Cline Observatory Double Star List (2018)

Cline Observatory, Guilford Technical Community College, Jamestown, NC

Bayer	Name	Other Designations	RA (2000.0)	Dec (2000.0)	Dist (ly)	Sep (″)	PA	VMag A	VMag B	Spec Type A	Spec Type B	Colors	Season	Notes
η Cas	Achird	24 Cas HD 4614 HIP 3821 SAO 21732 WDS 00491+5749	$00^h\ 49^m\ 06.3^s$	+57° 48′ 54.7″	19.4	12	307	3.52	7.51	G0V	K7V	Haas: bright yellow with vivid little companion Mullaney: yellow/ruddy purple "Easter Egg Double" Smyth: pale white/purple Webb: yellowish/ashy	Fall (20 Dec)	Binary, 480 yr orbit ~70 AU apart
γ Ari	Mesarthim	5 Ari HD 11502/11503 HIP 8832 SAO 92680/92681 WDS 01535+1918	$01^h\ 53^m\ 31.8^s$	+19° 17′ 37.9″	164	7.8	0	4.52	4.70	B9V	A1pSi	Haas: radiant white pair Mullaney: bluish silver-white pair Smyth: bright white/pale grey Webb: v. white/yellow-white	Winter (3 Jan)	Binary, Period > 5000 yr
γ And	Almach	57 And HD 12533/12534 HIP 9640 SAO 37734/37735 WDS 02039+4220	$02^h\ 03^m\ 54.0^s$	+42° 19′ 47.0″	355	9.8	63	2.10	5.82	K3IIb	B9.5V/B9.5V	Haas: vivid citrus orange/whitish deep blue Mullaney: topaz-orange/sea green Smyth: orange/emerald green Webb: gold/blue	Winter (5 Jan)	B component is a v. close binary 13-52 AU apart
α UMi	Polaris	1 Umi HD 8890 HIP 11767 SAO 308 WDS 02318+8916	$02^h\ 31^m\ 49.09^s$	+89° 15′ 50.8″	430	18.4	218	2.02	8.20	F8Ib	F3V	Haas: amber yellow/ghostly Mullaney: XX Smyth: Topaz yellow/pale white Webb: yellow/white	All	Distance noted is from 2007 Hipparcos parallax analysis. 2012 Pulsation analysis & spectroscopic parallax yield d ~320 ly. Period ≥ 42,000 yr ≥ 2,400 AU apart
γ Cet	Kaffaljidhma	86 Cet HD 16970 HIP 12706 SAO 110707 WDS 02433+0314	$02^h\ 43^m\ 18.0^s$	+03° 14′ 08.9″	80	2.8	294	3.540	6.119	A2Vn	F4V	Haas: banana yellow/pale opal green Mullaney: yellow/olive Smyth: pale yellow/lucid blue Webb: yellowish/ash	Winter (13 Jan)	≥ 70 AU apart
η Per	Miram	15 Per HD 17506 HIP 13268 SAO 23655 WDS 02507+5554	$02^h\ 50^m\ 41.8^s$	+55° 53′ 43.8″	330	28.3	300	3.79	8.51	K3Ib-IIa	B9V	Haas: apricot orange/cobalt blue Mullaney: orange/blue Smyth: orange/smalt blue Webb: very yellow/very blue	Winter (15 Jan)	Likely Optical - no parallax for Component B, but proper motions are different. Component A is a spectroscopic binary
32 Eri		32 Eri HD 24555 HIP 18255 SAO 130806 WDS 03543-0257	$03^h\ 54^m\ 17.5^s$	−02° 57′ 17.0″	315	6.8	347	4.79	5.862	G8III	A1V	Haas: grapefruit orange/silvery blue Mullaney: yellow/blue-green …... Smyth: topaz yellow/sea green Webb: topaz/bright green	Winter (28 Jan)	
β Ori	Rigel	19 Ori HD 34085 HIP 24436 SAO 131907 WDS 05145-0812	$05^h\ 14^m\ 32.3^s$	−08° 12′ 05.9″	860	9.5	202	0.13	10.4	B8Iae	B9+B9	Haas: brilliant white with hint of violet/tiny speck Mullaney: blue-white/bluish Smyth: pale yellow/sapphire blue Webb: yellow-white/not specified	Winter (13 Feb)	Period 25,000 years ≥ 2,500 AU apart
145 CMa		No Flamsteed Number/145 CMa* HD 56577/56578 HIP 35210/35213 SAO 173349/ 173353 WDS 07166-2319 h3945	$07^h\ 16^m\ 36.8^s$	−23° 18′ 56.1″	1400 300	26.8	52	4.79	5.79	K4III	A5mA5-A9	Haas: bright citrus orange/royal blue Mullaney: orange/blue Smyth: None Webb: orange/blue	Winter (10 Mar)	Optical alignment h3945 - the "winter Albireo" *The 145 CMa is NOT a Flamsteed Number, but rather a Gould Number, from B. Gould's Urano-metria Argentina (1879).

