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Double stars for light-polluted skies

Discovering Double Stars, All-Sky Edition

Double stars for light-polluted skies (Version 2022-1)

Agnes Clarke

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Using This Book

This book collects all the stars from the related books "Discovering Double Stars" and "Discovering Southern Double Stars", for those who would prefer to have all the stars in a single volume rather than two separate, lighter volumes. The charts and contents of the book have been designed for smaller telescopes and light polluted locations. I observe with smaller telescopes, the largest being a 150mm Schmidt-Cassegrain, and the smallest being my 50mm finderscope.

I locate targets using a 50mm finderscope and a red dot finder (RDF). The RDF helps me to point the telescope within a few degrees of the target by simply moving the projected red dot in the sight to the right place in the sky, and then the finderscope takes over as it shows about 5-7 degrees of sky with about 8-10 times magnification (it varies because my finderscope accepts different eyepieces).

This book has two types of diagrams to help with these two phases. Firstly, large diagrams show brighter stars visible from an urban location with the positions of the doubles indicated as 5 degree finderscope circles. This diagram helps with the rough pointing of the telescope via the red dot finder. Stars down to magnitude 5 are included in these overview charts, which is somewhat fainter than I can normally see from a light polluted location, unless it is a good clear night and it's past midnight!

The second type of diagram shows the faint stars visible in my finderscope, so that I can finally locate the double by matching the pattern to the book. I normally have the finderscope and telescope very precisely aligned, so that I can keep a high magnification eyepiece in the telescope and not have to keep switching between lower and higher magnification in the telescope to center the double in the telescope view. To increase the chance that the double will actually be in the telescope view, I prefer to use wide-angle eyepieces so that I still have a reasonably large field of view despite using hundredfold magnification.

All 400 doubles in this book have been selected for brightness, color, and uniqueness, and all are within

a few degrees of a relatively bright star of at least magnitude 4.0.

I have also included the position angles of the doubles in the finderscope diagrams. The position angle indicates the angle from the primary star to the secondary star, and I show this angle as a short line radiating from the double star. In the case the double is actually a triple or quadruple or quintuple the other position angles are shown as progressively shorter radiating lines, in order of increasing separation of the components. So the two components with the closest separation have the longest line.

All the charts show the rough spectral class of the stars as a color: hot blue stars of spectral class O or B are shown as dark blue. White stars like Sirius or Procyon (spectral class A or F) are shown as black. Yellow stars similar to our G-class Sun are shown as dark yellow, while cooler K class stars are dark orange and smouldering M class stars are deep red.

Note that the separation and position angle of double stars can change from year to year. This is one of the many charms of double stars: they offer the chance to see dynamic processes in deep space. However it does mean the data in this book is only valid as of 2021.

Astronomical Abbreviations

Constellations are often referred to in this work by three-letter abbreviations. When the constellation name is used in a star name, the constellation's genitive form is used. For example, Aquarius is abbreviated as Aqr, and one of its stars would be 5 Aquarii.

The following list gives the abbreviation and the full and genitive names.

And - Andromeda (Andromedae)	CrA - Corona Australis (Coronae Australis)
Ant - Antlia (Antliae)	CrB - Corona Borealis (Coronae Borealis)
Aps - Apus (Apodis)	Crv - Corvus (Corvi)
Aqr - Aquarius (Aquarii)	Crt - Crater (Crateris)
Aql - Aquila (Aquilae)	Cru - Crux (Crucis)
Ara - Ara (Arae)	Cyg - Cygnus (Cygni)
Ari - Aries (Arietis)	Del - Delphinus (Delphini)
Aur - Auriga (Aurigae)	Dor - Dorado (Doradus)
Boo - Bootes (Bootis)	Dra - Draco (Draconis)
Cae - Caelum (Caeli)	Equ - Equuleus (Equulei)
Cam - Camelopardalis (Camelopardalis)	Eri - Eridanus (Eridani)
Cnc - Cancer (Cancri)	For - Fornax (Fornacis)
CVn - Canes Venatici (Canum Venaticorum)	Gem - Gemini (Geminorum)
CMa - Canis Major (Canis Majoris)	Gru - Grus (Gruis)
CMi - Canis Minor (Canis Minoris)	Her - Hercules (Herculis)
Cap - Capricornus (Capricorni)	Hor - Horologium (Horologii)
Car - Carina (Carinae)	Hya - Hydra (Hydrae)
Cas - Cassiopeia (Cassiopeiae)	Hyi - Hydrus (Hydri)
Cen - Centaurus (Centauri)	Ind - Indus (Indi)
Cep - Cepheus (Cephei)	Lac - Lacerta (Lacertae)
Cet - Cetus (Ceti)	Leo - Leo (Leonis)
Cha - Chamaeleon (Chamaeleontis)	LMi - Leo Minor (Leonis Minoris)
Cir - Circinus (Circini)	Lep - Lepus (Leporis)
Col - Columba (Columbae)	Lib - Libra (Librae)
Com - Coma Berenices (Comae Berenices)	Lup - Lupus (Lupi)
	Lyn - Lynx (Lyncis)
	Lyr - Lyra (Lyrae)
	Men - Mensa Mensae)
	Mic - Microscopium (Microscopii)
	Mon - Monoceros (Monocerotis)
	Mus - Musca (Muscae)

Nor - Norma (Normae)
 Oct - Octans (Octantis)
 Oph - Ophiuchus (Ophiuchi)
 Ori - Orion (Orionis)
 Pav - Pavo (Pavonis)
 Peg - Pegasus (Pegasi)
 Per - Perseus (Persei)
 Phe - Phoenix (Phoenicis)
 Pic - Pictor (Pictoris)
 Psc - Pisces (Piscium)
 PsA - Piscis Austrinus (Piscis Austrini)
 Pup - Puppis (Puppis)
 Pyx - Pyxis (Pyxidis)
 Ret - Reticulum (Reticuli)
 Sge - Sagitta (Sagittae)
 Sgr - Sagittarius (Sagittarii)
 Sco - Scorpius (Scorpii)
 Scl - Sculptor (Sculptoris)
 Sct - Scutum (Scuti)
 Ser - Serpens (Serpentis)
 Sex - Sextans (Sextantis)
 Tau - Taurus (Tauri)
 Tel - Telescopium (Telescopii)
 Tri - Triangulum (Trianguli)
 TrA - Triangulum Australe (Trianguli Australis)
 Tuc - Tucana (Tucanae)
 UMa - Ursa Major (Ursae Majoris)
 UMi - Ursa Minor (Ursae Minoris)
 Vel - Vela (Velorum)
 Vir - Virgo (Virginis)
 Vol - Volans (Volantis)
 Vul - Vulpecula (Vulpeculae)

Greek letters are used in Bayer designations of stars, such as Alpha Canis Majoris (Sirius). Greek letters also have standardised three-letter abbreviations as follows:

α - alf - alpha
 β - bet - beta
 γ - gam - gamma
 δ - del - delta
 ϵ - eps - epsilon
 ζ - zet - zeta
 η - eta - eta
 θ - tet - theta
 ι - iot - iota
 κ - kap - kappa
 λ - lam - lamda, lambda
 μ - mu. - mu
 ν - nu. - nu
 ξ - ksi - xi
 \omicron - omi - omicron
 π - pi. - pi
 ρ - rho - rho
 σ - sig - sigma
 τ - tau - tau
 υ - ups - upsilon
 ϕ - phi - phi
 χ - khi - chi
 ψ - psi - psi
 ω - ome - omega

Doubles by Constellation

Andromeda

Almach: page 89 — A spectacular pairing of an intense orange primary with a fainter blue secondary.

Observed:

Groombridge 34: page 52 — A little pair of red stars, very widely separated.

Observed:

Pi And: page 53 — A bright blue primary widely separated from a fairly bright secondary.

Observed:

Struve 3050: page 51 — A tightly bound and perfectly balanced pair of bright yellow stars.

Observed:

Antlia

Zet1 Ant: page 189 — A close, bright pair of white stars.

Observed:

Aquarius

107 Aqr: page 68 — A bright white primary with a fairly bright yellowish companion close by.

Observed:

12 Aqr: page 306 — A very tight yellow-blue system, with the small blue component sufficiently bright to show some color.

Observed:

4 Aqr: page 303 — An extremely tight pair of fairly balanced yellowish stars.

Observed:

41 Aqr: page 308 — A close, balanced with a bright orange primary and yellowish secondary.

Observed:

53 Aqr: page 308 — An extremely tight and exactly equal pair of yellow suns.

Observed:

94 Aqr: page 67 — A bright yellowish primary easily separated from a fairly bright companion.

Observed:

Ome2 Aqr: page 71 — A brilliant bluish primary with a faint orange companion close by.

Observed:

Psi1 Aqr: page 70 — A brilliant orange primary distantly separated from a faint orange secondary.

Observed:

STF 2838: page 306 — An easily separated pair of white stars with a bright primary and a faint secondary.

Observed:

STF 2944: page 65 — An extremely tight pair of yellow stars, with a fainter distant third component.

Observed:

STF 3008: page 66 — An equal pair, with an orange primary closely separated from a slightly fainter secondary.

Observed:

Zeta Aqr: page 303 — A balanced, tight pair of white stars.

Observed:

Aquila

11 Aql: page 265 — A wide pair with a white primary and a faint blue companion.

Observed:

15 Aql: page 272 — A very wide pair of yellow stars.

Observed:

28 Aql: page 266 — A bright yellowish primary with a distant much fainter companion.

Observed:

57 Aql: page 304 — A very wide and balanced pair of bright, bluish stars.

Observed:

STF 2434: page 274 — A yellow-yellow pairing, widely separated.

Observed:

Struve 2404: page 266 — Two orange stars with very tight separation.

Observed:

Struve 2426: page 261 — A less common white-orange pair, the two components are easily separated.

Observed:

Struve 2449: page 262 — A close and well balanced yellow-blue pair.

Observed:

Struve 2532: page 299 — A very widely separated orange-blue duo, but the blue component is very faint.

Observed:

Aries

1 Ari: page 101 — A close pair with a brighter yellow primary and blue secondary.

Observed:

14 Ari: page 104 — A very wide triangle of three stars; the bright primary is yellowing and the other two components are significantly fainter.

Observed:

30 Ari: page 104 — Two bright yellow stars, almost equally matched and widely separated.

Observed:

33 Ari: page 99 — A bright yellow primary with a faint blue companion, widely separated.

Observed:

Gamma Ari: page 101 — An equal pair of icy blue stars with close separation.

Observed:

Lambda Ari: page 105 — A bright, wide pair with good colors: the A component is yellow and the B component is blue.

Observed:

Struve 326: page 103 — A faint, close orange-red pair.

Observed:

Struve 394: page 105 — A close white-yellow pairing.

Observed:

Auriga

14 Aur: page 128 — A bright yellow-blue pairing with comfortable separation.

Observed:

26 Aur: page 133 — A bright yellow primary easily separated from a significantly fainter blue companion.

Observed:

Omega Aur: page 131 — A yellow primary with a closely bound faint orange companion.

Observed:

Psi5 Aur: page 126 — A very wide yellow-blue duo. The primary is very bright and strongly colored.

Observed:

STT147: page 131 — A moderately bright yellow primary with two small blue companions, forming a widely separated triangle.

Observed:

Struve 644: page 132 — Struve 644 is a real challenge with the two stars separated by much less than 2". The components are equally bright and contrasting yellow and blue.

Observed:

Struve 698: page 132 — A wide orange-blue pair. The two stars are separated in brightness by almost exactly two magnitudes.

Observed:

Struve 872: page 128 — An easily separated pair of stars. Neither star is particularly bright, perhaps leading to fanciful star colors variously reported as pinkish or lilac.

Observed:

Struve 928: page 127 — A very close pair of white stars.

Observed:

Struve 929: page 127 — A close yellow-blue pair.

Observed:

Bootes

39 Boo: page 219 — A balanced tightly bound pair of yellow stars.

Observed:

Iota Boo: page 219 — A very wide pairing of a bright yellow primary and a blue companion.

Observed:

Izar: page 225 — A fine and very narrowly separated orange-yellow pair. Both components shine brilliantly.

Observed:

Kappa Boo: page 218 — A very bright white primary component nicely separated from a reasonably bright blue secondary.

Observed:

Pi Boo: page 230 — A close and reasonably balanced pair of white stars.

Observed:

SHJ 191: page 218 — A balanced (but somewhat less bright) pair of yellow stars with very wide separation.

Observed:

Struve 1825: page 225 — A very close yellow-orange pairing.

Observed:

Struve 1835: page 231 — A bright white primary close to a yellow secondary.

Observed:

Struve 1910: page 227 — A close pair of perfectly balanced yellow stars.

Observed:

Xi Boo: page 229 — A close yellow-orange duo, with a bright primary and brightish secondary.

Observed:

Camelopardalis

1 Cam: page 126 — A reasonably balanced and separated white-blue pair.

Observed:

11/12 Cam: page 129 — A distantly separated but strongly colored orange-blue pairing, both components being bright. 11 Cam is the blue star and 12 Cam is the orange star.

Observed:

32H. Cam: page 44 — A bright and balanced white-white pair, widely separated.

Observed:

Struve 1122: page 165 — An equal and easily separated pair of white stars.

Observed:

Struve 1625: page 41 — A balanced pair of yellow stars, comfortably separated.

Observed:

Struve 384: page 92 — A very tight pair of relatively faint stars, with a loosely associated dim third component.

Observed:

Struve 385: page 87 — A brilliant blue primary with a moderately faint companion, very tightly separated.

Observed:

Struve 485: page 92 — A widely separated equal pair of white stars.

Observed:

Cancer

Iota Cnc: page 169 — A strongly colored deeply yellow and blue pair. The separation is wide but both components are bright.

Observed:

Phi2 Cnc: page 173 — Two identical bright white stars nearly touching each other.

Observed:

Struve 1245: page 177 — A well matched white-yellow pair, easily separated.

Observed:

Struve 1254: page 177 — A wide yellow-blue pairing, but the small blue component is very faint.

Observed:

Struve 1311: page 176 — A close pair of equal yellowish stars.

Observed:

Zeta Cnc: page 174 — An equal pair of closely bound and bright yellow stars.

Observed:

Canes Venatici

16/17 CVn: page 196 — A distantly separated pair of bright white stars.

Observed:

2 CVn: page 196 — A yellow-blue pairing with easy separation.

Observed:

Cor Caroli: page 197 — A brilliant white primary star with a more orange secondary, easily separated.

Observed:

Struve 1755: page 220 — A fairly equal and very close pairing; the primary is yellow.

Observed:

Canis Major

17 CMa: page 150 — A bright white primary widely separated from a moderately fainter secondary.

Observed:

Beta CMa: page 155 — A fiercely brilliant blue primary with a distant very faint companion.

Observed:

HJ 3945: page 156 — A bright, wide and balanced pair of stars, the primary being orange, and the secondary pale yellow.

Observed:

STF 1097: page 154 — A fairly bright yellow primary with an easily separated and relatively faint companion.

Observed:

Sirius: page 155 — A ferociously brilliant white primary moderately separated from a relatively dim white dwarf companion.

Observed:

Tau CMa: page 156 — A brilliant blue primary with two faint stars close to the east, and a brighter component some distance beyond them.

Observed:

Zeta CMa: page 158 — A brilliant bluish primary distantly separated from a fairly apparent orange secondary.

Observed:

Canis Minor

Struve 1103: page 175 — A close but relatively faint yellow-blue pairing.

Observed:

Capricornus

Alpha1/2 Cap: page 307 — A distantly separated pair of brilliant white stars.

Observed:

Beta Cap: page 307 — A brilliant yellow primary distantly separated from bright white secondary.

Observed:

HJ 1537: page 305 — A yellow primary with a very close, faint companion.

Observed:

Pi Cap: page 305 — A very close pair, with a bright blue primary and fairly faint secondary.

Observed:

STF 2683: page 304 — An equal pair of easily separated yellowish stars.

Observed:

Carina

HJ 4383: page 320 — An extremely tight and relatively balanced pair of bluish stars.

Observed:

Cassiopeia

Eta Cas: page 51 — A brilliant yellow primary comfortably separated from a fairly faint red secondary.

Observed:

Iota Cas: page 43 — A bright, white primary with a yellow-orange secondary and a dim, colorless third component.

Observed:

Sigma Cas: page 52 — A tight primary with a brilliant blue-white primary almost touching a delicate secondary.

Observed:

Struve 163: page 87 — A wide binary with a strongly orange primary and blue secondary.

Observed:

Struve 3053: page 49 — A bright yellow primary with an easily apparent white companion, easily separated. There is a very faint third component distantly separated from the central two stars.

Observed:

Struve 45: page 50 — A wide double with a yellow primary.

Observed:

Struve 7: page 49 — A balanced pair with a bluish primary, with extremely tight separation.

Observed:

Centaurus

HJ 4491: page 214 — A widely separated, balanced pair with a yellowish primary and a somewhat yellower secondary.

Observed:

HJ 4500: page 211 — A fair bright orange primary distantly separated from a faint yellow secondary.

Observed:

HJ 4554: page 214 — A very wide pair dominated by a fairly bright red primary accompanied by an extremely faint companion.

Observed:

Rigel Kent: page 242 — A close, extremely brilliant pair with a yellow primary and orange secondary.

Observed:

Cepheus

Beta Cep: page 46 — A brilliant white primary split comfortably from a moderately faint blue companion.

Observed:

Delta Cep: page 288 — A bright, widely separated yellow and blue pair.

Observed:

Kappa Cep: page 43 — A scattered triple system, with a very bright blue primary with one close and one dim distant companion.

Observed:

Struve 2816: page 285 — Possibly yellow and white (the yellow primary being bracketed by two fainter white stars). Alternately, the primary might be blue.

Observed:

Xi Cep: page 285 — A bright white primary with a close moderately fainter white secondary.

Observed:

Cetus

12 Cet: page 69 — A bright red primary separated comfortably from a very faint companion.

Observed:

37 *Cet*: page 70 — A very widely separated pair, with a brilliant yellowish primary and a significantly fainter, strongly yellow secondary.

Observed:

66 *Cet*: page 110 — A comfortably separated yellow and blue pair.

Observed:

HJ 1968 AB: page 71 — A yellowish primary very widely separated from a faint secondary.

Observed:

HJ 2004: page 72 — A fairly bright white primary with a very close, faint secondary.

Observed:

S 390: page 67 — A close and equal pair of bluish stars.

Observed:

STF 39: page 69 — A wide pair with a yellow primary and pale yellow secondary.

Observed:

STF 49: page 66 — A close pair with a yellow primary and tiny orange secondary.

Observed:

STF 80 AB: page 62 — An orange primary widely separated from a slightly fainter yellow secondary.

Observed:

Columba

Dunlop 22: page 158 — A close and balanced pair with a white primary.

Observed:

Coma Berenices

2 *Com*: page 200 — A white primary with a tightly bound and fairly apparent secondary.

Observed:

24 *Com*: page 201 — An orange-blue pair, with a reasonable bright secondary and easy separation.

Observed:

Corona Austrina

BSO 14: page 280 — A fairly bright, balanced double, easily separated. Both components have a blue hue.

Observed:

Gamma CrA: page 281 — A brilliant yellowish primary tightly bound to a fairly bright companion.

Observed:

HJ 5014: page 281 — An extremely tight pairing of two equally bright white stars.

Observed:

Corona Borealis

STT305: page 221 — A close orange-blue pair, but the secondary is quite faint.

Observed:

Sigma CrB: page 221 — A well balanced yellow pair with quite close separation.

Observed:

Struve 1932: page 228 — A perfectly balanced pair of yellow stars, but extremely close.

Observed:

Zeta CrB: page 220 — A well-matched pair of bright bluish stars, closely separated. The pair are both blue, but some observers report seeing the fainter companion as greenish.

Observed:

Corvus

58 Crv: page 207 — A close pair of bright, yellowish stars, with a third faint, widely separated component.

Observed:

Delta Crv: page 207 — A brilliant bluish primary widely separated from a moderately faint companion.

Observed:

Crater

17 Cr: page 211 — A close, equal pair of bright, somewhat yellow stars.

Observed:

Gamma Cr: page 208 — A close pair with a brilliant white primary somewhat fainter secondary.

Observed:

Crux

Alpha Cru: page 213 — Two extremely brilliant blue stars, very close together. A third very bright component lies distantly from them.

Observed:

Beta Cru: page 215 — A extremely brilliant blue primary very widely separated from a faint blue secondary.

Observed:

Cygnus

17 Cyg: page 287 — A bright yellowish primary widely separated from a dim secondary.

Observed:

26 Cyg: page 288 — A bright orange primary very widely separated from a dim secondary.

Observed:

61 Cyg: page 286 — An orange-red pair with wide separation. I see both components as orange.

Observed:

Beta Cyg: page 287 — This is the renowned Albireo, a brilliant deep yellow primary with a bright and delicate blue companion.

Observed:

Delta Cyg: page 286 — A very close and unbalanced pair with a brilliant blueish primary and reasonably bright white secondary.

Observed:

STT394: page 289 — An orange primary with a faint blue secondary, easily split.

Observed:

STT437: page 290 — A balanced yellow-orange pair, very narrowly separated.

Observed:

Struve 2486: page 248 — A close and equal pair of yellow suns.

Observed:

Delphinus

Gamma Del: page 294 — A very bright yellow primary close to a bright blue secondary.

Observed:

Struve 2725: page 298 — A close yellow and blue pair.

Observed:

Draco

16 Dra: page 248 — 16 Draconis forms a triple with nearby 17 Draconis, which in turn is a close double.

Observed:

40/41 Dra: page 42 — A comfortably separated pair of bright yellow stars.

Observed:

Mu Dra: page 252 — A tightly bound pair of yellow stars.

Observed:

Nu Dra: page 247 — A very wide pair of balanced, very bright white stars.

Observed:

Omi Dra: page 251 — A widely separated pair. The strongly yellow primary has an adequately bright blue companion.

Observed:

Psi1 Dra: page 45 — A wide pair of reasonably balanced, bright white stars.

Observed:

Struve 1362: page 41 — A close and equal pair of pale yellow stars.

Observed:

Struve 2155: page 247 — A yellow-blue pairing. Easily separated but the small blue component lacks brightness in smaller telescopes.

Observed:

Struve 2348: page 252 — A yellow primary widely separated from a moderately faint white secondary.

Observed:

Equuleus

Eps Equ: page 296 — A yellow-blue combination with a moderately bright secondary. Easy separation.

Observed:

Lamda Equ: page 298 — An extremely tight and exactly equal pair of yellow stars.

Observed:

Struve 2786: page 295 — An extremely close and fairly balanced pair of white stars.

Observed:

Eridanus

32 Eri: page 111 — A close double with bright components; yellow and white.

Observed:

55 Eri: page 148 — An equal pair of quite close, moderately bright, yellow stars.

Observed:

62 Eri: page 147 — A distantly separated pair, with a bright, blue primary and a significantly fainter secondary.

Observed:

66 Eri: page 146 — A bright, bluish primary with an extremely close faint secondary; a further faint, white C component lies at some distance from A and B.

Observed:

Burnham 1042: page 110 — A very wide and unequal pairing. The primary is yellow, while the secondary is a very faint, balanced double (1.3", p.a. 40°).

Observed:

Chi Eri: page 120 — A brilliant yellow primary with a very close but vastly fainter secondary.

Observed:

Gamma Eri: page 112 — A brilliant red primary widely separated from a very dim companion.

Observed:

HJ 3527: page 115 — A tight pair of blue stars with third distant and dim companion.

Observed:

HJ 3556: page 116 — A yellowish primary very close to significantly fainter secondary.

Observed:

Omicron2 Eri: page 112 — A brilliant yellow-orange primary distantly separated from a dim white companion.

Observed:

Rho2 Eri: page 111 — A bright yellow-orange star with an extremely close, faint companion.

Observed:

Theta Eri: page 118 — A close, balanced double composed of two brilliant white stars.

Observed:

Gemini

15 Gem: page 138 — A widely separated orange and blue pairing.

Observed:

20 Gem: page 139 — A widely separated but balanced yellow-white pair.

Observed:

38 Gem: page 142 — A brilliant white primary with close yellow companion.

Observed:

Castor: page 167 — A tight pair of very brilliant, bluish stars.

Observed:

Kappa Gem: page 176 — A brilliant orange primary with a small blue companion close by.

Observed:

STT134: page 140 — A very wide pair with a yellow primary and a moderately fainter secondary.

Observed:

Struve 1083: page 138 — A close, relatively balanced pair. The primary is white.

Observed:

Struve 1108: page 173 — A yellow primary comfortably separated from a blue secondary.

Observed:

Wasat: page 137 — Delta Geminorum or Wasat is a brilliant white star with a close orange-yellow companion.

Observed:

Grus

COO 252 AC: page 77 — A bright yellow primary with a very faint close companion, and somewhat more distant and slightly less faint third member.

Observed:

DQ Gru: page 77 — A bright and easily separated pair of white stars.

Observed:

DUN 248: page 81 — An easy, equal pair of fairly bright stars; the primary is white, the secondary is yellow.

Observed:

Sig2 Gru: page 76 — An equal pair of bright white stars, very distantly separated.

Observed:

TOK 36: page 311 — A fairly bright yellow star with a tightly bound faint companion.

Observed:

Hercules

100 Her: page 263 — Two almost identical bright white stars, comfortably separated.

Observed:

56 Her: page 259 — A bright yellow-orange primary comfortably separated from very faint possibly bluish secondary. The secondary can be challenging to spot in a smaller telescope, especially with light pollution.

Observed:

95 Her: page 260 — A bright white-yellow pairing with close separation.

Observed:

Alpha Her: page 261 — A reasonably balanced orange-blue pair, very close with a brilliant primary and bright secondary.

Observed:

Delta Her: page 259 — A close white-blue pairing. The primary is brilliant but the secondary is just over 5 magnitudes fainter.

Observed:

Gamma Her: page 229 — A yellow-yellow pairing with a brilliant primary and dim secondary. Distantly separated.

Observed:

Kappa Her: page 226 — A reasonably balanced and bright, but widely separated, pair of yellow stars.

Observed:

Mu Her: page 251 — A brilliant yellow primary widely separated from a vastly fainter red secondary.

Observed:

Rho Her: page 249 — A very close equally matched pair with a brilliant white primary and slightly fainter blue companion.

Observed:

Struve 2063: page 253 — An easily separated white-yellow double.

Observed:

Struve 2120: page 255 — A wide pair with an orange primary and somewhat fainter secondary.

Observed:

Struve 2411: page 265 — A comfortably separated pair with a yellow primary and a faint secondary.

Observed:

Horoglium

COO 14: page 117 — A balanced pair of yellowish stars close together, with a somewhat brighter star some distance from them.

Observed:

DUN 10: page 116 — A balanced pair with a yellow primary widely separated from an orange secondary.

Observed:

DUN 7: page 121 — A wide and equal pairing of a yellow star and white companion.

Observed:

HJ 3503: page 117 — An extremely tight, balanced pair of yellow stars with an easily separated, faint yellow component.

Observed:

HJ 3520: page 120 — A balanced pair of yellow stars, widely separated.

Observed:

HJ 3576: page 119 — A very close pair with a white primary.

Observed:

HJ 3611: page 119 — A very close, balanced pair with a white primary.

Observed:

Hydra

27 Hya: page 182 — A brilliant orange-yellow primary with a pale yellow secondary, distantly separated.

Observed:

HJ 99: page 181 — A yellow primary with a reasonably balanced secondary, distantly separated.

Observed:

STF 1329: page 180 — A close and equal yellow pairing.

Observed:

Struve 1347: page 178 — A wide pair of slightly yellowish stars.

Observed:

Hydrus

CVN 14: page 318 — A brilliant yellow primary with a very close red companion.

Observed:

HJ 3464 AB: page 321 — A yellowish primary with very close, faint secondary.

Observed:

HJ 3475: page 118 — An equal and extremely tight pair of yellowish stars.

Observed:

Indus

Theta Ind: page 312 — A brilliant white primary with a close fairly bright yellow companion.

Observed:

Lacerta

8 Lac: page 50 — A fairly equally balanced and bright pair of blue-white stars, comfortably separated.

Observed:

Struve 2894: page 289 — A fairly bright yellow primary comfortably separated from a faint blue secondary.

Observed:

Leo

49 Leo: page 203 — A bright white primary with an extremely close, reasonably apparent companion.

Observed:

54 Leo: page 200 — A bright white primary which shines very close to a fairly bright white companion.

Observed:

78 *Leo*: page 202 — A tight white-yellow pair. The secondary is not too faint, but the primary shines brilliantly.

Observed:

83 *Leo*: page 204 — A fairly bright yellow primary with an easily apparent orange secondary, widely separated.

Observed:

90 *Leo*: page 202 — A balanced pair of fairly bright bluish stars, very closely separated.

Observed:

93 *Leo*: page 201 — A bright white primary very widely separated from a faint companion.

Observed:

Gamma Leo: page 174 — Known variously as Gamma Leonis or Algeiba, this is one of the finest yellow-yellow doubles, being both bright, fairly balanced and tightly bound.

Observed:

Lepus

Alpha Lep: page 149 — A brilliant yellowish primary widely separated from a very faint companion.

Observed:

BU 314: page 149 — An extremely tight pair of yellowish stars, with a faint, distant third companion.

Observed:

HJ 3752: page 150 — A bright yellow primary with a fairly bright and very close secondary.

Observed:

Libra

Alpha Lib: page 236 — A brilliant white primary with distant bright, white companion.

Observed:

Iota Lib: page 237 — A distantly separated pair, with a brilliant white primary and tiny secondary.

Observed:

SHJ 195: page 236 — A widely separated, fairly balanced pair of yellowish stars.

Observed:

Struve 1962: page 234 — An easily separated equal pair of yellow stars.

Observed:

Lupus

HJ 4690: page 241 — A bright yellow primary easily separated from a white secondary.

Observed:

Mu Lup: page 241 — An extraordinarily tight pair of equally brilliant bluish stars, with a widely separated, fairly bright, white third component.

Observed:

Xi Lup: page 240 — A bright white primary with an almost as bright blue companion close by.

Observed:

Lynx

12 Lyn: page 125 — A close pair with a bright yellow primary and a reasonably bright blue companion.

Observed:

19 Lyn: page 125 — An easily separated and reasonably balanced yellow-blue pairing.

Observed:

38 Lyn: page 168 — A bright white primary narrowly separated from a brightish white secondary.

Observed:

Struve 1282: page 169 — A faint double consisting of two equal and very close yellow stars.

Observed:

Struve 1333: page 166 — A challenging pair of equal white stars separated by less than two arc seconds.

Observed:

Struve 1338: page 166 — The tightest double in this book, Struve 1338 consists of two well-balanced white stars split by a mere arc second.

Observed:

Struve 1369: page 168 — An orange-yellow pair, widely separated.

Observed:

Struve 958: page 130 — Two tightly bound, perfectly matched bright stars.

Observed:

Lyra

Beta Lyr: page 250 — Two very widely separated white stars.

Observed:

Epsilon Lyr: page 249 — Two pairs of tightly bound and very well balanced bright white stars. The pairs are separated by over three arc minutes (one tenth of a full Moon), but each pair is split by only just over 2 arc seconds.

Observed:

STT525: page 254 — A colorless pair very widely separated. In addition to the two main components, a third faint component might be glimpsed within 2" of the primary.

Observed:

Struve 2470: page 254 — An easily split white-blue pairing.

Observed:

Struve 2474: page 250 — An easily split couple of yellow stars.

Observed:

Zeta Lyr: page 253 — A very widely separated double that can be split in the finder scope. It has two bright yellow components differing in brightness by 1.6 magnitudes.

Observed:

Microscopium

DUN 236: page 311 — A fairly bright, nearly equal pair, with a yellow primary widely separated from an orange companion.

Observed:

HJ 5218: page 310 — A fairly bright yellow primary with a very faint secondary close by.

Observed:

Monoceros

Beta Mon: page 153 — A wonderful triple showing a brilliant bluish primary closely separated from a tight pair of bluish stars.

Observed:

Epsilon Mon: page 142 — An unequal pair of bright yellow stars, easily separated.

Observed:

STF 1112: page 181 — A yellow primary widely separated from a somewhat fainter white secondary.

Observed:

STF 914: page 148 — A fairly bright white primary widely separated from a faint secondary.

Observed:

Zeta Mon: page 180 — A widely separated triple system with two brighter yellow components and a fainter orange companion.

Observed:

Musca

Beta Mus: page 324 — A sub-arcsecond pair of equally bright bluish stars.

Observed:

HJ 4498: page 216 — A fairly bright yellow primary with an orange companion close by.

Observed:

Lambda Mus: page 216 — A very brilliant white primary widely separated from an extremely faint companion.

Observed:

Theta Mus: page 213 — A close pair of blue stars with a bright primary and moderate secondary.

Observed:

Norma

HJ 4813: page 242 — A bright yellow primary with a very close companion.

Observed:

Octans

GLI 14: page 318 — A balanced, close pair with an orange primary.

Observed:

Lambda Oct: page 322 — A very close pair with a bright yellow-orange primary and a white companion.

Observed:

Mu2 Oct: page 322 — A well balanced and easily separated pair of yellow stars.

Observed:

R 38: page 323 — A very tight double, but the moderately bright blueish primary does not overwhelm the fainter secondary.

Observed:

Ophiuchus

36 Oph: page 276 — A bright, equal pair of orange dwarfs, closely separated.

Observed:

41 Oph: page 271 — A fantastically close unequal orange-white pairing.

Observed:

61 Oph: page 263 — A widely separated pair of white stars. Both components are fairly bright.

Observed:

70 Oph: page 267 — A brilliant yellow star with a bright orange companion. The pair are very close, especially given their apparent magnitude. The gap is currently near the maximum.

Observed:

Struve 2276: page 262 — A balanced and close pair of white stars.

Observed:

Tau Oph: page 275 — An extremely tight, balanced pair of yellowish stars.

Observed:

Orion

42/45 Ori: page 152 — A very wide and bright binocular pair, the brighter star (42 Ori) being bluish and the other white.

Observed:

Delta Ori: page 145 — A very wide pair consisting of a brilliant primary and significantly fainter blue secondary.

Observed:

Iota Ori: page 153 — In the same field as Struve 747, Iota Orionis is a brilliant white star with an easily separated and reasonably bright blue companion.

Observed:

Lambda Ori: page 139 — A close pair of white stars, with a brilliant primary and bright secondary.

Observed:

Rigel: page 154 — Rigel, one of the brightest stars in the sky, has a moderately bright companion that seems very faint in the glare of its primary. The separation is reasonable and the white secondary contrasts nicely with the blue primary.

Observed:

Sigma Ori: page 145 — A blue primary, flanked by one fainter star to the west, and two relatively bright white stars to the east, all easily separated from the primary.

Observed:

Struve 747: page 147 — A very wide pair of well matched and bright white stars.

Observed:

Struve 790: page 151 — A close blue-yellow pair roughly a degree north-east of the Orion Nebula.

Observed:

Theta1 Ori: page 146 — Better known as the Trapezium, this multiple star system pushes the boundaries between a multiple star system and a star cluster. The 4 brightest components form a trapezium, but fainter components can also be picked out.

Observed:

Theta2 Ori: page 152 — A very wide line of three bright white stars, often overlooked as it is on the border of the spectacular Orion Nebula.

Observed:

Zeta Ori: page 151 — A fiercely brilliant close blue-blue pairing, made difficult by the brightness of the primary.

Observed:

Pavo

R 314: page 319 — A very tight double consisting of a fairly bright blueish primary and a significantly fainter secondary.

Observed:

RMK 8550: page 312 — An equal and very tight pair of bright white stars.

Observed:

Pegasus

1 Peg: page 293 — A triple system, with a brilliant orange primary with two faint companions, one very close and the other quite widely separated.

Observed:

3 Peg: page 295 — A bright white primary distantly separated from a reasonably apparent yellowish secondary.

Observed:

57 Peg: page 58 — A bright red primary widely separated from a faint white secondary.

Observed:

Struve 2841: page 296 — A wide yellow-blue pairing. Some see some green in the secondary.

Observed:

Struve 2848: page 299 — An equal and easily split pair of yellow stars.

Observed:

Struve 3007: page 57 — A close pair with a brighter yellow component and a very faint orange dwarf companion.

Observed:

Perseus

56 Per: page 90 — A bright yellow primary with a close yellow companion.

Observed:

57 Per: page 130 — A distantly separated pair of moderately bright, balanced, white stars.

Observed:

Eta Per: page 88 — A bright orange primary with a much fainter blue secondary.

Observed:

Struve 270: page 93 — A wide yellow-blue double.

Observed:

Struve 304: page 94 — A faint, wide white and blue pair.

Observed:

Struve 331: page 93 — A bright and easily separated white-blue pair.

Observed:

Struve 336: page 95 — An orange primary easily separated from a bluish secondary.

Observed:

Struve 369: page 94 — A fairly balanced yellow-blue pairing. Very widely separated.

Observed:

Struve 392: page 88 — An orange-blue pair, widely separated. Neither companion is particularly bright.

Observed:

Struve 434: page 90 — A widely separated, balanced pair with an orange primary.

Observed:

Struve 533: page 95 — A bluish primary easily separated from somewhat fainter companion; there is a distant and very faint third component.

Observed:

Theta Per: page 89 — A wide and unbalanced double with a deep yellow primary and a very faint blue secondary.

Observed:

Phoenix

Beta Phe: page 81 — A equal and extremely tight pair of yellow stars.

Observed:

HJ 3390: page 80 — An yellow-orange primary with a faint white secondary, easily separated.

Observed:

HJ 3395: page 80 — A close, faint pair with an orange primary and a slightly fainter red secondary.

Observed:

Theta Phe: page 76 — A white primary with a slightly fainter yellowish secondary, very closely separated.

Observed:

Zeta Phe: page 82 — A pair of close bluish stars, the brilliant primary is much brighter and is itself an extreme sub-arcsecond pairing.

Observed:

Pictor

DUN 20: page 160 — A balanced and widely separated pair of fairly bright, white stars.

Observed:

I 5: page 161 — An extremely tight pair dominated by a fairly bright, yellow primary.

Observed:

Iota Pic: page 160 — An easily separated, balanced pair of bright yellowish stars.

Observed:

Pisces

100 Psc: page 106 — A comfortably separated pair of white stars.

Observed:

34 Psc: page 60 — A bright bluish primary with a faint secondary close by.

Observed:

35 Psc: page 58 — An easy, bright double star with comfortable separation and a reasonably bright secondary, consisting of a white primary and light yellow secondary.

Observed:

38 Psc: page 61 — A very close and equal pair of yellow stars.

Observed:

55 Psc: page 60 — A bright orange primary with a much fainter white secondary close by.

Observed:

65 Psc: page 53 — An equal pair of fairly bright light yellow stars.

Observed:

77 Psc: page 62 — A wide, fairly bright pairing of two yellow-white stars, separated in brightness by nearly one magnitude.

Observed:

Alrisha: page 107 — An extremely tight pair of bright, white stars.

Observed:

Psi I Psc: page 57 — An equally matched and widely separated pair of blue-white stars.

Observed:

STF 3019: page 59 — A balanced pair with a yellowish primary and white secondary.

Observed:

STF 8: page 65 — A yellowish primary with a close and faint secondary.

Observed:

Struve 3009: page 59 — A close combination of an orange primary close to a 2 magnitude fainter secondary. The secondary at magnitude 8.76 is too faint to show much color in smaller scopes, but some report it to be blue.

Observed:

Zeta Psc: page 61 — A widely separated pair of closely matched bright white stars.

Observed:

Piscis Austrinus

Dunlop 241: page 75 — A bright orange primary separated distantly from a moderate secondary.

Observed:

H 6 119: page 79 — An orange primary distantly separated from a somewhat fainter companion. The secondary has a tightly bound little companion.

Observed:

Puppis

DUN 23: page 159 — An equal pair of yellow stars, very closely separated.

Observed:

DUN 59: page 191 — An easily separated pair of fairly bright, blue stars.

Observed:

Kappa Pup: page 187 — A close pair of brilliant, bluish stars.

Observed:

NO Pup: page 190 — A balanced pair or fairly bright stars, the brighter being bluish and the companion white.

Observed:

STF 1121: page 182 — A close and equal pair of bluish stars.

Observed:

Y Pup: page 159 — A bright yellow-orange primary easily separated from a very slightly bluish secondary.

Observed:

Pyxis

HJ 4166: page 187 — A white primary easily separated from a very tightly separated unequal pair.

Observed:

Kappa Pyx: page 183 — A brilliant orange primary with a tightly bound very faint companion.

Observed:

Sagitta

HN 84: page 297 — A wide pair with a strongly orange primary and fainter blue companion.

Observed:

Zet Sge: page 294 — A bright white star with a relatively dim companion, closely separated.

Observed:

Sagittarius

Dunlop 219: page 280 — A yellow primary with two widely separated companions, one extremely faint.

Observed:

Eta Sgr: page 279 — A trio of stars, a brilliant red primary and very close secondary are distantly separated from a very faint third component.

Observed:

HN 40: page 273 — A close trio of stars, none of which are very bright. The primary is blue.

Observed:

HJ 5188: page 310 — A complex of 6 stars, centered on a fairly bright white primary. The widely separated C component is moderately bright, but the remaining four members are all faint.

Observed:

PZ 6: page 278 — A bright red star with a fairly bright, yellow companion close by.

Observed:

RS Sgr: page 279 — A very wide pair with a bright, blue primary and a fairly faint secondary.

Observed:

Zeta Sge: page 297 — A bright yellow primary with a much fainter blue secondary.

Observed:

Scorpius

Antares: page 240 — A fiercely brilliant and intensely red primary with a very close, bright, blue or green companion.

Observed:

HJ 4962: page 278 — A bright blue star with a close but faint blue companion.

Observed:

Nu Sco: page 237 — A bright, extremely tight and balanced pair of blue stars.

Observed:

Struve 1999: page 235 — An easily separated and well balanced pair of deep yellow stars.

Observed:

Xi Sco: page 235 — Xi Sco (Grafias) is a triple star system. The yellow primary can be split by larger telescopes into an equal pale yellow pair with a separation of 1.1". Lesser telescopes show a single yellow point distantly separated from a fairly apparent blue companion.

Observed:

Sculptor

HJ 3377: page 68 — A widely separated pair with an orange primary and a faint companion.

Observed:

HJ 5429: page 75 — An unequal and widely separated pair with a strongly red primary.

Observed:

LAL 193: page 72 — A close and balanced pair of yellowish stars.

Observed:

Tau Scl: page 115 — A bright yellowish primary with an almost inseparable companion. Requires a large telescope.

Observed:

Scutum

S Sct: page 272 — A deep red primary with an easily separated, tiny orange companion.

Observed:

STF 2306: page 276 — A deep yellow primary with a balanced secondary, closely separated.

Observed:

Struve 2313: page 275 — A close yellow and blue pair.

Observed:

Serpens

AC 11: page 271 — A balanced but difficult white-white double with a tiny separation.

Observed:

Delta Ser: page 230 — A reasonably balanced and very tight yellow-yellow pair.

Observed:

Eta Ser: page 274 — The primary is a brilliant orange but the companion is very faint indeed.

Observed:

STF 2204: page 273 — An equal pair of easily separated white stars.

Observed:

STT300: page 227 — An easily separated yellow-blue pair, although the B component is quite dim.

Observed:

Struve 1919: page 226 — A less bright and quite wide yellow-blue pairing.

Observed:

Struve 1987: page 228 — A white primary with a somewhat fainter blue companion, easily separated.

Observed:

Theta Ser: page 267 — A widely separated pair of bright blue stars.

Observed:

Sextans

35 Sex: page 203 — An unusual orange-yellow pairing, reasonably balanced and closely separated.

Observed:

HJ 2530: page 175 — An bright equal pair, extremely widely separated. Best enjoyed in the finder scope!

Observed:

Taurus

118 Tau: page 137 — A bright white primary with a closely bound yellow secondary. The secondary is reasonably bright, enhancing the color of the pair.

Observed:

30 Tau: page 102 — An unusual blue-red color combination, with reasonable separation, but the faint red companion needs a larger telescope to bring out its color.

Observed:

Chi Tau: page 99 — An easily separated white-blue pairing, where the secondary is also reasonably bright so seeing the color is easier.

Observed:

Phi Tau: page 96 — A bright yellow primary with a widely separated faint blue companion.

Observed:

Struve 401: page 96 — An easily separated equal pair of fairly bright white stars.

Observed:

Struve 422: page 103 — A bright yellow primary close to a relatively faint orange companion.

Observed:

Struve 449: page 100 — A bluish primary with a close, faint companion.

Observed:

Struve 450: page 100 — A close pair of white stars, not very bright but easily found.

Observed:

Struve 495: page 102 — A close pair of yellow stars. The primary is almost three magnitudes brighter than the secondary, meaning it is roughly 15 times brighter.

Observed:

Struve 572: page 129 — A close and equal pair of yellow stars.

Observed:

Struve 670: page 141 — A balanced, very close pair; the primary is bluish.

Observed:

Struve 740: page 141 — A faint pair with wide separation.

Observed:

Struve 742: page 140 — A nearly equal pair of yellowish stars with very close separation.

Observed:

Theta Tau: page 106 — A balanced blue-yellow pair of stars, with a barely visible distant companion.

Observed:

Triangulum

Iota Tri: page 91 — A tight, bright pair of well-matched yellow and blue stars.

Observed:

Struve 239: page 91 — A comfortably separated yellow-blue pairing.

Observed:

Triangulum Australe

RMK 20: page 243 — An extremely tight, equal pair of fairly bright, white stars.

Observed:

SLR 11: page 243 — A fairly bright blue primary with an almost inseparable companion.

Observed:

Tucana

Beta1 Tuc: page 78 — An equal pair of very bright, easily separated stars; Beta1 is bluish, while Beta2 is white.

Observed:

COO 3: page 82 — A fairly bright yellowish primary with a tightly bound secondary.

Observed:

Delta Tuc: page 313 — A brilliant bluish primary close to a fairly faint secondary.

Observed:

GLI 289: page 83 — A yellow primary very close to a faint secondary.

Observed:

HJ 3408: page 79 — An easily separated pair of yellow stars.

Observed:

HJ 3416 AB: page 78 — A close and equal pair of yellowish stars.

Observed:

HJ 3426: page 317 — An extremely close pairing, with a fairly bright white primary and moderate secondary.

Observed:

I 340: page 83 — A unbalanced sub-arcsecond pairing dominated by its orange primary.

Observed:

Kappa Tuc: page 321 — A tight pair of light yellow and yellow stars distantly separated from an extremely tight pair of orange stars.

Observed:

Lam1 Tuc: page 317 — A balanced and fairly bright pair of yellow stars, easily separated.

Observed:

Ursa Major

21 UMa: page 165 — A close yellow-blue pair.

Observed:

23 UMa: page 167 — A brilliant yellowish primary well separated from a faint secondary.

Observed:

65 UMa: page 195 — A white primary with a tightly bound secondary.

Observed:

Mizar: page 194 — A delightful triple system of white stars easily separated in any telescope.

Observed:

Struve 1520: page 195 — An easily separated pairing of two yellowish stars.

Observed:

Struve 1695: page 194 — A bright yellow primary tightly separated from a fainter blue companion.

Observed:

Xi UMa: page 197 — A bright white-yellow pair separated by anything between 1.6 and 3.0 arc seconds.

Observed:

Ursa Minor

Herschel 2682: page 44 — A widely separated triple star system with a white primary and two fainter blue companions.

Observed:

Pil UMi: page 42 — A very wide and reasonably balanced yellow-white pair.

Observed:

Polaris: page 45 — A brilliant yellow primary separated comfortably from a vastly fainter white secondary.

Observed:

Vela

DUN 70: page 188 — A bright blue primary with a very close and fairly bright secondary.

Observed:

Gamma Vel: page 191 — An extremely brilliant blue primary widely separated from a brilliant blue companion.

Observed:

HJ 4191: page 188 — A bright, bluish primary with a close faint companion.

Observed:

HJ 4220: page 189 — A well-balanced pair, with a bright bluish primary and a tightly bound, fairly bright companion.

Observed:

HJ 4330: page 215 — A bright orange primary widely separated from a fairly faint white secondary.

Observed:

HJ 4332: page 212 — A white primary widely separated from a faint secondary.

Observed:

KL Vel: page 190 — A bright bluish star with a fairly bright and very close companion.

Observed:

Mu Vel: page 212 — A very brilliant yellow primary with a bright yellow companion, very tightly separated.

Observed:

Virgo

Phi Vir: page 234 — A very close and unequal yellow-blue pair.

Observed:

Porrina: page 206 — An almost perfectly equal and very close pair of brilliant yellowish stars.

Observed:

STF 1627: page 206 — An equal and easily separated pair of fairly bright white stars.

Observed:

Volans

Epsilon Vol: page 324 — A close, unbalanced pair with a very bright blue primary and white secondary.

Observed:

Gam2 Vol: page 319 — A brilliant orange primary easily separated from a bright yellowish companion.

Observed:

HJ 3997: page 323 — An equal and extremely tight pair of bluish stars.

Observed:

Zeta Vol: page 320 — A very bright orange primary star comfortably separated from a much fainter companion.

Observed:

Vulpecula

Struve 2445: page 264 — An easily separated white-blue pair.

Observed:

Struve 2455: page 264 — A close white-blue pair.

Observed:

Struve 2457: page 260 — An easily separated white-blue pair.

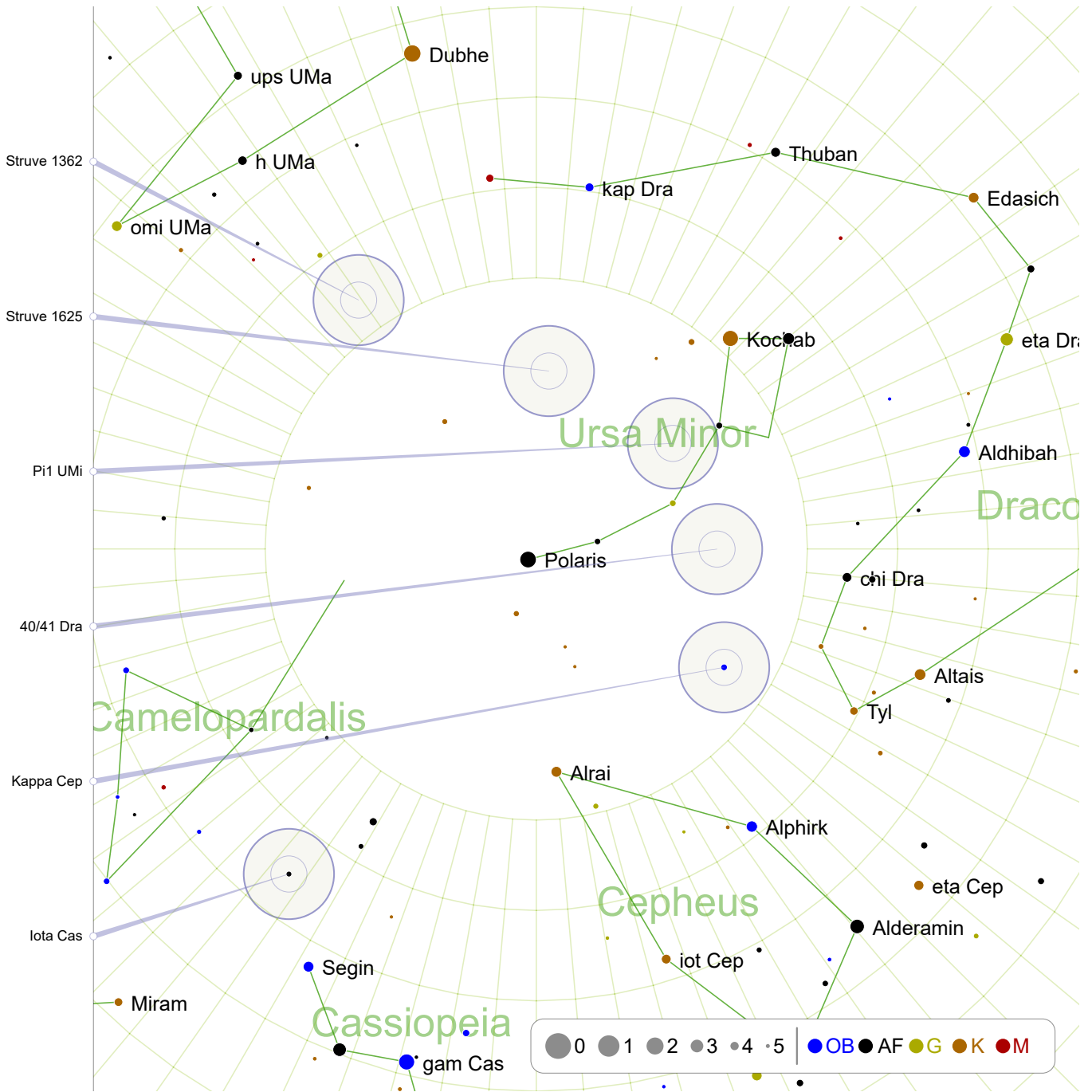
Observed:

Struve 2540: page 293 — A close white-blue pair.

Observed:

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Northern Circumpolar Sky (1)



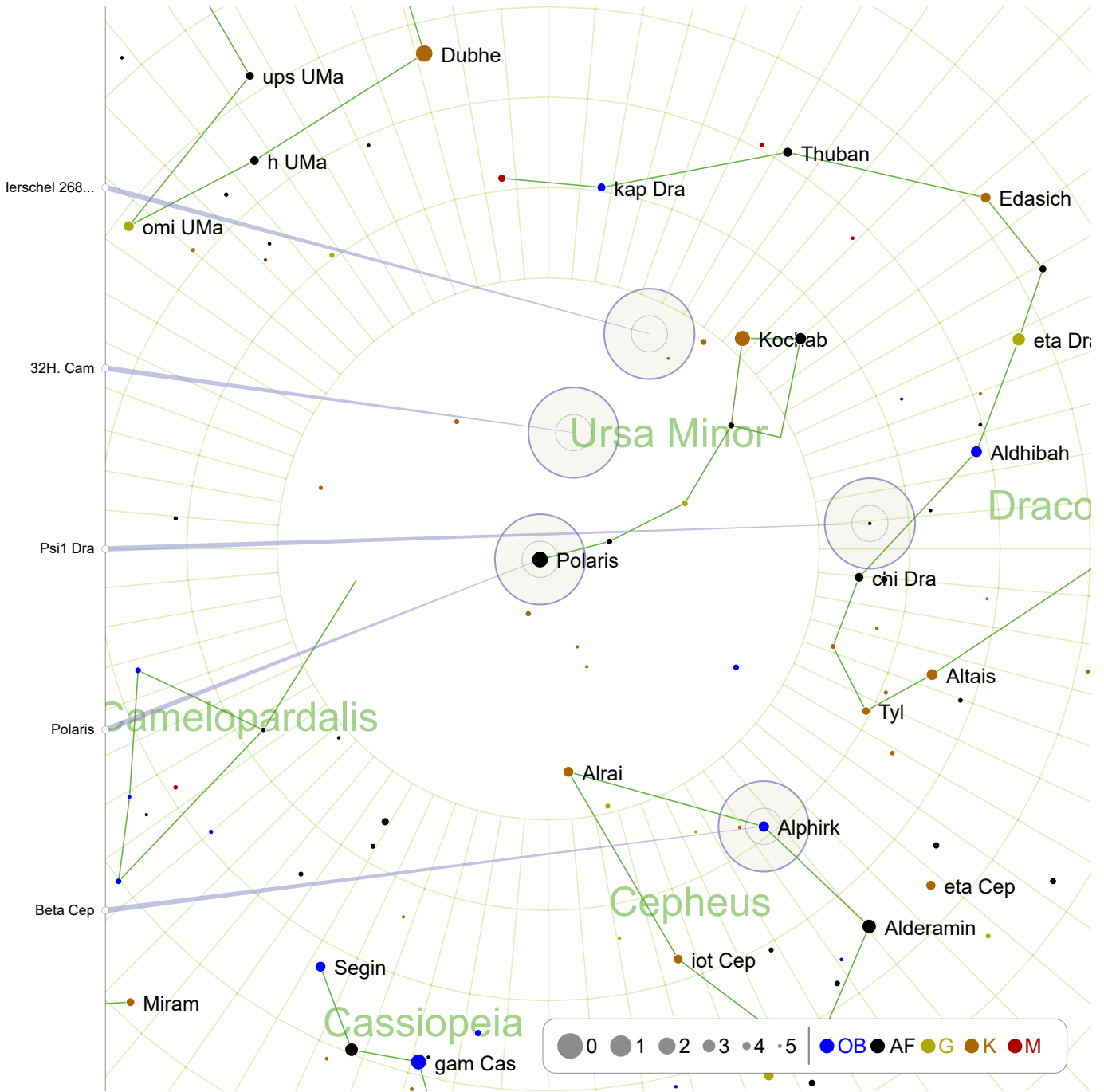
Struve 1362: page 41
Kappa Cep: page 43

Struve 1625: page 41
Iota Cas: page 43

Pi1 UMi: page 42

40/41 Dra: page 42

Northern Circumpolar Sky (2)

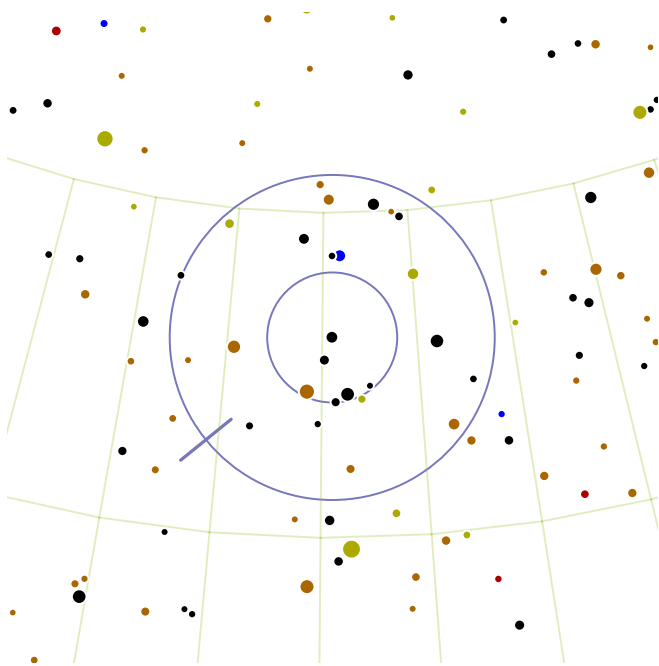


Herschel 2682: page 44
Beta Cep: page 46

32H. Cam: page 44

Psi1 Dra: page 45

Polaris: page 45



Struve 1362

RA: 144.48° | 9h 37.89' — DEC: 73.08° | 73° 5'

Magnitude: 7.2 | 7.2

Separation: 4.9"

Position Angle: 129°

SAO 6915 | HIP 47260 | GDR2 50284462208



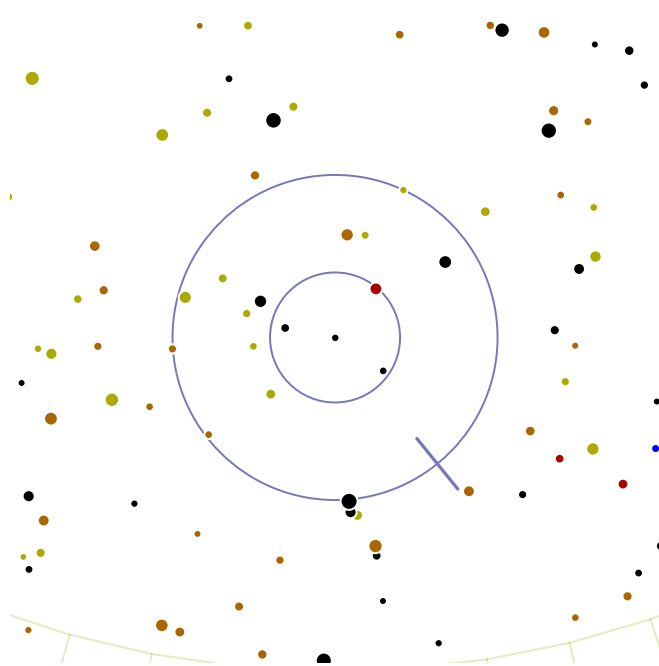
A close and equal pair of pale yellow stars.



Very hard to find. Draw a line from through magnitude 3.0 Pherkad through magnitude 2.0 Kochab (the "other" two brightish stars in Ursa Minor), and extend the line to form an isosceles triangle with Polaris. This puts you near this double.



This pair of F-type dwarfs is only 231 light-years away. They orbit in only 7.9 years, with the position angle changing strongly from year to year and the separation varying from 6" to 13". One to keep an eye on!



Struve 1625

RA: 184.05° | 12h 16.2' — DEC: 80.13° | 80° 8'

Magnitude: 7.3 | 7.8

Separation: 14.4"

Position Angle: 219°

SAO 2009 | HIP 59836 | GDR2 05156264704



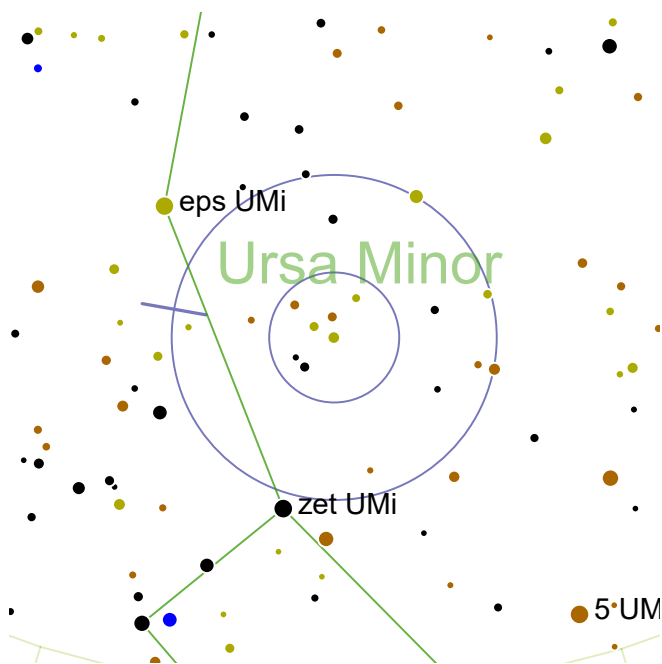
A balanced pair of yellow stars, comfortably separated.



Forms an obtuse angle with Kochab and Polaris. It lies on the southern edge of a scattering of sixth and seventh magnitude stars that should cover the northern half of the finder.



This pair of bright yellow-white dwarfs is 1623 light-years from the Sun.



Pi1 UMi


RA: 232.3° | 15h 29.2' — DEC: 80.45° | 80° 27'


Magnitude: 6.6 | 7.3

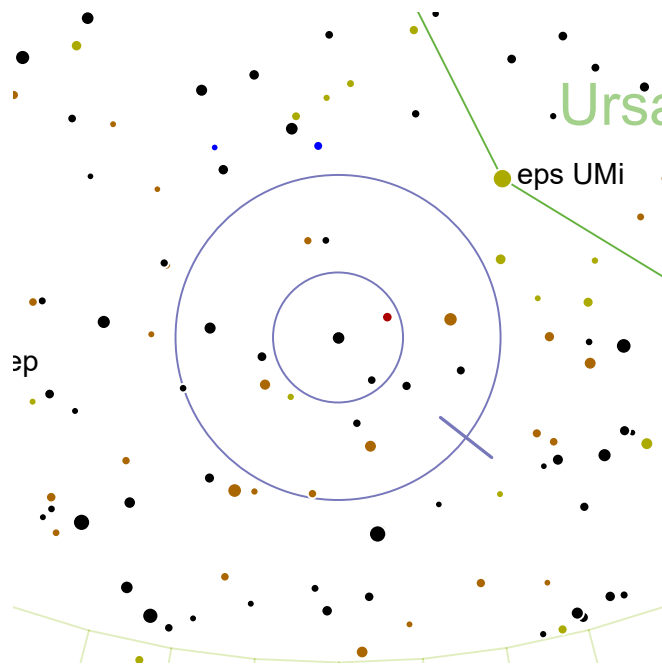
Separation: 31"

Position Angle: 80°

SAO 2556 | HIP 75809 | GDR2 98827435648

 A very wide and reasonably balanced yellow-white pair.

 Starting at magnitude 2.05 Kochab, move one and a half finder circles towards Polaris.



40/41 Dra


RA: 270.05° | 18h 0.2' — DEC: 80.0° | 80° 0'


Magnitude: 5.7 | 6.1


Separation: 19.3"

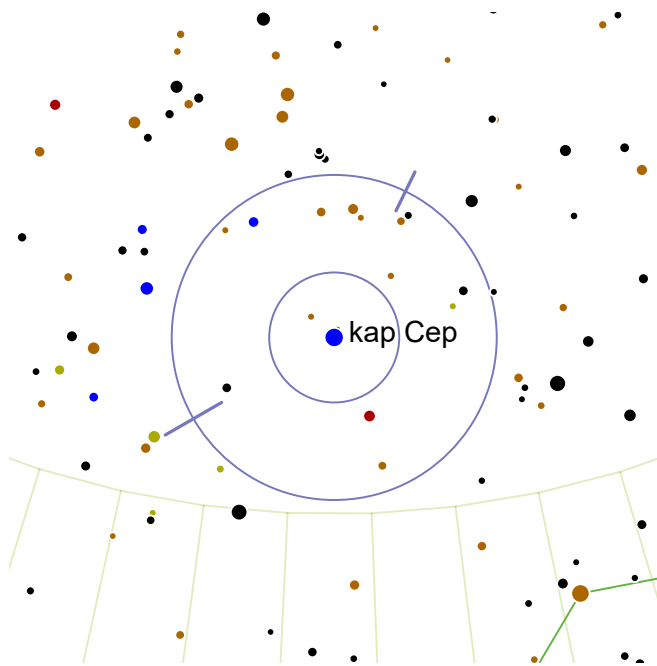
Position Angle: 232°

SAO 8996 | HIP 88136 | GDR2 24838599808

 A comfortably separated pair of bright yellow stars.

 Three degrees south-east of Epsilon Ursae Minoris. Alternately, draw a line from Kochab through Zeta Ursae Minoris (the star marking the point the long tail of the Little Bear joins the body). Continue this line an equal distance to get in the vicinity of 40/41 Draconis.

 This system of yellow-white dwarfs is only 207 light-years from the Sun.



Kappa Cep

RA: 302.23° | 20h 8.9' — DEC: 77.72° | 77° 43'

Magnitude: 4.4 | 8.3 | 10.3

Separation: 7.3" | 170.2"

Position Angle: 120° | 334°

SAO 9665 | HIP 99255 | GDR2 11287582464



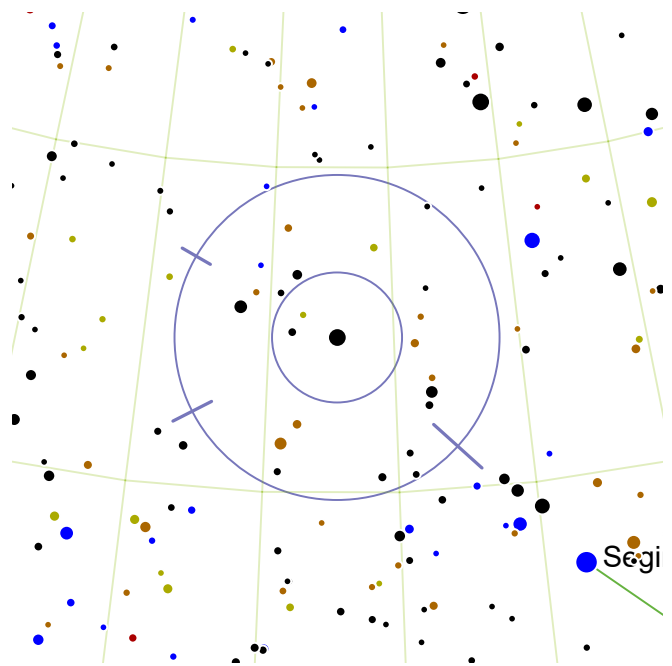
A scattered triple system, with a very bright blue primary with one close and one dim distant companion.



One and a half finder circles N from magnitude 3.99 Tyl. One and a half finder circles NE from magnitude 3.69 chi Dra.



The two brighter components are bound together by gravity but the third companion is merely a background star.



Iota Cas

RA: 37.28° | 2h 29.09' — DEC: 67.4° | 67° 24'

Magnitude: 4.6 | 6.9 | 9.0 | 8.4

Separation: 3.0" | 6.7" | 211"

Position Angle: 228° | 117° | 60°

SAO 12298 | HIP 11569 | GDR2 517650349234855424



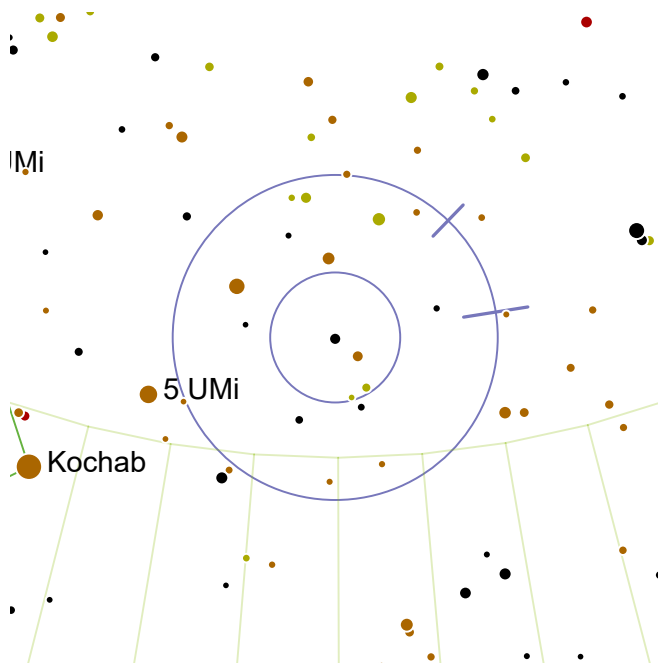
A bright, white primary with a yellow-orange secondary and a dim, colorless third component.



One finder circle NE from magnitude 3.44 Segin. Two finder circles NE from magnitude 2.25 gam Cas.



The needle-like reflection nebula VdB 8 (mag. 8.5) is on the NEE edge of the finder circle.



Herschel 2682

RA: 205.18° | 13h 40.7' — DEC: 76.85° | 76° 51'

Magnitude: 6.7 | 9.7 | 9.0

Separation: 26.3" | 45.9"

Position Angle: 279° | 316°

SAO 7867 | HIP 66728 | GDR2 33167493120



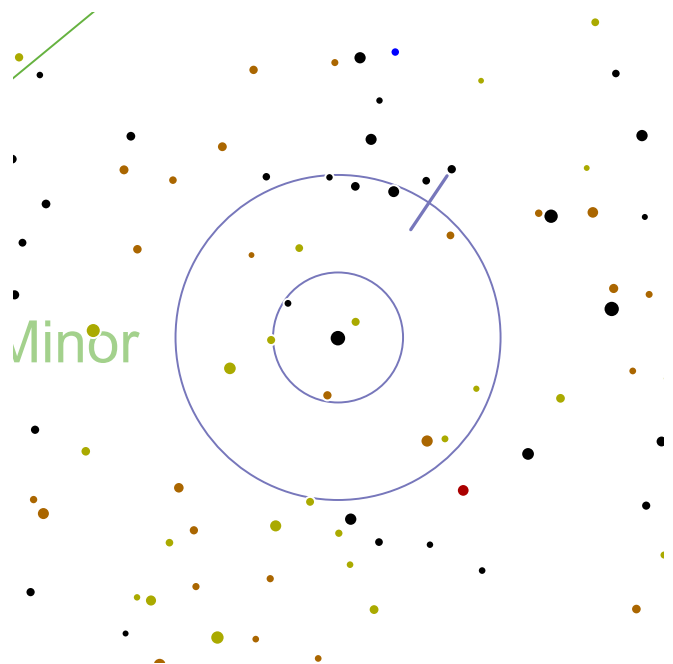
A widely separated triple star system with a white primary and two fainter blue companions.



Draw a line from Pherkad (magnitude 3.0) through Kochab (magnitude 2.05) and continue for just over one finder circle.



Hipparchos data indicates this triple is only a line-of-sight coincidence and the stars are not gravitationally bound together.



32H. Cam

RA: 192.3° | 12h 49.2' — DEC: 83.42° | 83° 25'

Magnitude: 5.3 | 5.8

Separation: 21.6"

Position Angle: 326°

SAO 2102 | HIP 62572 | GDR2 77354219648



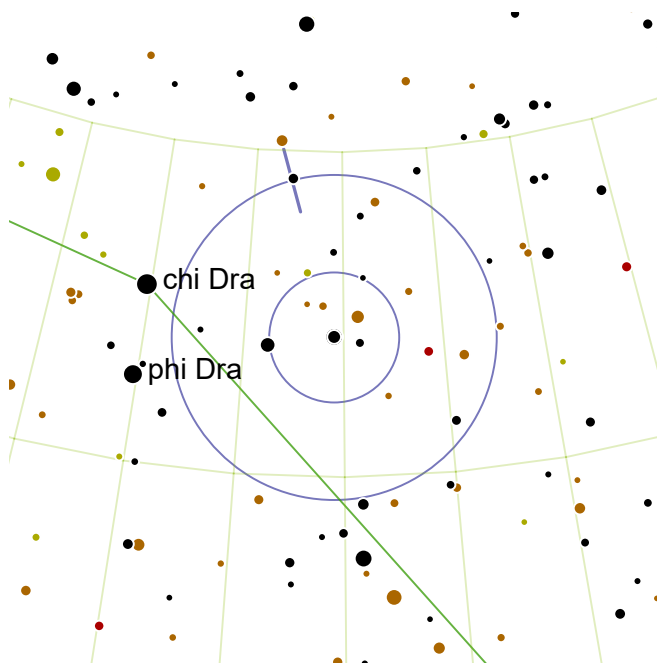
A bright and balanced white-white pair, widely separated.



From Polaris move one and a half finder circles towards bright Dubhe in Ursa Major, then half a finder towards the other brightish star in Ursa Minor, Kochab.



Also known as Struve 1694, 32H. Camelopardalis is not to be confused with Flamsteed's 32 Cam, which is now confusingly named as Xi Aurigae. "32H." means Hevelius' 32nd of Camelopardalis.



Psi1 Dra

RA: 265.48° | 17h 41.9' — DEC: 72.15° | 72° 9'

Magnitude: 4.9 | 6.1

Separation: 30.3"

Position Angle: 15°

SAO 8890 | HIP 86614 | GDR2 60202647296



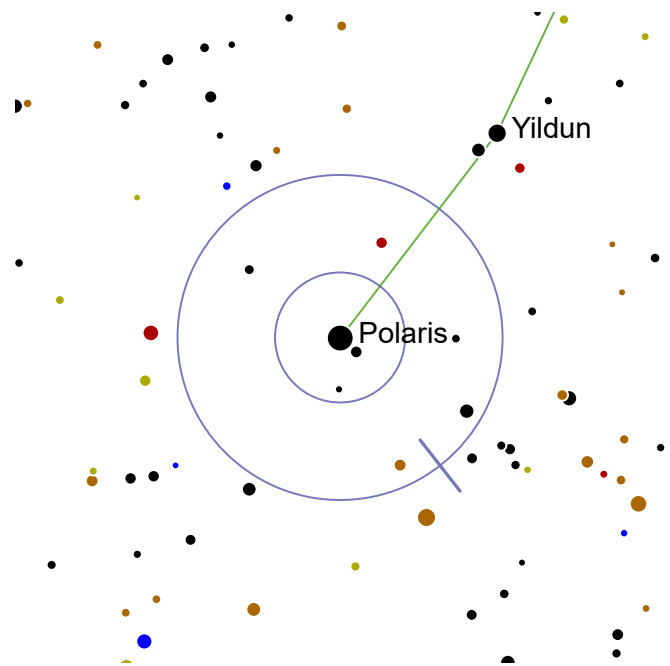
A wide pair of reasonably balanced, bright white stars.



Particularly difficult to locate in light polluted skies, Psi 1 Draconis is two and half finder circles east of Kochab. Look for a triangle of four fifth and sixth magnitude stars filling the finder and pointing west. Psi 1 Draconis is the westernmost of these stars.



Only 75 light-years away, the B component is orbited by an exoplanet (Psi1 Dra Bb) which is at least 50% more massive than Jupiter. It orbits Psi1 Dra B every 8.5 years.



Polaris

RA: 37.95° | 2h 31.8' — DEC: 89.27° | 89° 16'

Magnitude: 2.0 | 9.0

Separation: 18.4"

Position Angle: 218°

SAO 308 | HIP 11767 | GDR2 9921505664



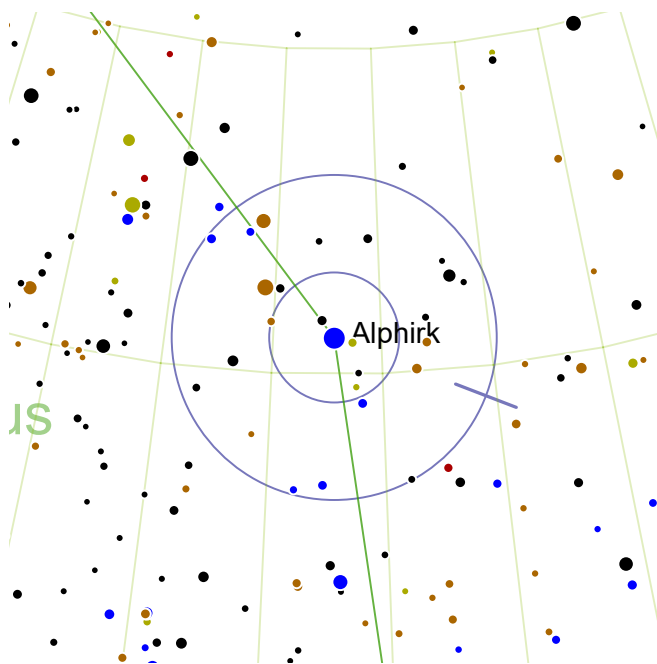
A brilliant yellow primary separated comfortably from a vastly fainter white secondary.



Polaris being the Pole star should be easy to find.



Although Delta Cephei is the model of all Cepheid variables, Polaris is the best-known member of this class of stars, although it currently varies with a very small amplitude. The variability was significantly more pronounced when it was first measured in 1911.



Beta Cep

RA: 322.18° | 21h 28.7' — DEC: 70.57° | 70° 34'

Magnitude: 3.2 | 7.9

Separation: 13.3"

Position Angle: 249°

SAO 10057 | HIP 106032 | GDR2 59992826624



A brilliant white primary split comfortably from a moderately faint blue companion.

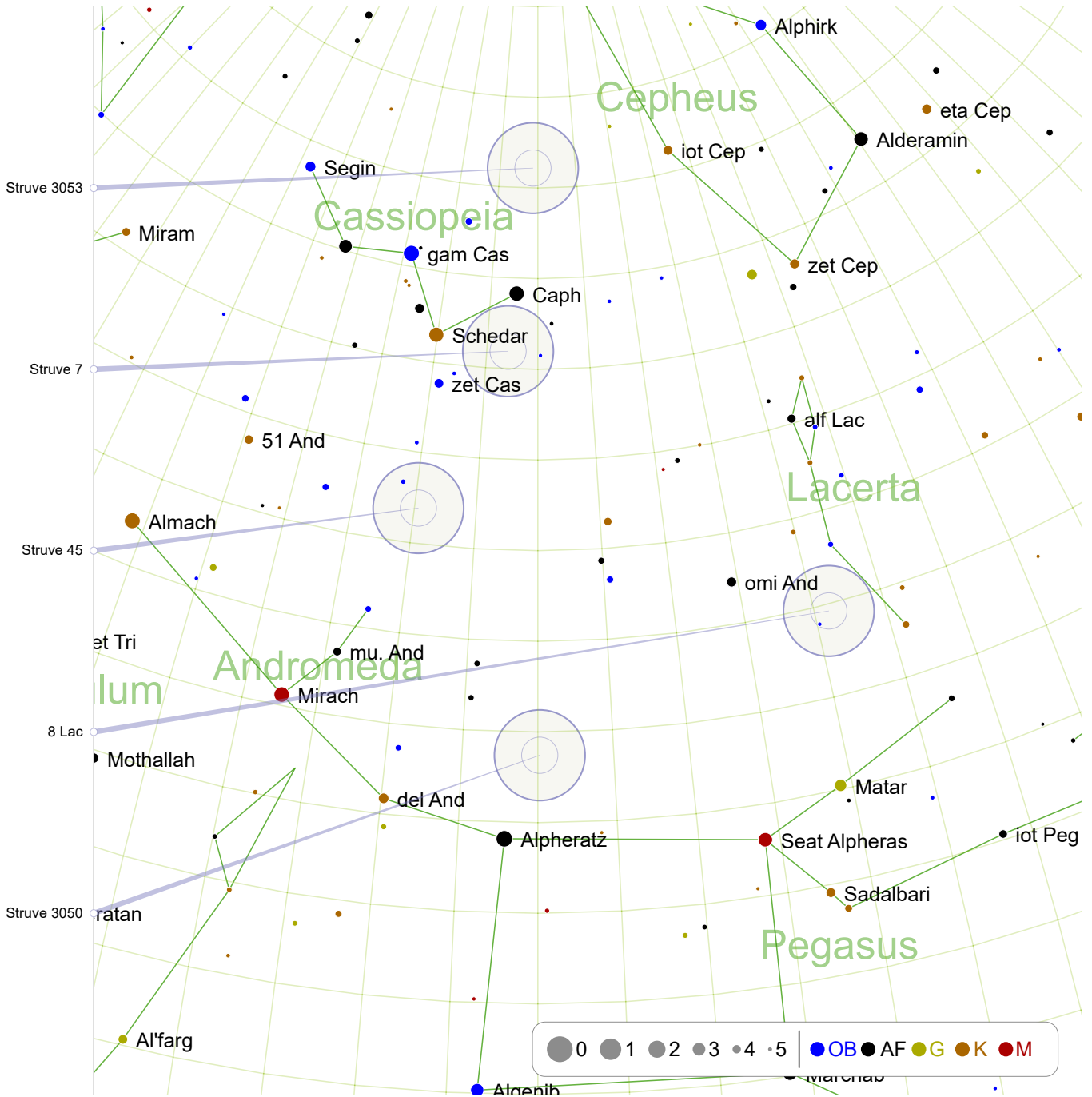


One of the brightest stars of the Cepheus polygon, Beta Cephei is the second furthest north of these stars.



If you position Beta Cephei (also known as Alfirk) in the north-east quadrant of a finder, the famous Iris nebula is on the opposite quadrant.

October: 45° North (1)



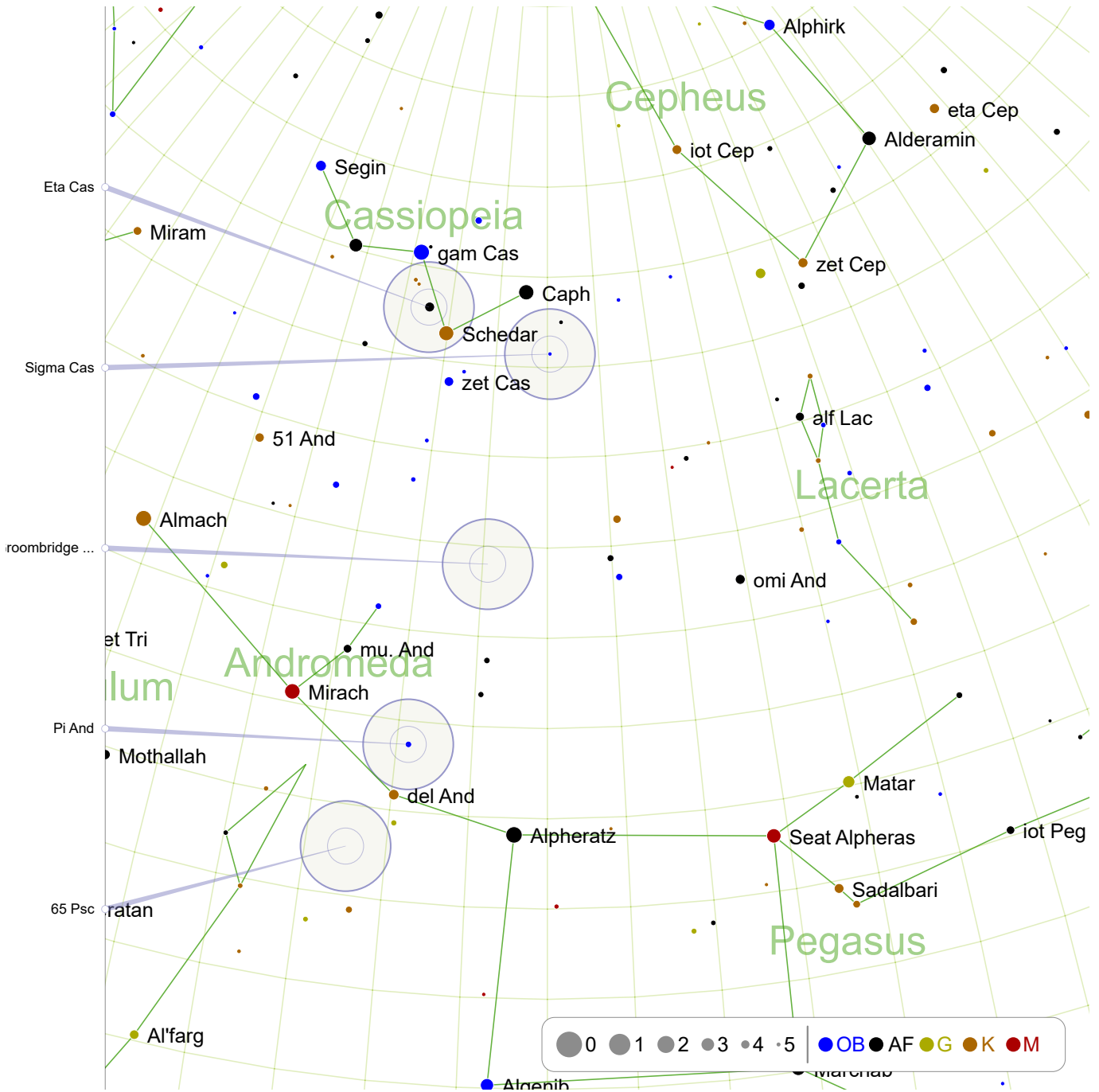
Struve 3053: page 49
Struve 3050: page 51

Struve 7: page 49

Struve 45: page 50

8 Lac: page 50

October: 45° North (2)

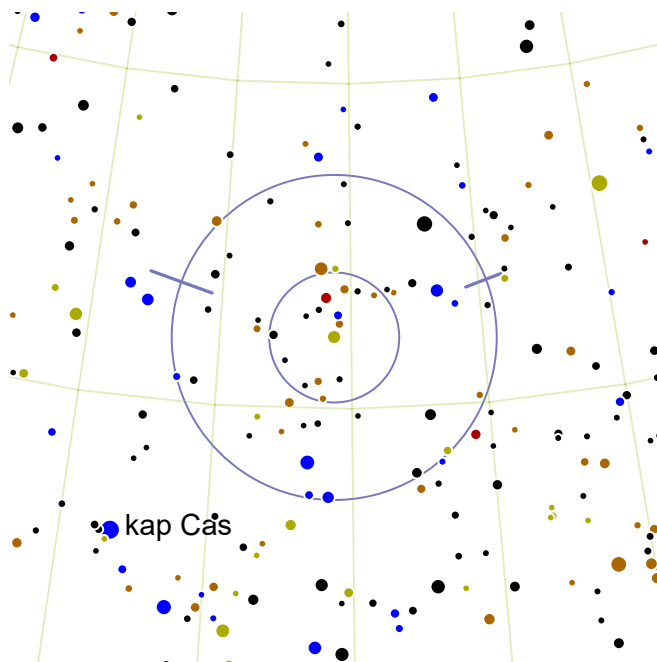


Eta Cas: page 51
65 Psc: page 53

Sigma Cas: page 52

Groombridge 34: page 52

Pi And: page 53



Struve 3053


RA: 0.65° | 0h 2.6' — DEC: 66.1° | 66° 6'


Magnitude: 6.0 | 7.2 | 11.0


Separation: 15.2" | 98.5"

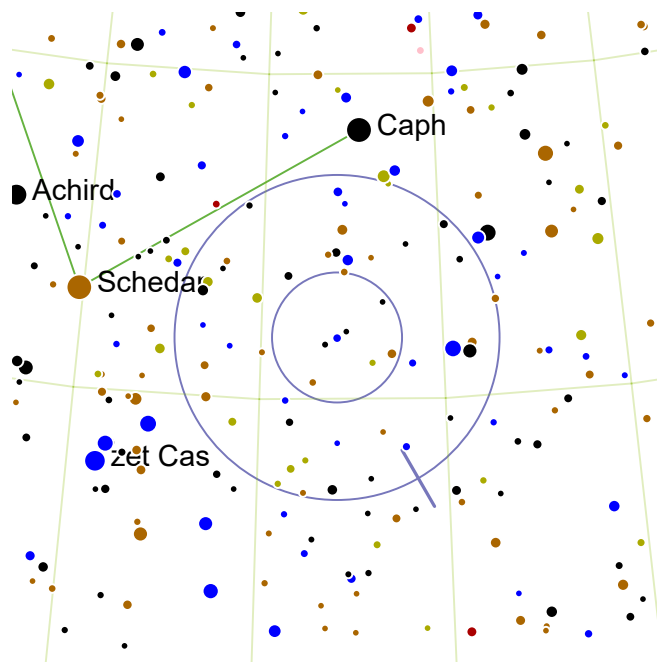
Position Angle: 70° | 291°

SAO 10937 | HIP 207 | GDR2 6794345472

 A bright yellow primary with an easily apparent white companion, easily separated. There is a very faint third component distantly separated from the central two stars.

 One finder circle N from magnitude 2.42 Caph. One and a half finder circles NNW from magnitude 3.64 Achird.

 The primary star is a giant with the same temperature as the Sun (but much larger) while the white companion is an A-class main sequence star.



Struve 7


RA: 2.92° | 0h 11.66' — DEC: 55.97° | 55° 58'


Magnitude: 8.0 | 8.5


Separation: 1.3"

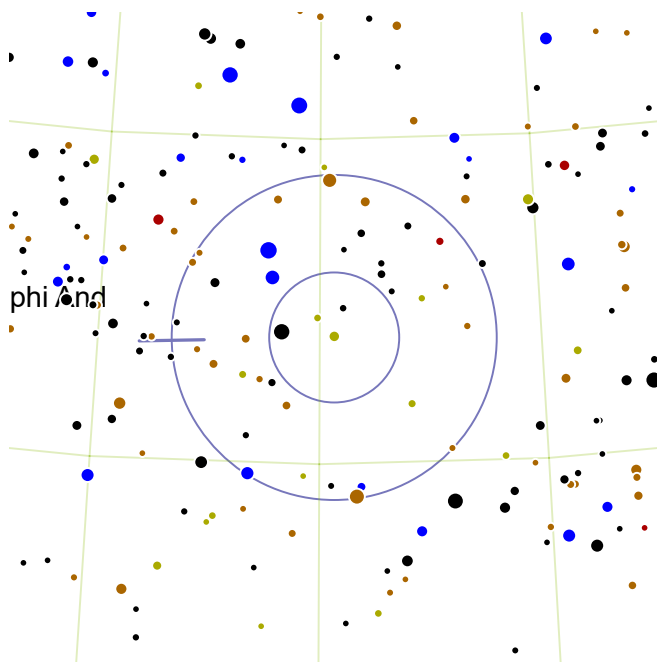
Position Angle: 210°

SAO 21191 | HIP 945 | GDR2 7309603456

 A balanced pair with a bluish primary, with extremely tight separation.

 Half a finder circle S from magnitude 2.42 Caph. Half a finder circle W from magnitude 2.47 Schedar.

 With this double centered, Caroline's Rose Cluster (NGC 7789) is on the NWW edge of the finder



Struve 45

RA: 9.68° | 0h 38.7' — DEC: 46.95° | 46° 57'

Magnitude: 6.9 | 10.0

Separation: 19.1"

Position Angle: 91°

SAO 36542 | HIP 3045 | GDR2 8318472192



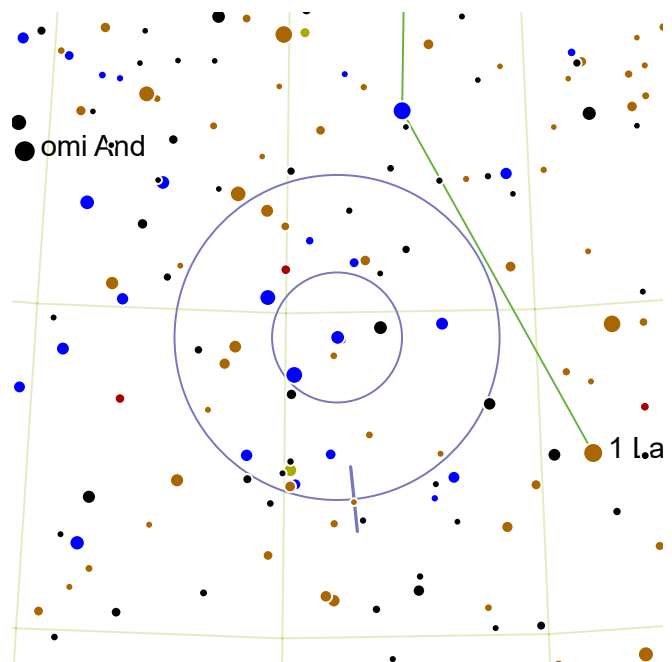
A wide double with a yellow primary.



One finder circle S from magnitude 3.72 zet Cas. One and a half finder circles NNW from magnitude 3.94 mu. And.



The primary is a bright yellow giant, 366 light-years from Earth. The Galaxy Caldwell 18 (NGC 185) is 1.5 degrees north of this double. A degree to the west of Caldwell 17 is another galaxy, Caldwell 17 (NGC 147).



8 Lac

RA: 338.98° | 22h 35.9' — DEC: 39.63° | 39° 38'

Magnitude: 5.7 | 6.5

Separation: 22.4"

Position Angle: 186°

SAO 72509 | HIP 111546 | GDR2 97999299840



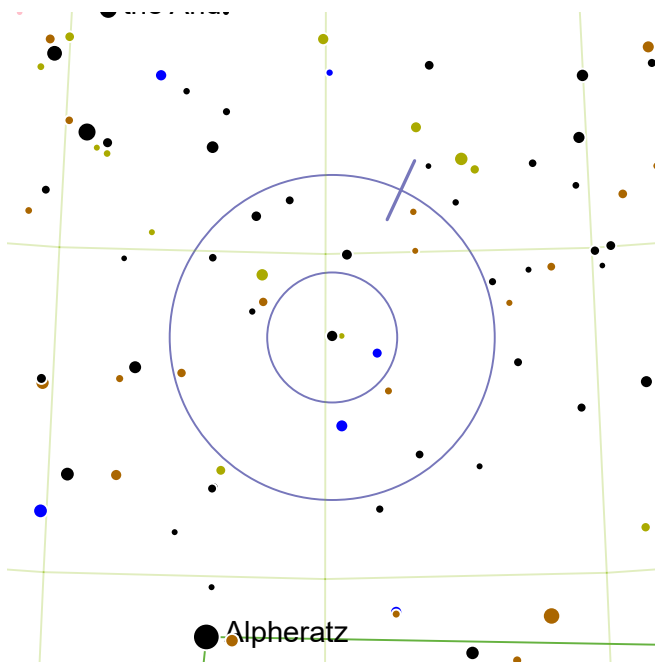
A fairly equally balanced and bright pair of blue-white stars, comfortably separated.



