

Astronomical and Physical Constants

Astronomical Constants		
Solar mass	$1 M_{\odot}$	$= 1.9891 \times 10^{30} \text{ kg}$
Solar irradiance	S	$= 1.365(2) \times 10^3 \text{ W m}^{-2}$
Solar luminosity	$1 L_{\odot}$	$= 3.839(5) \times 10^{26} \text{ W}$
Solar radius	$1 R_{\odot}$	$= 6.95508(26) \times 10^8 \text{ m}$
Solar effective temperature	$T_{e,\odot}$	$\equiv L_{\odot}/(4\pi\sigma R_{\odot}^2)^{1/4}$ $= 5777(2) \text{ K}$
Solar absolute bolometric magnitude	M_{bol}	$= 4.74$
Solar apparent bolometric magnitude	m_{bol}	$= -26.83$
Solar apparent ultraviolet magnitude	U	$= -25.91$
Solar apparent blue magnitude	B	$= -26.10$
Solar apparent visual magnitude	V	$= -26.75$
Solar bolometric correction	BC	$= -0.08$
Earth mass	$1 M_{\oplus}$	$= 5.9736 \times 10^{24} \text{ kg}$
Earth radius (equatorial)	$1 R_{\oplus}$	$= 6.378136 \times 10^6 \text{ m}$
Astronomical unit	1 AU	$= 1.4959787066 \times 10^{11} \text{ m}$
Light (Julian) year	1 ly	$= 9.460730472 \times 10^{15} \text{ m}$
Parsec	1 pc	$= 206264.806 \text{ AU}$ $= 3.0856776 \times 10^{16} \text{ m}$ $= 3.2615638 \text{ ly (Julian)}$
Sidereal day		$= 23^{\text{h}}56^{\text{m}}04.0905309^{\text{s}}$
Solar day		$= 86400 \text{ s}$
Sidereal year		$= 3.15581450 \times 10^7 \text{ s}$ $= 365.256308 \text{ d}$
Tropical year		$= 3.155692519 \times 10^7 \text{ s}$ $= 365.2421897 \text{ d}$
Julian year		$\equiv 3.1557600 \times 10^7 \text{ s}$ $\equiv 365.25 \text{ d}$
Gregorian year		$\equiv 3.1556952 \times 10^7 \text{ s}$ $\equiv 365.2425 \text{ d}$

Note: Uncertainties in the last digits are indicated in parentheses. For instance, the solar radius, $1 R_{\odot}$, has an uncertainty of $\pm 0.00026 \times 10^8 \text{ m}$.

Astronomical and Physical Constants

Physical Constants			
Gravitational constant	G	$=$	$6.673(10) \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
Speed of light (exact)	c	\equiv	$2.99792458 \times 10^8 \text{ m s}^{-1}$
Permeability of free space	μ_0	\equiv	$4\pi \times 10^{-7} \text{ N A}^{-2}$
Permittivity of free space	ϵ_0	\equiv	$1/\mu_0 c^2$ $= 8.854187817 \dots \times 10^{-12} \text{ F m}^{-1}$
Electric charge	e	$=$	$1.602176462(63) \times 10^{-19} \text{ C}$
Electron volt	1 eV	$=$	$1.602176462(63) \times 10^{-19} \text{ J}$
Planck's constant	h	$=$	$6.62606876(52) \times 10^{-34} \text{ J s}$ $= 4.13566727(16) \times 10^{-15} \text{ eV s}$
	\hbar	\equiv	$h/2\pi$ $= 1.054571596(82) \times 10^{-34} \text{ J s}$ $= 6.58211889(26) \times 10^{-16} \text{ eV s}$
Planck's constant \times speed of light	hc	$=$	$1.23984186(16) \times 10^3 \text{ eV nm}$ $\simeq 1240 \text{ eV nm}$
Boltzmann's constant	k	$=$	$1.3806503(24) \times 10^{-23} \text{ J K}^{-1}$ $= 8.6173423(153) \times 10^{-5} \text{ eV K}^{-1}$
Stefan–Boltzmann constant	σ	\equiv	$2\pi^5 k^4 / (15c^2 h^3)$ $= 5.670400(40) \times 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$
Radiation constant	a	$=$	$4\sigma/c$ $= 7.565767(54) \times 10^{-16} \text{ J m}^{-3} \text{ K}^{-4}$
Atomic mass unit	1 u	$=$	$1.66053873(13) \times 10^{-27} \text{ kg}$ $= 931.494013(37) \text{ MeV}/c^2$
Electron mass	m_e	$=$	$9.10938188(72) \times 10^{-31} \text{ kg}$ $= 5.485799110(12) \times 10^{-4} \text{ u}$
Proton mass	m_p	$=$	$1.67262158(13) \times 10^{-27} \text{ kg}$ $= 1.00727646688(13) \text{ u}$
Neutron mass	m_n	$=$	$1.67492716(13) \times 10^{-27} \text{ kg}$ $= 1.00866491578(55) \text{ u}$
Hydrogen mass	m_H	$=$	$1.673532499(13) \times 10^{-27} \text{ kg}$ $= 1.00782503214(35) \text{ u}$
Avogadro's number	N_A	$=$	$6.02214199(47) \times 10^{23} \text{ mol}^{-1}$
Gas constant	R	$=$	$8.314472(15) \text{ J mol}^{-1} \text{ K}^{-1}$
Bohr radius	$a_{0,\infty}$	\equiv	$4\pi\epsilon_0 \hbar^2 / m_e e^2$ $= 5.291772083(19) \times 10^{-11} \text{ m}$
	$a_{0,H}$	\equiv	$(m_e/\mu)a_{0,\infty}$ $= 5.294654075(20) \times 10^{-11} \text{ m}$
Rydberg constant	R_∞	\equiv	$m_e e^4 / 64\pi^3 \epsilon_0^2 \hbar^3 c$ $= 1.0973731568549(83) \times 10^7 \text{ m}^{-1}$
	R_H	\equiv	$(\mu/m_e)R_\infty$ $= 1.09677583(13) \times 10^7 \text{ m}^{-1}$