Bayer	Name	Other Designations	RA (2000.0)	Dec (2000.0)	Dist (ly)	Sep (")	PA	VMag A	VMag B	Spec Type A	Spec Type B	Colors	Season	Notes
δ Gem	Wasat	55 Gem HD 56986 HIP 35550 SAO 79294 WDS 07201+2159	$07^h\ 20^m\ 37.4^s$	+21° 58′ 56.3″	60	6.8	211	3.518	8.18	F2VkF0mF0	K6V	Haas: amber yellow/ghostly speck Mullaney: yellow/reddish purple Smyth: bright white/pale white Webb: yellowish/purplish	Winter (10 Mar)	Pluto was discovered near this star in 1930. ~100 AU apart, with a 1200 year orbit.
α Gem	Castor	66 Gem HD 60179/60178 HIP 36850 SAO 60198 WDS 07346+3153	$07^h\ 34^m\ 37.6^s$	+31° 53′ 17.8″	51	2.2	171	1.93	2.97	A1.5IV	kA0hA2: mA1IVs	Haas: lemon-white pair Mullaney: blue-white pair Smyth: bright white/pale white Webb: greenish	Winter (13 Mar)	Average 104 AU apart. Dim 10^{th} magnitude C component 71" away. Actually a 6-star system since each star is a close binary.
ι Cnc		48 Cnc HD 74739/74738 HIP 43103/43100 SAO 80416/80415 WDS 08467+2846	$08^h\ 46^m\ 41.8^s$	+28° 45′ 35.6″	330 280	30	307	4.028	6.57	G8IIIa_ Ba0.2	G2V	Haas: sun-yellow/royal blue Mullaney: orange/clear blue Smyth: Not specified Webb: yellow/blue	Spring (28 Mar)	High proper motion star. Components have common proper motion - so possibly a true binary. (Uncertainty in B component parallax allows this.)
γ Leo	Algieba	41 Leo HD 89484/89485 HIP 50583 SAO 81298/81299 WDS 10200+1950	$10^h\ 19^m\ 58.4^s$	+19° 50′ 29.3″	130	4.4	122	1.98	4.225	K1-III	G7IIIb	Haas: grapefruit-orange pair Mullaney: radiant golden pair Smyth: Bright orange/greenish yellow Webb: gold/greenish red	Spring (17 Apr)	Binary 112 AU apart
δ Crv	Algorab	7 Crv HD 108767 HIP 60965 SAO 157323 WDS 12299-1631	$12^h\ 29^m\ 51.9^s$	−16° 30′ 55.6″	87	24.2	214	2.94	8.43	A0IV(n)kB9	K0V	Haas: straw yellow/gray Mullaney: yellow/pale lilac or purple Smyth: pale yellow/purple Webb: yellow/lilac	Spring (14 May)	High proper motion star. ≥ 650 AU apart Period ≥ 9,400 years
γ Vir	Porrima	29 Vir HD110379/110380 HIP 61941 SAO 138917 WDS 12417-0127	$12^h\ 41^m\ 39.6^s$	–01° 26′ 57.7″	38	3.6	293	3.440	3.484	F0IV	F0mF2IV	Haas: both yellow-white Mullaney: yellowish pair Smyth: silvery white/pale yellow Webb: yellowish	Spring (17 May)	Average 43 AU apart Period 168.93 years
α CVn	Cor Caroli	12 CVn A HD 112413 HIP 63125 SAO 63257 WDS 12560+3819	$12^h\ 56^m\ 01.7^s$	+38° 19′ 06.2″	110	19.4	229	2.88	5.6	A0VpSiEu	F2V	Haas: white/bluish sea green Mullaney: blue-white/lilac Smyth: flushed white/pale lilac Webb: pale yellow/pale copper	Spring (19 May)	Primary is variable - changes by 0.14 mag with a 5.47 day period. Period ≥ 8300 years ≥ 675 AU apart
ζ UMa	Mizar	79/80 UMa HD 116656/116842 HIP 65378/65477 SAO 28737/28751 WDS 13239+5456	$13^h\ 23^m\ 55.5^s$	+54° 55′ 31″	86	14.4	152	2.23	3.88	A1.5Vas	kA1h(eA) mA7IV-V	Haas: greenish white pair Mullaney: both bluish white Smyth: brilliant white/pale emerald Webb: greenish/white	Spring (26 May)	All components are also binary. Mizar & Alcor are 11.5 arcminutes apart Third star in the view is called Sidus Ludoviciana
ε Boo	Izar	36 Boo HD 129989/129988 HIP 72105 SAO 83500 WDS 14450+2704	$14^h\ 44^m\ 59.2^s$	+27° 04′ 27.2″	200	2.8	339	2.45	4.801	K0-II/III	A0V	Haas: amber yellow/deep blue Mullaney: pale orange/sea green Smyth: None Webb: very yellow/very blue	Spring (12 Jun)	≥ 185 AU apart Period > 1000 years