There are also possibly C, D and E components, much fainter and very widely separated.



Very slightly more than one finder circle due south is the Deer Lick group of galaxies (Caldwell 30).



Struve 3050

RA: 359.88° | 23h 59.5' — DEC: 33.72° | 33° 43'

Magnitude: 6.6 | 6.6

Separation: 1.7"

Position Angle: 335°

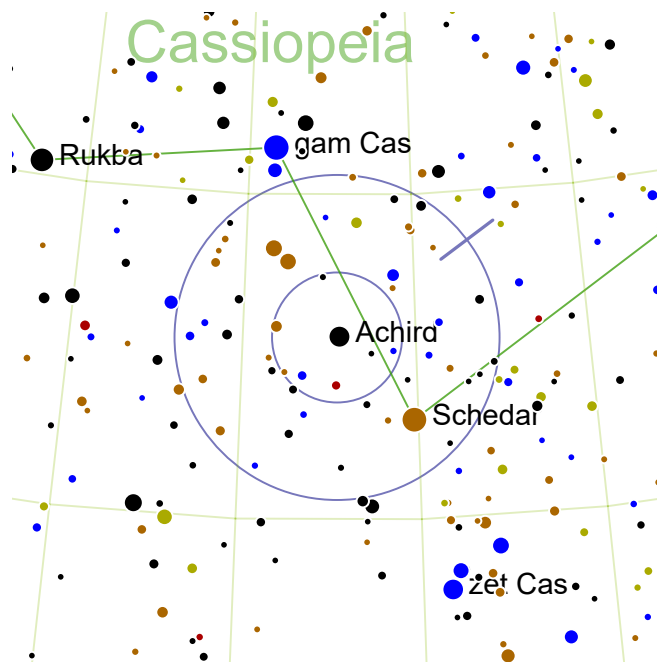
SAO 73656 | HIP 118281 | GDR2 78193873024



A tightly bound and perfectly balanced pair of bright yellow stars.



One finder circle north and slightly west of Alpheratz.



Eta Cas

RA: 12.28° | 0h 49.1' — DEC: 57.82° | 57° 49'

Magnitude: 3.4 | 7.5

Separation: 12"

Position Angle: 307°

SAO 21732 | HIP 3821 | GDR2 425040000951479424



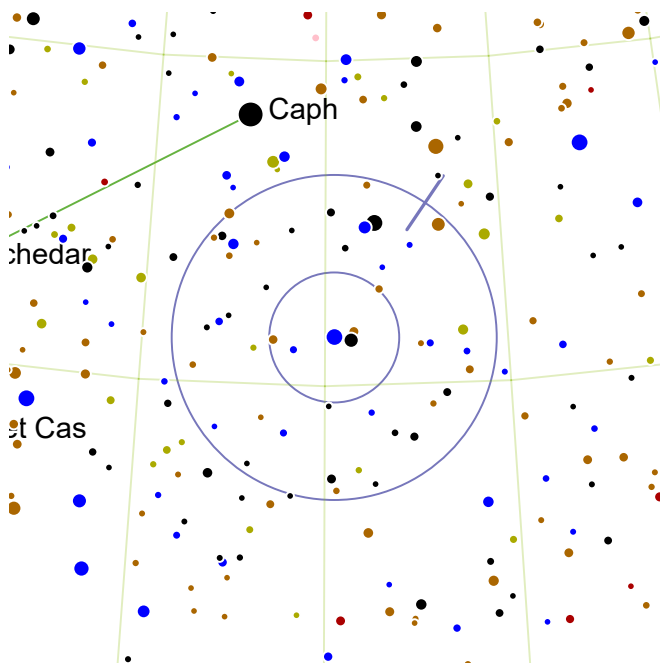
A brilliant yellow primary comfortably separated from a fairly faint red secondary.



Center Schedar in the finder; Eta Cas lies less than 2 degrees to the north-east.



William Herschel discovered the binary nature of this system in August 1779. The meaning and origin of the common name “Achird” is unknown. Note that Achird is one of the closest stars to us, at only 19 light-years distance. The primary star is very similar to the Sun, while the companion is a much dimmer K-type star roughly half as massive.



Sigma Cas

RA: 359.75° | 23h 59.0' — DEC: 55.75° | 55° 45'

Magnitude: 5.0 | 7.1

Separation: 3"

Position Angle: 326°

SAO 35947 | HIP 118243 | GDR2 37220412288



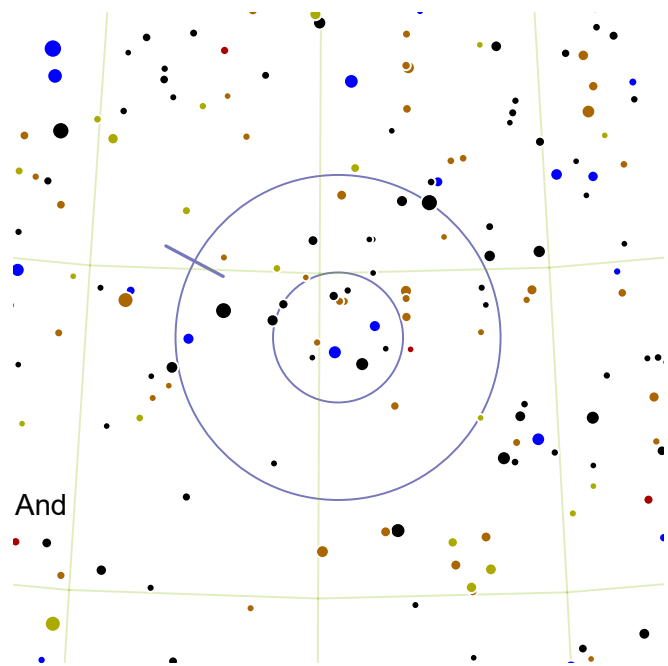
A tight primary with a brilliant blue-white primary almost touching a delicate secondary.



Position magnitude 2.25 Caph towards the north-east of the finder. Sigma Cas is at the southern end of the finder field. It can be found a quarter of a degree to the east of V1022 Cas.



The system is roughly 5000 light-years from us. The primary is 25,000 times more luminous than the Sun. One degree to the north of Sigma Cas is the star cluster NGC 7789, found by Caroline Herschel in 1783.



Groombridge 34

RA: 4.6° | 0h 18.39' — DEC: 44.02° | 44° 1'

Magnitude: 8.2 | 10.6

Separation: 40.0"

Position Angle: 62°

SAO 36248 | HIP 1475



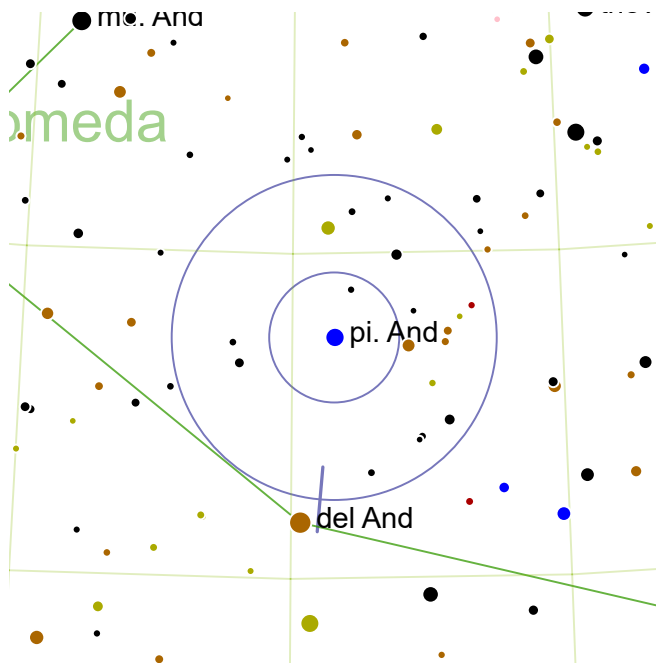
A little pair of red stars, very widely separated.



Groombridge 34 is midway between Alpheratz in the square of Pegasus and Schedar, the southernmost bright star of Cassiopeia.



This curiosity is a pair of red dwarfs 11.6 light-years away, zooming through the sky at 2.9" per year from Earth's perspective. The brighter component is two fifths of the Sun's mass, while the fainter companion is less than half that. Two exoplanets have been found in this system.



Pi And

RA: 9.23° | 0h 36.9' — DEC: 33.72° | 33° 43'

Magnitude: 4.4 | 7.1

Separation: 36.2"

Position Angle: 175°

SAO 54033 | HIP 2912 | GDR2 8611467520



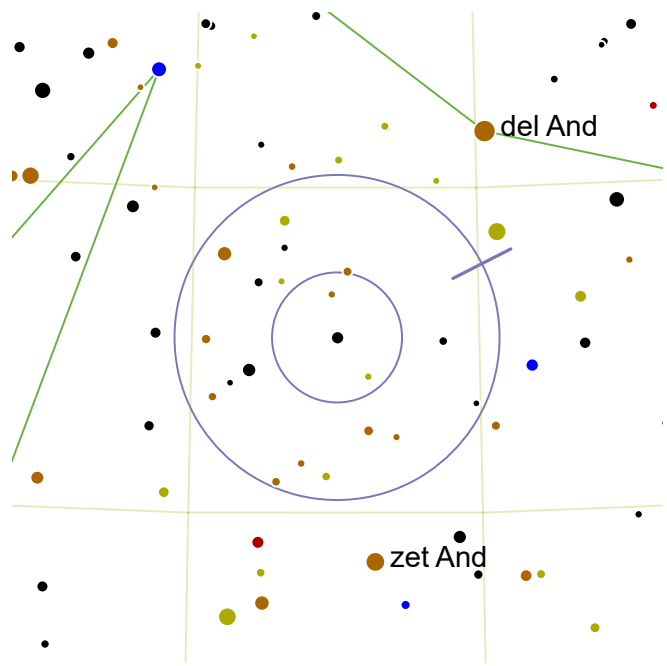
A bright blue primary widely separated from a fairly bright secondary.



Half a finder circle N from magnitude 3.49 del And. One finder circle SW from magnitude 3.94 mu. And.



The primary is a spectroscopic binary with an orbital period of 143 days.



65 Psc

RA: 12.48° | 0h 49.9' — DEC: 27.72° | 27° 43'

Magnitude: 6.3 | 6.3

Separation: 4.4"

Position Angle: 297°

SAO 74296 | HIP 3885 | GDR2 72903101824



An equal pair of fairly bright light yellow stars.



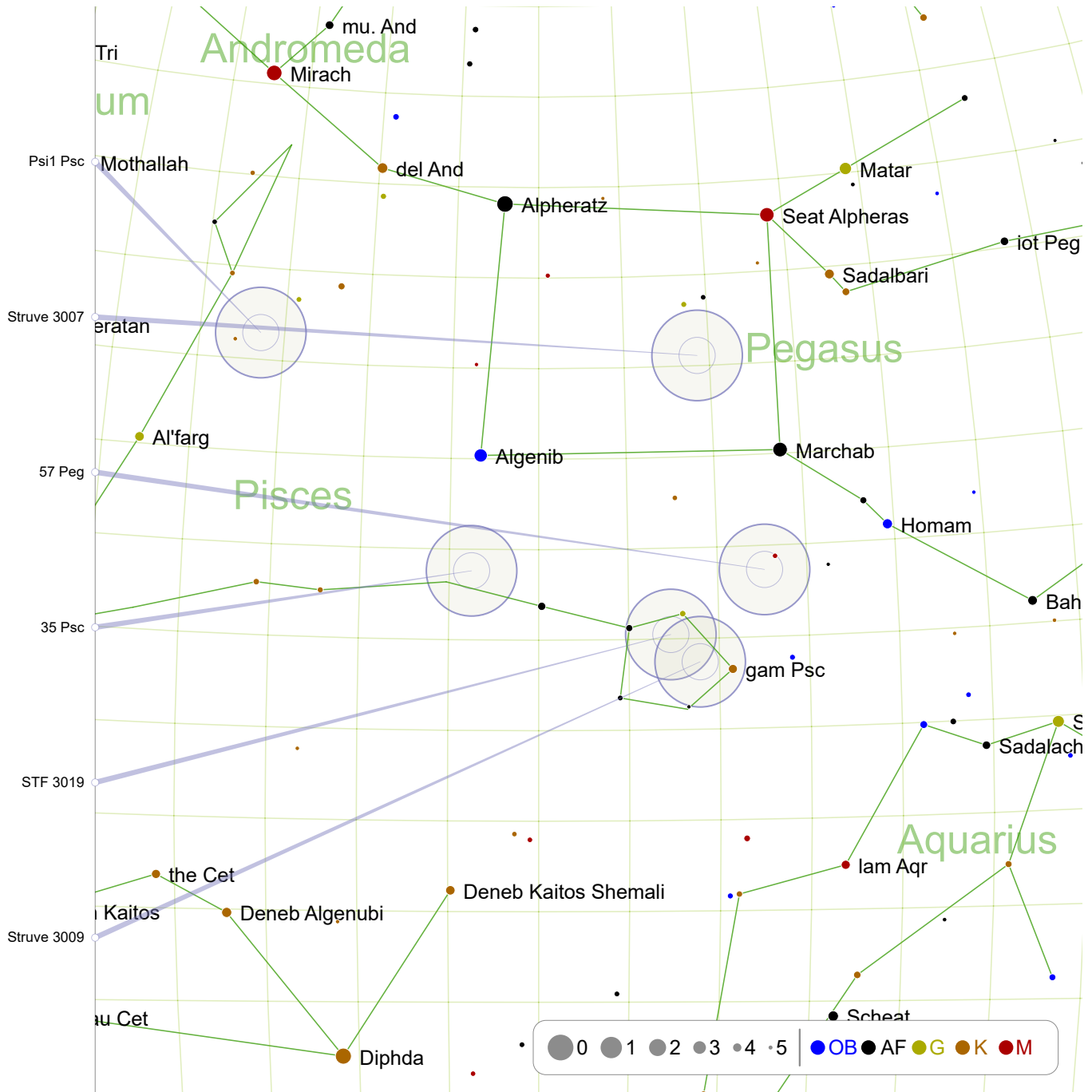
One and a half finder circles east of Alpheratz, the magnitude 2.05 north east corner of the square of Pegasus.



This double was found by William Herschel in 1783.

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October: 10° North (1)



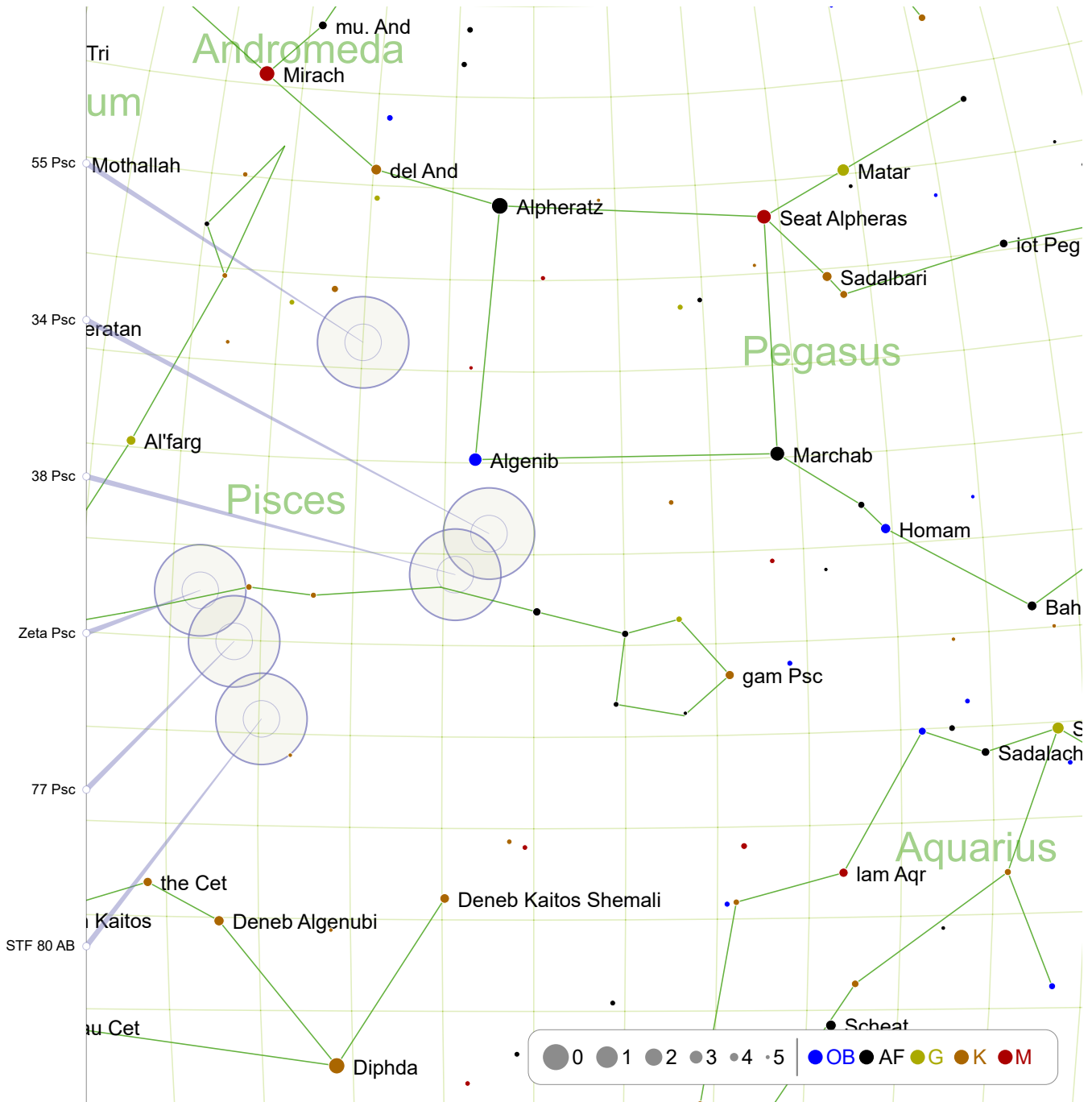
Psi1 Psc: page 57
 STF 3019: page 59

Struve 3007: page 57
 Struve 3009: page 59

57 Peg: page 58

35 Psc: page 58

October: 10° North (2)

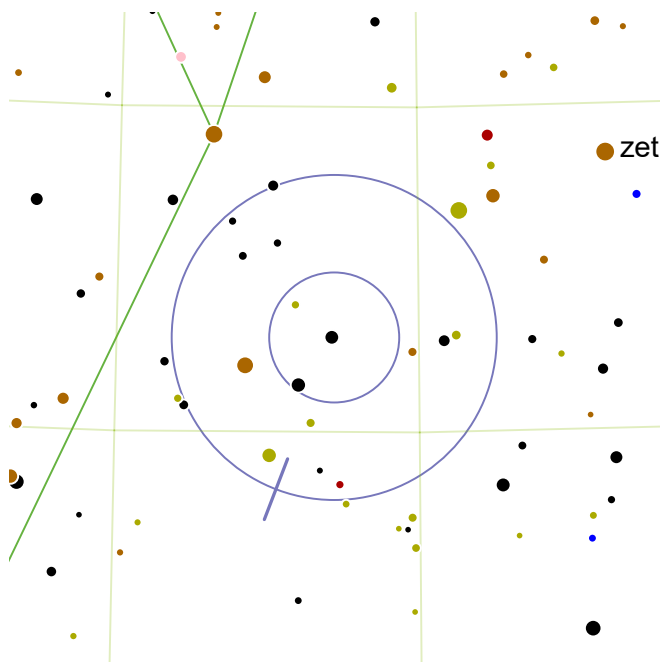


55 Psc: page 60
77 Psc: page 62

34 Psc: page 60
STF 80 AB: page 62

38 Psc: page 61

Zeta Psc: page 61



Psi1 Psc

RA: 16.4° | 1h 5.59' — DEC: 21.47° | 21° 28'

Magnitude: 5.6 | 5.8

Separation: 30"

Position Angle: 159°

SAO 74482 | HIP 5131 | GDR2 34190737152



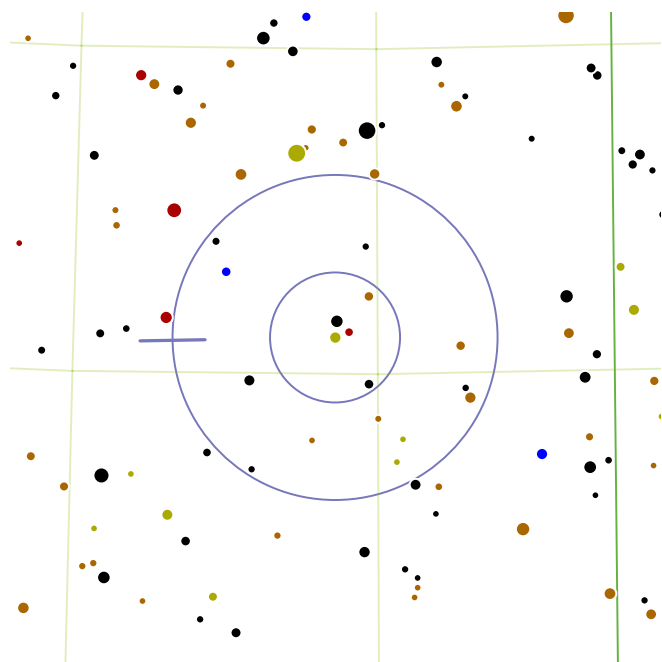
An equally matched and widely separated pair of blue-white stars.



Two and a half finder circles east and slightly north of magnitude 2.8 Algenib, the south-eastern star of the square of Pegasus.



The primary is reported to be a close binary.



Struve 3007

RA: 350.7° | 23h 22.79' — DEC: 20.57° | 20° 34'

Magnitude: 6.6 | 9.6

Separation: 5.9"

Position Angle: 91°

SAO 91222 | HIP 115417 | GDR2 74536867584



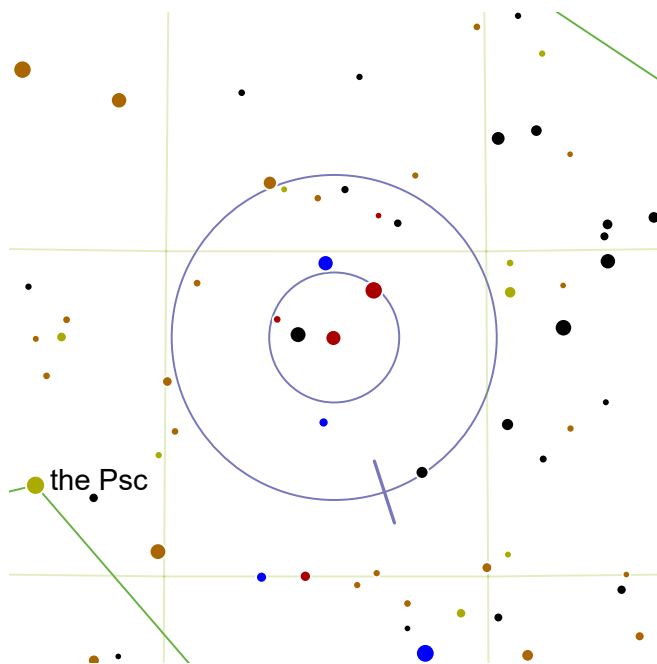
A close pair with a brighter yellow component and a very faint orange dwarf companion.



One and a half finder circles north east of Marchab.



The primary is very similar to the Sun, the Sun being a G2V star and Struve 3007 A is a G3V. The system is only 37 light-years away.



57 Peg




RA: 347.38° | 23h 9.5' — DEC: 8.68° | 8° 41'

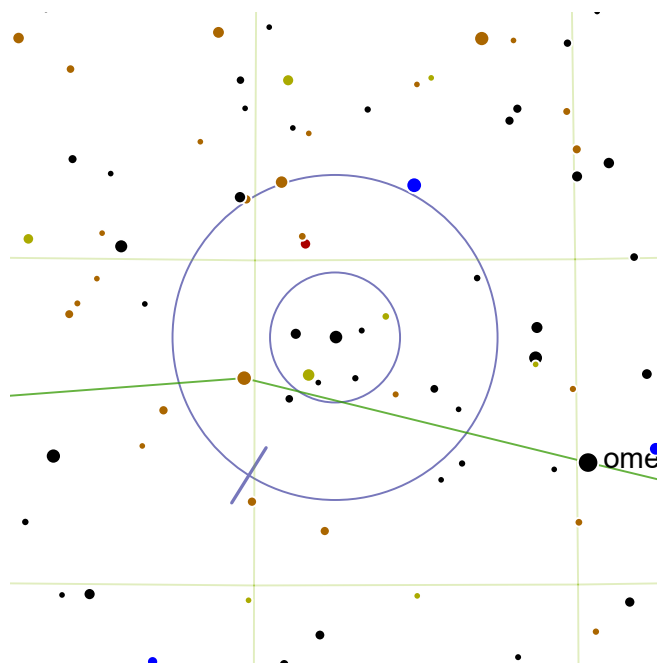
Magnitude: 5.3 | 10.1

Separation: 32.6"

Position Angle: 198°

SAO 128001 | HIP 114347 | GDR2 26470336768

-  A bright red primary widely separated from a faint white secondary.
-  One finder circle NNW from magnitude 3.85 gam Psc. One finder circle S from magnitude 2.57 Marchab.
-  The primary is a semiregular variable designated as GZ Pegasi, varying in brightness from 4.95 to 5.23 over a period of roughly 93 days. Although the brightness range is quite small, the star can be compared to 55 Pegasi to 59 Peg (mag. 5.15) less than a degree to the east.



35 Psc




RA: 3.75° | 0h 15.0' — DEC: 8.82° | 8° 49'

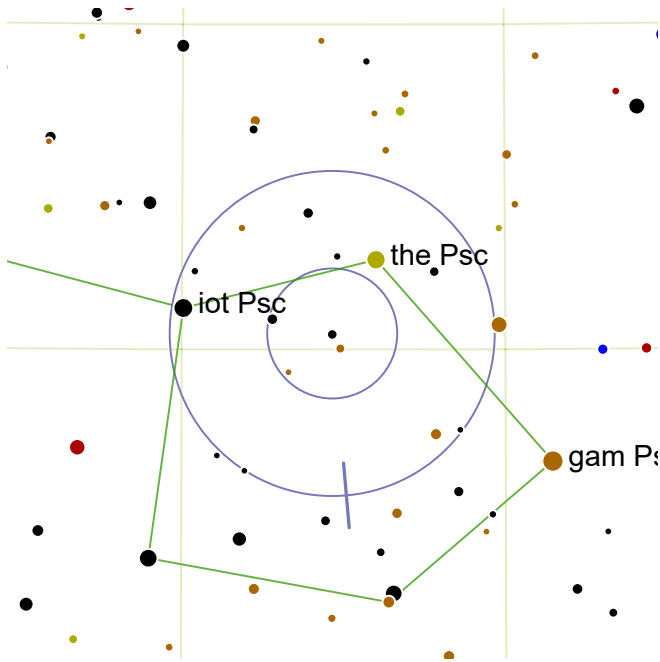
Magnitude: 6.0 | 7.6

Separation: 11.6"

Position Angle: 148°

SAO 109087 | HIP 1196 | GDR2 27234710784

-  An easy, bright double star with comfortable separation and a reasonably bright secondary, consisting of a white primary and light yellow secondary.
-  One and a half finder circles south of magnitude 2.8 Algenib.
-  35 Piscium is a triple star system roughly 250 light-years from the Sun. The primary star is itself a spectroscopic binary, with two stars circling each other in just 0.84 days. This causes a slight variability in the primary star, which shows two dips of slightly less than 0.1 magnitude each cycle.



STF 3019

RA: 352.68° | 23h 30.7' — DEC: 5.25° | 5° 15'

Magnitude: 7.8 | 8.4

Separation: 10.7"

Position Angle: 185°

SAO 128216 | HIP 116035 | GDR2 60632206720



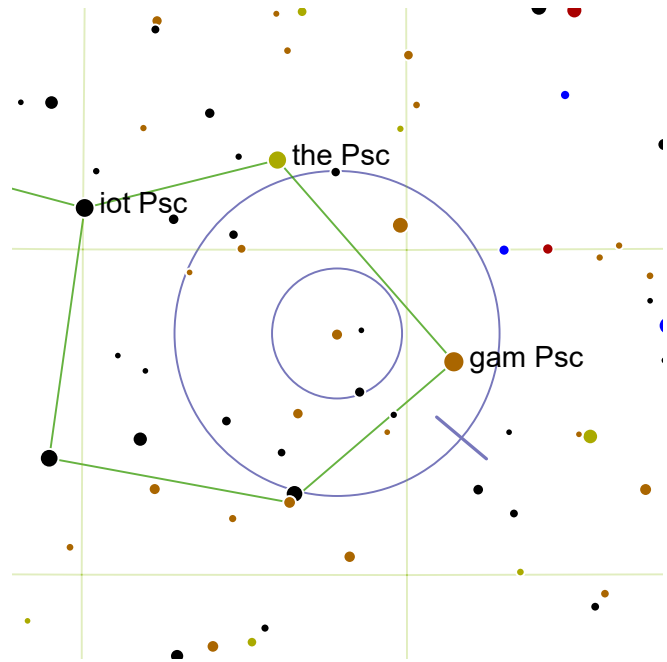
A balanced pair with a yellowish primary and white secondary.



Half a finder circle NEE from magnitude 3.85 gam Psc. Two finder circles SSE from magnitude 2.57 Marchab.



This highly luminous pair is gravitationally bound and is very distant - 5931 light-years from Earth.



Struve 3009

RA: 351.08° | 23h 24.29' — DEC: 3.72° | 3° 43'

Magnitude: 6.8 | 8.8

Separation: 7.0"

Position Angle: 230°

HIP 115544 | GDR2 98163694976 | TY2 0581-01198-1



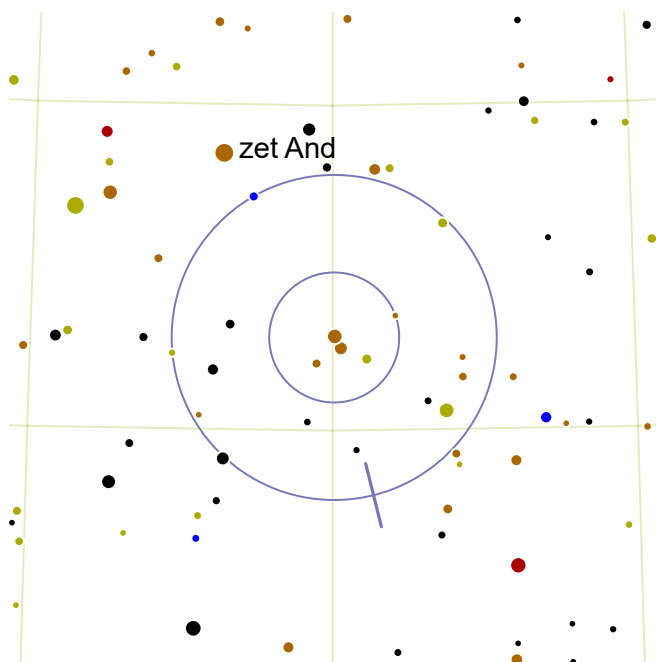
A close combination of an orange primary close to a 2 magnitude fainter secondary. The secondary at magnitude 8.76 is too faint to show much color in smaller scopes, but some report it to be blue.



Two and a half finder circles south east of Marchab.



The primary is a small K class giant star, similar in mass to the Sun but much older.



55 Psc

RA: 9.98° | 0h 39.9' — DEC: 21.43° | 21° 26'

Magnitude: 5.4 | 8.7

Separation: 6.5"

Position Angle: 194°

SAO 74182 | HIP 3138 | GDR2 79926374144



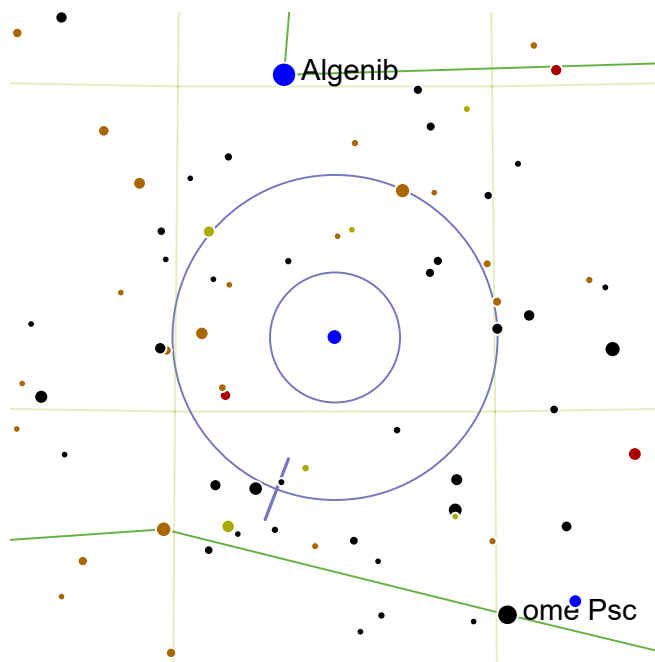
A bright orange primary with a much fainter white secondary close by.



One and a half finder circles north-east of magnitude 2.8 Algenib, the south-eastern star of the square of Pegasus.



The primary is an orange giant star similar in color to Arcturus.



34 Psc

RA: 2.5° | 0h 10.0' — DEC: 11.15° | 11° 9'

Magnitude: 5.5 | 9.4

Separation: 7.6"

Position Angle: 159°

SAO 91750 | HIP 813 | GDR2 22041820928



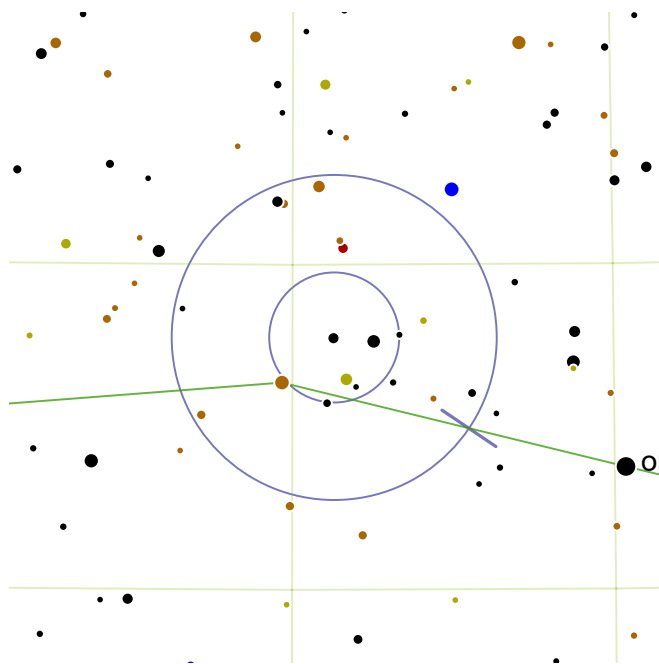
A bright bluish primary with a faint secondary close by.



Half a finder circle S from magnitude 2.87 Algenib.



It is not known if this double is gravitationally bound. The primary is 305 light-years from Earth.



38 Psc

RA: 4.35° | 0h 17.39' — DEC: 8.88° | 8° 53'

Magnitude: 7.9 | 7.8

Separation: 4.3"

Position Angle: 236°

SAO 109111 | HIP 1317



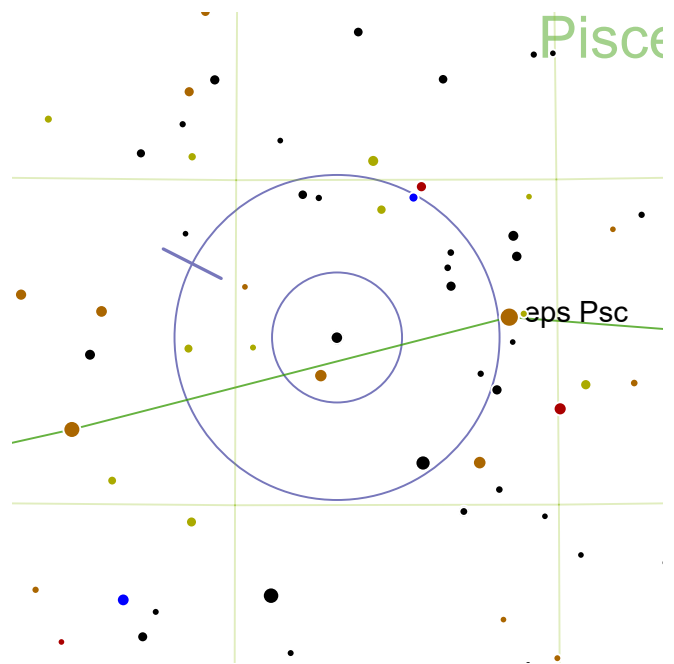
A very close and equal pair of yellow stars.



One and a half finder circles south of Algenib, the magnitude 2.8 star marking the south-eastern corner of the square of Pegasus.



38 Psc shares the same finder circle as the slightly brighter 35 Psc, which lies half a degree to the west.



Zeta Psc

RA: 18.43° | 1h 13.7' — DEC: 7.58° | 7° 35'

Magnitude: 5.6 | 6.5

Separation: 23"

Position Angle: 63°

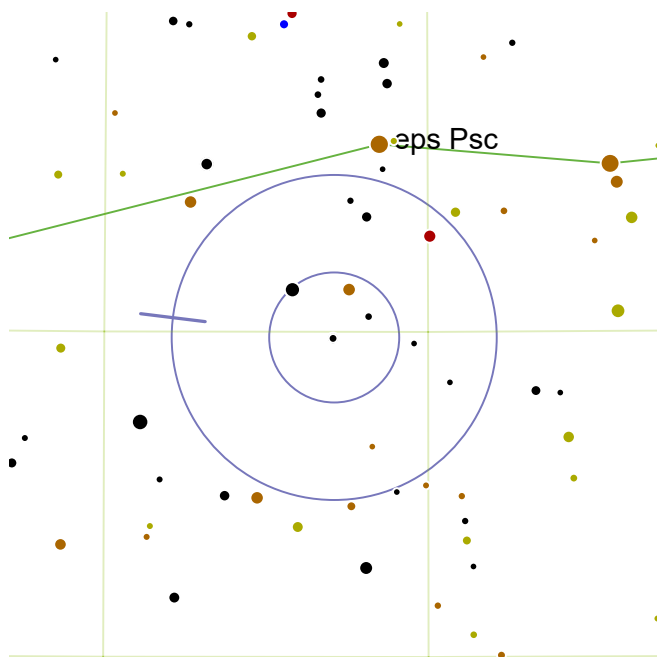
SAO 109739 | HIP 5737 | GDR2 92921353984



A widely separated pair of closely matched bright white stars.



The primary is a pair of A class stars with separation of 0.15". The secondary is a triplet of stars - a spectroscopic pair of F and G stars, and a further magnitude 12.2 star separated by 1".



77 Psc


RA: 16.45° | 1h 5.79' — DEC: 4.92° | 4° 55'


Magnitude: 6.8 | 7.6


Separation: 33"

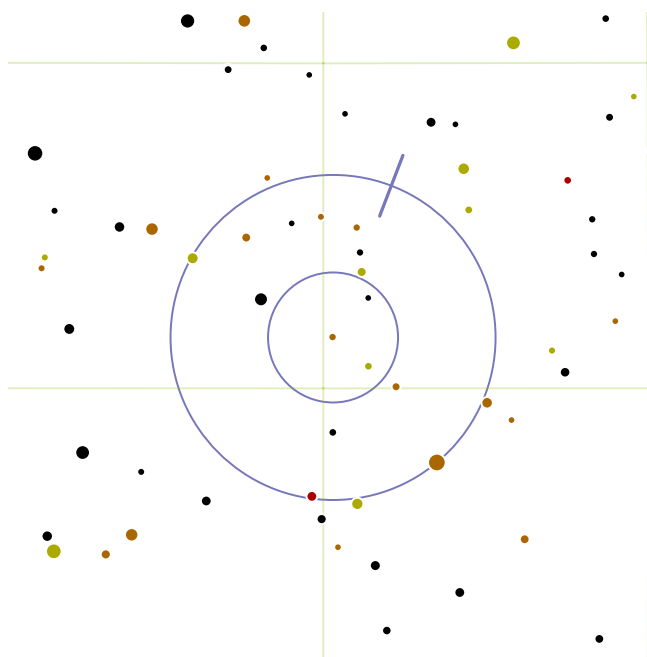
Position Angle: 83°

SAO 109666 | HIP 5141 | GDR2 91858705024

 A wide, fairly bright pairing of two yellow-white stars, separated in brightness by nearly one magnitude.

 Starting in the square of Pegasus, draw a line from the north-west corner (magnitude 2.40 Seat Alphas) through the opposite corner (magnitude 2.8 Algenib), and extend the line an equal distance out to 77 Psc.

 Only 132 light-years away, this system is composed of two F-class dwarfs.



STF 80 AB


RA: 14.85° | 0h 59.4' — DEC: 0.78° | 0° 47'


Magnitude: 7.8 | 9.1


Separation: 29.9"

Position Angle: 339°

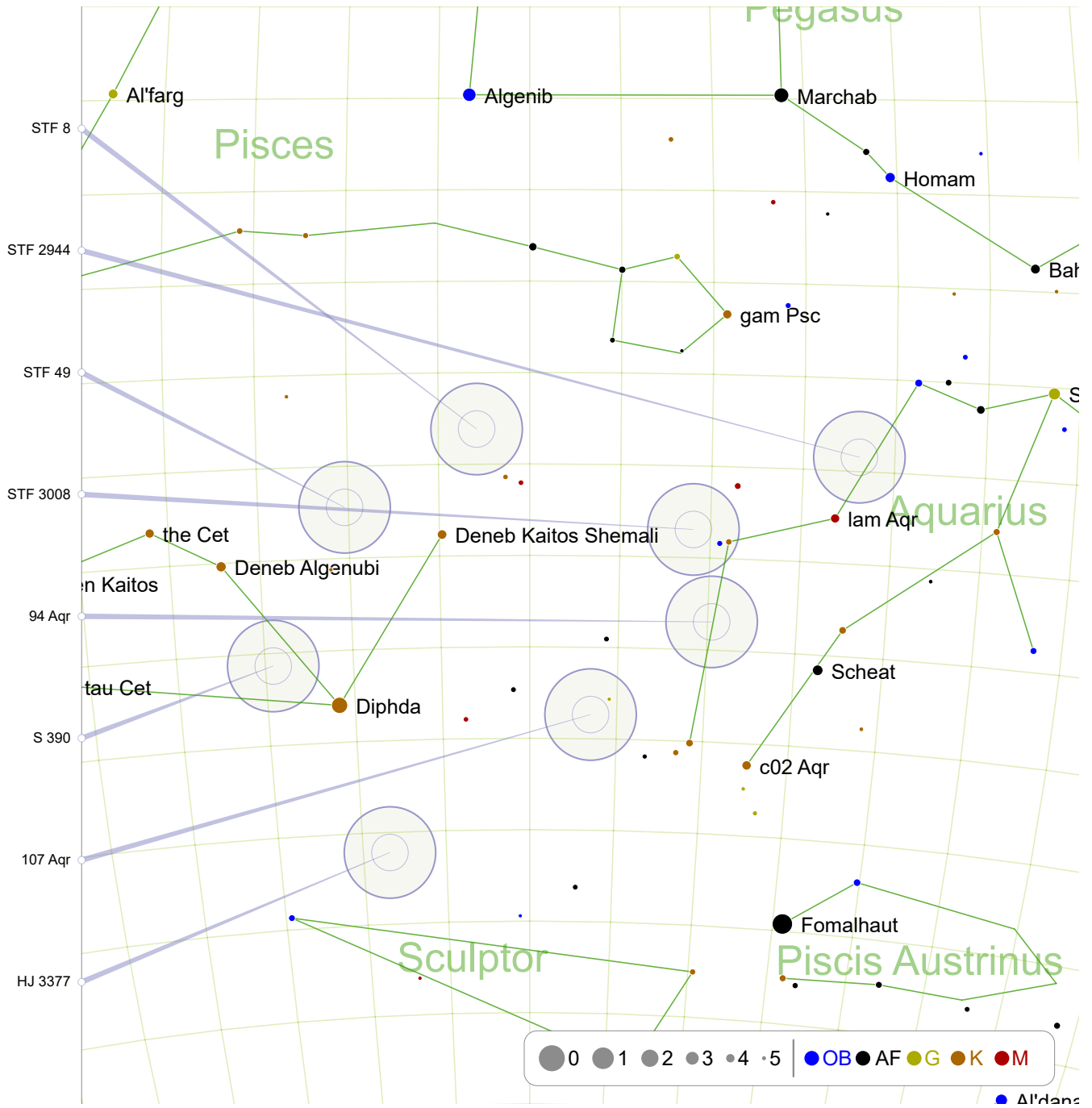
SAO 109577 | HIP 4624 | GDR2 39382201856

 An orange primary widely separated from a slightly fainter yellow secondary.

 Two finder circles NW from magnitude 3.83 the Cet. Two finder circles NNW from magnitude 3.6 Deneb Algenubi.

 With the double centered in the finder, Caldwell 51 (mag. 9.2 galaxy) is in the north-eastern quarter of the finder view.

October: -10° South (1)



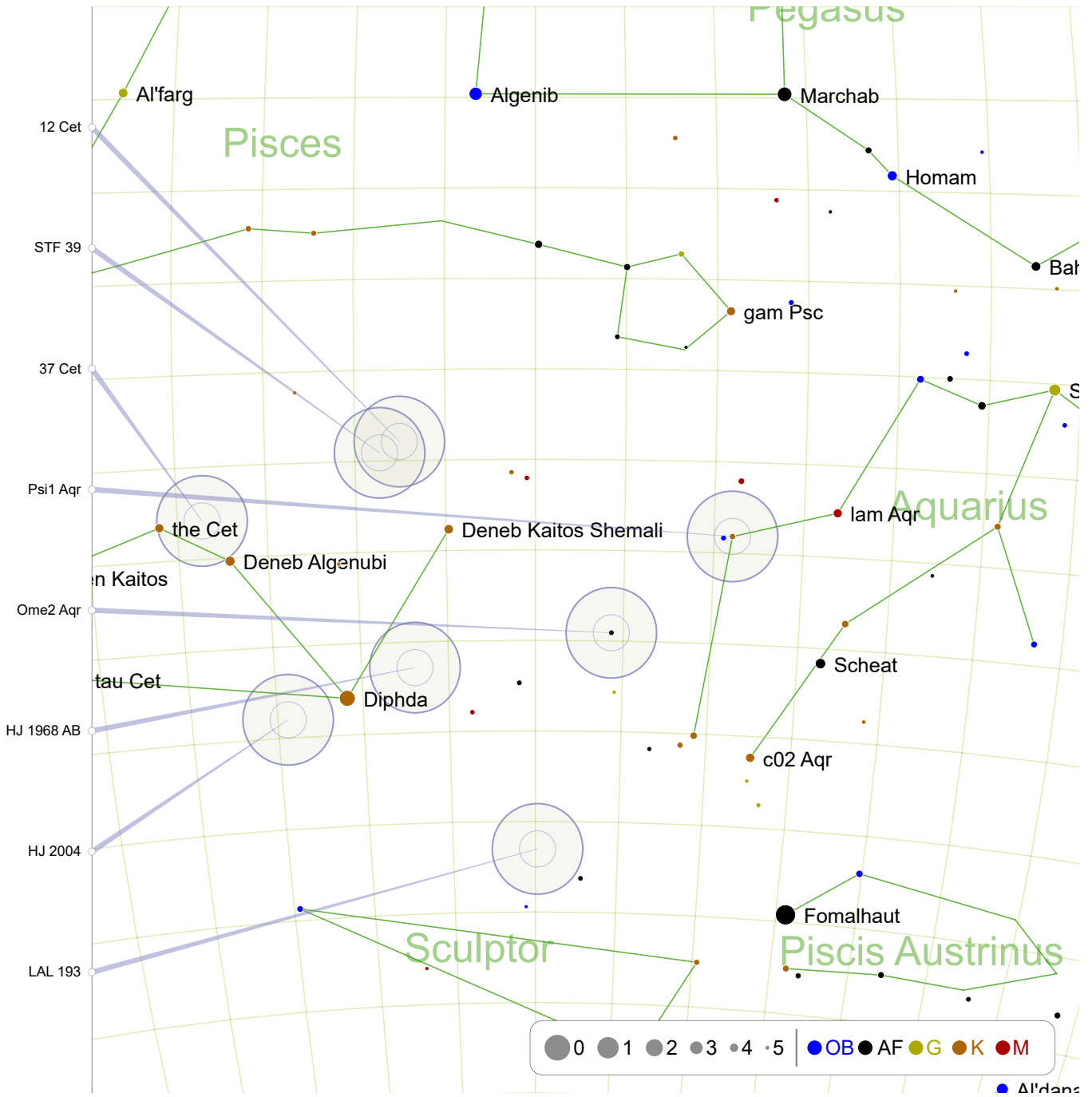
STF 8: page 65
94 Aqr: page 67

STF 2944: page 65
S 390: page 67

STF 49: page 66
107 Aqr: page 68

STF 3008: page 66
HJ 3377: page 68

October: -10° South (2)

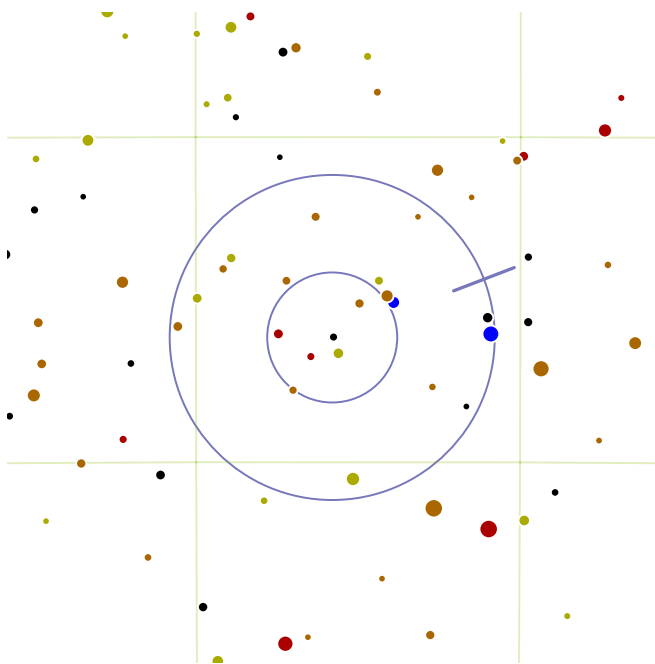


12 Cet: page 69
Ome2 Aqr: page 71

STF 39: page 69
HJ 1968 AB: page 71

37 Cet: page 70
HJ 2004: page 72

Psi1 Aqr: page 70
LAL 193: page 72



STF 8

RA: 2.9° | 0h 11.6' — DEC: -3.08° | -3° 4'

Magnitude: 7.8 | 9.3

Separation: 7.8"

Position Angle: 291°

SAO 128631 | HIP 931 | GDR2 82076017408



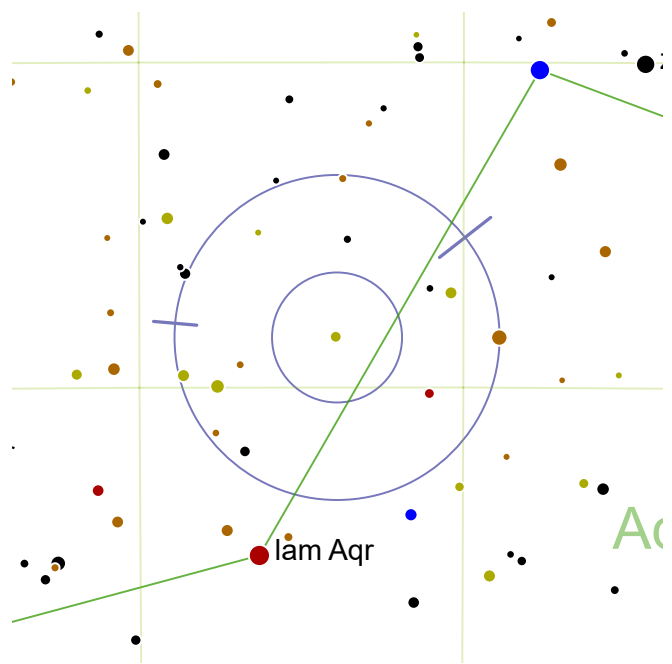
A yellowish primary with a close and faint secondary.



One finder circle NNW from magnitude 3.75 Deneb Kaitos Shemali.



The star is surrounded in the finder view by a lovely grouping of fairly bright orange and red stars.



STF 2944

RA: 341.95° | 22h 47.79' — DEC: -4.23° | -4° 13'

Magnitude: 7.3 | 7.7 | 8.6

Separation: 1.8" | 60.6"

Position Angle: 308° | 85°

SAO 146315 | HIP 112559



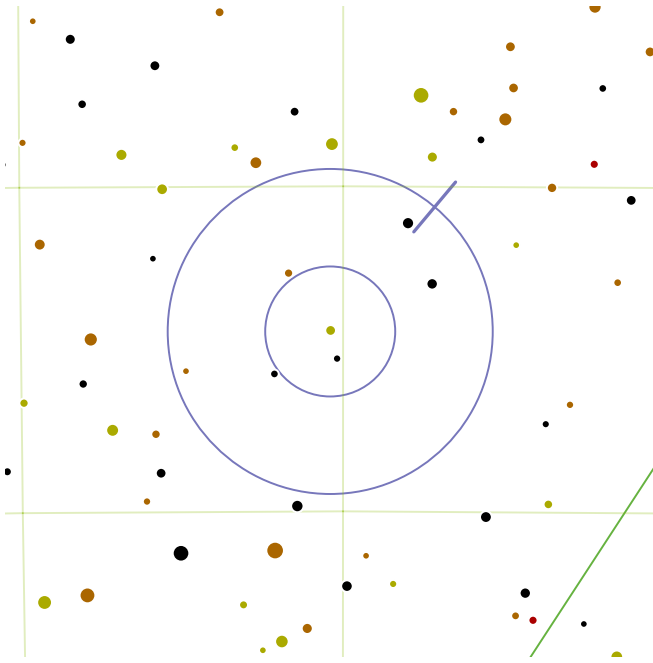
An extremely tight pair of yellow stars, with a fainter distant third component.



Half a finder circle NNW from magnitude 3.84 lam Aqr. One finder circle SEE from magnitude 3.97 Sadalachbia.



The two brightest components are very similar to the Sun in color and absolute magnitude. This gravitationally bound system is 104 light-years from Earth.



STF 49

RA: 10.2° | 0h 40.79' — DEC: -7.23° | -7° 13'

Magnitude: 7.1 | 10.0

Separation: 8.6"

Position Angle: 320°

SAO 128892 | HIP 3203 | GDR2 51179609344



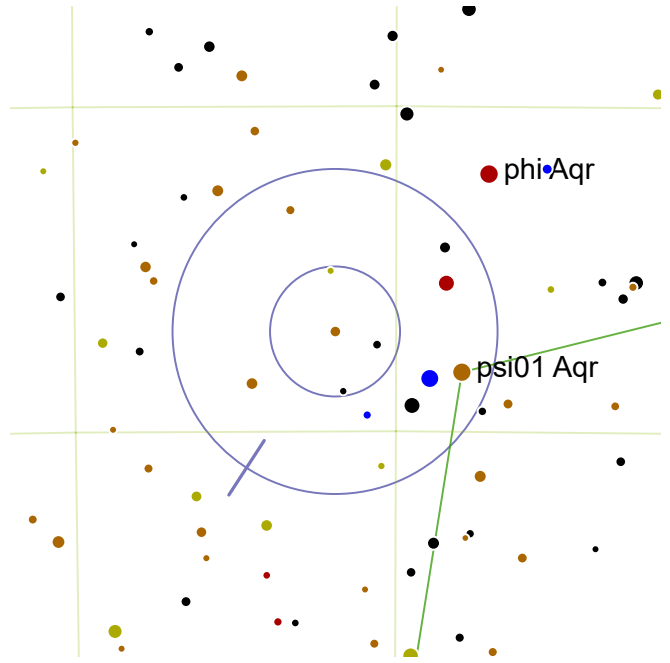
A close pair with a yellow primary and tiny orange secondary.



One finder circle NEE from magnitude 3.75 Deneb Kaitos Shemali. One finder circle NWW from magnitude 3.6 Deneb Algenubi.



Only 86 light-years away, the primary is a slightly brighter version of our Sun.



STF 3008

RA: 350.95° | 23h 23.79' — DEC: -8.47° | -8° 27'

Magnitude: 7.2 | 7.7

Separation: 7.1"

Position Angle: 147°

HIP 115495 | GDR2 34443398656



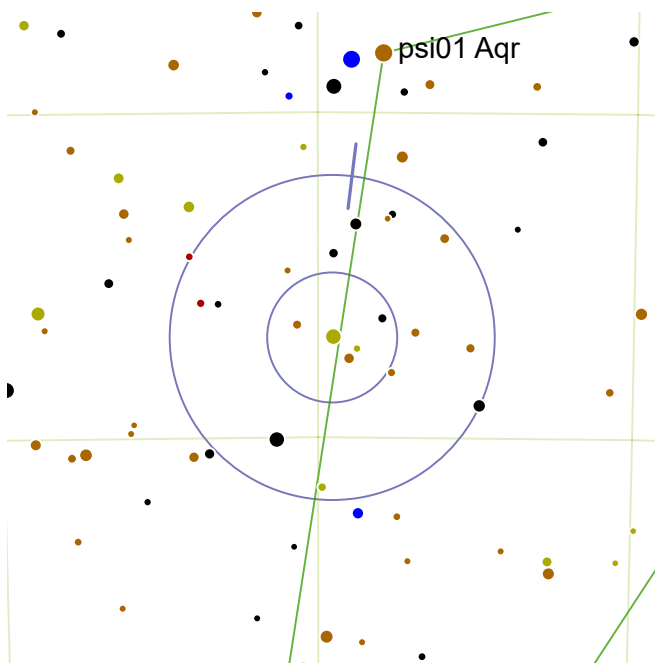
An equal pair, with an orange primary closely separated from a slightly fainter secondary.



One and a half finder circles E from magnitude 3.84 lam Aqr. Two finder circles NE from magnitude 3.51 Scheat.



The pair are not gravitationally bound. The primary is K-class giant 588 light-years from Earth.



94 Aqr

RA: 349.78° | 23h 19.09' — DEC: -13.47° | -13° 27'

Magnitude: 5.3 | 7.0

Separation: 12.1"

Position Angle: 353°

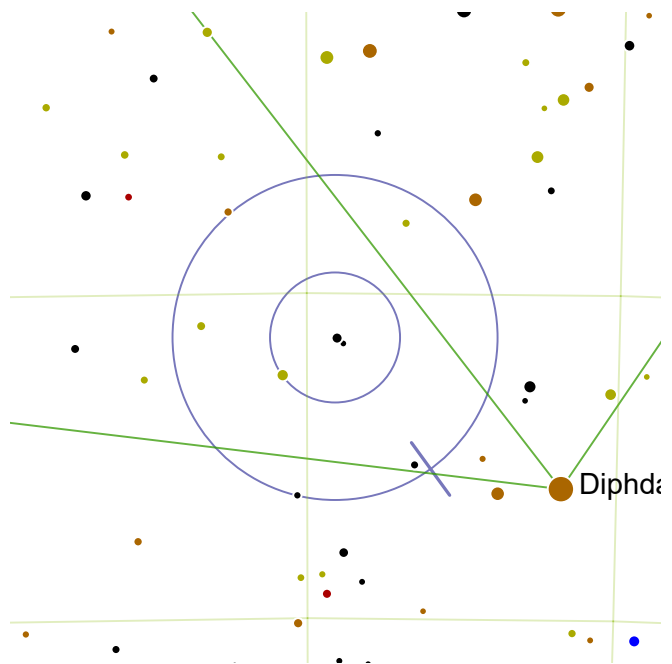
SAO 165625 | HIP 115126



A bright yellowish primary easily separated from a fairly bright companion.



One finder circle NEE from magnitude 3.51 Scheat.



S 390

RA: 14.55° | 0h 58.2' — DEC: -15.68° | -15° 40'

Magnitude: 7.8 | 7.9

Separation: 6.5"

Position Angle: 216°

SAO 147543 | HIP 4540 | GDR2 73629560704



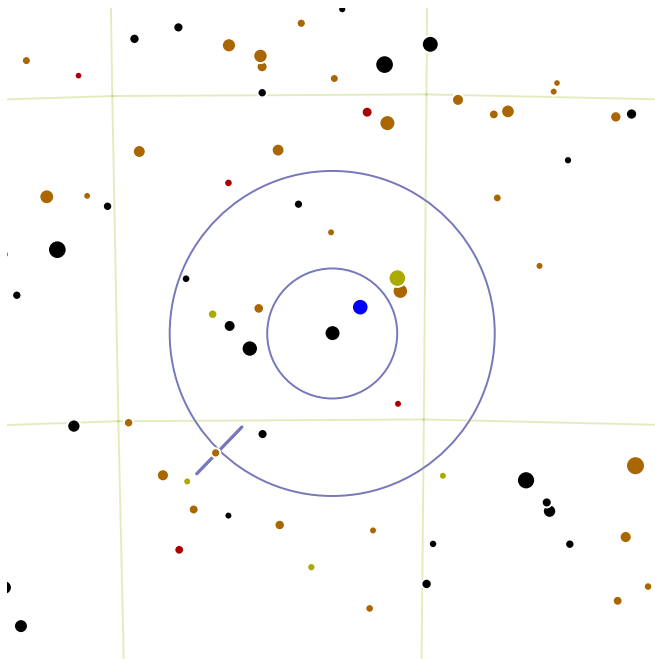
A close and equal pair of bluish stars.



Half a finder circle NEE from magnitude 2.24 Diphda.



This pair of hot bluish stars is 194 light-years from Earth.



107 Aqr

RA: 356.5° | 23h 46.0' — DEC: -18.68° | -18° 40'

Magnitude: 5.7 | 6.5

Separation: 7.0"

Position Angle: 136°

SAO 165867 | HIP 117218 | GDR2 07944627712



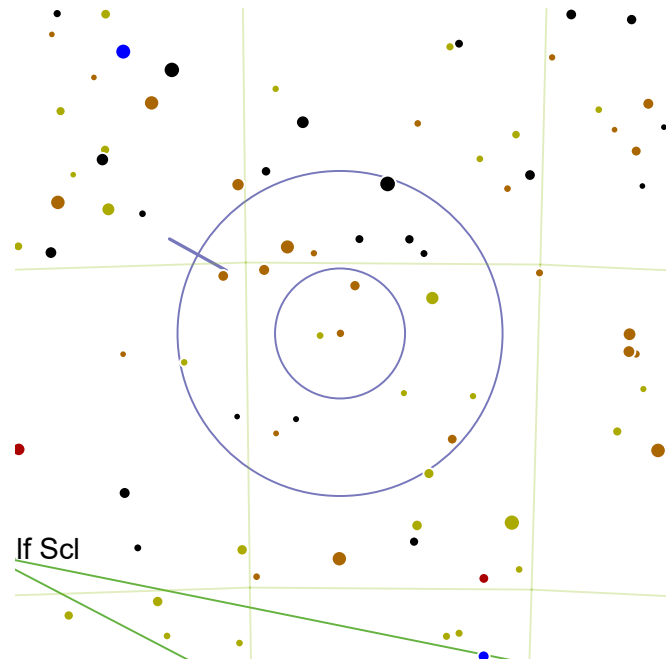
A bright white primary with a fairly bright yellowish companion close by.



One and a half finder circles NEE from magnitude 3.8 c02 Aqr. Two and a half finder circles SEE from magnitude 3.51 Scheat.



This double is not gravitationally bound and is only a line of sight coincidence. The primary is 239 light-years from Earth.



HJ 3377

RA: 8.4° | 0h 33.6' — DEC: -26.1° | -26° 5'

Magnitude: 7.5 | 9.8

Separation: 21.4"

Position Angle: 61°

SAO 166362 | HIP 2649 | GDR2 46029987712



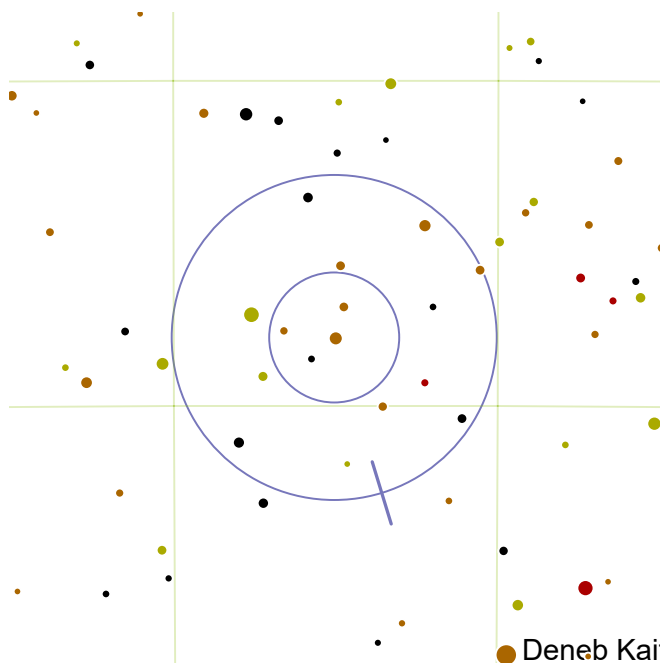
A widely separated pair with an orange primary and a faint companion.



One and a half finder circles SSW from magnitude 2.24 Diphda.



Several interesting objects are nearby. The Sculptor Galaxy (magnitude 8, NGC 253) is less than three degrees to the east. Two degrees to the south east of this galaxy in the globular cluster NGC 288 (magnitude 8), while active galaxy NGC 247 (magnitude 9) is four degrees to the north.



12 Cet

RA: 7.53° | 0h 30.1' — DEC: -3.95° | -3° 56'

Magnitude: 6.5 | 11

Separation: 10.7"

Position Angle: 197°

SAO 128791 | HIP 2353 | GDR2 21022169728



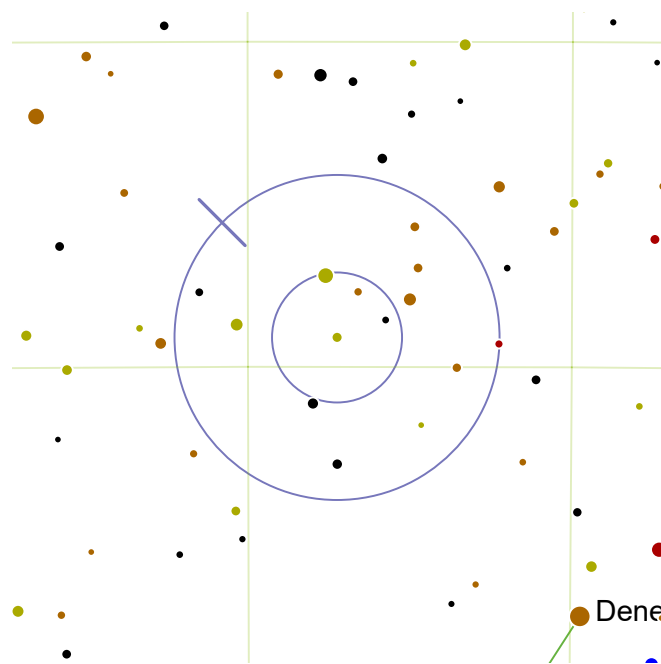
A bright red primary separated comfortably from a very faint companion.



One finder circle NNE from magnitude 3.75 Deneb Kaitos Shemali. Two finder circles NWW from magnitude 3.6 Deneb Algenubi.



Also known as h 322, the primary is a notably red Carbon Star.



STF 39

RA: 8.63° | 0h 34.5' — DEC: -4.55° | -4° 32'

Magnitude: 7.1 | 8.7

Separation: 20.1"

Position Angle: 45°

SAO 128831 | HIP 2713 | GDR2 34557758464



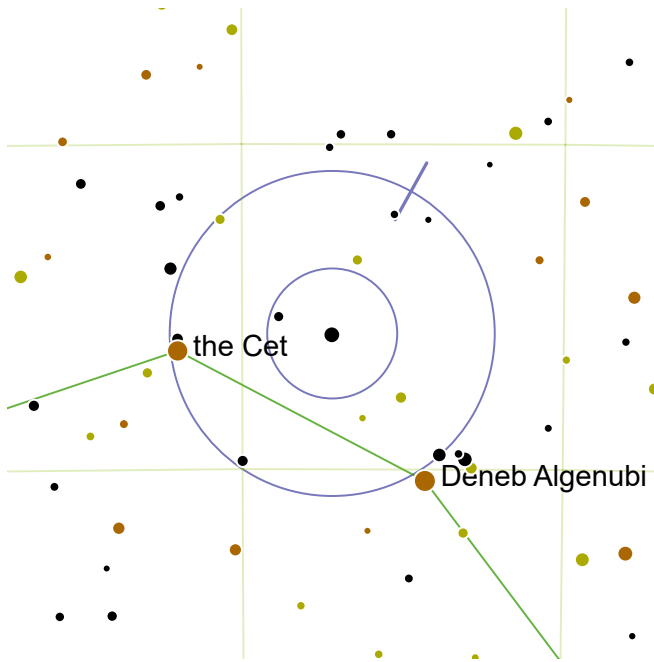
A wide pair with a yellow primary and pale yellow secondary.



One finder circle NE from magnitude 3.75 Deneb Kaitos Shemali. Two finder circles NWW from magnitude 3.6 Deneb Algenubi.



Caldwell 51 (mag. 9.2 galaxy) lies two and a half finder circles north east of this double. With Caldwell 51 centered in the finder,



37 Cet

RA: 18.6° | 1h 14.4' — DEC: -7.92° | -7° 54'

Magnitude: 5.2 | 7.9

Separation: 47.1"

Position Angle: 331°

SAO 129193 | HIP 5799 | GDR2 28340199936



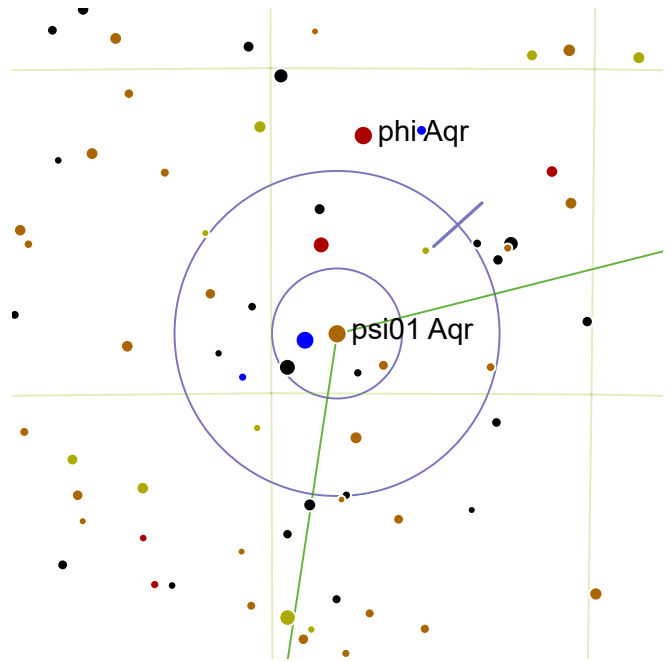
A very widely separated pair, with a brilliant yellowish primary and a significantly fainter, strongly yellow secondary.



One and a half degrees W from magnitude 3.83 the Cet. Half a finder circle NNE from magnitude 3.6 Deneb Algenubi.



This gravitationally bound system is only 73 light-years from Earth.



Psi1 Aqr

RA: 348.98° | 23h 15.9' — DEC: -9.08° | -9° 4'

Magnitude: 4.4 | 9.6

Separation: 49"

Position Angle: 312°

SAO 146598 | HIP 114855



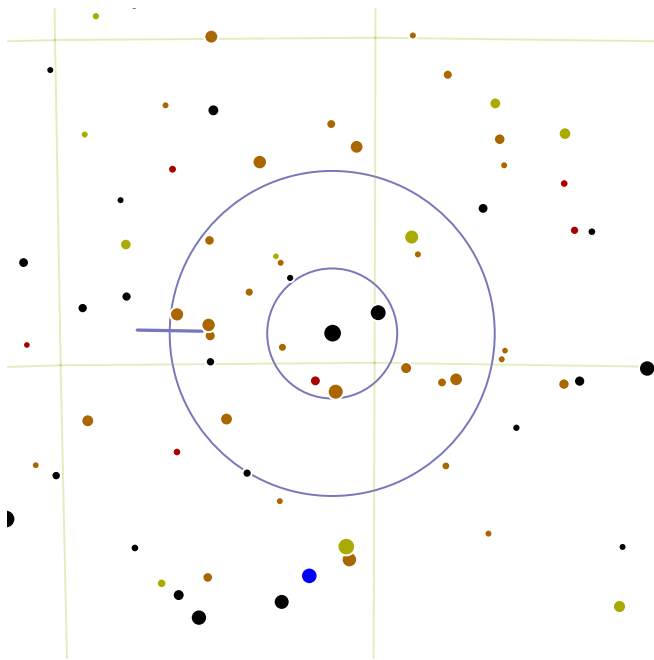
A brilliant orange primary distantly separated from a faint orange secondary.



One finder circle SEE from magnitude 3.84 lam Aqr. One and a half finder circles NE from magnitude 3.51 Scheat.



The secondary is itself a reasonably balanced double with a separation of 0.4". Also known as 91 Aqr, the primary is orbited by a massive exoplanet as least 3.2 times the mass of Jupiter.



Ome2 Aqr

RA: 355.68° | 23h 42.7' — DEC: -14.55° | -14° 32'

Magnitude: 4.5 | 9.5

Separation: 5.5"

Position Angle: 89°

SAO 165842 | HIP 116971 | GDR2 49815948416



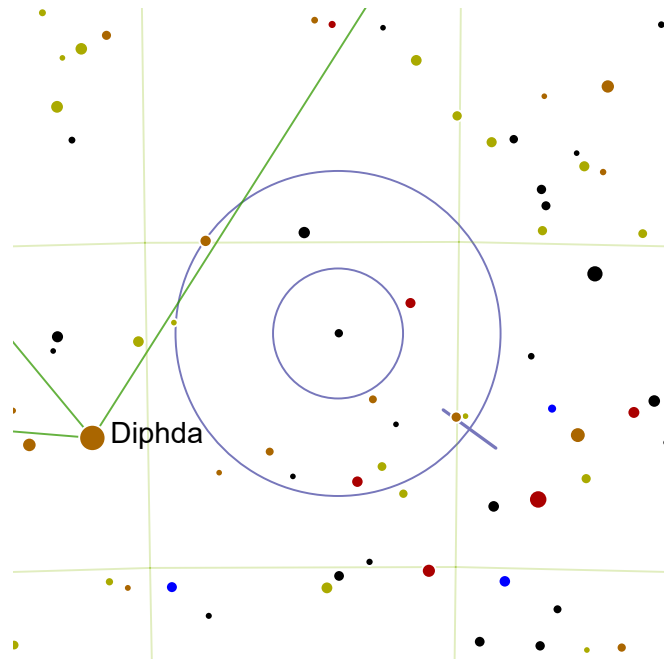
A brilliant bluish primary with a faint orange companion close by.



Two finder circles NE from magnitude 3.8 c02 Aqr. Two finder circles SWW from magnitude 3.75 Deneb Kaitos Shemali.



The system is a strong nearby X-ray source, as the primary is a hot B-type main sequence star with a surface temperature of 10,500 K.



HJ 1968 AB

RA: 6.93° | 0h 27.7' — DEC: -16.42° | -16° 24'

Magnitude: 7.3 | 10.0

Separation: 37.0"

Position Angle: 234°

SAO 147286 | HIP 2190 | GDR2 26008993152



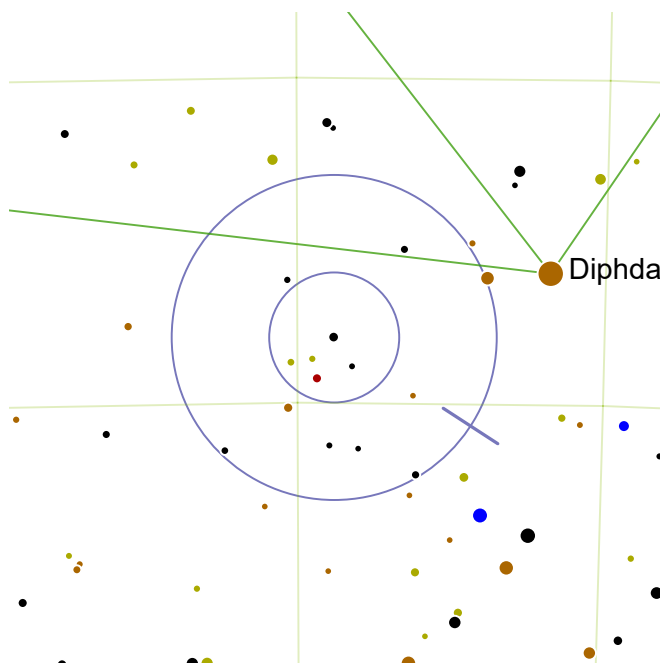
A yellowish primary very widely separated from a faint secondary.



Half a finder circle NWW from magnitude 2.24 Diphda.



Two and a half finder circles SSE is the bright galaxy Caldwell 65 (mag. 8.0) and globular cluster NGC 288 (mag. 8.1). Just over one finder circle SE is Caldwell 62 (mag. 9.1 active galaxy).



HJ 2004

RA: 14.4° | 0h 57.6' — DEC: -19.0° | -18° 59'

Magnitude: 7.0 | 9.8

Separation: 3.3"

Position Angle: 237°

SAO 147537 | HIP 4496 | GDR2 63244742016



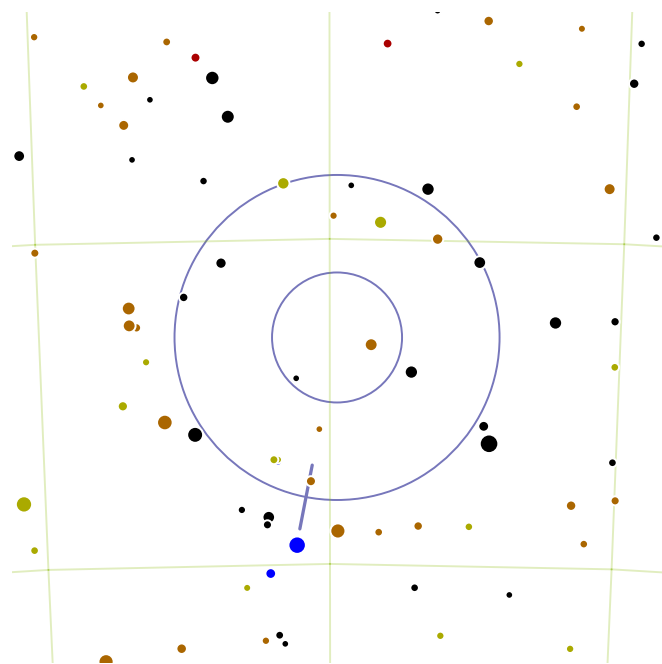
A fairly bright white primary with a very close, faint secondary.



Half a finder circle SEE from magnitude 2.24 Diphda.



Position this little double in the north-eastern quarter of the finder, and Caldwell 62 (mag. 9.1 active galaxy) is in the south-western quarter.



LAL 193

RA: 359.88° | 23h 59.5' — DEC: -26.52° | -26° 30'

Magnitude: 8.1 | 8.3

Separation: 10.4"

Position Angle: 169°

SAO 192295 | HIP 118284 | GDR2 78955522432



A close and balanced pair of yellowish stars.

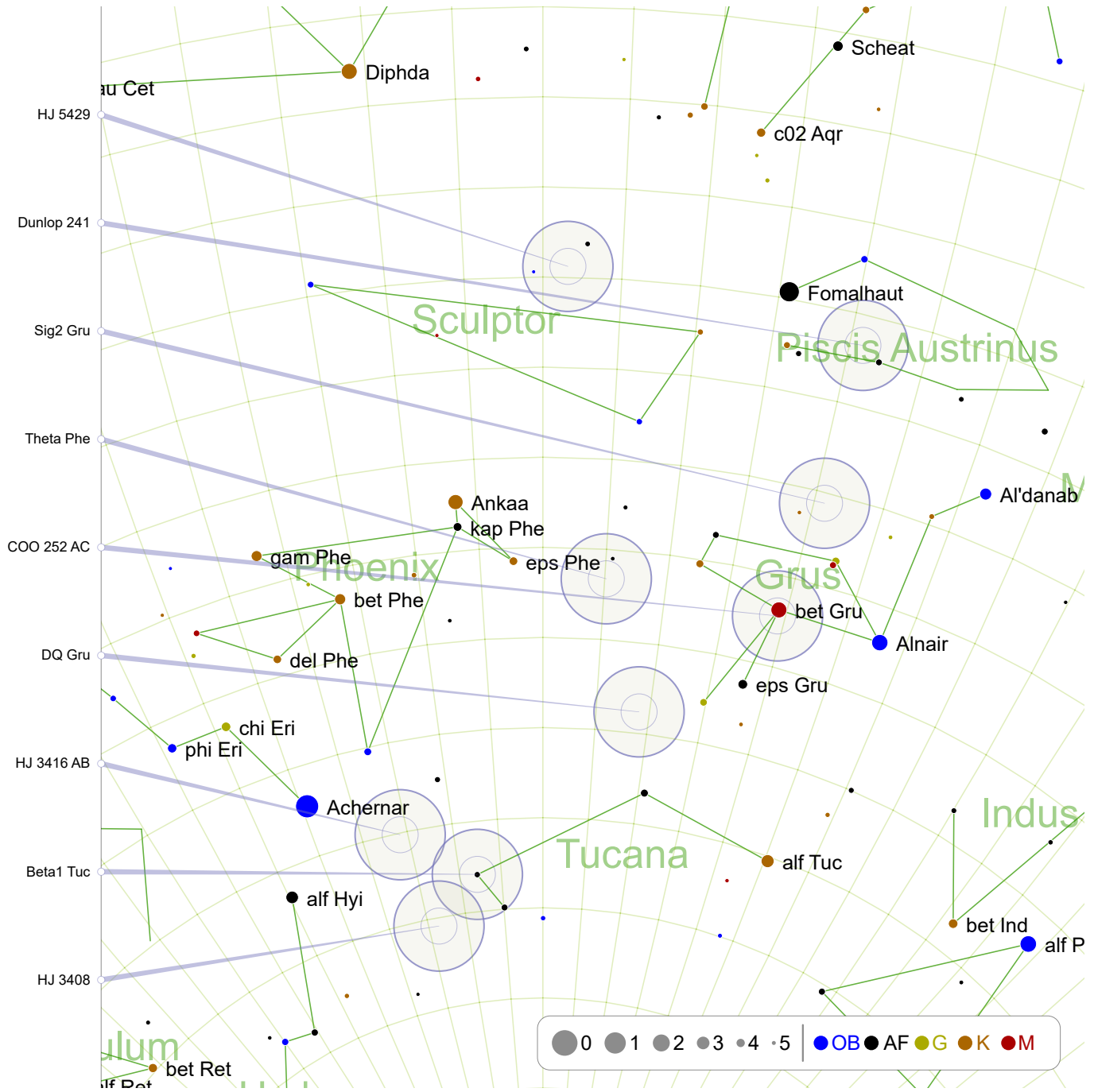


Two and a half finder circles SEE from magnitude 3.8 c02 Aqr. Two and a half finder circles SW from magnitude 2.24 Diphda.



This gravitationally bound binary system is 334 light-years from Earth.

October: -45° South (1)



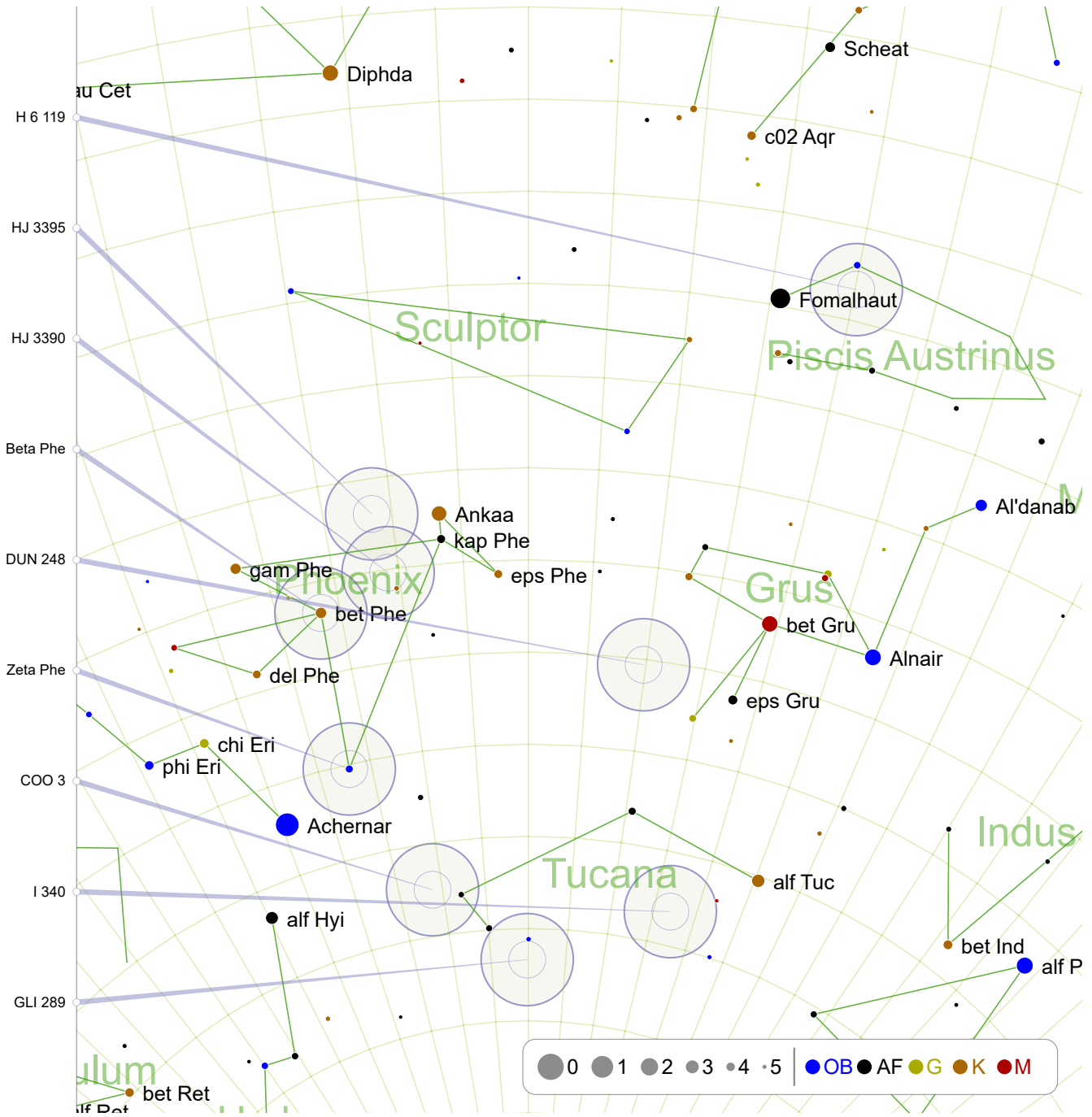
HJ 5429: page 75
 COO 252 AC: page 77
 HJ 3408: page 79

Dunlop 241: page 75
 DQ Gru: page 77

Sig2 Gru: page 76
 HJ 3416 AB: page 78

Theta Phe: page 76
 Beta1 Tuc: page 78

October: -45° South (2)

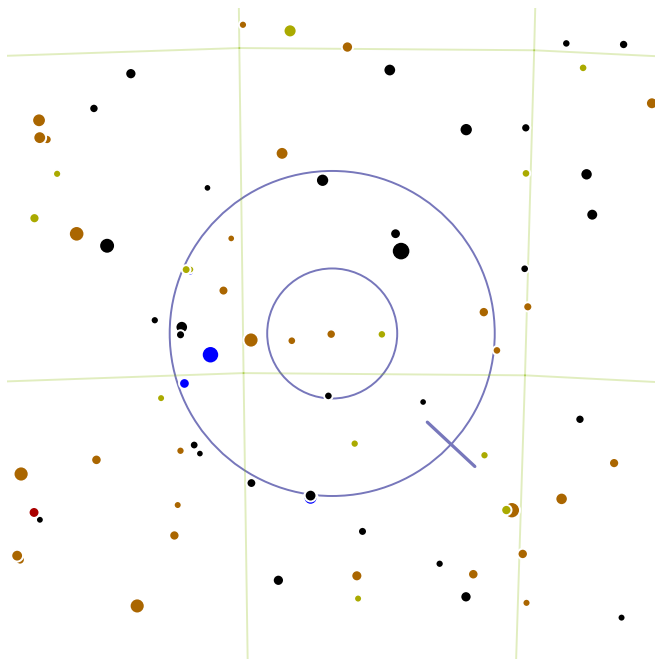


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HJ 3395: page 80
 Zeta Phe: page 82

HJ 3390: page 80
 COO 3: page 82

Beta Phe: page 81
 I 340: page 83



HJ 5429

RA: 358.43° | 23h 53.7' — DEC: -29.4° | -29° 23'

Magnitude: 7.5 | 10.6

Separation: 31.3"

Position Angle: 227°

SAO 192224 | HIP 117822 | GDR2 32441844352



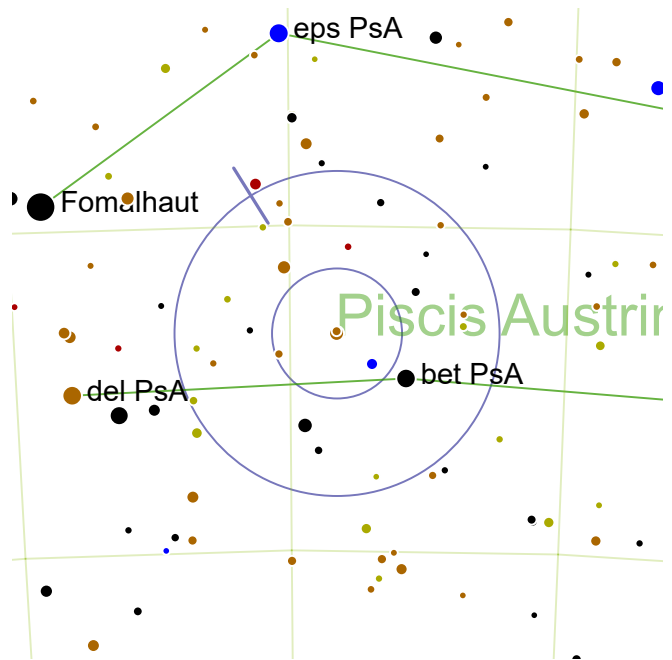
An unequal and widely separated pair with a strongly red primary.



Two finder circles E from magnitude 1.29 Fomalhaut.



There are several galaxies nearby. With this double centered, NGC 7755 is in the south-western quarter of the finder. Just beyond the southern edge of the finder circle is Bond's Galaxy (NGC 7793) which at magnitude 9.1 is 2.2 magnitudes brighter than NGC 7793.



Dunlop 241

RA: 339.15° | 22h 36.59' — DEC: -31.67° | -31° 39'

Magnitude: 5.9 | 7.6

Separation: 93.4"

Position Angle: 32°

SAO 213948 | HIP 111600 | GDR2 54099267456



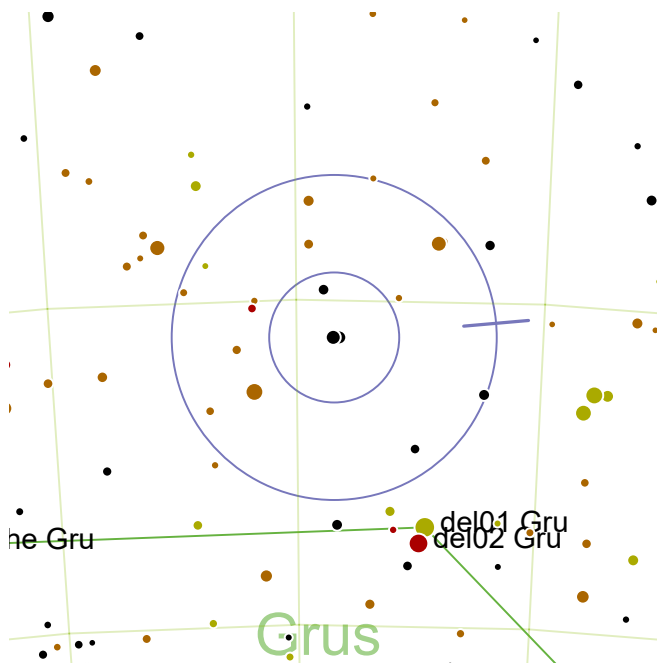
A bright orange primary separated distantly from a moderate secondary.



Half a finder circle SWW from magnitude 1.29 Fomalhaut. Two finder circles NEE from magnitude 3.16 Al'danab.



The primary is a K-class giant star 358 light-years from Earth. The secondary is an unrelated background star.



Sig2 Gru

RA: 339.24° | 22h 36.95' — DEC: -40.58° | -40° 34'

Magnitude: 5.9 | 6.3

Separation: 337.9"

Position Angle: 275°

SAO 231217 | HIP 111643 | GDR2 25165622144



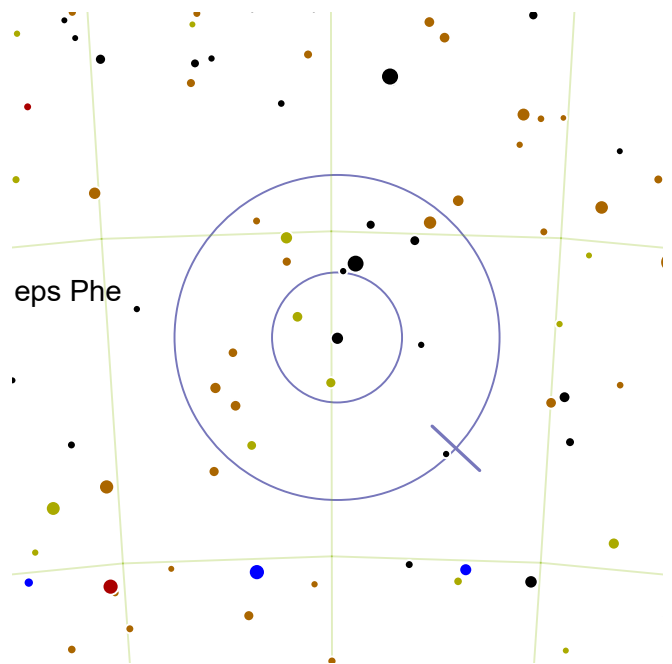
An equal pair of bright white stars, very distantly separated.



One finder circle N from magnitude 2.24 bet Gru. One and a half finder circles NE from magnitude 2.16 Alnair.



