapteyn's Star	5	09.7	-45	00	3.91	8.39	+245	M0V			+8.81				+10.8		
Kruger 60	22	26.3	+57	27	3.94	0.86	-26	M3V	M4.5V		+9.85	+11.3			+11.9	+13.3	
Ross 614	6	26.8	-2	46	4.12	0.99	+24	M7V	?		+11.07	+14.8			+13.1	+16.8	
BD-12°4523	16	27.5	-12	32	4.20	1.18	-13	M5V			+10.12				+12.1		
Wolf 424	12	30.9	+9	18	4.27	1.75	-5	M5.5V	M6V		+13.16	+13.4			+15.0	+15.2	
v. Maanen's Star	0	46.5	+5	9	4.31	2.95	+54	wd			+12.37				+14.3		
CD-37°15492	0	2.5	-37	36	4.44	6.08	+23	M3V			+8.63				+10.4		
Luyten 1159-16	1	57.4	+12	51	4.52	2.08		M8V			+12.27				+13.9		
BD+50°1725	10	8.3	+49	52	4.61	1.45	-26	K7V			+6.59				+8.3		
CD-46°11540	17	24.9	-46	51	4.63	1.13		M4V			+9.36				+11.0		
CD-49°13515	21	30.2	-49	13	4.67	0.81	+8	M3V			+8.67				+10.3		
CD-44°11909	17	33.5	-44	17	4.69	1.16		M5V			+11.2				+12.8		
BD+68°946	17	36.7	+68	23	4.69	1.33	-22	M3.5V			+9.15				+10.8		
G158-27	0	4.2	-7	48	4.72	2.06		MV			+13.7				+15.3		
G208-44/45	19	53.3	+44	17	4.76	0.75		MV	MV		+13.4	+14.0			+15.0	+15.6	
Ross 780	22	50.6	-14	31	4.78	1.16	+9	M5V			+10.7				+11.8		
40 Eridani	4	13.0	-7	44	4.83	4.08	-43	K0V	wd	M4.5V	+4.43	+9.53	+11.17		+6.0	+11.1	+12.7
Luyten 145-141	11	43.0	-64	33	4.85	2.68		wd			+11.44				+13.0		
BD+20°2465	10	16.9	+20	7	4.93	0.49	+11	M4.5V			+9.43				+11.0		
70 Ophiuchi	18	2.9	+2	31	4.93	1.13	-7	K1V	K5V		+4.2	+6.0			+5.7	+7.5	
BD+43°4305	22	44.7	+44	5	5.00	0.83	-2	M4.5V			+10.2				+11.7		

*Proxima Centauri is sometimes considered an outlying member of the α Centauri system. Adapted from data supplied by the U.S. Naval Observatory.