Note: Uncertainties in the last digits are indicated in parentheses. For instance, the universal gravitational constant, G , has an uncertainty of $\pm 0.010 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$.

Solar System Data

Planetary Physical Data						
Planet	Mass ^a (M_{\oplus})	Equatorial Radius ^b (R_{\oplus})	Average Density (kg m^{-3})	Sidereal Rotation Period (d)	Oblateness ($R_e - R_p$)/ R_e	Bond Albedo
Mercury	0.05528	0.3825	5427	58.6462	0.00000	0.119
Venus	0.81500	0.9488	5243	243.018	0.00000	0.750
Earth	1.00000	1.0000	5515	0.997271	0.0033396	0.306
Mars	0.10745	0.5326	3933	1.02596	0.006476	0.250
Jupiter	317.83	11.209	1326	0.4135	0.064874	0.343
Saturn	95.159	9.4492	687	0.4438	0.097962	0.342
Uranus	14.536	4.0073	1270	0.7183	0.022927	0.300
Neptune	17.147	3.8826	1638	0.6713	0.017081	0.290
Pluto	0.0021	0.178	2110	6.3872	0.0000	0.4 – 0.6
2003 UB313	0.002?	0.188	2100?			0.6?

Planetary Orbital and Satellite Data						
Planet	Semimajor Axis (AU)	Orbital Eccentricity	Sidereal Orbital Period (yr)	Orbital Inclination to Ecliptic (°)	Equatorial Inclination to Orbit (°)	Number Natural Satellites
Mercury	0.3871	0.2056	0.2408	7.00	0.01	0
Venus	0.7233	0.0067	0.6152	3.39	177.36	0
Earth	1.0000	0.0167	1.0000	0.000	23.45	1
Mars	1.5236	0.0935	1.8808	1.850	25.19	2
Jupiter	5.2044	0.0489	11.8618	1.304	3.13	63
Saturn	9.5826	0.0565	29.4567	2.485	26.73	47
Uranus	19.2012	0.0457	84.0107	0.772	97.77	27
Neptune	30.0476	0.0113	164.79	1.769	28.32	13
Pluto	39.4817	0.2488	247.68	17.16	122.53	3
2003 UB313	67.89	0.4378	559	43.99		1

^a $M_{\oplus} = 5.9736 \times 10^{24}$ kg

^b $R_{\oplus} = 6.378136 \times 10^6$ m

Solar System Data

Data of Selected Major Satellites						
Satellite	Parent Planet	Mass (10^{22} kg)	Radius (10^3 km)	Density (kg m^{-3})	Orbital Period (d)	Semimajor Axis (10^3 km)
Moon	Earth	7.349	1.7371	3350	27.322	384.4
Io	Jupiter	8.932	1.8216	3530	1.769	421.6
Europa	Jupiter	4.800	1.5608	3010	3.551	670.9
Ganymede	Jupiter	14.819	2.6312	1940	7.155	1070.4
Callisto	Jupiter	10.759	2.4103	1830	16.689	1882.7
Titan	Saturn	13.455	2.575	1881	15.945	1221.8
Triton	Neptune	2.14	1.3534	2050	5.877	354.8