Sig2 Gru is a very close double, with a magnitude 10.0 companion separated by 2.7".



Theta Phe

RA: 354.88° | 23h 39.5' — DEC: -46.63° | -46° 37'

Magnitude: 6.5 | 7.3

Separation: 3.9"

Position Angle: 227°

SAO 231719 | HIP 116737 | GDR2 31089676800



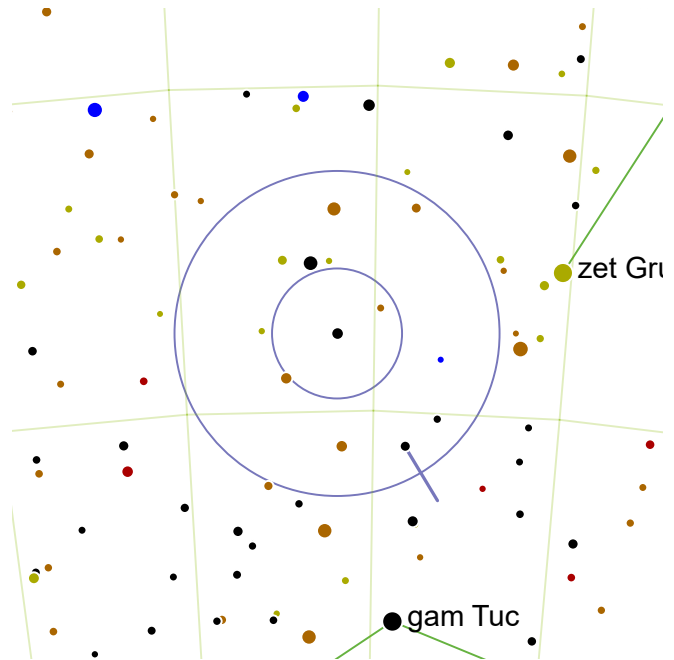
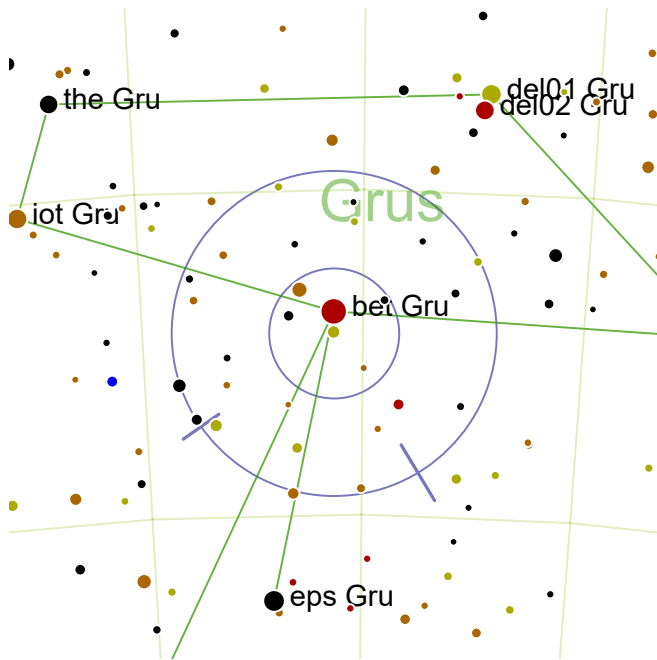
A white primary with a slightly fainter yellowish secondary, very closely separated.



One finder circle SWW from magnitude 3.94 eps Phe.



A dim galaxy shares the finder view, two degrees to the north west: magnitude 11.0 IC 5328.



COO 252 AC

DQ Gru

RA: 340.65° | 22h 42.59' — DEC: -47.22° | -47° 12'

RA: 350.98° | 23h 23.9' — DEC: -53.82° | -53° 48'

Magnitude: 6.1 | 9.5 | 11.1

Magnitude: 6.1 | 7.1

Separation: 45.3" | 7.1"


Separation: 26.4"


Position Angle: 211° | 125°


Position Angle: 211°


SAO 231257 | HIP 112117


SAO 247854 | HIP 115510 | GDR2 65274954496


 A bright yellow primary with a very faint close companion, and somewhat more distant and slightly less faint third member.

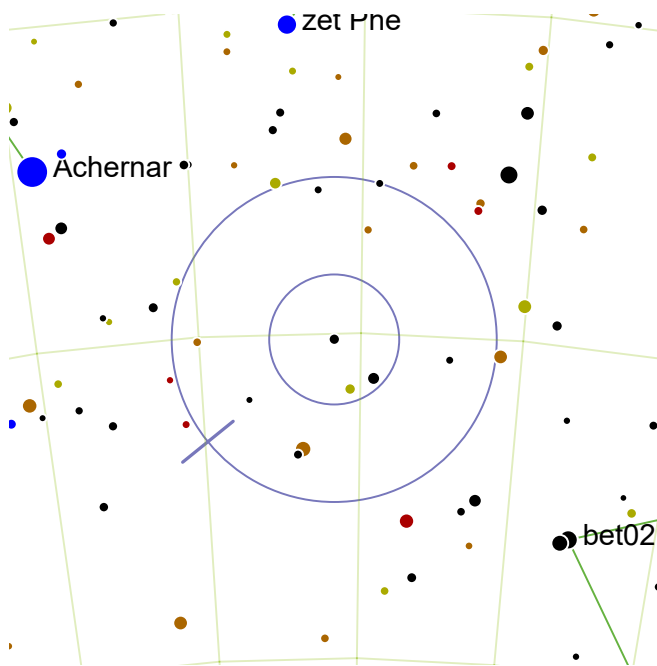
 A bright and easily separated pair of white stars.

 Less than half a degree S from magnitude 2.24 bet Gru. One finder circle E from magnitude 2.16 Alnair.

 One finder circle SEE from magnitude 3.69 eps Gru. One and a half finder circles SE from magnitude 2.24 bet Gru.

 Nearby Beta Gruis (proper name Tiaki) is a red, variable star with magnitude slowly varying between roughly 2.0 and 2.3.

 The hot white giant primary is 387 light-years from Earth.



HJ 3416 AB

RA: 15.83° | 1h 3.29' — DEC: -60.1° | -60° 5'

Magnitude: 7.6 | 7.7

Separation: 5.1"

Position Angle: 129°

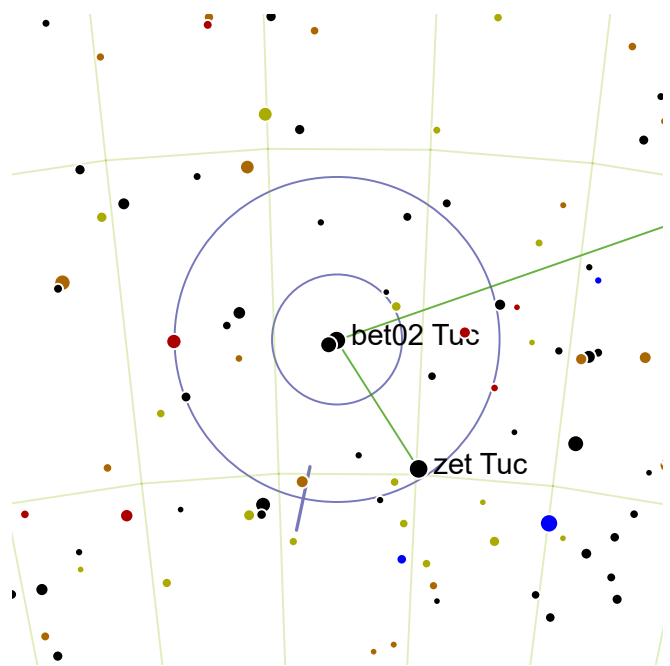
SAO 248309 | HIP 4934 | GDR2 43079066752



A close and equal pair of yellowish stars.



One finder circle SW from magnitude 0.6 Achernar.



Beta1 Tuc

RA: 7.88° | 0h 31.5' — DEC: -62.95° | -62° 56'

Magnitude: 4.3 | 4.5

Separation: 27.1"

Position Angle: 168°

SAO 248201 | HIP 2484 | GDR2 34176620160



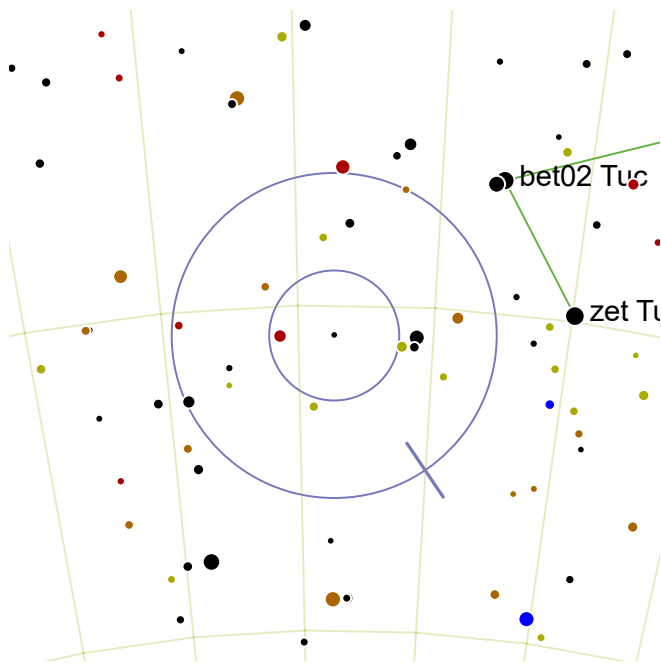
An equal pair of very bright, easily separated stars; Beta1 is bluish, while Beta2 is white.



One and a half finder circles SW from magnitude 0.6 Achernar.



The primary has a faint magnitude 13.5 companion (2.6" separation, position angle 153).



HJ 3408

RA: 13.68° | 0h 54.7' — DEC: -65.47° | -65° 27'

Magnitude: 8.0 | 9.5

Separation: 16.1"

Position Angle: 214°

SAO 248280 | HIP 4273 | GDR2 16185020416



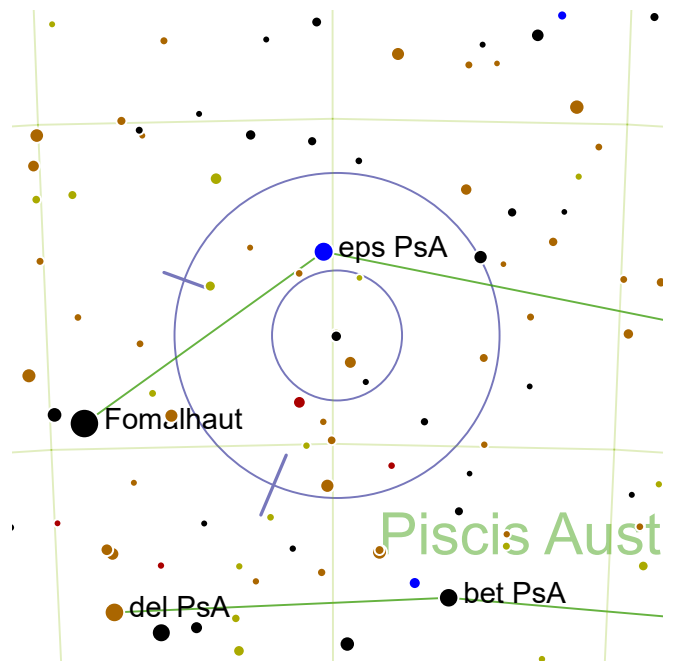
An easily separated pair of yellow stars.



One and a half finder circles SW from magnitude 3.02 alf Hyi. One and a half finder circles SSW from magnitude 0.6 Achernar.



The bright double Bet1 Tuc is one finder circle to the north west.



H 6 119

RA: 339.93° | 22h 39.7' — DEC: -28.33° | -28° 19'

Magnitude: 6.4 | 7.5 | 8.6

Separation: 86" | 3.1"

Position Angle: 157° | 70°

4.1° NWW from mag.1.29 Fomalhaut



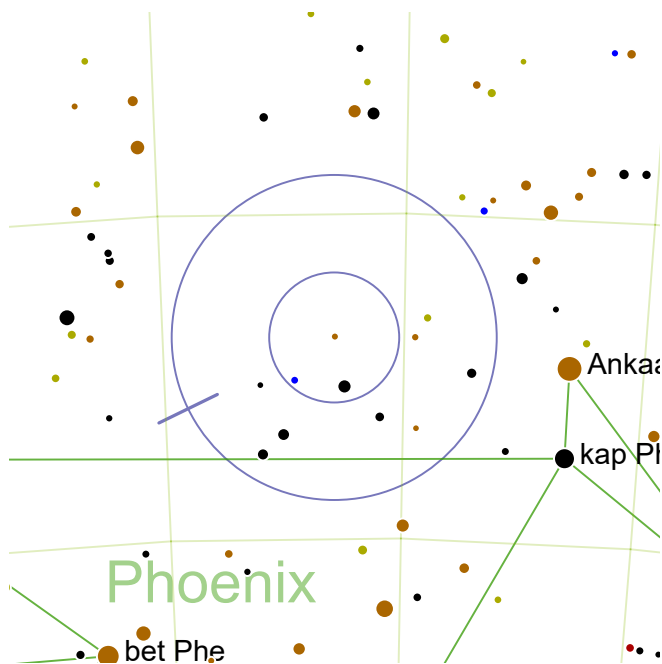
An orange primary distantly separated from a somewhat fainter companion. The secondary has a tightly bound little companion.



Half a finder circle NWW from magnitude 1.29 Fomalhaut. Two and a half finder circles NE from magnitude 3.16 Al'danab.



This system is 367 light-years from Earth.



HJ 3395

RA: 11.45° | 0h 45.8' — DEC: -41.92° | -41° 54'

Magnitude: 8.5 | 9.1

Separation: 4.8"

Position Angle: 116°

SAO 215231 | HIP 3588 | GDR2 75602213504



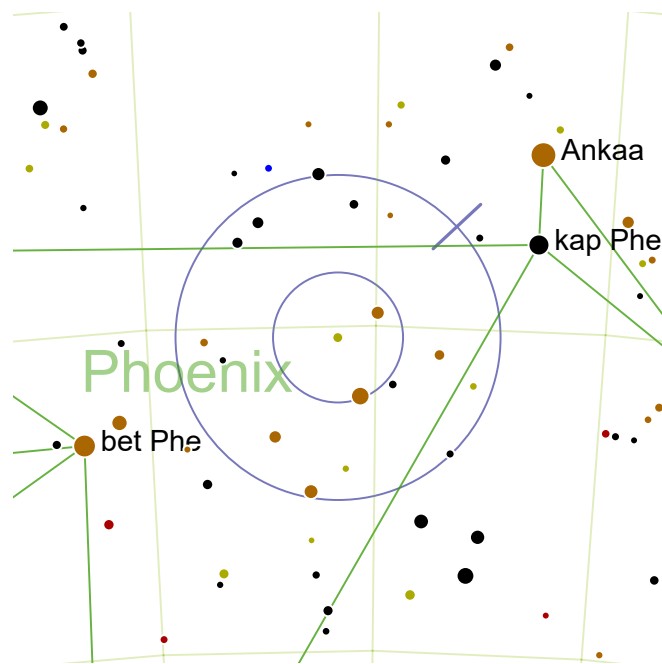
A close, faint pair with an orange primary and a slightly fainter red secondary.



Half a finder circle E from magnitude 2.44 Ankaa. Half a finder circle NEE from magnitude 3.9 kap Phe.



Only 51 light-years away, the pair is composed of a faint orange dwarf and an even fainter red dwarf.



HJ 3390

RA: 10.83° | 0h 43.3' — DEC: -45.18° | -45° 10'

Magnitude: 7.1 | 9.7

Separation: 14"

Position Angle: 313°

SAO 215208 | HIP 3397 | GDR2 18874792576



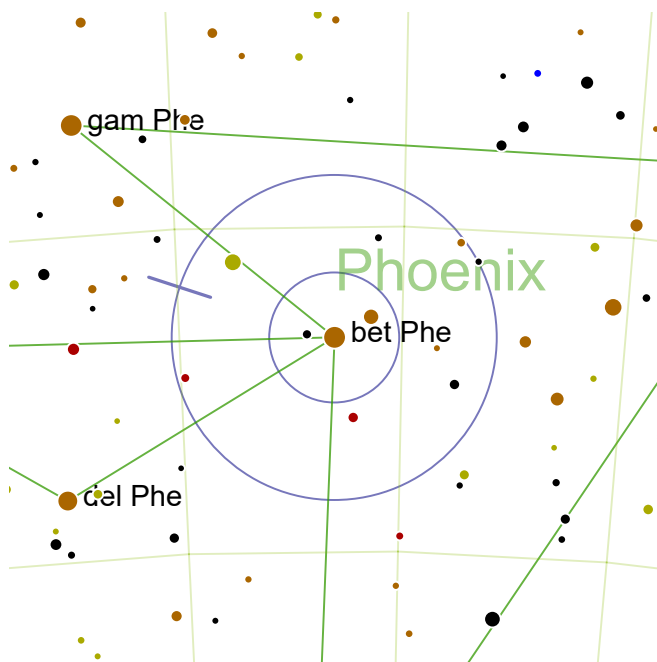
An yellow-orange primary with a faint white secondary, easily separated.



Half a finder circle SEE from magnitude 3.9 kap Phe. Half a finder circle NWW from magnitude 3.35 bet Phe.



The primary is an orange giant 514 light-years from Earth. The pair are gravitationally bound.



Beta Phe

RA: 16.52° | 1h 6.09' — DEC: -46.72° | -46° 42'

Magnitude: 4.1 | 4.2

Separation: 0.7"

Position Angle: 72°

SAO 215365 | HIP 5165 | GDR2 24587749504



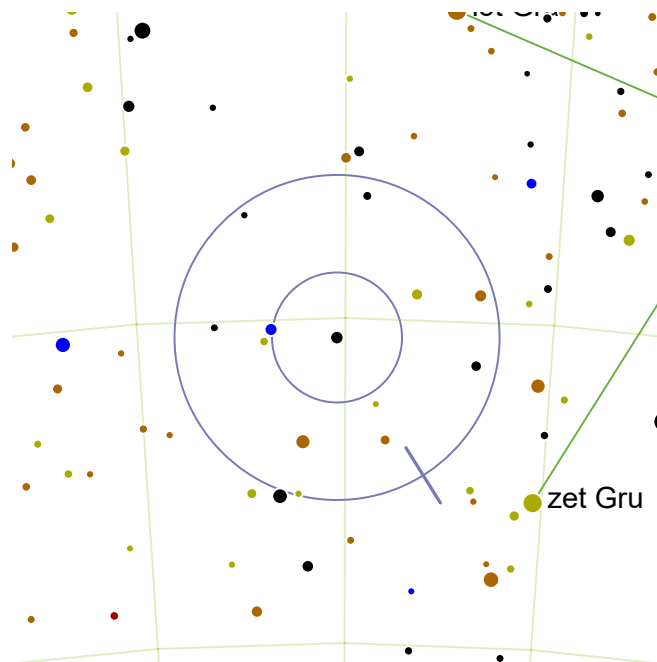
A equal and extremely tight pair of yellow stars.



Beta Phe is a bright star in Phoenix. One and a half finder circles E from magnitude 3.94 eps Phe.



Requires excellent seeing and a larger telescope. It has been difficult measuring the distance to this system, with figures ranging from 200 to 27000 light-years being given!



DUN 248

RA: 350.2° | 23h 20.79' — DEC: -50.3° | -50° 17'

Magnitude: 6.2 | 6.6

Separation: 17.0"

Position Angle: 212°

SAO 247838 | HIP 115272 | GDR2 31546224512



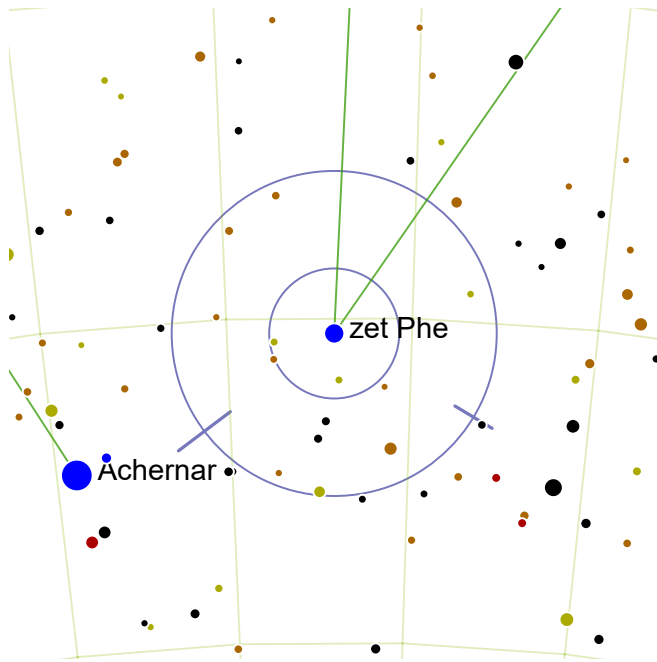
An easy, equal pair of fairly bright stars; the primary is white, the secondary is yellow.



One finder circle E from magnitude 3.69 eps Gru. One finder circle SEE from magnitude 2.24 bet Gru.



Although the stars are quite close and well-balanced, the pair are not part of the same system.



Zeta Phe

RA: 17.1° | 1h 8.4' — DEC: -55.25° | -55° 14'

Magnitude: 4.1 | 6.8 | 8.2

Separation: 0.6" | 6.5"

Position Angle: 127° | 239°

SAO 232306 | HIP 5348 | GDR2 89156808960



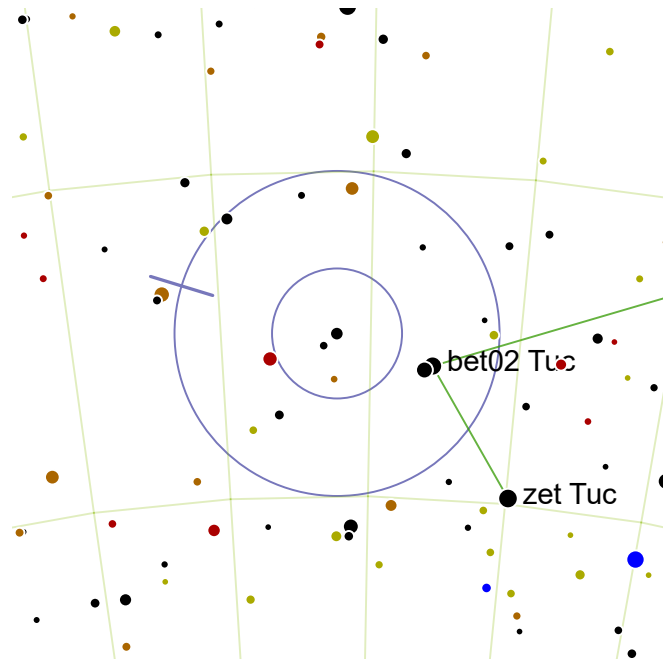
A pair of close bluish stars, the brilliant primary is much brighter and is itself an extreme sub-arcsecond pairing.



Half a finder circle NWW from magnitude 0.6 Achernar. Two and a half finder circles SE from magnitude 3.94 eps Phe.



The wider pairing is also referred to as Rossiter 1205. Richard Alfred Rossiter (1886-1977) discovered more than 5000 double stars.



COO 3

RA: 11.13° | 0h 44.5' — DEC: -62.5° | -62° 29'

Magnitude: 6.3 | 8.0

Separation: 2.4"

Position Angle: 73°

SAO 248243 | HIP 3489 | GDR2 40124725760



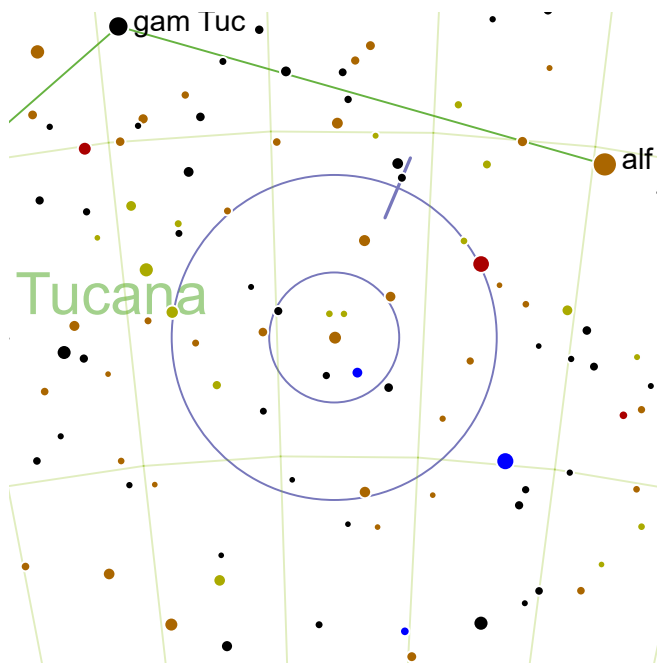
A fairly bright yellowish primary with a tightly bound secondary.



One and a half finder circles SW from magnitude 0.6 Achernar.



BQ Tuc is a strongly red and moderately variable star one degree to the south east (mag 5.7, Δ mag. 0.2). Beta 1 and 2 Tuc are a lovely brilliant double just over a degree to the south west.



I 340


RA: 343.05° | 22h 52.2' — DEC: -63.18° | -63° 10'


Magnitude: 6.3 | 9.0


Separation: 0.9"

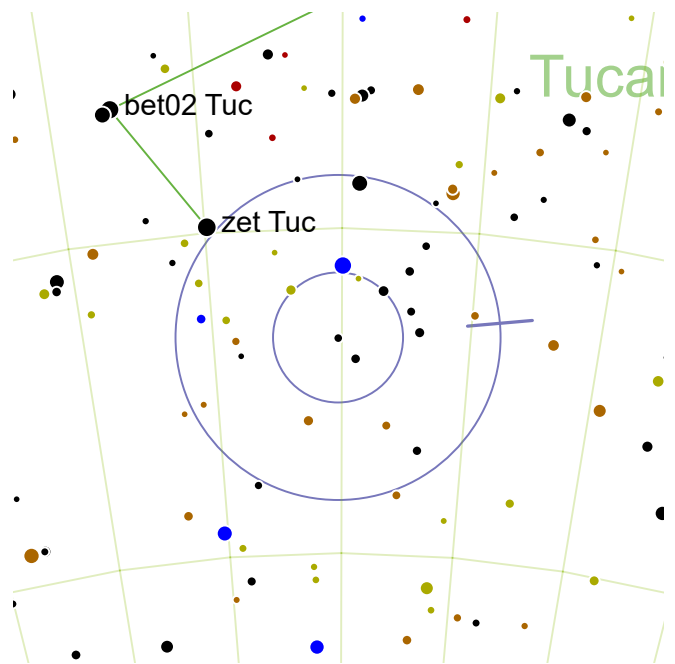
Position Angle: 337°

SAO 255339 | HIP 112924 | GDR2 64734625920

 A unbalanced sub-arcsecond pairing dominated by its orange primary.

 Half a finder circle SE from magnitude 2.91 alf Tuc. Two and a half finder circles E from magnitude 3.6 bet Pav.

 "I" 340 denotes Robert T.A. Innes (1861-1933), a self-taught astronomer and the discoverer of Proxima Centauri and of many doubles. His main telescope was the 26.5 inch refractor at the Union Observatory in Johannesburg. I too have looked through that instrument, at Mars however!



GLI 289


RA: 0.15° | 0h 0.6' — DEC: -66.68° | -66° 40'


Magnitude: 7.7 | 9.2

Separation: 3.8"

Position Angle: 275°

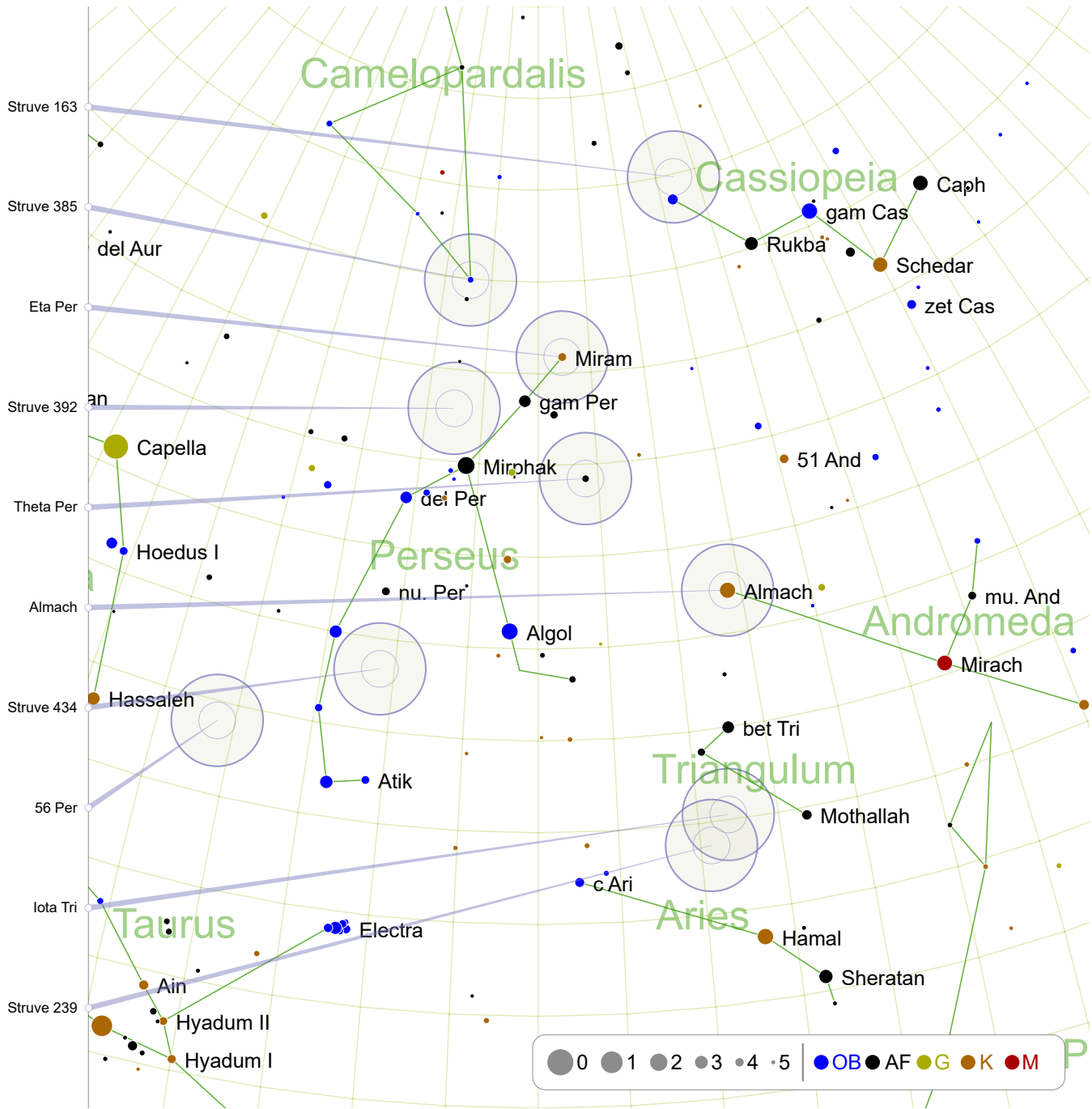
SAO 255620 | HIP 55 | GDR2 73434034048

 A yellow primary very close to a faint secondary.

 Two finder circles NNW from magnitude 2.9 bet Hyi. Two and a half finder circles SE from magnitude 2.91 alf Tuc.

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November: 45° North (1)



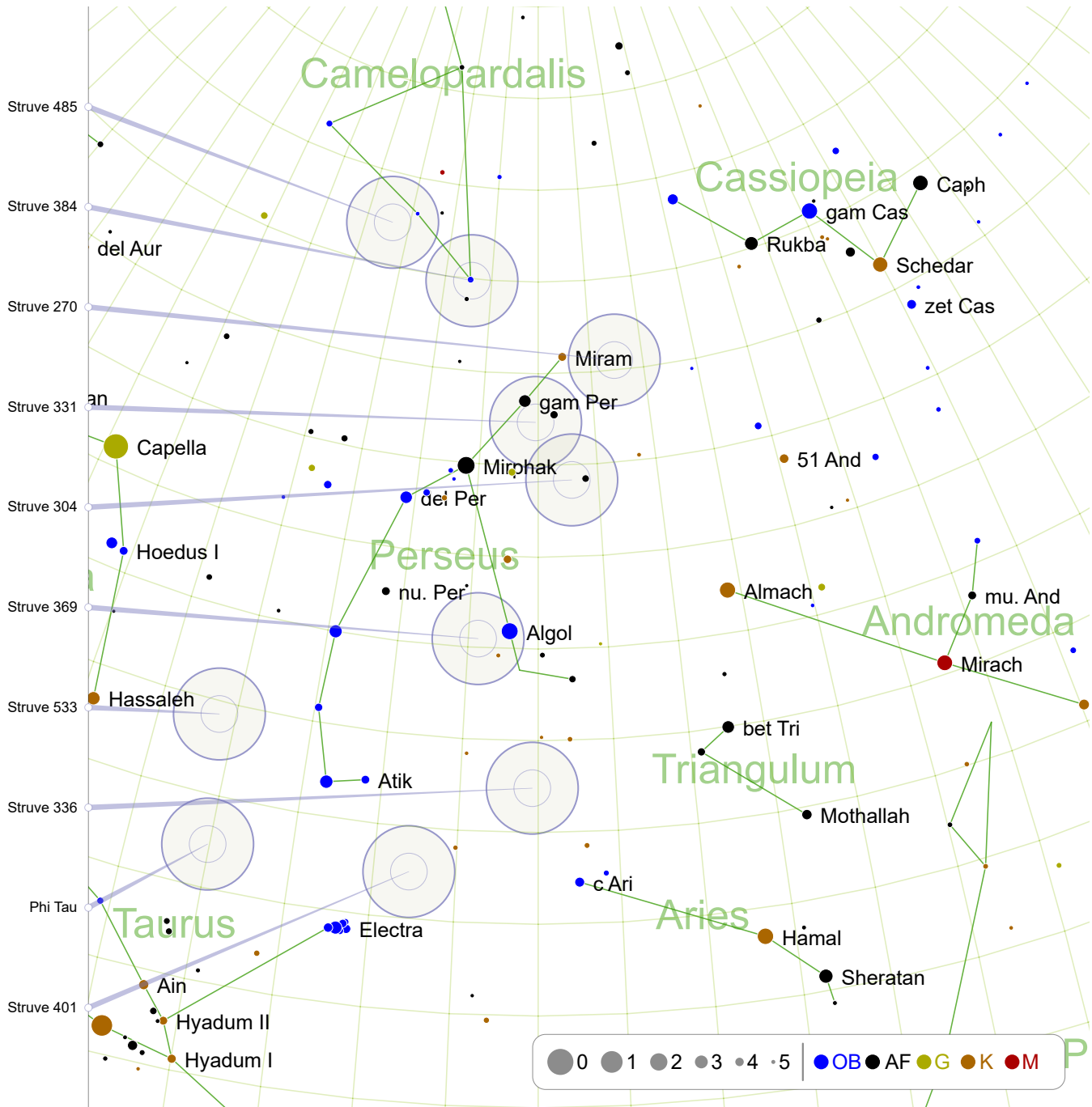
Struve 163: page 87
 Theta Per: page 89
 Iota Tri: page 91

Struve 385: page 87
 Almach: page 89
 Struve 239: page 91

Eta Per: page 88
 Struve 434: page 90

Struve 392: page 88
 56 Per: page 90

November: 45° North (2)

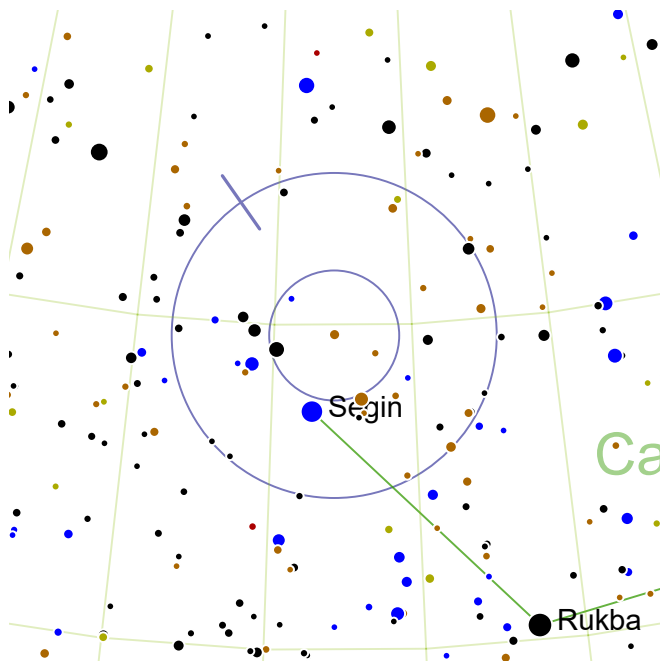


Struve 485: page 92
 Struve 304: page 94
 Phi Tau: page 96

Struve 384: page 92
 Struve 369: page 94
 Struve 401: page 96

Struve 270: page 93
 Struve 533: page 95

Struve 331: page 93
 Struve 336: page 95



Struve 163

RA: 27.83° | 1h 51.3' — DEC: 64.85° | 64° 51'

Magnitude: 6.8 | 8.8

Separation: 34.8"

Position Angle: 35°

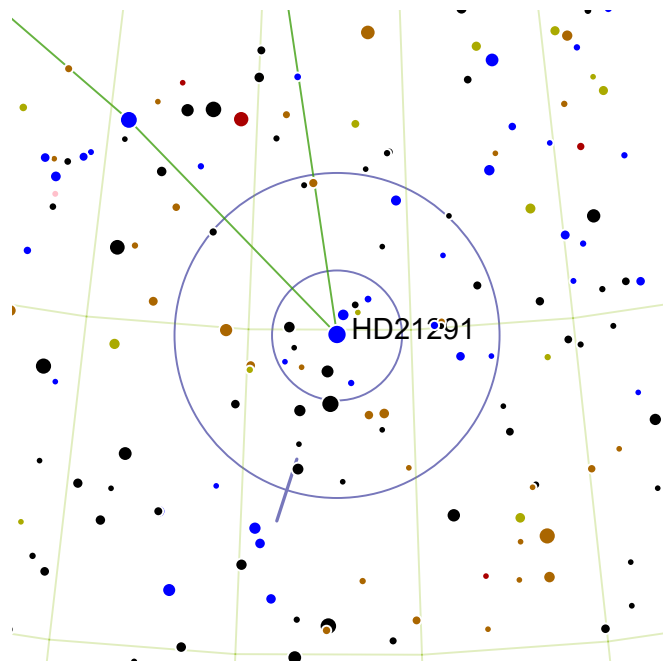
SAO 12006 | HIP 8626 | GDR2 8783536768



A wide binary with a strongly orange primary and blue secondary.



A degree north and slightly west of Segin, the faintest of the five stars of Cassiopeia's "W".



Struve 385

RA: 52.28° | 3h 29.09' — DEC: 59.93° | 59° 56'

Magnitude: 4.2 | 7.8

Separation: 2.3"

Position Angle: 162°

SAO 24054 | HIP 16228 | GDR2 8616785152



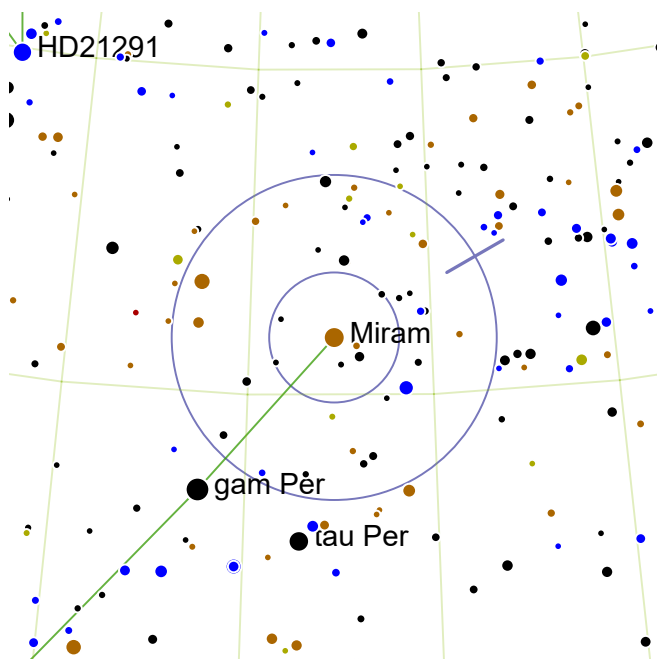
A brilliant blue primary with a moderately faint companion, very tightly separated.



One finder circle NE from magnitude 3.93 Mimir. Two finder circles E from magnitude 3.44 Segin.



This system is also known as CS Cam, indicating it is a variable star (of type Alpha Cygni). The magnitude range is barely 0.05 magnitudes, so this is not apparent to visual observers. The star is located in the dim reflection nebula VdB 14.



Eta Per




RA: 42.68° | 2h 50.69' — DEC: 55.9° | 55° 54'

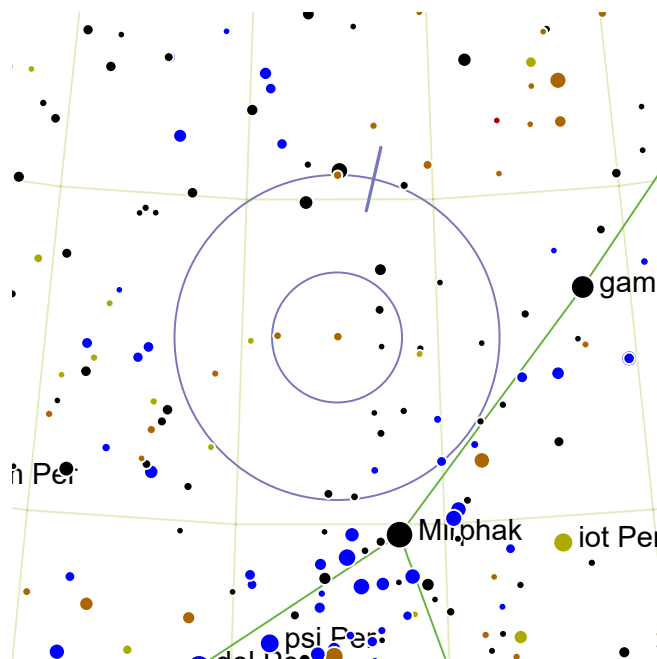
Magnitude: 3.8 | 8.5

Separation: 28.3"

Position Angle: 300°

SAO 23655 | HIP 13268 | GDR2 1980370304

-  A bright orange primary with a much fainter blue secondary.
-  Shares the same finder circle as the slightly brighter Gamma Persei to the south east.
-  The common name for the system, “Miram”, originates in the 20th century but its meaning (if any) is unclear. The primary is about ten times the Sun’s mass with approximately 4130 times the luminosity and 220 times the radius.



Struve 392




RA: 52.58° | 3h 30.3' — DEC: 52.9° | 52° 54'

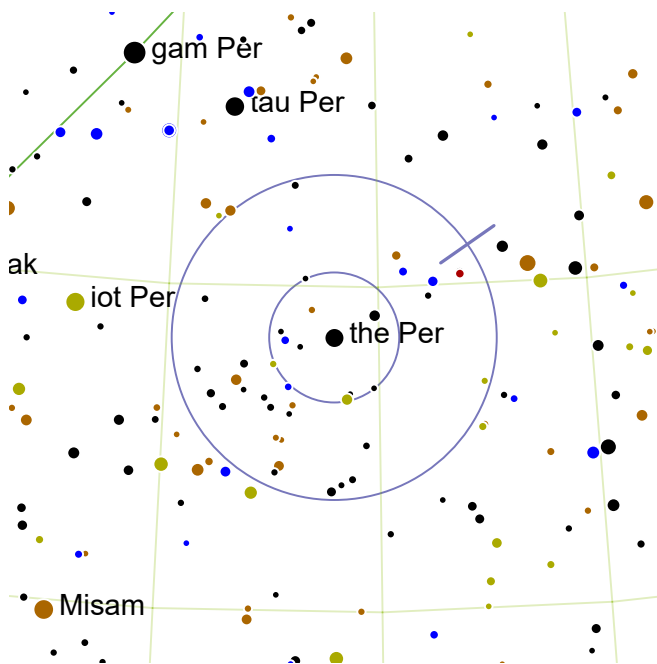
Magnitude: 7.4 | 9.6

Separation: 25.8"

Position Angle: 347°

SAO 24068 | HIP 16316 | GDR2 526287820

-  An orange-blue pair, widely separated. Neither companion is particularly bright.
-  Easily lost in the busy star fields of Perseus. Position magnitude 1.75 Mirphak at the southern edge of the finder. Struve 392 is a brightish star just north of center.
-  Open cluster NGC 1444 lies just beyond the eastern edge of the finder with this double centered. Fainter open cluster NGC 1496 lies a further 2.5 degrees further east.



Theta Per

RA: 41.05° | 2h 44.19' — DEC: 49.23° | 49° 14'

Magnitude: 4.1 | 9.9

Separation: 20"

Position Angle: 305°

SAO 38288 | HIP 12777



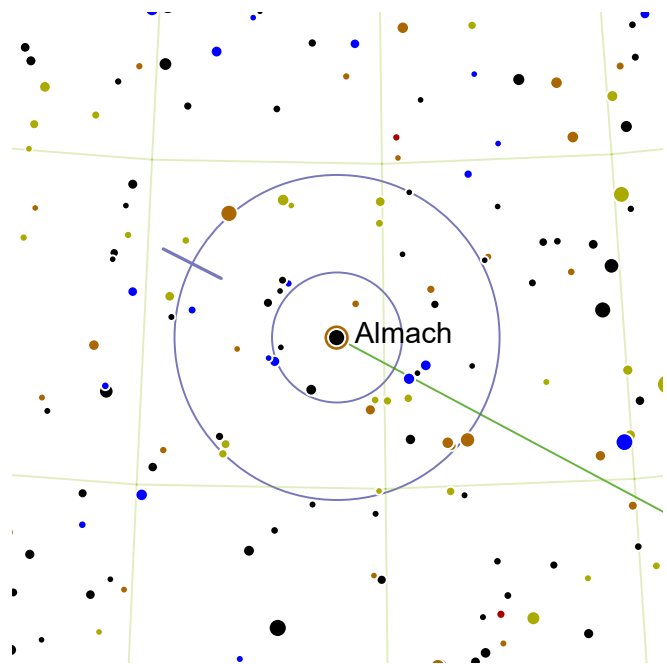
A wide and unbalanced double with a deep yellow primary and a very faint blue secondary.



One finder circle south west of Gamma Persei.



Only 38 light-years away, the primary is 2.3 times brighter than the Sun, while the companion is an above-averagely bright "early" red dwarf. The term early comes from an old mistaken belief that stars grow fainter as they age, meaning a brighter star would be early and fainter star would be late. We now know stars get brighter as they age.



Almach

RA: 30.98° | 2h 3.9' — DEC: 42.33° | 42° 20'

Magnitude: 2.3 | 5.5

Separation: 9.8"

Position Angle: 63°

SAO 37734 | HIP 9640



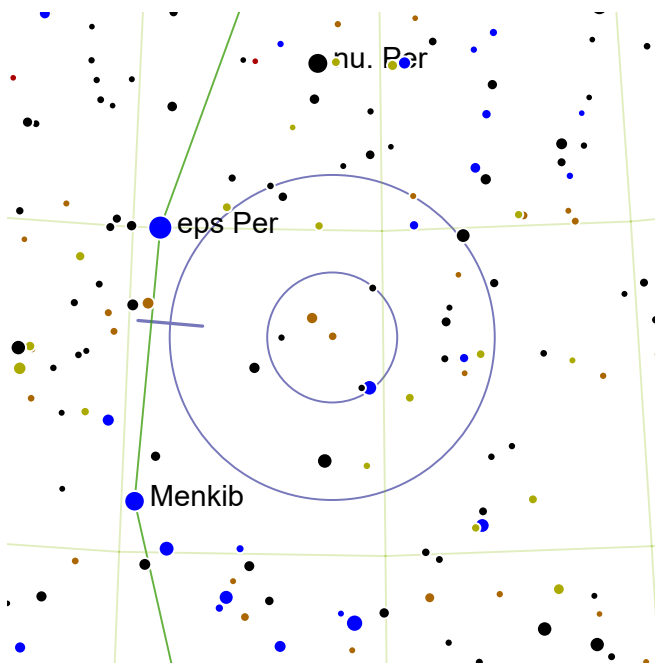
A spectacular pairing of an intense orange primary with a fainter blue secondary.



The secondary component is a triple system consisting a two closely bound B class stars separated by less than 0.2" from an A class star.



Johann Tobias Mayer discovered the binary nature of this strongly colored system in 1778. In 1842, Wilhelm Struve found the blue B component is itself a double star with a separation of around 1". Spectroscopy reveals the fainter component of the B system is also a double resulting in a quadruple star system.



Struve 434

RA: 56.0° | 3h 44.0' — DEC: 38.37° | 38° 22'

Magnitude: 7.8 | 8.6

Separation: 31"

Position Angle: 85°

SAO 56667 | HIP 17424 | GDR2 3312776960



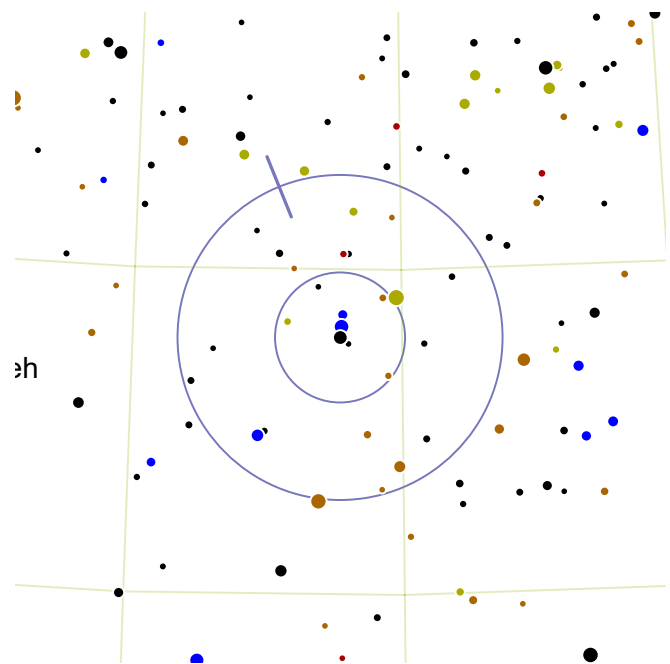
A widely separated, balanced pair with an orange primary.



Half a finder circle SWW from magnitude 2.96 eps Per. Half a finder circle S from magnitude 3.93 nu. Per.



The pair does not seem to be gravitationally bound. The primary is a K-class orange giant, 1426 light-years from Earth.



56 Per

RA: 66.15° | 4h 24.6' — DEC: 33.97° | 33° 58'

Magnitude: 5.9 | 8.7

Separation: 4.2"

Position Angle: 22°

SAO 57216 | HIP 20591 | GDR2 9818083712



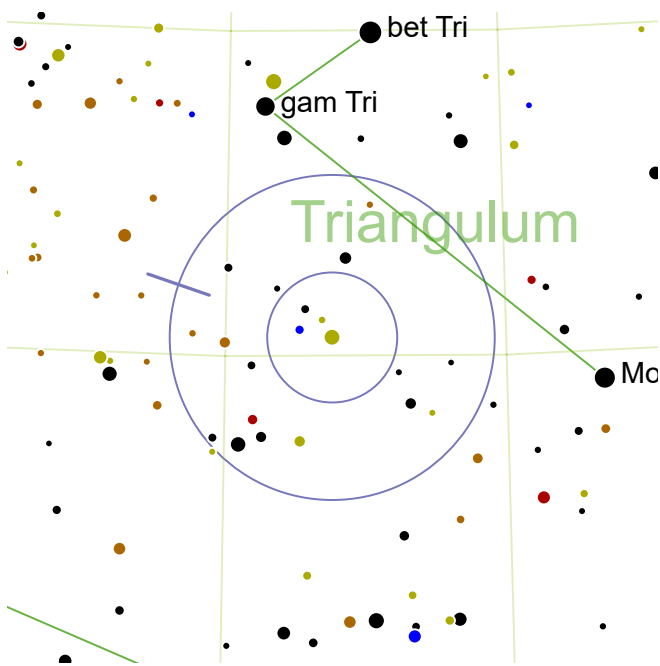
A bright yellow primary with a close yellow companion.



One and a half finder circles north of Zeta Persei.



The primary star is an F4V main sequence star 50% more massive than the Sun and seven times brighter. It has a very dim close white dwarf companion (magnitude 15), but the brighter star identified as the B component is further separated and 86% of the mass of the sun.



Iota Tri

RA: 33.1° | 2h 12.4' — DEC: 30.3° | 30° 18'

Magnitude: 5.3 | 6.9

Separation: 3.9"

Position Angle: 71°

SAO 55347 | HIP 10280



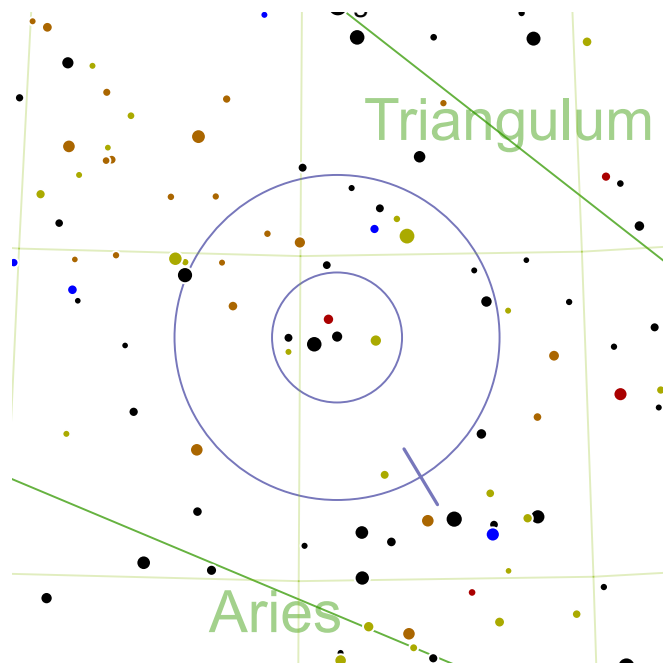
A tight, bright pair of well-matched yellow and blue stars.



A finder circle south of Gamma Trianguli.



Although only two stars are visible, this system is quadruple as the A and B components are spectroscopic binaries.



Struve 239

RA: 34.35° | 2h 17.4' — DEC: 28.75° | 28° 45'

Magnitude: 7.0 | 8.0

Separation: 13.8"

Position Angle: 211°

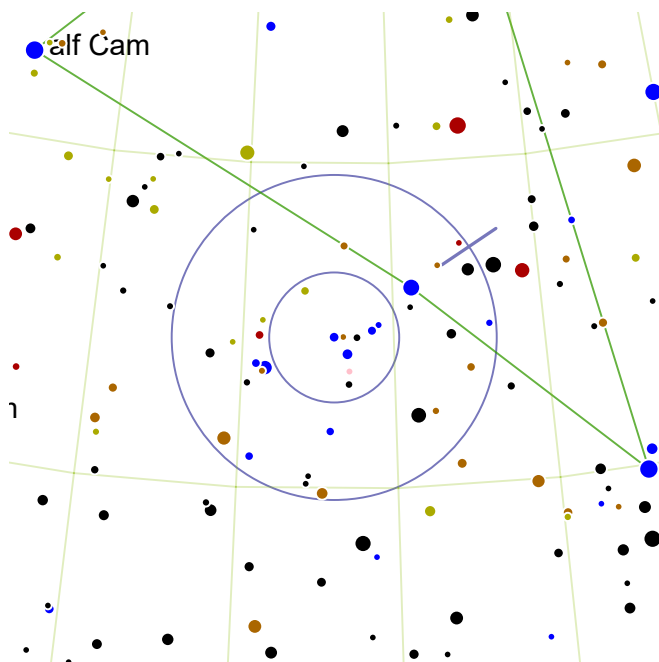
SAO 75265 | HIP 10680 | GDR2 2769886848



A comfortably separated yellow-blue pairing.



Just over a finder circle north and slightly east of Hamal.



Struve 485

RA: 61.98° | 4h 7.9' — DEC: 62.33° | 62° 20'

Magnitude: 7.0 | 7.1

Separation: 18"

Position Angle: 304°

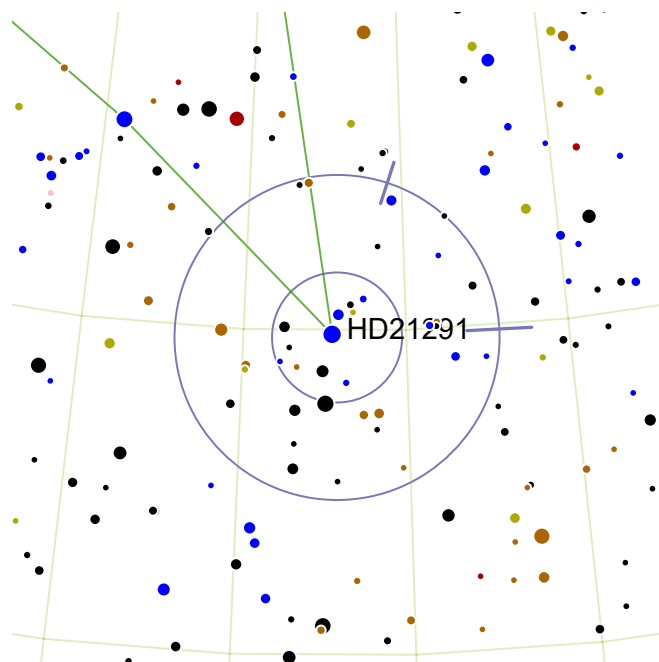
SAO 13031 | HIP 19272 | GDR2 4001466752



A widely separated equal pair of white stars.



Situated in the star cluster NGC 1502. one of the two stars is variable, ranging from magnitude 7.0 to 7.3 in roughly two days.



Struve 384

RA: 52.13° | 3h 28.5' — DEC: 59.9° | 59° 54'

Magnitude: 8.1 | 8.9 | 10.6

Separation: 2.0" | 116"

Position Angle: 273° | 342°

HIP 16183 | GDR2 7609785600



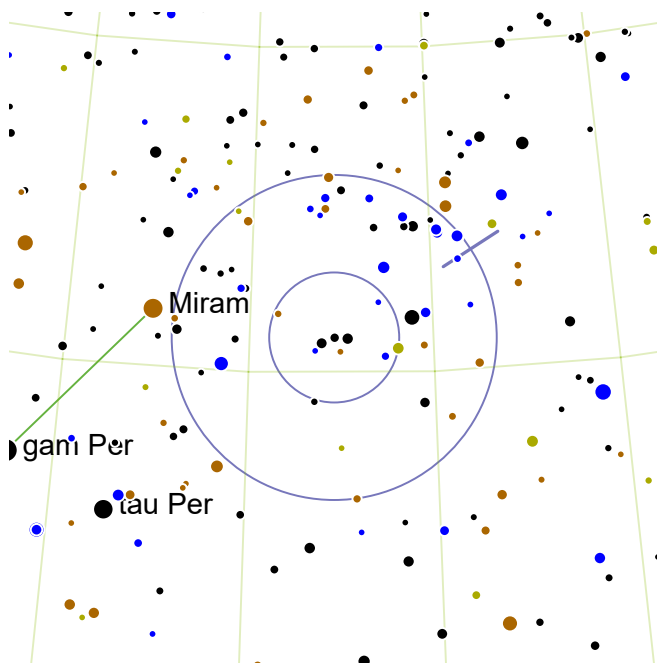
A very tight pair of relatively faint stars, with a loosely associated dim third component.



One finder circle NE from magnitude 3.93 Miram. Two finder circles E from magnitude 3.44 Segin.



Even at high magnification, this shares the field with the bright double Struve 385. Many nebulae are close by. One finder circle to the west is the Soul Nebula, and a couple of degrees further is the Heart Nebula.



Struve 270

RA: 37.7° | 2h 30.8' — DEC: 55.55° | 55° 33'

Magnitude: 7.4 | 9.2

Separation: 21.2"

Position Angle: 303°

SAO 23389 | HIP 11696 | GDR2 0673147264



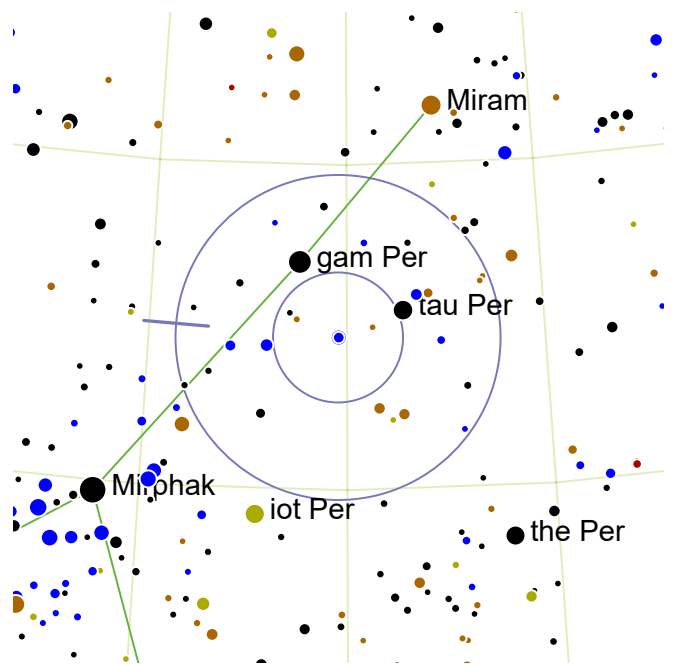
A wide yellow-blue double.



Located midway between magnitude 2.65 Ruchbah in Cassiopeia and magnitude 1.75 Mirphak in Perseus, either two finder circles north west of Mirphak or two finder circles south east of Ruchbah.



If you have the famous Double cluster in view, you are nearly there. Position the Double Cluster on the north west edge of the finder and Struve 270 is in the center of the finder, closely flanked by two equally bright stars.



Struve 331

RA: 45.23° | 3h 0.9' — DEC: 52.35° | 52° 21'

Magnitude: 5.3 | 6.7

Separation: 12.1"

Position Angle: 85°

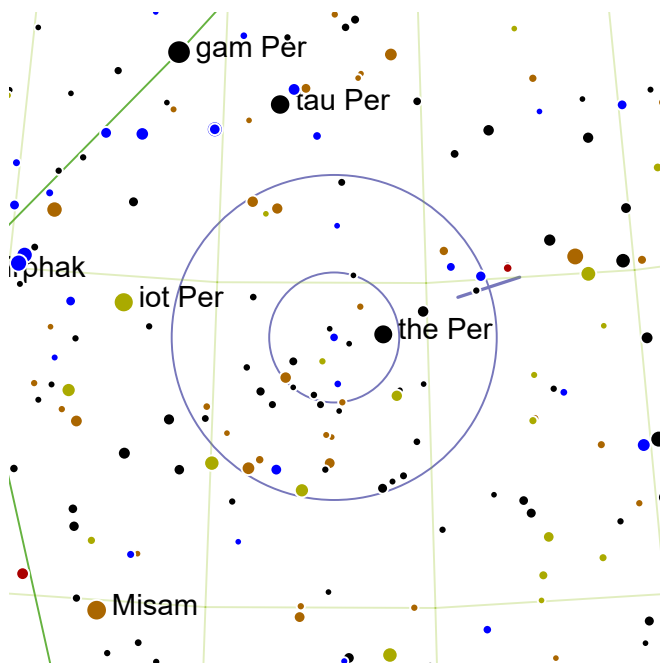
SAO 23763 | HIP 14043 | GDR2 9385318656



A bright and easily separated white-blue pair.



Just over one degree to the south of Gamma Persei.



Struve 304

RA: 42.2° | 2h 48.8' — DEC: 49.18° | 49° 11'

Magnitude: 7.5 | 10.7

Separation: 25"

Position Angle: 288°

SAO 38352 | HIP 13124 | GDR2 9992325504



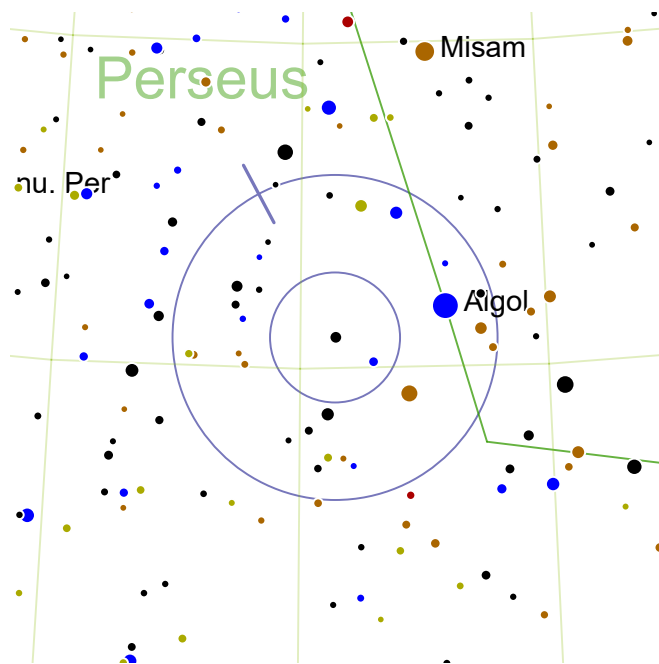
A faint, wide white and blue pair.



One and a half finder circles west of Mirphak.



This system is 604 light-years from the Sun.



Struve 369

RA: 49.3° | 3h 17.19' — DEC: 40.48° | 40° 29'

Magnitude: 6.7 | 8.0

Separation: 3.5"

Position Angle: 28°

SAO 38700 | HIP 15282 | GDR2 5109311360



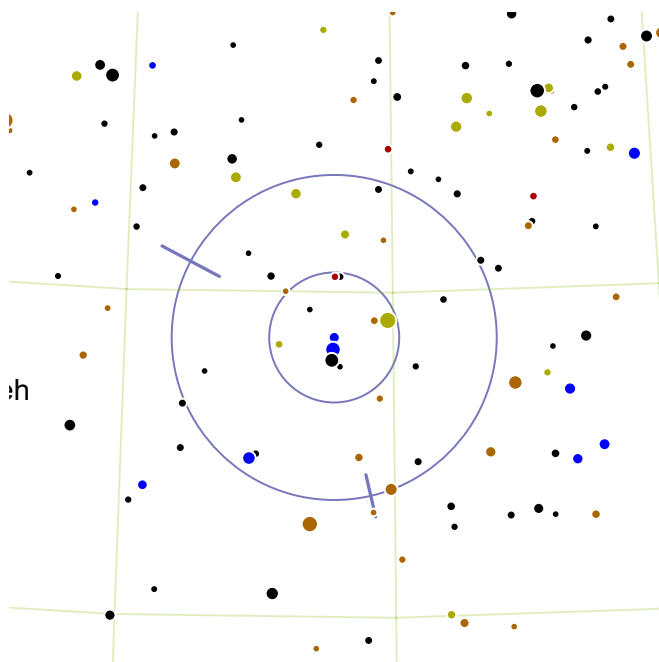
A fairly balanced yellow-blue pairing. Very widely separated.



Center Algol in the finder; Struve 369 lies to the eastern edge of the finder.



Algol (the "Demon Star") is the most famous of eclipsing binaries, with a period of 2.867 days dropping from magnitude 2.1 to 3.4 in a matter of hours.



Struve 533

RA: 66.1° | 4h 24.39' — DEC: 34.32° | 34° 19'

Magnitude: 7.3 | 8.5 | 12.0

Separation: 19" | 107"

Position Angle: 62° | 193°

SAO 57211 | HIP 20570 | GDR2 3071472512



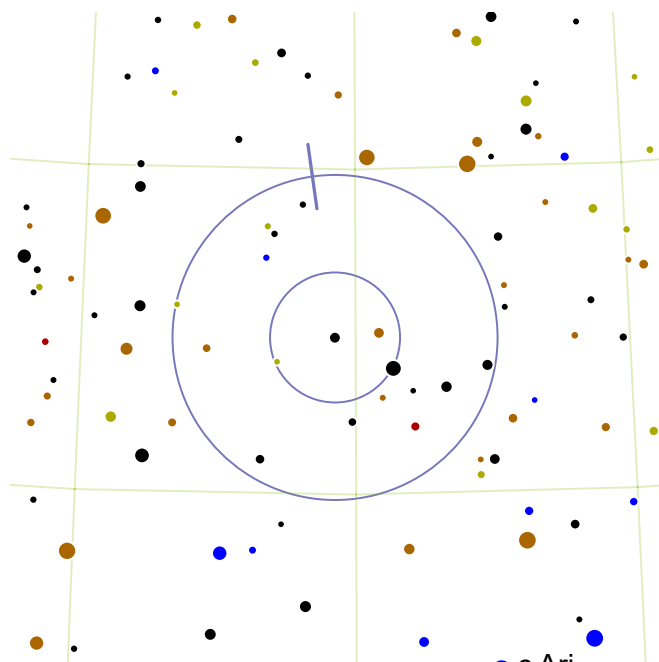
A bluish primary easily separated from somewhat fainter companion; there is a distant and very faint third component.



One finder circle NEE from magnitude 2.91 zet Per. One and a half finder circles NEE from magnitude 3.94 Atik.



The primary is also identified as variable star V590 Per, with a small magnitude range of 7.2 to 7.44. Two degrees to the north east is NGC 1679, an emission nebula.



Struve 336

RA: 45.38° | 3h 1.5' — DEC: 32.42° | 32° 25'

Magnitude: 6.9 | 8.4

Separation: 8.4"

Position Angle: 8°

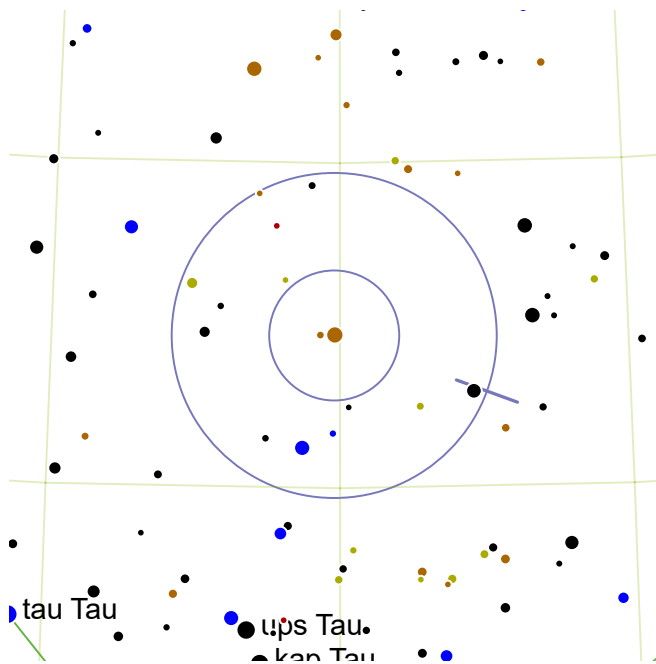
SAO 56095 | HIP 14081 | GDR2 5089525248



An orange primary easily separated from a bluish secondary.



Nearly two finder circles south of Algol.



Phi Tau

RA: 65.1° | 4h 20.39' — DEC: 27.35° | 27° 21'

Magnitude: 5.0 | 8.4

Separation: 52.1"

Position Angle: 250°

SAO 76558 | HIP 20250 | GDR2 6556443904



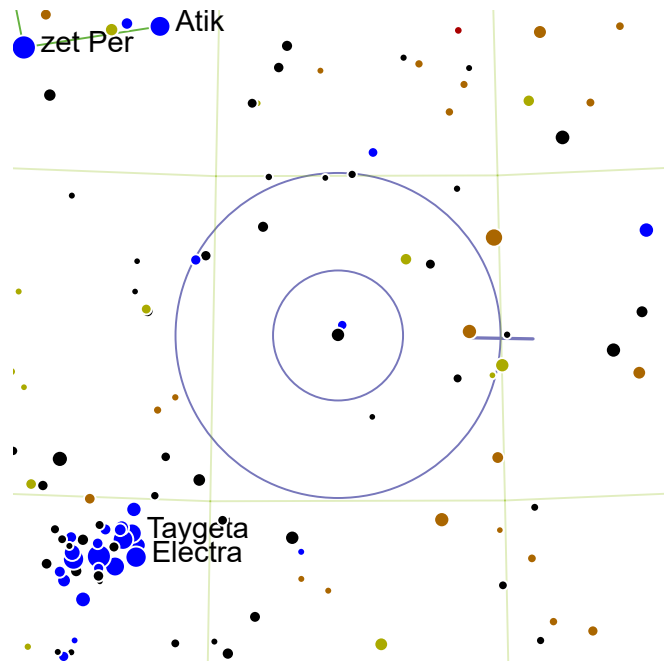
A bright yellow primary with a widely separated faint blue companion.



One and a half finder circles south east of Zeta Persei.



This double is only a line-of-sight coincidence and the components are not gravitationally related.



Struve 401

RA: 52.83° | 3h 31.32' — DEC: 27.57° | 27° 34'

Magnitude: 6.6 | 6.9

Separation: 11.4"

Position Angle: 269°

SAO 75970 | HIP 16411 | GDR2 5464382080



An easily separated equal pair of fairly bright white stars.

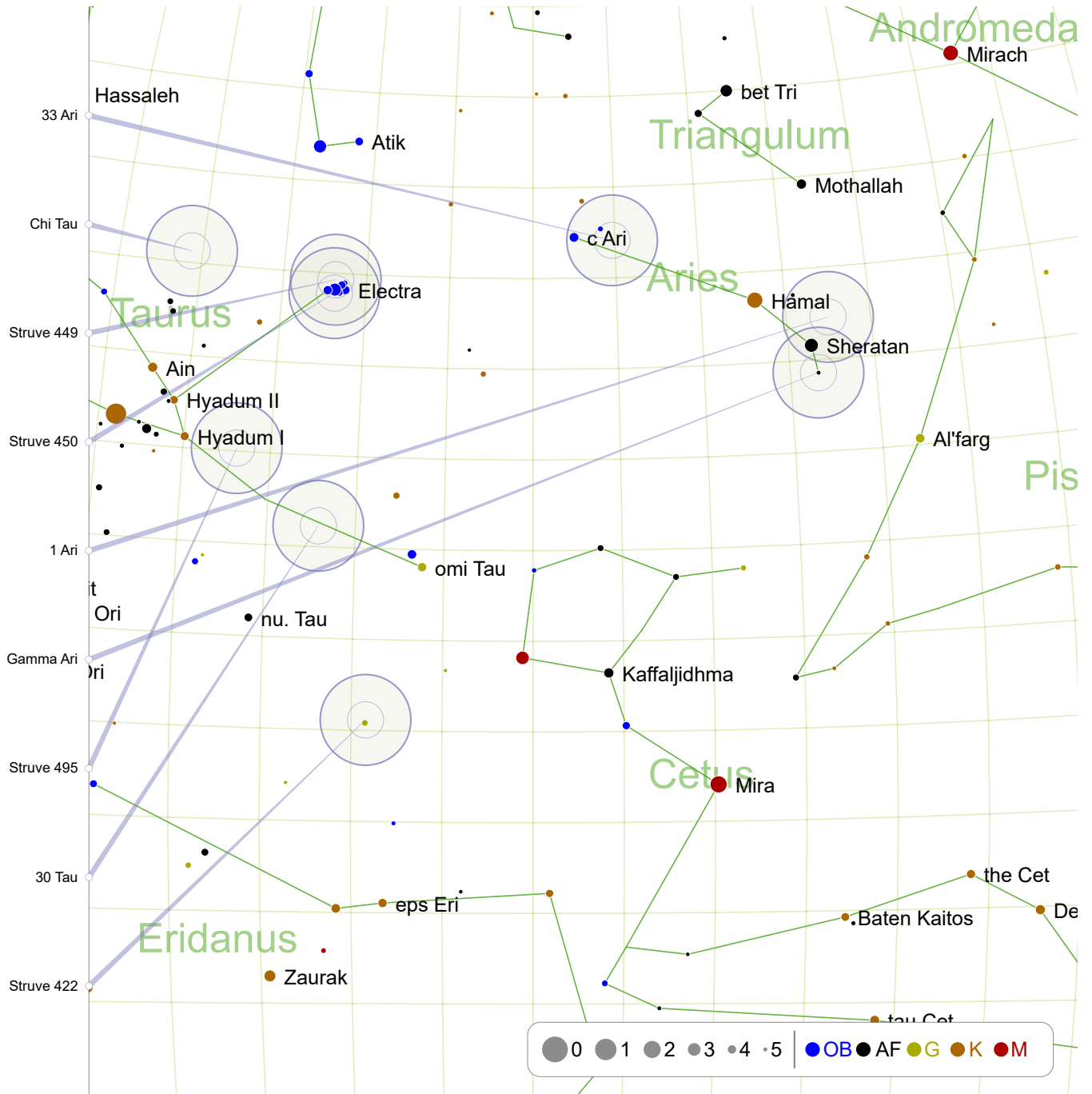


Half a finder circle NW from magnitude 3.81 Electra. One finder circle SSW from magnitude 3.94 Atik.



This system lies one finder circle north west of the Pleiades.

November: 10° North (1)



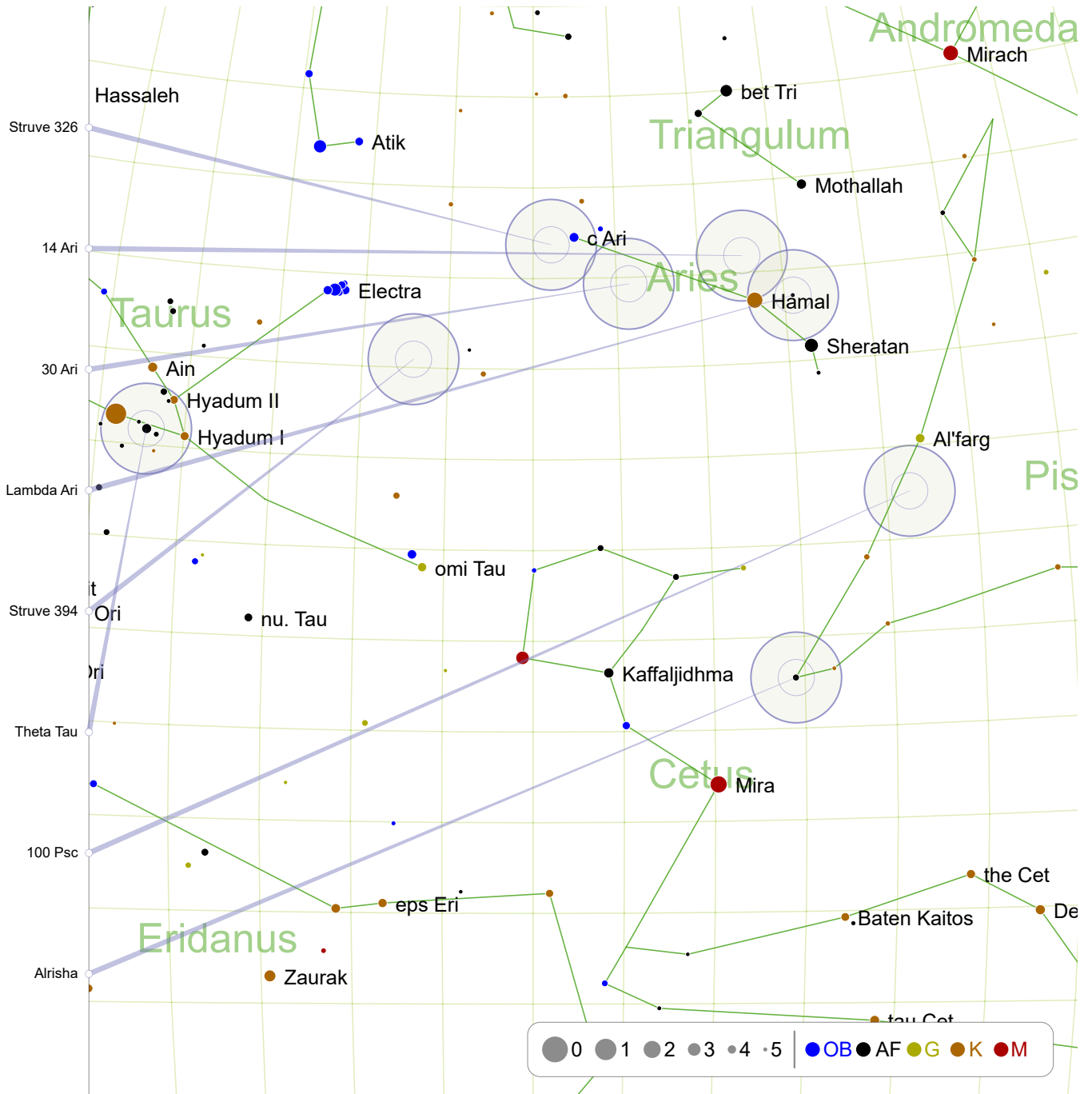
33 Ari: page 99
 1 Ari: page 101
 Struve 422: page 103

Chi Tau: page 99
 Gamma Ari: page 101

Struve 449: page 100
 Struve 495: page 102

Struve 450: page 100
 30 Tau: page 102

November: 10° North (2)

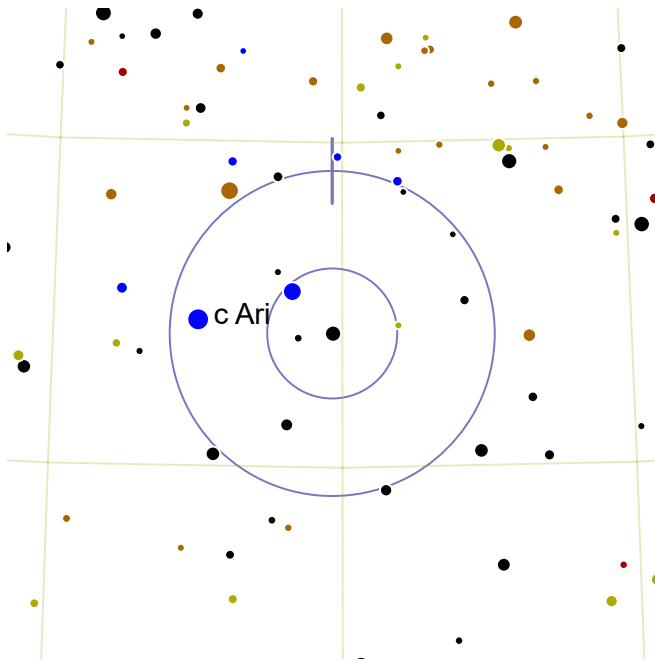


Struve 326: page 103
Struve 394: page 105

14 Ari: page 104
Theta Tau: page 106

30 Ari: page 104
100 Psc: page 106

Lambda Ari: page 105
Alrisha: page 107



33 Ari

RA: 40.17° | 2h 40.69' — DEC: 27.07° | 27° 4'

Magnitude: 5.5 | 8.4

Separation: 28.6"

Position Angle: 0°

SAO 75510 | HIP 12489 | GDR2 4883932160



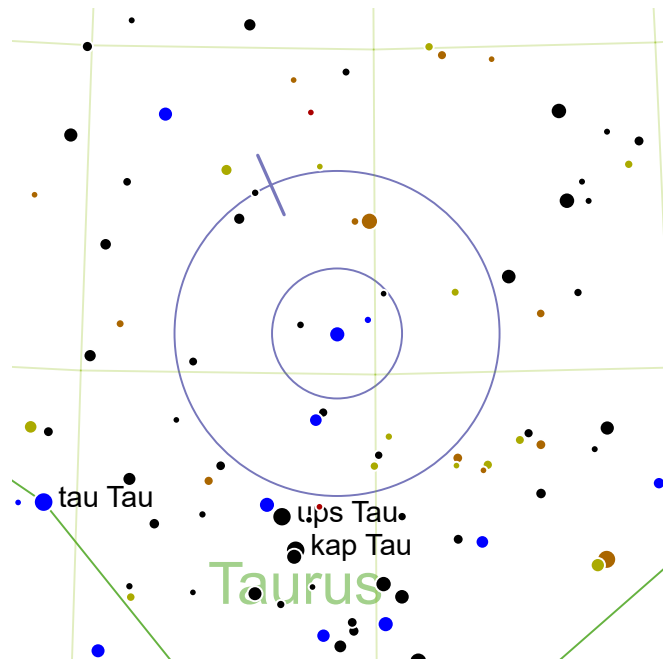
A bright yellow primary with a faint blue companion, widely separated.



Nearly two finder circles east and slightly north of Hamal.



Also known as Barani I. Circumstellar dust has been detected in this system.



Chi Tau

RA: 65.65° | 4h 22.6' — DEC: 25.63° | 25° 38'

Magnitude: 5.5 | 7.6

Separation: 19.4"

Position Angle: 24°

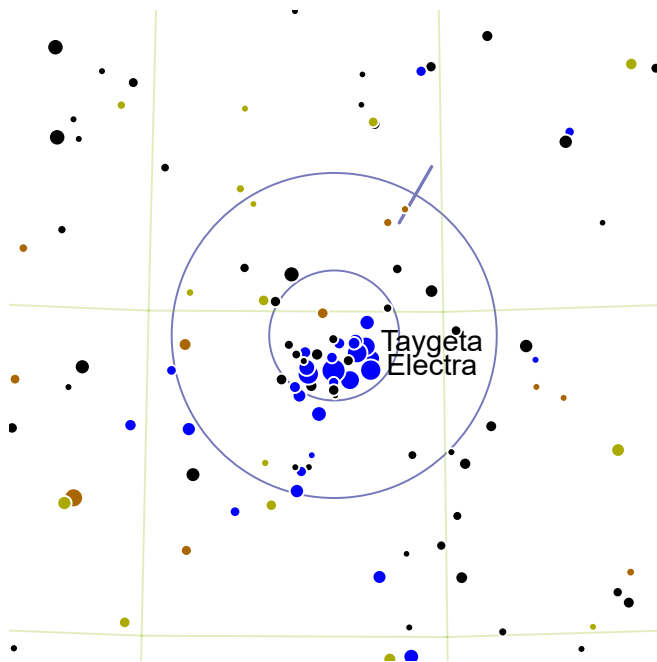
SAO 76573 | HIP 20430 | GDR2 2453366528



An easily separated white-blue pairing, where the secondary is also reasonably bright so seeing the color is easier.



Also known as Alkalbain II. Find Alkalbain I two degrees to the north.



Struve 449

RA: 56.85° | 3h 47.4' — DEC: 24.65° | 24° 39'

Magnitude: 8.5 | 11.0

Separation: 6.8"

Position Angle: 330°

SAO 76194 | GDR2 985307264



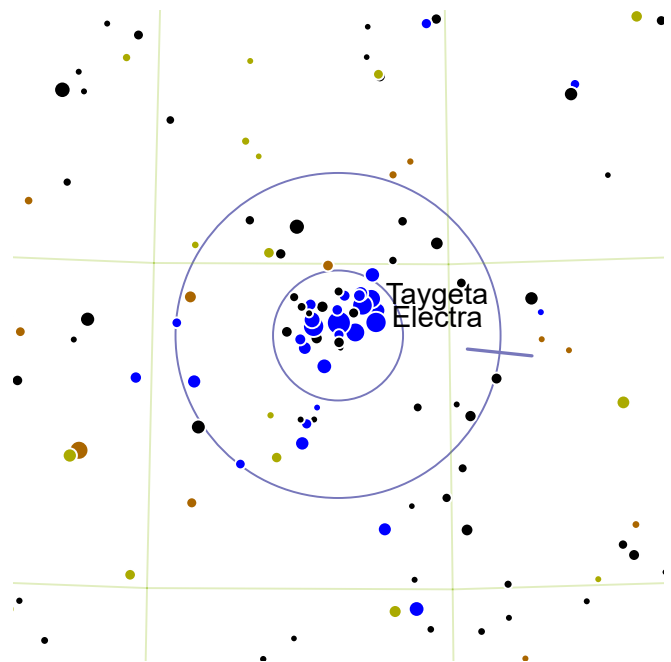
A bluish primary with a close, faint companion.



Less than half a degree N from magnitude 2.96 Alcyone. Half a degree NE from magnitude 3.81 Electra.



Located on the north-eastern edge of the Pleiades.



Struve 450

RA: 56.88° | 3h 47.5' — DEC: 23.92° | 23° 55'

Magnitude: 7.1 | 9.1

Separation: 6.2"

Position Angle: 264°

SAO 76197 | GDR2 611941376



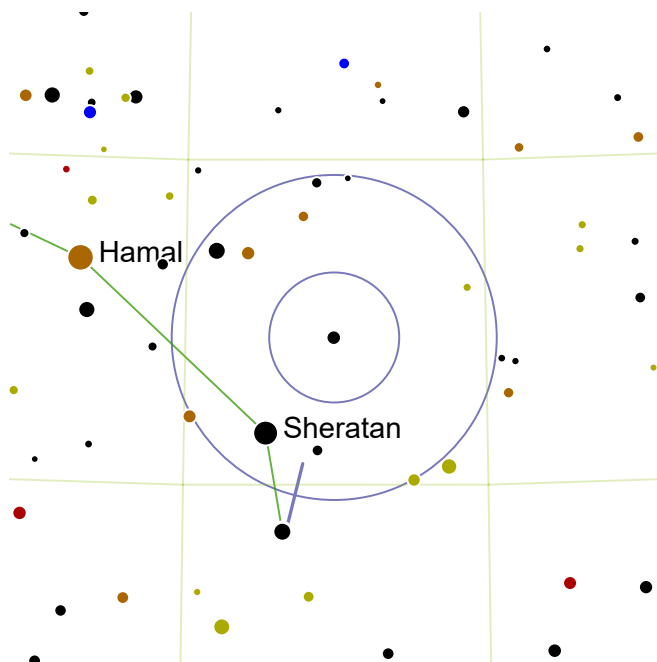
A close pair of white stars, not very bright but easily found.



Located in the Pleiades less than a quarter of a degree south of Alcyone (at magnitude 2.85, the brightest member of the Pleiades).



The Pleiades is the nearest object in the Messier catalog to the Earth as it is only 444 light-years away. It contains over 1000 stars with a total mass of around 800 solar masses.



1 Ari

RA: 27.53° | 1h 50.09' — DEC: 22.28° | 22° 17'

Magnitude: 6.2 | 7.2

Separation: 2.8"

Position Angle: 166°

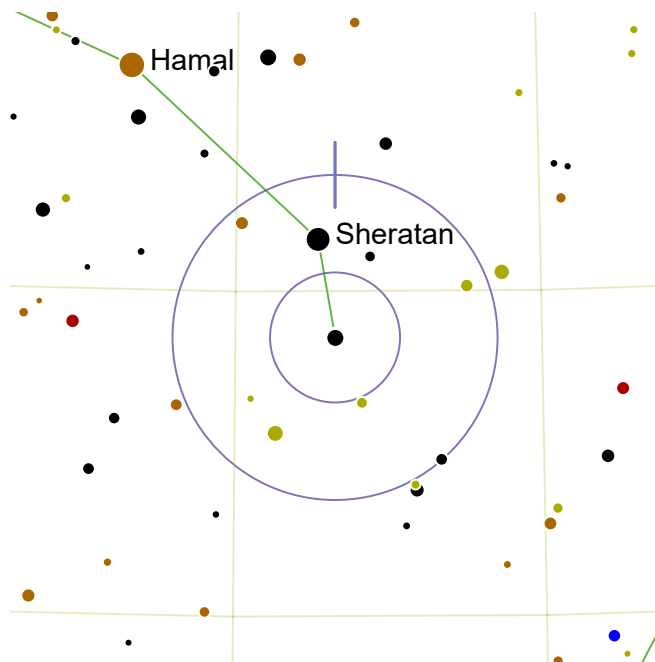
SAO 74966 | HIP 8544 | GDR2 357332864



A close pair with a brighter yellow primary and blue secondary.



The secondary is sufficiently bright to fully appreciate its color in smaller telescopes.



Gamma Ari

RA: 28.38° | 1h 53.5' — DEC: 19.3° | 19° 18'

Magnitude: 4.8 | 4.8

Separation: 7.8"

Position Angle: 0°

SAO 92681 | HIP 8832 | GDR2 367308544



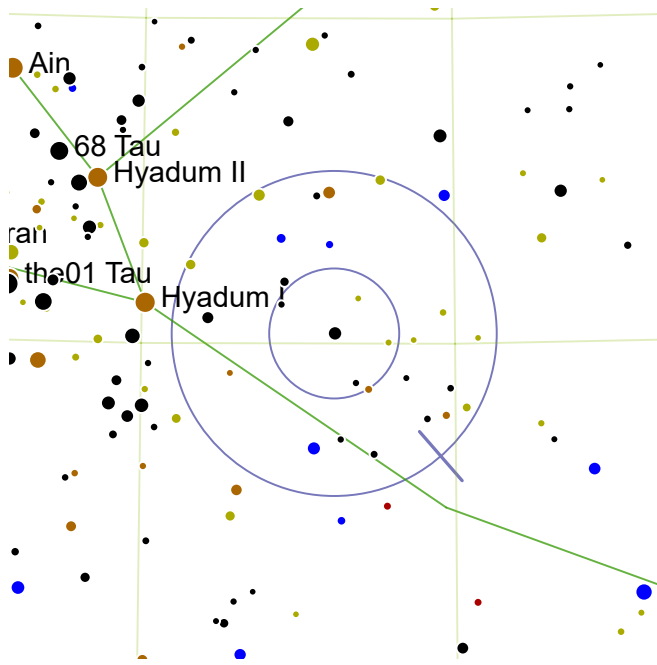
An equal pair of icy blue stars with close separation.



The faint galaxy NGC 772 lies 1.5 degrees SEE of Gamma Ari in the finder view.



Robert Hooke discovered this double in 1664. Hooke is most famous for his microscope work, but made significant contributions in physics, geology, architecture and paleontology, as well as astronomy.



Struve 495

RA: 61.93° | 4h 7.69' — DEC: 15.17° | 15° 10'

Magnitude: 6.0 | 8.8

Separation: 3.8"

Position Angle: 221°

SAO 93775 | HIP 19261 | GDR2 521351552



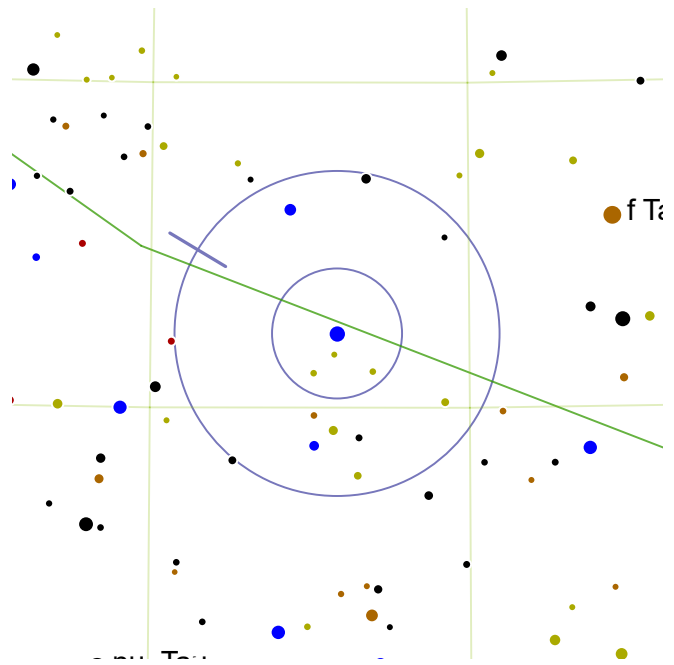
A close pair of yellow stars. The primary is almost three magnitudes brighter than the secondary, meaning it is roughly 15 times brighter.