THE TWENTY BRIGHTEST STARS

STAR	RIGHT ASCENSION (1950)		DECLINATION (1950)	DISTANCE* (pc)	PROPER MOTION	SPECTRA OF COMPONENTS			VISUAL MAGNITUDES OF COMPONENTS			ABSOLUTE VISUAL MAGNITUDES OF COMPONENTS			
	h	m				A	B	C	A	B	C	A	B	c	
Sirius	6	42.9	-16	39	2.7	1.33	A1V	wd		-1.46	+ 8.7		+ 1.4	+11.6	
Canopus	6	22.8	-5.2	40	30	0.02	F0 Ib-II			-0.72			-3.1		
α Centauri	14	36.2	-6.0	38	1.3	3.68	G2V	K0V		-0.01	+ 1.3		+4.4	+5.7	
Arcturus	14	13.4	+ 19	27	11	2.28	K2IIp			0.06			-0.3		
Vega	18	35.2	+ 38	44	8.0	0.34	A0V			+0.04			+ 0.5		
Capella	5	13.0	+ 45	57	14	0.44	GIII	M1V	M5V	+0.05	+ 10.2	+ 13.7	-0.7	+9.5	+13
Rigel	5	12.1	- 8	15	250	0.00	B8 Ia	B9		+0.14	+6.6		-6.8	0.4	
Procyon	7	36.7	+ 5	21	3.5	1.25	F5IV-V	wd		+0.37	+ 10.7		+2.6	+ 13.0	
Betelgeuse	5	52.5	+ 7	24	150	0.03	M2Iab			+0.41v			-5.5		
Achernar	1	35.9	-5.7	29	20	0.10	B5V			+0.51			-1.0		
β Centauri	14	00.3	-6.0	08	90	0.04	B1III	?		+0.63	+ 4		-4.1	-0.8	
Altair	19	48.3	+ 8	44	5.1	0.66	A7IV-V			+0.77			+ 2.2		
α Crucis	12	23.8	-6.2	49	120	0.04	B1V	B3		+1.39	+ 1.9		-4.0	-3.5	
Aldebaran	4	33.0	+ 16	25	16	0.20	K5III	M2V		+0.86	+ 13		-0.2	+ 12	
Spica	13	22.6	- 10	54	80	0.05	B1V			+0.91v			-3.6		
Antares	16	26.3	-2.6	19	120	0.03	MIIb	B4eV		+0.92v	+ 5.1		-4.5	-0.3	
Pollux	7	42.3	+ 28	09	12	0.62	K0III			+1.16			+0.8		
Fomalhaut	22	54.9	-2.9	53	7.0	0.37	A3V	K4V		+1.19	+ 6.5		+ 2.0	17.3	
Deneb	20	39.7	+ 45	06	430	0.00	A2Ia			+1.26			-6.9		
β Crucis	12	44.8	-5.9	24	150	0.05	B0.5IV			+1.28v			-4.6		

*Distances of the more remote stars have been estimated from their spectral types and apparent magnitudes, and are only approximate.

Note: Several of the components listed are themselves spectroscopic binaries. A "v" after a magnitude denotes that the star is variable, in which case the magnitude at median light is given. A "p" after a spectral type indicates that the spectrum is peculiar. An "e" after a spectral type indicates that emission lines are present. When the luminosity classification is rather uncertain, a range is given.

THE MESSIER CATALOGUE OF NEBULAE AND STAR CLUSTERS

M	NGC or (IC)	RIGHT ASCENSION (1980)		DECLI- NATION (1980)		APPARENT VISUAL MAGNITUDE	DESCRIPTION
		h	m	°	'		
1	1952	5	33.3	+22	01	8.4	"Crab" nebulae in Taurus; remains of SN 1054
2	7089	21	32.4	-0	54	6.4	Globular cluster in Aquarius
3	5272	13	41.2	+28	29	6.3	Globular cluster in Canes Venatici
4	6121	16	22.4	-26	28	6.5	Globular cluster in Scorpio
5	5904	15	17.5	+2	10	6.1	Globular cluster in Serpens
6	6405	17	38.8	-32	11	5.5	Open cluster in Scorpio
7	6475	17	52.7	-34	48	3.3	Open cluster in Scorpio
8	6523	18	02.4	-24	23	5.1	"Lagoon" nebula in Sagittarius
9	6333	17	18.1	-18	30	8.0	Globular cluster in Ophiuchus
10	6254	16	56.1	-4	05	6.7	Globular cluster in Ophiuchus
11	6705	18	50.0	-6	18	6.8	Open cluster in Scutum Sobieskii
12	6218	16	46.3	-1	55	6.6	Globular cluster in Ophiuchus
13	6205	16	41.0	+36	30	5.9	Globular cluster in Hercules
14	6402	17	36.6	-3	14	8.0	Globular cluster in Ophiuchus
15	7078	21	28.9	+12	05	6.4	Globular cluster in Pegasus
16	6611	18	17.8	-13	47	6.6	Open cluster with nebulosity in Serpens
17	6618	18	19.6	-16	11	7.5	"Swan" or "Omega" nebula in Sagittarius
18	6613	18	18.7	-17	08	7.2	Open cluster in Sagittarius
19	6273	17	01.4	-26	14	6.9	Globular cluster in Ophiuchus
20	6514	18	01.2	-23	02	8.5	"Trifid" nebula in Sagittarius
21	6531	18	03.4	-22	30	6.5	Open cluster in Sagittarius
22	6656	18	35.2	-23	56	5.6	Globular cluster in Sagittarius
23	6494	17	55.8	-19	00	5.9	Open cluster in Sagittarius
24	6603	18	17.3	-18	26	4.6	Open cluster in Sagittarius
25	(4725)	18	30.5	-19	16	6.2	Open cluster in Sagittarius
26	6694	18	44.1	-9	25	9.3	Open cluster in Scutum Sobieskii
27	6853	19	58.8	+22	40	8.2	"Dumbbell" planetary nebula in Vulpecula
28	6626	18	23.2	-24	52	7.6	Globular cluster in Sagittarius
29	6913	20	23.3	+38	27	8.0	Open cluster in Cygnus
30	7099	21	39.2	-23	16	7.7	Globular cluster in Capricornus
31	224	0	41.6	+41	10	3.5	Andromeda galaxy
32	221	0	41.6	+40	46	8.2	Elliptical galaxy; companion to M31
33	598	1	32.7	+30	33	5.8	Spiral galaxy in Triangulum
34	1039	2	40.7	+42	43	5.8	Open cluster in Perseus
35	2168	6	07.5	+24	21	5.6	Open cluster in Gemini
36	1960	5	35.0	+34	05	6.5	Open cluster in Auriga
37	2099	5	51.1	+32	33	6.2	Open cluster in Auriga
38-	1912	5	27.3	+35	48	7.0	Open cluster in Auriga
39	7092	21	31.5	+48	21	5.3	Open cluster in Cygnus
40		12	21	+59			Close double star in Ursa Major