The Constellations

Latin Name	Genitive	Abbrev.	Translation	R. A. h	Dec. deg
Andromeda	Andromedae	And	Princess of Ethiopia	1	+40
Antlia	Antliae	Ant	Air Pump	10	-35
Apus	Apodis	Aps	Bird of Paradise	16	-75
Aquarius	Aquarii	Aqr	Water Bearer	23	-15
Aquila	Aquilae	Aql	Eagle	20	+5
Ara	Arae	Ara	Altar	17	-55
Aries	Arietis	Ari	Ram	3	+20
Auriga	Aurigae	Aur	Charioteer	6	+40
Boötes	Boötis	Boo	Herdsman	15	+30
Caelum	Caeli	Cae	Chisel	5	-40
Camelopardalis	Camelopardis	Cam	Giraffe	6	+70
Cancer	Cancri	Cnc	Crab	9	+20
Canes Venatici	Canum Venaticorum	CVn	Hunting Dogs	13	+40
Canis Major	Canis Majoris	CMa	Big Dog	7	-20
Canis Minor	Canis Minoris	CMi	Little Dog	8	+5
Capricornus	Capricorni	Cap	Goat	21	-20
Carina	Carinae	Car	Ship's Keel	9	-60
Cassiopeia	Cassiopeiae	Cas	Queen of Ethiopia	1	+60
Centaurus	Centauri	Cen	Centaur	13	-50
Cepheus	Cephei	Cep	King of Ethiopia	22	+70
Cetus	Ceti	Cet	Sea Monster (whale)	2	-10
Chamaeleon	Chamaeleontis	Cha	Chameleon	11	-80
Circinus	Circini	Cir	Compass	15	-60
Columba	Columbae	Col	Dove	6	-35
Coma Berenices	Comae Berenices	Com	Berenice's Hair	13	+20
Corona Australis	Coronae Australis	CrA	Southern Crown	19	-40
Corona Borealis	Coronae Borealis	CrB	Northern Crown	16	+30
Corvus	Corvi	Crv	Crow	12	-20
Crater	Crateris	Crt	Cup	11	-15
Crux	Crucis	Cru	Southern Cross	12	-60
Cygnus	Cygni	Cyg	Swan	21	+40
Delphinus	Delphini	Del	Dolphin, Porpoise	21	+10
Dorado	Doradus	Dor	Swordfish	5	-65
Draco	Draconis	Dra	Dragon	17	+65
Equuleus	Equulei	Equ	Little Horse	21	+10
Eridanus	Eridani	Eri	River Eridanus	3	-20
Fornax	Fornacis	For	Furnace	3	-30
Gemini	Geminorum	Gem	Twins	7	+20
Grus	Gruis	Gru	Crane	22	-45
Hercules	Herculis	Her	Son of Zeus	17	+30