One and a half finder circles west of Aldebaran.



This binary lies 5 degrees to the west of the Hyades, the nearest star cluster to the Earth, only 153 light-years distant.



30 Tau

RA: 57.08° | 3h 48.3' — DEC: 11.15° | 11° 9'

Magnitude: 5.1 | 10.2

Separation: 9"

Position Angle: 59°

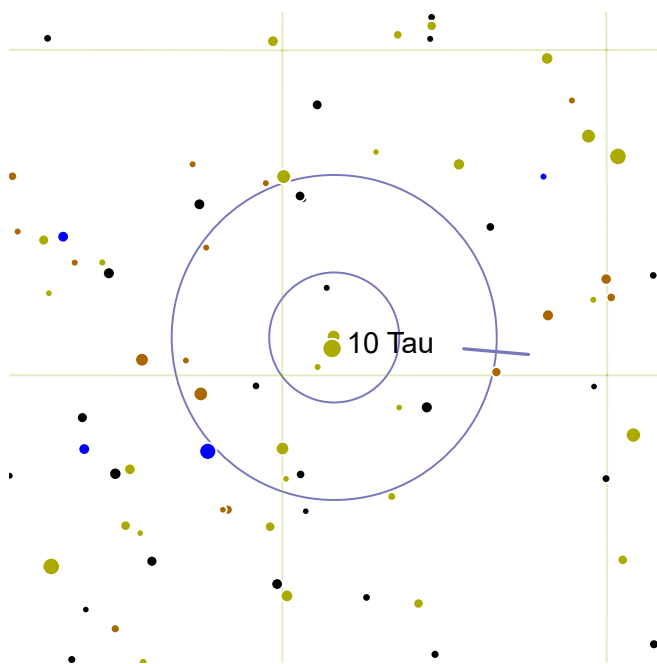
SAO 93611 | HIP 17771 | GDR2 767519232



An unusual blue-red color combination, with reasonable separation, but the faint red companion needs a larger telescope to bring out its color.



One finder circle NEE from magnitude 3.75 ksi Tau. One finder circle NEE from magnitude 3.8 omi Tau.



Struve 422

RA: 54.2° | 3h 36.8' — DEC: 0.58° | 0° 35'

Magnitude: 5.9 | 8.8

Separation: 6.6"

Position Angle: 265°

SAO 111291 | HIP 16846 | GDR2 92671872384



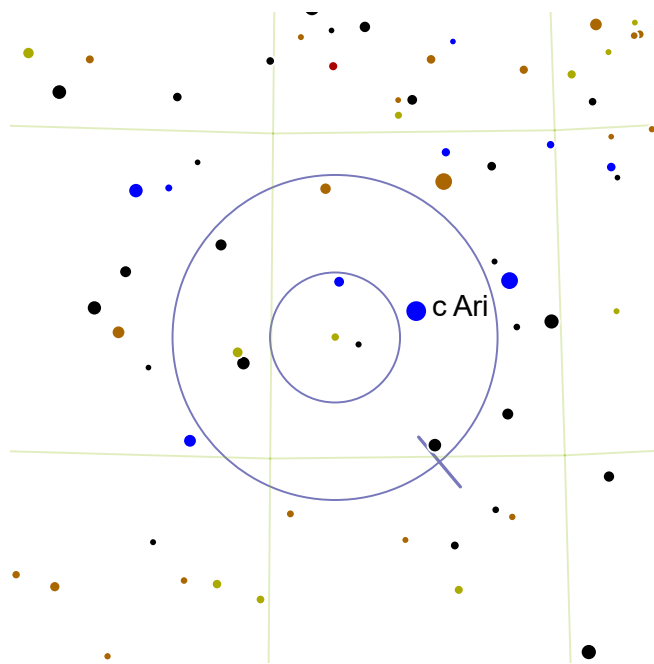
A bright yellow primary close to a relatively faint orange companion.



Start at magnitude 2.5 Alpha Ceti (Menkar) and move two and a bit finder circles SEE. Struve 422 lies a fifth of a degree north of the slightly brighter 10 Taurus.



The system is an RS Cvn-type variable system, where an evolved G-class star with a spectroscopic companion has significant starspots that rotate in and out of view.



Struve 326

RA: 43.9° | 2h 55.59' — DEC: 26.87° | 26° 52'

Magnitude: 7.6 | 9.8

Separation: 5.9"

Position Angle: 220°

SAO 75644 | HIP 13642



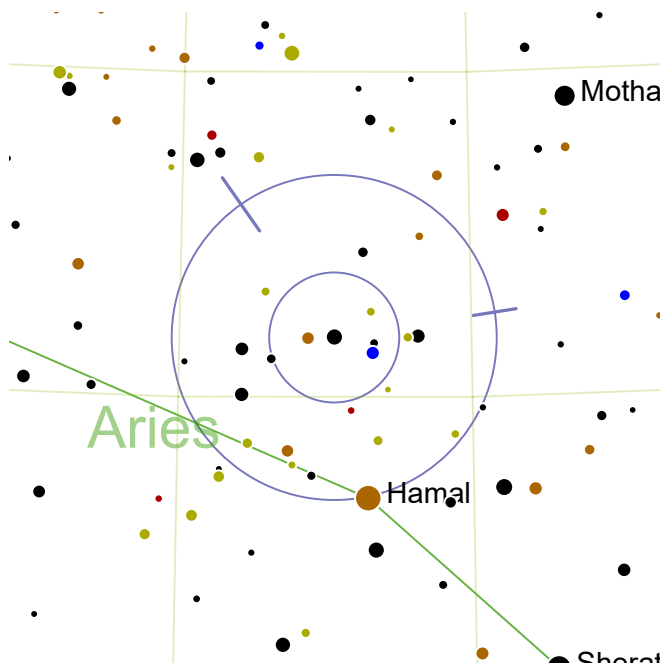
A faint, close orange-red pair.



Two and a half finder circles east and slightly north of magnitude 2.0 Hamal.



This system is very close (only 76 light-years from us), consisting of an orange subgiant and a relatively bright red dwarf.



14 Ari




RA: 32.35° | 2h 9.4' — DEC: 25.93° | 25° 56'

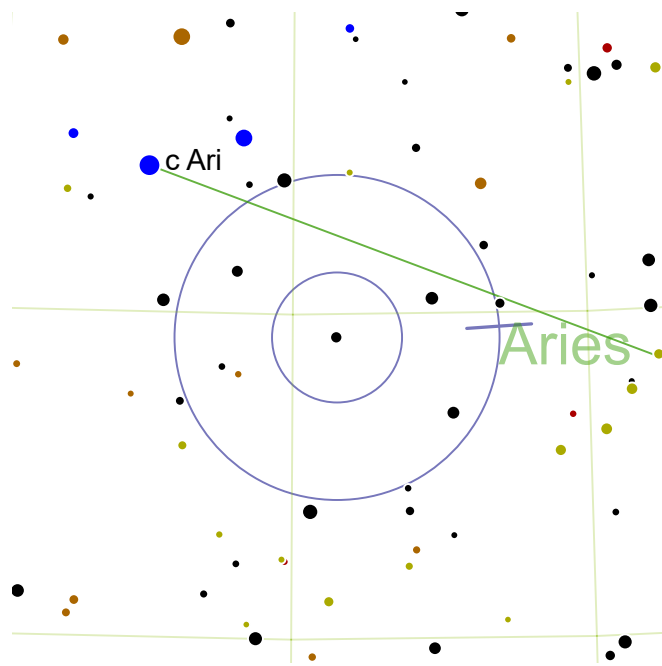
Magnitude: 5.0 | 8.0 | 8.0

Separation: 93.1" | 106"

Position Angle: 35° | 279°

SAO 75171 | HIP 10053 | GDR2 2601324672

-  A very wide triangle of three stars; the bright primary is yellowing and the other two components are significantly fainter.
-  Half a finder circle NNE from magnitude 2.23 Hamal. One finder circle SE from magnitude 3.58 Mothallah.
-  This is a gravitationally bound, physical double, 289 light-years from the Earth.



30 Ari



RA: 39.25° | 2h 37.0' — DEC: 24.65° | 24° 39'

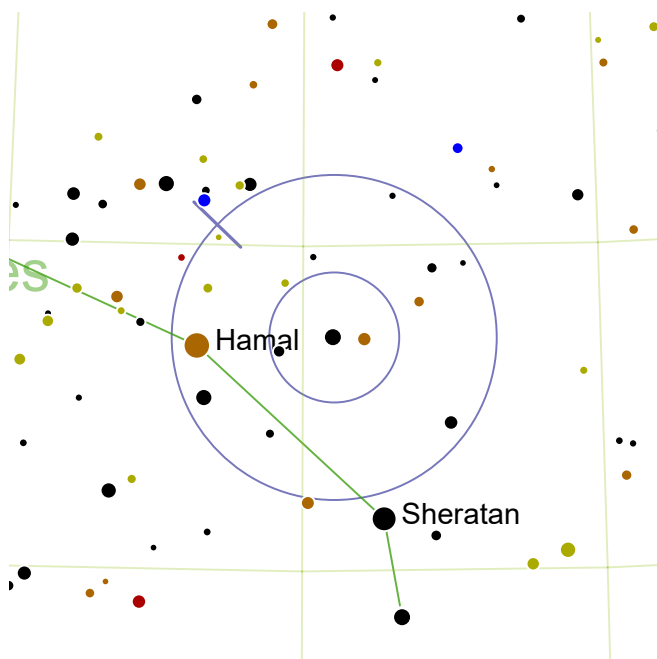
Magnitude: 6.6 | 7.4

Separation: 38.6"

Position Angle: 274°

SAO 75471 | HIP 12189 | GDR2 9030066560

-  Two bright yellow stars, almost equally matched and widely separated.
-  One and a half finders east and slightly north of Hamal.



Lambda Ari

RA: 29.48° | 1h 57.9' — DEC: 23.6° | 23° 36'

Magnitude: 4.9 | 7.7

Separation: 37"

Position Angle: 46°

SAO 75051 | HIP 9153 | GDR2 7609412352



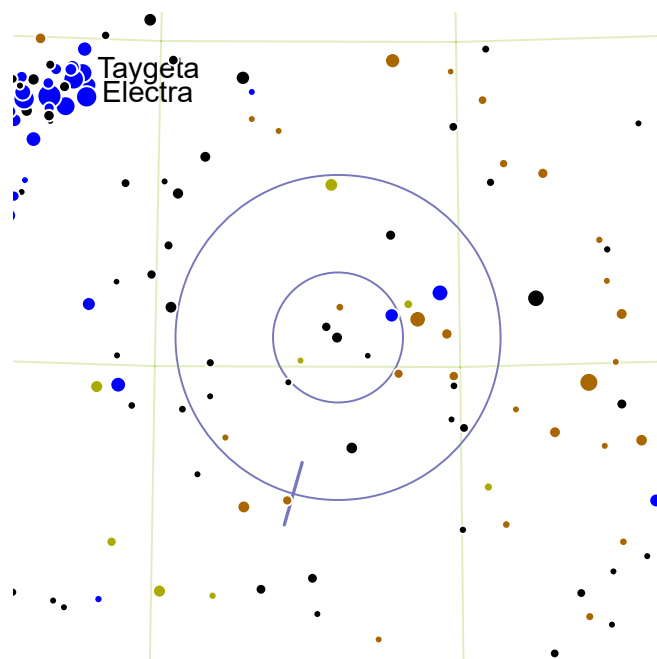
A bright, wide pair with good colors: the A component is yellow and the B component is blue.



Center Hamal in the finder; Lambda Ari is in the western edge of the finder.



"Lambda" is the traditional English spelling, but the official Unicode spelling for the character is "lamda", following representations during drafting of the Unicode standard by the Greek national body.



Struve 394

RA: 52.0° | 3h 28.0' — DEC: 20.47° | 20° 28'

Magnitude: 7.1 | 8.2

Separation: 6.8"

Position Angle: 164°

SAO 75940 | HIP 16143 | GDR2 004372224



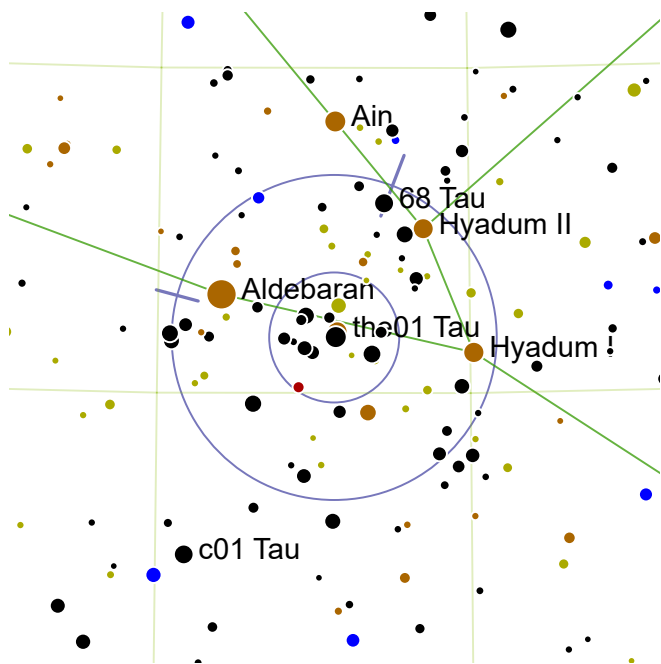
A close white-yellow pairing.



Center the Pleiades, and move one and a half finder circles south west.



The finder circle shows many brilliant stars completely overwhelming little Struve 394.



Theta Tau

RA: 67.18° | 4h 28.69' — DEC: 15.87° | 15° 52'

Magnitude: 3.4 | 3.9 | 12.0

Separation: 347.9" | 268.3"

Position Angle: 339° | 75°

SAO 93957 | HIP 20894 | GDR2 19987686144



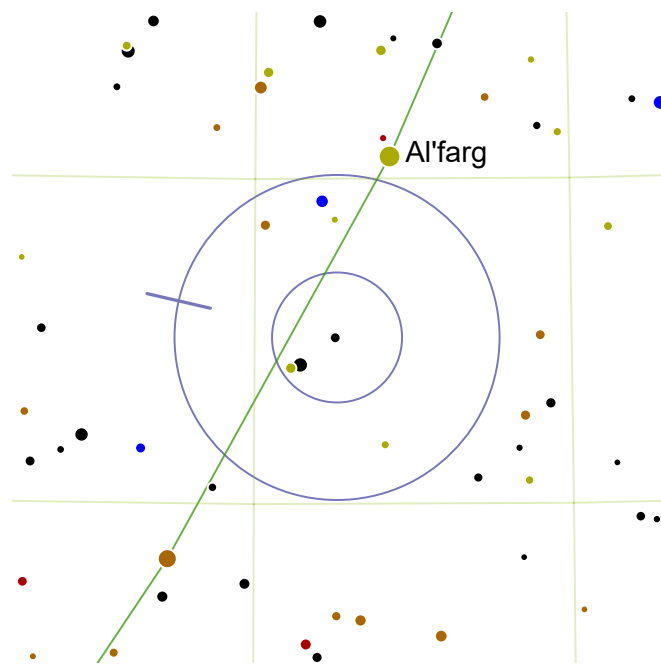
A balanced blue-yellow pair of stars, with a barely visible distant companion.



Theta Tau is a bright star in Taurus. One and a half degrees E from magnitude 3.86 Hyadum I.



Composed of Theta2 and Theta1 Tauri, with Theta2 being brighter, this system is in the heart of the Hyades cluster, the closest open cluster to the Sun. Theta1 and Theta2 are both impossibly tight doubles themselves.



100 Psc

RA: 23.7° | 1h 34.79' — DEC: 12.57° | 12° 34'

Magnitude: 7.3 | 8.3

Separation: 15.7"

Position Angle: 77°

SAO 92521 | HIP 7364 | GDR2 88972205696



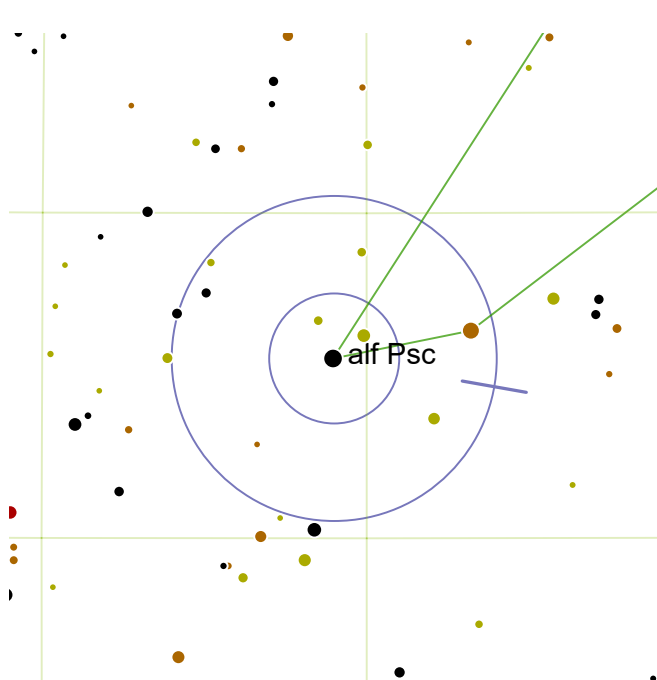
A comfortably separated pair of white stars.



From magnitude 2.6 Sheratan in Aries, hop two finder circles south west.



With this double centered, faint galaxy NGC 660 lies on the north-eastern edge of the finder circle.



Alrisha

RA: 30.5° | 2h 2.0' — DEC: 2.77° | 2° 46'

Magnitude: 4.1 | 5.2

Separation: 1.8"

Position Angle: 260°

SAO 110291 | HIP 9487 | GDR2
2517584007848935808



An extremely tight pair of bright, white stars.



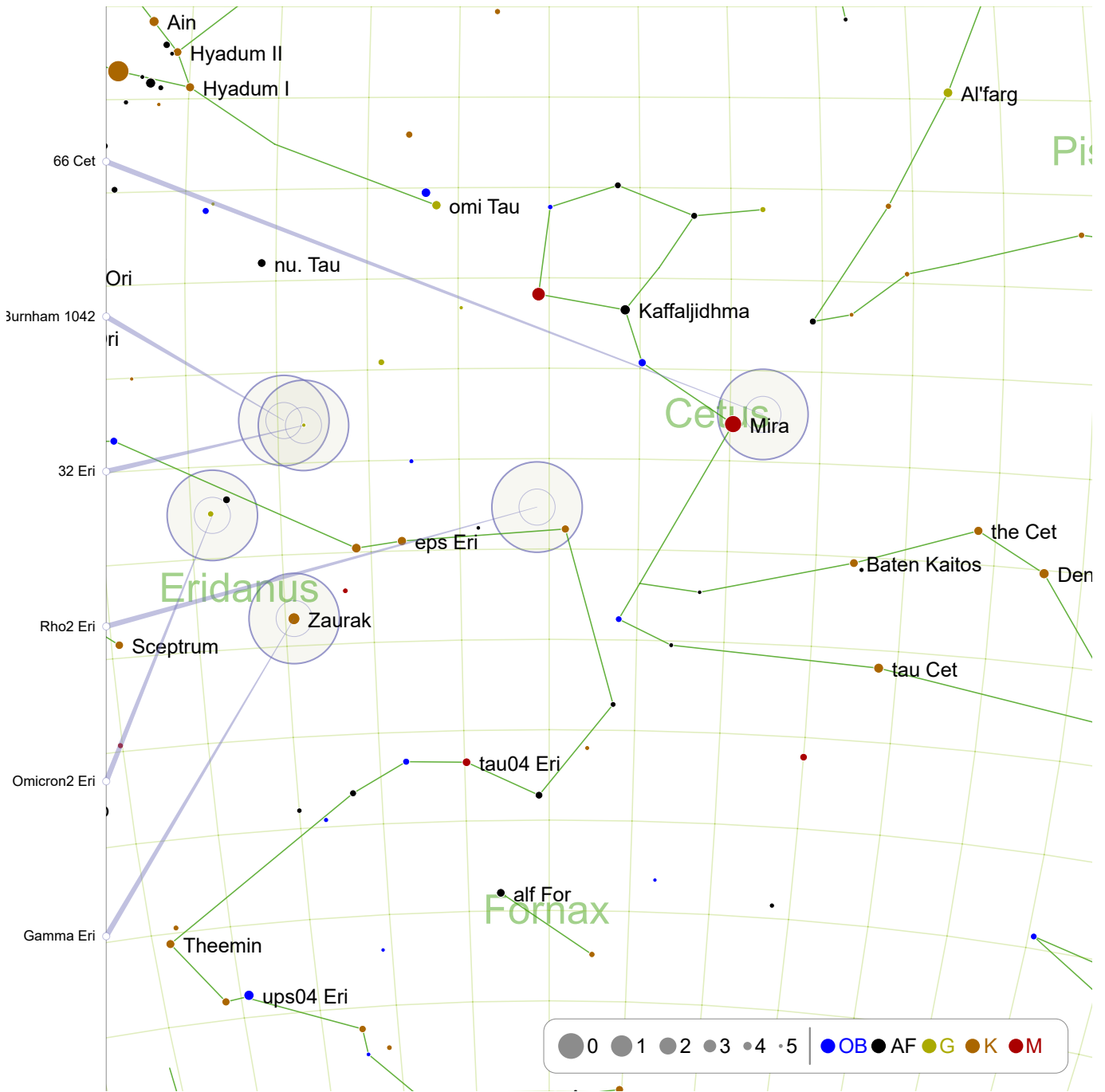
Aside from the infrequently visible Mira, no bright star is near Alrisha. Look for a fourth magnitude star 14 degrees west of magnitude 2.5 Menkar.



Although classified as Alpha Piscium, Alrisha (or Alrescha) is only the third brightest star in the dim constellation of Pisces.

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November: -10° South

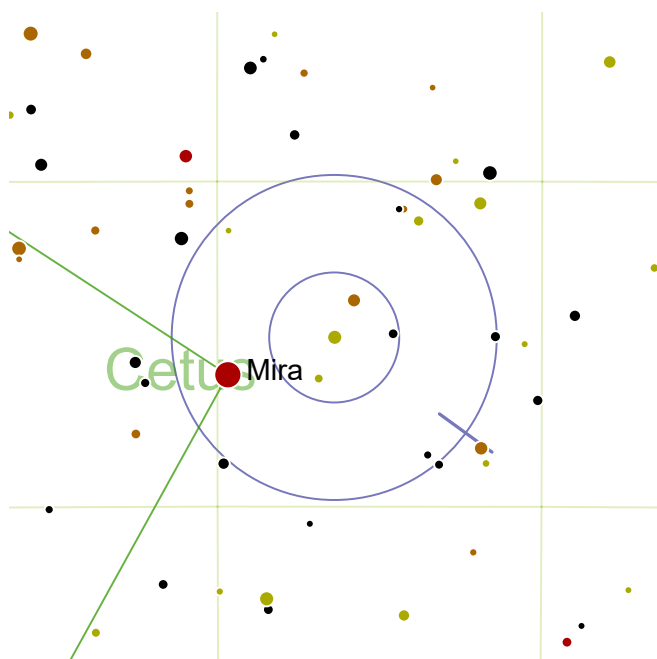


66 Cet: page 110
Omicron2 Eri: page 112

Burnham 1042: page 110
Gamma Eri: page 112

32 Eri: page 111

Rho2 Eri: page 111



66 Cet

RA: 33.2° | 2h 12.8' — DEC: -2.4° | -2° 23'

Magnitude: 5.7 | 7.5

Separation: 16.5"

Position Angle: 234°

SAO 129752 | HIP 10305 | TY2 4690-01110-1



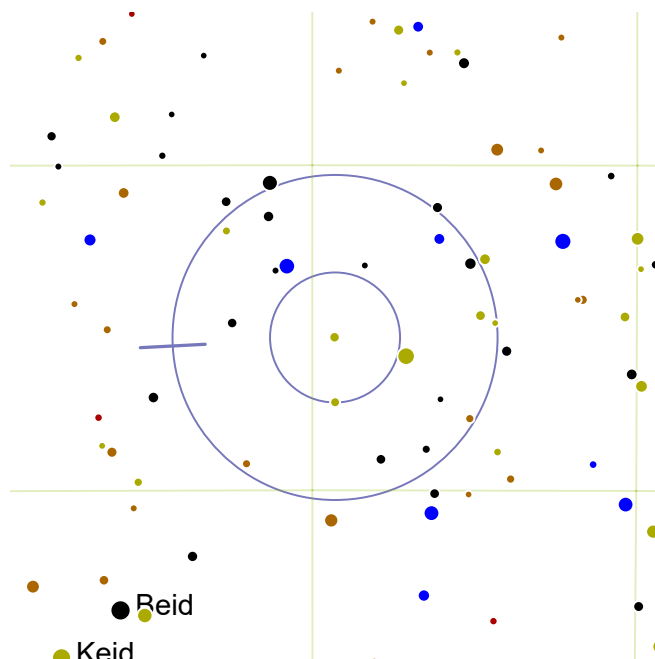
A comfortably separated yellow and blue pair.



The primary star shines brilliantly in the finder, while the secondary is also relatively bright and only appears dim in contrast to the primary.



Nearby Mira is a wildly variable star, varying between magnitude 3.0 and 10.1 over a period of 332 days. Sometimes Mira peaks at magnitude 2.0 but this is rare. The next peaks in visual luminosity are at 2021-08-18, 2022-07-16, and 2023-06-13.



Burnham 1042

RA: 59.65° | 3h 58.59' — DEC: -2.65° | -2° 38'

Magnitude: 7.5 | 8.5

Separation: 56"

Position Angle: 93°

SAO 130858 | HIP 18583 | GDR2
3253028059856131456



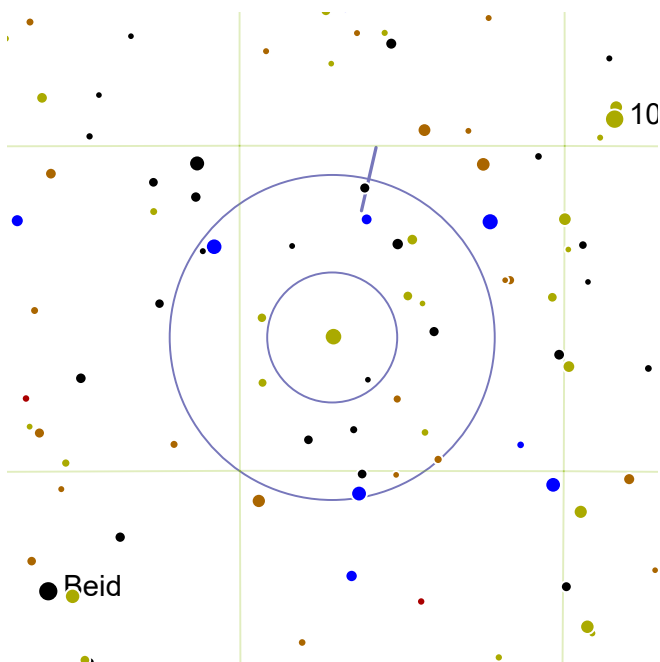
A very wide and unequal pairing. The primary is yellow, while the secondary is a very faint, balanced double (1.3", p.a. 40°).



One and a half finder circles NNE from magnitude 3.72 Rana. One and a half finder circles NE from magnitude 3.81 eps Eri.



The Burnham Double Star Catalog was a comprehensive collection of all known double stars within 121° of the celestial North Pole. It was finally published in 1906, but Burnham had been attempting to publish it since 1870.



32 Eri

RA: 58.58° | 3h 54.3' — DEC: -2.95° | -2° 56'

Magnitude: 4.8 | 6.1

Separation: 6.8"

Position Angle: 347°

SAO 130806 | HIP 18255 | GDR2 73003772032



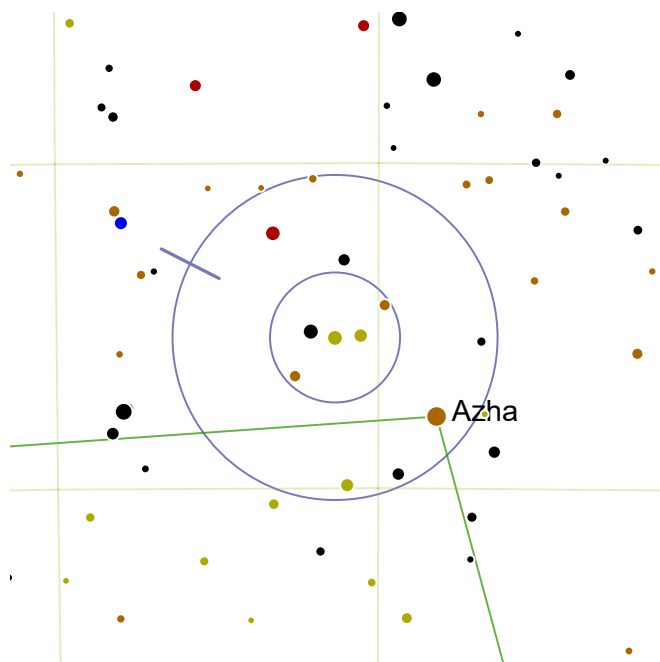
A close double with bright components; yellow and white.



One finder circle NNE from magnitude 3.72 Rana. One and a half finder circles NE from magnitude 3.81 eps Eri.



This double offers a very strong color contrast, because of the intrinsic color of the stars and their apparent brilliance.



Rho2 Eri

RA: 45.68° | 3h 2.69' — DEC: -7.68° | -7° 40'

Magnitude: 5.3 | 8.9

Separation: 1.4"

Position Angle: 63°

SAO 130254 | HIP 14168



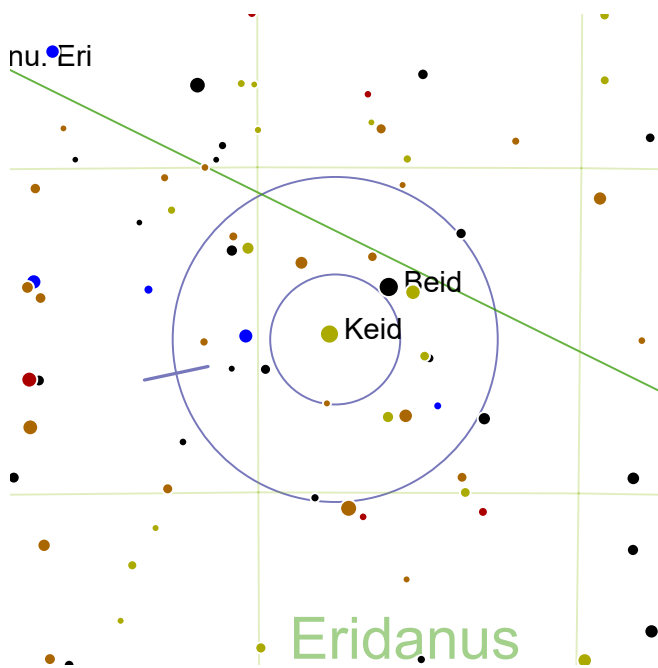
A bright yellow-orange star with an extremely close, faint companion.



One and a half finder circles NWW from magnitude 3.81 eps Eri.



Rho2 is the central star of asterism of three equally bright stars in a 1° long line, namely Rho1, Rho2 and Rho3 Eridani.



Omicron2 Eri

RA: 63.8° | 4h 15.19' — DEC: -7.65° | -7° 38'

Magnitude: 4.4 | 9.3

Separation: 82.7"

Position Angle: 102°

SAO 131063 | HIP 19849



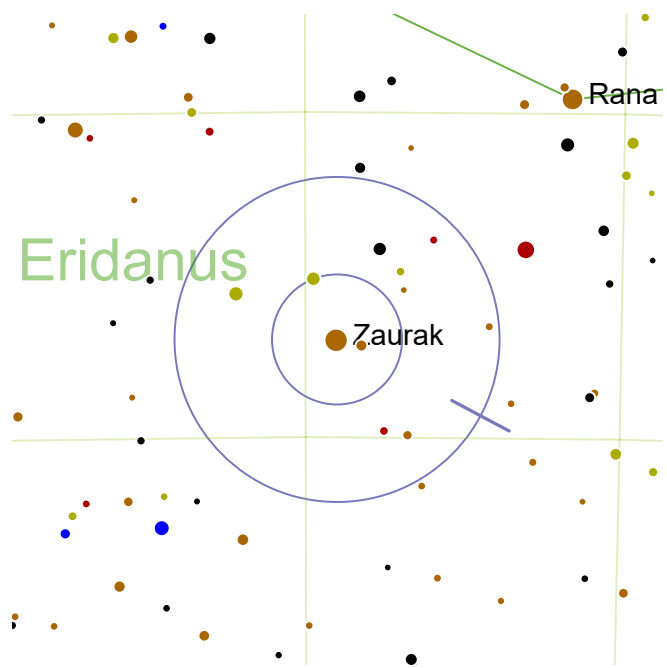
A brilliant yellow-orange primary distantly separated from a dim white companion.



One finder circle NE from magnitude 3.19 Zaurak. One and a half finder circles NEE from magnitude 3.72 Rana.



The secondary component is a white dwarf (spectral class DA3). The primary is an orange dwarf, and only shines so brightly in our skies as the system lies just 16 light-years from Earth.



Gamma Eri

RA: 59.5° | 3h 58.0' — DEC: -13.5° | -13° 29'

Magnitude: 3.5 | 11

Separation: 52.8"

Position Angle: 242°

SAO 149283 | HIP 18543



A brilliant red primary widely separated from a very dim companion.

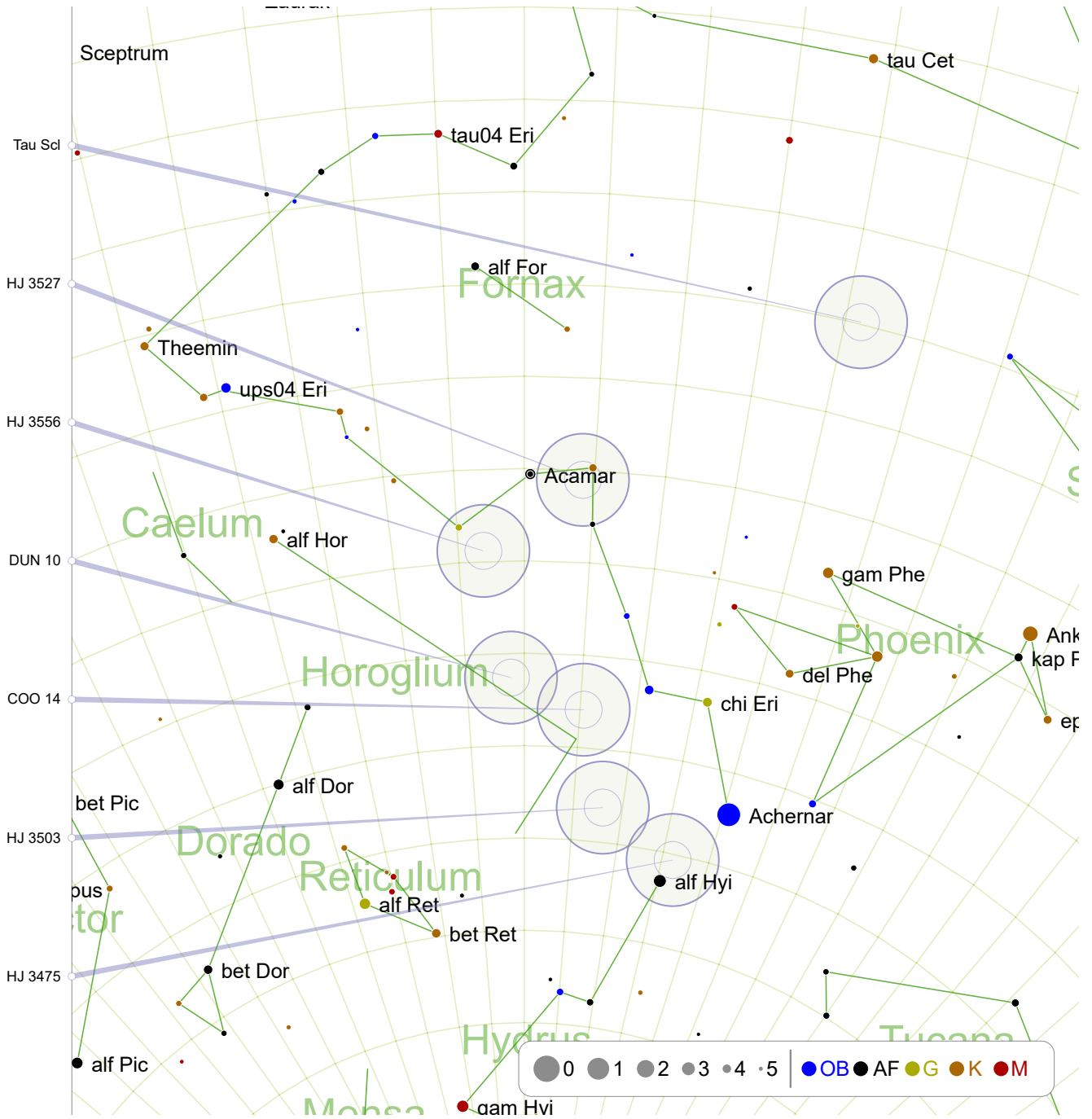


Gamma Eri is a bright star in Eridanus. One finder circle SE from magnitude 3.72 Rana.



This gravitationally bound system consists of a red giant and a very faint companion, lying 203 light-years from us. The primary bears the proper name Zaurak.

November: -45° South (1)



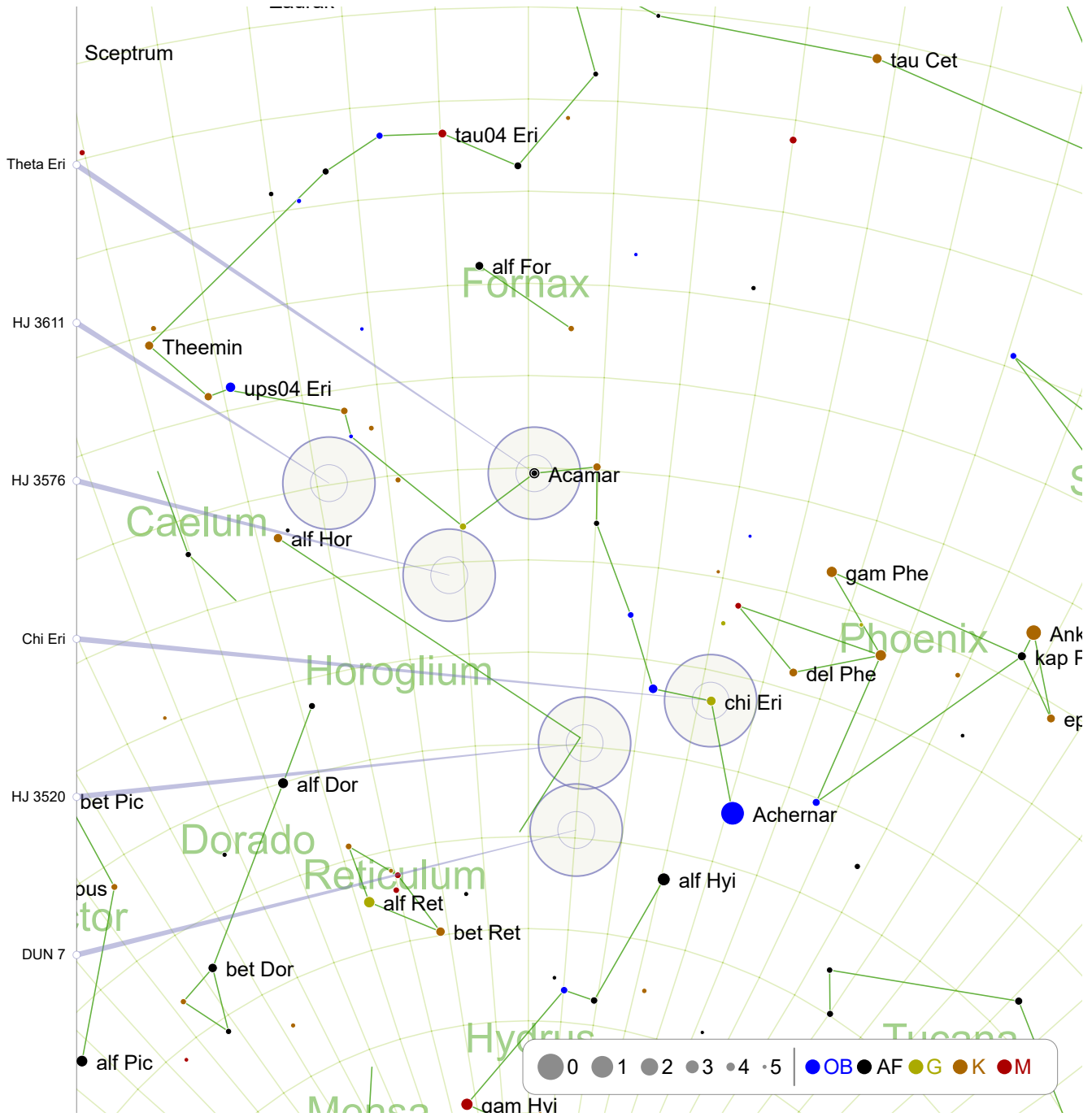
Tau Scl: page 115
COO 14: page 117

HJ 3527: page 115
HJ 3503: page 117

HJ 3556: page 116
HJ 3475: page 118

DUN 10: page 116

November: -45° South (2)

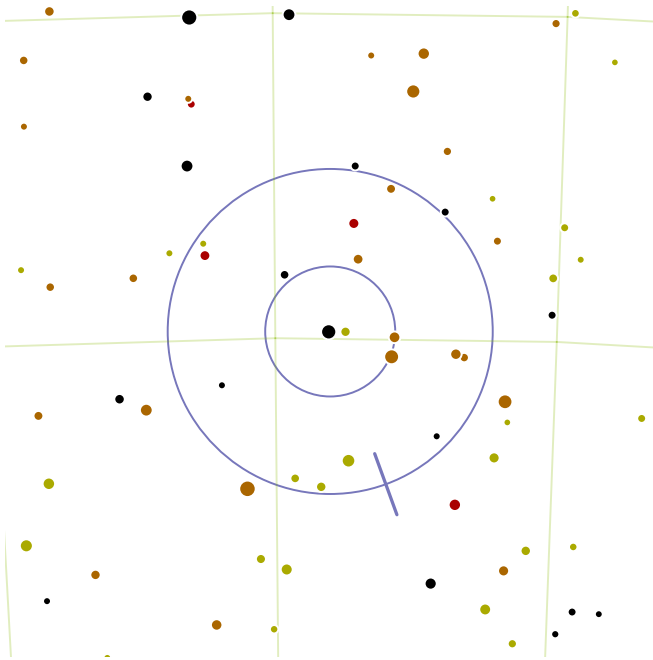


Theta Eri: page 118
HJ 3520: page 120

HJ 3611: page 119
DUN 7: page 121

HJ 3576: page 119

Chi Eri: page 120



Tau ScI

RA: 24.03° | 1h 36.09' — DEC: -29.9° | -29° 53'

Magnitude: 6.0 | 7.4

Separation: 0.82"

Position Angle: 200°

SAO 193201 | HIP 7463 | GDR2 91741784064



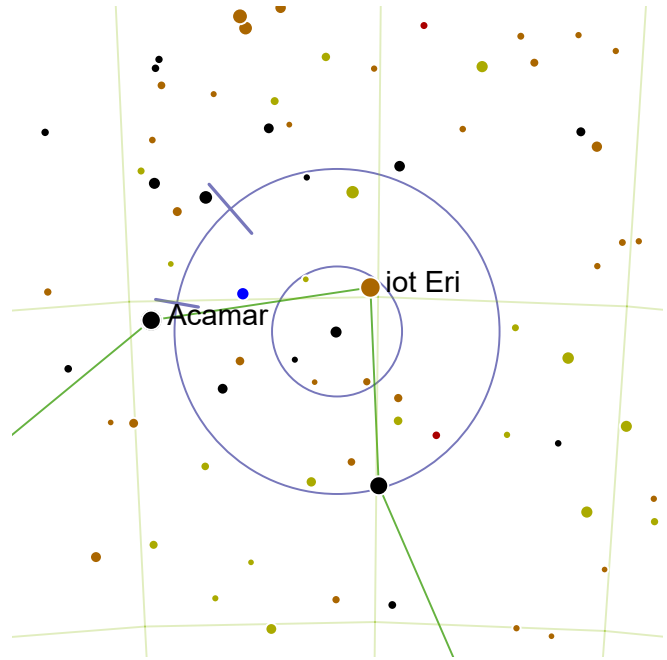
A bright yellowish primary with an almost inseparable companion. Requires a large telescope.



Two and a half finder circles N from magnitude 3.4 gam Phe. Two and a half finder circles S from magnitude 3.65 tau Cet.



This gravitationally bound binary system is 226 light-years from Earth.



HJ 3527

RA: 40.83° | 2h 43.3' — DEC: -40.53° | -40° 31'

Magnitude: 7.0 | 7.2 | 11.6

Separation: 2.3" | 132.8"

Position Angle: 41° | 80°

SAO 216019 | HIP 12708 | GDR2 04644963968



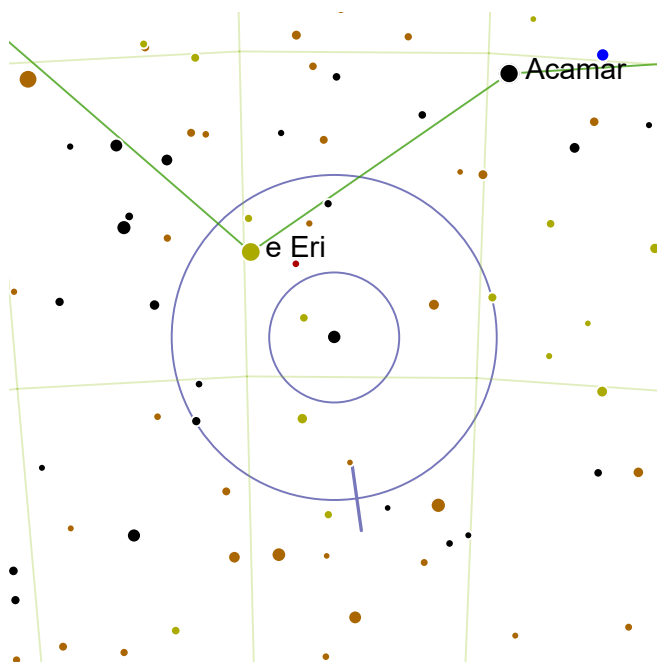
A tight pair of blue stars with third distant and dim companion.



Half a finder circle W from magnitude 3.42 Acamar. Two finder circles NNE from magnitude 3.78 phi Eri.



This system is 595 light-years from the Earth.



HJ 3556

RA: 48.1° | 3h 12.4' — DEC: -44.42° | -44° 24'

Magnitude: 6.4 | 8.9

Separation: 3.7"

Position Angle: 188°

SAO 216209 | HIP 14913 | GDR2 74392311168



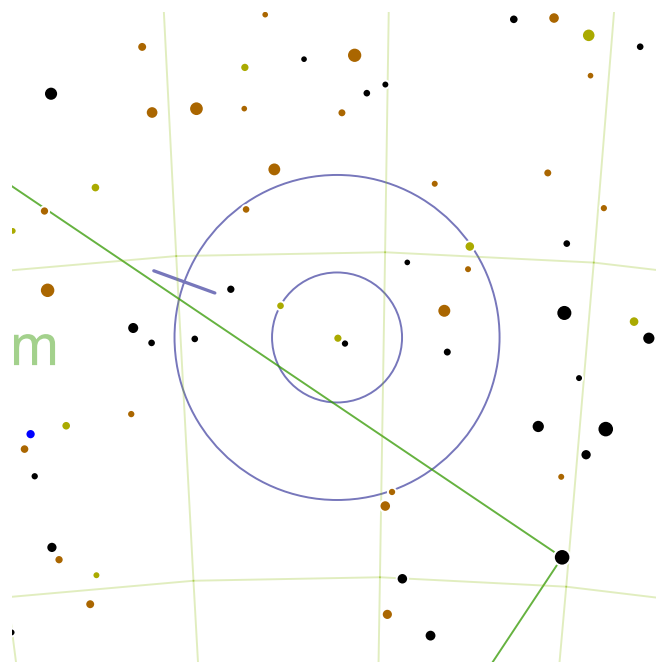
A yellowish primary very close to significantly fainter secondary.



Half a finder circle SSE from magnitude 3.42 Acamar. Two finder circles SWW from magnitude 3.83 alf Hor.



The primary is itself a double but at barely 0.2" separation is unsplitable in amateur instruments.



DUN 10

RA: 46.15° | 3h 4.59' — DEC: -51.32° | -51° 18'

Magnitude: 7.6 | 8.5

Separation: 38.3"

Position Angle: 70°

SAO 232983 | HIP 14307 | GDR2 78185293312



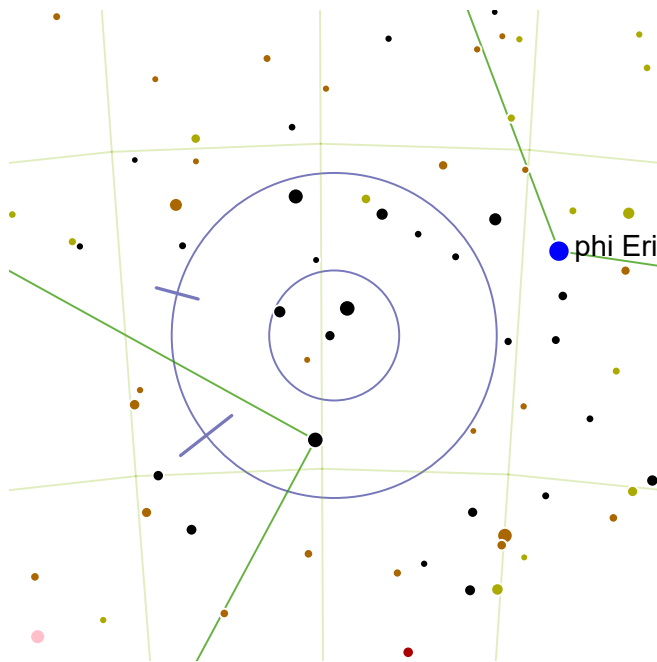
A balanced pair with a yellow primary widely separated from an orange secondary.



One and a half finder circles E from magnitude 3.78 phi Eri. Two finder circles E from magnitude 3.73 chi Eri.



This pair are gravitationally bound. Globular cluster Caldwell 87 is one finder circle south of this double.



COO 14




RA: 39.67° | 2h 38.69' — DEC: -52.95° | -52° 56'

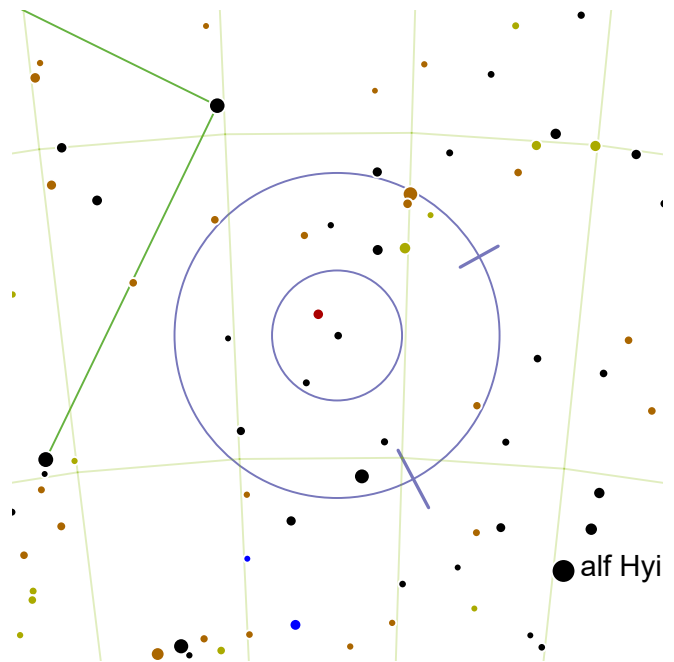
Magnitude: 7.9 | 8.5 | 6.8

Separation: 8.7" | 218"

Position Angle: 128° | 75°

SAO 232841 | HIP 12326 | GDR2 23399969536

-  A balanced pair of yellowish stars close together, with a somewhat brighter star some distance from them.
-  Half a finder circle SEE from magnitude 3.78 phi Eri. One finder circle SEE from magnitude 3.73 chi Eri.
-  Globular cluster Caldwell 87 (magnitude 8.6) is one finder circle to the south-east.



HJ 3503




RA: 37.0° | 2h 28.0' — DEC: -58.13° | -58° 7'

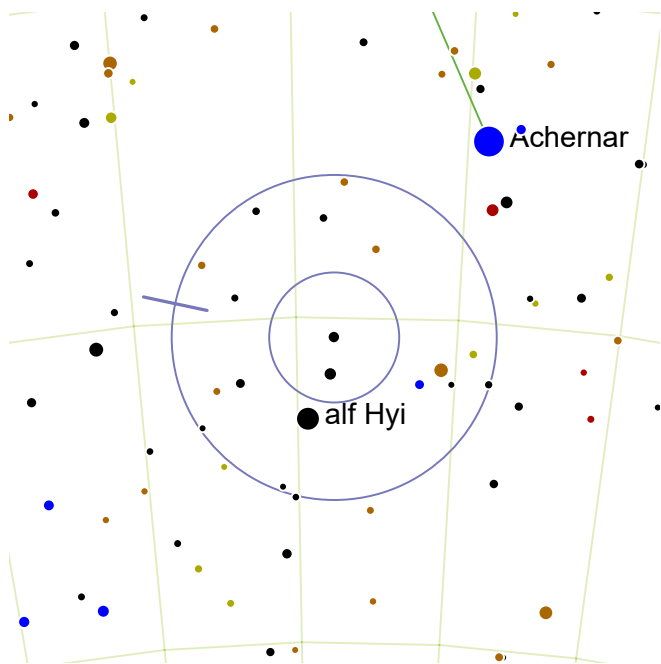
Magnitude: 8.0 | 8.5 | 9.6

Separation: 1.2" | 17.6"

Position Angle: 208° | 299°

SAO 232780 | HIP 11469 | GDR2 40366808576

-  An extremely tight, balanced pair of yellow stars with an easily separated, faint yellow component.
-  One finder circle NE from magnitude 3.02 alf Hyi. One finder circle SEE from magnitude 0.6 Achernar.
-  The F-type main sequence primary star is 346 light-years from Earth.



HJ 3475

RA: 28.83° | 1h 55.3' — DEC: -60.32° | -60° 18'

Magnitude: 7.2 | 7.2

Separation: 2.5"

Position Angle: 78°

SAO 248461 | HIP 8957 | GDR2 54010869760



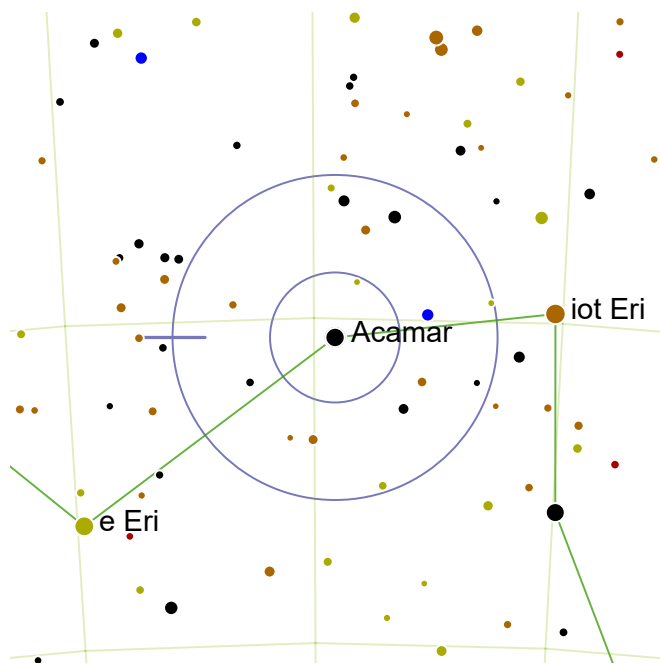
An equal and extremely tight pair of yellowish stars.



One degree NNW from magnitude 3.02 alf Hyi. Half a finder circle SE from magnitude 0.6 Achernar.



The minimally brighter primary is a F-type main sequence star 181 light-years from Earth.



Theta Eri

RA: 44.58° | 2h 58.3' — DEC: -40.3° | -40° 17'

Magnitude: 3.2 | 4.1

Separation: 8.2"

Position Angle: 90°

SAO 216113 | HIP 13847 | GDR2 71869592832



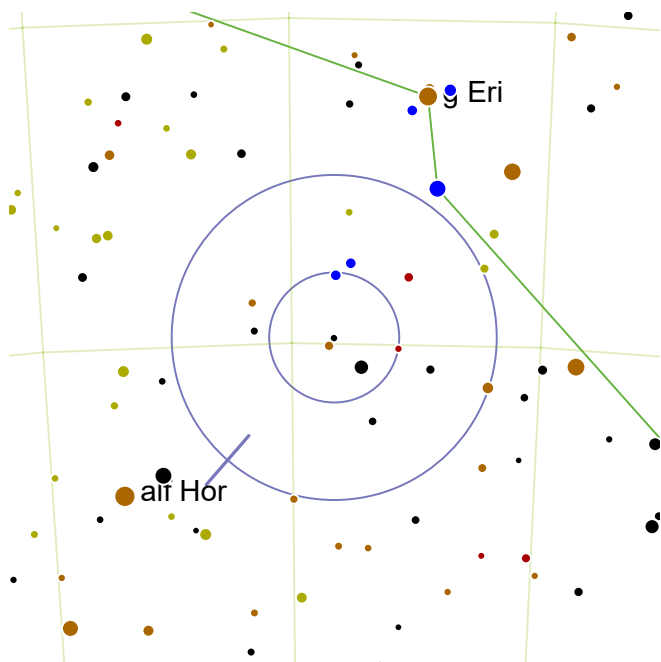
A close, balanced double composed of two brilliant white stars.



Theta Eri is a bright star in Eridanus. Two and a half finder circles NE from magnitude 3.78 phi Eri.



The system is composed of Theta1 and Theta2 Eridani and bears the proper name Acamar. In classical Greece this system marked the end of the river constellation Eridani, while in modern times the river continues south to the similarly named Achernar (both Achernar and Acamar mean "end of the river").



HJ 3611

RA: 59.15° | 3h 56.59' — DEC: -39.92° | -39° 54'

Magnitude: 8.0 | 8.7

Separation: 4.2"

Position Angle: 139°

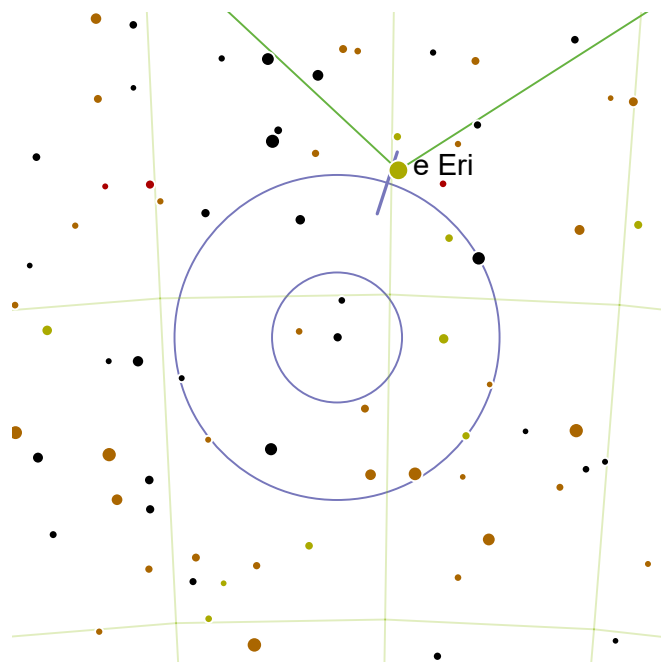
SAO 216564 | HIP 18452 | GDR2 55888851200



A very close, balanced pair with a white primary.



Half a finder circle NW from magnitude 3.83 alf Hor.



HJ 3576

RA: 51.15° | 3h 24.59' — DEC: -45.67° | -45° 39'

Magnitude: 7.3 | 8.8

Separation: 2.8"

Position Angle: 342°

SAO 216302 | HIP 15883 | GDR2 61065332096



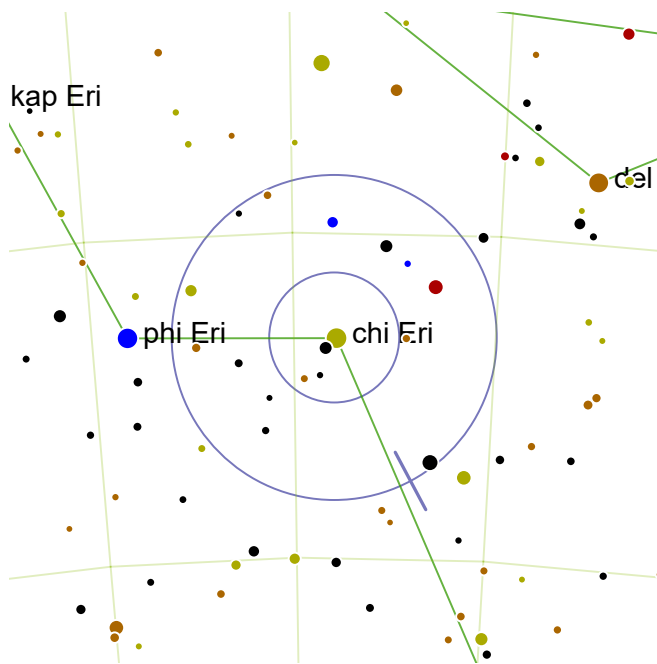
A very close pair with a white primary.



One finder circle SE from magnitude 3.42 Acamar. One and a half finder circles SWW from magnitude 3.83 alf Hor.



It is not clear if this pair is gravitationally bound. The primary is 449 light-years from Earth.



Chi Eri


RA: 29.0° | 1h 56.0' — DEC: -51.62° | -51° 36'


Magnitude: 3.8 | 10.7


Separation: 2.6"

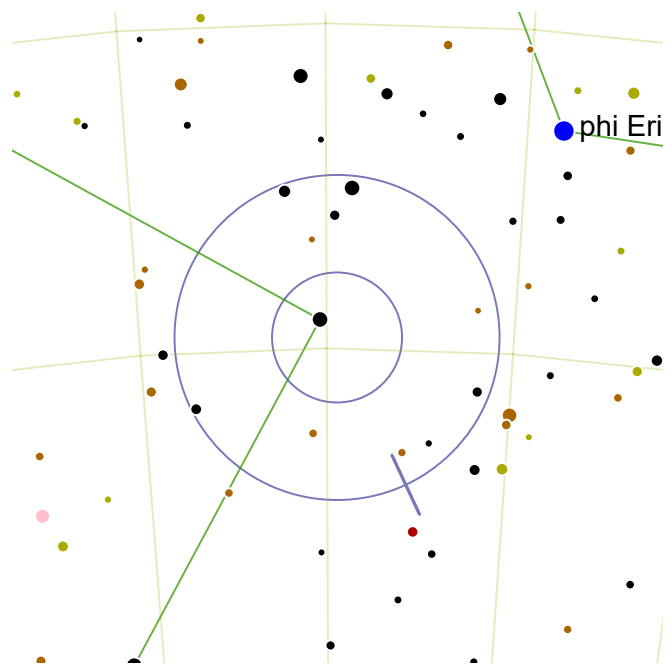
Position Angle: 208°

SAO 232573 | HIP 9007

 A brilliant yellow primary with a very close but vastly fainter secondary.

 Chi Eri is a bright star in Eridanus. One finder circle NNE from magnitude 0.6 Achernar.

 Chi Eridani is nearby - only 58 light-years from Earth.



HJ 3520


RA: 39.73° | 2h 38.9' — DEC: -54.83° | -54° 49'


Magnitude: 7.7 | 8.6


Separation: 20.6"

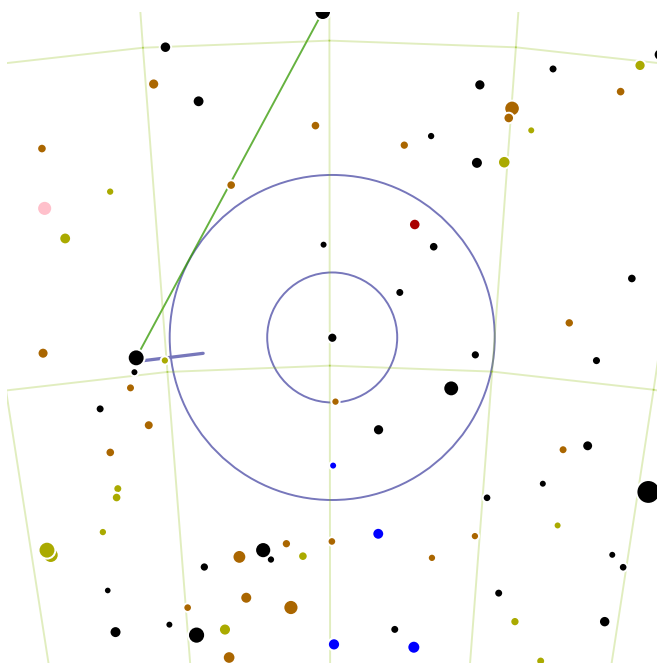
Position Angle: 205°

SAO 232845 | HIP 12345 | GDR2 18682255232

 A balanced pair of yellow stars, widely separated.

 Half a finder circle SE from magnitude 3.78 phi Eri. One finder circle SEE from magnitude 3.73 chi Eri.

 This gravitationally bound pair are 420 light-years from Earth.



DUN 7




RA: 39.92° | 2h 39.69' — DEC: -59.57° | -59° 33'

Magnitude: 7.7 | 7.7

Separation: 36.5"

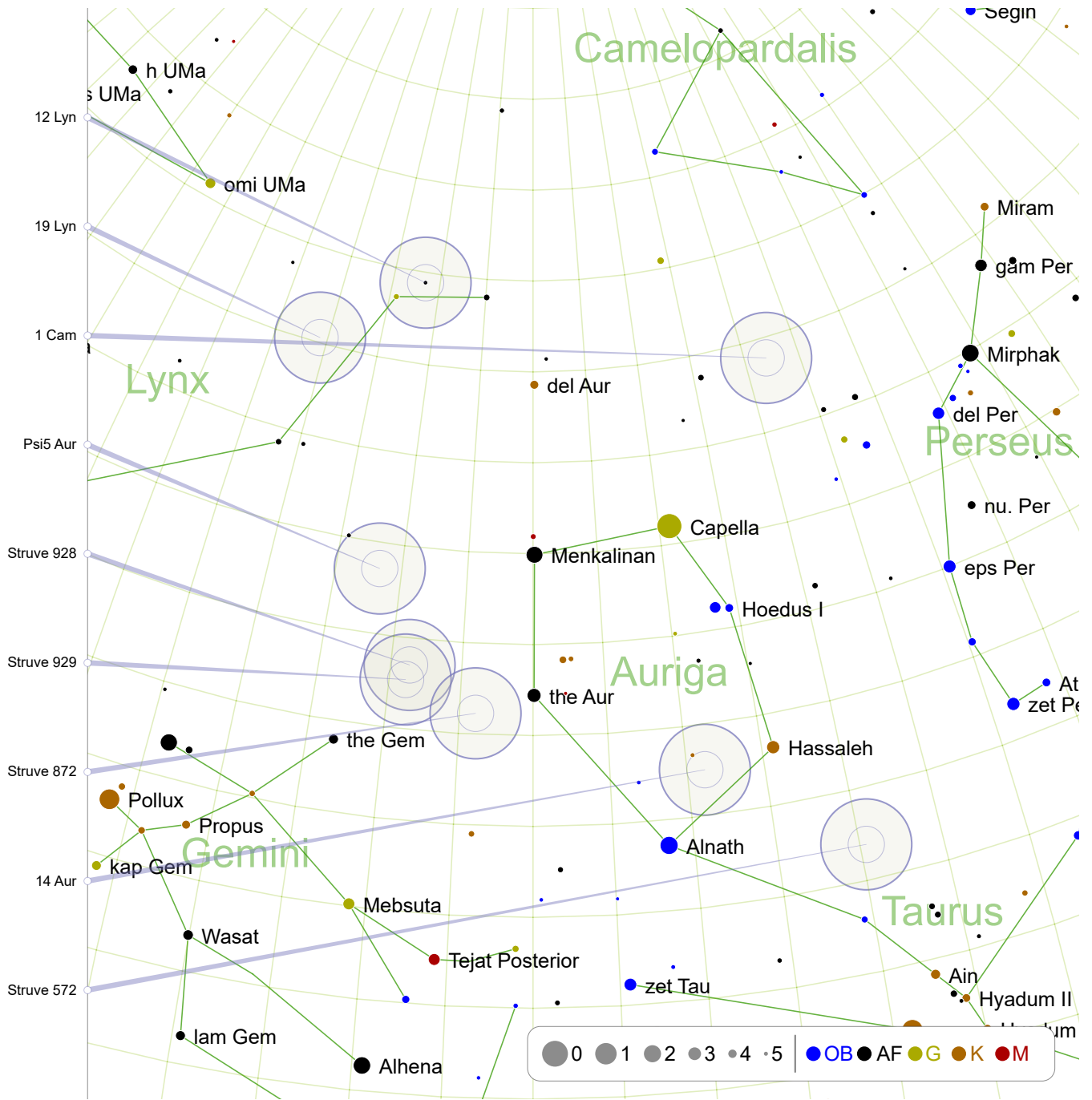
Position Angle: 97°

SAO 232851 | HIP 12401 | GDR2 11542143616

-  A wide and equal pairing of a yellow star and white companion.
-  One finder circle NEE from magnitude 3.02 alf Hyi. One and a half finder circles SEE from magnitude 0.6 Achernar.
-  The white component is itself an balanced, extreme double (separation: 0.4").

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December: 45° North (1)



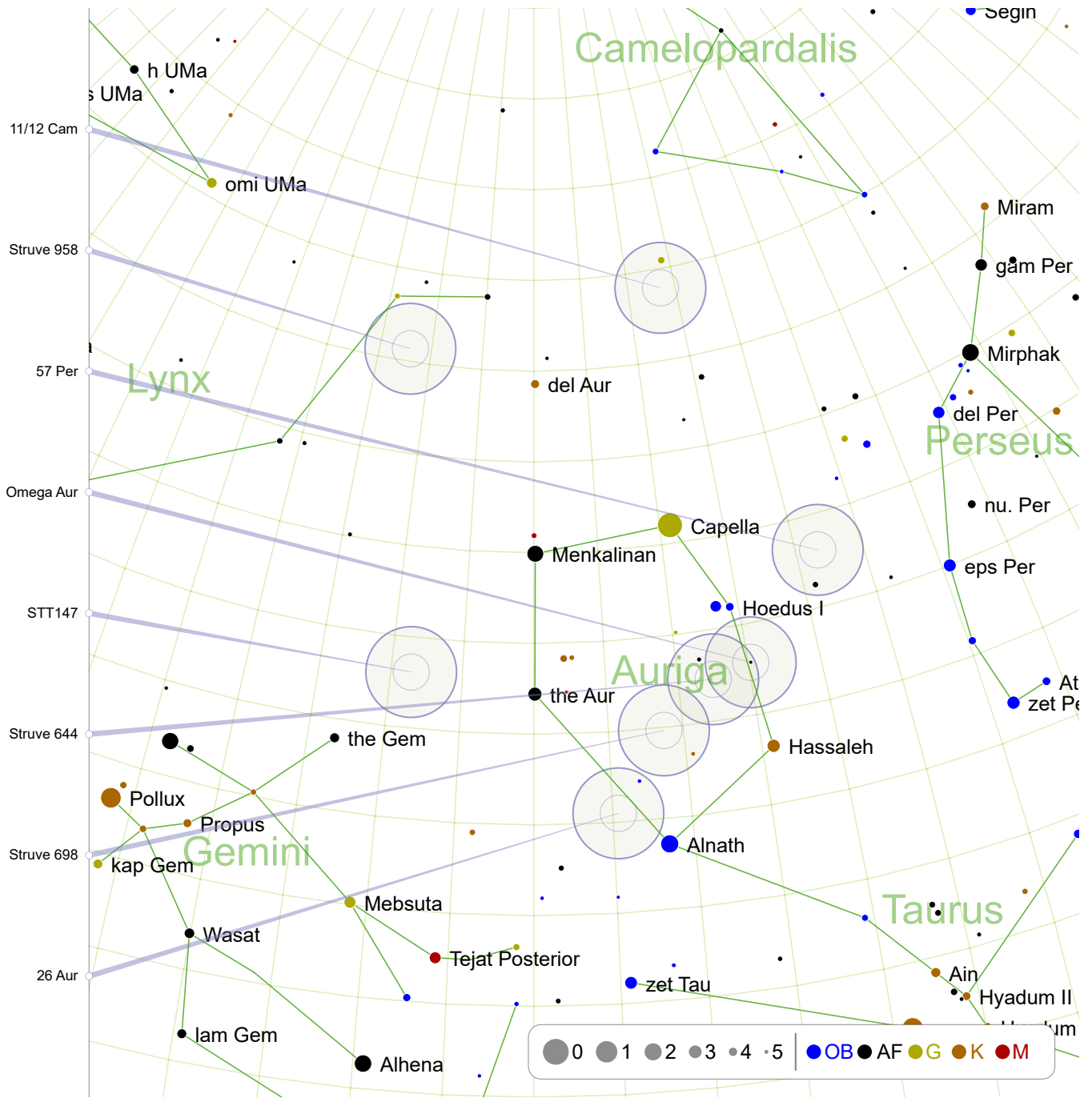
12 Lyn: page 125
 Struve 928: page 127
 Struve 572: page 129

19 Lyn: page 125
 Struve 929: page 127

1 Cam: page 126
 Struve 872: page 128

Psi5 Aur: page 126
 14 Aur: page 128

December: 45° North (2)

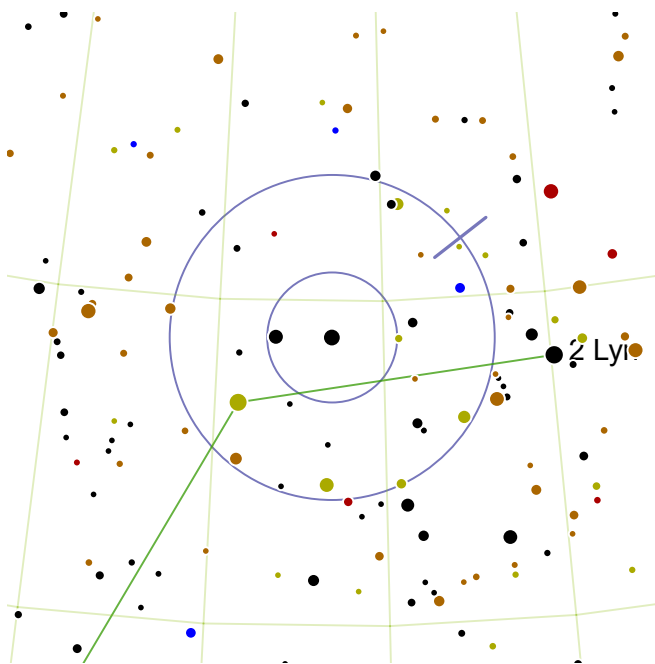


11/12 Cam: page 129
STT147: page 131

Struve 958: page 130
Struve 644: page 132

57 Per: page 130
Struve 698: page 132

Omega Aur: page 131
26 Aur: page 133



12 Lyn

RA: 101.55° | 6h 46.19' — DEC: 59.45° | 59° 27'

Magnitude: 5.4 | 7.3

Separation: 8.7"

Position Angle: 308°

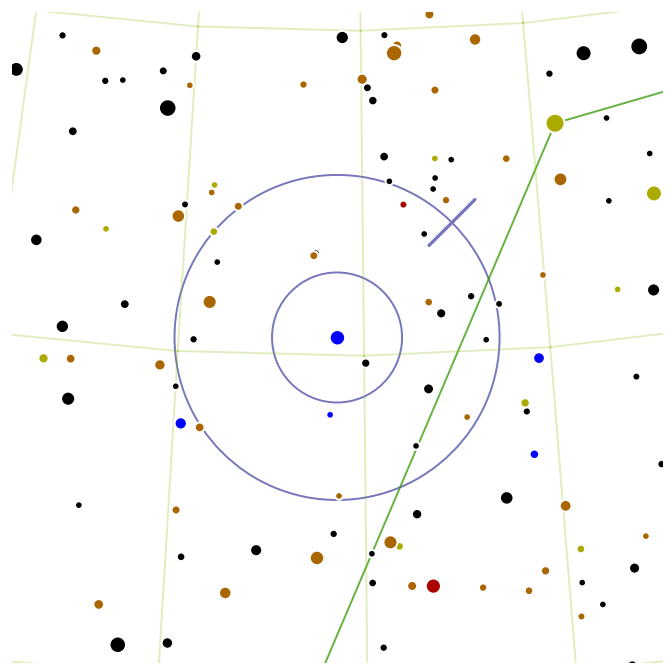
SAO 25939 | HIP 32438 | GDR2 71970061184



A close pair with a bright yellow primary and a reasonably bright blue companion.



Hard to find as it is out in the void away from any good signposts. Draw a line from Alnath through Menkalinan and double it out to the north. This will put you in the neighborhood of 12 Lyncis and Struve 958.



19 Lyn

RA: 110.73° | 7h 22.89' — DEC: 55.28° | 55° 17'

Magnitude: 5.6 | 6.5

Separation: 14.8"

Position Angle: 315°

SAO 26312 | HIP 35785 | GDR2 8587778432



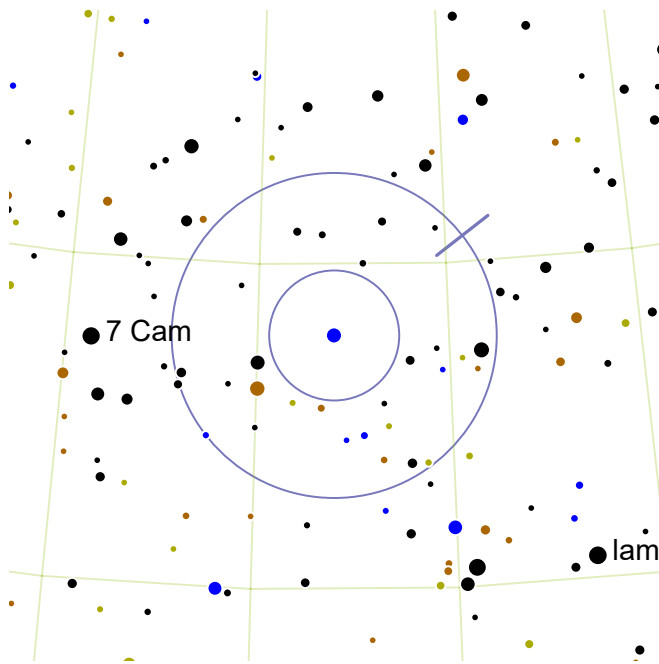
An easily separated and reasonably balanced yellow-blue pairing.



Draw a line from Hassaleh (Iota Aurigae) through Menkalinan and double it out to the north east. This puts you in the vicinity of 19 Lyncis.



This system of two hot B-class stars is about 680 light-years away. The primary is 166 times more luminous than the Sun.



1 Cam

RA: 68.0° | 4h 32.0' — DEC: 53.92° | 53° 55'

Magnitude: 5.7 | 6.8

Separation: 10.3"

Position Angle: 308°

SAO 24672 | HIP 21148 | GDR2 1446188288



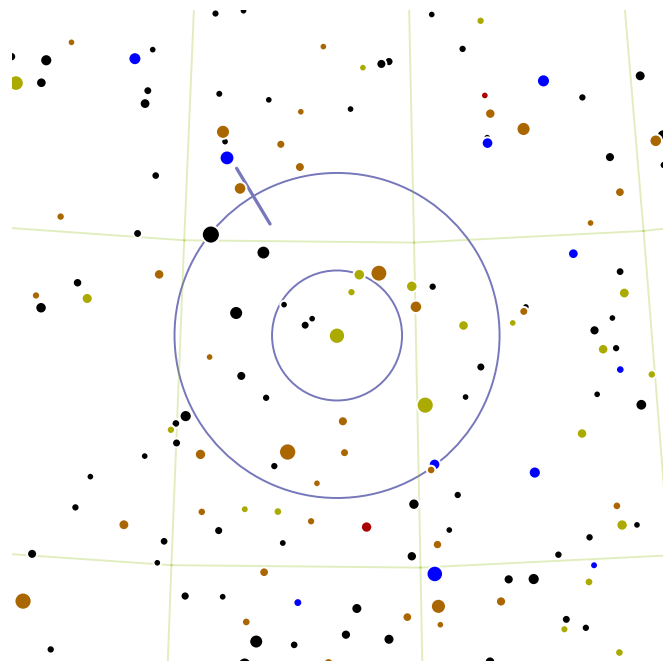
A reasonably balanced and separated white-blue pair.



Two finder circles north east of Delta Persei.



Position 1 Camelopardalis on the north-eastern edge of the finder and a bright pair of clusters will come into view on the opposite edge: NGC 1528 and NGC 1545. The clusters are each around the size of the full Moon and separated by 1.5 degrees, so the cluster pair make a nice sight at very low magnification.



Psi5 Aur

RA: 101.68° | 6h 46.69' — DEC: 43.58° | 43° 35'

Magnitude: 5.3 | 8.3

Separation: 36.2"

Position Angle: 31°

SAO 41330 | HIP 32480 | GDR2 4452337792



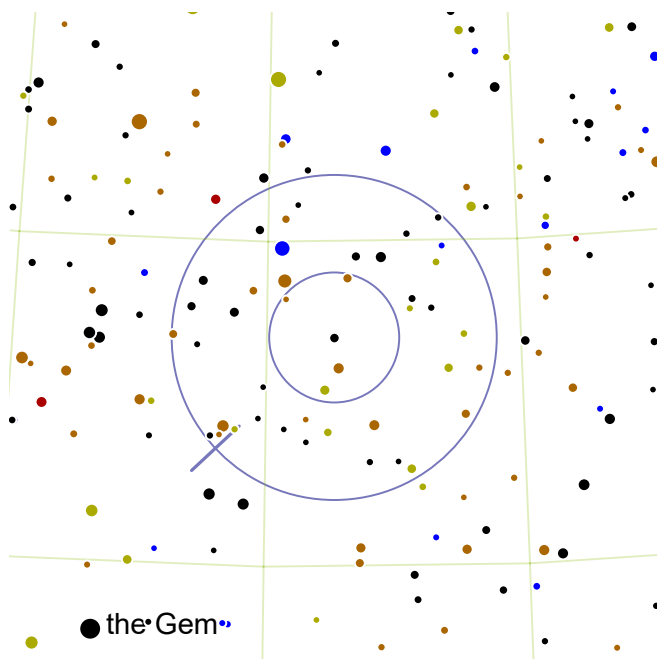
A very wide yellow-blue duo. The primary is very bright and strongly colored.



Draw a line from Capella through Menkalinan, and extend it east an equal distance.



With Psi 5 Aurigae centered in the finder, bright open cluster NGC 2281 is just on the southern edge of the finder.



Struve 928

RA: 98.68° | 6h 34.69' — DEC: 38.53° | 38° 32'

Magnitude: 7.6 | 8.2

Separation: 3.5"

Position Angle: 133°

SAO 59239 | HIP 31373 | GDR2 0770768640



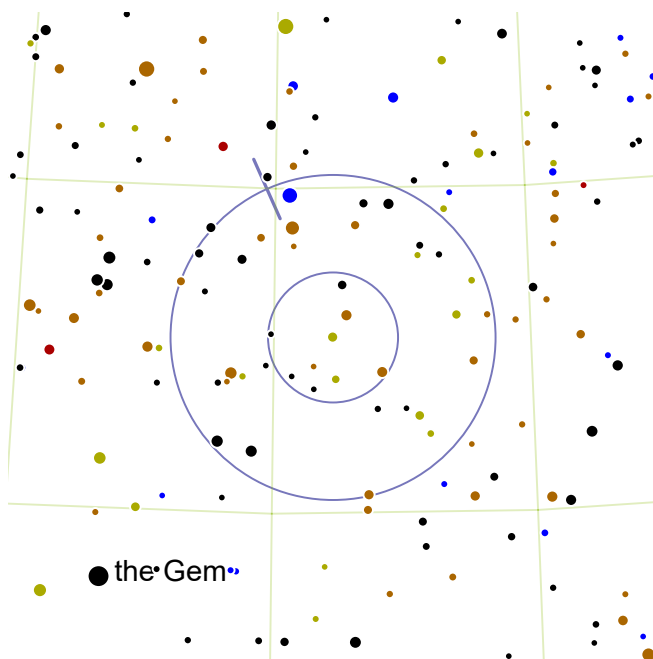
A very close pair of white stars.



Two finder circles south east of magnitude 1.9 Menkalinan in Auriga.



The variable UU Aurigae (magnitude 5.4) is 0.3 degrees to the east of this star. Open cluster NGC 2281 is visible in the north-eastern quadrant if you place Struve 928 on the south-western edge of the finder.



Struve 929

RA: 98.85° | 6h 35.39' — DEC: 37.72° | 37° 43'

Magnitude: 7.4 | 8.4

Separation: 6.2"

Position Angle: 24°

SAO 59259 | HIP 31454 | GDR2 6010105344



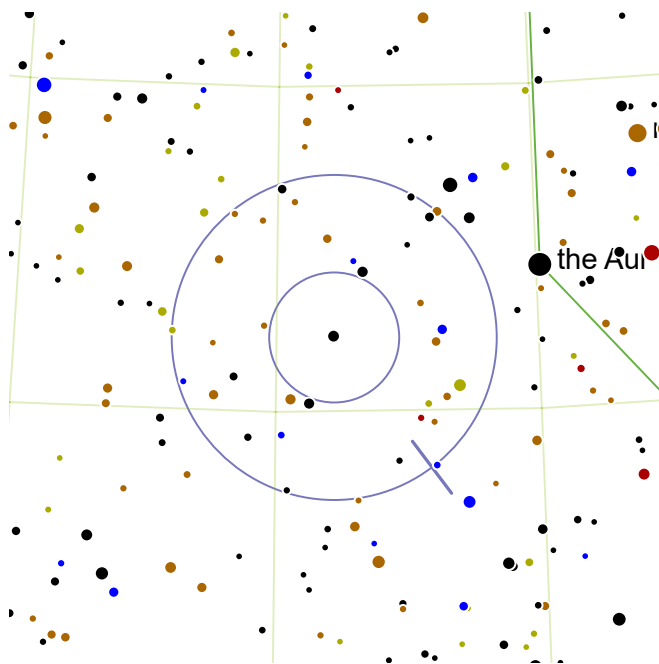
A close yellow-blue pair.



Two finder circles south east of magnitude 1.9 Menkalinan in Auriga.



The primary is 600 light-years from the Sun, but it is not clear if the secondary is gravitationally bound.



Struve 872




RA: 93.9° | 6h 15.6' — DEC: 36.15° | 36° 9'

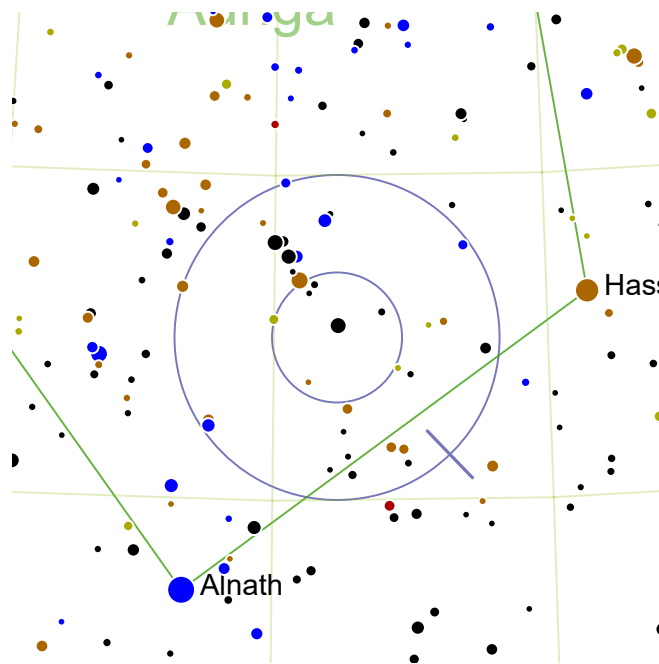
Magnitude: 6.9 | 7.9

Separation: 11.3"

Position Angle: 217°

SAO 58905 | HIP 29725 | GDR2 11912257664

-  An easily separated pair of stars. Neither star is particularly bright, perhaps leading to fanciful star colors variously reported as pinkish or lilac.
-  Located one and a half finder circles due east from Theta Aurigae, one of the stars of the Auriga pentagon.
-  Theta itself is a challenging double with components separated by 4.1" and 4.6 magnitudes.



14 Aur




RA: 78.85° | 5h 15.39' — DEC: 32.52° | 32° 31'

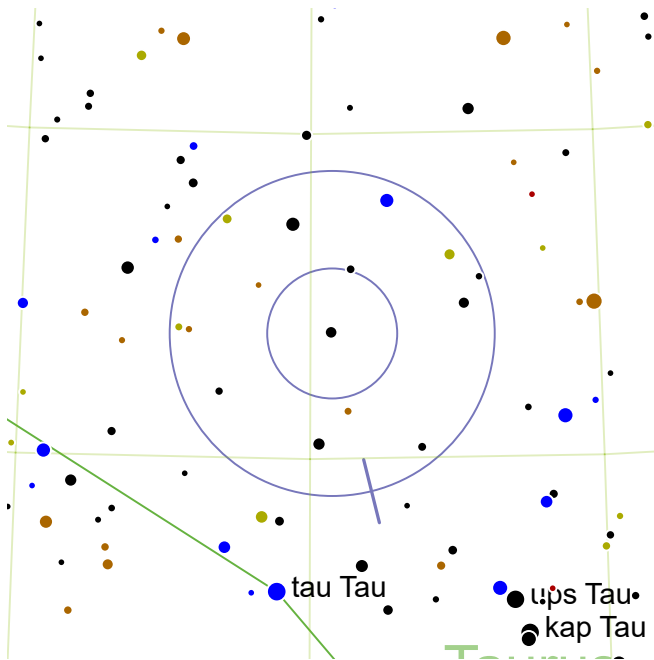
Magnitude: 5.1 | 7.4

Separation: 14.6"

Position Angle: 224°

SAO 57799 | HIP 24504 | GDR2 8220217344

-  A bright yellow-blue pairing with comfortable separation.
-  Find 14 Aurigae one and a half finder circles north west from Alnath (the southernmost star of the Auriga pentagon).
-  The bright emission Flaming Star nebula is two degrees to the north of this double.



Struve 572

RA: 69.63° | 4h 38.5' — DEC: 26.93° | 26° 56'

Magnitude: 7.3 | 7.3

Separation: 4.0"

Position Angle: 194°

SAO 76682 | HIP 21619 | GDR2 6504442624



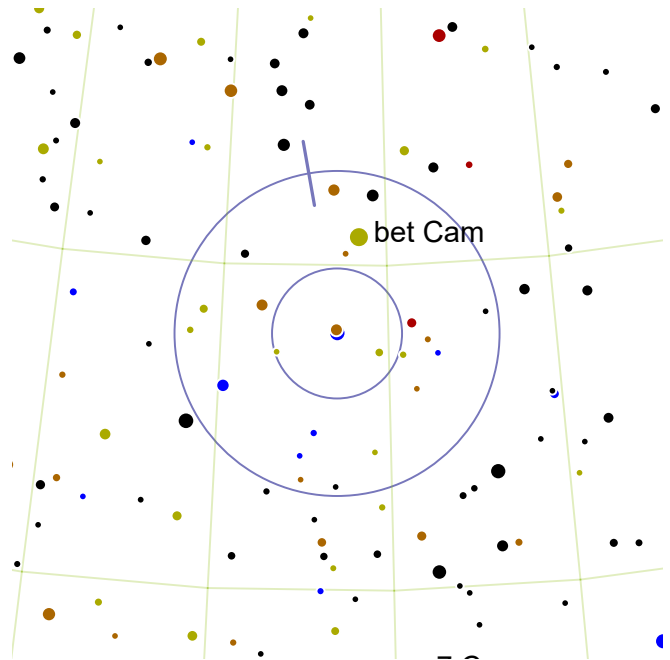
A close and equal pair of yellow stars.



Two and a half finder circles west of Elnath, the southernmost star of the Auriga polygon.



This double lies on the northern edge of the dark nebula B22, which has a span of about 2 degrees.



11/12 Cam

RA: 76.53° | 5h 6.12' — DEC: 58.97° | 58° 58'

Magnitude: 5.20 | 6.21

Separation: 178"

Position Angle: 10°

SAO 25001 | HIP 23734 | GDR2 9317110400



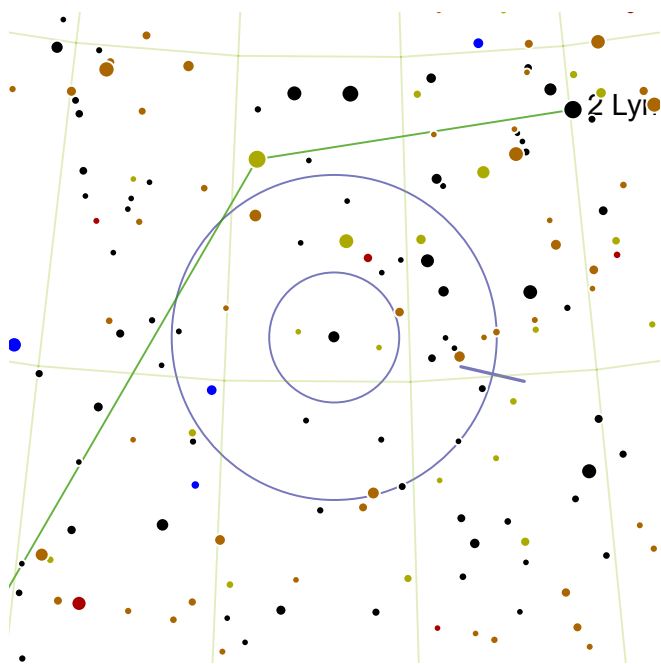
A distantly separated but strongly colored orange-blue pairing, both components being bright. 11 Cam is the blue star and 12 Cam is the orange star.



Find 11/12 Cam 1.5 degrees south of magnitude 4.00 Beta Camelopardalis. Alternately, find first magnitude Capella and move two and a half finder circles due north.



This pair are shown on the cover of this book.