Bayer	Name	Other Designations	RA (2000.0)	Dec (2000.0)	Dist (ly)	Sep (")	PA	VMag A	VMag B	Spec Type A	Spec Type B	Colors	Season	Notes
β Sco	Graffias or Acrab	8 Sco HD 144217/144218 HIP 78820/78821 SAO 159682 WDS 16054-1948	$16^h\ 05^m\ 26.2^s$	–19° 48′ 19.6″	400	13.6	21	2.62	4.89	B1V	B2V	Haas: white/cobalt blue Mullaney: both blue-white Smyth: pale white/lilac tinge Webb: pale yellow/greenish	Summer (12 Jul)	6-star system
α Her	Rasalgethi	64 Her HD 156014J HIP 84345 SAO 102680 WDS 17146+1423	$17^h\ 14^m\ 38.8^s$	+14° 23′ 25″	360	4.7	42	3.350	5.322	M5Ib-II	G5II+F2V	Haas: orange-red/bluish turquoise Mullaney: orange/blue-green Smyth: orange/emerald Webb: orange/bluish green	Summer (22 Jul)	AGB star. Primary is a semiregular variable, varying by about a magnitude. 550 AU apart
ε Lyr	Double-Double	4 Lyr HD 173582/173585 HIP 91919 SAO 67310/67309 WDS 18443+3940	$18^h\ 44^m\ 20.4^s$ $18^h\ 44^m\ 20.4^s$	+39° 40′ 12.4″ +39° 36′ 45.8″	160	2.6 2.3	173 94	4.99/6.06	5.14/5.38	A3V/F0V	A6Vn/A7Vn	Haas: straw yellow/arctic blue & amber-yellow twins Mullaney: all white Smyth: yellow/ruddy & white/white Webb: greenish white/bluish white & both very white	Summer (18 Aug)	All components are binary. The two pairs are 208" apart.
β Lyr	Sheliak	10 Lyr HD 174638 HIP 92420 SAO 67451 WDS 18501+3322	$18^h\ 50^m\ 04.8^s$	+33° 21′ 45.6″	960	46	149	3.42 var	7.05	B8.5Ib-II	B7V	Haas: white/sapphire Mullaney: not specified Smyth: very white/pale grey Webb: yellow/white	Summer (23 Aug)	Primary = semidetached binary with accretion disk that causes eclipsing variation. Varies from 3.2-4.4 in 12.9 days
β Cyg	Albireo	6 Cyg HD 183912/183913 HIP 95947/95951 SAO 87301/87302 WDS 19307+2758	$19^h\ 30^m\ 43.3^s$	+27° 57′ 34.8″	430 400	34.4	54	3.085	5.11	K3II+B9.5V	B8Ve	Haas: brilliant citrus orange/vivid royal blue Mullaney: topaz-orange/sapphire-blue Smyth: topaz yellow/sapphire blue Webb: "beautiful" colors not specified	Summer (9 Sep)	May not be binary (differences in parallax and proper motion indicate that they are probably not related. If binary, estimated period > 100,000 years.)
γ Del	Sualocin	6 Del HD 197963/197964 HIP 102531/102532 SAO 106475/ 106476 WDS 20467+1607	$20^h\ 46^m\ 38.9^s$	+16° 07′ 26.9″	125	9.6	268	4.27	5.14	F7V	K1IV	Haas: grapefruit orange pair Mullaney: golden yellow/greenish blue Smyth: Yellow/light emerald Webb: gold, bluish green	Fall (9 Oct)	Period 17 years 12 AU apart
δ Cep		27 Cep HD 213306 HIP 110991 SAO 34508 WDS 22292+5825	$22^h\ 29^m\ 10.3^s$	+58° 24′ 54.7″	865	41	192	3.75 var	6.3	F5Iab:+B7-8	B7IV	Haas: vivid citrus orange/deep royal blue Mullaney: pale orange/blue Smyth: orange tint/fine blue Webb: very yellow/blue	Fall (13 Nov)	Primary is Cepheid variable prototype - varies from 3.48-4.37 in 5.366 days. During the cycle, temperature/spectral type vary from 5500K (F5) - 6800K (G2). Cooler, & thus redder near minimum.