The Constellations

Latin Name	Genitive	Abbrev.	Translation	R. A. h	Dec. deg
Horologium	Horologii	Hor	Clock	3	-60
Hydra	Hydrae	Hya	Water Snake	10	-20
Hydrus	Hydri	Hyi	Sea Serpent	2	-75
Indus	Indi	Ind	Indian	21	-55
Lacerta	Lacertae	Lac	Lizard	22	+45
Leo	Leonis	Leo	Lion	11	+15
Leo Minor	Leonis Minoris	LMi	Little Lion	10	+35
Lepus	Leporis	Lep	Hare	6	-20
Libra	Librae	Lib	Balance, Scales	15	-15
Lupus	Lupi	Lup	Wolf	15	-45
Lynx	Lyncis	Lyn	Lynx	8	+45
Lyra	Lyrae	Lyr	Lyre, Harp	19	+40
Mensa	Mensae	Men	Table, Mountain	5	-80
Microscopium	Microscopii	Mic	Microscope	21	-35
Monoceros	Monocerotis	Mon	Unicorn	7	-5
Musca	Muscae	Mus	Fly	12	-70
Norma	Normae	Nor	Square, Level	16	-50
Octans	Octantis	Oct	Octant	22	-85
Ophiuchus	Ophiuchi	Oph	Serpent-bearer	17	0
Orion	Orionis	Ori	Hunter	5	+5
Pavo	Pavonis	Pav	Peacock	20	-65
Pegasus	Pegasi	Peg	Winged Horse	22	+20
Perseus	Persei	Per	Rescuer of Andromeda	3	+45
Phoenix	Phoenicis	Phe	Phoenix	1	-50
Pictor	Pictoris	Pic	Painter, Easel	6	-55
Pisces	Piscium	Psc	Fish	1	+15
Piscis Austrinus	Piscis Austrini	PsA	Southern Fish	22	-30
Puppis	Puppis	Pup	Ship's Stern	8	-40
Pyxis	Pyxidis	Pyx	Ship's Compass	9	-30
Reticulum	Reticuli	Ret	Net	4	-60
Sagitta	Sagittae	Sge	Arrow	20	+10
Sagittarius	Sagittarii	Sgr	Archer	19	-25
Scorpius	Scorpii	Sco	Scorpion	17	-40
Sculptor	Sculptoris	Scl	Sculptor	0	-30
Scutum	Scuti	Sct	Shield	19	-10
Serpens	Serpentis	Ser	Serpent	17	0
Sextans	Sextantis	Sex	Sextant	10	0
Taurus	Tauri	Tau	Bull	4	+15
Telescopium	Telescopii	Tel	Telescope	19	-50
Triangulum	Trianguli	Tri	Triangle	2	+30
Triangulum Australe	Trianguli Australis	TrA	Southern Triangle	16	-65
Tucana	Tucanae	Tuc	Toucan	0	-65
Ursa Major	Ursae Majoris	UMa	Big Bear	11	+50
Ursa Minor	Ursae Minoris	UMi	Little Bear	15	+70
Vela	Velorum	Vel	Ship's Sai	9	-50
Virgo	Virginis	Vir	Maiden, Virgin	13	0
Volans	Volantis	Vol	Flying Fish	8	-70
Vulpecula	Vulpeculae	Vul	Little Fox	20	+25

The Brightest Stars

Name	Star	Spectral Class		V^a		M_V	
		A	B	A	B	A	B
Sirius	α CMa	A1 V	wd ^b	-1.44	+8.7	+1.45	+11.6
Canopus	α Car	F0 Ib		-0.62		-5.53	
Arcturus	α Boo	K2 II Ip		-0.05		-0.31	
Rigel Kentaurus	α Cen	G2 V	K0 V	-0.01	+1.3	+4.34	+5.7
Vega	α Lyr	A0 V		+0.03		+0.58	
Capella ^c	α Aur	M1 III	M1 V	+0.08	+10.2	-0.48	+9.5
Rigel	β Ori	B8 Ia	B9	+0.18	+6.6	-6.69	-0.4
Procyon	α CMi	F5 IV-V	wd ^b	+0.40	+10.7	+2.68	+13.0
Betelgeuse	α Ori	M2Ib		+0.45v		-5.14	
Achernar	α Eri	B3 Vp		+0.45		-2.77	
Hadar	β Cen	B1 III	?	+0.61	+4	-5.42	-0.8
Altair	α Aql	A7 IV-V		+0.76		+2.20	
Acrux	α Cru	B0.5 IV	B3	+0.77	+1.9	-4.19	-3.5
Aldebaran	α Tau	K5 III	M2V	+0.87	+13	-0.63	+12
Spica	α Vir	B1 V		+0.98v		-3.55	
Antares	α Sco	M1 Ib	B4eV	+1.06v	+5.1	-5.58	-0.3
Pollux	β Gem	K0 III		+1.16		+1.09	
Fomalhaut	α PsA	A3 V	K4V	+1.17	+6.5	+1.74	+7.3
Deneb	α Cyg	A2 Ia		+1.25		-8.73	
Mimosa	β Cru	B0.5 III	B2 V	+1.25v		-3.92	

^a Values labeled v designate variable stars.

^b wd represents a white dwarf star.

^c Capella has a third member of spectral class M5 V, $V = +13.7$, and $M_V = +13$.