Struve 958

RA: 102.05° | 6h 48.19' — DEC: 55.7° | 55° 42'

Magnitude: 6.3 | 6.3

Separation: 4.8"

Position Angle: 257°

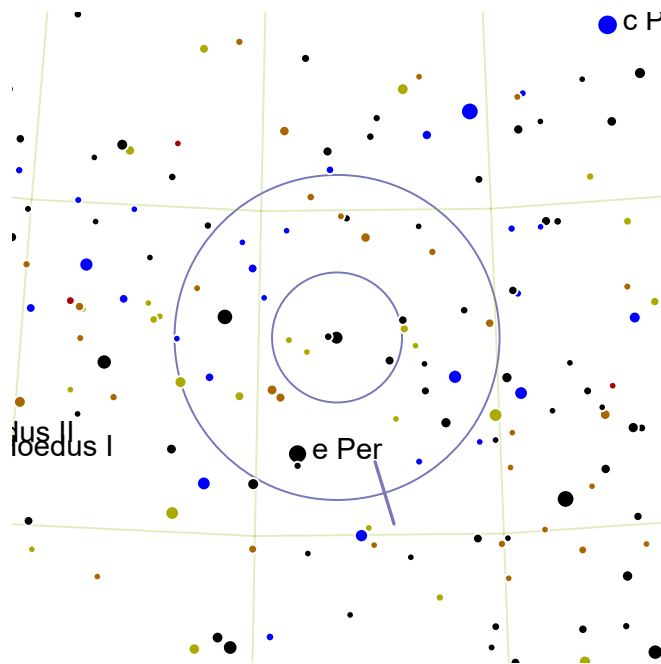
SAO 25962 | HIP 32609 | GDR2 8386708864



Two tightly bound, perfectly matched bright stars.



Hard to find as it is out in the void away from any good signposts. Draw a line from Alnath through Menkalinan and double it out to the north. This will put you in the neighborhood of 12 Lyncis and Struve 958.



57 Per

RA: 68.35° | 4h 33.39' — DEC: 43.07° | 43° 4'

Magnitude: 6.1 | 6.8

Separation: 121.4"

Position Angle: 197°

SAO 39604 | HIP 21242



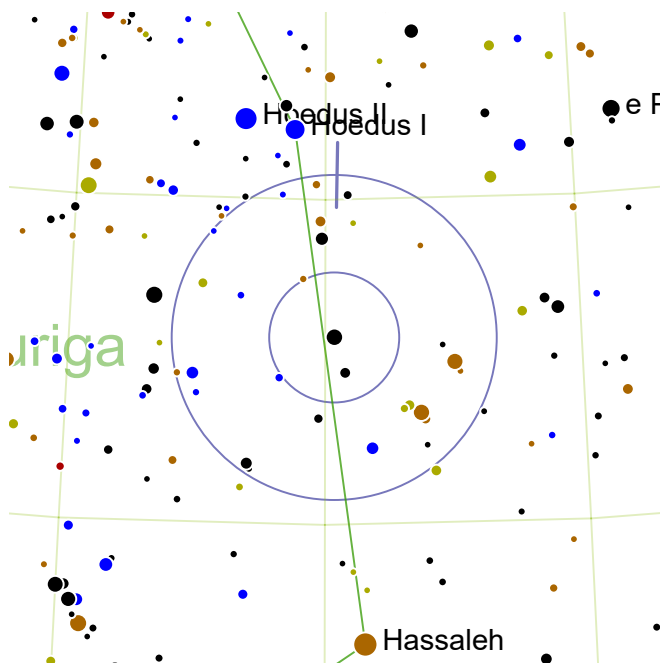
A distantly separated pair of moderately bright, balanced, white stars.



One finder circle NWW from magnitude 3.94 Hoedus I. One finder circle NWW from magnitude 3.94 32069.



This pair is very wide and best viewed in the finder scope or binoculars. Open cluster NGC 1582 lies a degree to the north.



Omega Aur

RA: 74.83° | 4h 59.3' — DEC: 37.88° | 37° 53'

Magnitude: 5.0 | 8.0

Separation: 5.4"

Position Angle: 359°

SAO 57548 | HIP 23179 | GDR2 3956317312



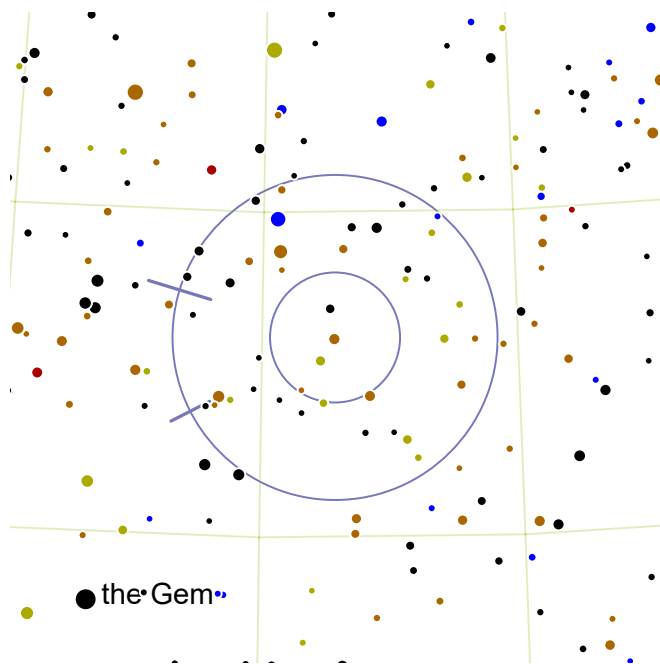
A yellow primary with a closely bound faint orange companion.



Follow the border of the Auriga pentagon south from Capella; Omega Aurigae is located two thirds of the way to the next corner.



Open star cluster NGC 1778 lies two degrees to the south east of this double.



STT147

RA: 98.58° | 6h 34.3' — DEC: 38.08° | 38° 5'

Magnitude: 6.6 | 10.0 | 10.6

Separation: 43" | 46"

Position Angle: 73° | 117°

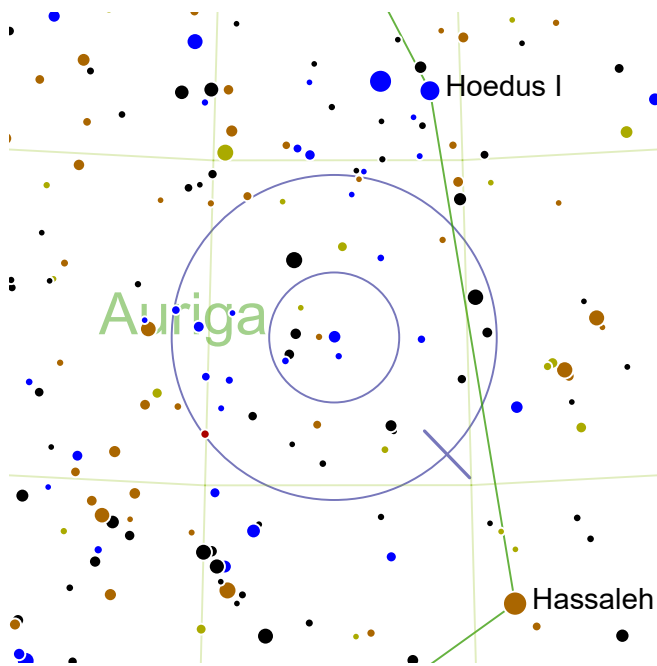
SAO 59230 | HIP 31340 | GDR2 4998228864



A moderately bright yellow primary with two small blue companions, forming a widely separated triangle.



Located two and a half finder circles east of Theta Aurigae, this double is harder to spot.



Struve 644

RA: 77.58° | 5h 10.3' — DEC: 37.3° | 37° 18'

Magnitude: 6.8 | 7.0

Separation: 1.6"

Position Angle: 224°

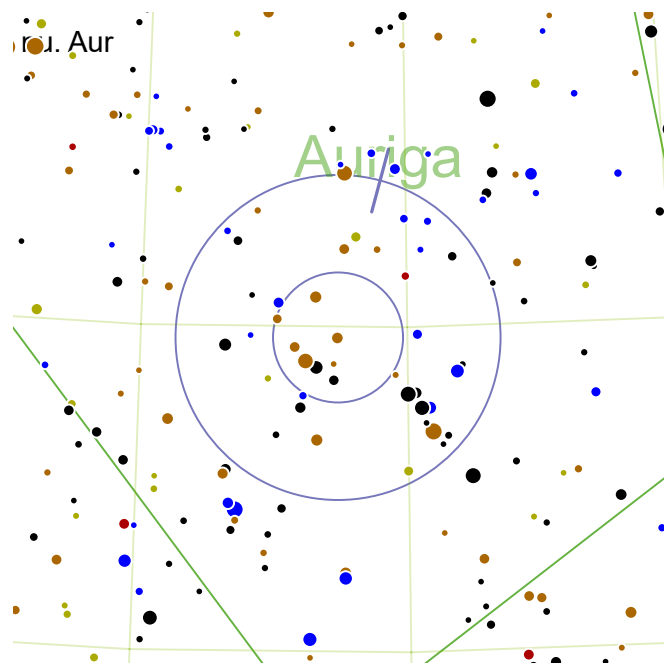
SAO 57704 | GDR2 9467977984



Struve 644 is a real challenge with the two stars separated by much less than 2". The components are equally bright and contrasting yellow and blue.



First find Omega Aurigae: Struve 644 lies at the eastern edge of the finder circle.



Struve 698

RA: 81.3° | 5h 25.19' — DEC: 34.85° | 34° 51'

Magnitude: 6.6 | 8.7

Separation: 31.2"

Position Angle: 345°

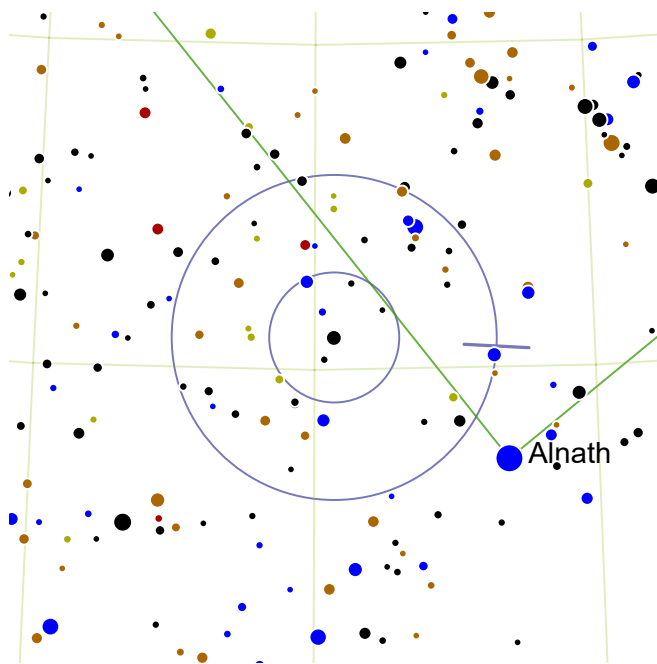
SAO 57999 | HIP 25343 | GDR2 4103451264



A wide orange-blue pair. The two stars are separated in brightness by almost exactly two magnitudes.



Struve 698 lies two finder circles north of Alnath. If you first locate the brighter 14 Aurigae and then move the finder north-east, the both 14 Aurigae and Struve 698 will be visible in opposite quadrants of the finder.



26 Aur

RA: 84.65° | 5h 38.6' — DEC: 30.5° | 30° 30'

Magnitude: 6.0 | 8.0

Separation: 12.4"

Position Angle: 267°

SAO 58280 | HIP 26536 | GDR2 41986921216



A bright yellow primary easily separated from a significantly fainter blue companion.



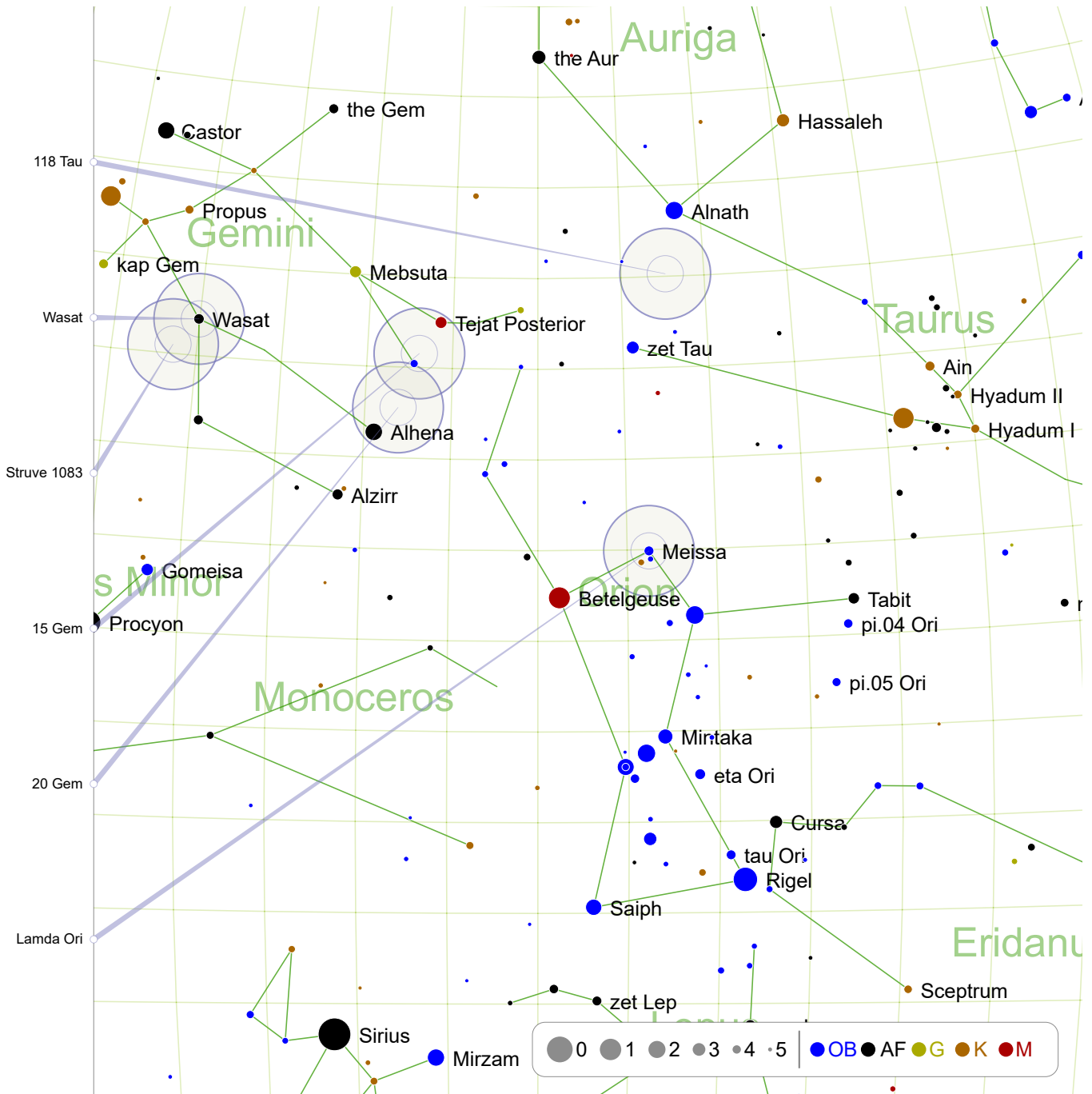
Another good double in the vicinity of Alnath, find 26 Aurigae one and a half finder circles to the north-east of Alnath.



Wonderful open cluster Messier 37 lies just three degrees to the north-east.

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December: 10° North (1)



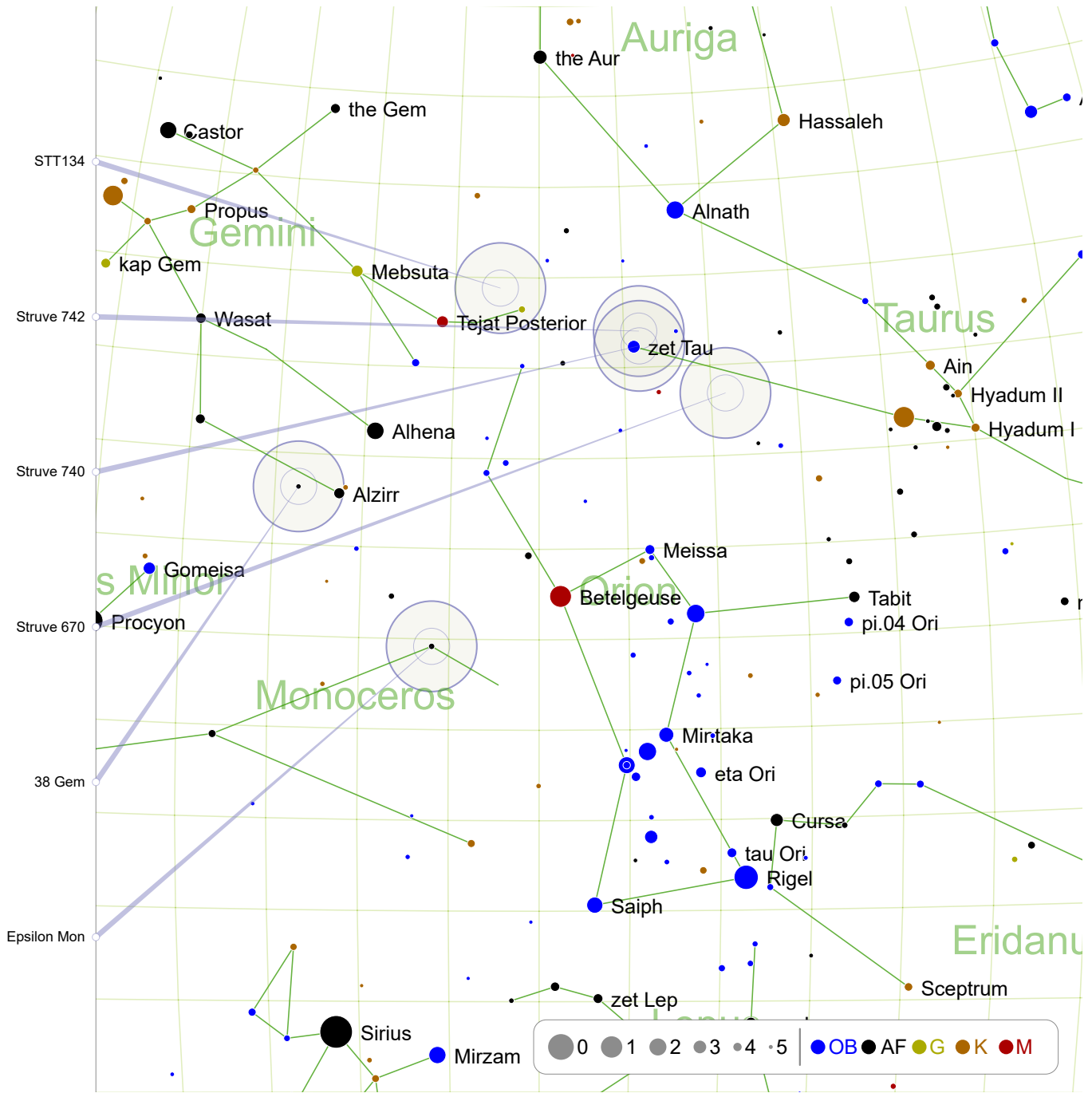
118 Tau: page 137
20 Gem: page 139

Wasat: page 137
Lamda Ori: page 139

Struve 1083: page 138

15 Gem: page 138

December: 10° North (2)

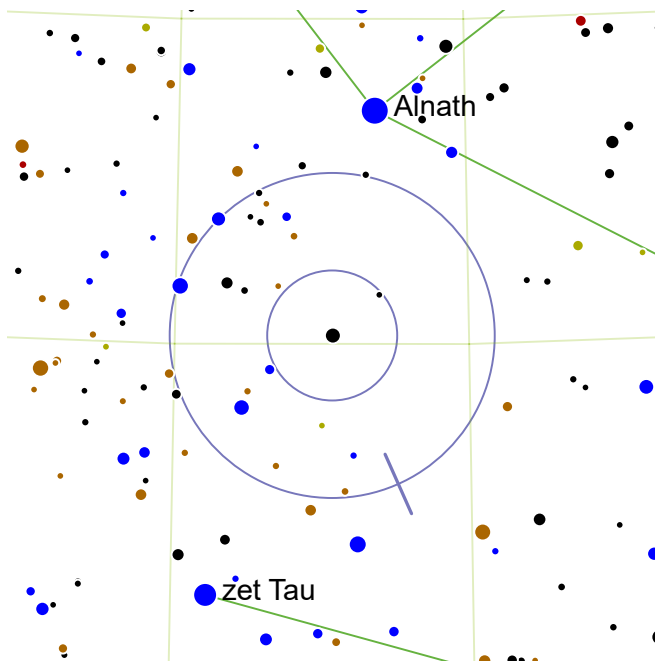


STT134: page 140
38 Gem: page 142

Struve 742: page 140
Epsilon Mon: page 142

Struve 740: page 141

Struve 670: page 141



118 Tau

RA: 82.33° | 5h 29.3' — DEC: 25.15° | 25° 9'

Magnitude: 5.8 | 6.6

Separation: 4.8"

Position Angle: 204°

SAO 77201 | HIP 25695 | GDR2 01913604352



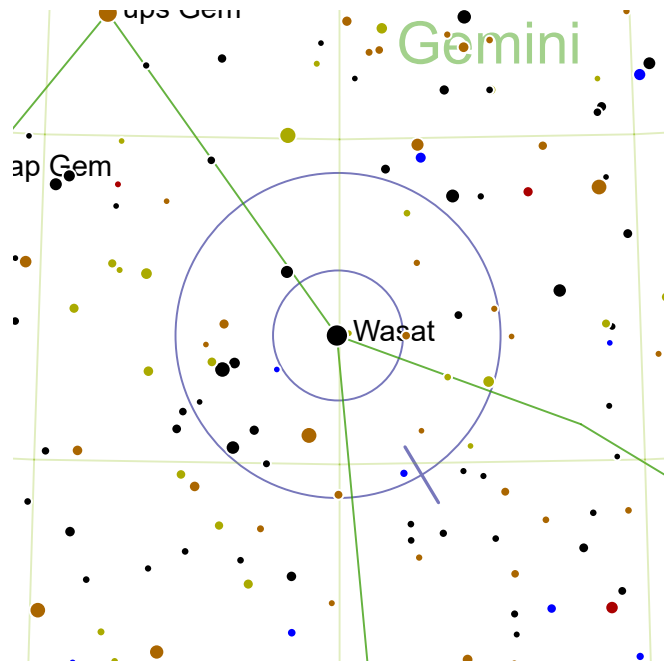
A bright white primary with a closely bound yellow secondary. The secondary is reasonably bright, enhancing the color of the pair.



Just over half a finder circle south of Alnath.



118 Tauri is 118 light-years away. If you position 118 Tauri in the northern quadrant of the finder, the supernova remnant the Crab Nebula will appear on the south-eastern edge of the finder.



Wasat

RA: 110.03° | 7h 20.1' — DEC: 21.98° | 21° 59'

Magnitude: 3.5 | 8.2

Separation: 6.8"

Position Angle: 211°

SAO 79294 | HIP 35550 | GDR2 1953646464



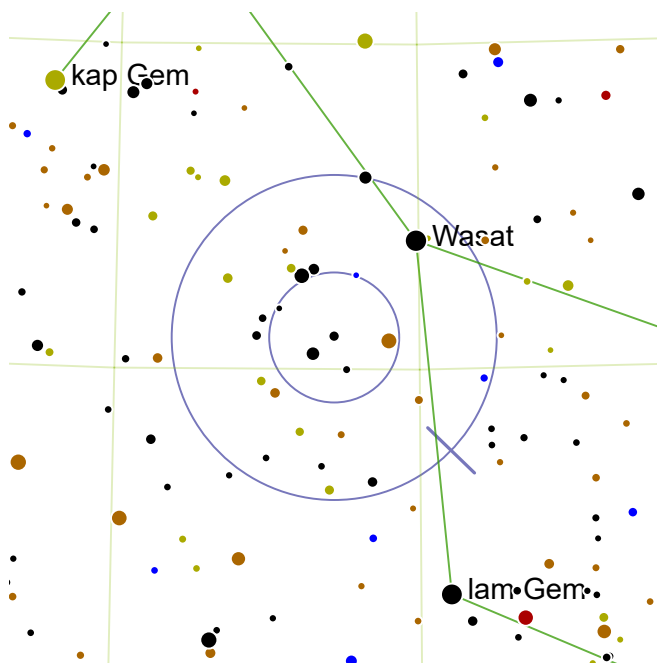
Delta Geminorum or Wasat is a brilliant white star with a close orange-yellow companion.



Easily found as one of the bright stars of Gemini, Wasat is midway between Alhena to the south-west and Pollux to the north-east.



The primary is a subgiant star 61 light-years from the Sun. The system is believed to be 1.6 billion years old.



Struve 1083

RA: 111.4° | 7h 25.6' — DEC: 20.5° | 20° 30'

Magnitude: 7.3 | 8.1

Separation: 6.9"

Position Angle: 226°

SAO 79375 | HIP 36035 | GDR2 9064340864



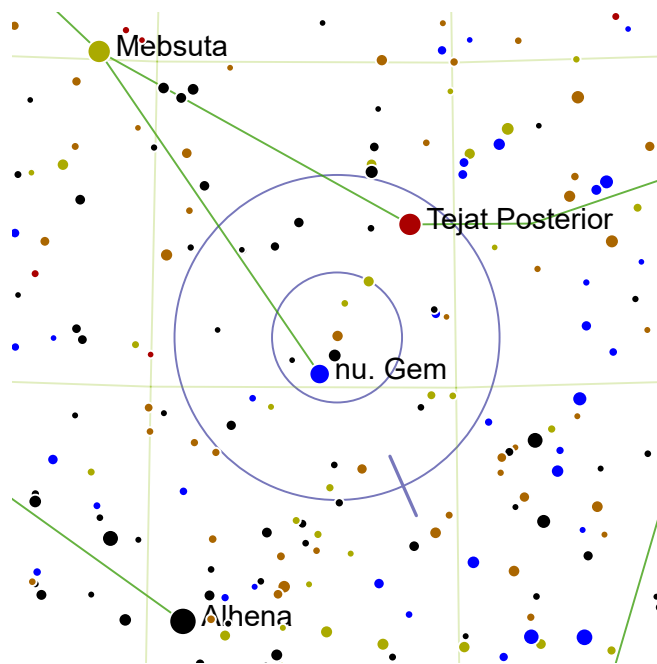
A close, relatively balanced pair. The primary is white.



One degree SE from magnitude 3.51 Wasat. Half a finder circle NNE from magnitude 3.65 lam Gem.



The Eskimo Nebula, a bright planetary nebula, is one degree to the north east. Just beyond the north eastern edge of the finder circle is open star cluster NGC2420.



15 Gem

RA: 96.95° | 6h 27.8' — DEC: 20.78° | 20° 47'

Magnitude: 6.6 | 8.0

Separation: 27.1"

Position Angle: 204°

SAO 78395 | HIP 30757 | GDR2 03574840832



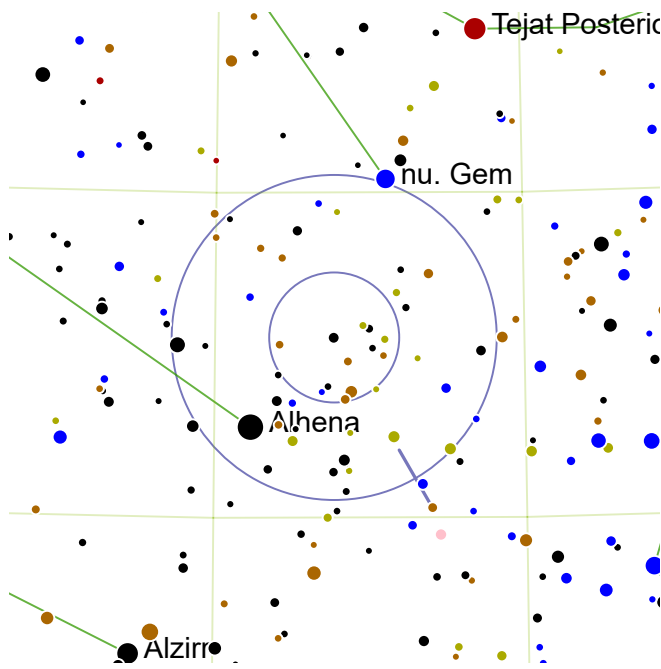
A widely separated orange and blue pairing.



Within half a degree of Nu Geminorum.



561 light-years away, the A component is a cool K class giant star.



20 Gem

RA: 98.08° | 6h 32.3' — DEC: 17.78° | 17° 47'

Magnitude: 6.3 | 6.9

Separation: 20.0"

Position Angle: 210°

SAO 95795 | HIP 31158 | GDR2 88717092096



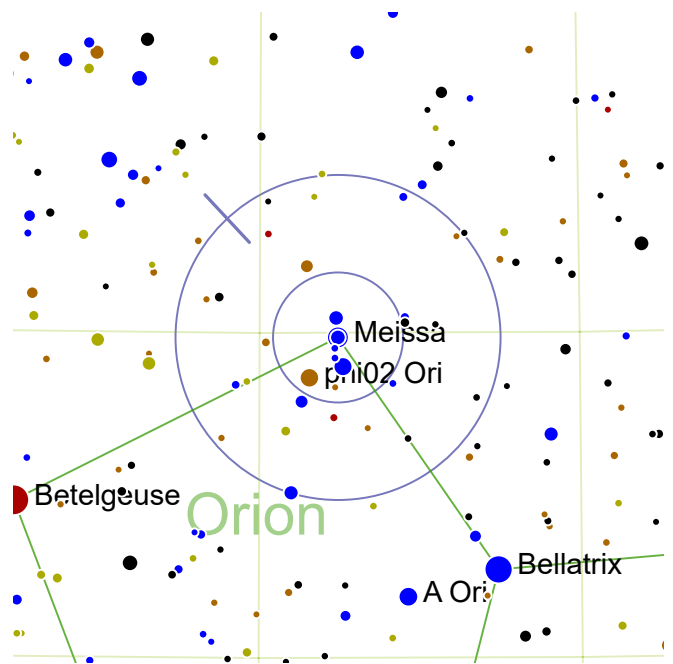
A widely separated but balanced yellow-white pair.



20 Geminorum lies exactly in the middle of the feet of Castor and Pollux.



The primary is a yellowish giant star 262 light-years away.



Lamda Ori

RA: 83.78° | 5h 35.1' — DEC: 9.93° | 9° 56'

Magnitude: 3.6 | 5.5

Separation: 4.4"

Position Angle: 43°

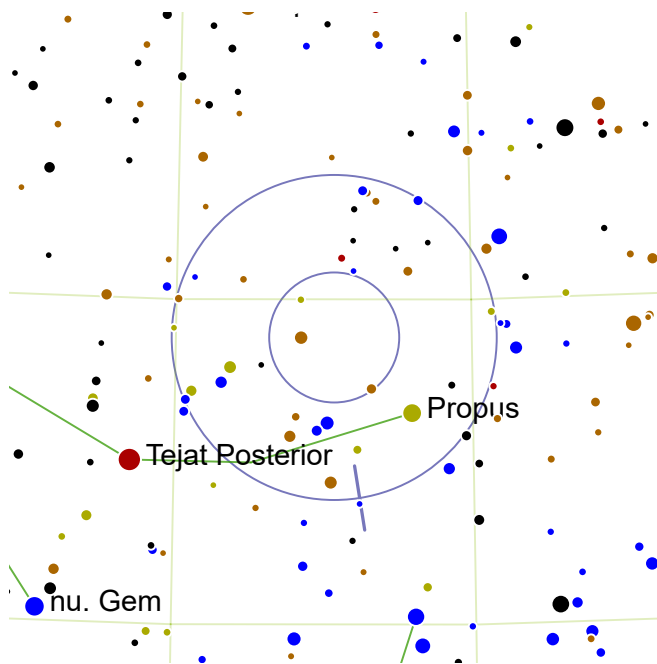
SAO 112921 | HIP 26207 | GDR2 83942617088



A close pair of white stars, with a brilliant primary and bright secondary.



Lamda Orionis is one of the three stars forming Orion's head, and is situated in the loose star cluster Collinder 69.



STT134


RA: 92.33° | 6h 9.3' — DEC: 24.43° | 24° 26'


Magnitude: 7.6 | 9.1


Separation: 31"

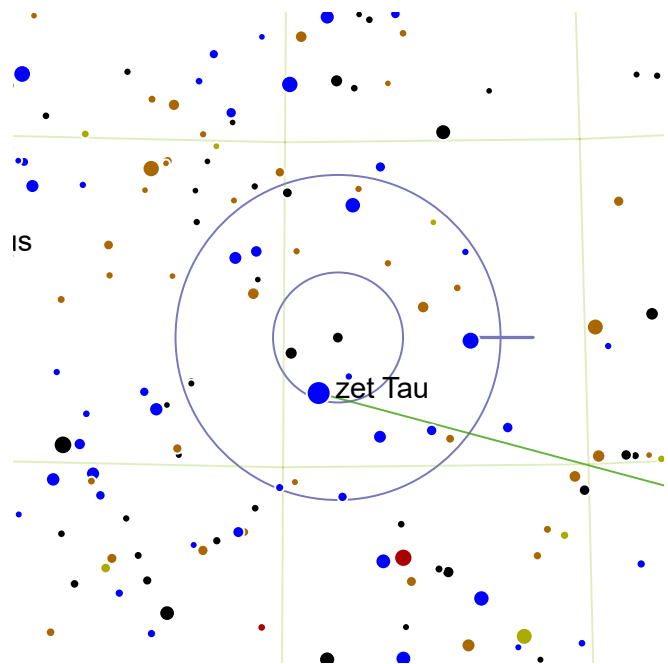
Position Angle: 189°

SAO 78038 | GDR2 72539132032

 A very wide pair with a yellow primary and a moderately fainter secondary.

 Half a finder circle NWW from magnitude 3.19 Tejat Posterior. One and a half finder circles NEE from magnitude 3.0 zet Tau.

 The double lies on the north-eastern margins of the open cluster M35. Another open cluster, NGC 2129, lies 2,5 degrees to the south west.



Struve 742


RA: 84.1° | 5h 36.39' — DEC: 22.0° | 22° 0'


Magnitude: 7.2 | 7.8


Separation: 3.9"

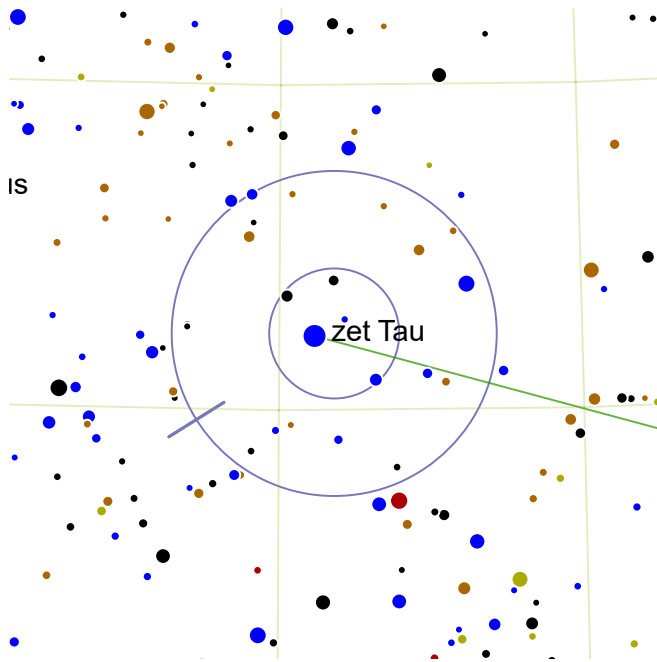
Position Angle: 270°

SAO 77313 | HIP 26328 | GDR2 51001136256

 A nearly equal pair of yellowish stars with very close separation.

 Half a degree NNW from magnitude 3.0 zet Tau. Two finder circles N from magnitude 3.66 Meissa.

 The Crab Nebula lies half a degree to the west of this system.



Struve 740

RA: 84.1° | 5h 36.37' — DEC: 21.18° | 21° 11'

Magnitude: 9.0 | 9.9

Separation: 21.7"

Position Angle: 122°

SAO 77308 | GDR2 12247302528



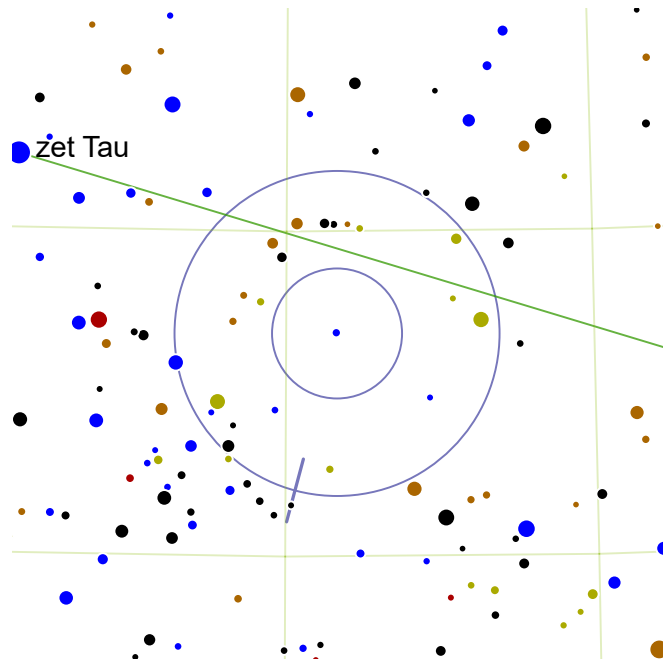
A faint pair with wide separation.



Less than half a degree W from magnitude 3.0 zet Tau. Two finder circles N from magnitude 3.66 Meissa.



The Crab Nebula, the most famous supernova remnant, lies less than two degrees to the north west.



Struve 670

RA: 79.18° | 5h 16.69' — DEC: 18.43° | 18° 26'

Magnitude: 7.7 | 8.3

Separation: 2.6"

Position Angle: 165°

SAO 94431 | HIP 24612 | GDR2 31577483904



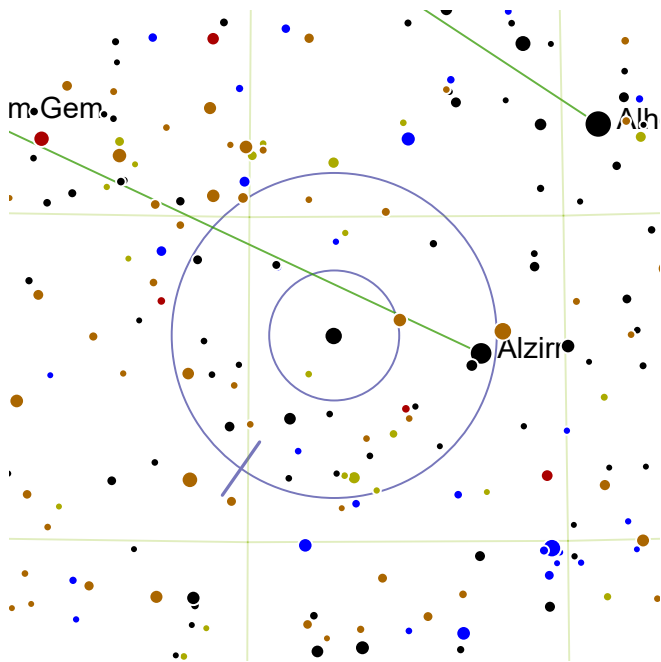
A balanced, very close pair; the primary is bluish.



One finder circle SWW from magnitude 3.0 zet Tau. One and a half finder circles NNW from magnitude 3.66 Meissa.



Open cluster NGC 1807 lies 2.5 degrees to the south west.



38 Gem

RA: 103.65° | 6h 54.6' — DEC: 13.18° | 13° 11'

Magnitude: 4.7 | 7.7

Separation: 7.1"

Position Angle: 145°

SAO 96265 | HIP 33202 | GDR2 95121612032



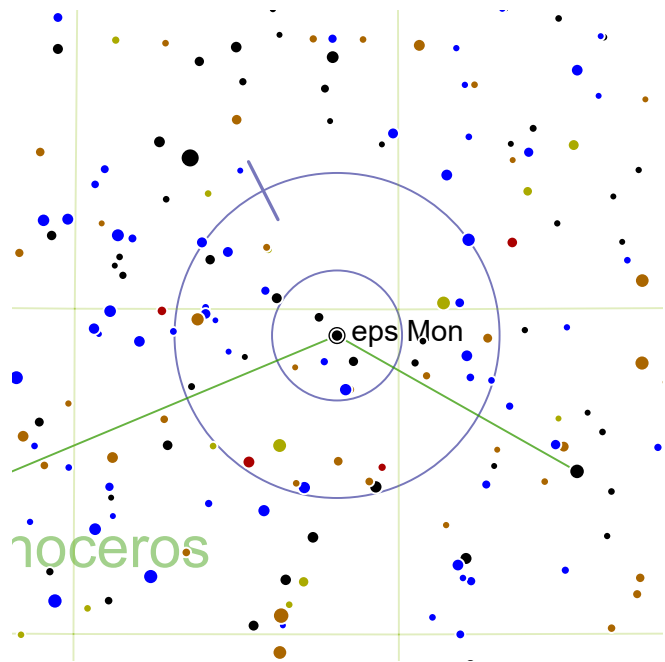
A brilliant white primary with close yellow companion.



About three degrees east of the most southerly foot (third magnitude Alzirr) of the Gemini twins.



Quite close to us, this system is only 98 light-years distant, and the components are separated by about 184 AU. The secondary is a G-class star similar to the Sun but somewhat fainter and yellower.



Epsilon Mon

RA: 95.95° | 6h 23.8' — DEC: 4.6° | 4° 36'

Magnitude: 4.5 | 6.5

Separation: 13.4"

Position Angle: 27°

SAO 113810 | HIP 30419 | GDR2 81815810432



An unequal pair of bright yellow stars, easily separated.

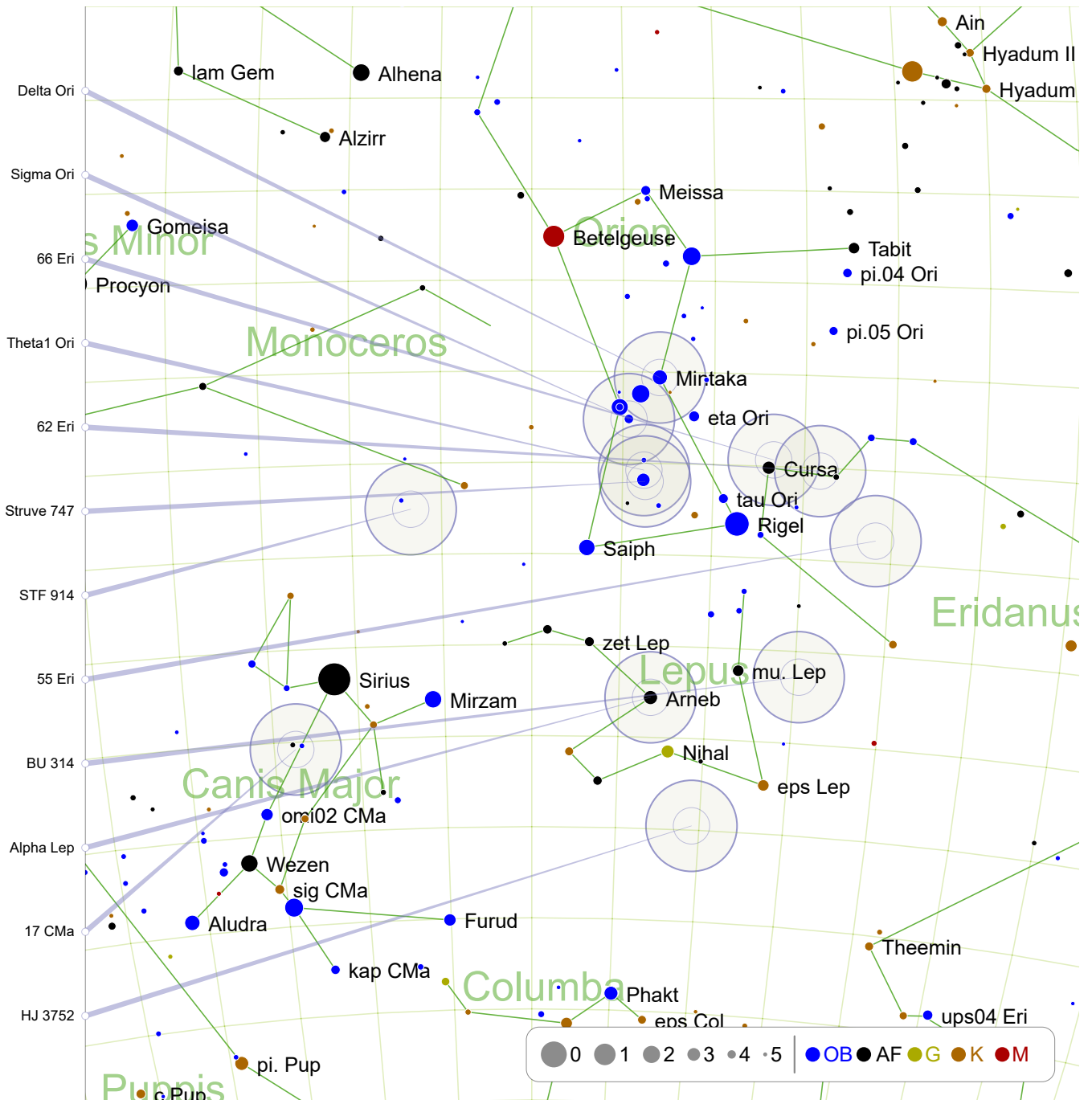


Follow a line from the head of Orion through Betelgeuse and extend it an equal distance further east. This should bring you to the vicinity of an isolated fourth magnitude star which is Epsilon Monocerotis.



Only 121 light-years away, Epsilon Mon A is a subgiant star 25 times brighter than the Sun, while the B star is only twice as bright as the Sun.

December: -10° South (1)



Delta Ori: page 145

Sigma Ori: page 145

66 Eri: page 146

Theta1 Ori: page 146

62 Eri: page 147

Struve 747: page 147

STF 914: page 148

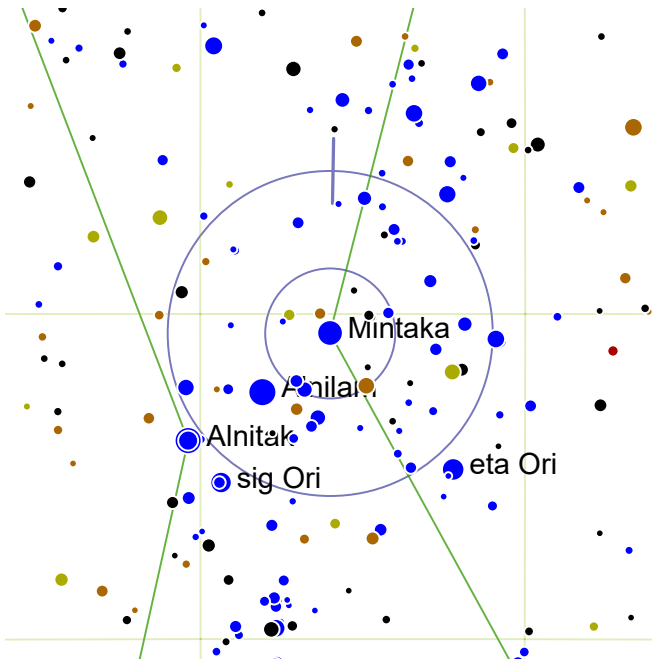
55 Eri: page 148

BU 314: page 149

Alpha Lep: page 149

17 CMa: page 150

HJ 3752: page 150



Delta Ori

RA: 83.0° | 5h 32.0' — DEC: -0.3° | 0° 17'

Magnitude: 2.2 | 6.3

Separation: 52.6"

Position Angle: 359°

SAO 132220 | HIP 25930 | HD 36486



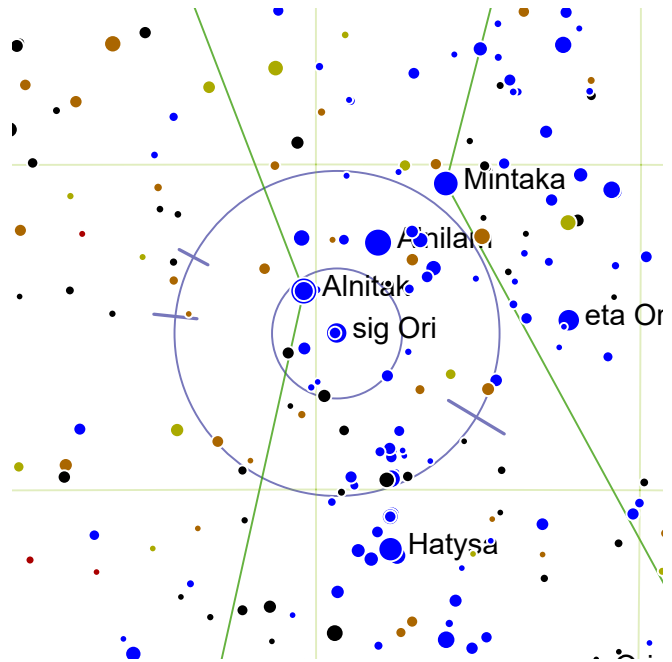
A very wide pair consisting of a brilliant primary and significantly fainter blue secondary.



Delta Orionis, better known as Mintaka, is the westernmost star of Orion's belt.



The secondary only appears faint in contrast with the bright primary; in its own right it is a reasonably bright star that that would be visible without a telescope in a dark location.



Sigma Ori

RA: 84.68° | 5h 38.69' — DEC: -2.6° | -2° 35'

Magnitude: 3.8 | 8.8 | 6.6 | 6.3

Separation: 11.4" | 12.9" | 41.4"

Position Angle: 239° | 84° | 62°

SAO 132406 | HIP 26549 | GDR2 39446556544



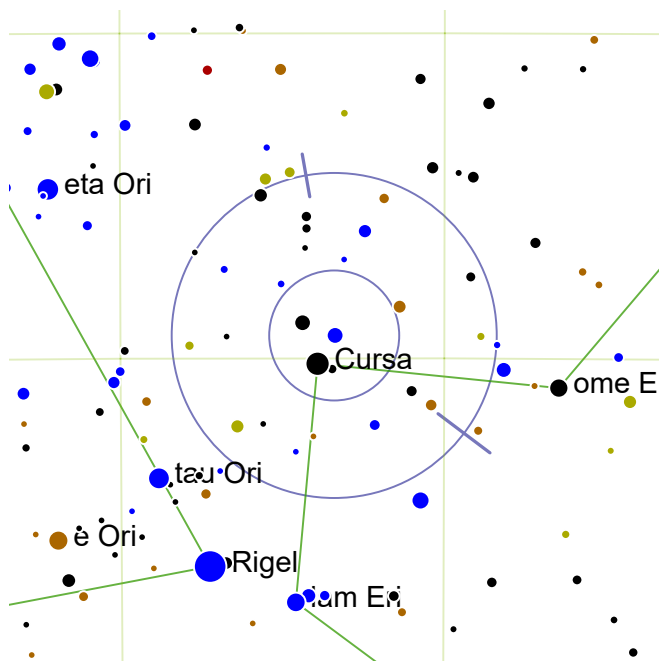
A blue primary, flanked by one fainter star to the west, and two relatively bright white stars to the east, all easily separated from the primary.



Sigma Orionis is a degree south-west of Alnitak.



A complex star system, The primary is a very tight pair separated by only 0.3". This can only be split in extremely large telescopes, leaving four easily seen components. A further tiny component lies close to the primary (mag. 12, p.a. 20°, 3.2").



66 Eri

RA: 76.7° | 5h 6.8' — DEC: -4.65° | -4° 38'

Magnitude: 5.1 | 9.4 | 10.8

Separation: 1.6" | 52.2"

Position Angle: 233° | 10°

SAO 131777 | HIP 23794 | GDR2 15193261568



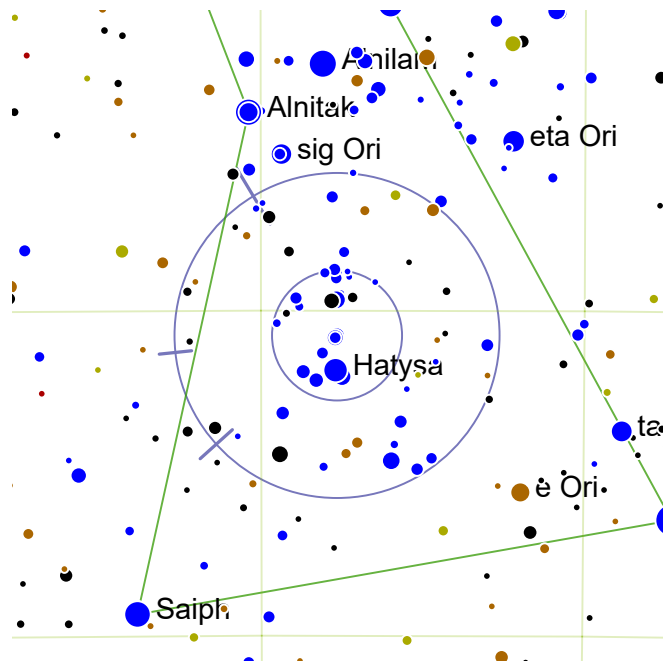
A bright, bluish primary with an extremely close faint secondary; a further faint, white C component lies at some distance from A and B.



Less than half a degree NNW from magnitude 2.92 Cursa. One finder circle W from magnitude 2.87 Hatysa.



With 66 Eri centered, the famous Witch Head reflection nebula is in the southern quarter of the finder.



Theta1 Ori

RA: 83.83° | 5h 35.3' — DEC: -5.38° | -5° 22'

Magnitude: 6.7 | 7.9 | 5.1 | 6.7

Separation: 8.8" | 13" | 21.5"

Position Angle: 31° | 132° | 96°

SAO 132314 | HIP 26220 | GDR2 32050194688



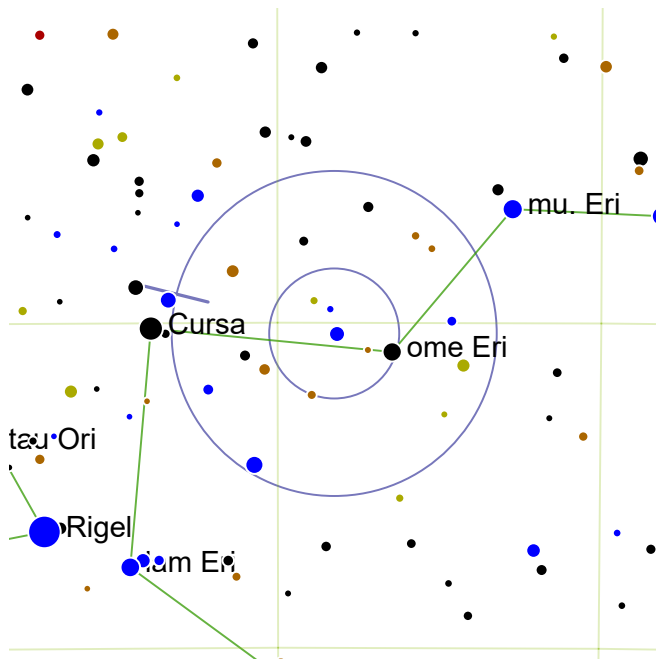
Better known as the Trapezium, this multiple star system pushes the boundaries between a multiple star system and a star cluster. The 4 brightest components form a trapezium, but fainter components can also be picked out.



The members of the Trapezium are cosmic babies, less than 100,000 years old. Galileo first sketched the A, C and D components, although he failed to record the bright nebula around the stars!



A 100 mm telescope can see four stars in the Trapezium, while a 150 mm telescope can resolve six.



62 Eri

RA: 74.13° | 4h 56.5' — DEC: -5.17° | -5° 9'

Magnitude: 5.5 | 8.9

Separation: 66.1"

Position Angle: 76°

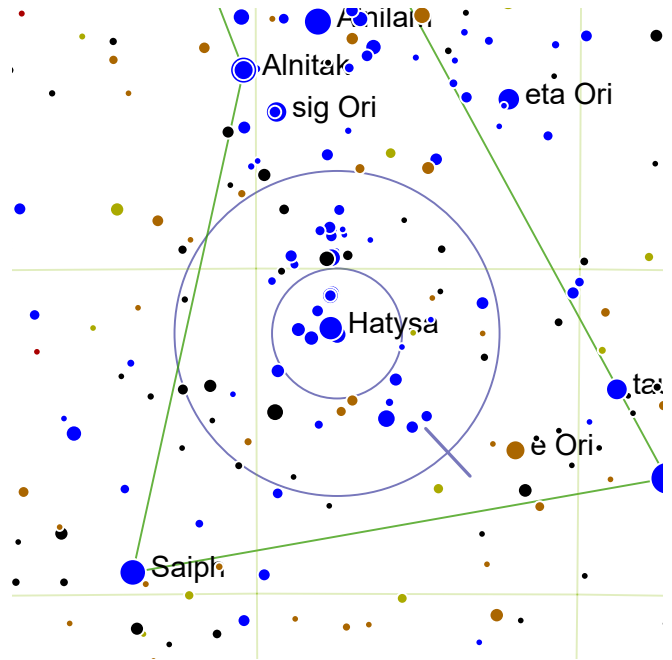
SAO 131614 | HIP 22958 | GDR2 89532331904



A distantly separated pair, with a bright, blue primary and a significantly fainter secondary.



Half a finder circle W from magnitude 2.92 Cursa. One and a half finder circles S from magnitude 3.87 pi. Ori.



Struve 747

RA: 83.75° | 5h 35.0' — DEC: -6.0° | -6° 0'

Magnitude: 4.8 | 5.7

Separation: 35.7"

Position Angle: 223°

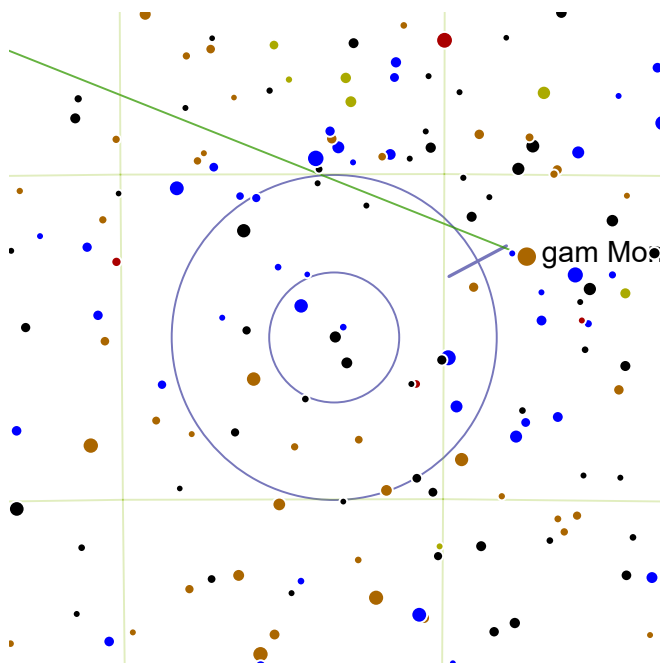
SAO 132301 | HIP 26199 | GDR2 66581304832



A very wide pair of well matched and bright white stars.



Right next to Hatysa (Iota Orionis), the bright star at the end of Orion's sword.



STF 914

RA: 96.7° | 6h 26.8' — DEC: -7.52° | -7° 30'

Magnitude: 6.3 | 8.7

Separation: 21.1"

Position Angle: 298°

SAO 133263 | HIP 30675 | GDR2 21199006720



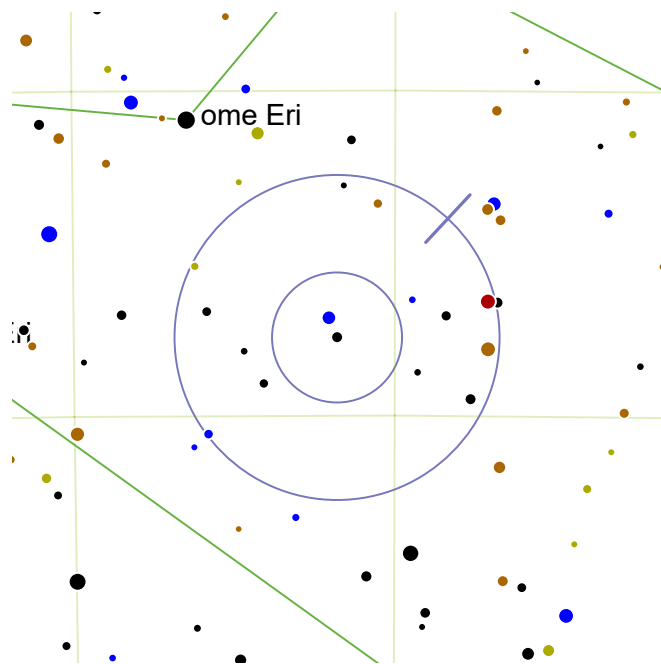
A fairly bright white primary widely separated from a faint secondary.



One and a half finder circles NEE from magnitude 2.2 Saiph. Two finder circles NE from magnitude 3.67 zet Lep.



The bright open star cluster NGC 2232 is three degrees north of STF 914.



55 Eri

RA: 70.9° | 4h 43.6' — DEC: -8.8° | -8° 47'

Magnitude: 6.7 | 6.8

Separation: 9.2"

Position Angle: 317°

SAO 131442 | HIP 21986 | GDR2 19107361024



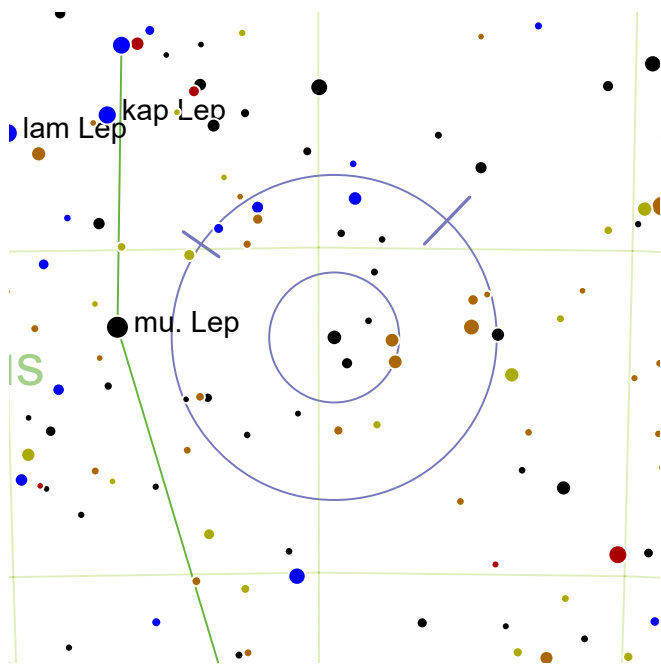
An equal pair of quite close, moderately bright, yellow stars.



One and a half finder circles west and slightly south of Cursa.



According to the Hipparchos satellite, 55 Eridani is 2132 light-years from the Sun.



BU 314




RA: 74.75° | 4h 59.0' — DEC: -16.38° | -16° 22'

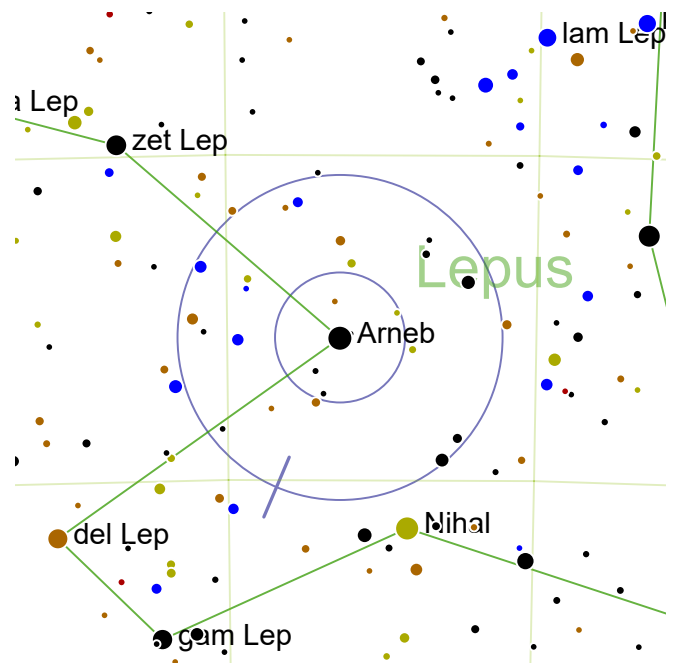
Magnitude: 5.9 | 7.5 | 10.4

Separation: 0.8" | 53"

Position Angle: 316° | 55°

SAO 150052 | HIP 23166 | GDR2 39399498240

-  An extremely tight pair of yellowish stars, with a faint, distant third companion.
-  Half a finder circle W from magnitude 3.3 mu. Lep. One finder circle SEE from magnitude 3.98 Sceptrum.
-  This pair of F-type dwarfs is 132 light-years from Earth.



Alpha Lep




RA: 83.18° | 5h 32.69' — DEC: -17.82° | -17° 48'

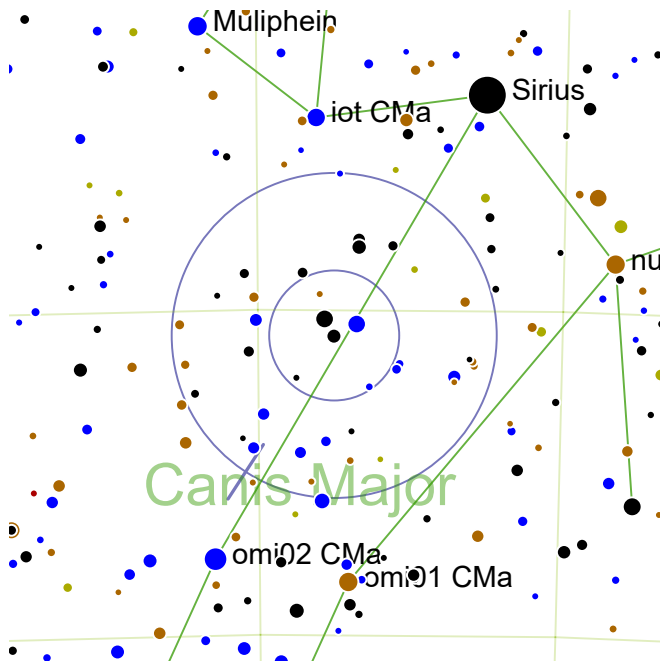
Magnitude: 2.6 | 11.2

Separation: 35.4"

Position Angle: 157°

SAO 150547 | HIP 25985 | GDR2 10610441856

-  A brilliant yellowish primary widely separated from a very faint companion.
-  Alpha Lep is a bright star in Lepus.
-  Also known as Arneb, the primary is an impressive supergiant 2200 light-years from Earth.



17 CMa




RA: 103.75° | 6h 55.0' — DEC: -20.4° | -20° 23'

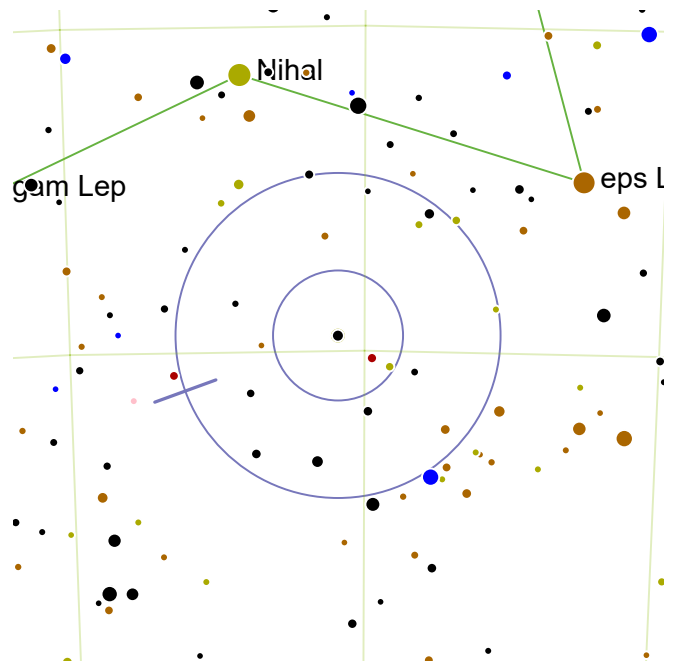
Magnitude: 5.8 | 8.7

Separation: 42.9"

Position Angle: 147°

SAO 172569 | HIP 33248 | GDR2 10610225408

-  A bright white primary widely separated from a moderately fainter secondary.
-  Half a finder circle NNW from magnitude 3.12 omi02 CMa. One and a half finder circles NNW from magnitude 3.68 sig CMa.
-  With this double centered, bright open cluster M41 (mag. 4.5) lies on the western edge of the finder circle.



HJ 3752




RA: 80.45° | 5h 21.8' — DEC: -24.77° | -24° 45'

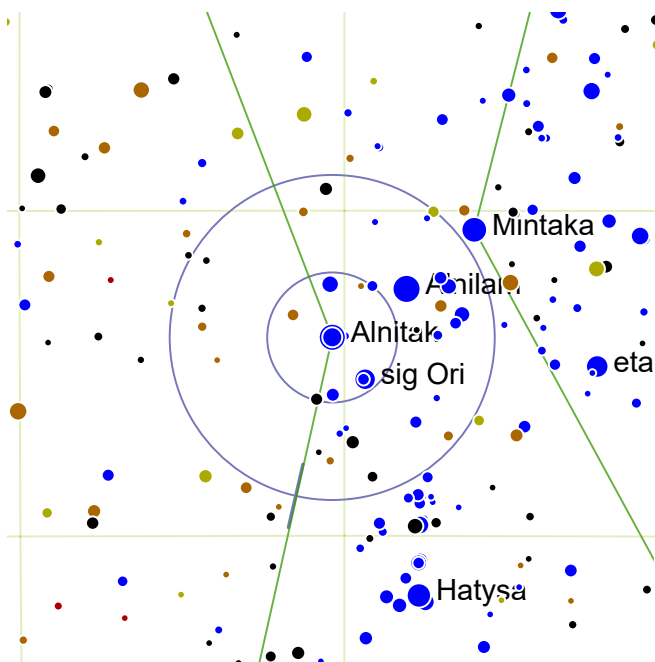
Magnitude: 5.4 | 6.6

Separation: 3.5"

Position Angle: 110°

SAO 170351 | HIP 25045 | GDR2 91568577536

-  A bright yellow primary with a fairly bright and very close secondary.
-  Half a finder circle SSW from magnitude 2.96 Nihal. Half a finder circle SEE from magnitude 3.29 eps Lep.
-  Messier 79, a magnitude 8.6 globular cluster) is less than a degree to the north east.



Zeta Ori

RA: 85.19° | 5h 40.75' — DEC: -1.95° | -1° 56'

Magnitude: 1.88 | 3.70 | 9.55

Separation: 2.17" | 58.5"

Position Angle: 167°

SAO 132444 | HIP 26727 | GDR2 28221605248



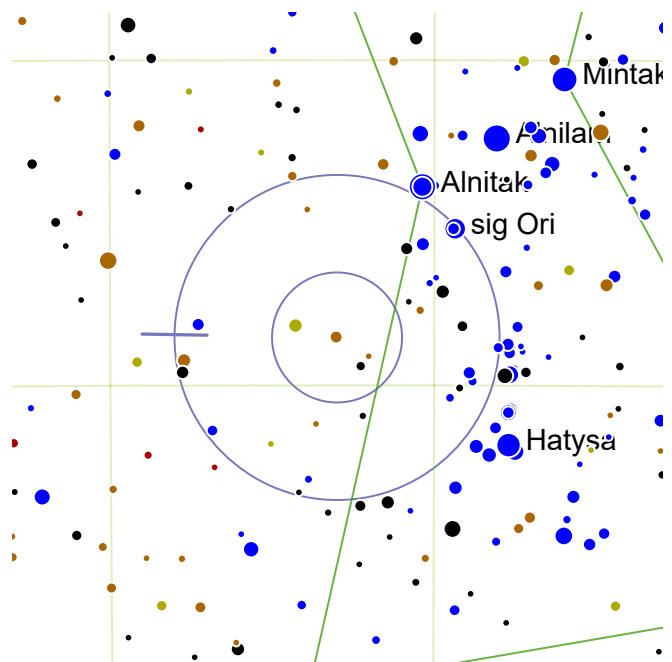
A fiercely brilliant close blue-blue pairing, made difficult by the brightness of the primary.



The eastern star of Orion's belt.



Zeta Orionis, or Alnitak, is the astrophotographer's devil as it overwhelms pictures of the Flame and Horsehead nebulae. In addition it is the brightest O-class star in Earth's sky, which makes it very blue, which is a difficult star color to control in astrophotographs.



Struve 790

RA: 86.5° | 5h 46.0' — DEC: -4.27° | -4° 15'

Magnitude: 6.4 | 8.7

Separation: 6.9"

Position Angle: 89°

SAO 132515 | HIP 27212 | GDR2 54756157184



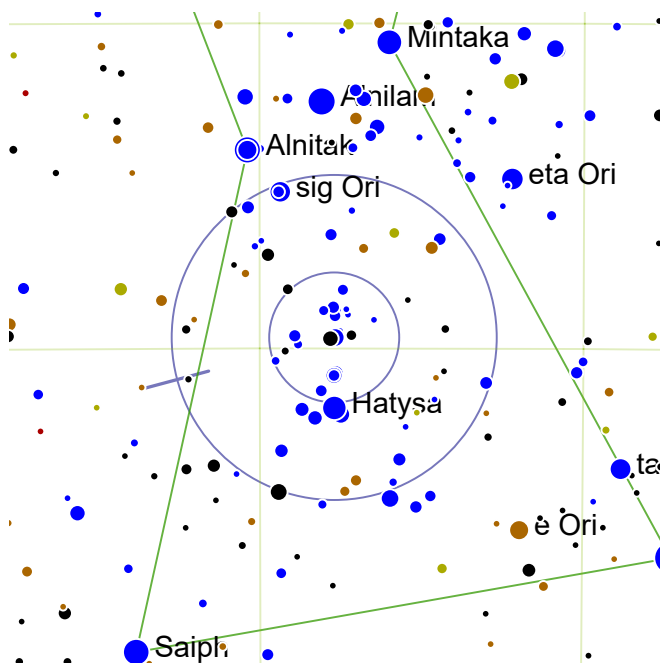
A close blue-yellow pair roughly a degree north-east of the Orion Nebula.



Position Alnitak near the north-western edge of the finder; Struve 790 is near the center of the view.



With Alnitak centered in the finder, both the Flame Nebula and the dark Horsehead Nebula will be in the view, but very difficult to detect from a light polluted location.



42/45 Ori




RA: 83.85° | 5h 35.39' — DEC: -4.83° | -4° 49'

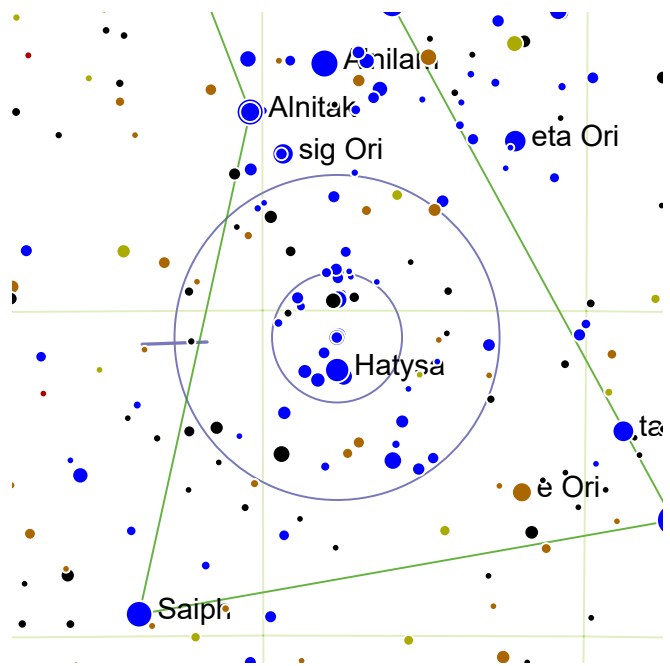
Magnitude: 4.7 | 5.3

Separation: 252"

Position Angle: 105°

SAO 132320 | HIP 26237 | GDR2 52067563392

-  A very wide and bright binocular pair, the brighter star (42 Ori) being bluish and the other white.
-  Half a degree N from magnitude 2.87 Hatysa. Half a finder circle S from magnitude 2.48 Mintaka.
-  There is a third magnitude 7.1 star between 42 and 45 Orionis. This optical double is shrouded in the nebulosity of M43 (De Mairan's Nebula).



Theta2 Ori




RA: 83.85° | 5h 35.39' — DEC: -5.42° | -5° 24'

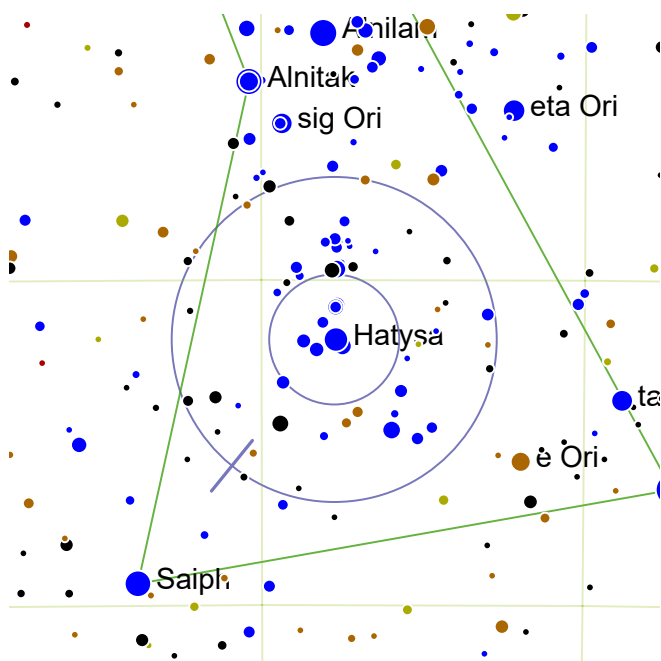
Magnitude: 5.2 | 6.5

Separation: 52"

Position Angle: 92°

SAO 132321 | HIP 26235

-  A very wide line of three bright white stars, often overlooked as it is on the border of the spectacular Orion Nebula.
-  Half a a degree (one Moon diameter) north of Hatsya.
-  Best viewed at lower magnifications.



Iota Ori

RA: 83.88° | 5h 35.5' — DEC: -5.92° | -5° 54'

Magnitude: 2.8 | 6.9

Separation: 11.3"

Position Angle: 141°

SAO 132323 | HIP 26241 | GDR2 46640875904



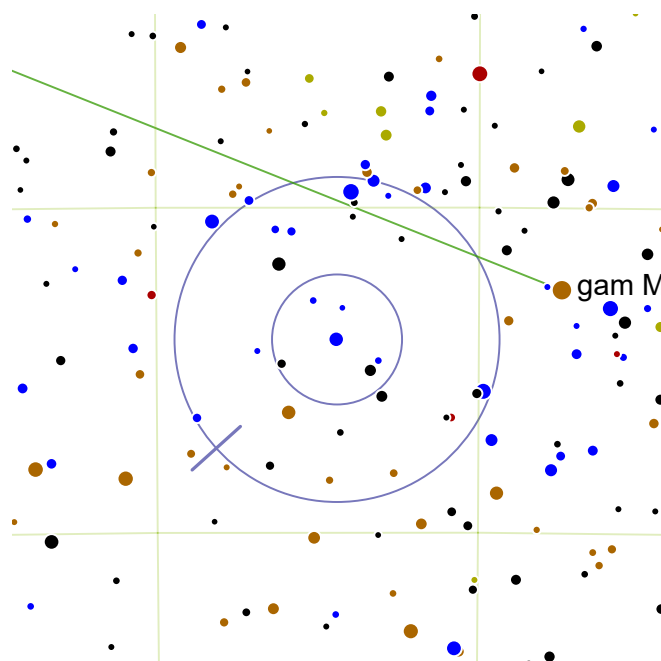
In the same field as Struve 747, Iota Orionis is a brilliant white star with an easily separated and reasonably bright blue companion.



Iota is the southernmost star of Orion's sword.



Iota Orionis is one the brightest member of loose star cluster NGC 1980. NGC 1980 is regarded as a slightly older version of the Trapezium cluster that illuminates the Orion Nebula, but how two similar clusters can form so closely together is a subject of further study.



Beta Mon

RA: 97.2° | 6h 28.8' — DEC: -7.03° | -7° 1'

Magnitude: 4.7 | 5.2

Separation: 7.3"

Position Angle: 132°

SAO 133316 | HIP 30867 | GDR2 65675574272



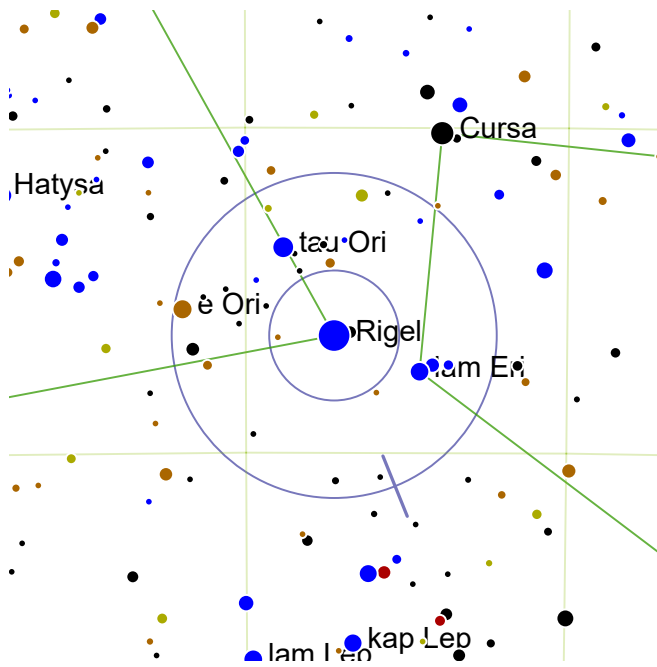
A wonderful triple showing a brilliant bluish primary closely separated from a tight pair of bluish stars.



Locate fourth magnitude Gamma Monocerotis and track east by one-and-a-half finder circles.



Situated in the inky void between Orion and Sirius, this is a hard to find compared to other nearby doubles.



Rigel

RA: 78.63° | 5h 14.5' — DEC: -8.2° | -8° 11'

Magnitude: 0.3 | 6.8

Separation: 9.7"

Position Angle: 202°

SAO 131907 | HIP 24436 | HD 34085



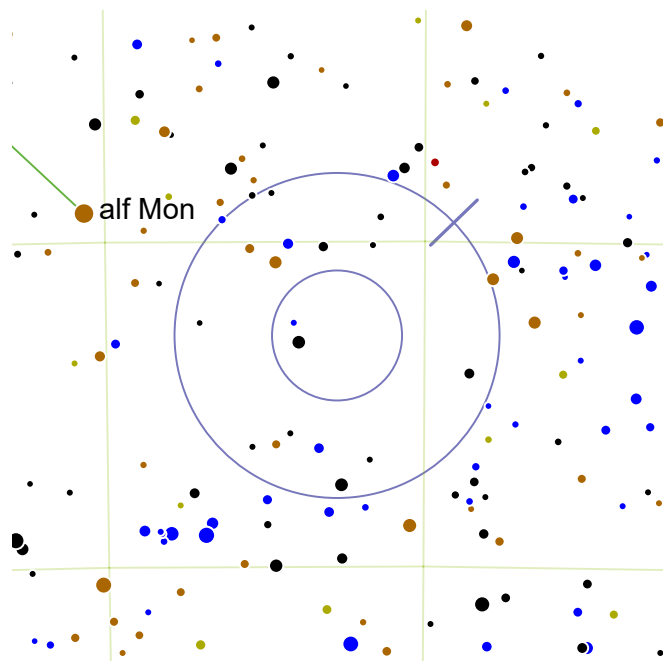
Rigel, one of the brightest stars in the sky, has a moderately bright companion that seems very faint in the glare of its primary. The separation is reasonable and the white secondary contrasts nicely with the blue primary.



Rigel is the bright blue star in the southwestern corner of the square of Orion.



The secondary is actually a close double but the separation is only 0.1".



STF 1097

RA: 111.38° | 7h 25.5' — DEC: -11.45° | -11° 26'

Magnitude: 5.5 | 8.5

Separation: 20"

Position Angle: 314°

SAO 152909 | HIP 36251 | GDR2 64130366336



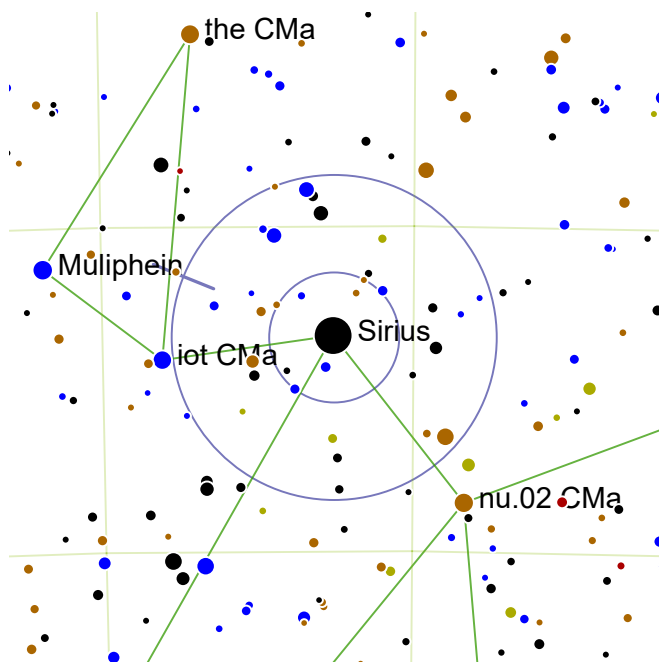
A fairly bright yellow primary with an easily separated and relatively faint companion.



Two finder circles NEE from magnitude -1.58 Sirius. Two and a half finder circles NNE from magnitude 3.12 omi02 CMa.



The double lies on the northern edge of the open star cluster NGC 2396 (magnitude 7.4).



Sirius




RA: 101.28° | 6h 45.1' — DEC: -16.72° | -16° 42'

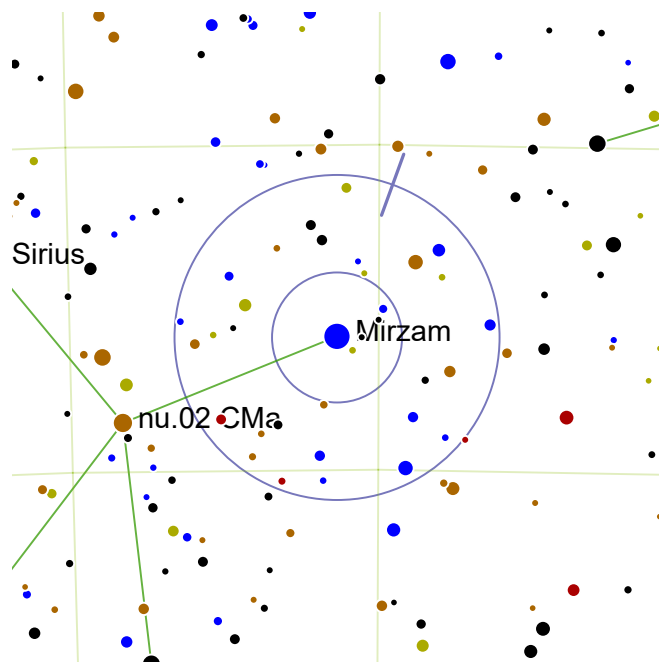
Magnitude: -1.47 | 8.44

Separation: 11.2"

Position Angle: 68°

SAO 151881 | HIP 32349 | HD 48915

-  A ferociously brilliant white primary moderately separated from a relatively dim white dwarf companion.
-  Sirius the brightest star in Earth's sky, south-east of Orion.
-  The secondary is a tiny Earth-sized white dwarf, among the smallest deep sky objects visible in an amateur telescope. The little companion, known affectionately as the "Pup", is lost in the glare of the primary, but standing alone would be an easy binocular target. To tame Sirius, try spotting the Pup in twilight.



Beta CMa




RA: 95.68° | 6h 22.69' — DEC: -17.97° | -17° 57'

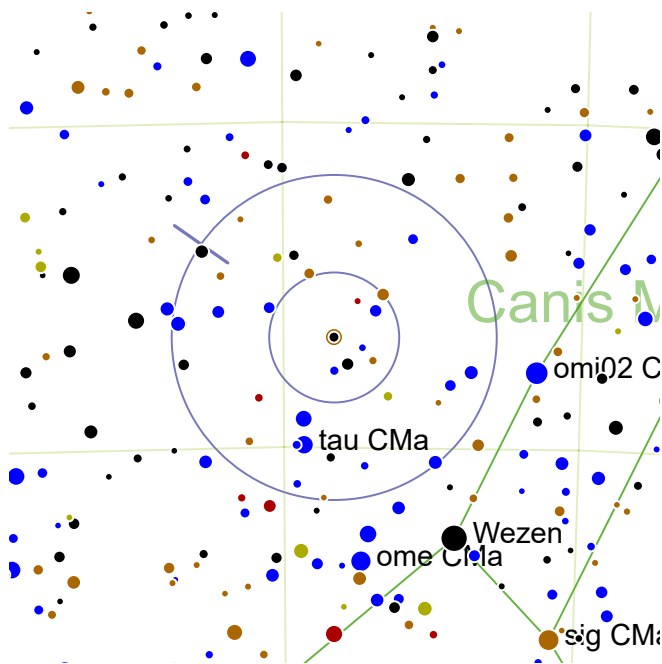
Magnitude: 1.9 | 10.5

Separation: 186.1"

Position Angle: 340°

SAO 151428 | HIP 30324 | GDR2 66754014976

-  A fiercely brilliant blue primary with a distant very faint companion.
-  Beta CMa is a bright star in Canis Major. One finder circle SEE from magnitude 3.77 eta Lep.
-  Also known as Mirzam, 2 CMa, and BUP 88.



HJ 3945

RA: 109.15° | 7h 16.6' — DEC: -23.32° | -23° 18'

Magnitude: 4.8 | 6.8

Separation: 26.6"

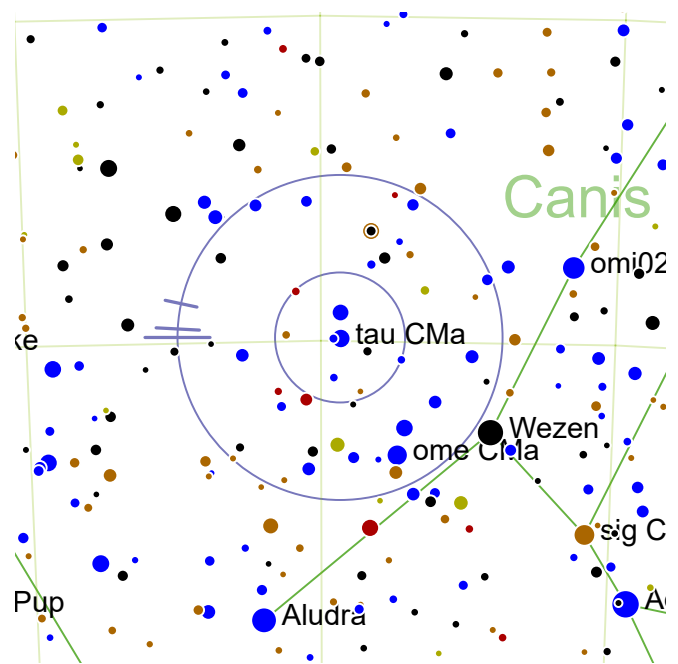
Position Angle: 55°

SAO 173349 | HIP 35210 | GDR2 60635836928

A bright, wide and balanced pair of stars, the primary being orange, and the secondary pale yellow.

Half a finder circle E from magnitude 3.12 omi02 CMa. One finder circle NE from magnitude 3.68 sig CMa.

Open star cluster NGC 2367 (mag. 7.9) lies two degrees to the north east.



Tau CMA

RA: 109.68° | 7h 18.69' — DEC: -24.95° | -24° 56'

Magnitude: 4.4 | 10.2 | 11.2 | 8.2

Separation: 8.3" | 14.2" | 83.5"

Position Angle: 90° | 87° | 78°

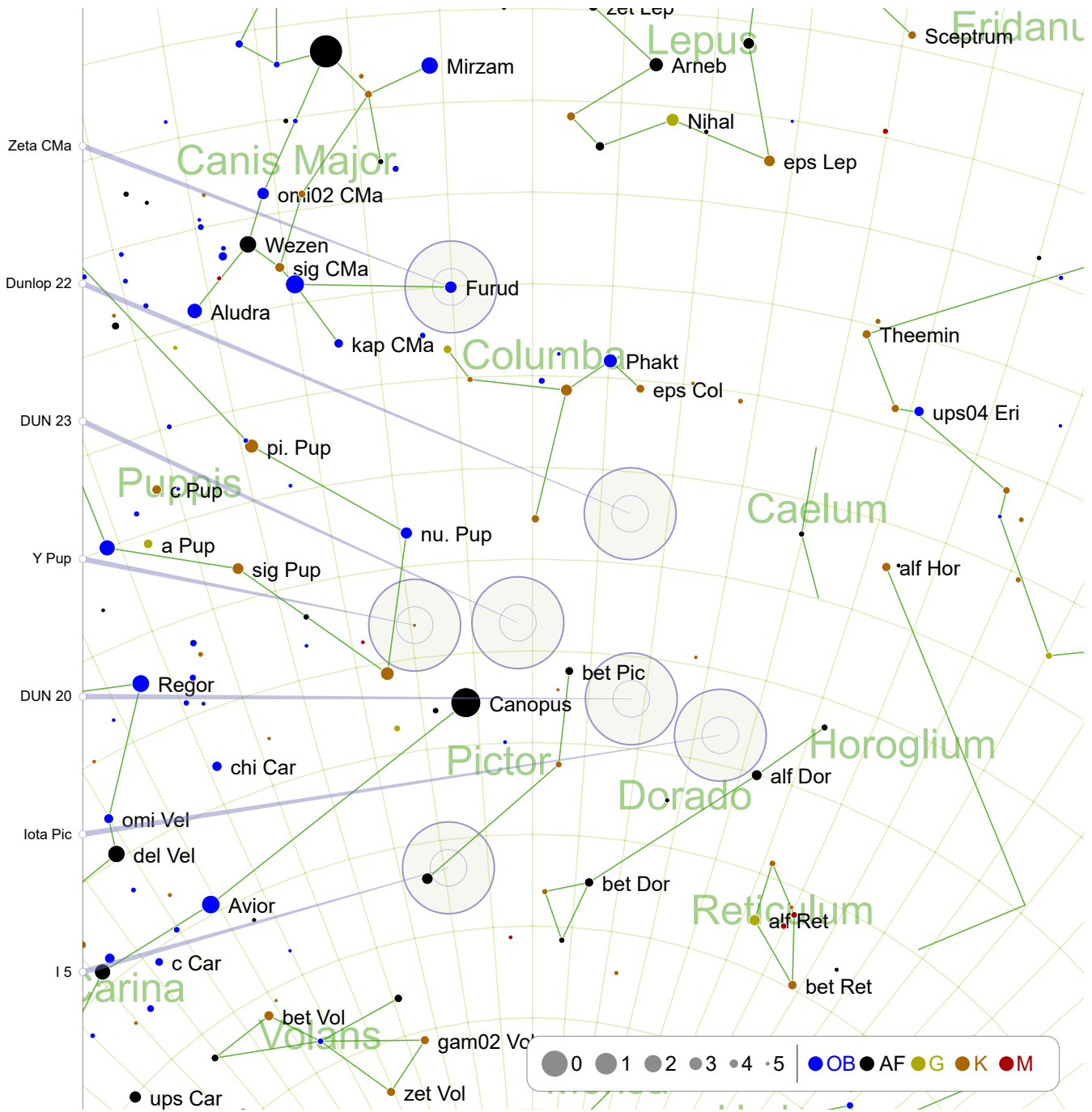
SAO 173446 | HIP 35415 | GDR2 13676667392

A brilliant blue primary with two faint stars close to the east, and a brighter component some distance beyond them.