Table continues on next page.

THE MESSIER CATALOGUE OF NEBULAE AND STAR CLUSTERS (Continued)

M	NGC or (IC)	RIGHT ASCENSION (1980)		DECLI- NATION (1980)		APPARENT VISUAL MAGNITUDE	DESCR IPTION
		h	in				
41	2287	6	46.2	- 20	43	5.0	Loose open cluster in Canis Major
42	1976	5	34.4	- 5	24	4	Orion nebula
43	1982	5	34.6	- 5	18	9	Northeast portion of Orion nebula
44	2632	8	3.9	+ 20	04	3.9	Praesepe ; open cluster in Cancer
45		3	46.3	+ 24	03	1.6	The Pleades ; open cluster in Taurus
46	2437	7	40.9	- 14	46	6.6	Open cluser in Puppis
47	2422	7	35.7	- 14	26	5	Loose group of stars in Puppis
4x	2548	8	12.8	- 5	44	6	"Cluster of very small stars";
49	4472	12	28.8	+ 8	06	8.5	Elliptical galaxy in Virgo
50	2323	7	02.0	- 8	19	6.3	Loose open cluser in Monoceros
51	5194	13	29.1	+ 47	18	8.4	"Whirlpool" spiral galaxy in Canes Venatici
52	7654	23	23.3	+ 61	30	8.2	Loose open cluster in Cassiopeia
53	5024	13	12.0	+ 18	16	7.8	Globular cluster in Coma Berenices
54	6715	18	53.x	- 30	30	7.8	Globular cluster in Sagittarius
55	6809	19	38.7	- 30	59	6.2	Globular cluster in Sagittarius
56	6779	19	15.8	+ 30	08	8.7	Globular cluster in Lyra
57	6720	18	52.x	+ 33	00	9.0	" Ring " nebula; planetary nebula in Lyra
58	4579	12	36.7	+ 11	55	9.9	Spiral galaxy in Virgo
59	4621	12	41.0	- 11	46	10.0	Spiral galaxy in Virgo
60	4649	12	42.6	+ 11	40	9.0	Elliptical galaxy in Virgo
61	4303	12	20.8	+ 4	35	9.6	Spiral galaxy in Virgo
62	6266	16	59.9	- 30	05	6.6	Globular cluser in Scorpio
63	5055	13	14.8	+ 42	07	8.9	Spiral galaxy in Canes Venarici
64	4826	12	55.7	+ 21	39	8.5	Spiral galaxy in Coma Berenices
65	3623	11	17.9	+ 13	12	9.4	Spiral galaxy in Leo
66	3627	11	19.2	+ 13	06	9.0	Spiral galaxy in Leo, companion to M65
67	26x2	8	50.0	+ 11	53	6.1	Open cluster in Cancer
68	4590	12	38.4	- 26	39	x.2	Globular cluster in Hydra
69	6637	18	30.1	- 32	23	8.0	Globular cluster in Sagittarius
70	6681	18	42.0	- 32	18	8.1	Globular cluster in Sagittarius
71	6838	19	52.8	+ 1x	44	7.6	Globular cluster in Sagitta
72	698.1	20	52.3	- 12	38	9.3	Globular cluser in Aquarius
73	6994	20	57.8	- 12	43	9.1	Open cluster in Aquarius
74	628	1	35.6	+ 15	41	9.3	Spiral galaxy in Pisces
75	6864	20	04.9	- 21	59	8.6	Globular cluster in Sagittarius
76	650	1	41.0	+ 51	28	11.4	Planetary nebula in Perseus
77	1068	2	41.6	- 0	04	x.9	Spiral galaxy in Cetus
78	2068	5	45.7	0	03	s.3	Small emission nebula in Orion
79	1904	5	23.3	- 24	32	7.5	Globular cluster in Lepus
80	6093	16	15.x	- 22	56	7.5	Globular cluster in Scorpi o