Key

Colors: S. Haas (*Double Stars for Small Telescopes*, 2006), J. Mullaney (*Cambridge Double Star Atlas*, 2009), W. H. Smyth (*The Bedford Catalogue*, 1844 - Willman Bell 1986 ed.), T. W. Webb (*Celestial Objects for Common Telescopes*, Dover publication of the 1917 ed., 1962)

Season: Season of best placement for evening observations, given with date at which the star culminates ~2 hours after local sunset (Jamestown, NC)

Separation/Position Angle taken from the Astronomical League Double Star Club Observing List (2017)

Magnitudes, spectral types, distances from SIMBAD astronomical database (2017)

Triples														
Bayer	**Name**	**Other Designations**	**RA (2000.0)**	**Dec (2000.0)**	**Dist (ly)**	**Sep (")**	**PA**	**VMag A**	**VMag B**	**Spec Type A/B/C**		**Colors**	**Season**	**Notes**
ι Cas		No Flamsteed Number HD 15089 HIP 11569 SAO 12298 WDS 02291+6724	$02^h\ 29^m\ 04.0^s$	+67° 24′ 09.0″	60	AC 7.1	115	4.61 6.87 8.40		knA2h(eA)VSr ((Eu)) F5V G4V		Haas: lemon yellow/blue/speck Mullaney: yellow/lilac/blue Smyth: yellow/lilac/blue Webb: A-yellow/C-pale lilac	Winter (11 Jan)	AB period ~850 years. C component might be optical.
β Mon		11 Mon HD 45725 HIP 30867 SAO 133316 WDS 06288-0702	$06^h\ 28^m\ 49.1^s$	−07° 01′ 59.1″	680	AC 7.3	132	4.60 5.00 5.32		B4VeShell B2Vn(e) B3V:nne		Haas: All white – exactly alike Mullaney: all blueish white Smyth: white/pale white/pale white Webb: yellowish/white/grey-blueish	Winter (28 Feb)	No relative motion between them, but they all have similar proper motion.
ζ Cnc	Tegmine	16 Cnc HD 3208/3209/ 3210 HIP 40167 SAO 97645/97646 WDS 08122+1739	$08^h\ 12^m\ 12.7^s$	+17° 38′ 52″	83	AC 6.3	63	5.58 5.99 6.12		F7V F9V G0V		Haas: AB=lemon yellow pair Mullaney: All yellowish Smyth: yellow/orange/yellowish Webb: yellow	Spring (22 Mar)	The close (1 arcsec) AB pair is separated by ~83 light years and has a 60-year orbit.
μ Boo	Alkalurops	51 Boo HD 137391/137392 HIP 75411/75415 SAO 64686/64687 WDS 15245+3723 A component is μ^1 & BC is μ^2	$15^h\ 24^m\ 29.4^s$	+37° 22′ 37.8″	μ^1=116 μ^2=118	AB 109 BC 2.3	AB 171 BC 3	4.30	7.03 7.55	F0IV	G0V G0V	Haas: not specified Mullaney: yellow/orange/orange Smyth: flushed white/greenish white/greenish white Webb: μ^2 greenish white	Summer (22 Jun)	μ^1 is also a binary that is too close to resolve. μ^2 is a high proper motion star – this & abundance studies indicate that μ^1 & μ^2 not related. μ^2 period =260 years.
ξ Sco		51 Lib HD 144069/144070 HIP 78738/78739 SAO 159665 WDS	$16^h\ 04^m\ 22.1^s$	−11° 22′ 23.0″	90	AC 7.6	51	4.87 5.16 7.30		F4(V) F6(V) G1V		Haas: A-amber yellow/C-royal blue Mullaney: AC=yellow pair Smyth: white/pale yellow/gray Webb: whitish yellow	Summer (2 Jul)	Double star Σ1999 is also in the field.

This document was compiled by Tom English (Director, Cline Observatory/GTCC), as a reference for Cline Observatory volunteers. Cline Observatory at GTCC hosts free public viewing sessions every clear Friday night (weather permitting) throughout the year.

Thanks are due to Kyle Wiesbarth for help with construction of the tables and Jim Mullaney & Roger Ivester for suggestions.

Update 2018 July 3