One and a half degrees NNE from magnitude 3.83 ome CMa. Half a finder circle NEE from magnitude 1.98 Wezen.

Tau CMA dominates open cluster Caldwell 64 (also known as the Tau CMA cluster).

December: -45° South

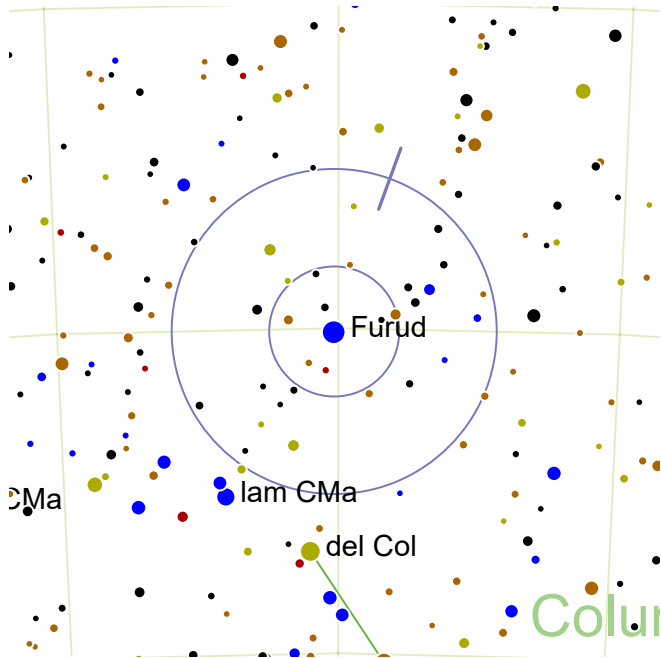


Zeta CMa: page 158
DUN 20: page 160

Dunlop 22: page 158
Iota Pic: page 160

DUN 23: page 159
I 5: page 161

Y Pup: page 159



Zeta CMA

RA: 95.08° | 6h 20.3' — DEC: -30.05° | -30° 2'

Magnitude: 3.0 | 7.7

Separation: 169.6"

Position Angle: 340°

SAO 196698 | HIP 30122



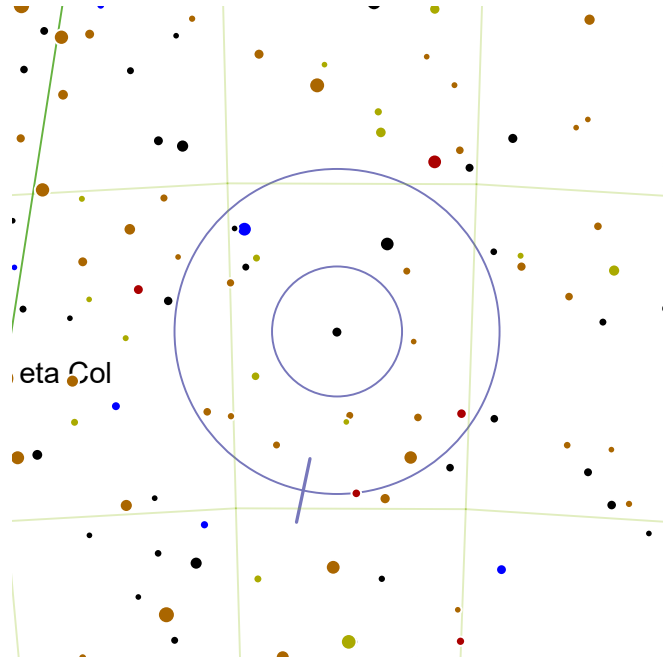
A brilliant bluish primary distantly separated from a fairly apparent orange secondary.



Zeta CMA is a bright star in Canis Major. One finder circle NWW from magnitude 3.78 kap CMA.



Also known as Furud. Arabic astronomers gave the name Furud ("the solitary ones") to many otherwise anonymous stars, but the name has been officially granted to Zeta CMA by the IAU.



Dunlop 22

RA: 82.8° | 5h 31.19' — DEC: -42.3° | -42° 17'

Magnitude: 7.2 | 7.8

Separation: 7.3"

Position Angle: 168°

SAO 217374 | HIP 25856 | GDR2 76992118784



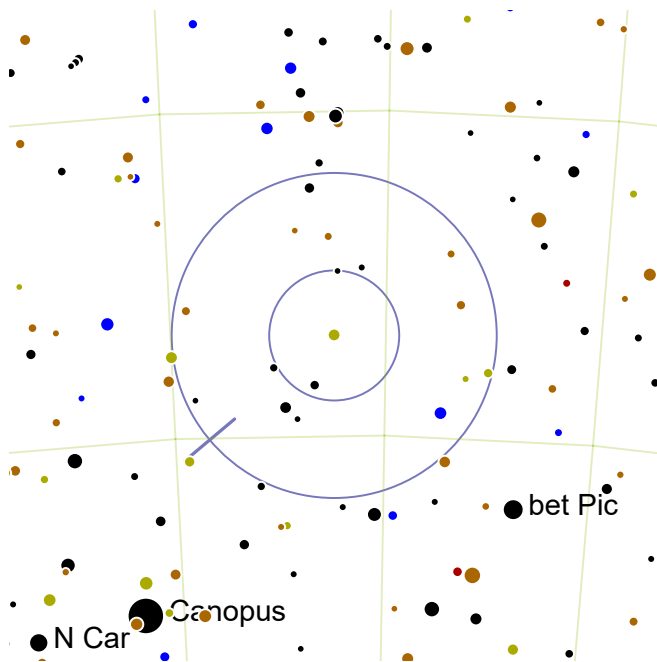
A close and balanced pair with a white primary.



One finder circle S from magnitude 3.92 eps Col.



Caldwell 73, a magnitude 7.2 globular cluster, is one finder circle to the north west.



DUN 23

RA: 91.2° | 6h 4.8' — DEC: -48.47° | -48° 27'

Magnitude: 7.3 | 7.7

Separation: 2.6"

Position Angle: 130°

SAO 217708 | HIP 28796 | GDR2 85020871424



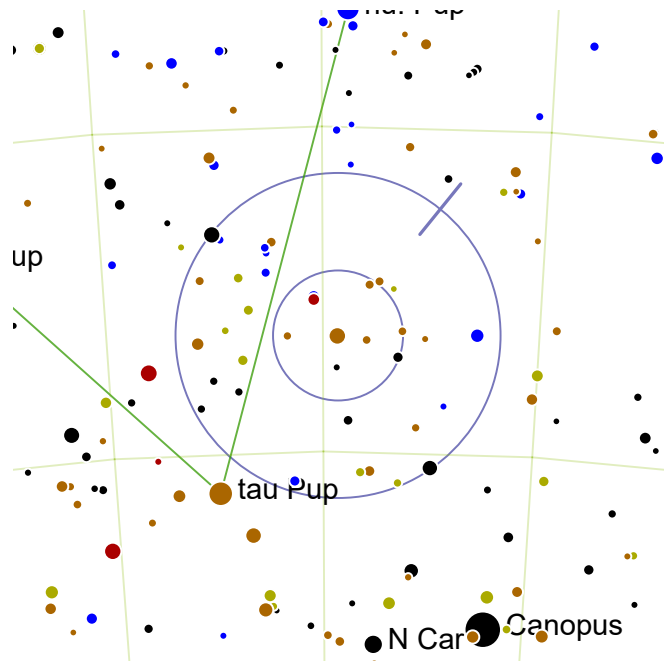
An equal pair of yellow stars, very closely separated.



Half a finder circle NE from magnitude 3.94 bet Pic. Two and a half finder circles SSE from magnitude 3.92 eps Col.



The binary system is only 98 light-years from Earth. The primary is an eruptive variable star designated as V575 Pup.



Y Pup

RA: 99.65° | 6h 38.6' — DEC: -48.22° | -48° 12'

Magnitude: 5.1 | 7.4

Separation: 12.9"

Position Angle: 321°

SAO 218093 | HIP 31765 | GDR2 86235237248



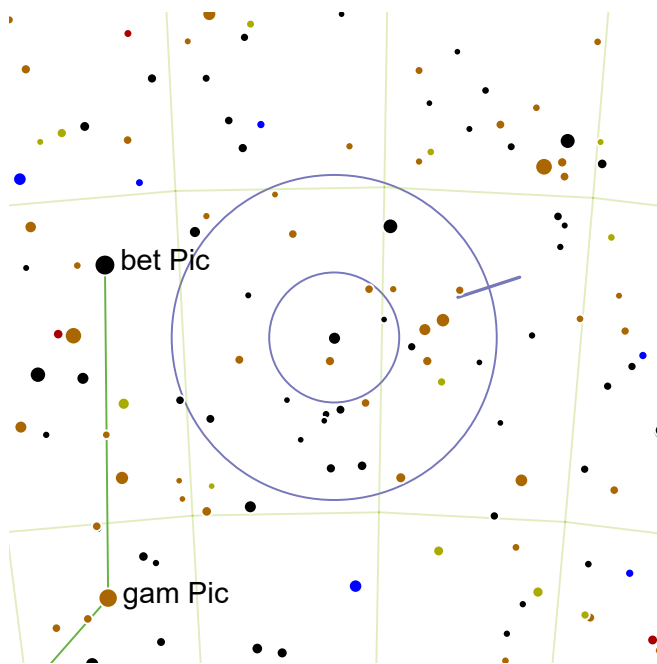
A bright yellow-orange primary easily separated from a very slightly bluish secondary.



Half a finder circle NW from magnitude 2.83 tau Pup. One and a half finder circles NEE from magnitude 3.94 bet Pic.



Half a degree to the north east, HIP 31966 (mag. 6.7) and HIP 31962 (mag 6.7) form a lovely very wide but equal orange and blue pairing (192" separation),



DUN 20


RA: 81.2° | 5h 24.8' — DEC: -52.32° | -52° 18'


Magnitude: 6.2 | 6.7


Separation: 38.3"

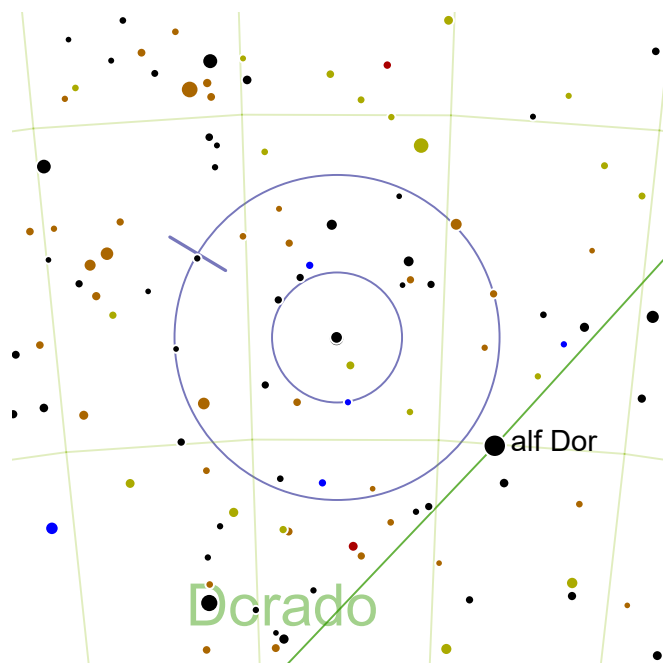
Position Angle: 288°

SAO 233965 | HIP 25303 | GDR2 29385988992

 A balanced and widely separated pair of fairly bright, white stars.

 Half a finder circle SWW from magnitude 3.94 bet Pic. Two finder circles N from magnitude 3.81 bet Dor.

 The primary is also double, being a balanced pair of stars separated by a mere 0.4".



Iota Pic


RA: 72.72° | 4h 50.89' — DEC: -53.45° | -53° 26'


Magnitude: 5.6 | 6.2

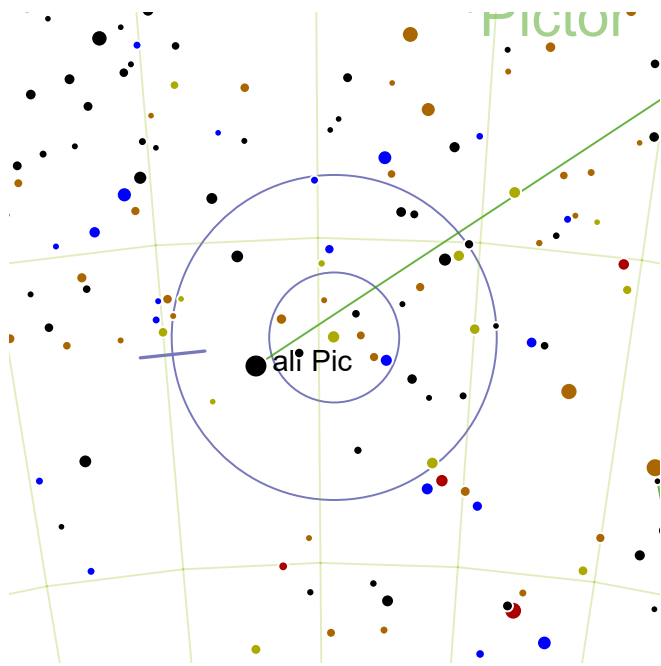
Separation: 12.8"

Position Angle: 59°

SAO 233709 | HIP 22531 | GDR2 72882315648

 An easily separated, balanced pair of bright yellowish stars.

 Half a finder circle NEE from magnitude 3.47 alf Dor. One and a half finder circles SWW from magnitude 3.94 bet Pic.



15

RA: 99.5° | 6h 38.0' — DEC: -61.53° | -61° 31'

Magnitude: 6.3 | 8.8

Separation: 1.0"

Position Angle: 96°

SAO 249604 | HIP 31711 | GDR2 65278589568



An extremely tight pair dominated by a fairly bright, yellow primary.



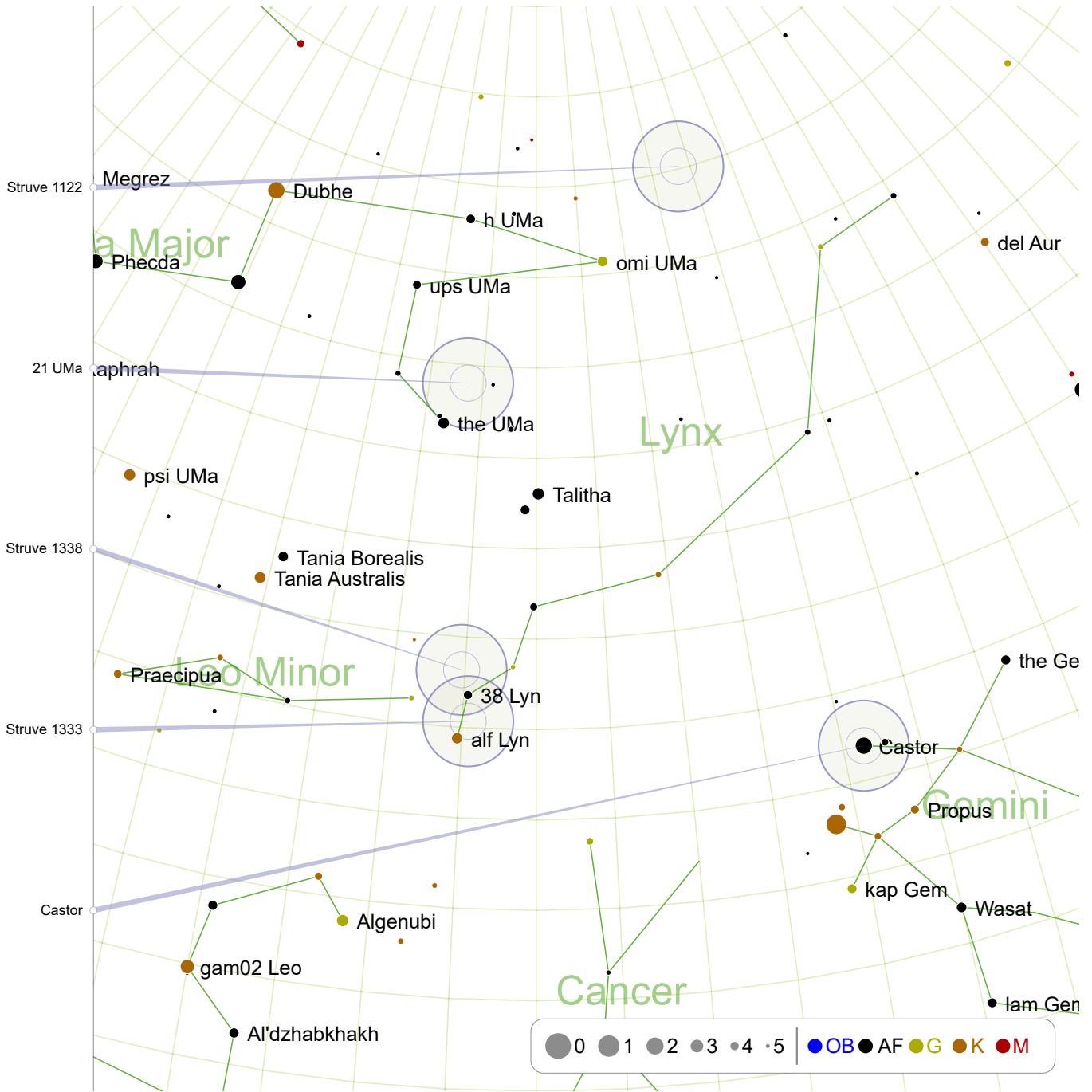
One degree NWW from magnitude 3.3 alf Pic. One and a half finder circles E from magnitude 3.81 bet Dor.



The primary is slightly variable, designated as AK Pictoris.

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February: 45° North (1)



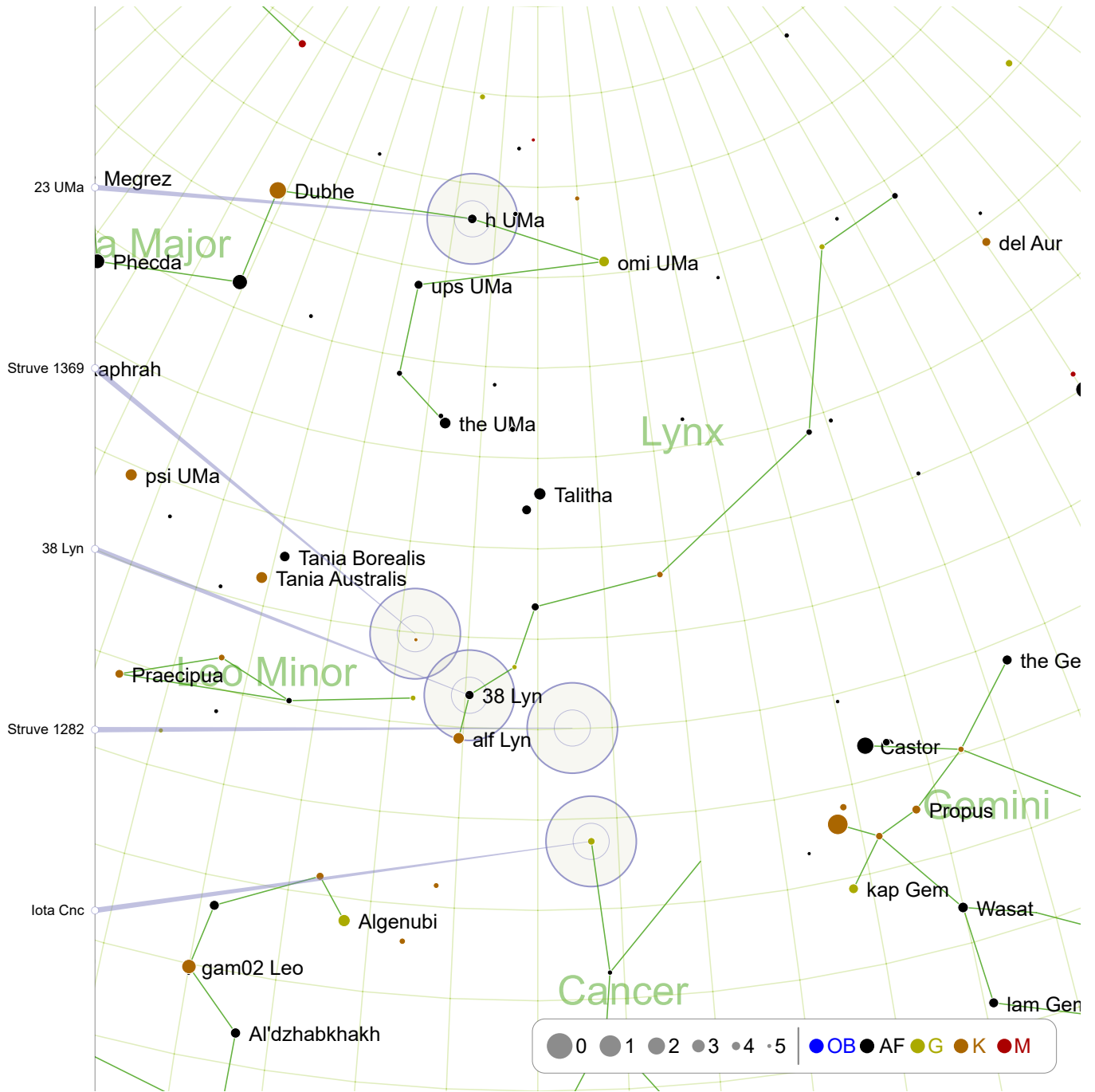
Struve 1122: page 165
Castor: page 167

21 UMa: page 165

Struve 1338: page 166

Struve 1333: page 166

February: 45° North (2)



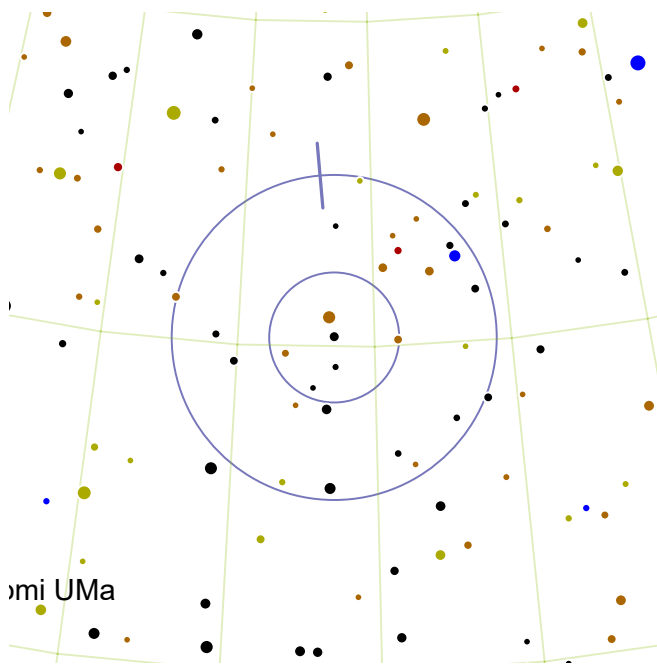
23 UMa: page 167

Struve 1369: page 168

38 Lyn: page 168

Struve 1282: page 169

Iota Cnc: page 169



Struve 1122

RA: 116.48° | 7h 45.89' — DEC: 65.15° | 65° 9'

Magnitude: 7.8 | 7.8

Separation: 15.4"

Position Angle: 5°

SAO 14312 | HIP 37884 | GDR2 30663886080



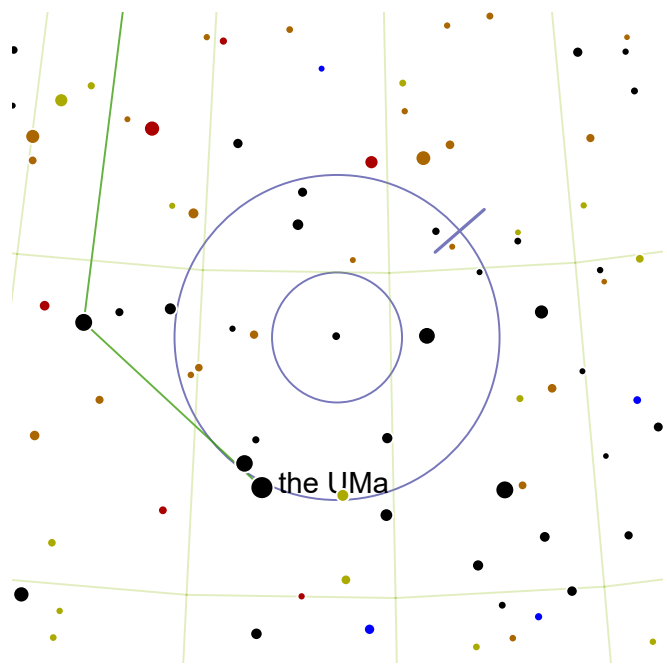
An equal and easily separated pair of white stars.



Starting from magnitude 3.35 Muscida (the great bear's nose), move one and a half finder circles north-west.



A degree to the north west of this double is Caldwell 7, NGC 2403, a relatively bright spiral galaxy with many luminous star-forming regions.



21 UMa

RA: 141.4° | 9h 25.6' — DEC: 54.02° | 54° 1'

Magnitude: 7.8 | 8.8

Separation: 5.7"

Position Angle: 311°

SAO 27249 | HIP 46239 | GDR2 88145841408



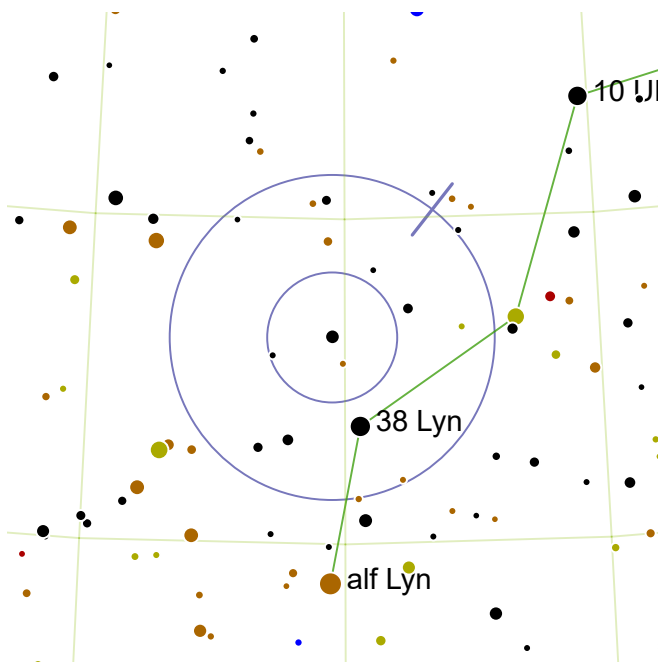
A close yellow-blue pair.



Half a finder circle north and slightly west of Alhaud V, the magnitude 3.15 star in the middle of the great bear's front leg.



Three degrees south of this double is the active galaxy NGC 2841.



Struve 1338

RA: 140.25° | 9h 20.99' — DEC: 38.18° | 38° 11'

Magnitude: 6.72 | 7.08

Separation: 1.00"

Position Angle: 322°

SAO 61411 | HIP 45858 | GDR2 6439695232



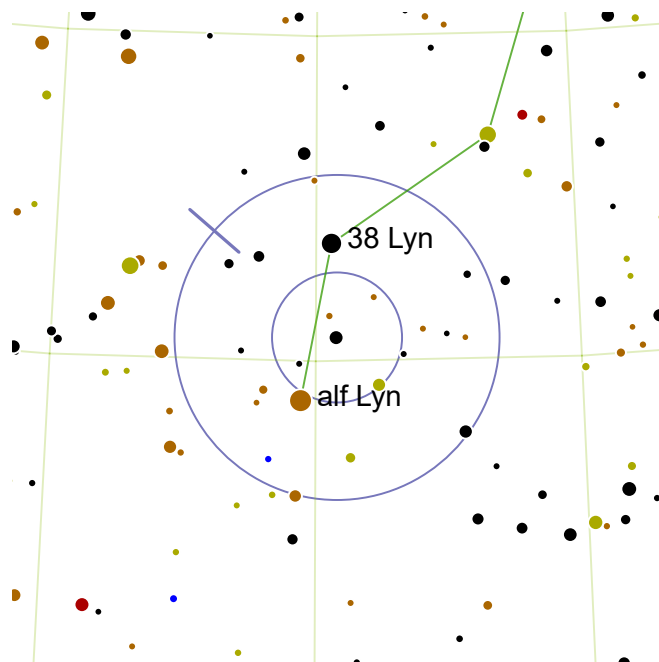
The tightest double in this book, Struve 1338 consists of two well-balanced white stars split by a mere arc second.



Just over a degree north of 38 Lyncis. There are no other equally bright stars within a degree of Struve 1338.



In all but very large telescopes and very good seeing conditions, the most that can be achieved is a slight elongation of the star.



Struve 1333

RA: 139.6° | 9h 18.39' — DEC: 35.37° | 35° 22'

Magnitude: 6.4 | 6.7

Separation: 1.6"

Position Angle: 49°

SAO 61387 | HIP 45661 | GDR2 3219596800



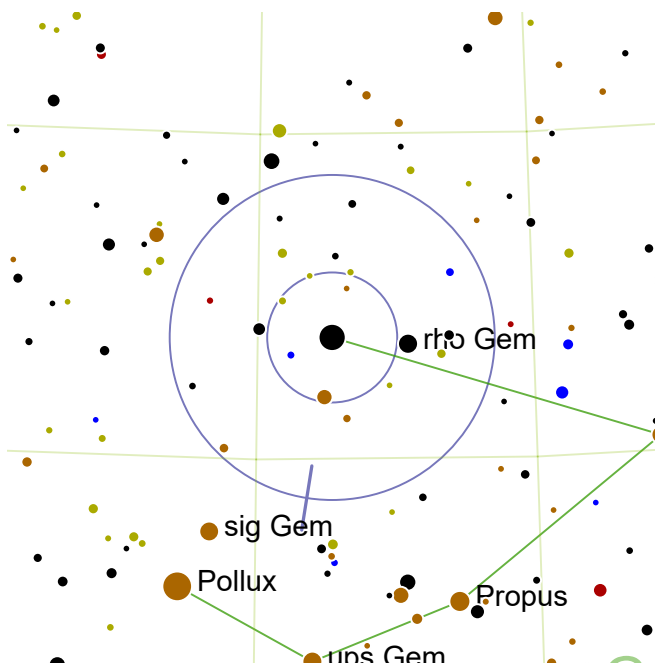
A challenging pair of equal white stars separated by less than two arc seconds.



Located a degree north of Alpha Lyncis, midway to 38 Lyncis.



Once you have Struve 1333 in view, the fine doubles 38 Lyncis, Struve 1338, Struve 1369 and Struve 1282 are short hops away.



Castor

RA: 113.65° | 7h 34.6' — DEC: 31.88° | 31° 53'

Magnitude: 1.9 | 2.9

Separation: 2.2"

Position Angle: 171°

SAO 60198 | HIP 36850 | GDR2 4913021056



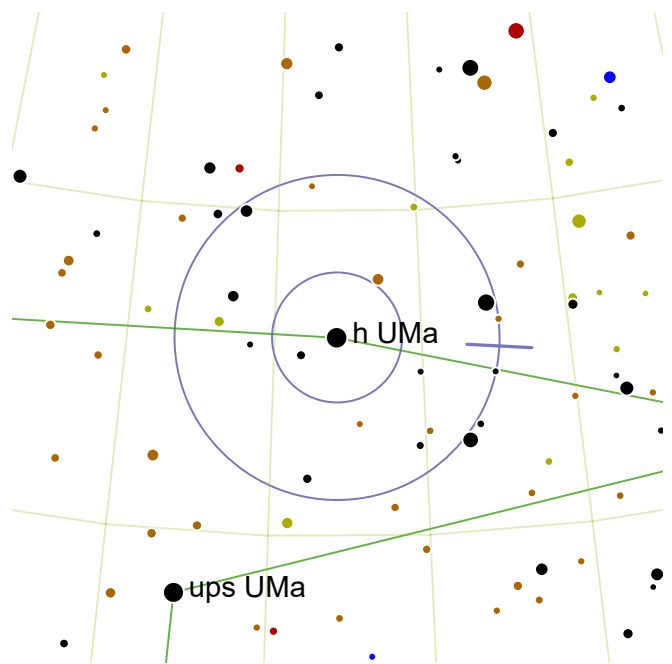
A tight pair of very brilliant, bluish stars.



Castor is one of the brightest stars in the sky, forming a wide visual pair with Pollux.



Perhaps you are like me and occasionally confuse Castor for its evil twin Pollux. For reference, Castor is the one to the north!



23 UMa

RA: 142.88° | 9h 31.5' — DEC: 63.07° | 63° 4'

Magnitude: 3.7 | 9.2

Separation: 22.7"

Position Angle: 267°

SAO 14908 | HIP 46733 | GDR2 89128664960



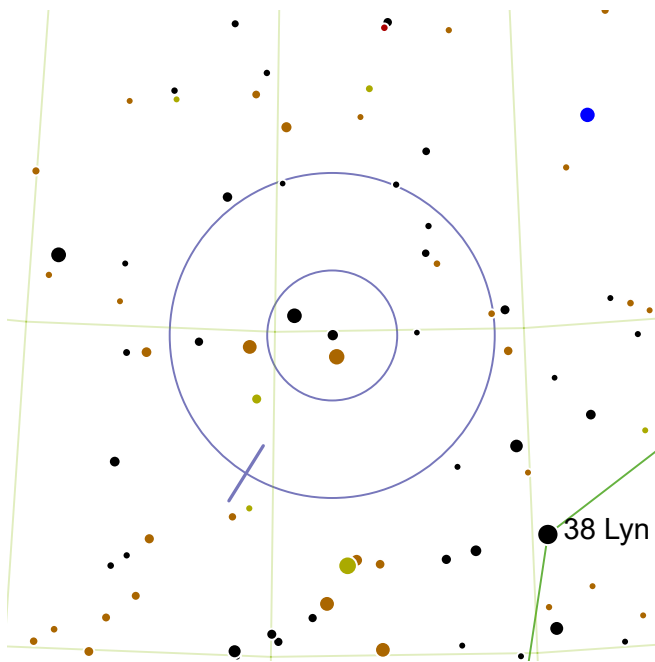
A brilliant yellowish primary well separated from a faint secondary.



23 UMa is a bright star in Ursa Major. Two finder circles NWW from magnitude 1.95 Dubhe.



Located nearly 78 light-years from Earth, the primary of this gravitationally bound system burns with nearly 15 times the light of the Sun.



Struve 1369

RA: 143.85° | 9h 35.39' — DEC: 39.95° | 39° 57'

Magnitude: 7.0 | 8.0

Separation: 24.7"

Position Angle: 148°

SAO 42931 | HIP 47053 | GDR2 9701758080



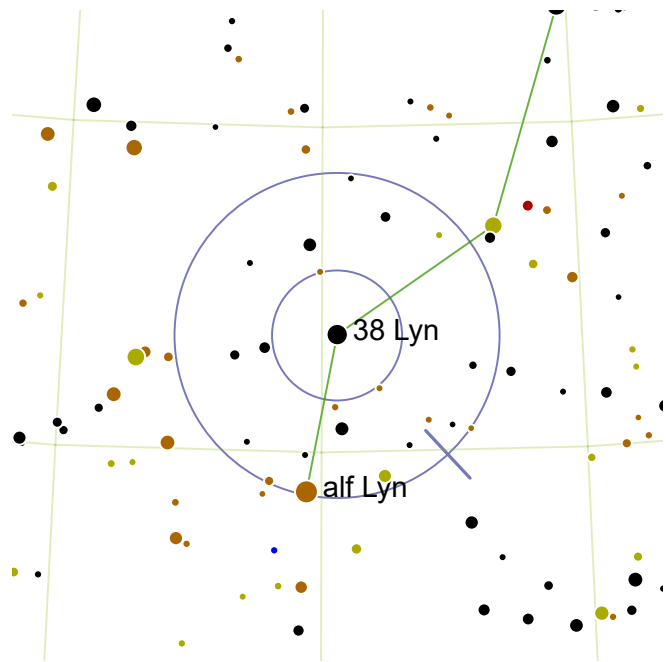
An orange-yellow pair, widely separated.



One and a half finder circles north-east of Struve 1333.



The primary is an eclipsing binary system with a period of 1.68 days.



38 Lyn

RA: 139.71° | 9h 18.84' — DEC: 36.8° | 36° 48'

Magnitude: 3.92 | 6.09

Separation: 2.62"

Position Angle: 223°

SAO 61391 | HIP 45688 | GDR2 8347151360



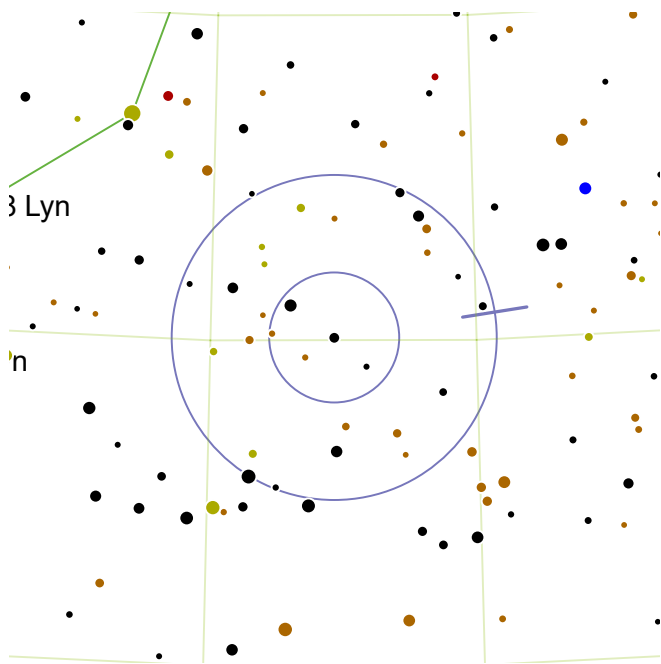
A bright white primary narrowly separated from a brightish white secondary.



Look for the bright star nearly 3 degrees north of Alpha Lyncis.



A dim galaxy, NGC 2859, lies 2.5 degrees SSE of this double.



Struve 1282

RA: 132.68° | 8h 50.7' — DEC: 35.07° | 35° 4'

Magnitude: 7.5 | 7.5

Separation: 3.6"

Position Angle: 279°

SAO 61077 | HIP 43426 | GDR2 1236997888



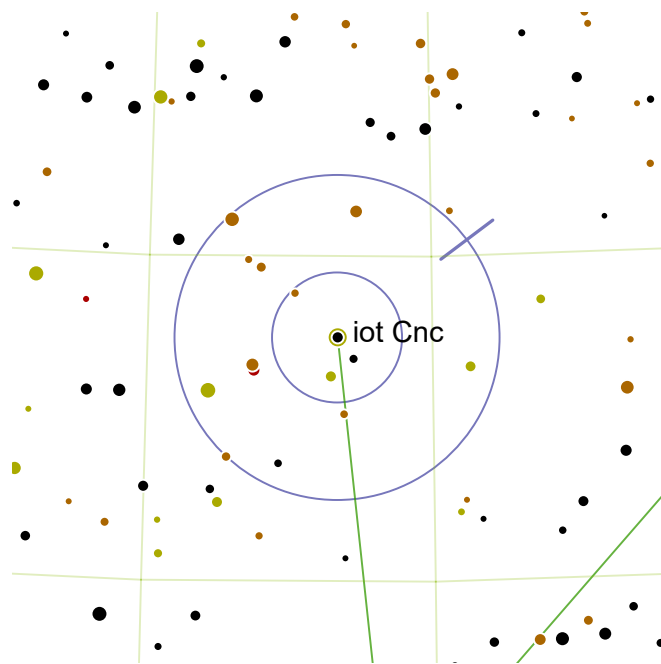
A faint double consisting of two equal and very close yellow stars.



Two finder circles west of Struve 1333.



The primary is a main-sequence F8 star, so it is somewhat brighter and less yellow than our Sun.



Iota Cnc

RA: 131.68° | 8h 46.7' — DEC: 28.77° | 28° 46'

Magnitude: 4.2 | 6.6

Separation: 30"

Position Angle: 307°

SAO 80416 | HIP 43103 | GDR2 0011771264



A strongly colored deeply yellow and blue pair. The separation is wide but both components are bright.



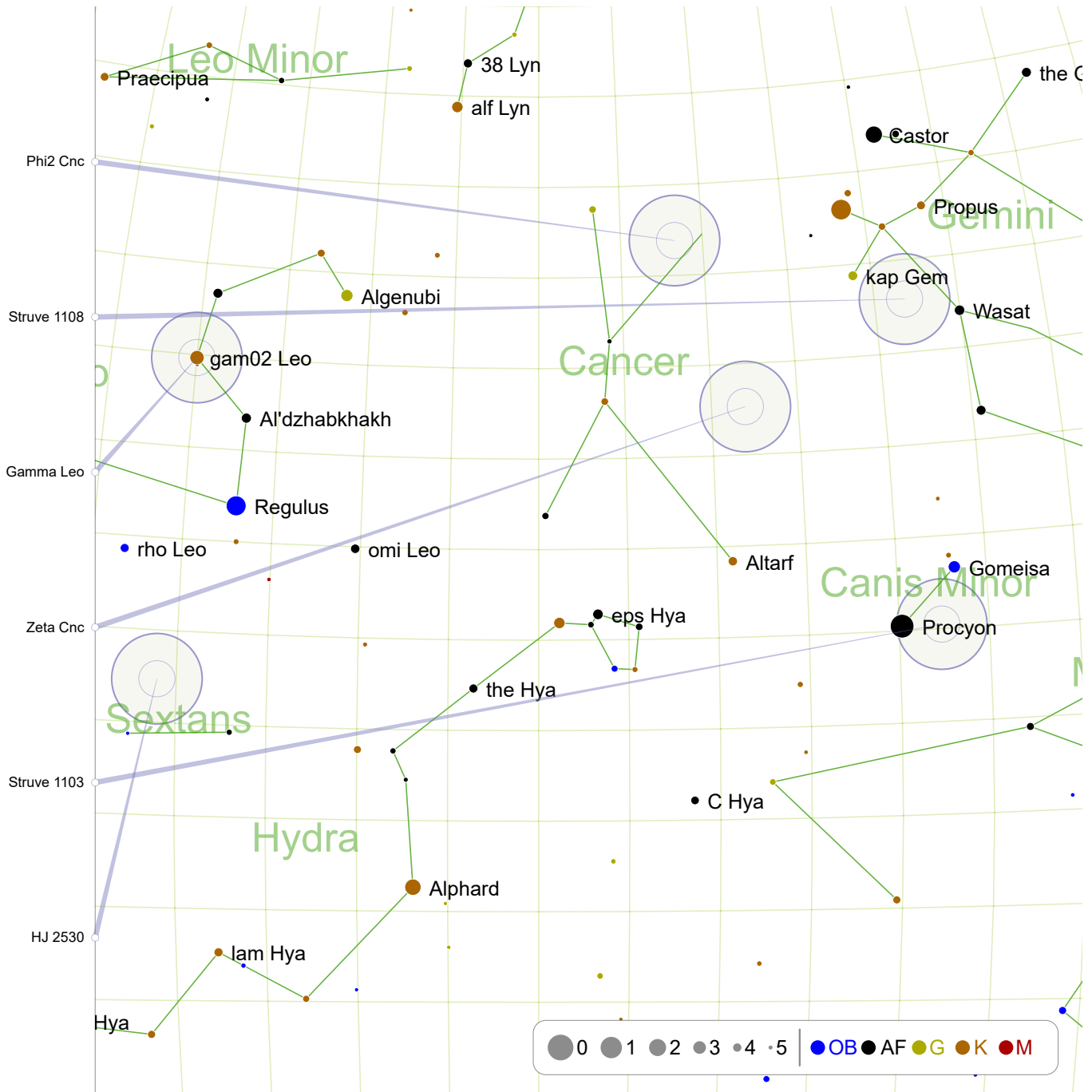
Iota Cancri is a finder circle to the north east of Phi2 Cancri.



The yellow primary is a G-class giant star over 200 times brighter and 3.5 times more massive than the Sun, while secondary is a main-sequence dwarf roughly twice the mass of the Sun and only 16 times brighter.

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February: 10° North (1)



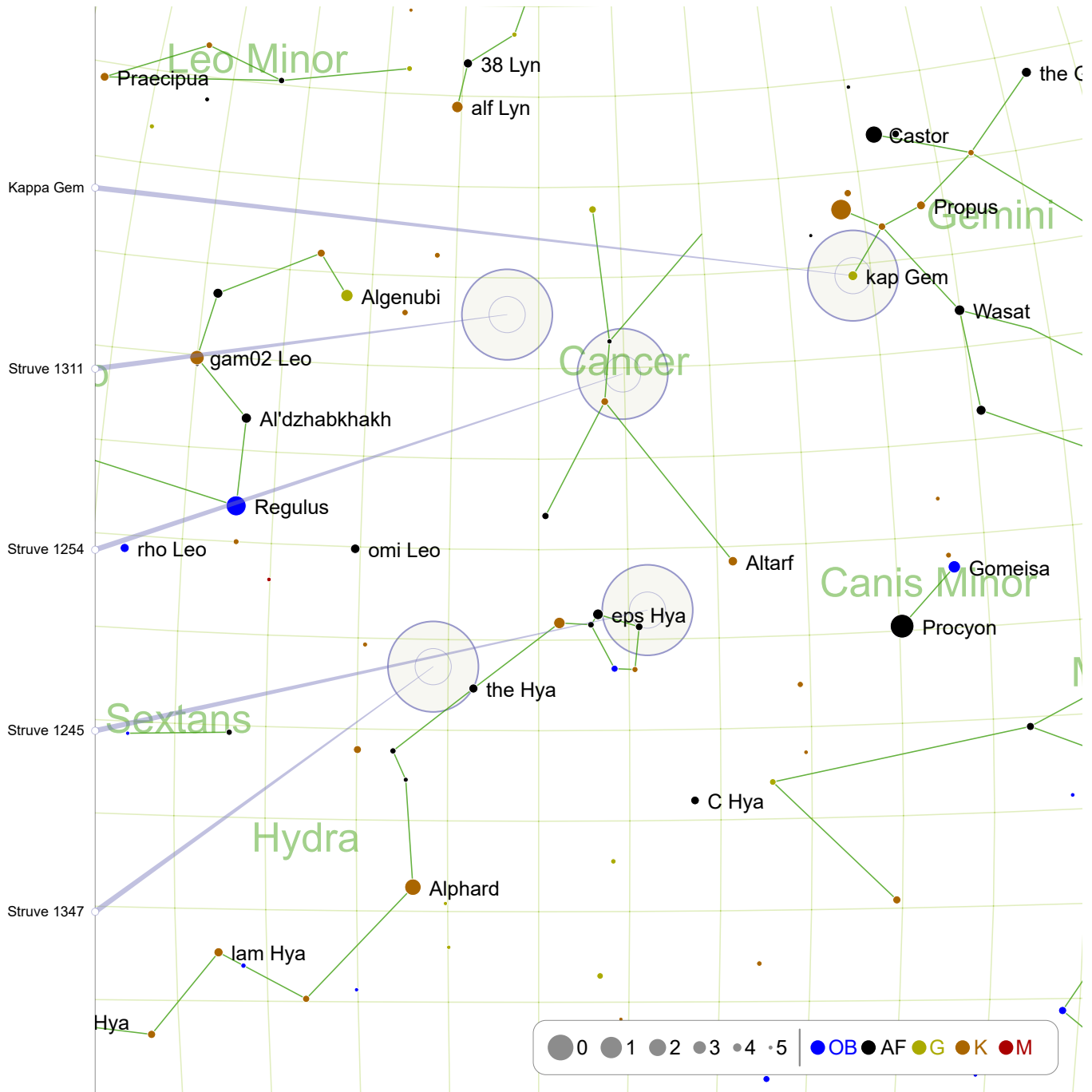
Phi2 Cnc: page 173
 Struve 1103: page 175

Struve 1108: page 173
 HJ 2530: page 175

Gamma Leo: page 174

Zeta Cnc: page 174

February: 10° North (2)

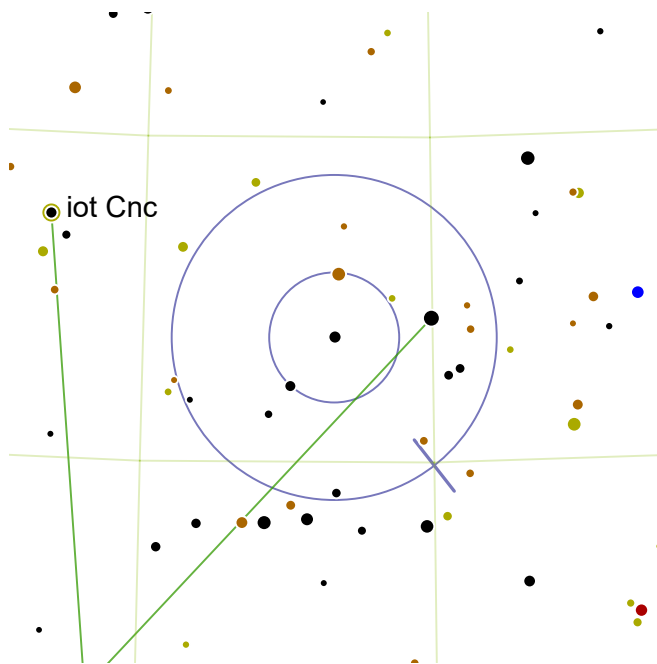


Kappa Gem: page 176
 Struve 1347: page 178

Struve 1311: page 176

Struve 1254: page 177

Struve 1245: page 177



Phi2 Cnc




RA: 126.7° | 8h 26.8' — DEC: 26.93° | 26° 56'

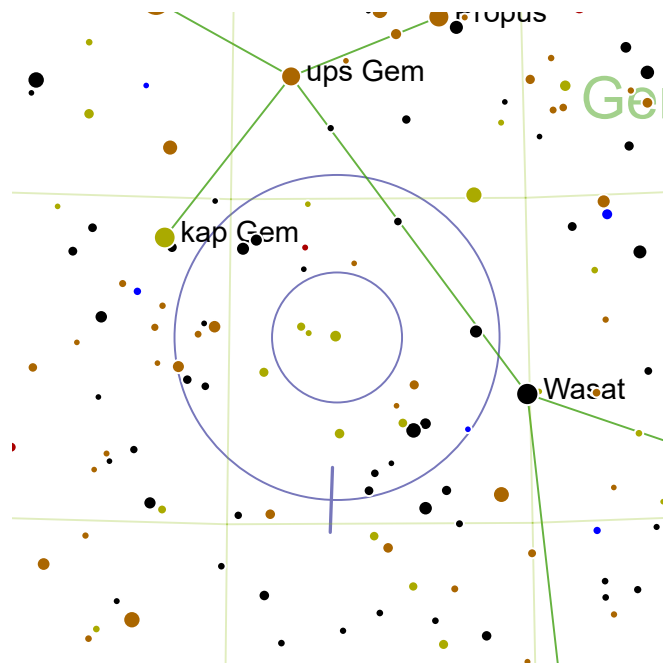
Magnitude: 6.3 | 6.3

Separation: 5.1"

Position Angle: 218°

SAO 80188 | HIP 41404 | GDR2 0631907456

-  Two identical bright white stars nearly touching each other.
-  Track east by two finder circles from Pollux to Algeiba. Phi2 is in the middle of a Y of relatively dim stars.
-  Once you have found this one, the good news is lovely Iota Cancri is a finder circle away to the north east.



Struve 1108




RA: 113.2° | 7h 32.8' — DEC: 22.88° | 22° 53'

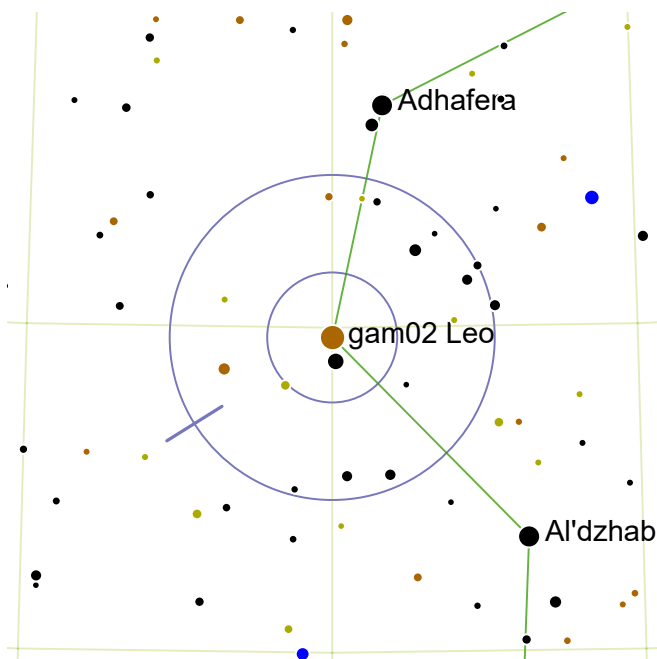
Magnitude: 6.6 | 8.3

Separation: 11.5"

Position Angle: 178°

SAO 79489 | HIP 36690 | GDR2 3847454592

-  A yellow primary comfortably separated from a blue secondary.
-  Struve 1108 lies one and a half finder circles east of Wasat, which marks the hips of Pollux. Wasat is a worthy double star in its own right.
-  With this double centered in the finder, the Eskimo Nebula (a planetary nebula) lies on the SSW edge of the finder circle. Open cluster NGC 2420 is in the SE quadrant of the finder.



Gamma Leo

RA: 155.0° | 10h 20.0' — DEC: 19.85° | 19° 51'

Magnitude: 2.2 | 3.5

Separation: 4.4"

Position Angle: 122°

SAO 81298 | HIP 50583



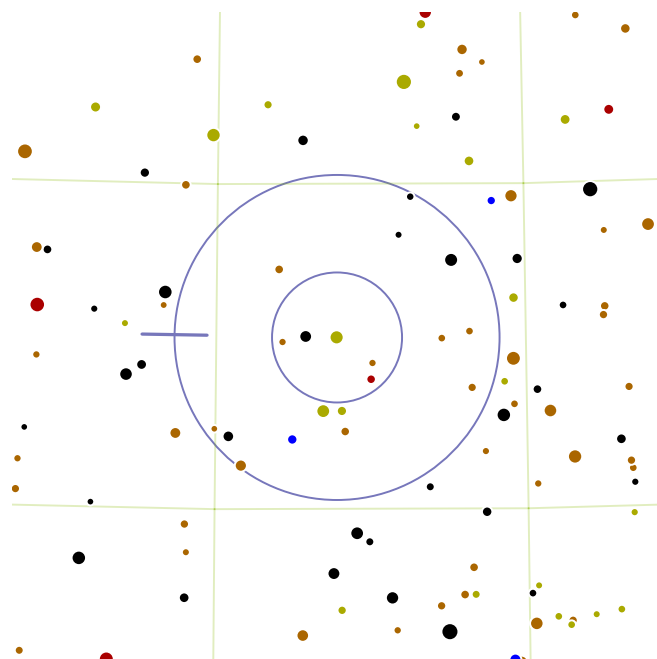
Known variously as Gamma Leonis or Algeiba, this is one of the finest yellow-yellow doubles, being both bright, fairly balanced and tightly bound.



Unmissable as the bright star at the base of Leo's head.



The components are at least 170 astronomical units apart and orbit each other in roughly 500 years. The A component has at least one exoplanet.



Zeta Cnc

RA: 123.05° | 8h 12.19' — DEC: 17.65° | 17° 39'

Magnitude: 5.6 | 6.0

Separation: 5.9"

Position Angle: 89°

SAO 97646 | HIP 40167 | GDR2 1593509376



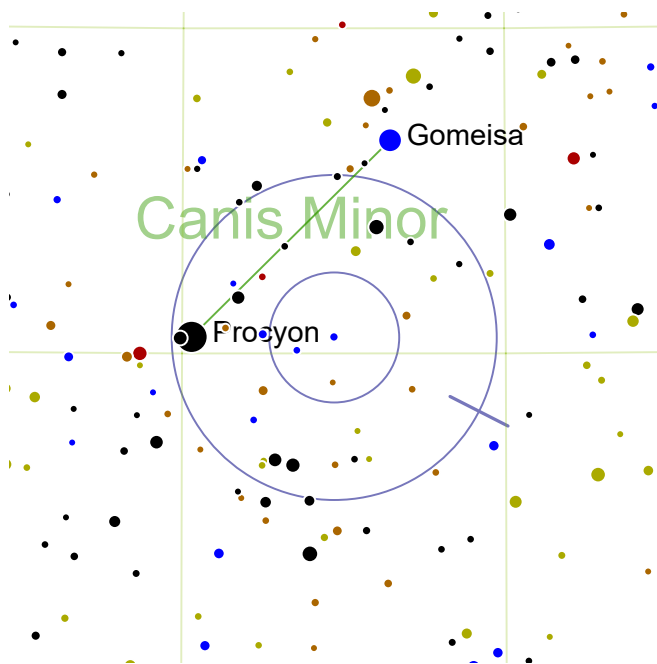
An equal pair of closely bound and bright yellow stars.



Castor and Pollux point south to this double. Follow the imaginary line south-east for three times the separation of Castor and Pollux.



One and a half finder circles NEE is the wonderful Beehive Cluster. Under dark skies this cluster rivals the Pleiades as a naked-eye sight!



Struve 1103




RA: 112.65° | 7h 30.6' — DEC: 5.25° | 5° 15'

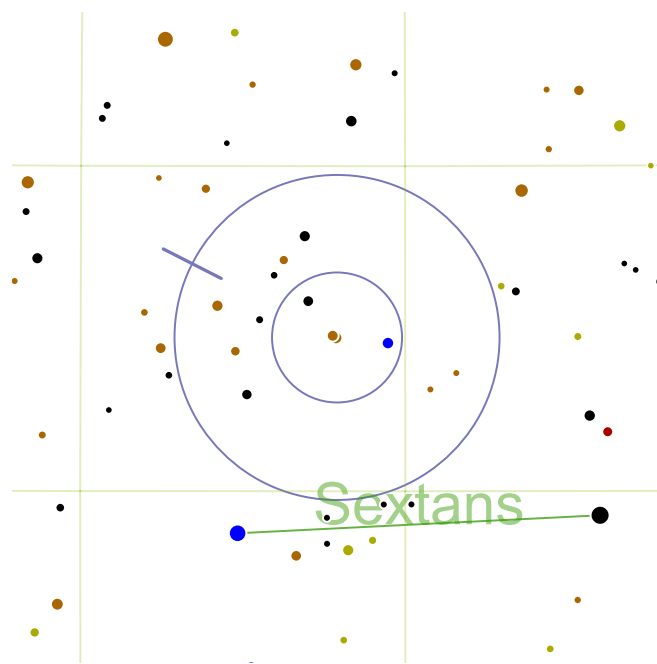
Magnitude: 7.7 | 9.2

Separation: 4.4"

Position Angle: 243°

SAO 115532 | HIP 36499 | GDR2
3141290328124151680

-  A close but relatively faint yellow-blue pairing.
-  Position brilliant Procyon on the eastern edge of the finder; Struve 1103 should be in the center.
-  Procyon is a fine and extremely challenging double star, similar to but harder than Sirius as it is a bright nearby star and its companion is a dim white dwarf (magnitude difference 10.34, position angle 328°, separation 4.8").



HJ 2530




RA: 156.05° | 10h 24.2' — DEC: 2.37° | 2° 22'

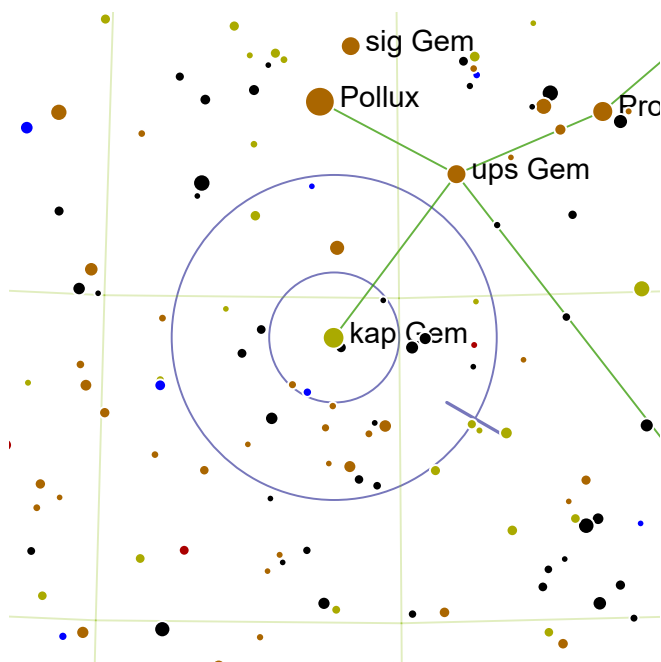
Magnitude: 6.4 | 6.7

Separation: 201.6"

Position Angle: 63°

SAO 118278 | HIP 50939 | GDR2 23812160640

-  An bright equal pair, extremely widely separated. Best enjoyed in the finder scope!
-  One finder circle SSW from magnitude 3.85 rho Leo.
-  The primary is a nearby yellow star slightly cooler than our Sun, and is only 307 light-years away. The secondary component is not gravitationally bound.



Kappa Gem




RA: 116.1° | 7h 44.39' — DEC: 24.4° | 24° 24'

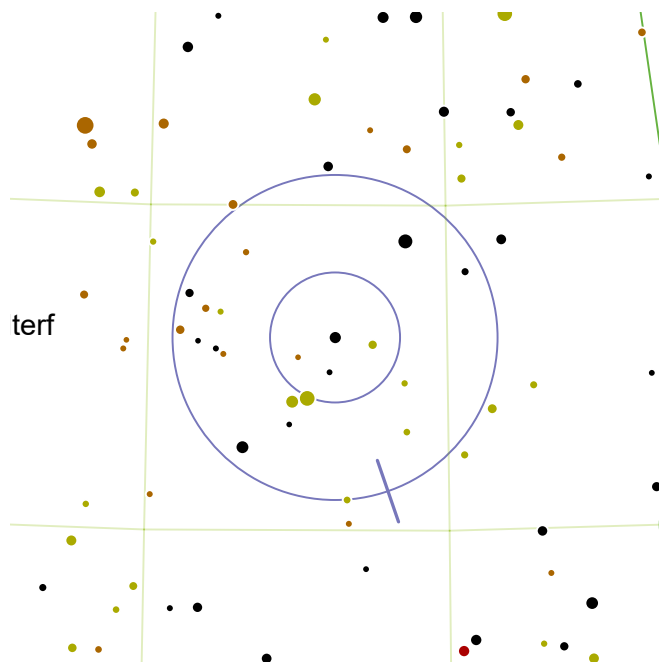
Magnitude: 3.6 | 8.1

Separation: 7.1"

Position Angle: 240°

SAO 79653 | HIP 37740 | GDR2 9158182656

-  A brilliant orange primary with a small blue companion close by.
-  Kappa Geminorum is Pollux's right hand, the southernmost of the stars marking their linked arms.
-  The primary, 68 times brighter than the Sun, is 11 times larger than our star by radius. The system is roughly two billion years old and lies 141 light-years away.



Struve 1311




RA: 136.88° | 9h 7.5' — DEC: 22.98° | 22° 59'

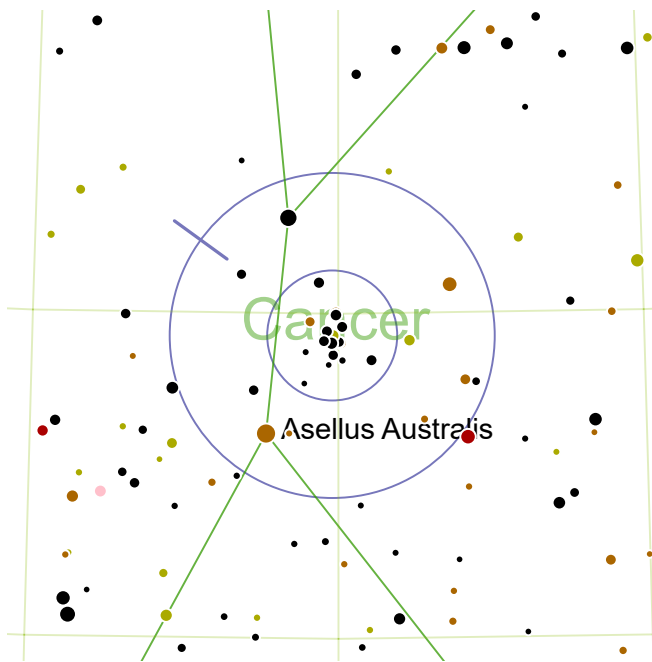
Magnitude: 6.9 | 7.1

Separation: 7.5"

Position Angle: 199°

SAO 80643 | HIP 44768 | GDR2 7313623168

-  A close pair of equal yellowish stars.
-  One and a half finder circles W from magnitude 3.12 Algenubi. Two finder circles SSW from magnitude 3.3 alf Lyn.
-  Only 190 light-years from Earth, this system is composed of two F-class stars. Larger telescopes might spot a C component (magnitude 13.2, separation 27.8, position angle 117°). The C component is not gravitationally bound to the other two components, and is instead only a background star.



Struve 1254

RA: 130.1° | 8h 40.39' — DEC: 19.67° | 19° 40'

Magnitude: 6.4 | 10.4

Separation: 20"

Position Angle: 54°

SAO 98021 | HIP 42549 | GDR2 0936069632



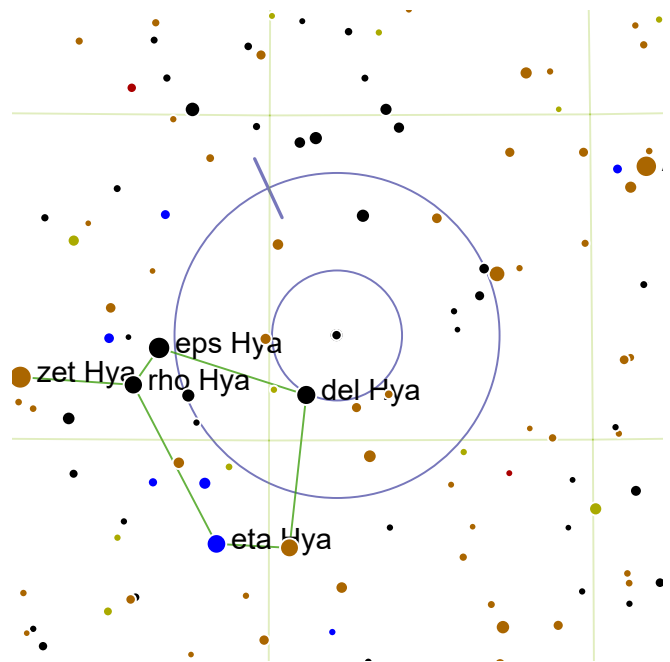
A wide yellow-blue pairing, but the small blue component is very faint.



Found at the very center of the Praesepe cluster.



The primary is a K-class giant 712 light-years from the Sun. It is not clear if the companion is gravitationally bound to the primary, or if this is just a line-of-sight pairing.



Struve 1245

RA: 128.95° | 8h 35.79' — DEC: 6.62° | 6° 37'

Magnitude: 6.0 | 7.2

Separation: 10.3"

Position Angle: 25°

SAO 116929 | HIP 42172 | GDR2 8593414016



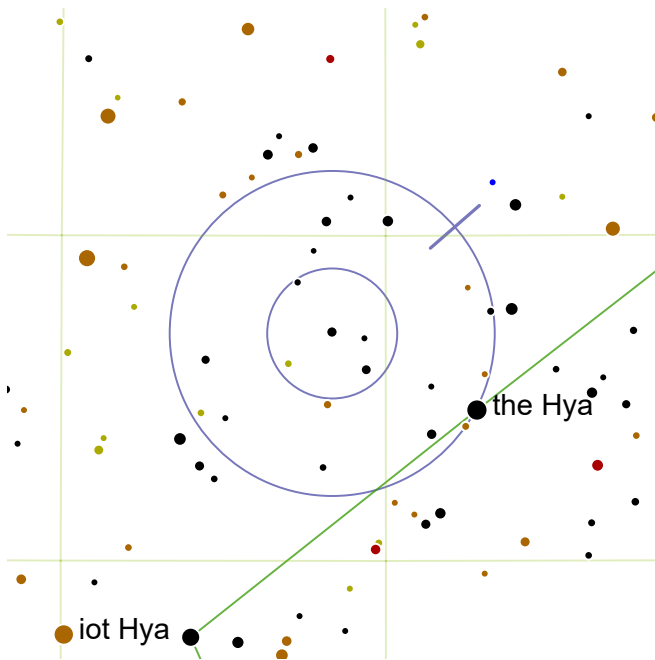
A well matched white-yellow pair, easily separated.



A degree north west of dim Delta Hydra, Struve 1245 might be found more easily by tracking west from Procyon for three finder circles.



Struve 1245 is only 82 light-years from the Sun. The secondary star is similar to the Sun, but slightly cooler.



Struve 1347


RA: 140.82° | 9h 23.29' — DEC: 3.5° | 3° 30'


Magnitude: 7.3 | 8.6


Separation: 21.2"

Position Angle: 311°

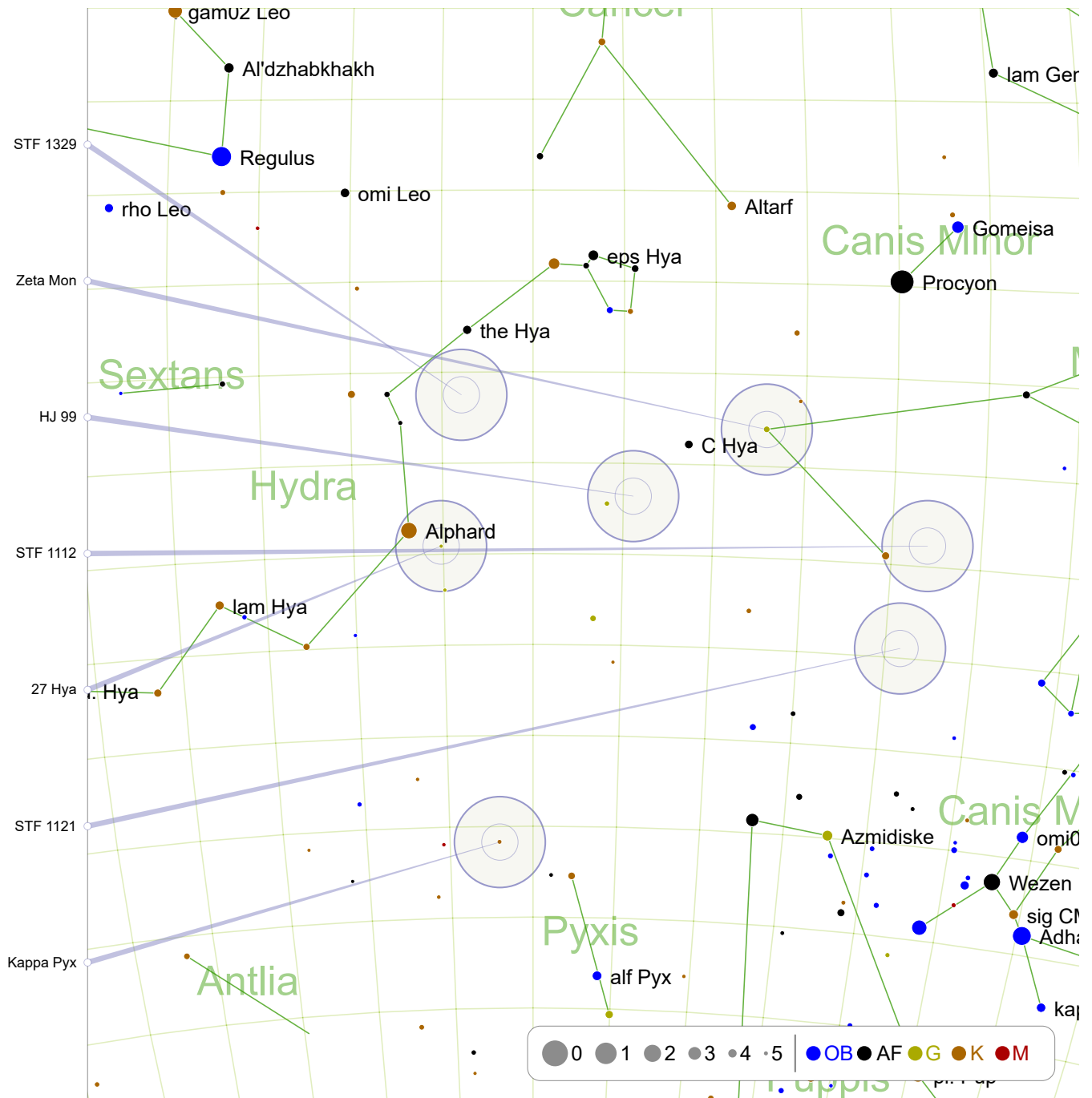
SAO 117641 | HIP 46029

 A wide pair of slightly yellowish stars.

 Three finder circles south west of Regulus. Position magnitude 3.85 Theta Hydra on the south western edge of the finder and Struve 1347 should be in the center.

 This pair of main-sequence stars is only 109 light-years from the Sun.

February: -10° South

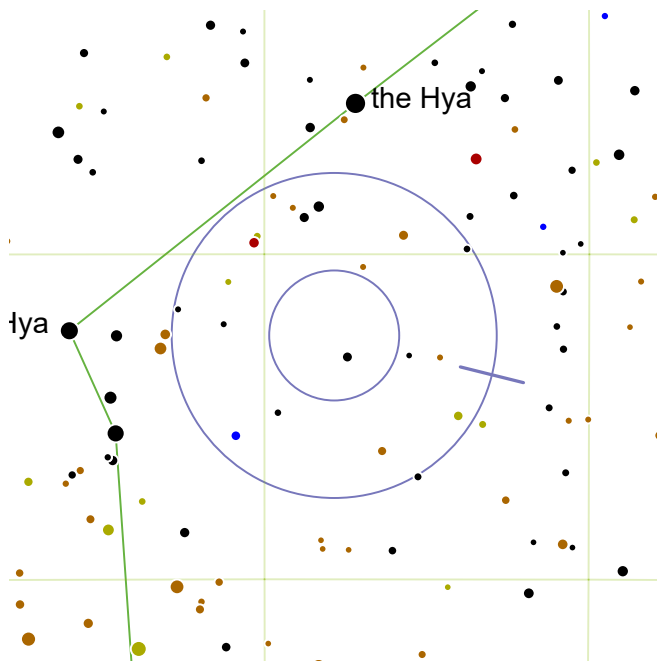


STF 1329: page 180
27 Hya: page 182

Zeta Mon: page 180
STF 1121: page 182

HJ 99: page 181
Kappa Pyx: page 183

STF 1112: page 181



STF 1329

RA: 138.93° | 9h 15.7' — DEC: -1.25° | -1° 14'

Magnitude: 8.7 | 8.7

Separation: 13.1"

Position Angle: 256°

SAO 136705 | GDR2 3841759877320639360



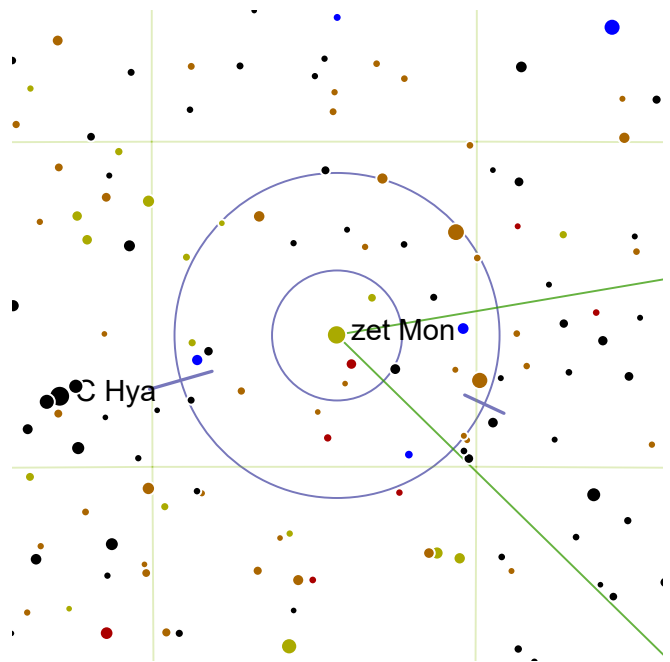
A close and equal yellow pairing.



Half a finder circle S from magnitude 3.84 the Hya. One and a half finder circles SE from magnitude 3.3 zet Hya.



This double is a line of sight pairing. The components are not gravitationally bound.



Zeta Mon

RA: 122.15° | 8h 8.6' — DEC: -2.98° | -2° 58'

Magnitude: 4.5 | 10.3 | 9.7

Separation: 33" | 67"

Position Angle: 106° | 245°

SAO 135551 | HIP 39863



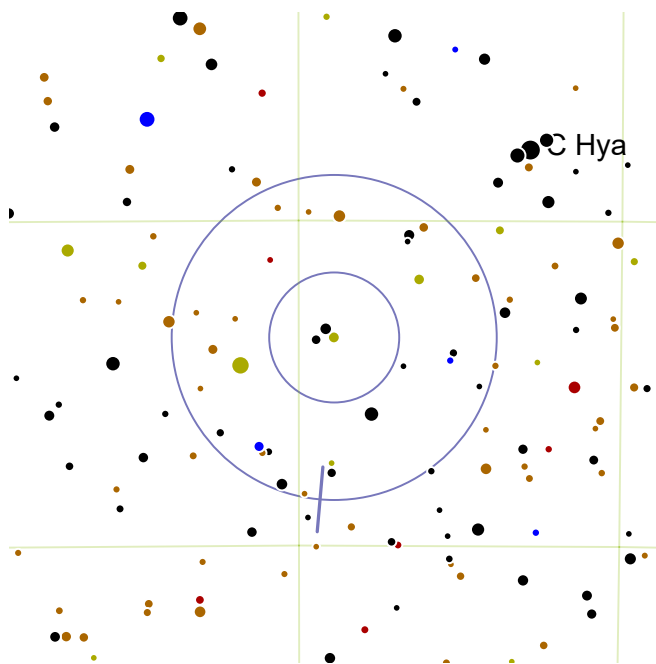
A widely separated triple system with two brighter yellow components and a fainter orange companion.



Two finder circles south east of Procyon.



The main component is yellow supergiant six times the mass of the Sun with 2,200 times the luminosity.



HJ 99




RA: 129.45° | 8h 37.79' — DEC: -6.8° | -6° 47'

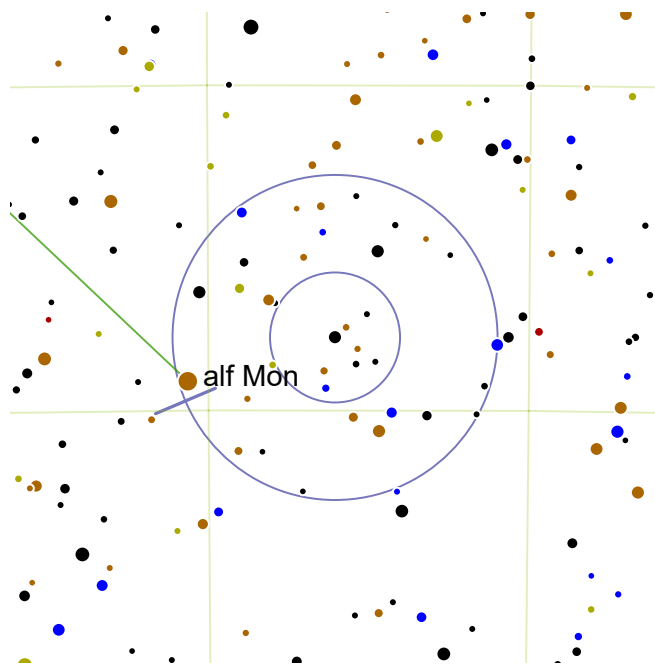
Magnitude: 6.8 | 8.3

Separation: 60.5"

Position Angle: 175°

SAO 136111 | HIP 42333 | GDR2 87956174720

-  A yellow primary with a reasonably balanced secondary, distantly separated.
-  Half a finder circle SE from magnitude 3.95 C Hya. Two finder circles W from magnitude 2.16 Alphard.
-  The primary is also a variable designated V401 Hya (Δ magnitude 0.05).



STF 1112




RA: 113.03° | 7h 32.1' — DEC: -8.88° | -8° 52'

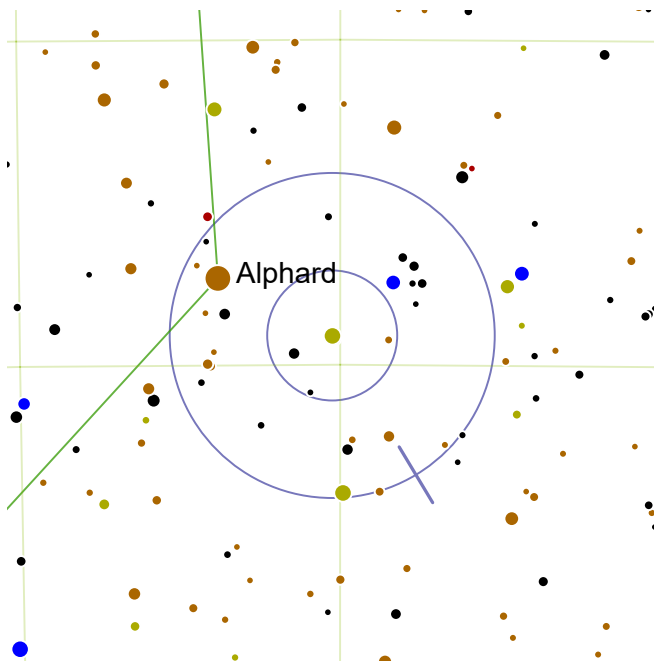
Magnitude: 6.0 | 8.7

Separation: 23.9"

Position Angle: 113°

SAO 134806 | HIP 36640 | GDR2 81541641600

-  A yellow primary widely separated from a somewhat fainter white secondary.
-  Two and a half finder circles NEE from magnitude -1.58 Sirius. Two and a half finder circles SWW from magnitude 3.95 C Hya.
-  The binary system is only 91 light-years from Earth. Open star cluster NGC 2396 (mag. 7.4) lies just beyond the southern edge of the finder circle.



27 Hya

RA: 140.13° | 9h 20.5' — DEC: -9.55° | -9° 32'

Magnitude: 4.8 | 6.9

Separation: 229"

Position Angle: 211°

SAO 136768 | HIP 45811 | GDR2 62061629056



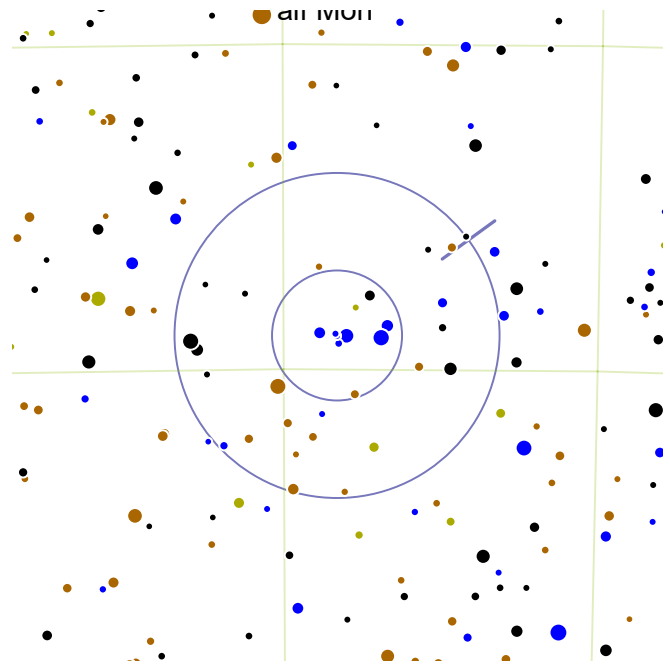
A brilliant orange-yellow primary with a pale yellow secondary, distantly separated.



One degree SWW from magnitude 2.16 Alphard. Two finder circles S from magnitude 3.84 the Hya.



The primary is twice the Sun's mass and roughly 1.9 billion years old, shining with 57.5 the luminosity of the Sun.



STF 1121

RA: 114.15° | 7h 36.6' — DEC: -14.48° | -14° 28'

Magnitude: 6.9 | 7.3

Separation: 7.4"

Position Angle: 306°

SAO 153143 | GDR2 88012822272



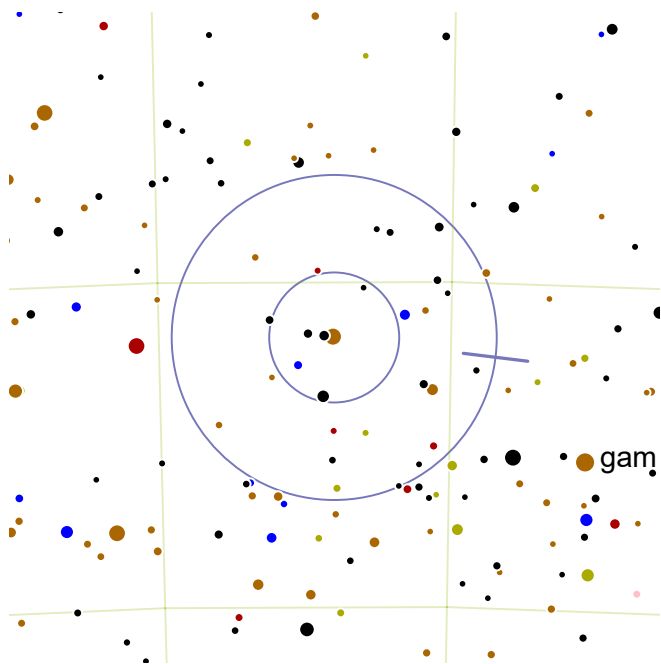
A close and equal pair of bluish stars.



Two finder circles NNW from magnitude 3.47 Azmidiske.



With the double centered in the finder, there are three open clusters in view - M46 to the east, NGC 2423 to the north, and M47 in the center.



Kappa Pyx

RA: 137.0° | 9h 8.0' — DEC: -25.87° | -25° 51'

Magnitude: 4.6 | 10.1

Separation: 2.1"

Position Angle: 263°

SAO 177002 | HIP 44824 | GDR2 95271628928



A brilliant orange primary with a tightly bound very faint companion.



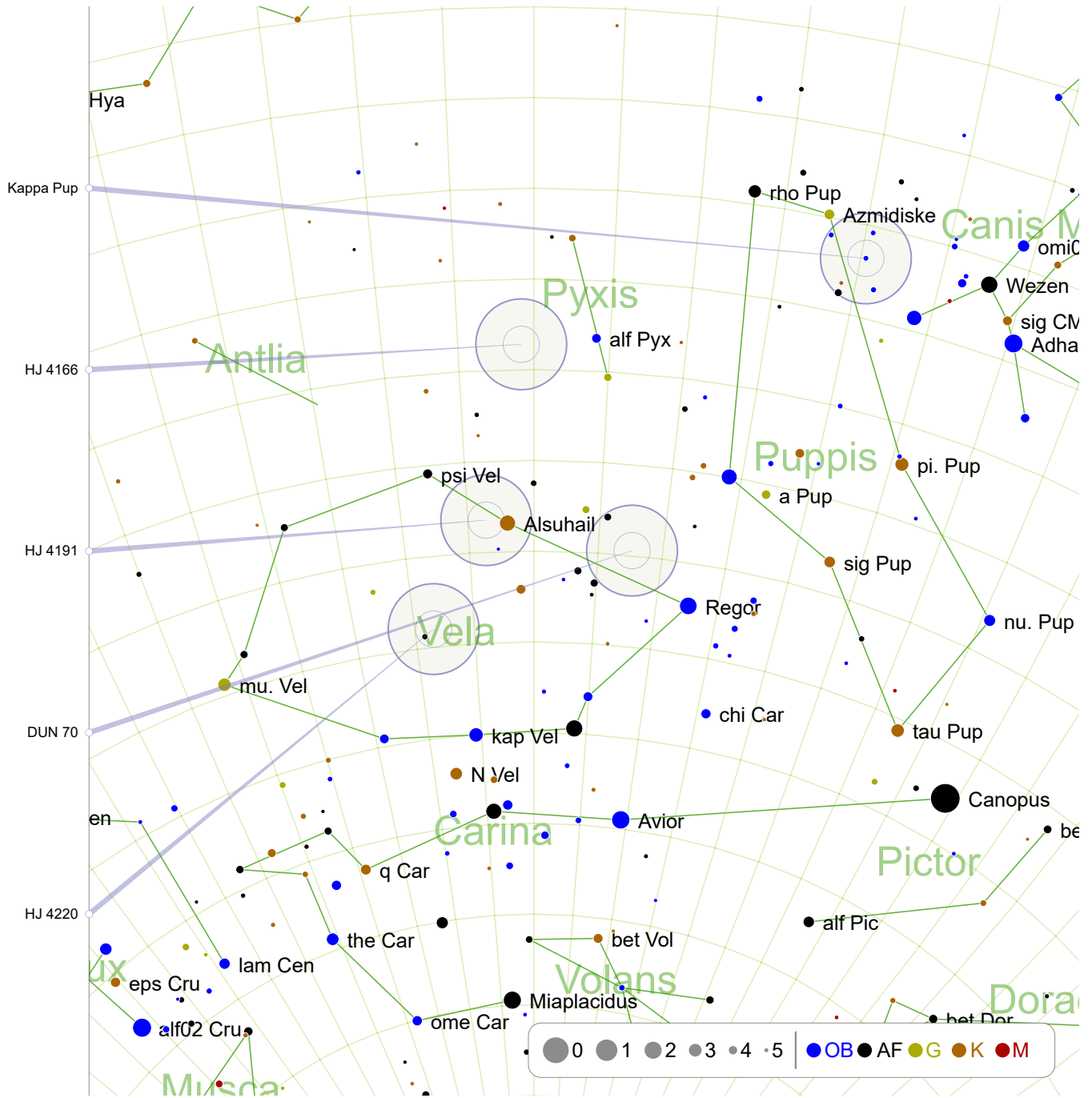
One and a half finder circles NE from magnitude 3.7 alf Pyx. Two and a half finder circles E from magnitude 2.88 rho Pup.



Magnitude 10.1 galaxy NGC 2784 is in the northern quarter of the finder view.

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February: -45° South (1)



Kappa Pup: page 187

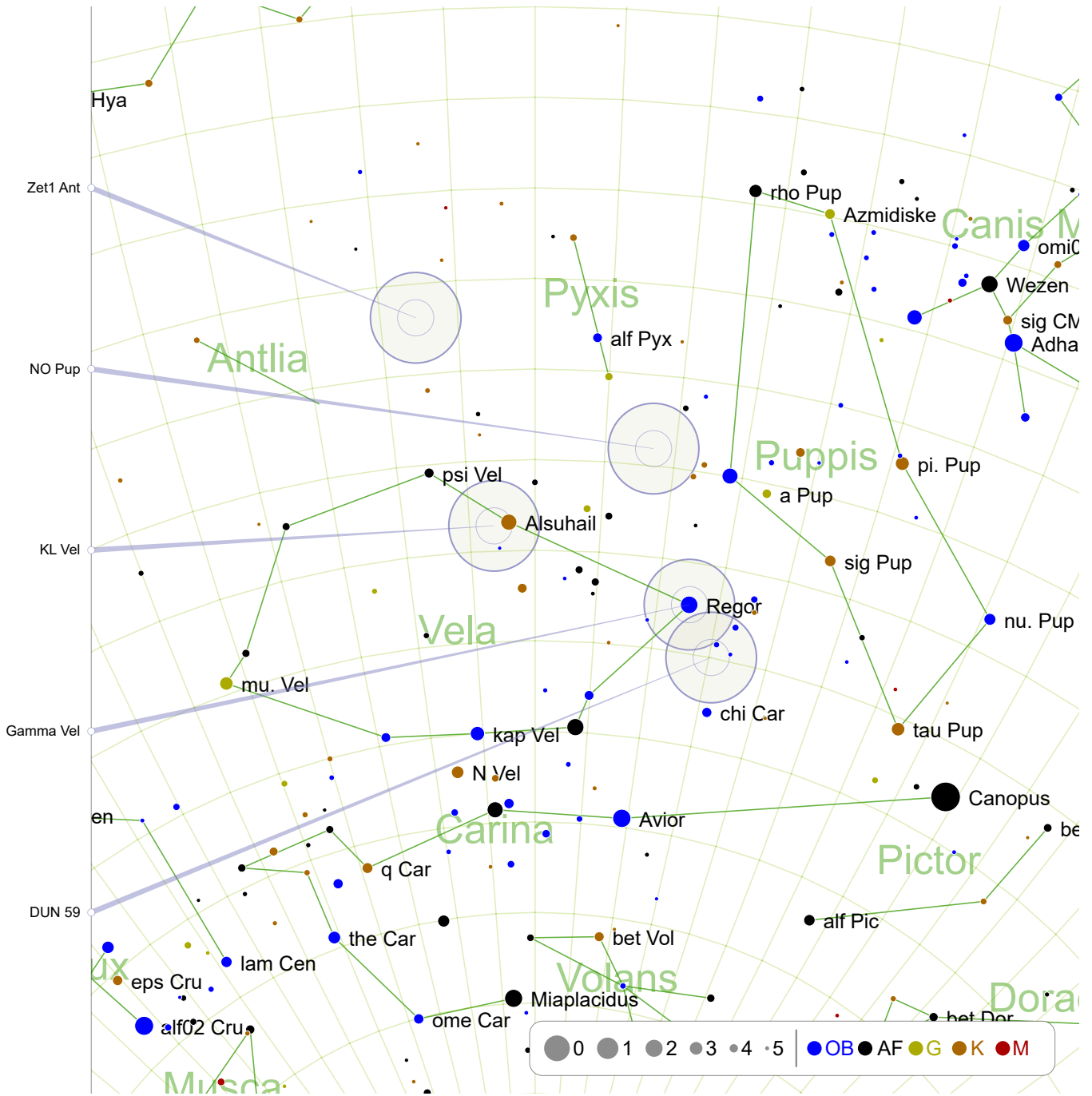
HJ 4166: page 187

HJ 4191: page 188

DUN 70: page 188

HJ 4220: page 189

February: -45° South (2)



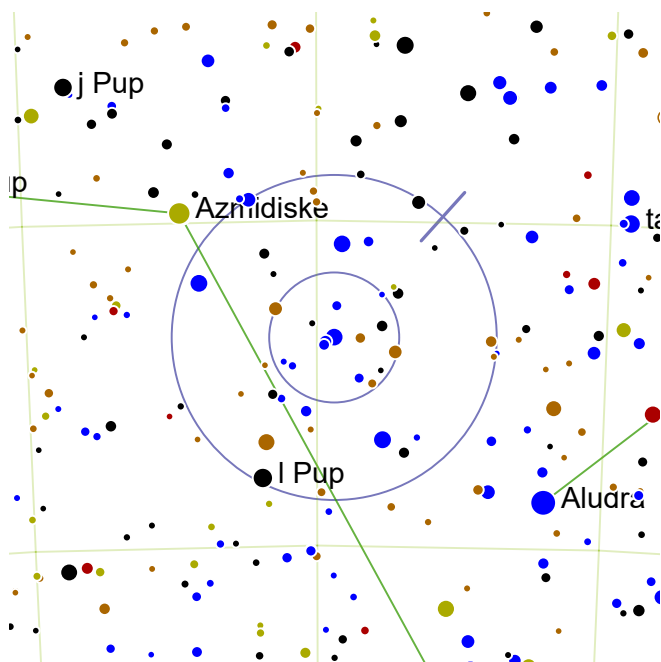
Zet1 Ant: page 189

NO Pup: page 190

KL Vel: page 190

Gamma Vel: page 191

DUN 59: page 191



Kappa Pup

RA: 114.7° | 7h 38.8' — DEC: -26.8° | -26° 47'

Magnitude: 4.4 | 4.6

Separation: 9.9"

Position Angle: 318°

SAO 174199 | HIP 37229 | DGR2 14549657728



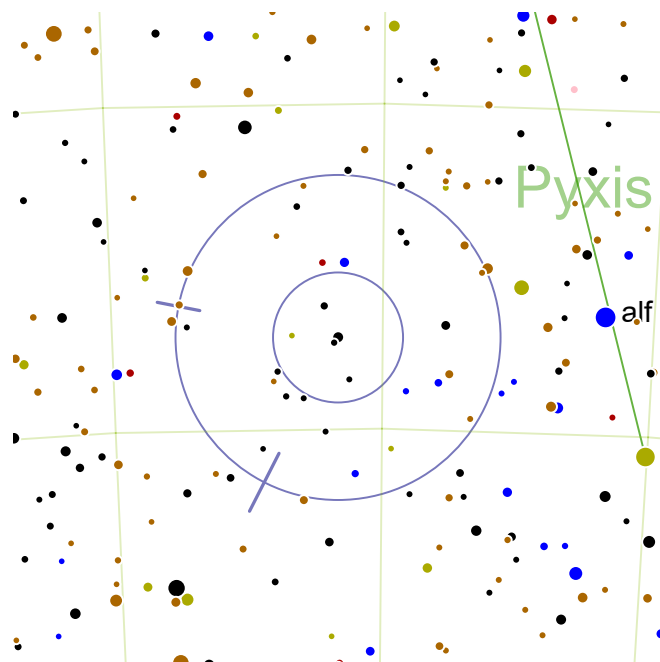
A close pair of brilliant, bluish stars.