The Brightest Stars

Name	R. A. ^a (h m s)	Dec. ^a (° ' ")	Parallax ^b (")	Distance ^c (pc)	Proper Motion ^d ('' yr ⁻¹)	Radial Velocity (km s ⁻¹)
Sirius	06 45 08.92	-16 41 58.0	0.37921(158)	2.64	1.33942	-7.7
Canopus	06 23 57.11	-52 41 44.4	0.01043(53)	95.88	0.03098	+20.5
Arcturus	14 15 39.67	+19 10 56.7	0.08885(74)	11.26	2.27887	-5.2
Rigel Kentaurus	14 39 36.50	-60 50 02.3	0.74212(140)	1.35	3.70962	-24.6
Vega	18 36 56.34	+38 47 01.3	0.12893(55)	7.76	0.35077	-13.9
Capella	05 16 41.36	+45 59 52.8	0.07729(89)	12.94	0.43375	+30.2
Rigel	05 14 32.27	-08 12 05.9	0.00422(81)	237	0.00195	+20.7
Procyon	07 39 18.12	+05 13 30.0	0.28593(88)	3.50	1.25850	-3.2
Betelgeuse	05 55 10.31	+07 24 25.4	0.00763(164)	131	0.02941	+21.0
Achernar	01 37 42.85	-57 14 12.3	0.02268(57)	44.09	0.09672	+19
Hadar	14 03 49.40	-60 22 22.9	0.00621(56)	161	0.04221	-12
Altair	19 50 47.0	+08 52 06.0	0.19444(94)	5.14	0.66092	-26.3
Acrux	12 26 35.90	-63 05 56.7	0.01017(67)	98.33	0.03831	-11.2
Aldebaran	04 35 55.24	+16 30 33.5	0.05009(95)	19.96	0.19950	+54.1
Spica	13 25 11.58	-11 09 40.8	0.01244(86)	80.39	0.05304	+1.0
Antares	16 29 24.46	-26 25 55.2	0.00540(168)	185	0.02534	-3.2
Pollux	07 45 18.95	+28 01 34.3	0.09674(87)	10.34	0.62737	+3.3
Fomalhaut	22 57 39.05	-29 37 20.1	0.13008(92)	7.69	0.36790	+6.5
Deneb	20 41 25.91	+45 16 49.2	0.00101(57)	990	0.00220	-4.6
Mimosa	12 47 43.26	-59 41 19.5	0.00925(61)	108	0.04991	+10.3

^a Right ascension and declination are given in epoch J2000.0.

^b Parallax data are from the Hipparcos Space Astrometry Mission. Uncertainties are in parentheses; for instance, the parallax of Sirius is $0.37921'' \pm 0.00158''$.

^c Distance was calculated from the parallax measurement.

^d Proper motion data are from the Hipparcos Space Astrometry Mission.

The Nearest Stars

Name	HIP ^a	Spectral Class	V^b	M_V	$B - V$	Parallax ^c (")	Distance ^d (pc)
Proxima Centauri (α Cen C)	70890	M5 Ve	11.01	15.45	+1.81	0.77233(242)	1.29
α Cen B	71681	K1 V	1.35	5.70	+0.88	0.74212(140)	1.35
α Cen A	71683	G2 V	-0.01	4.34	+0.71	0.74212(140)	1.35
Barnard's Star	87937	M5 V	9.54	13.24	+1.57	0.54901(158)	1.82
Gl 411	54035	M2 Ve	7.49	10.46	+1.50	0.39240(91)	2.55
Sirius A (α CMa)	32349	A1 V	-1.44	1.45	+0.01	0.37921(158)	2.64
Sirius B (α CMa)		wd (DA)	8.44	11.33	-0.03	0.37921(158) ^e	2.64 ^e
Gl 729	92403	M4.5 Ve	10.37	13.00	+1.51	0.33648(182)	2.97
ϵ Eri	16537	K2 V	3.72	6.18	+0.88	0.31075(85)	3.22
Gl 887	114046	M2 Ve	7.35	9.76	+1.48	0.30390(87)	3.29
Ross 128 (Gl 447)	57548	M4.5 V	11.12	13.50	+1.75	0.29958(220)	3.34
δ 1 Cyg A (Gl 820)	104214	K5 Ve	5.20	7.49	+1.07	0.28713(151)	3.48
Procyon A (α CMi)	37279	F5 IV-V	0.40	2.68	+0.43	0.28593(88)	3.50
Procyon B (α CMi)		wd	10.7	13.0	+0.00	0.28593(88) ^e	3.50 ^e
δ 1 Cyg B (Gl 820B)	104217	K7 Ve	6.05	8.33	+1.31	0.28542(72)	3.50
Gl 725B	91772	M5 V	9.70	11.97	+1.56	0.28448(501)	3.52
Gl 725A	91768	M4 V	8.94	11.18	+1.50	0.28028(257)	3.57
GX And	1475	M2 V	8.09	10.33	+1.56	0.28027(105)	3.57
ϵ Ind	108870	K5 Ve	4.69	6.89	+1.06	0.27576(69)	3.63
τ Cet	8102	G8 Vp	3.49	5.68	+0.73	0.27417(80)	3.65
Gl 54.1	5643	M5.5 Ve	12.10	14.25	+1.85	0.26905(757)	3.72
Luyten's Star (Gl 237)	36208	M3.5	9.84	11.94	+1.57	0.26326(143)	3.80
Kapteyn's Star	24186	M0 V	8.86	10.89	+1.55	0.25526(86)	3.92
AX Mic	105090	M0 Ve	6.69	8.71	+1.40	0.25337(113)	3.95
Kruger 60	110893	M2 V	9.59	11.58	+1.61	0.24952(303)	4.01
Ross 614 (GL 234A)	30920	M4.5 Ve	11.12	13.05	+1.69	0.24289(264)	4.12