THE MESSIER CATALOGUE OF NEBULAE AND STAR CLUSTERS (Continued)

M	NGC or (IC)	RIGHT ASCENSION (1980)		DECLI- NATION (1980)		APPARENT VISUAL MAGNITUDE	DESCRIPTION
		h	m	°	'		
81	3031	9	54.2	+69	09	7.0	Spiral galaxy in Ursa Major
82	3034	9	54.4	+69	47	8.4	Irregular galaxy in Ursa Major
83	5236	13	35.4	-29	31	7.6	Spiral galaxy in Hydra
84	4374	12	24.1	+13	00	9.4	Elliptical galaxy in Virgo
85	4382	12	24.3	+18	18	9.3	Elliptical galaxy in Coma Berenices
86	4406	12	25.1	+13	03	9.2	Elliptical galaxy in Virgo
87	4486	12	29.7	+12	30	8.7	Elliptical galaxy in Virgo
88	4501	12	30.9	+14	32	9.5	Spiral galaxy in Coma Berenices
89	4552	12	34.6	+12	40	10.3	Elliptical galaxy in Virgo
90	4569	12	35.8	+13	16	9.6	Spiral galaxy in Virgo
91	omitted						
92	6341	17	16.5	+43	10	6.4	Globular cluster in Hercules
93	2447	7	43.7	-23	49	6.5	Open cluster in Puppis
94	4736	12	50.0	+41	14	8.3	Spiral galaxy in Canes Venatici
95	3351	10	42.9	+11	49	9.8	Barred spiral galaxy in Leo
96	3368	10	45.7	+11	56	9.3	Spiral galaxy in Leo
97	3587	11	13.7	+55	07	11.1	"Owl" nebula; planetary nebula in Ursa Major
98	4192	12	12.7	+15	01	10.2	Spiral galaxy in Coma Berenices
99	4254	12	17.8	+14	32	9.9	Spiral galaxy in Coma Berenices
100	4321	12	21.9	+15	56	9.4	Spiral galaxy in Coma Berenices
101	5457	14	02.5	+54	27	7.9	Spiral galaxy in Ursa Major
102	5866(?)	15	05.9	+55	50	10.5	Spiral galaxy (identification as M102 in doubt)
103	581	1	31.9	+60	35	6.9	Open cluster in Cassiopeia
104*	4594	12	39.0	-11	31	8.3	Spiral galaxy in Virgo
105*	3379	10	46.8	+12	51	9.7	Elliptical galaxy in Leo
106*	4258	12	18.0	+47	25	8.4	Spiral galaxy in Canes Venatici
107*	6171	16	31.4	-13	01	9.2	Globular cluster in Ophiuchus
108*	3556	11	10.5	+55	47	10.5	Spiral galaxy in Ursa Major
109*	3992	11	56.6	+53	29	10.0	Spiral galaxy in Ursa Major
110*	205	0	39.2	+41	35	9.4	Elliptical galaxy (companion to M31)

*Not in Messier's original (1781) list; added later by others.