Half a finder circle SW from magnitude 3.47 Azmidiske. Two finder circles N from magnitude 3.72 c Pup.



NGC 2453, a magnitude 8.3 open cluster, is in the eastern quarter of the finder view.



HJ 4166

RA: 135.82° | 9h 3.29' — DEC: -33.6° | -33° 35'

Magnitude: 7.1 | 8.0 | 11.2

Separation: 13.6" | 1.2"

Position Angle: 153° | 79°

SAO 199924 | HIP 44442 | GDR2 58334382080



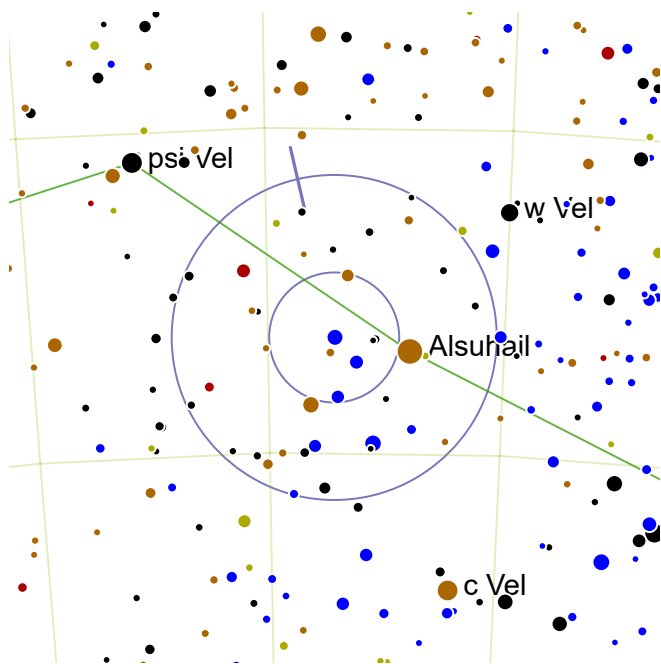
A white primary easily separated from a very tightly separated unequal pair.



Half a finder circle E from magnitude 3.7 alf Pyx. One and a half finder circles NW from magnitude 3.64 psi Vel.



One finder circle to the south east is planetary nebula NGC 2818 (magnitude 8.2).



HJ 4191




RA: 138.6° | 9h 14.39' — DEC: -43.23° | -43° 13'

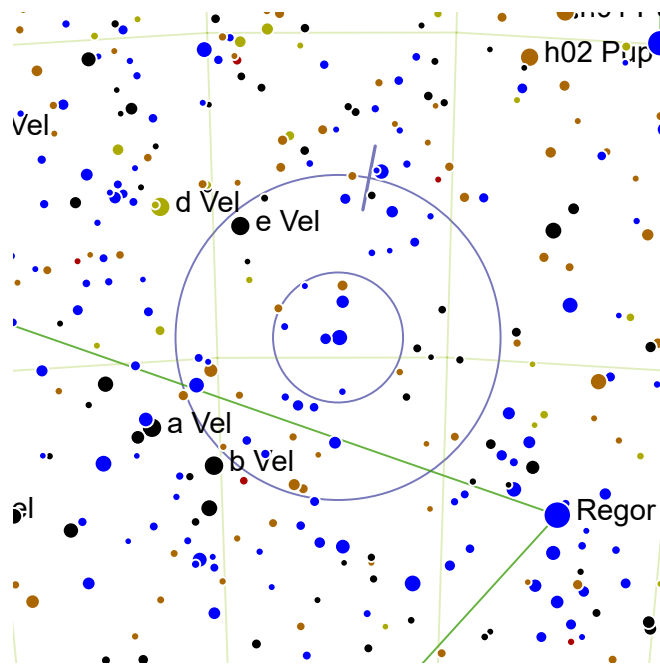
Magnitude: 5.2 | 9.2

Separation: 5.9"

Position Angle: 13°

SAO 220978 | HIP 45344 | GDR2 76191999616

-  A bright, bluish primary with a close faint companion.
-  Half a degree E from magnitude 2.22 Alshail. Half a finder circle NNE from magnitude 3.69 c Vel.
-  Less than a degree north east of the double KL Vel.



DUN 70




RA: 127.38° | 8h 29.5' — DEC: -44.72° | -44° 42'

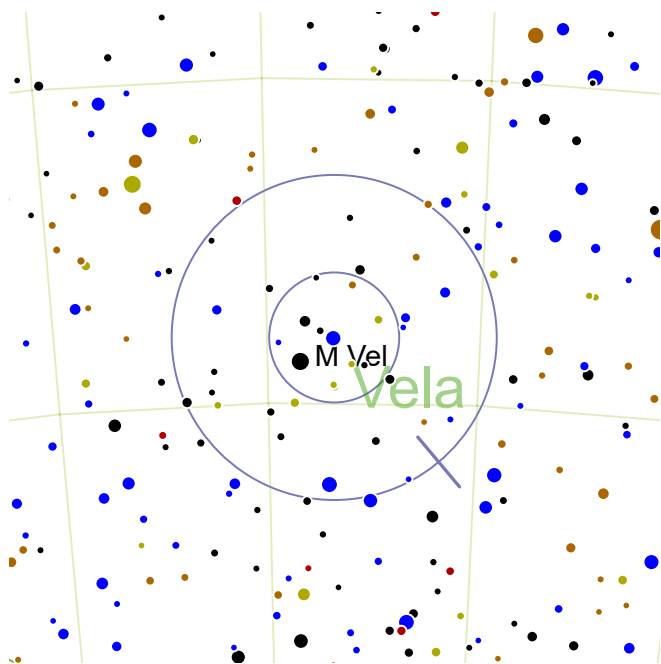
Magnitude: 5.2 | 7.0

Separation: 4.3"

Position Angle: 349°

SAO 219996 | HIP 41639

-  A bright blue primary with a very close and fairly bright secondary.
-  Half a finder circle NE from magnitude 1.92 Regor. One finder circle NWW from magnitude 3.69 c Vel.
-  The double is situated in a wide region of diffuse nebulosity cataloged as Ced 106a/e.



HJ 4220

RA: 143.43° | 9h 33.7' — DEC: -49.0° | -49° 0'

Magnitude: 5.5 | 6.2

Separation: 2"

Position Angle: 220°

SAO 221288 | HIP 46914 | GDR2 60957618560



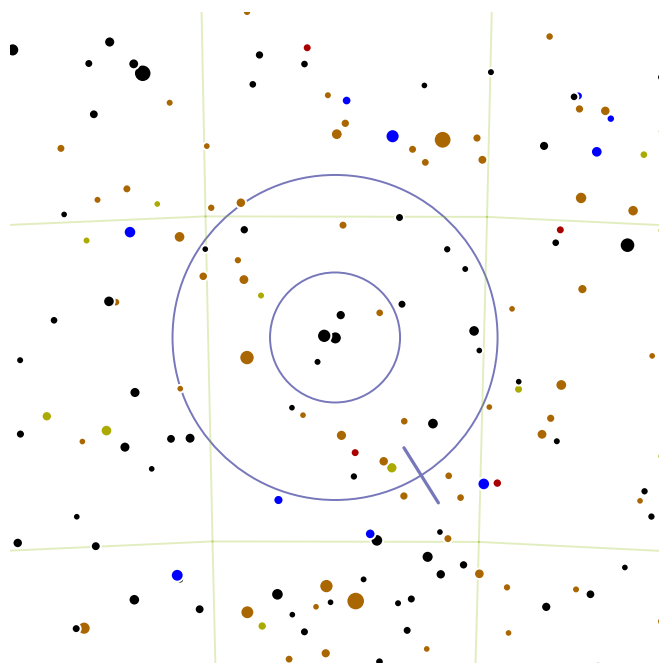
A well-balanced pair, with a bright bluish primary and a tightly bound, fairly bright companion.



One finder circle SEE from magnitude 3.69 c Vel. Two and a half finder circles NNE from magnitude 3.98 c Car.



Open cluster NGC 2972 (magnitude 9.9) is two degrees to the south east.



Zet1 Ant

RA: 142.7° | 9h 30.79' — DEC: -31.88° | -31° 52'

Magnitude: 6.2 | 6.8

Separation: 8.3"

Position Angle: 212°

SAO 200445 | HIP 46657 | GDR2 76500794496



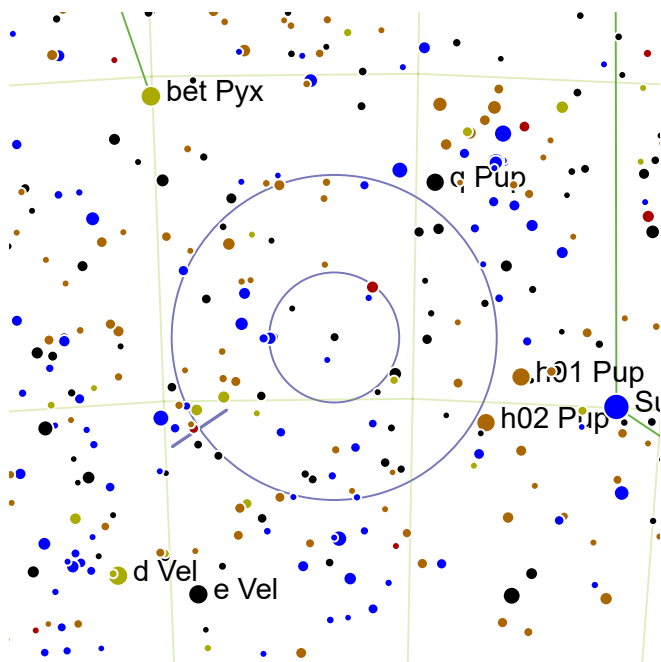
A close, bright pair of white stars.



One and a half finder circles N from magnitude 3.64 psi Vel. Two finder circles NNE from magnitude 2.22 Alshail.



Zet1 Ant forms a pretty binocular or finderscope double with Zet2 Ant, which lies 0.2 degrees to the east.



NO Pup

RA: 126.58° | 8h 26.3' — DEC: -39.07° | -39° 3'

Magnitude: 6.5 | 7.1

Separation: 8.1"

Position Angle: 124°

SAO 199222 | HIP 41361 | GDR2 99779517568



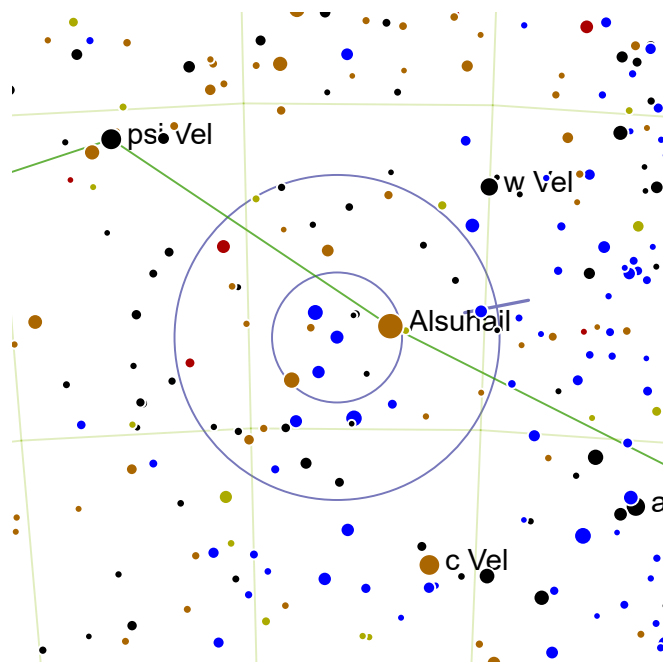
A balanced pair of fairly bright stars, the brighter being bluish and the companion white.



Half a finder circle E from magnitude 2.27 Suhail Hadar. One finder circle E from magnitude 3.76 a Pup.



Located in a rich field, V436 Pup (mag. 6.3) stands out as a bright red star two degrees to the north west. NO Pup is a variable with a Δ mag. of 0.5. There are two comparison stars in the finder, HIP 40947 to the south east (mag. 6.15) and HIP 41806 to the west (mag. 6.45).



KL Vel

RA: 138.13° | 9h 12.5' — DEC: -43.62° | -43° 36'

Magnitude: 6.0 | 6.8

Separation: 2.9"

Position Angle: 281°

SAO 220952 | HIP 45189 | GDR2 29650918528



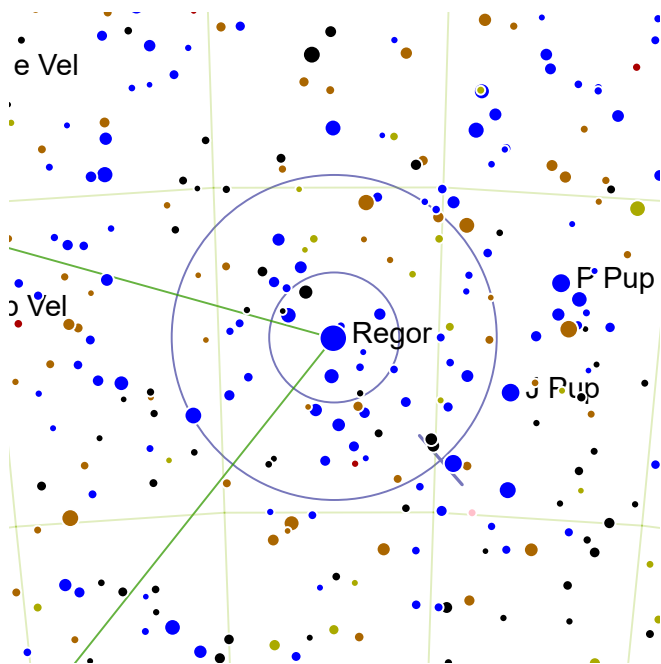
A bright bluish star with a fairly bright and very close companion.



Half a degree SEE from magnitude 2.22 Alshail. Half a finder circle NNE from magnitude 3.69 c Vel.



The planetary nebula NGC 2792 (magnitude 11.8) is one degree north of this double.



Gamma Vel

RA: 122.38° | 8h 9.5' — DEC: -47.33° | -47° 19'

Magnitude: 1.8 | 4.1

Separation: 41.2"

Position Angle: 221°

SAO 219504 | HIP 39953



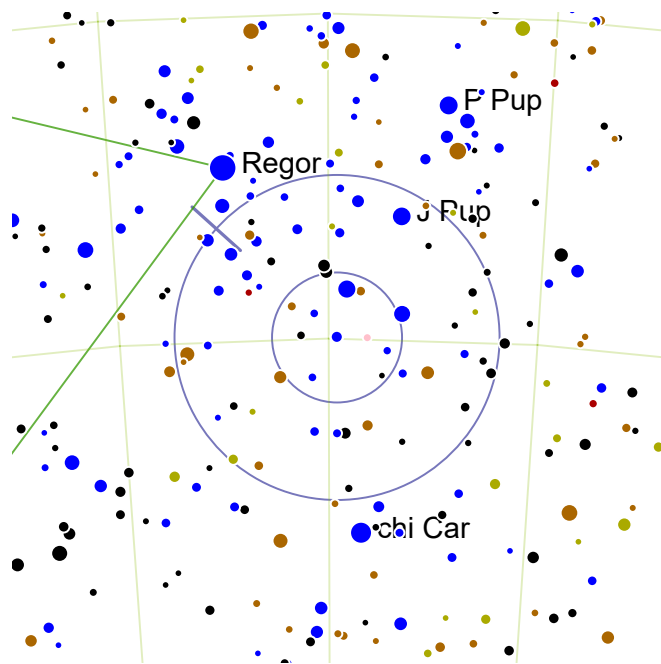
An extremely brilliant blue primary widely separated from a brilliant blue companion.



Gamma Vel is a bright star in Vela. One finder circle NNE from magnitude 3.6 chi Car.



The primary is a Wolf-Rayet star, an unstable monster with a titanic stellar wind driven by the extreme surface temperature of the star.



DUN 59

RA: 119.8° | 7h 59.19' — DEC: -49.98° | -49° 58'

Magnitude: 6.2 | 6.2

Separation: 16.3"

Position Angle: 48°

SAO 219249 | HIP 39035 | GDR2 00016110976



An easily separated pair of fairly bright, blue stars.



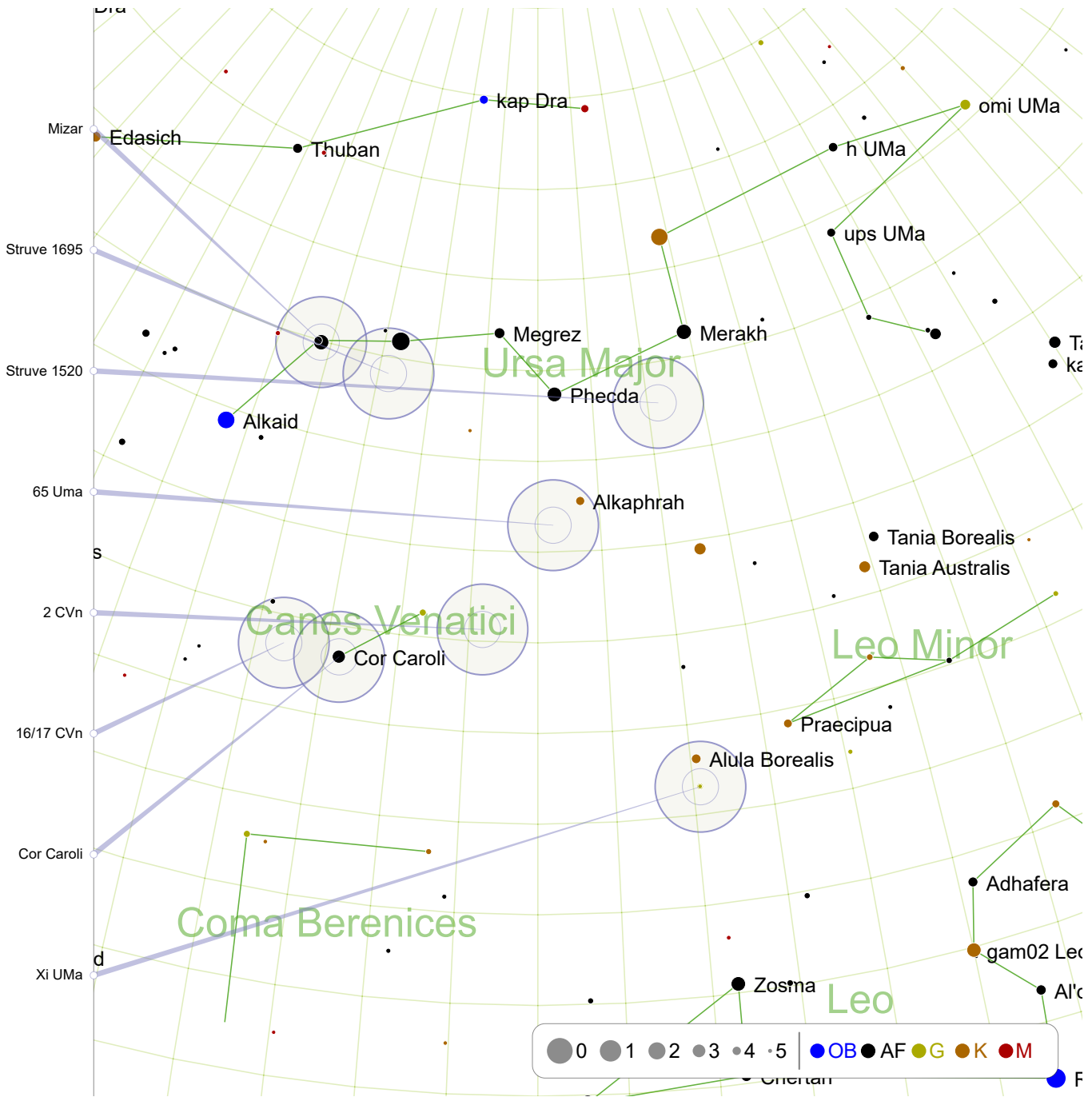
Half a finder circle N from magnitude 3.6 chi Car. One and a half finder circles S from magnitude 3.76 a Pup.



The finder view is richly decorated with bright stars. The north-eastern quarter of the finder view contains the bright open cluster NGC 2547 (magnitude 4.7).

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April: 45° North

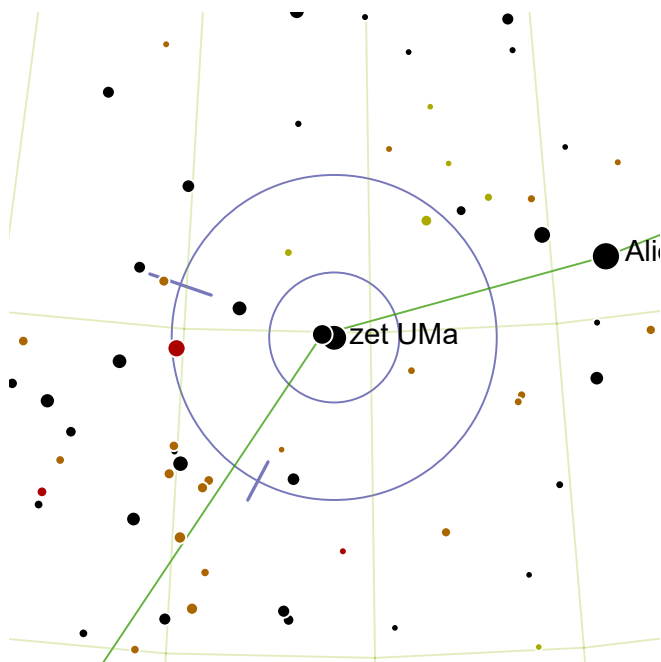


Mizar: page 194
2 CVn: page 196

Struve 1695: page 194
16/17 CVn: page 196

Struve 1520: page 195
Cor Caroli: page 197

65 Uma: page 195
Xi UMa: page 197



Mizar

RA: 200.98° | 13h 23.89' — DEC: 54.93° | 54° 56'

Magnitude: 2.3 | 4.0 | 4.0

Separation: 709" | 14.4"

Position Angle: 71° | 152°

SAO 28737 | HIP 65378 | GDR2 79345330944



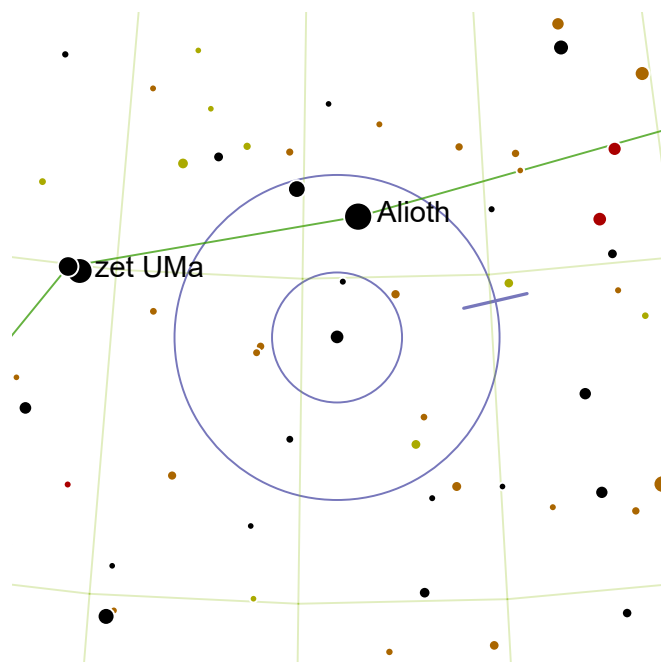
A delightful triple system of white stars easily separated in any telescope.



Mizar is the middle star of the handle of the Plough.



Those with good eyesight can see the star is double with the naked eye, but a telescope reveals a delightful triple system composed of fierce white stars. This system is unusual as the outlying member has its own official name, Alcor.



Struve 1695

RA: 194.08° | 12h 56.29' — DEC: 54.1° | 54° 6'

Magnitude: 6.0 | 7.9

Separation: 3.7"

Position Angle: 283°

SAO 28572 | HIP 63143 | GDR2 72198878848



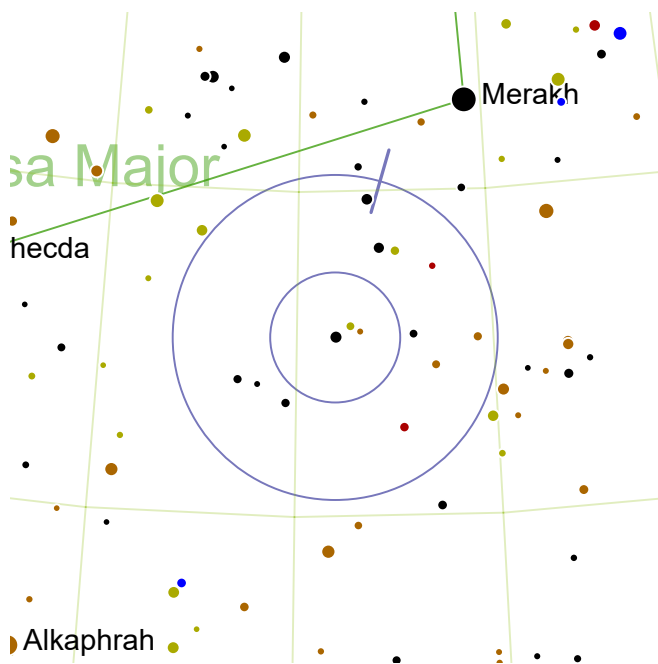
A bright yellow primary tightly separated from a fainter blue companion.



Struve 1695 lies one finder circle west of Mizar. Bright Alioth should be in the same finder circle as this double, roughly two degrees to the north.



The spectacular triple system of Mizar and Alcor lies one finder circle to the east.



Struve 1520

RA: 169.03° | 11h 16.1' — DEC: 52.77° | 52° 46'

Magnitude: 6.6 | 7.9

Separation: 12.7"

Position Angle: 344°

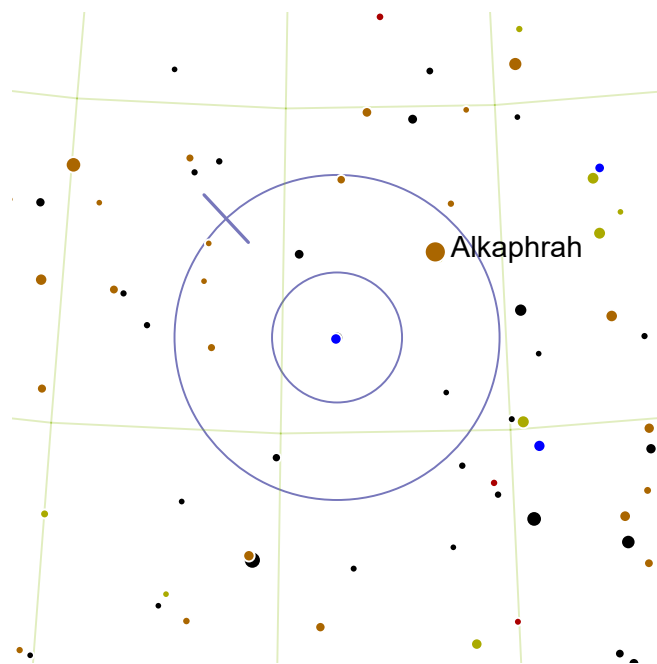
SAO 27970 | HIP 55044 | GDR2 5463337728



An easily separated pairing of two yellowish stars.



Two finder circles west of Phecda, and one and a half finder circles south east of Merakh.



65 Uma

RA: 178.78° | 11h 55.1' — DEC: 46.48° | 46° 29'

Magnitude: 6.5 | 8.3

Separation: 3.9"

Position Angle: 43°

SAO 43945 | HIP 58112 | GDR2 2546451840



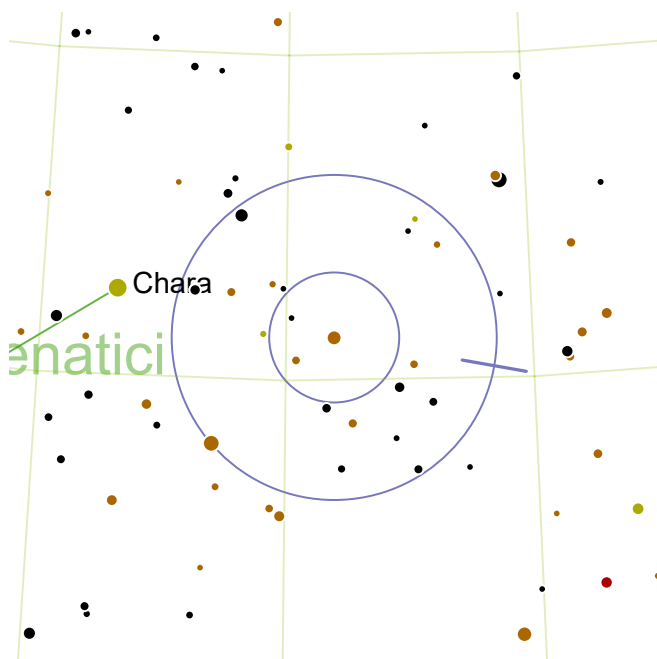
A white primary with a tightly bound secondary.



One and a half degrees SE from magnitude 3.85 Alkaphrah.



The Primary is itself an extreme double, with a magnitude 9.0 companion with a separation of 0.3" at position angle 358°.



2 CVn

RA: 184.03° | 12h 16.1' — DEC: 40.67° | 40° 40'

Magnitude: 5.8 | 8.1

Separation: 11.4"

Position Angle: 260°

SAO 44097 | HIP 59831 | GDR2 25675920512



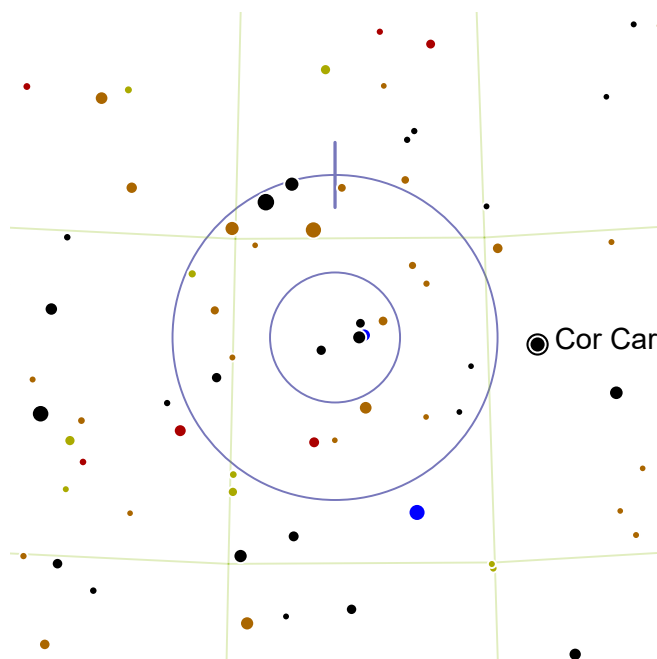
A yellow-blue pairing with easy separation.



This is two finder circles west of Cor Caroli. It forms the western corner of a two-degree square with four similarly bright stars.



Three galaxies lie close to this double. Find NGC 4151 two degrees to the south-west, while NGC 4369 two degrees to the south-east. Three degrees to the north east is NGC 4490.



16/17 CVn

RA: 198.0° | 13h 12.0' — DEC: 38.5° | 38° 30'

Magnitude: 6.0 | 6.3

Separation: 277.5"

Position Angle: 0°

SAO 63380 | HIP 64246 | GDR2 17316419712



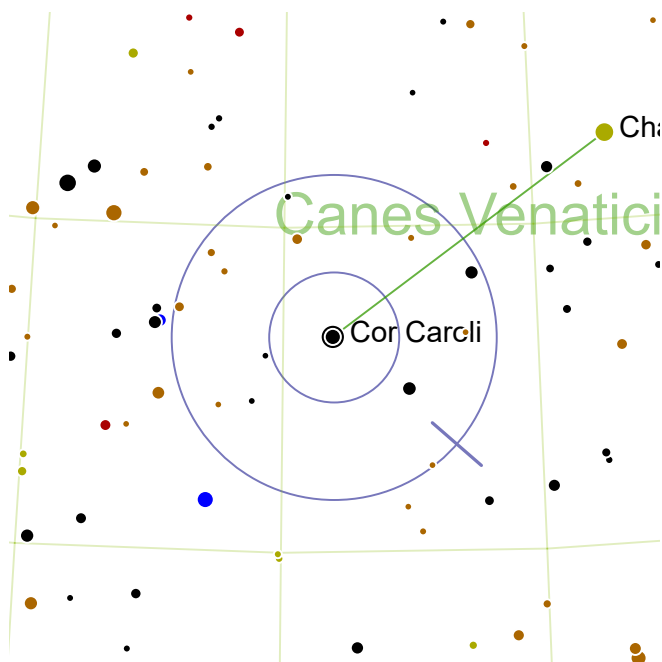
A distantly separated pair of bright white stars.



Half a finder circle E from magnitude 2.9 Cor Caroli. Two and a half finder circles SW from magnitude 1.91 Alkaid.



A good binocular or finderscope pair.



Cor Caroli


RA: 194.0° | 12h 56.0' — DEC: 38.32° | 38° 19'


Magnitude: 2.9 | 5.5


Separation: 19.4"

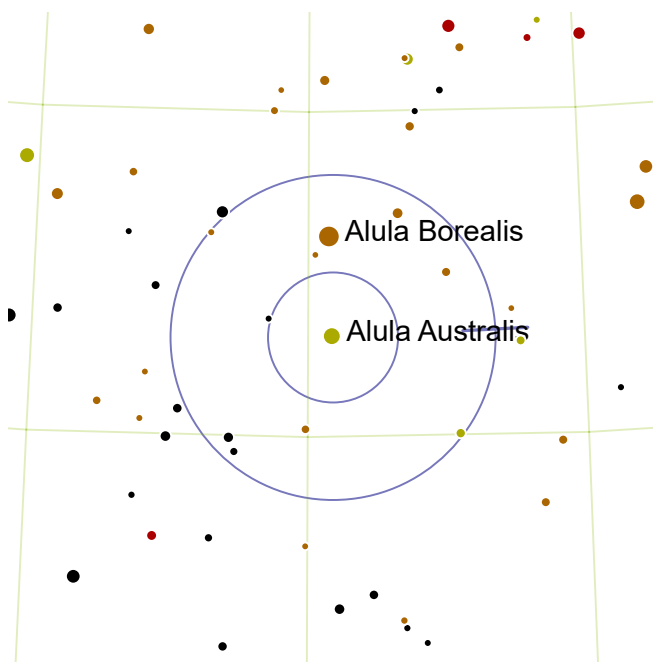
Position Angle: 229°

SAO 63257 | HIP 63125 | GDR2 16348324992

 A brilliant white primary star with a more orange secondary, easily separated.

 The handle of the Plough forms an arc with Cor Caroli at its focus point.

 The name means "Charles' Heart" and was given the name by King Charles II of England's physician, who claimed the star shone especially bright on the night the king was restored to power following a period of revolution.



Xi UMa


RA: 169.55° | 11h 18.2' — DEC: 31.53° | 31° 32'


Magnitude: 4.3 | 4.8


Separation: 1.8"

Position Angle: 273°

SAO 62484 | HIP 55203

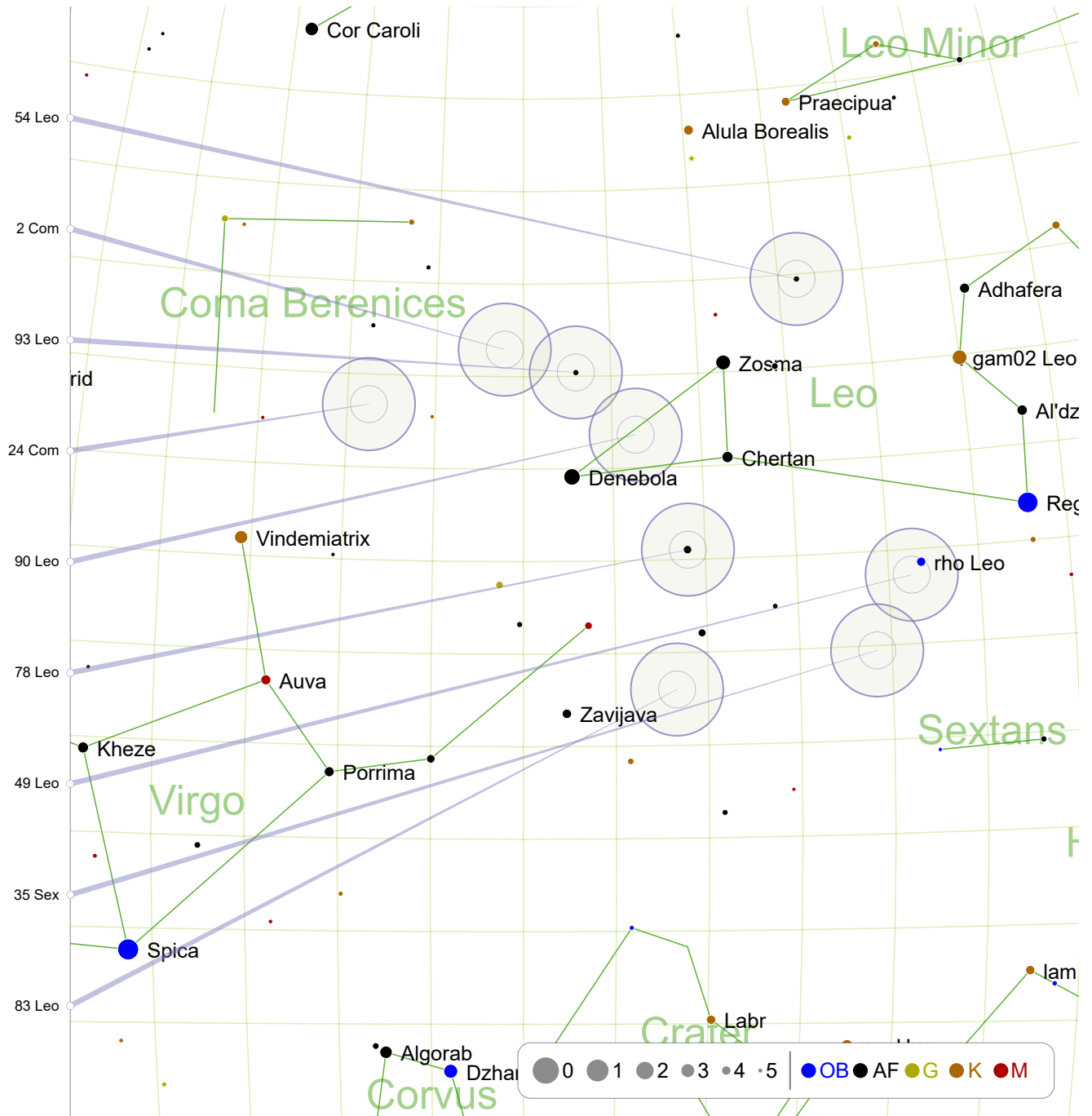
 A bright white-yellow pair separated by anything between 1.6 and 3.0 arc seconds.

 Two and a half finder circles north of Zosma.

 Also known as Alula Australis, this was the first binary to have its 60-year orbit calculated in 1828. This is one to watch over the years as the separation evolves and the position angle rotates.

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April: 10° North

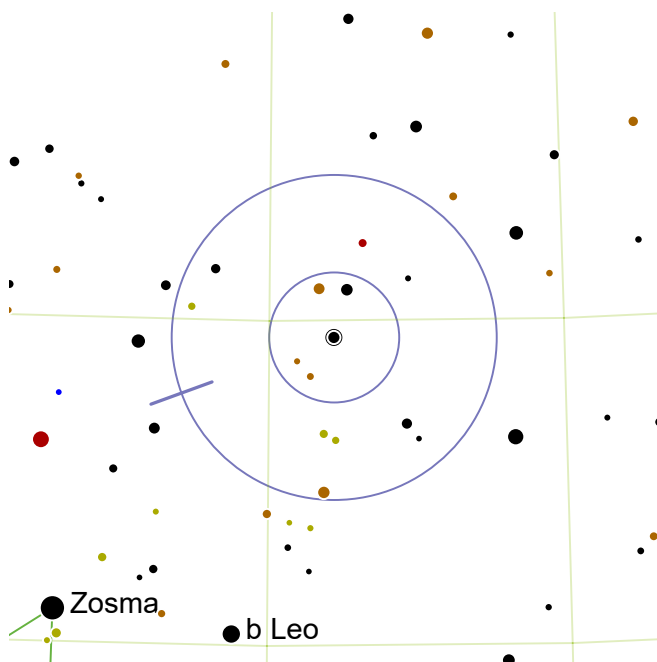


54 Leo: page 200
 90 Leo: page 202
 83 Leo: page 204

2 Com: page 200
 78 Leo: page 202

93 Leo: page 201
 49 Leo: page 203

24 Com: page 201
 35 Sex: page 203



54 Leo

RA: 163.9° | 10h 55.6' — DEC: 24.75° | 24° 45'

Magnitude: 4.5 | 6.3

Separation: 6.5"

Position Angle: 110°

SAO 81583 | HIP 53417 | GDR2 10033740160



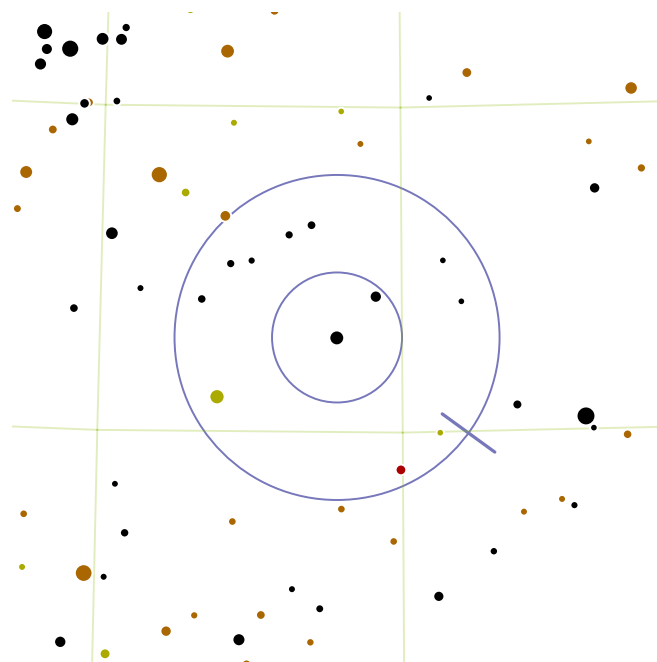
A bright white primary which shines very close to a fairly bright white companion.



Two finders north west of Zosma.



Two galaxies are nearby, both faint. NGC 3437 lies 2 degrees SSE, and NGC 3344 is 3 degrees east.



2 Com

RA: 181.08° | 12h 4.29' — DEC: 21.47° | 21° 28'

Magnitude: 6.2 | 7.5

Separation: 3.4"

Position Angle: 234°

SAO 82123 | HIP 58858 | GDR2 73730936448



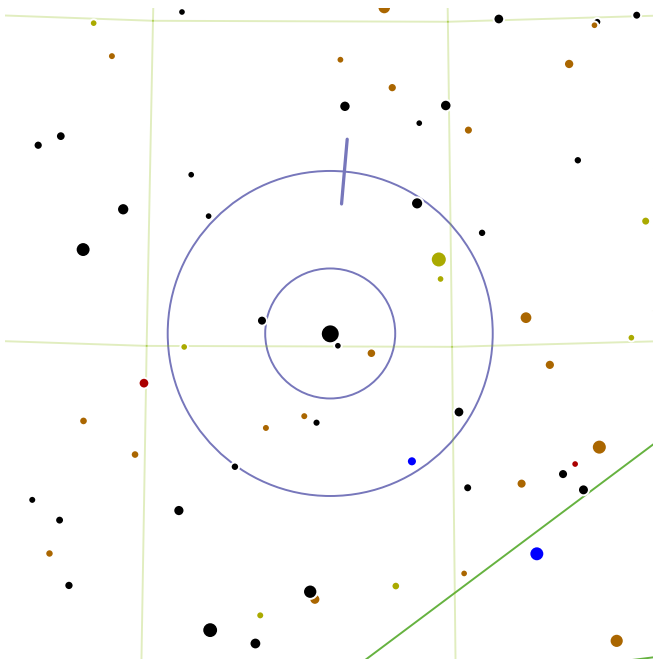
A white primary with a tightly bound and fairly apparent secondary.



One and a half finder circles NNE from magnitude 2.23 Denebola.



The bright Coma Berenices open cluster (Melotte 111) is one finder circle to the north east.



93 Leo

RA: 177.0° | 11h 47.98' — DEC: 20.22° | 20° 13'

Magnitude: 4.59 | 9.03

Separation: 74.9"

Position Angle: 355°

SAO 81998 | HIP 57565 | GDR2 11362055168



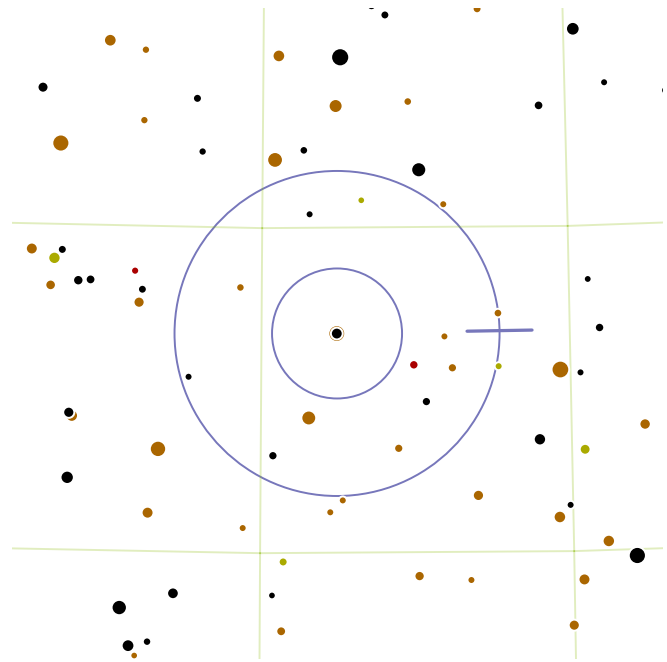
A bright white primary very widely separated from a faint companion.



One and a half finder circles directly north of Denebola.



There is a small galaxy one degree west of 93 Leonis.



24 Com

RA: 188.78° | 12h 35.1' — DEC: 18.38° | 18° 23'

Magnitude: 5.2 | 6.7

Separation: 20.3"

Position Angle: 271°

SAO 100160 | HIP 61418 | GDR2 69267207296



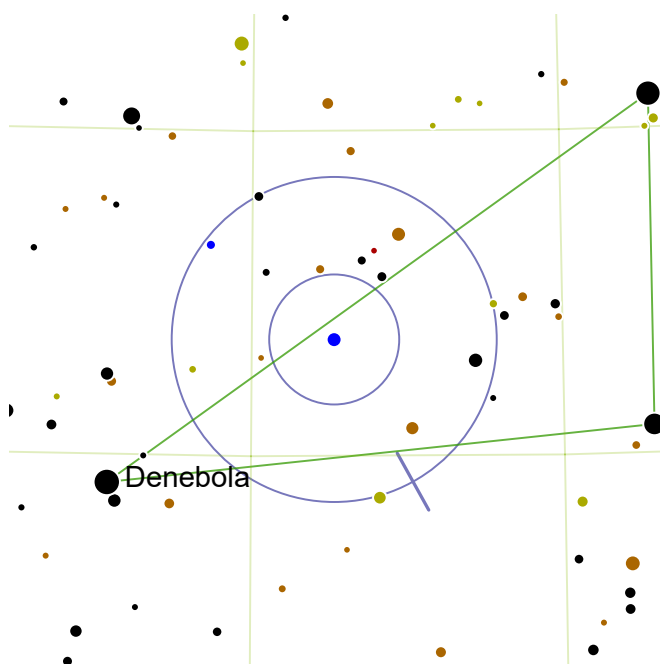
An orange-blue pair, with a reasonable bright secondary and easy separation.



Draw a line from Regulus to Chertan (the star of Leo's hind triangle closest to Regulus), and double it out to the east. This puts you in the neighborhood of 24 Com.



Track just over one finder south and your finder should be full of galaxies, light pollution permitting. Track two finders further East and your finder should show the globular clusters Messier 53 and NGC 5053.



90 Leo


RA: 173.68° | 11h 34.7' — DEC: 16.8° | 16° 48'


Magnitude: 6.3 | 7.3


Separation: 3.1"

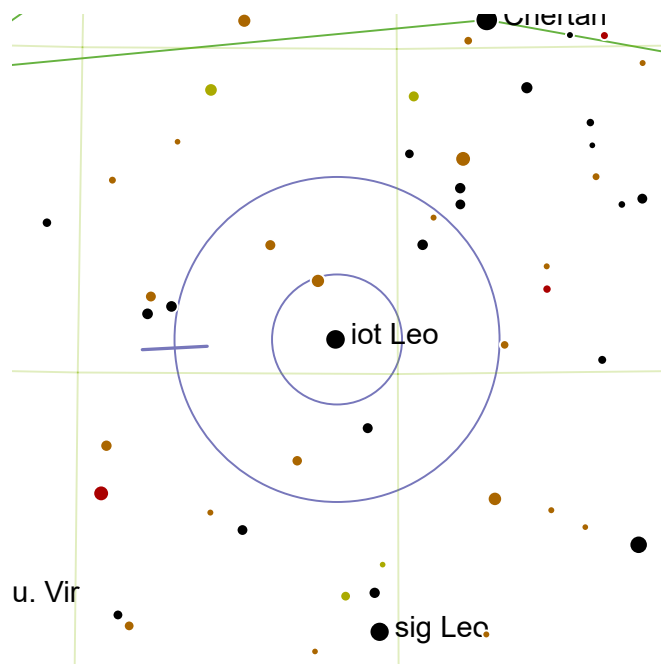
Position Angle: 209°

SAO 99673 | HIP 56473

 A balanced pair of fairly bright bluish stars, very closely separated.

 Half a finder circle NWW from magnitude 2.23 Denebola.

 Three faint galaxies lie toward the western edge of the finder circle: NGC 3686, NGC 3684 and NGC 3681. This system is 1897 light-years from Earth.



78 Leo


RA: 170.95° | 11h 23.79' — DEC: 10.53° | 10° 32'


Magnitude: 4.06 | 6.71


Separation: 2.22"

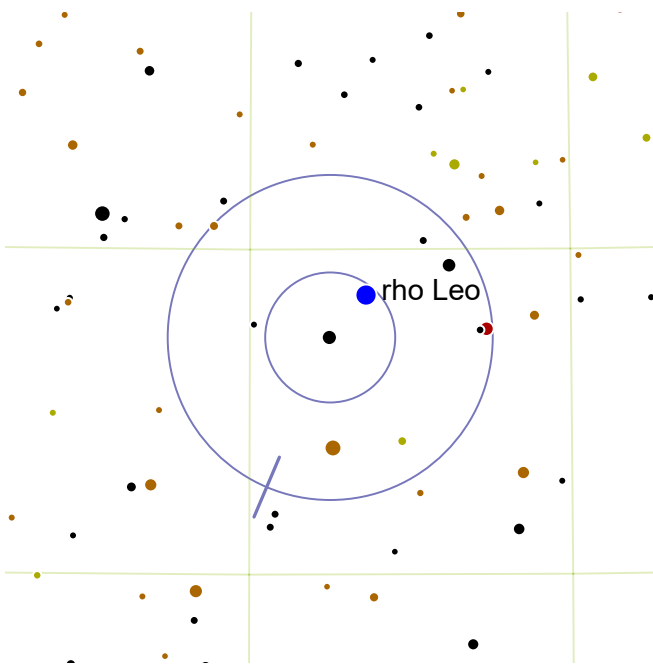
Position Angle: 93°

SAO 99587 | HIP 55642 | GDR2 30249291008

 A tight white-yellow pair. The secondary is not too faint, but the primary shines brilliantly.

 One and a half finder circles south west of bright Denebola (magnitude 2.10) at the rear of Leo.

 The system lies only 78 light-years away. The yellow companion star is very similar to the Sun, with a mass approximately 8% greater. If you place 78 Leonis on the south eastern edge of a finder, the famous Leo Triplet of galaxies fills the opposite quadrant.



49 Leo

RA: 158.75° | 10h 35.0' — DEC: 8.65° | 8° 39'

Magnitude: 5.8 | 7.9

Separation: 2.0"

Position Angle: 157°

SAO 118380 | HIP 51802 | GDR2 97365638528



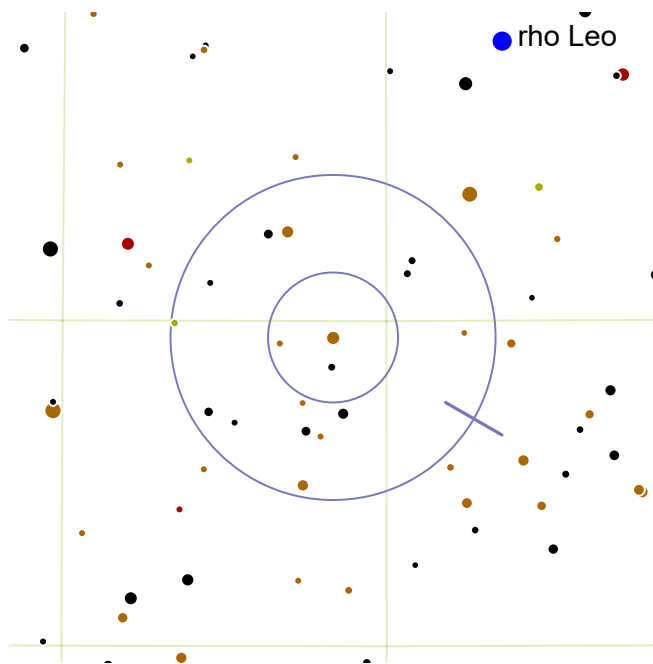
A bright white primary with an extremely close, reasonably apparent companion.



Half a degree SE from magnitude 3.85 rho Leo.



One finder circle to the north east, the finder view is full of galaxies, including M95, M96, M105, NGC 3384, NGC 3412, NGC 3377, and NGC 3367. The brightest is M96 at magnitude 9.25.



35 Sex

RA: 160.82° | 10h 43.29' — DEC: 4.75° | 4° 45'

Magnitude: 6.3 | 7.4

Separation: 6.8"

Position Angle: 240°

SAO 118449 | HIP 52452 | GDR2 36489909632



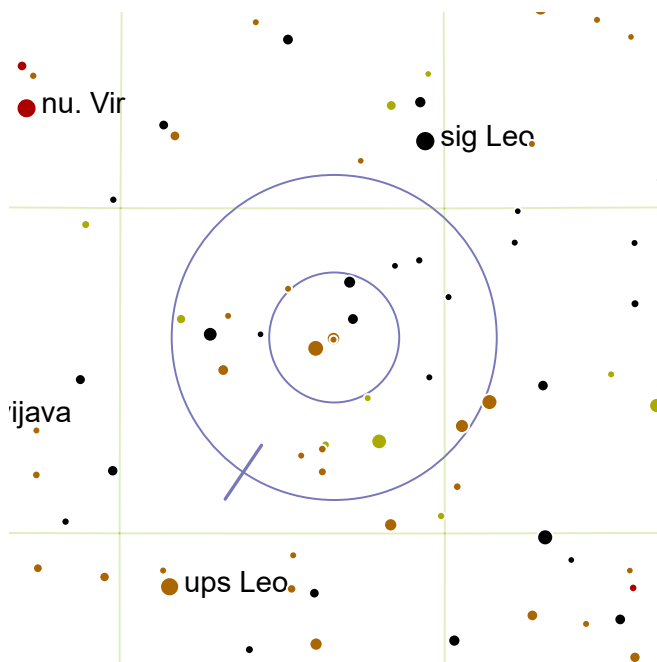
An unusual orange-yellow pairing, reasonably balanced and closely separated.



35 Sextantis is two finder circles south east of 47 Leonis.



A difficult double to locate far south east of Regulus. South east of Regulus lies 47 Leonis (magnitude 3.8), a very interesting pulsating variable star and also a spectroscopic binary. 47 Leonis is very massive, around 21 times the mass of the Sun and nearly 300,000 brighter than the Sun.



83 Leo

RA: 171.7° | 11h 26.79' — DEC: 3.02° | 3° 1'

Magnitude: 6.6 | 7.5

Separation: 28.6"

Position Angle: 146°

SAO 118864 | HIP 55846



A fairly bright yellow primary with an easily apparent orange secondary, widely separated.

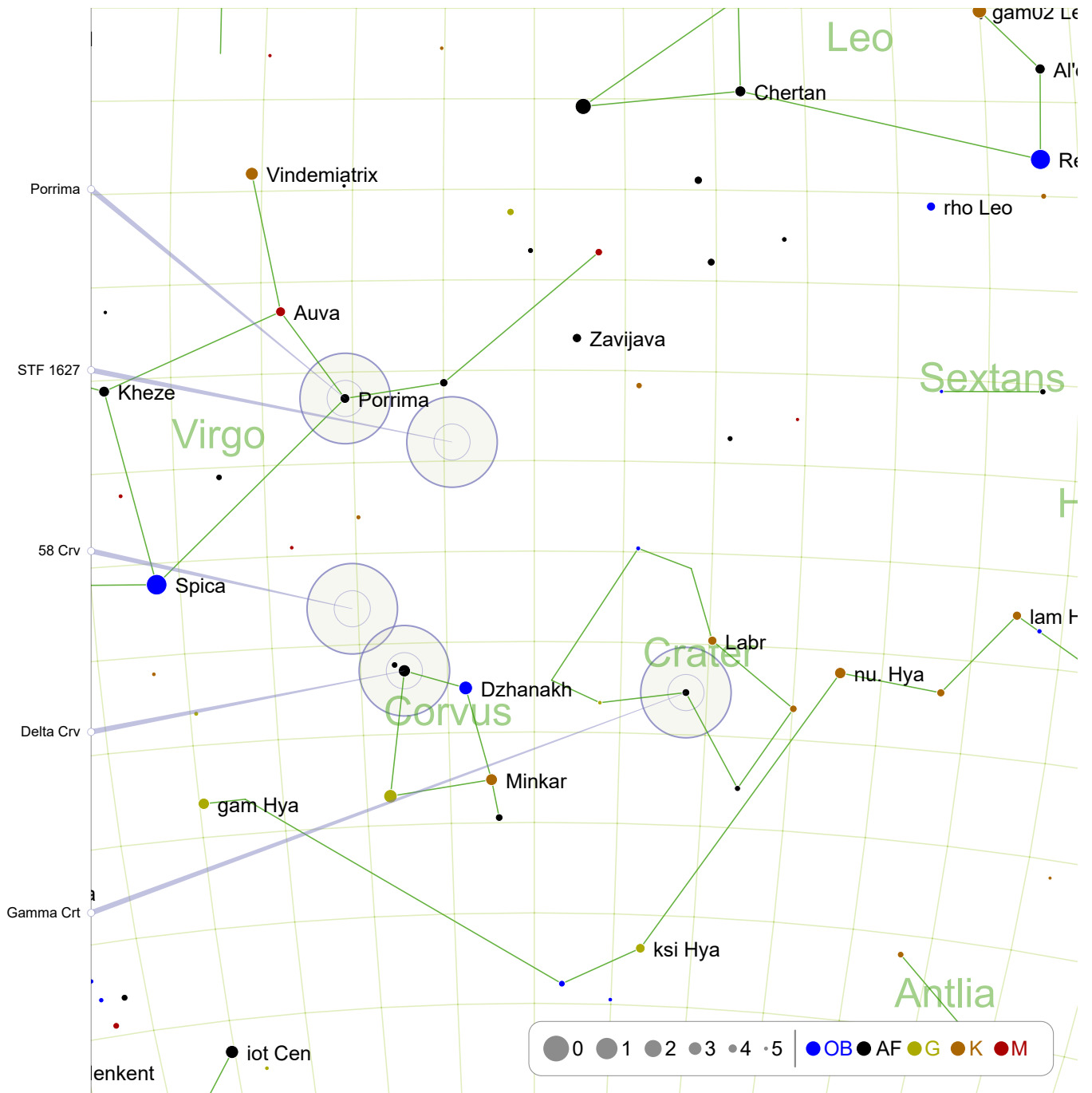


One finder circle NWW from magnitude 3.8 Zavijava.



The galaxy NGC 3640 (mag. 10.4) lies toward the eastern edge of the finder view.

April: -10° South

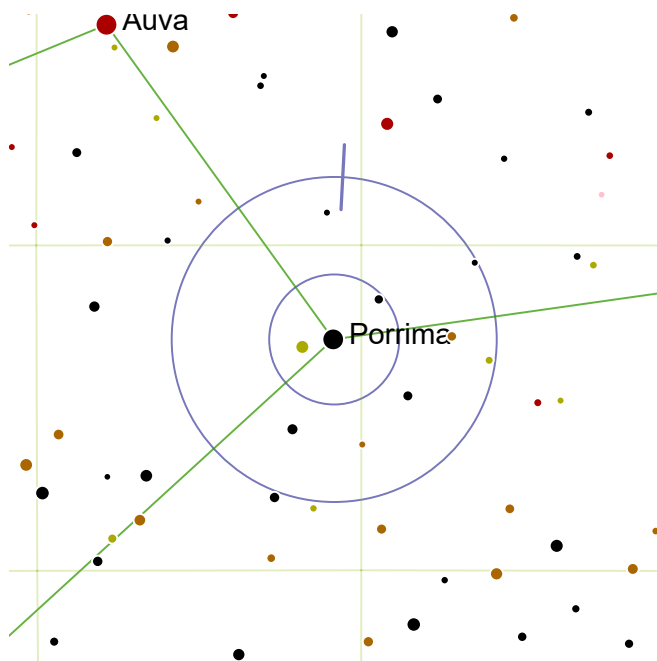


Porrima: page 206
Gamma Crt: page 208

STF 1627: page 206

58 Crv: page 207

Delta Crv: page 207



Porrima

RA: 190.42° | 12h 41.66' — DEC: -1.45° | -1° 26'

Magnitude: 3.48 | 3.53

Separation: 2.93"

Position Angle: 357°

SAO 138917 | HIP 61941



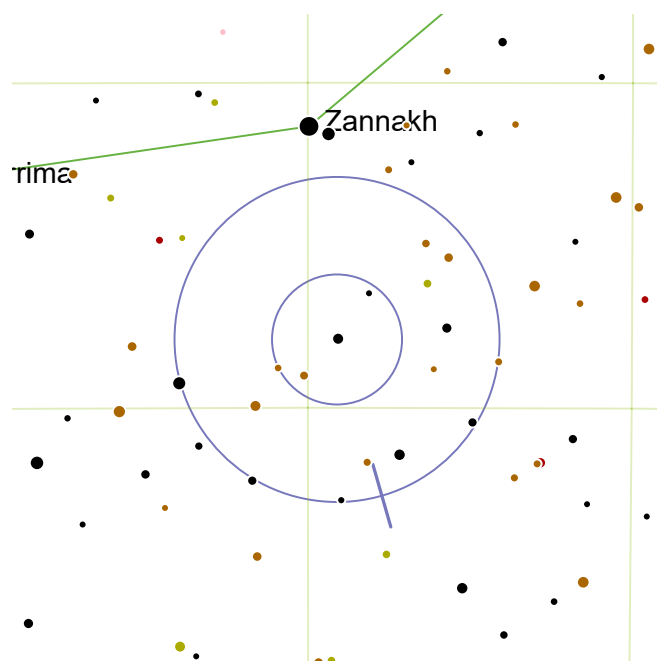
An almost perfectly equal and very close pair of brilliant yellowish stars.



The bottom star of the "cup" of Virgo, Porrima lies on line between magnitude 0.95 Spica and magnitude 2.55 Zosma in Leo.



The galaxy NGC 4753 lies just beyond the eastern edge of the finder circle when this double is centered.



STF 1627

RA: 184.55° | 12h 18.2' — DEC: -3.95° | -3° 56'

Magnitude: 6.6 | 6.9

Separation: 20.1"

Position Angle: 196°

SAO 138704 | HIP 59984 | GDR2 78922038528



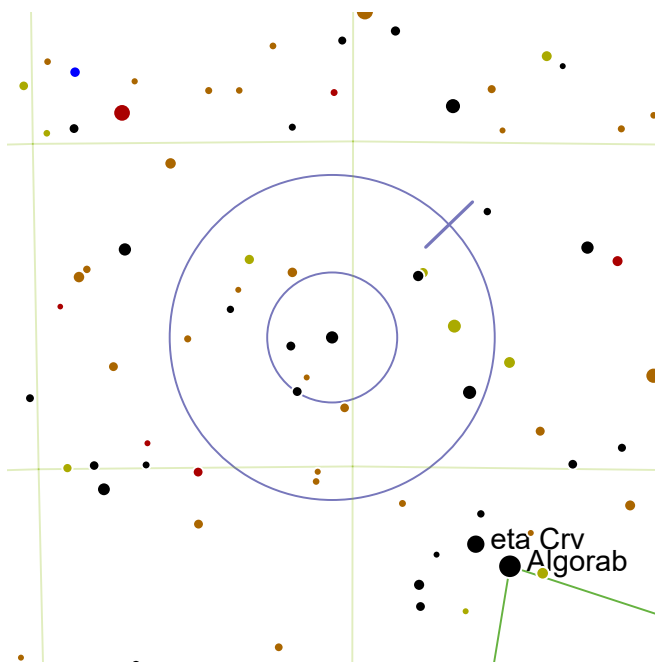
An equal and easily separated pair of fairly bright white stars.



One finder circle SWW from magnitude 3.68 gam Vir. One finder circle SWW from magnitude 3.65 Porrima.



This pair of F-class main sequence stars is only 172 light-years from Earth.



58 Crv


RA: 190.33° | 12h 41.29' — DEC: -13.02° | -13° 0'


Magnitude: 5.9 | 5.9


Separation: 5.3"

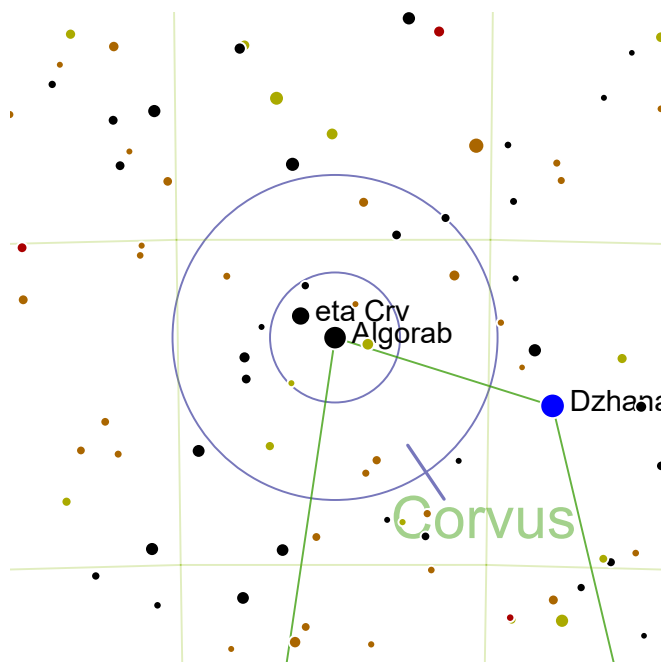
Position Angle: 314°

SAO 157448 | HIP 61910 | GDR2 41368899712

 A close pair of bright, yellowish stars, with a third faint, widely separated component.

 Half a finder circle NE from magnitude 3.11 Algorab. One and a half finder circles NE from magnitude 2.78 Dzhanakh.

 With this double centered in the finder, the famous Sombrero Galaxy (M104, magnitude 8.0) is in the northern quarter of the finder circle.



Delta Crv


RA: 187.48° | 12h 29.89' — DEC: -16.52° | -16° 30'


Magnitude: 3 | 9.2


Separation: 24.2"

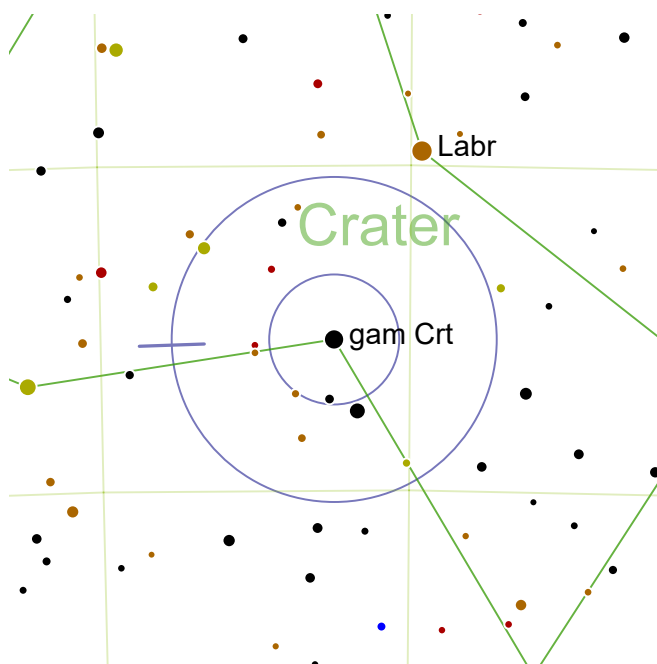
Position Angle: 214°

SAO 157323 | HIP 60965 | GDR2 71216143488

 A brilliant bluish primary widely separated from a moderately faint companion.

 Delta Crv is a bright star in Corvus. Half a finder circle NEE from magnitude 2.78 Dzhanakh.

 This bright star, also known as Algorab, is a mere 87 light-years from Earth.



Gamma Crt

RA: 171.23° | 11h 24.89' — DEC: -17.68° | -17° 40'

Magnitude: 4.1 | 7.9

Separation: 4.4"

Position Angle: 92°

SAO 156661 | HIP 55705 | GDR2 85853638912



A close pair with a brilliant white primary somewhat fainter secondary.

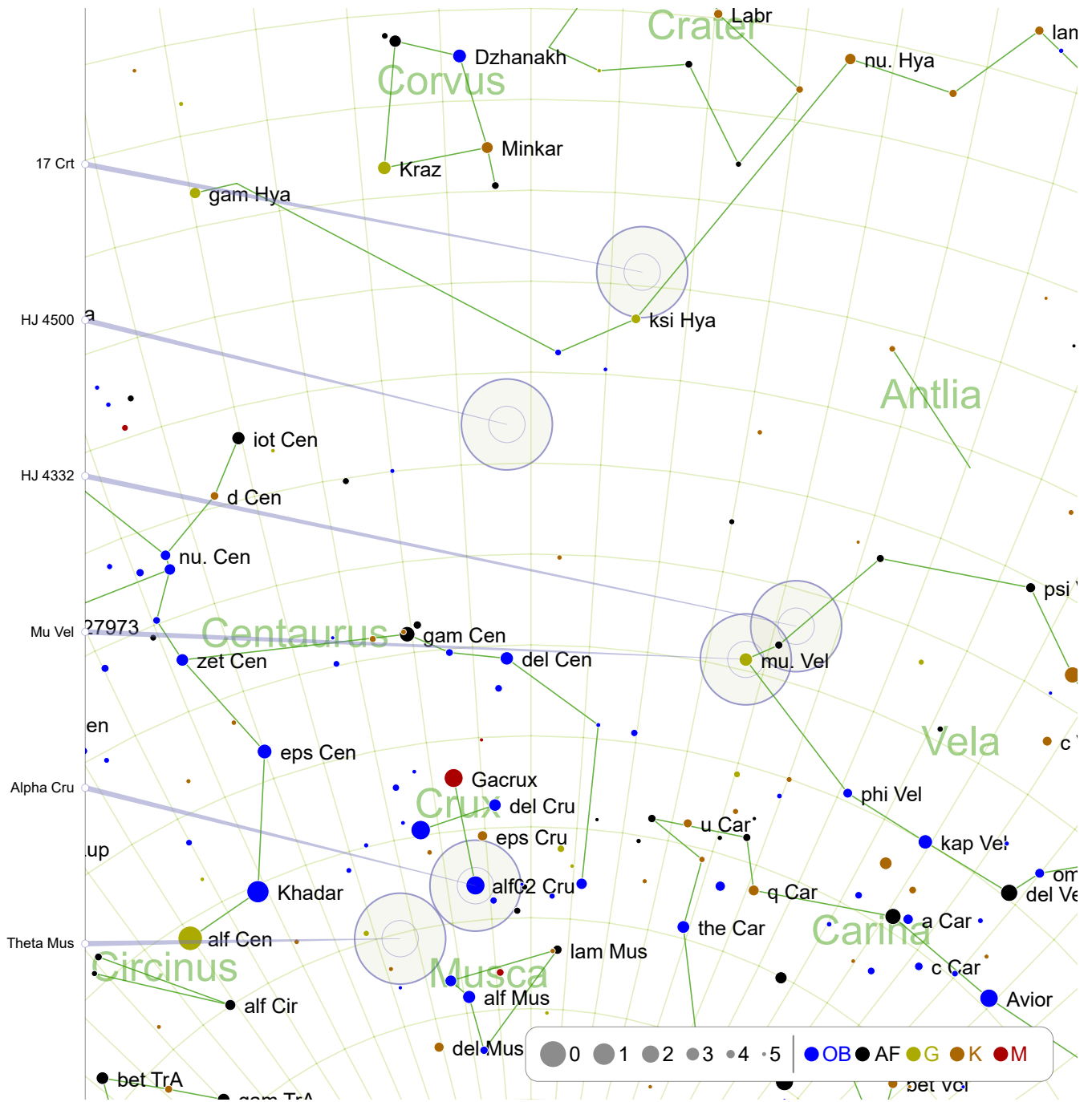


Half a finder circle SSE from magnitude 3.82 Labr. One and a half finder circles SEE from magnitude 3.32 nu. Hya.



Only 82 light-years away, the primary is an A-type main sequence dwarf.

April: -45° South (1)



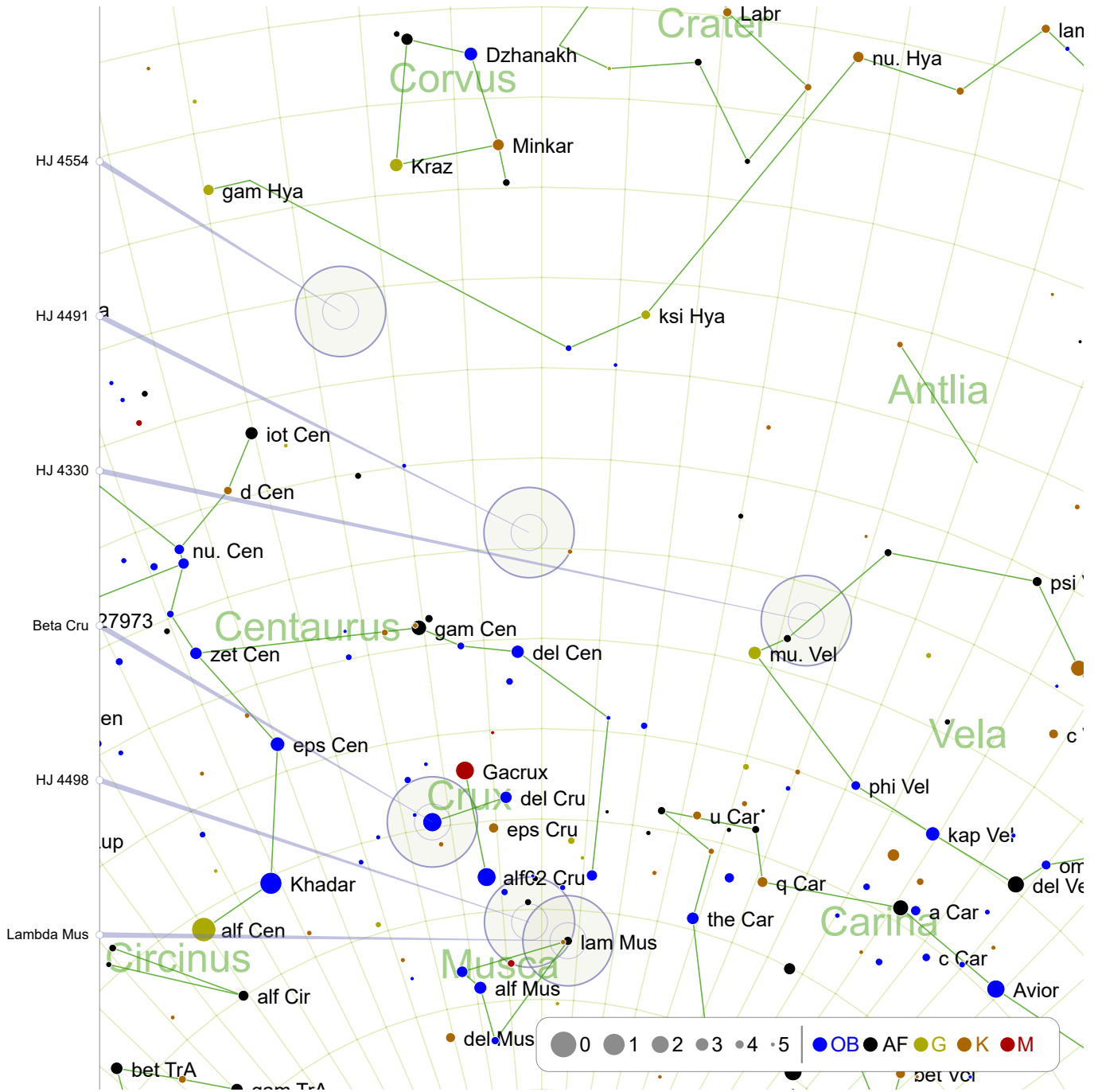
17 Crt: page 211
Alpha Cru: page 213

HJ 4500: page 211
Theta Mus: page 213

HJ 4332: page 212

Mu Vel: page 212

April: -45° South (2)



HJ 4554: page 214

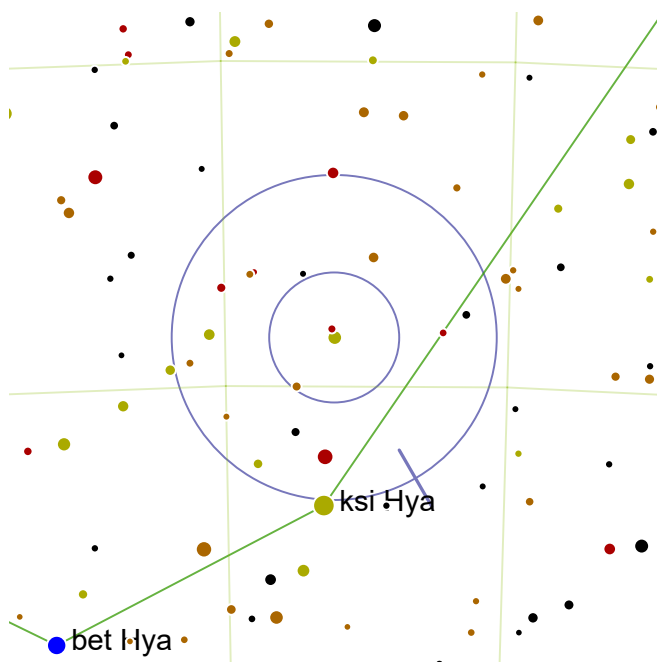
HJ 4491: page 214

HJ 4330: page 215

Beta Cru: page 215

HJ 4498: page 216

Lambda Mus: page 216



17 Crt

RA: 173.08° | 11h 32.29' — DEC: -29.27° | -29° 15'

Magnitude: 5.6 | 5.7

Separation: 9.6"

Position Angle: 210°

SAO 179968 | HIP 56280 | GDR2 08703712896



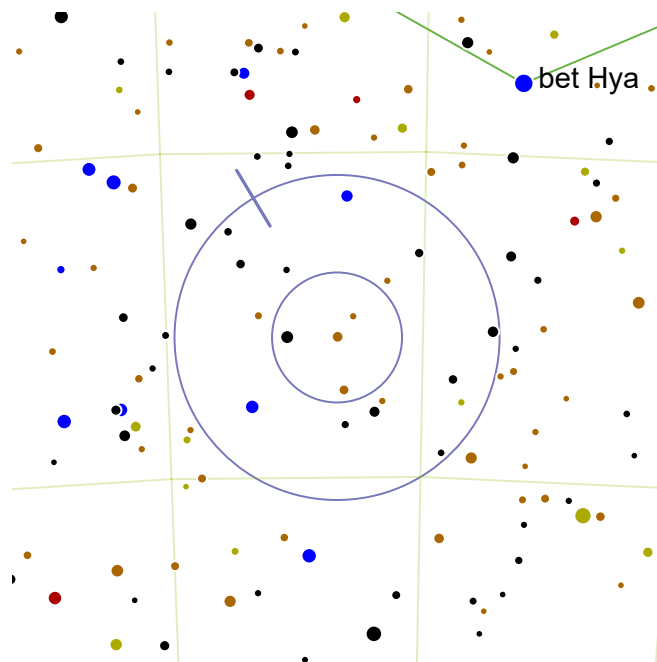
A close, equal pair of bright, somewhat yellow stars.



Half a finder circle N from magnitude 3.72 ksi Hya.



This physical binary system is one of our closest neighbors at a distance of only 26 light-years. The two components are separated by roughly 241 AU. Both components are about three times the brightness of the Sun.



HJ 4500

RA: 181.68° | 12h 6.7' — DEC: -37.87° | -37° 51'

Magnitude: 7 | 9

Separation: 50.3"

Position Angle: 31°

SAO 203137 | HIP 59055 | GDR2 86421605120



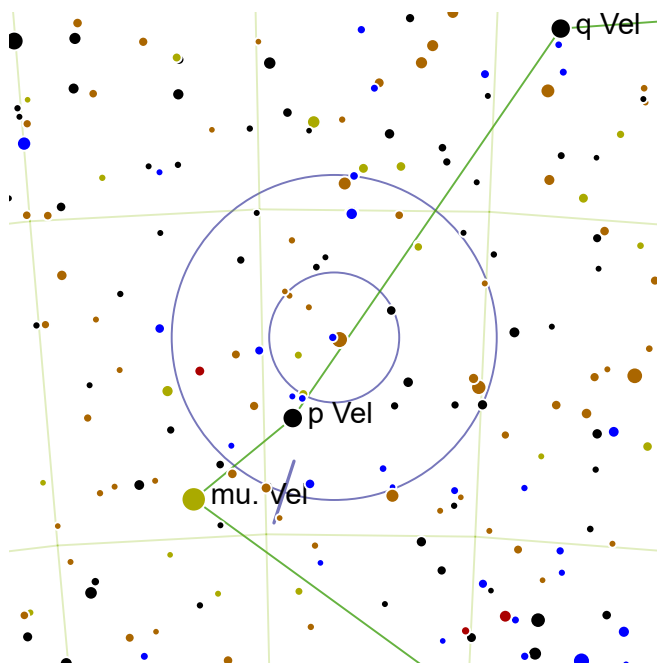
A fair bright orange primary distantly separated from a faint yellow secondary.



One and a half finder circles SE from magnitude 3.72 ksi Hya.



This gravitationally bound system lies 492 light-years from Earth.



HJ 4332

RA: 158.38° | 10h 33.5' — DEC: -46.98° | -46° 58'

Magnitude: 7.1 | 9.8

Separation: 28.4"

Position Angle: 162°

SAO 222145 | HIP 51688 | GDR2 82642742912



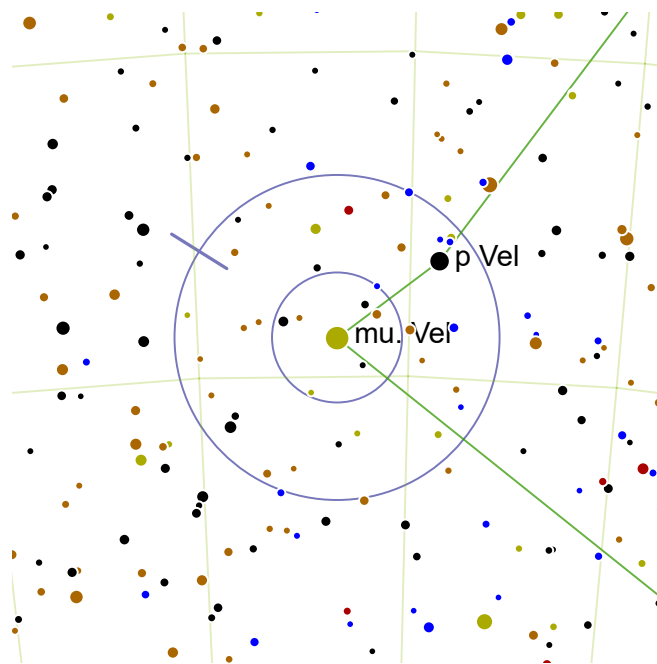
A white primary widely separated from a faint secondary.



Half a finder circle NW from magnitude 2.84 mu. Vel. Two and a half finder circles N from magnitude 3.58 p Car.



This pair is a gravitationally bound binary system.



Mu Vel

RA: 161.7° | 10h 46.79' — DEC: -49.42° | -49° 24'

Magnitude: 2.8 | 5.7

Separation: 2.3"

Position Angle: 58°

SAO 222321 | HIP 52727 | GDR2 34681413248



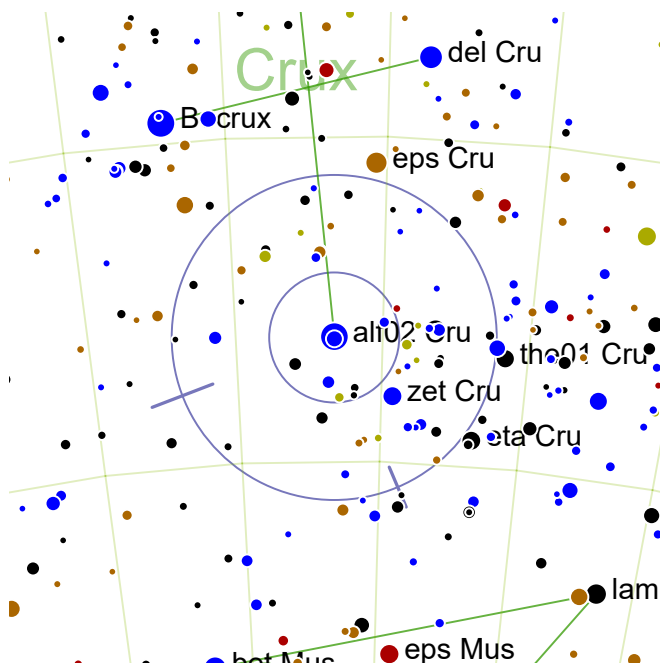
A very brilliant yellow primary with a bright yellow companion, very tightly separated.



Mu Vel is a bright star in Vela. Two finder circles N from magnitude 3.58 p Car.



This gravitationally bound binary system is only 117 light-years from Earth.



Alpha Cru

RA: 186.65° | 12h 26.6' — DEC: -63.1° | -63° 5'

Magnitude: 1.3 | 1.6 | 4.8

Separation: 3.5" | 89"

Position Angle: 111° | 203°

SAO 251904 | HIP 60718



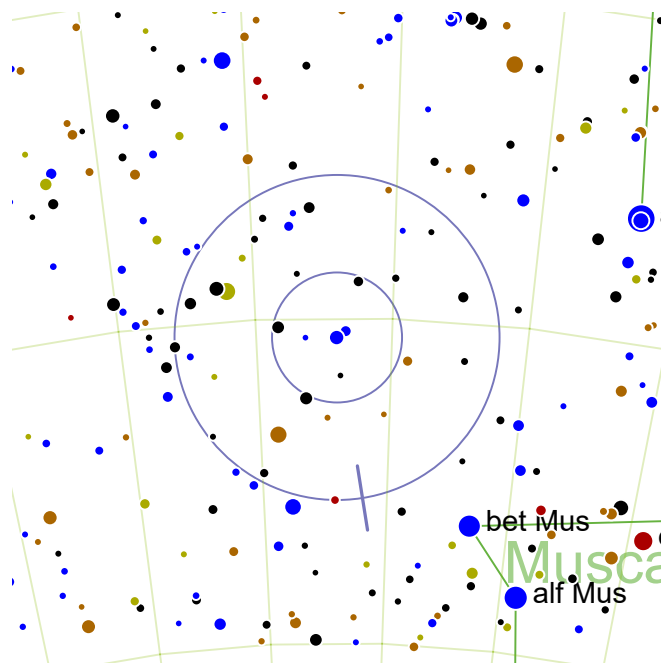
Two extremely brilliant blue stars, very close together. A third very bright component lies distantly from them.



Alpha Cru is a bright star in Crux. Alpha Cru is a bright star in Crux.



The system is has 6 members, but only 3 can be resolved visually. The brightest component is fully 25,000 times brighter than the Sun.



Theta Mus

RA: 197.03° | 13h 8.1' — DEC: -65.3° | -65° 17'

Magnitude: 5.7 | 7.6

Separation: 5.5"

Position Angle: 189°

SAO 252162 | HIP 64094 | GDR2 66471945984



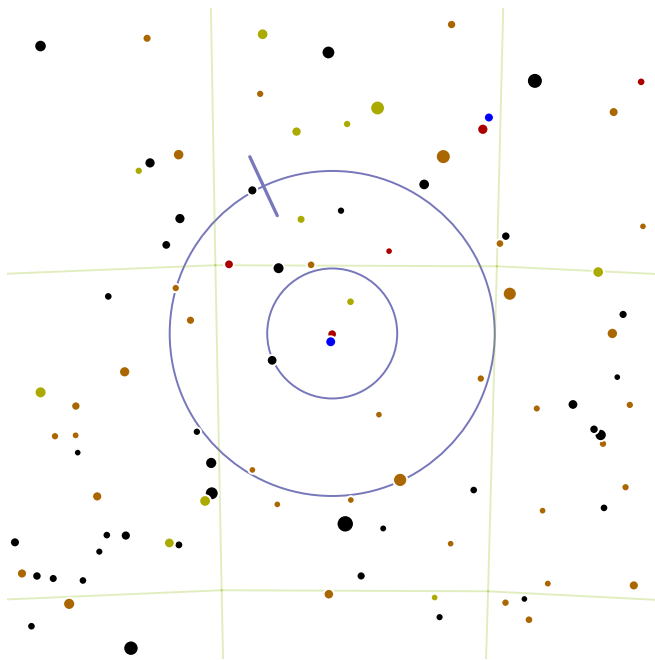
A close pair of blue stars with a bright primary and moderate secondary.



Half a finder circle NE from magnitude 3.26 bet Mus. Half a finder circle NE from magnitude 2.94 alf Mus.



The secondary in an intensely hot Wolf-Rayet star, boiling of its outer layers of gas in an intense stellar wind.



HJ 4554

RA: 192.93° | 12h 51.7' — DEC: -31.07° | -31° 3'

Magnitude: 7.3 | 11.8

Separation: 31.6"

Position Angle: 25°

SAO 203877 | HIP 62767 | GDR2 93857676032



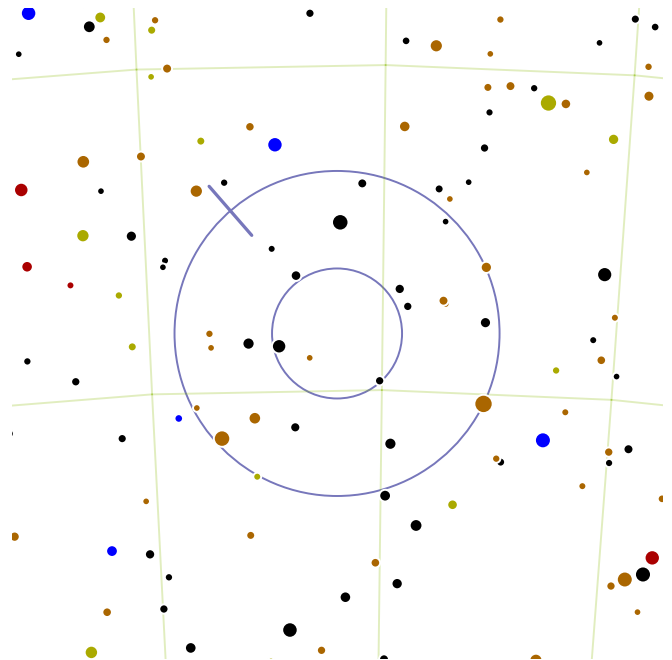
A very wide pair dominated by a fairly bright red primary accompanied by an extremely faint companion.