^a HIP designates the Hipparcos catalog number.

^b Values labeled v designate variable stars.

^c Parallax data are from the Hipparcos Space Astrometry Mission. Uncertainties are in parentheses; for instance, the parallax of Proxima Centauri is $0.77233'' \pm 0.00242''$.

^d Distances were calculated from the Hipparcos parallax data.

^e Parallax and distance taken to be that of bright companion.

The Nearest Stars

Name	R. A. ^a		Proper Motion		Radial Velocity	
	(h m s)	(^o ' ")	R. A. ^b (" yr ⁻¹)	dec. ^b (" yr ⁻¹)	(km s ⁻¹)	(km s ⁻¹)
Proxima Centauri	14 29 42.95	-62 40 46.1	-3.77564(152)		0.76816(182)	-33.4
α Cen B	14 39 35.08	-60 50 13.8	-3.60035(2610)		0.95211(1975)	-23.4
α Cen A	14 39 36.50	-60 50 02.3	-3.67819(151)		0.48184(124)	-23.4
Barnard's Star	17 57 48.50	+04 41 36.2	-0.79784(161)		10.32693(129)	-112.3
Gl 411	11 03 20.19	+35 58 11.6	-0.58020(77)		-4.76709(77)	-85.
Sirius A	06 45 08.92	-16 41 58.0	-0.54601(133)		-1.22308(124)	-7.7
Gl 729	18 49 49.36	-23 50 10.4	0.63755(222)		-0.19247(145)	-7.0
ϵ Eri	03 32 55.84	-09 27 29.7	-0.97644(98)		0.01797(91)	+13.
Gl 887	23 05 52.04	-35 51 11.1	6.76726(70)		1.32666(74)	-6.4
Ross 128	11 47 44.40	+00 48 16.4	0.60562(214)		-1.21923(186)	-31.
61 Cyg A	21 06 53.94	+38 44 57.9	4.15510(95)		3.25890(119)	-65.
Procyon A	07 39 18.12	+05 13 30.0	-0.71657(88)		-1.03458(38)	-3.2
61 Cyg B	21 06 55.26	+38 44 31.4	4.10740(43)		3.14372(59)	-65.
Gl 725B	18 42 46.90	+59 37 36.6	-1.39320(1150)		1.84573(1202)	+1.
Gl 725A	18 42 46.69	+59 37 49.4	-1.32688(310)		1.80212(358)	-1.
GX And	00 18 22.89	+44 01 22.6	2.88892(75)		0.41058(63)	+13.5
ϵ Ind	22 03 21.66	-56 47 09.5	3.95997(55)		-2.53884(42)	-40.4
τ Cet	01 44 04.08	-15 56 14.9	-1.72182(83)		0.85407(80)	-16.4
Gl 54.1	01 12 30.64	-16 59 56.3	1.21009(521)		0.64695(391)	+37.0
Luyten's Star	07 27 24.50	+05 13 32.8	0.57127(141)		-3.69425(90)	+18.
Kapteyn's Star	05 11 40.58	-45 01 06.3	6.50605(95)		-5.73139(90)	+242.8
AX Mic	21 17 15.27	-38 52 02.5	-3.25900(128)		-1.14699(56)	+23.
Kruger 60	22 27 59.47	+57 41 45.1	-0.87023(300)		-0.47110(297)	-34.
Ross 614	06 29 23.40	-02 48 50.3	0.69473(300)		-0.61862(248)	+23.2

^a Right ascension and declination are given in epoch J2000.0.

^b Proper-motion data are from the Hipparcos Space Astrometry Mission. Uncertainties are in parentheses; for instance, the proper motion of Proxima Centauri in right ascension is $-3.77564'' \text{ yr}^{-1} \pm 0.00152'' \text{ yr}^{-1}$.