One and a half finder circles NW from magnitude 2.91 *iot Cen*. One and a half finder circles SW from magnitude 3.33 *gam Hya*.



The primary is a pulsating variable star (Δ mag. 0.34) identified as V942 Cen. Seven arc minutes to the south, blue V943 Cen forms a colorful optical binocular double with the primary.



HJ 4491

RA: 180.98° | 12h 3.89' — DEC: -44.13° | -44° 7'

Magnitude: 8.5 | 8.5

Separation: 23.4"

Position Angle: 41°

SAO 223195 | HIP 58813 | GDR2 37517738624



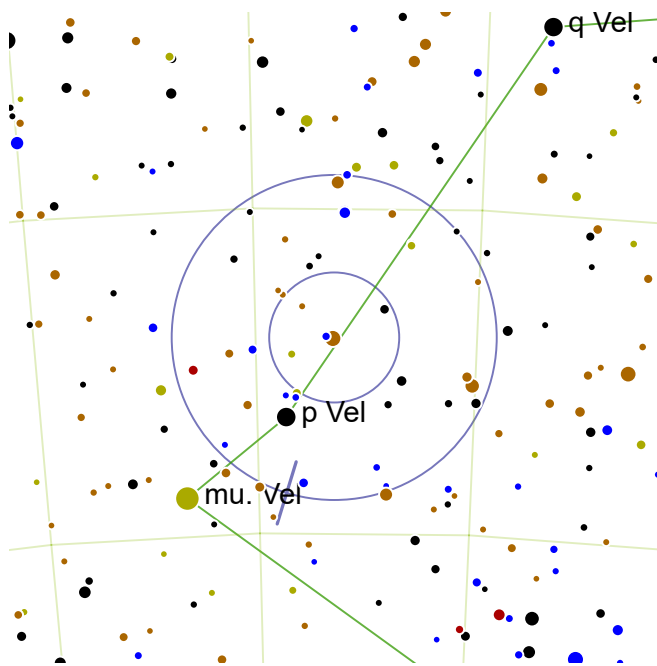
A widely separated, balanced pair with a yellowish primary and a somewhat yellower secondary.



One finder circle N from magnitude 2.88 *del Cen*. Two and a half finder circles SSE from magnitude 3.72 *ksi Hya*.



This gravitationally bound pair is 178 light-years from Earth.



HJ 4330

RA: 158.23° | 10h 32.89' — DEC: -47.0° | -47° 0'

Magnitude: 5.2 | 8.6

Separation: 40.3"

Position Angle: 163°

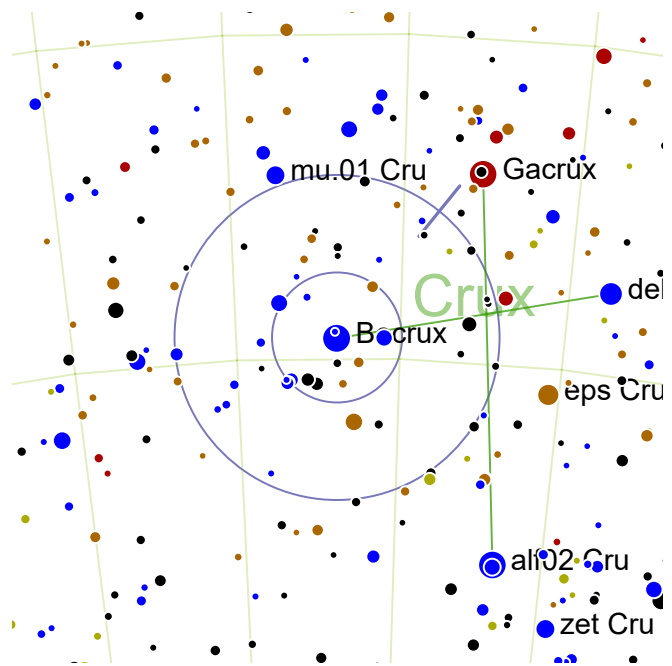
SAO 222136 | HIP 51635 | GDR2 06787969536



A bright orange primary widely separated from a fairly faint white secondary.



Half a finder circle NW from magnitude 2.84 mu. Vel. Two and a half finder circles N from magnitude 3.58 p Car.



Beta Cru

RA: 191.93° | 12h 47.7' — DEC: -59.68° | -59° 40'

Magnitude: 1.3 | 11.4

Separation: 44"

Position Angle: 321°

SAO 240259 | HIP 62434



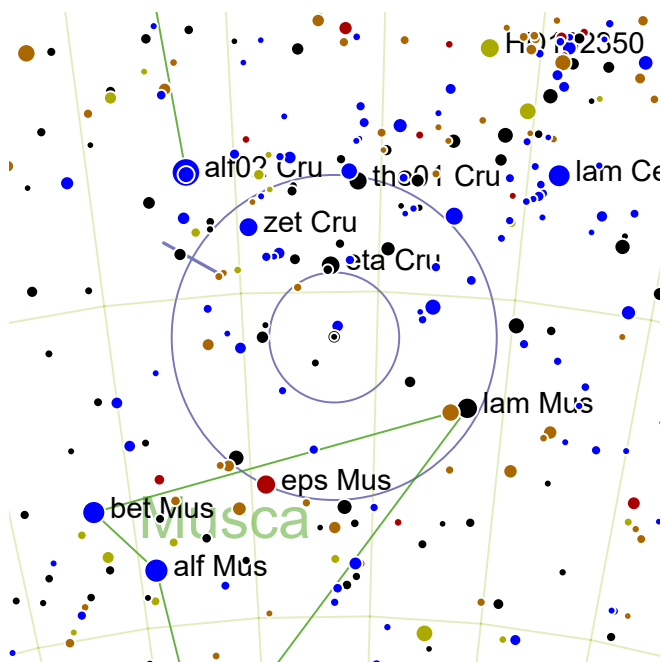
A extremely brilliant blue primary very widely separated from a faint blue secondary.



Beta Cru is a bright star in Crux. Half a finder circle E from magnitude 3.57 eps Cru.



Aldo known as Mimosa, the primary component is 34,000 times brighter than the sun as well as being 16 times more massive. This monstrous star has exhausted its hydrogen fuel and is now burning (and producing) heavier elements. In a matter of millions of years, the star will end its life as a supernova.



HJ 4498


RA: 181.6° | 12h 6.39' — DEC: -65.72° | -65° 42'


Magnitude: 7 | 7.9


Separation: 8.7"

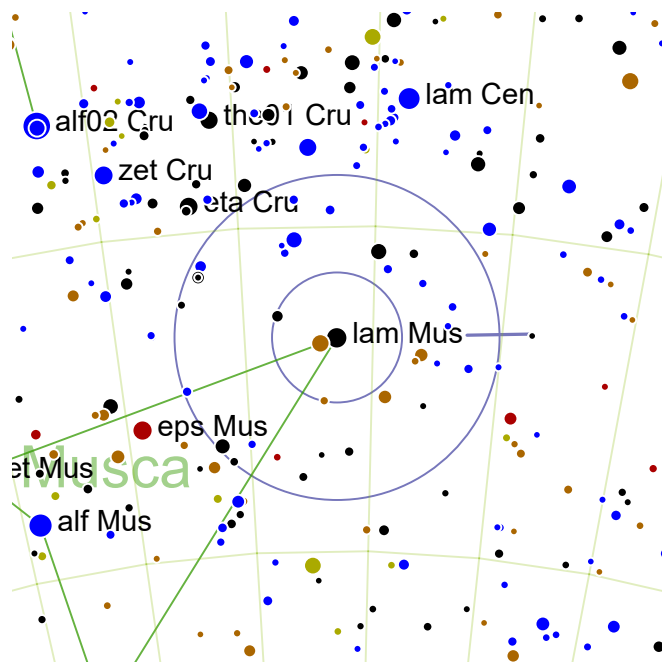
Position Angle: 61°

SAO 251738 | HIP 59050 | GDR2 30979343616

 A fairly bright yellow primary with an orange companion close by.

 One and a half degrees NEE from magnitude 3.8 lam Mus. Half a finder circle SE from magnitude 3.34 lam Cen.

 NGC 4463 a magnitude 7.2 open star cluster, is on the eastern edge the finder view.



Lambda Mus


RA: 176.4° | 11h 45.6' — DEC: -66.72° | -66° 42'


Magnitude: 3.6 | 11.4


Separation: 31.9"

Position Angle: 271°

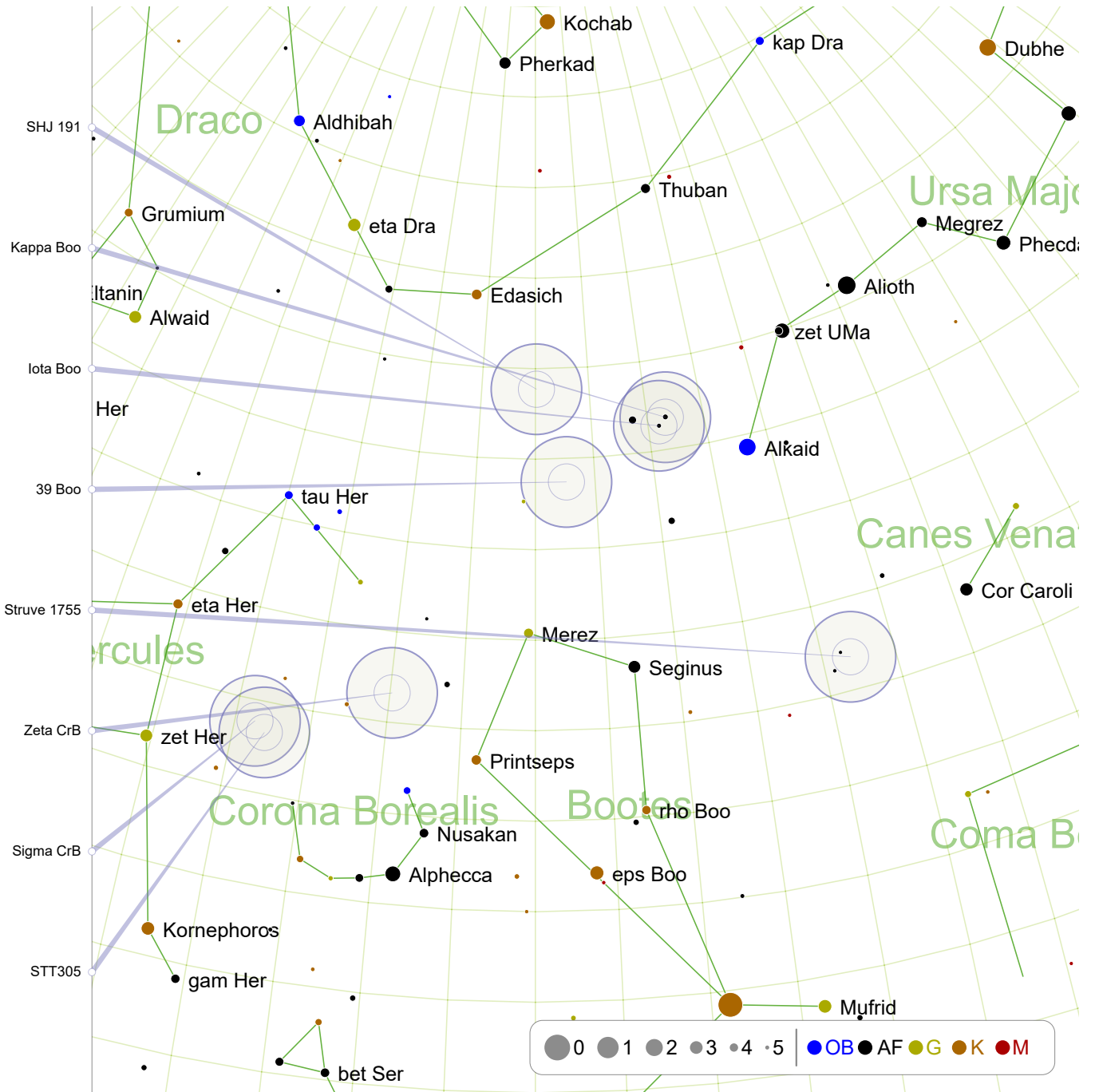
SAO 251575 | HIP 57363 | GDR2 71555481344

 A very brilliant white primary widely separated from an extremely faint companion.

 Lambda Mus is a bright star in Musca. Half a finder circle SSE from magnitude 3.34 lam Cen.

 Forms a pleasing binocular double with brilliant Mu Muscae.

May: 45° North

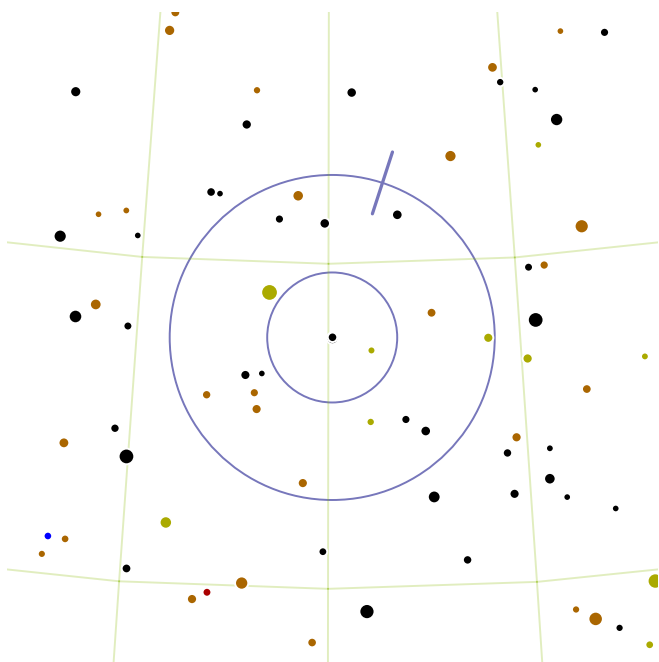


SHJ 191: page 218
Struve 1755: page 220

Kappa Boo: page 218
Zeta CrB: page 220

Iota Boo: page 219
Sigma CrB: page 221

39 Boo: page 219
STT305: page 221



SHJ 191

RA: 224.9° | 14h 59.6' — DEC: 53.87° | 53° 52'

Magnitude: 6.8 | 7.4

Separation: 40.5"

Position Angle: 342°

SAO 29372 | HIP 73366 | GDR2 28192378752



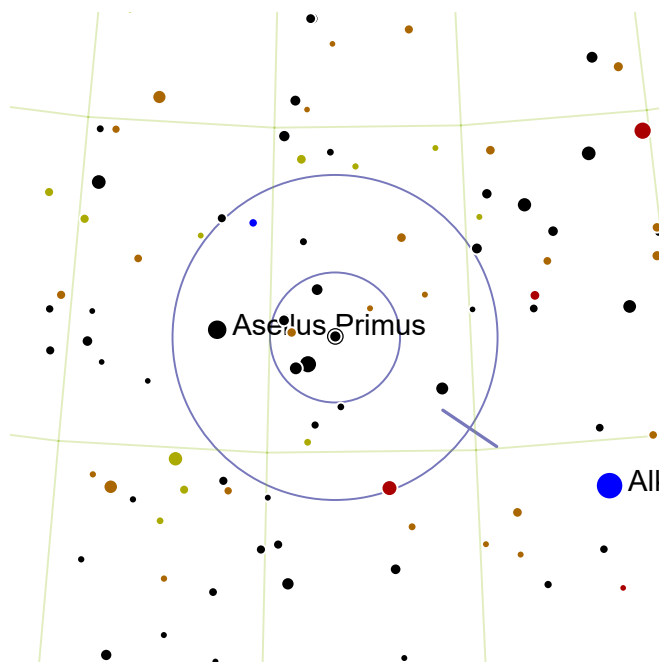
A balanced (but somewhat less bright) pair of yellow stars with very wide separation.



First locate the triangle of fourth-magnitude Asellus Primus, Secundus and Tertius one and a half finders east of Alkaid. Go a further finder and a half NEE to SHJ 191.



Best at very low magnification. "Asellus" means "donkey colt". Asellus Primus has an 11th magnitude red dwarf companion (separation: 70").



Kappa Boo

RA: 213.38° | 14h 13.5' — DEC: 51.78° | 51° 47'

Magnitude: 4.6 | 6.6

Separation: 13.4"

Position Angle: 236°

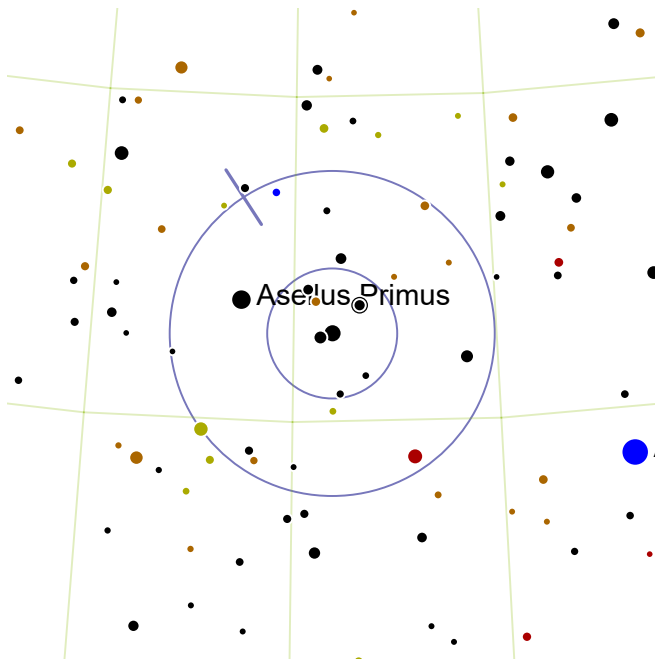
SAO 29046 | HIP 69483 | GDR2 67598402944



A very bright white primary component nicely separated from a reasonably bright blue secondary.



Surprisingly part of Bootes not the much nearer Ursa Major, Kappa Boo is one and a half finder circles north east of Alkaid at the end of the handle of the Plough. It is within a degree of Iota Bootis, and two degrees to the east lies the slightly brighter Theta Bootis (Asellus Primus).



Iota Boo

RA: 214.05° | 14h 16.2' — DEC: 51.37° | 51° 22'

Magnitude: 4.9 | 7.5

Separation: 38"

Position Angle: 33°

SAO 29071 | HIP 69713 | GDR2 33122255744



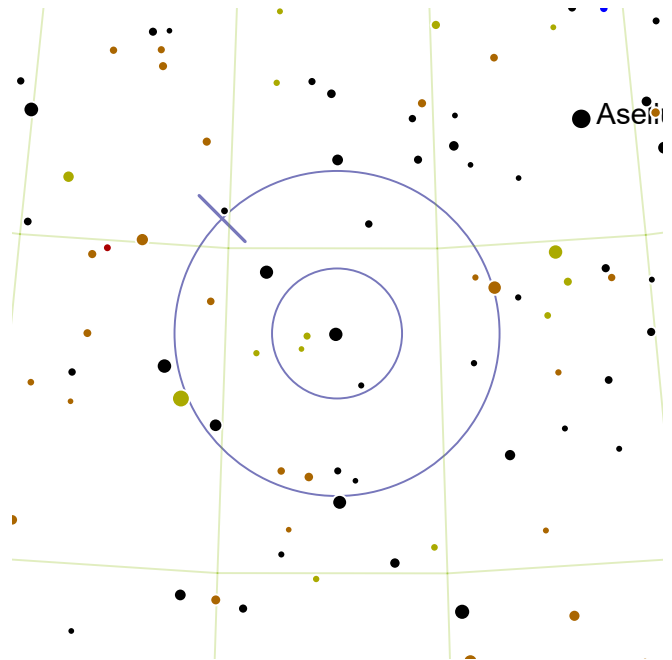
A very wide pairing of a bright yellow primary and a blue companion.



Like Kappa Bootis, find Iota one and a half finder circles north east of Alkaid.



Two degrees to the east lies slightly brighter Asellus Primus ("the first donkey"). This star has a dim magnitude 11.46 companion (an M2.5 red dwarf a third of the mass of the sun) separated by 70" at a position angle of 182°.



39 Boo

RA: 222.4° | 14h 49.6' — DEC: 48.72° | 48° 43'

Magnitude: 6.2 | 6.9

Separation: 2.9"

Position Angle: 45°

SAO 45231 | HIP 72524 | GDR2 42798813824



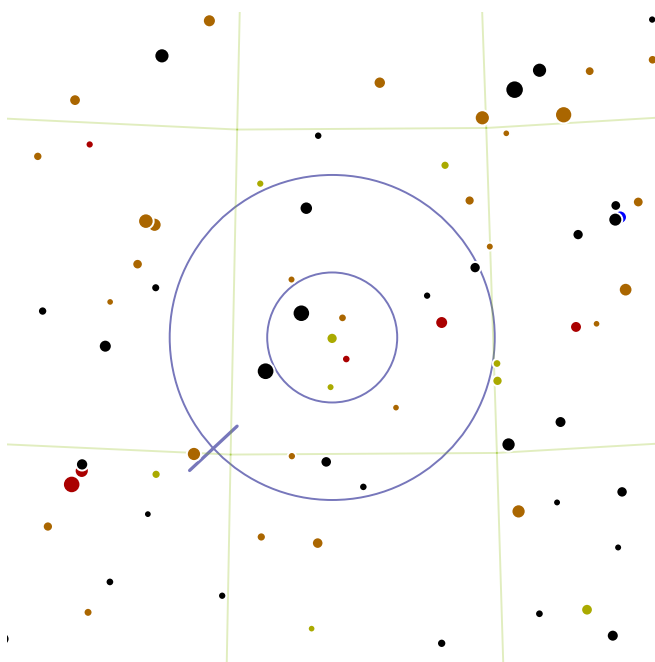
A balanced tightly bound pair of yellow stars.



First locate the triangle of fourth-magnitude Asellus Primus, Secundus and Tertius one and a half finders east of Alkaid. Go a further finder and a half south-east from Asellus Primus to 39 Boo.



This system is charging towards the Sun at 31 km/s, but as it is a mere 224 light-years away there is no immediate cause for concern. The brighter star is actually a spectroscopic binary so this is a triple star system.



Struve 1755

RA: 203.09° | 13h 32.37' — DEC: 36.82° | 36° 49'

Magnitude: 7.3 | 8.1

Separation: 4.1"

Position Angle: 133°

SAO 63593 | HIP 66042 | GDR2 57146586240



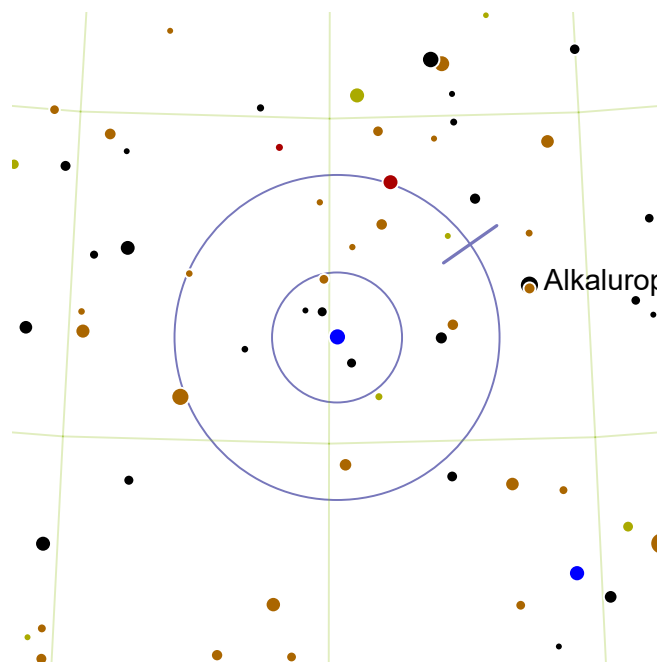
A fairly equal and very close pairing; the primary is yellow.



One finder circle E from magnitude 2.9 Cor Caroli. Two and a half finder circles SSW from magnitude 1.91 Alkaid.



This is only an optical double - the components are not part of the same system.



Zeta CrB

RA: 234.85° | 15h 39.39' — DEC: 36.63° | 36° 38'

Magnitude: 5.1 | 6.0

Separation: 6.3"

Position Angle: 305°

SAO 64834 | HIP 76669 | GDR2 06328813568



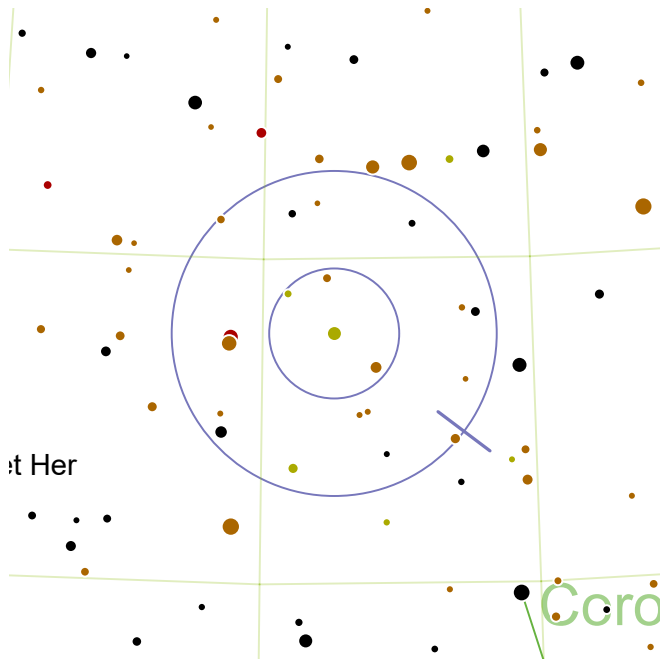
A well-matched pair of bright bluish stars, closely separated. The pair are both blue, but some observers report seeing the fainter companion as greenish.



Follow a line through Arcturus, Izar and Thiba and continue for a little more than one finder circle.



This system is formed by two hot B-class main sequence stars, 473 light-years from the Sun.



Sigma CrB

RA: 243.68° | 16h 14.7' — DEC: 33.87° | 33° 52'

Magnitude: 5.6 | 6.6

Separation: 6.2"

Position Angle: 233°

SAO 65165 | HIP 79607 | GDR2 62170960512



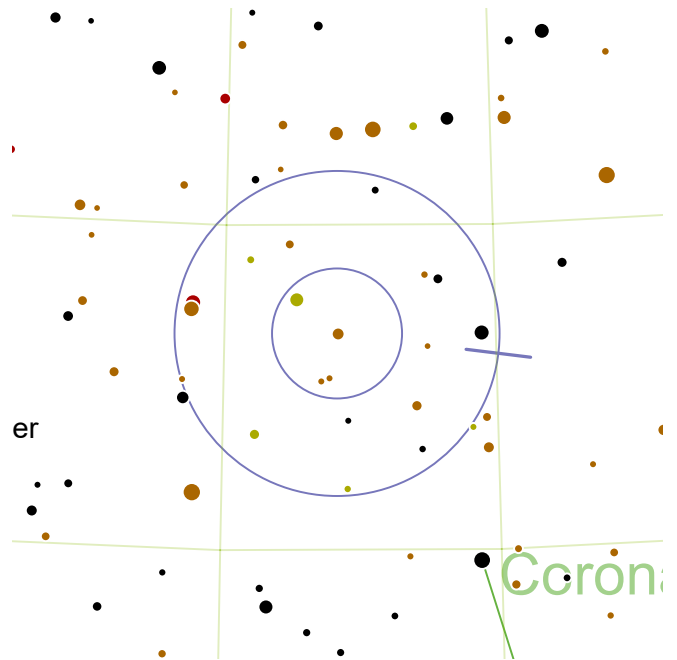
A well balanced yellow pair with quite close separation.



Located 1 degree to the north east of O. Struve 305.



Don't forget to slide one and quarter finder circles to the north east to view Messier 13, the Great Globular Cluster.



STT305

RA: 242.93° | 16h 11.7' — DEC: 33.35° | 33° 21'

Magnitude: 6.4 | 10.2

Separation: 5.4"

Position Angle: 263°

SAO 65129 | HIP 79350 | GDR2 14413070464



A close orange-blue pair, but the secondary is quite faint.



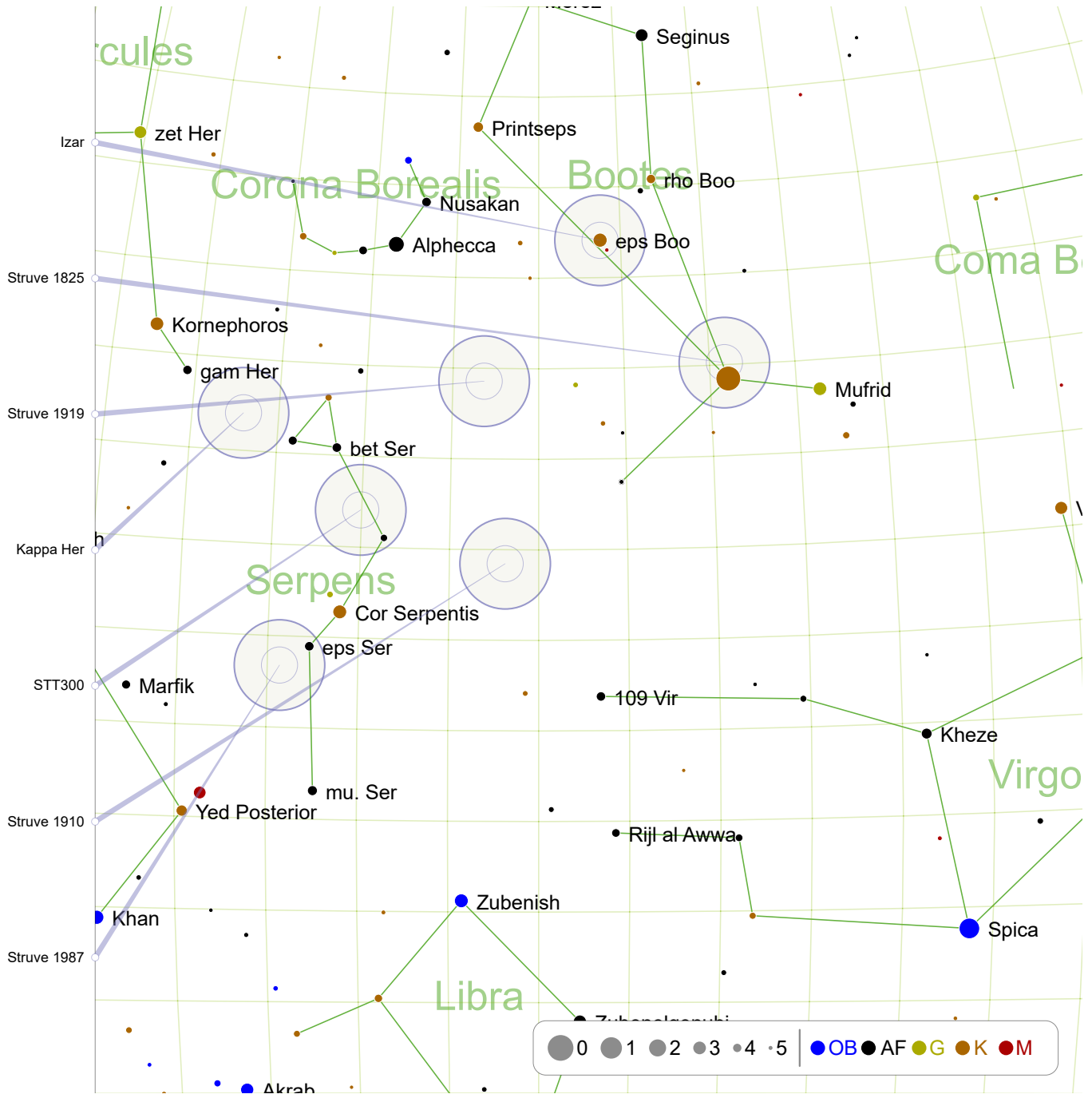
Starting from Zeta Herculis (the southernmost star of the Hercules keystone asterism) and track one and a half finder circles west.



Sigma CrB lies one degree to the north east.

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May: 10° North (1)



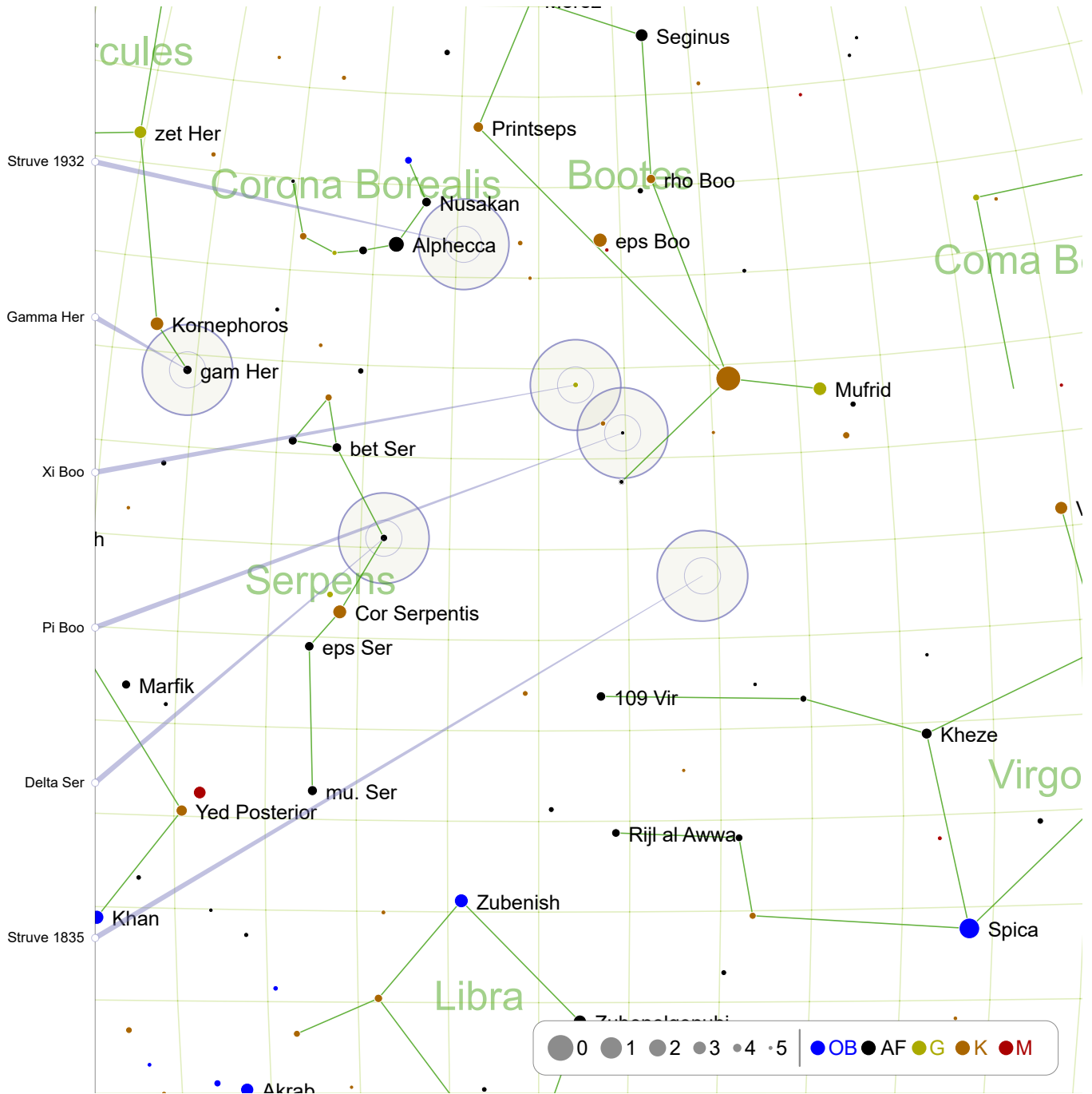
Izar: page 225
STT300: page 227

Struve 1825: page 225
Struve 1910: page 227

Struve 1919: page 226
Struve 1987: page 228

Kappa Her: page 226

May: 10° North (2)

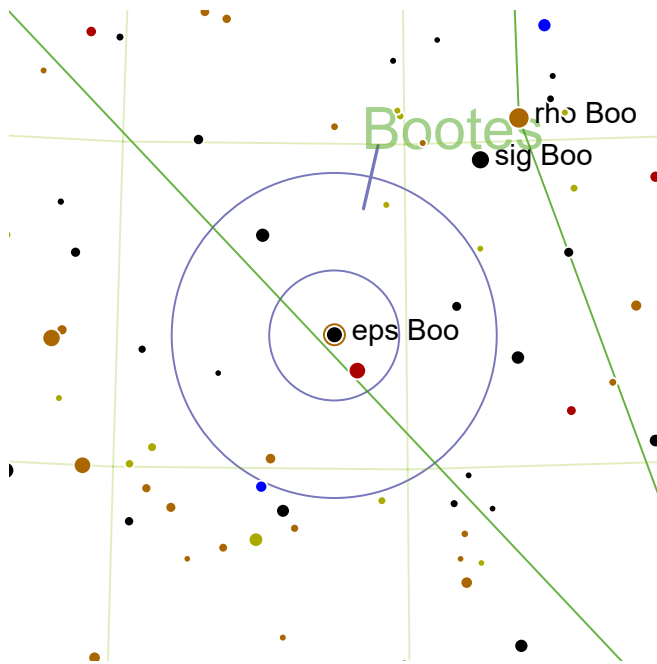


Struve 1932: page 228
Delta Ser: page 230

Gamma Her: page 229
Struve 1835: page 231

Xi Boo: page 229

Pi Boo: page 230



Izar

RA: 221.25° | 14h 44.99' — DEC: 27.07° | 27° 4'

Magnitude: 2.58 | 4.51

Separation: 2.80"

Position Angle: 347°

SAO 83500 | HIP 72105 | GDR2 89901591168



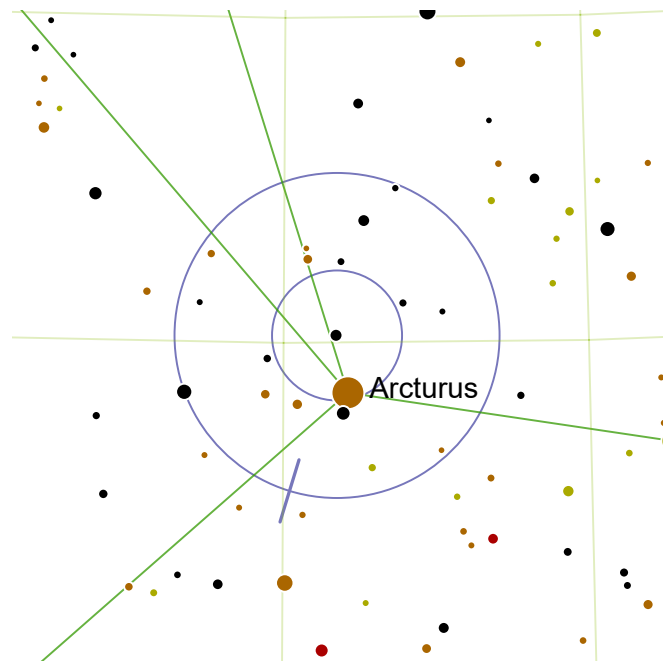
A fine and very narrowly separated orange-yellow pair. Both components shine brilliantly.



As a magnitude 2.5 star it stands out prominently in the sky, 20 degrees to the north east of Arcturus.



Izar is also known as Epsilon Bootis or Pulcherrima. This last name, meaning "loveliest", was awarded by Friedrich Georg Wilhelm von Struve, perhaps the most renowned of all double star observers.



Struve 1825

RA: 214.13° | 14h 16.5' — DEC: 20.12° | 20° 7'

Magnitude: 6.5 | 8.2

Separation: 4.4"

Position Angle: 163°

SAO 83259 | HIP 69751



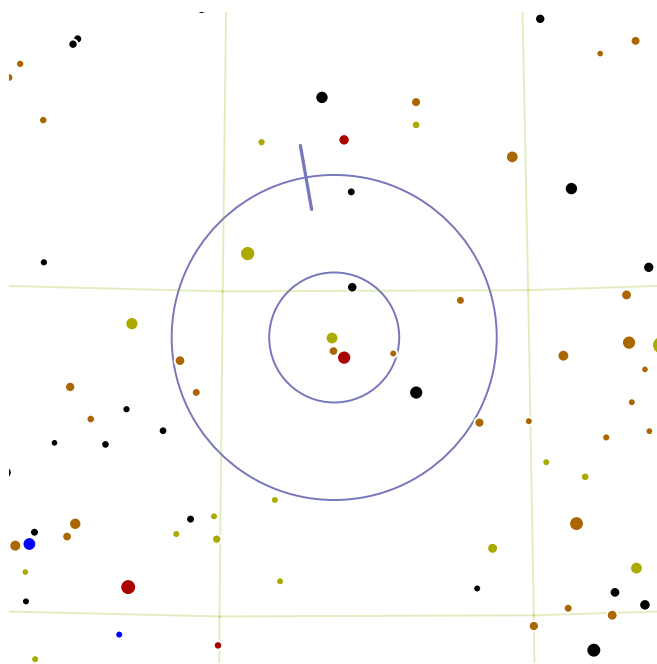
A very close yellow-orange pairing.



An easy spot, just one degree north of brilliant Arcturus.



The system is 106 light-years away.



Struve 1919

RA: 228.18° | 15h 12.7' — DEC: 19.3° | 19° 18'

Magnitude: 6.7 | 7.6

Separation: 23.9"

Position Angle: 10°

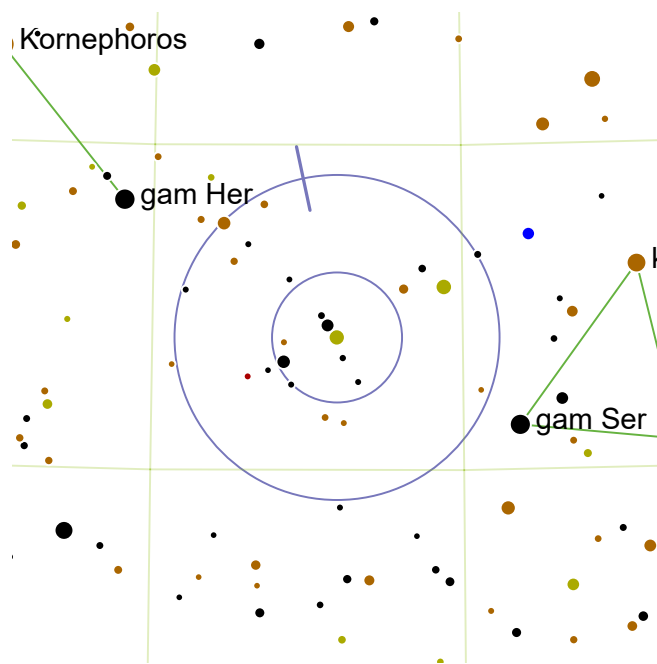
SAO 101437 | HIP 74432



A less bright and quite wide yellow-blue pairing.



Three finder circles east of Arcturus, so quite far out in the inky void. But if you can first locate the brighter Xi Bootis, then it is a short one-finder hop east to Struve 1919.



Kappa Her

RA: 242.03° | 16h 8.1' — DEC: 17.05° | 17° 3'

Magnitude: 5.3 | 6.5

Separation: 28"

Position Angle: 12°

SAO 101951 | HIP 79043 | GDR2 34296727296



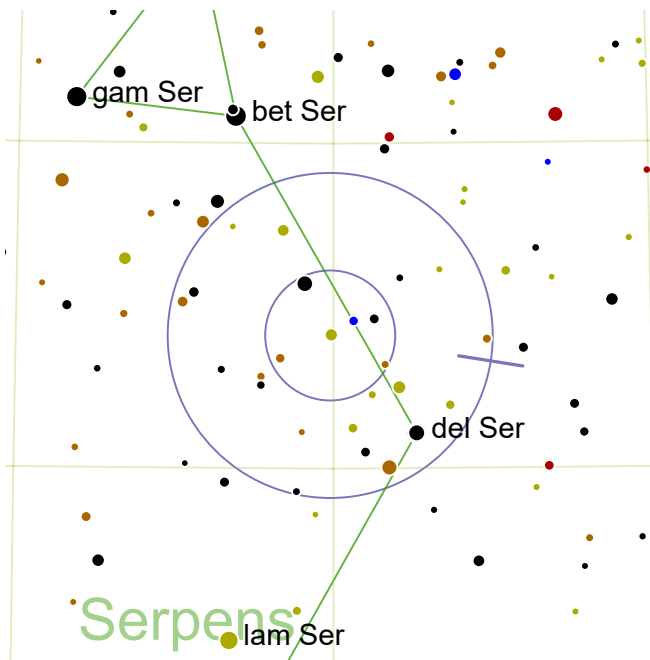
A reasonably balanced and bright, but widely separated, pair of yellow stars.



Midway between Gamma Herculis and Gamma Serpentis, perhaps the best way to find this double is to fill the finder view with the three stars of Serpens' head, and then track east one finder circle.



The planetary nebula IC 4593 is one finder circle south and very slightly east of this double.



STT300

RA: 235.05° | 15h 40.2' — DEC: 12.05° | 12° 3'

Magnitude: 6.4 | 9.5

Separation: 15.3"

Position Angle: 261°

SAO 101673 | HIP 76733 | GDR2 34460189824



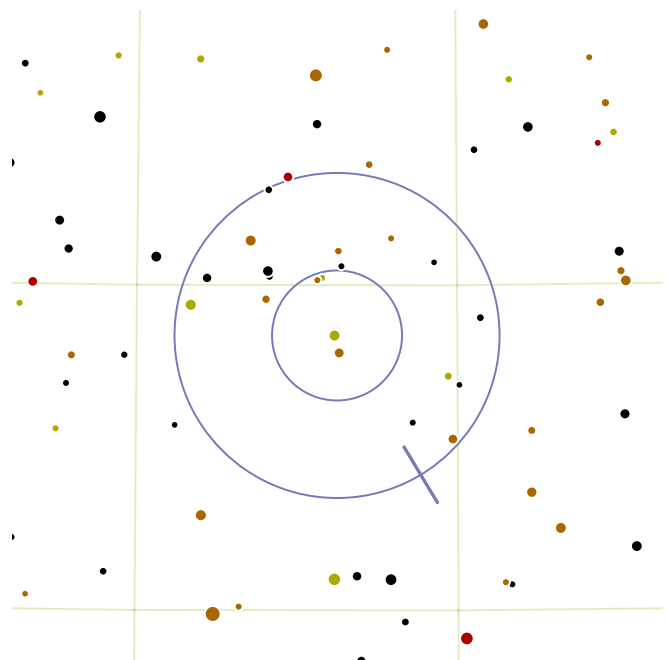
An easily separated yellow-blue pair, although the B component is quite dim.



Center Delta Serpentis in your finder; Struve 300 lies on the north-eastern edge of the field.



The primary is a luminous G-class giant star shining from a distance of nearly 1000 light-years.



Struve 1910

RA: 226.88° | 15h 7.5' — DEC: 9.23° | 9° 14'

Magnitude: 7.5 | 7.5

Separation: 4.3"

Position Angle: 211°

HIP 74016 | GDR2 49194619264



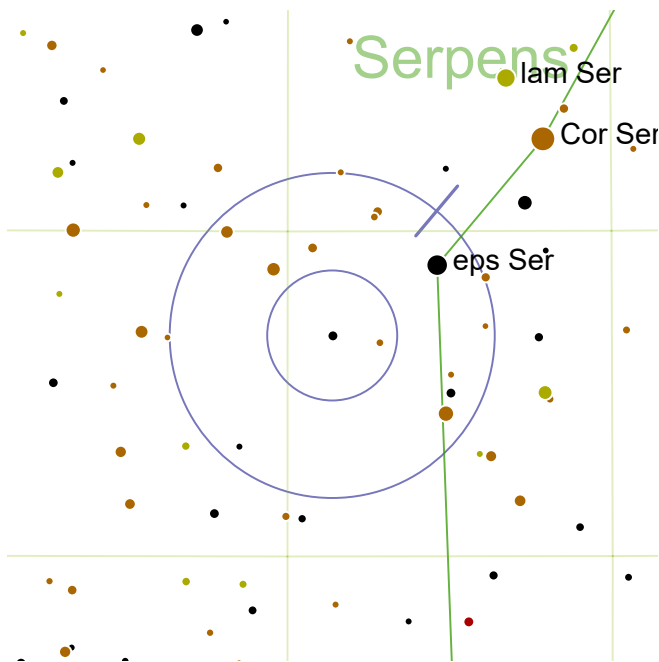
A close pair of perfectly balanced yellow stars.



Starting at Alpha Serpentis or Unukalhai (magnitude 2.6), move two finder circles west and slightly north.



Consisting of two stars almost identical to the Sun, these stars are in our backyard at only 103 light-years distance.



Struve 1987

RA: 239.31° | 15h 57.25' — DEC: 3.4° | 3° 24'

Magnitude: 7.3 | 8.7

Separation: 10.4"

Position Angle: 320°

SAO 121277 | HIP 78134 | GDR2
4425002520426044032



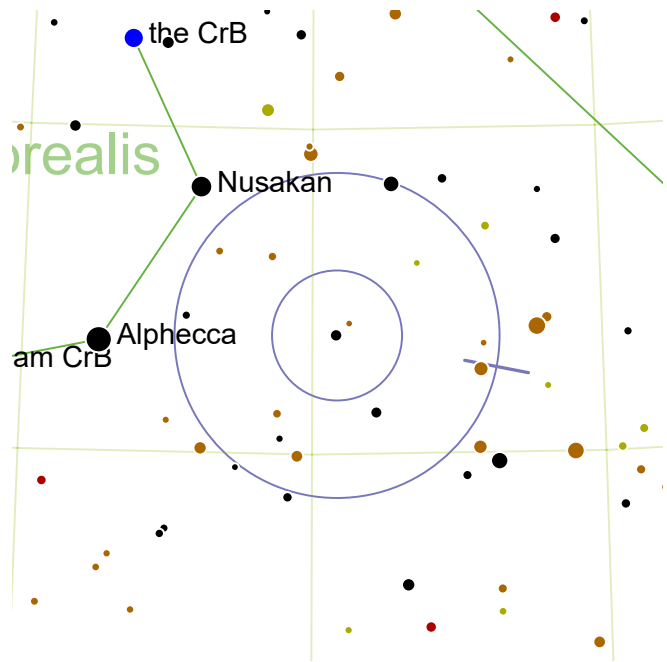
A white primary with a somewhat fainter blue companion, easily separated.



One degree SEE from magnitude 3.75 eps Ser. Half a finder circle SE from magnitude 2.75 Cor Serpentis.



This is a physical binary system. The stars are about 585 light-years from Earth.



Struve 1932

RA: 229.58° | 15h 18.29' — DEC: 26.83° | 26° 50'

Magnitude: 7.3 | 7.4

Separation: 1.6"

Position Angle: 259°

SAO 83756 | HIP 74893 | GDR2 15518148736



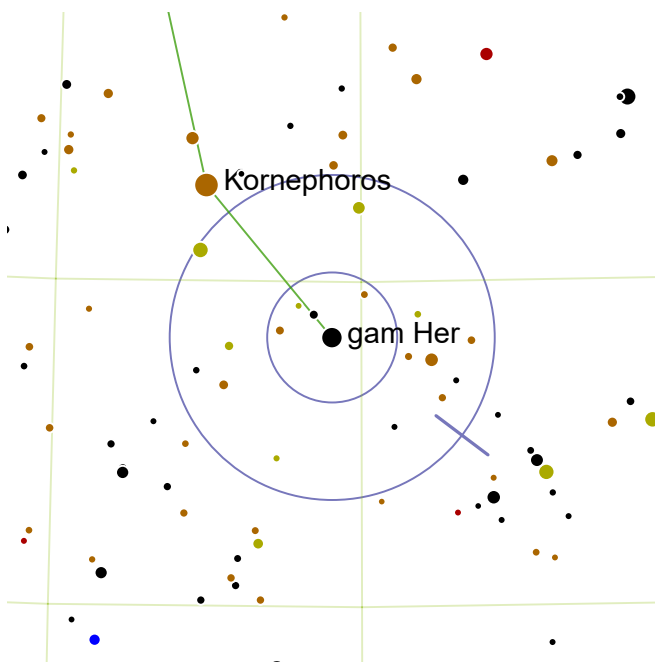
A perfectly balanced pair of yellow stars, but extremely close.



Shares the same finder circles as the brightest star of on Corona Borealis, Alphecca (magnitude 2.2). Position Alphecca in the eastern quadrant of the finder; Struve 1932 is the brightest star in the western quadrant.



Alphecca is a nearby (75 light-years) eclipsing binary, with an orbital period of 17.36 days but an amplitude of only 0.11 magnitudes.



Gamma Her

RA: 245.48° | 16h 21.89' — DEC: 19.15° | 19° 9'

Magnitude: 3.8 | 9.8

Separation: 41.6"

Position Angle: 233°

SAO 102107 | HIP 80170 | GDR2 39456872704



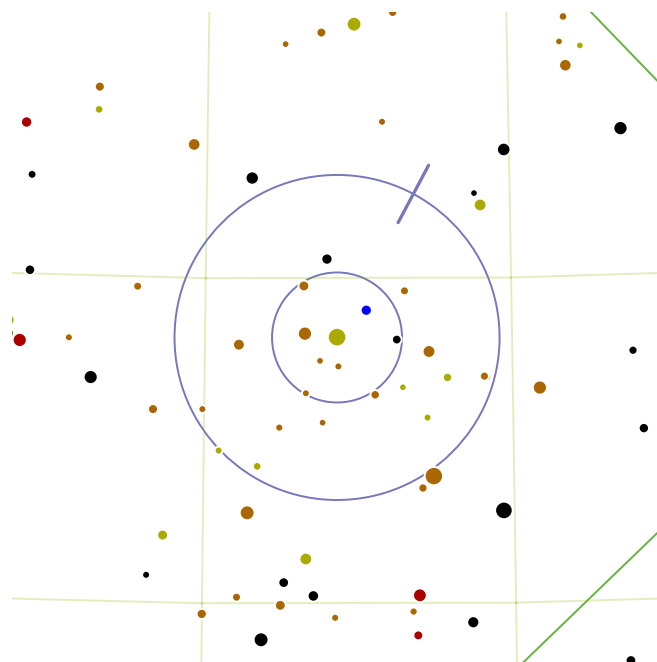
A yellow-yellow pairing with a brilliant primary and dim secondary. Distantly separated.



Find magnitude 2.75 Kornephoros south west of the Keystone asterism of Hercules. Track west by a degree and Gamma Herculis will appear on the western edge of the finder.



One and a half finder circles north east is the dim planetary nebula NGC 6210. An equal distance in the opposite direction to the SSW, lies another planetary nebula, IC 4593.



Xi Boo

RA: 222.85° | 14h 51.39' — DEC: 19.1° | 19° 6'

Magnitude: 4.7 | 7.0

Separation: 6.9"

Position Angle: 332°

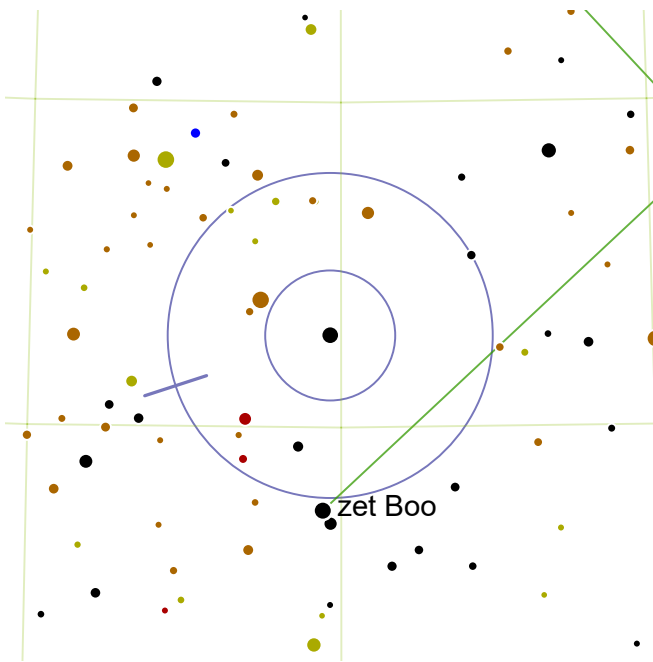
SAO 101250 | HIP 72659 | GDR2 38916392704



A close yellow-orange duo, with a bright primary and brightish secondary.



Two finder circles due east of Arcturus. Xi and Pi Bootis just fit in a finder, on the outer edges of the north-east and south-west quadrants.



Pi Boo

RA: 220.18° | 14h 40.7' — DEC: 16.42° | 16° 25'

Magnitude: 4.9 | 5.8

Separation: 5.6"

Position Angle: 108°

SAO 101138 | HIP 71762 | GDR2 87617291520



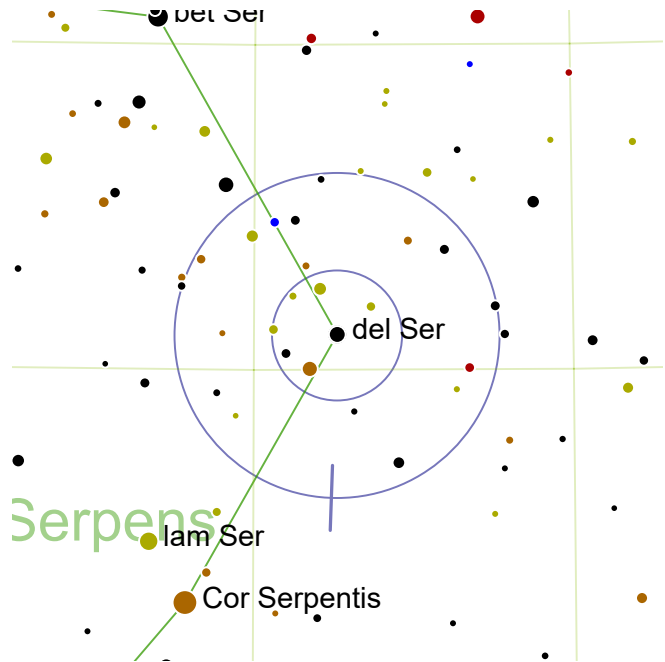
A close and reasonably balanced pair of white stars.



One and a half finder circles east of south-east of Arcturus.



Pi Bootis is 305 light-years from the Sun.



Delta Ser

RA: 233.7° | 15h 34.79' — DEC: 10.53° | 10° 32'

Magnitude: 4.2 | 5.2

Separation: 3.9"

Position Angle: 178°

SAO 101623 | HIP 76276 | GDR2 58411028096



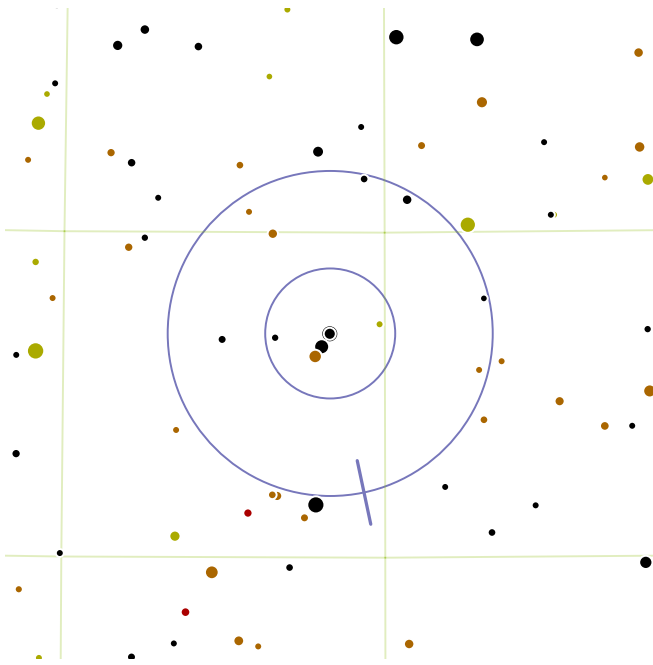
A reasonably balanced and very tight yellow-yellow pair.



Bright enough to be picked out in strong light pollution, you can find find this star five degrees north-west of Cor Serpentis.



The orbit of these two F-type stars has been calculated at 3200 years with a separation of 375 astronomical units (nearly ten times the distance between Pluto and the Sun).



Struve 1835


RA: 215.85° | 14h 23.39' — DEC: 8.45° | 8° 27'


Magnitude: 5.1 | 7.6


Separation: 6.2"

Position Angle: 192°

SAO 120426 | HIP 70327 | HIP 16168739456

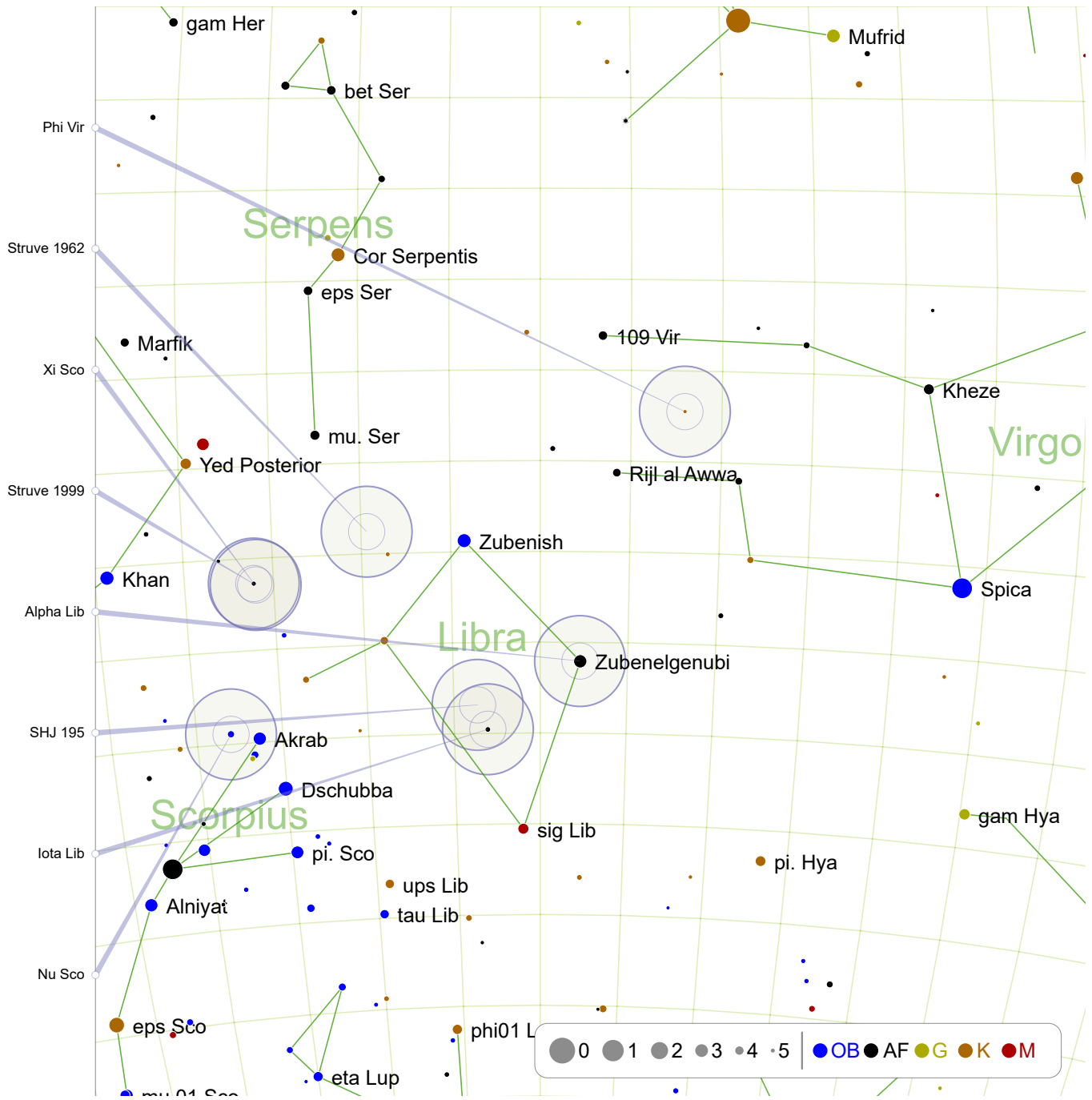
 A bright white primary close to a yellow secondary.

 Struve 1835 is located just over two finder circles due south and slightly east of Arcturus. Struve 1835 is the northernmost of a one-degree line of three stars.

 The system is 216 light-years away.

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May: -10° South



Phi Vir: page 234

Struve 1962: page 234

Xi Sco: page 235

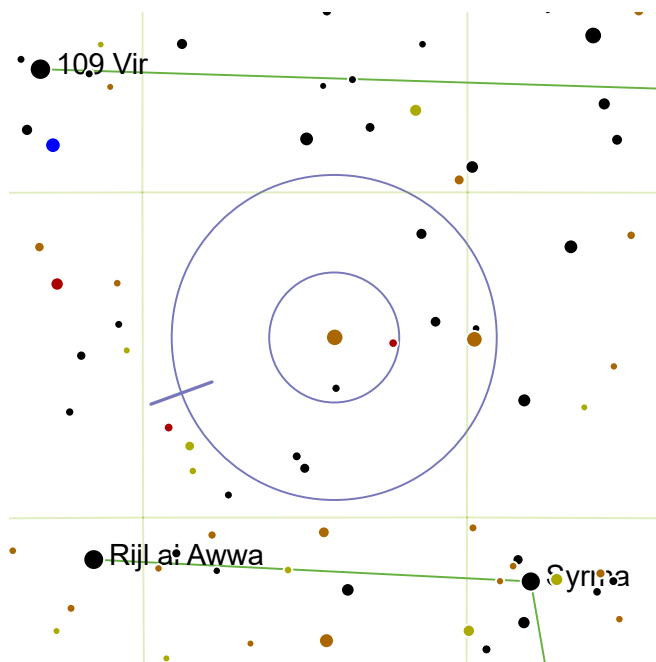
Struve 1999: page 235

Alpha Lib: page 236

SHJ 195: page 236

Iota Lib: page 237

Nu Sco: page 237



Phi Vir

RA: 217.05° | 14h 28.2' — DEC: -2.23° | -2° 13'

Magnitude: 4.8 | 9.3

Separation: 4.8"

Position Angle: 110°

SAO 139951 | HIP 70755 | GDR2 95468596480



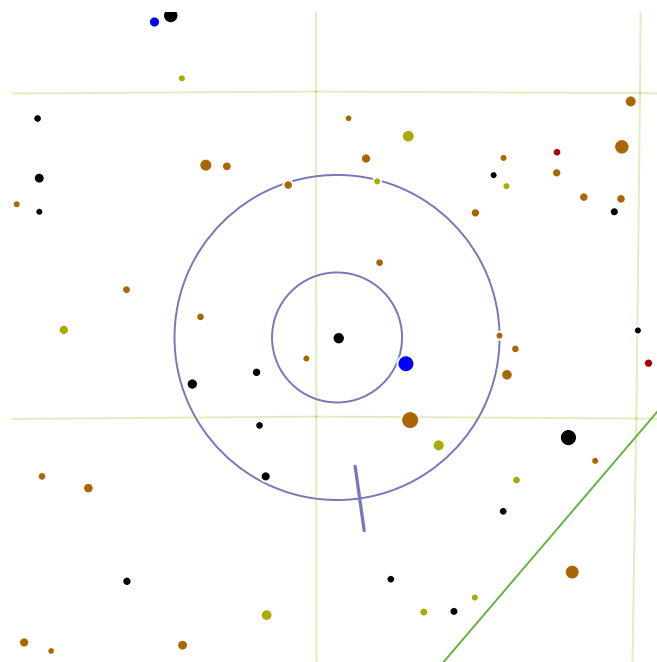
A very close and unequal yellow-blue pair.



One finder circle NW from magnitude 3.95 Rijl al Awwa.



The system is only 118 light-years from Earth.



Struve 1962

RA: 234.68° | 15h 38.7' — DEC: -8.78° | -8° 46'

Magnitude: 6.5 | 6.6

Separation: 11.9"

Position Angle: 188°

SAO 140672 | HIP 76603 | GDR2 01723597440



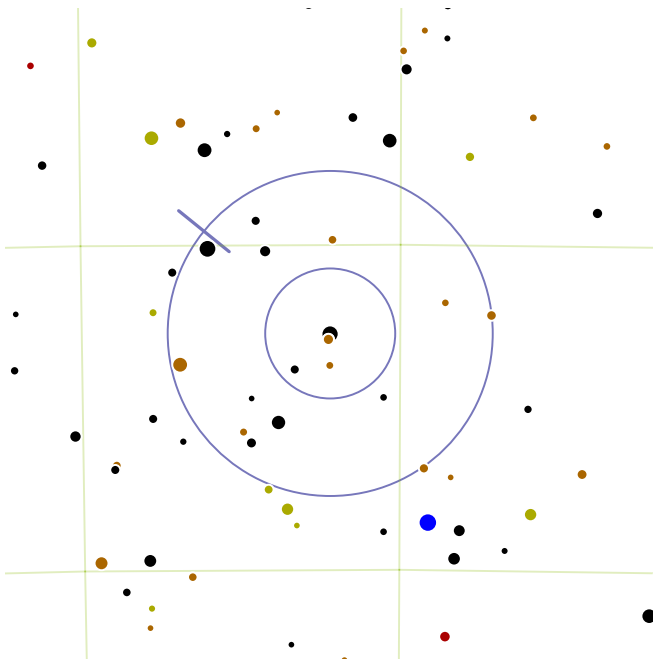
An easily separated equal pair of yellow stars.



This southerly double is located just over two finder circles due east of the gloriously named Zubeneschamali, which at magnitude 2.61 is a good signpost.



Zubeneschamali means the "northern claw" of Scorpius, although now the star is classified as the brightest star of Libra.



Xi Sco

RA: 241.1° | 16h 4.39' — DEC: -11.37° | -11° 21'

Magnitude: 4.8 | 7.3

Separation: 7.6"

Position Angle: 51°

SAO 159665 | HIP 78727 | GDR2 92367555200



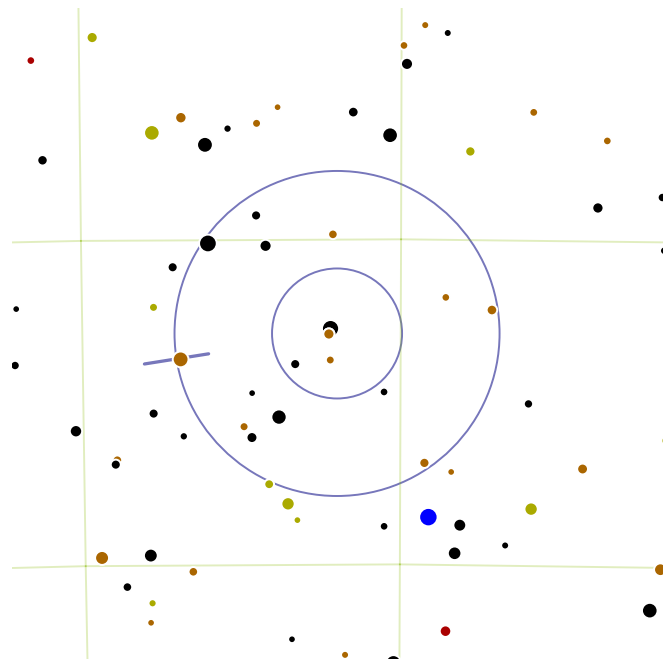
Xi Sco (Grafias) is a triple star system. The yellow primary can be split by larger telescopes into a pair of equal pale yellow stars with a separation of 1.1". Lesser telescopes show a single yellow point distinctly separated from a fairly apparent blue companion.



This double lies one and a half finder circles north of the arc of three stars marking Scorpius' head.



While in the region of Scorpius, turn your telescope to Antares and try to resolve its blue companion (or is it green?).



Struve 1999

RA: 241.0° | 16h 4.0' — DEC: -11.45° | -11° 26'

Magnitude: 7.4 | 8.1

Separation: 11.6"

Position Angle: 99°

SAO 159668 | HIP 78738 | GDR2 77465522816



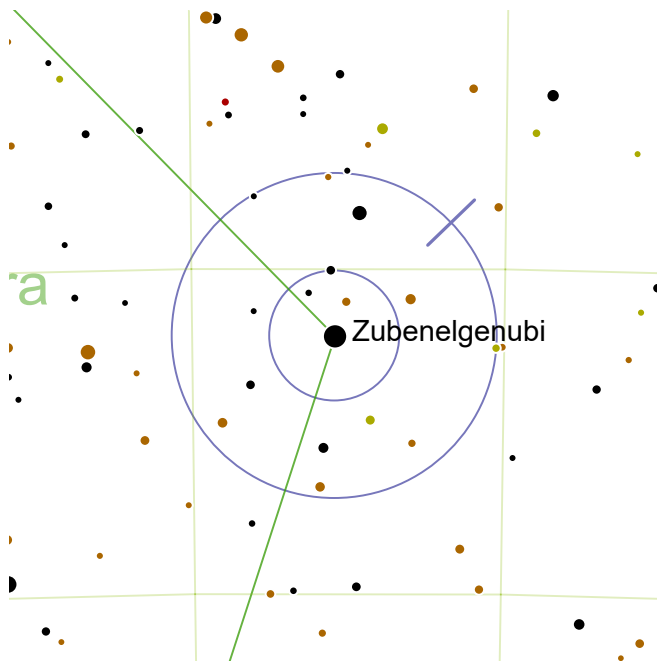
An easily separated and well balanced pair of deep yellow stars.



Two and a half finder circles south east of Arcturus.



Only 82 light-years distant, this double is a pair of cool yellow (slightly orange) main sequence dwarfs, smaller and cooler than our Sun.



Alpha Lib

RA: 222.73° | 14h 50.89' — DEC: -16.03° | -16° 1'

Magnitude: 2.8 | 5.2

Separation: 231"

Position Angle: 314°

SAO 158840 | HIP 72622 | GDR2 07860824832



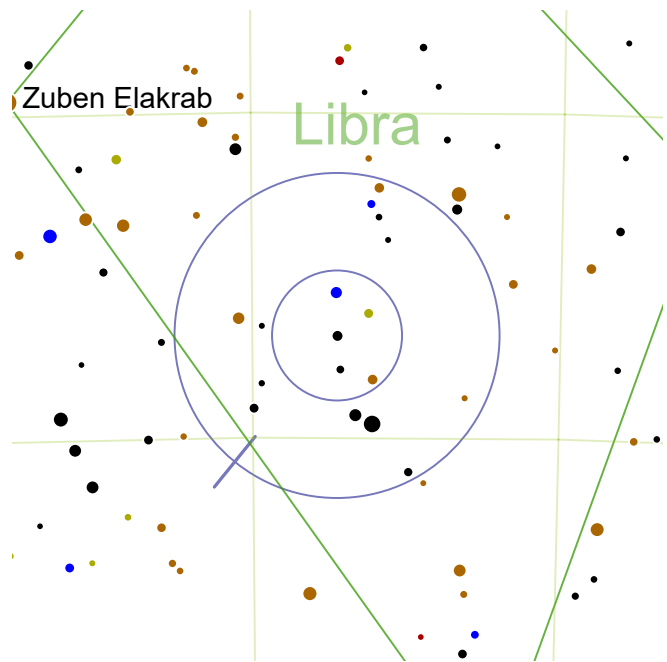
A brilliant white primary with distant bright, white companion.



Alpha Lib is a bright star in Libra. Two finder circles S from magnitude 3.95 Rijnl al Awwa.



This system of F-class main sequence stars (with the delicious proper name of Zubenelgenubi) is 76 light-years from Earth.



SHJ 195

RA: 228.63° | 15h 14.5' — DEC: -18.43° | -18° 25'

Magnitude: 6.8 | 8.3

Separation: 47.5"

Position Angle: 141°

SAO 159118 | HIP 74593 | GDR2 95725037696



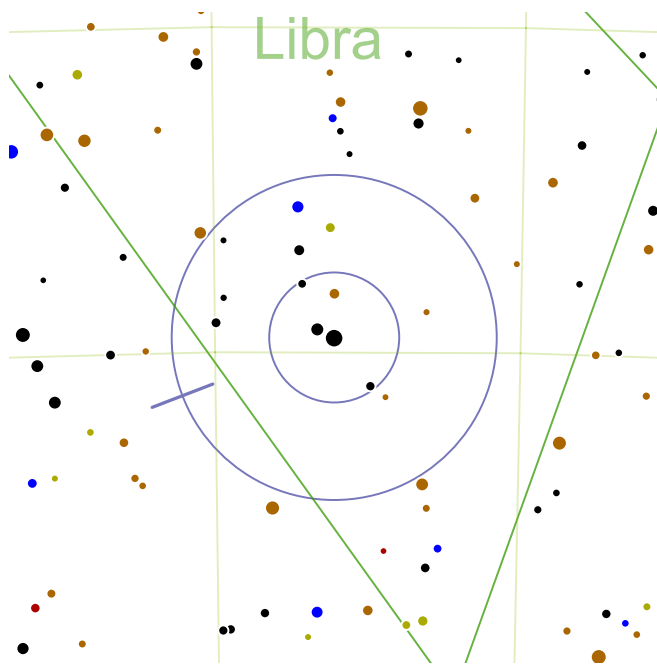
A widely separated, fairly balanced pair of yellowish stars.



One finder circle SEE from magnitude 2.9 Zubenelgenubi. Two finder circles NWW from magnitude 2.54 Dschubba.



With this double centered in the finder, globular cluster NGC 5897 (magnitude 8.5) is on the southern edge of the finder circle.



Iota Lib




RA: 228.05° | 15h 12.2' — DEC: -19.78° | -19° 46'

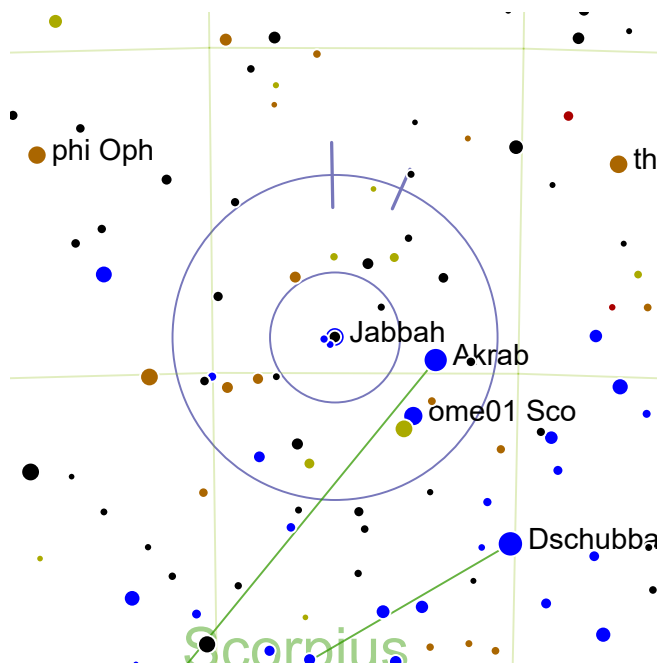
Magnitude: 4.5 | 10.9

Separation: 57.8"

Position Angle: 111°

SAO 159090 | HIP 74392 | GDR2 84362600064

-  A distantly separated pair, with a brilliant white primary and tiny secondary.
-  One finder circle NNE from magnitude 3.41 sig Lib. One finder circle SE from magnitude 2.9 Zubenelgenubi.
-  This pair are gravitationally bound. The tiny secondary is a challenging, balanced double in its own right, with a separation of 1.9".



Nu Sco




RA: 243.0° | 16h 12.0' — DEC: -19.47° | -19° 27'

Magnitude: 4.35 | 5.31 | 6.60

Separation: 1.3" | 41.3"

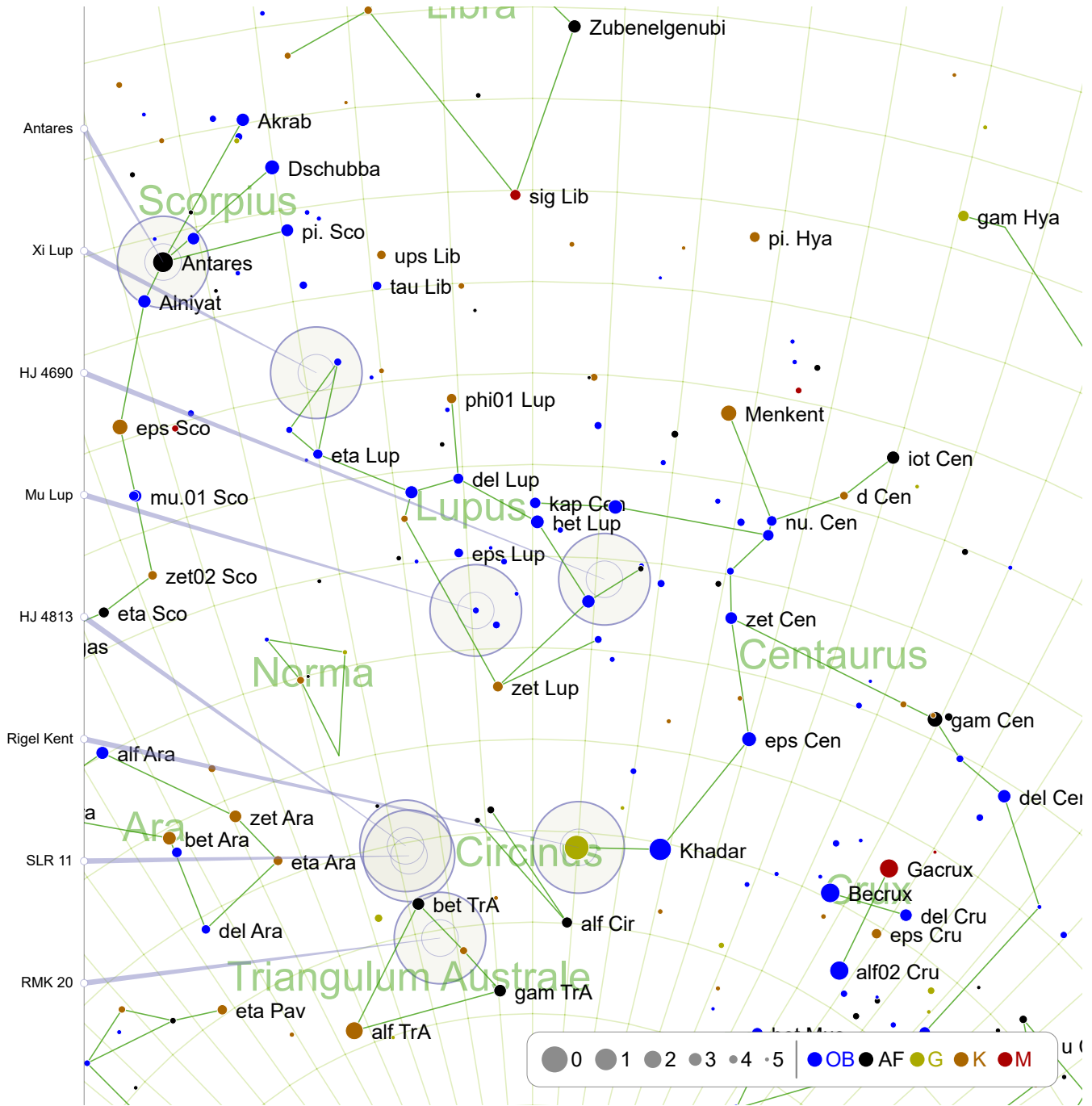
Position Angle: 1° | 336°

SAO 159763 | HIP 79374 | GDR2 81070158080

-  A bright, extremely tight and balanced pair of blue stars.
-  One degree NEE from magnitude 2.9 Akrab. Half a finder circle NE from magnitude 2.54 Dschubba.
-  This double, also known as Jabbah, lies in front of of the Blue Horsehead Nebula (IC 4592).

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May: -45° South

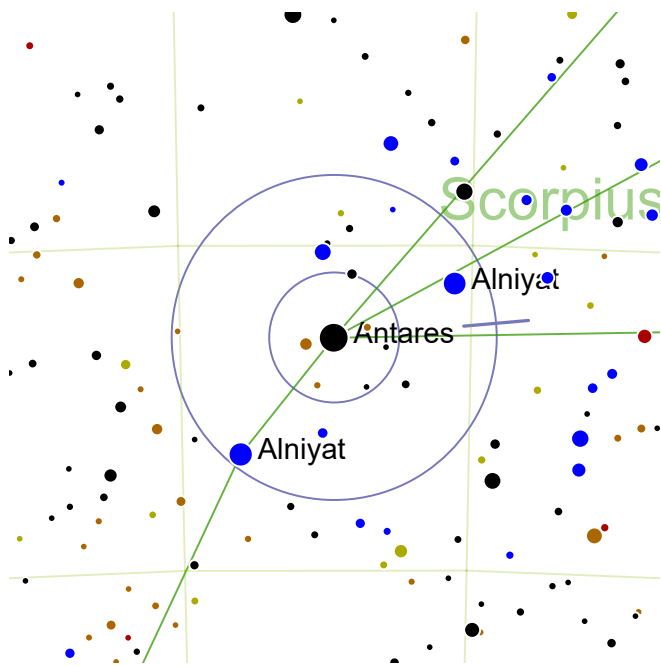


Antares: page 240
HJ 4813: page 242

Xi Lup: page 240
Rigel Kent: page 242

HJ 4690: page 241
SLR 11: page 243

Mu Lup: page 241
RMK 20: page 243



Antares

RA: 247.35° | 16h 29.39' — DEC: -26.43° | -26° 25'

Magnitude: 1.2 | 5.4

Separation: 2.9"

Position Angle: 275°

SAO 184415 | HIP 80763



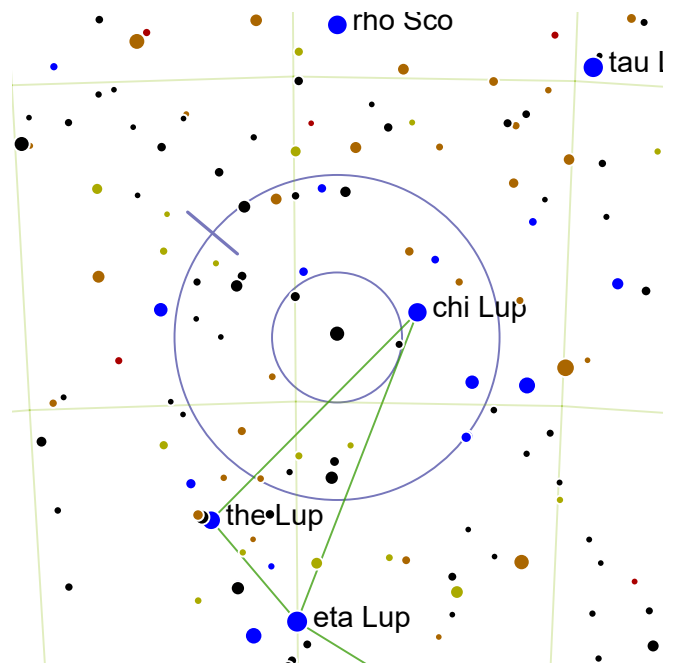
A fiercely brilliant and intensely red primary with a very close, bright, blue or green companion.



Antares is a bright star in Scorpius. Antares is a bright star in Scorpius.



Antares means the "rival of Mars" as this star's color competes with that of the Red Planet. This is a gravitationally bound binary system about 550 light-years from Earth. Antares is fairly red (B-V color index: 1.86).



Xi Lup

RA: 239.23° | 15h 56.89' — DEC: -34.02° | -34° 0'

Magnitude: 5.1 | 5.6

Separation: 10.2"

Position Angle: 50°

SAO 207144 | HIP 78105 | GDR2 02400278016



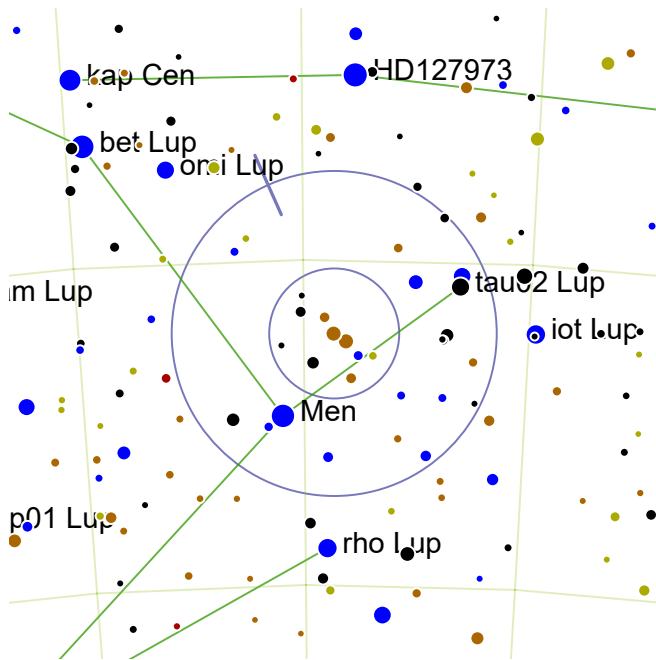
A bright white primary with an almost as bright blue companion close by.



Half a finder circle N from magnitude 3.61 eta Lup. One and a half finder circles S from magnitude 3.0 pi. Sco.



Globular cluster NGC 5986 (mag. 6.9) lies one finder circle to the south.



HJ 4690

RA: 219.33° | 14h 37.29' — DEC: -46.13° | -46° 7'

Magnitude: 5.6 | 7.7

Separation: 19.2"

Position Angle: 24°

SAO 225062 | HIP 71500 | GDR2 32950518528



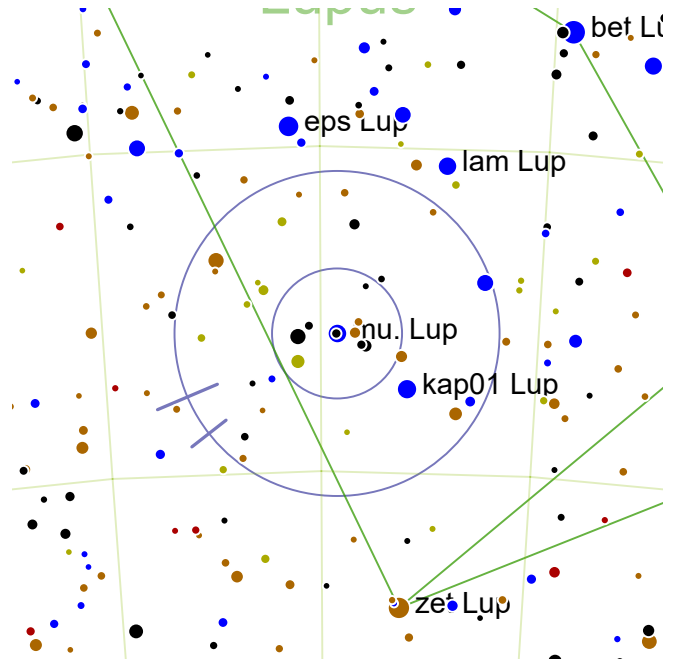
A bright yellow primary easily separated from a white secondary.



One degree NNW from magnitude 2.89 Men. Two and a half finder circles N from magnitude 1.7 alf Cen.



The primary is itself an equal double (separation 0.2"). Tau 1 and 2 Lupi form a lovely binocular double on the north-western edge of the finder view.



Mu Lup

RA: 229.63° | 15h 18.5' — DEC: -47.88° | -47° 52'

Magnitude: 4.9 | 4.9 | 6.3

Separation: 0.74" | 23.1"

Position Angle: 113° | 128°

SAO 225638 | HIP 74911



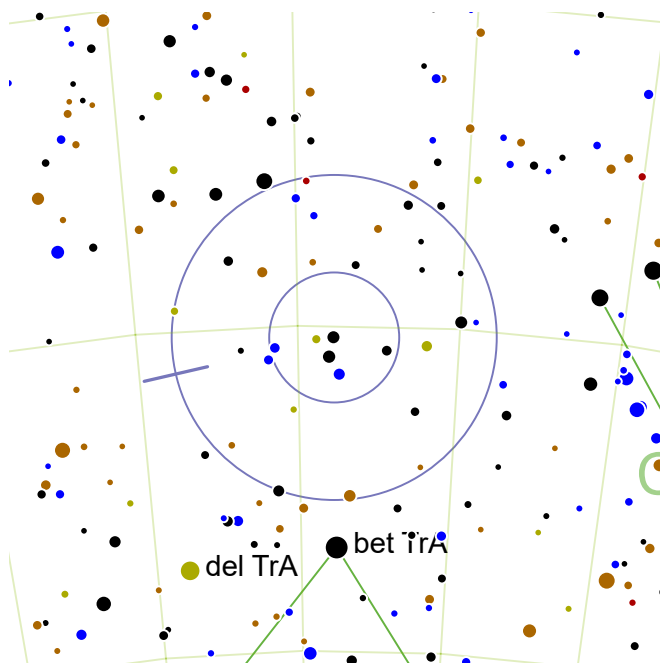
An extraordinarily tight pair of equally brilliant bluish stars, with a widely separated, fairly bright, white third component.



Half a finder circle SSW from magnitude 3.74 eps Lup. Half a finder circle NNE from magnitude 3.5 zet Lup.



Just beyond the south-eastern edge of the finder circle are two globular clusters: NGC 5927 (mag. 8.9) is closest, with NGC 5946 (mag 10.7) nearly two degrees further east.



HJ 4813




RA: 238.88° | 15h 55.5' — DEC: -60.18° | -60° 10'

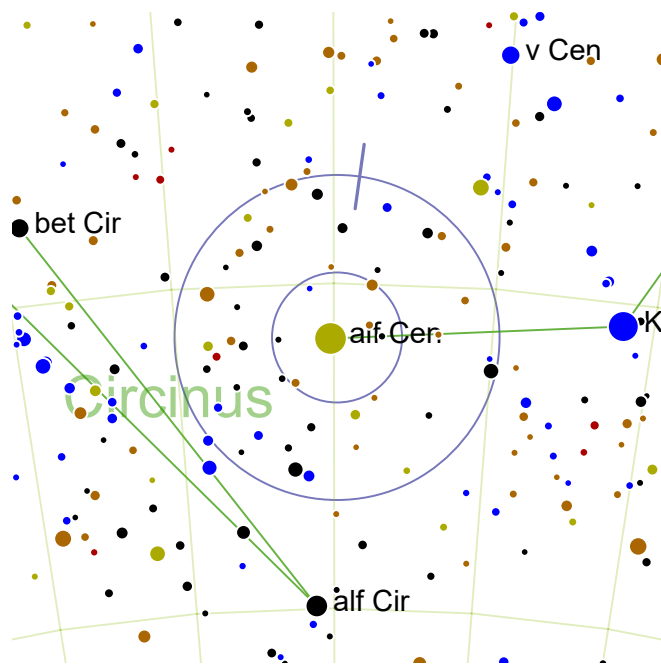
Magnitude: 5.9 | 8.4

Separation: 4.8"

Position Angle: 103°

SAO 253349 | HIP 77990 | GDR2 34699732352

-  A bright yellow primary with a very close companion.
-  Half a finder circle N from magnitude 3.04 bet TrA. One and a half finder circles E from magnitude 1.7 alf Cen.
-  Located in a very rich region of the sky, magnitude 5.1 open cluster Caldwell 95 is only one degree to the east of this double.



Rigel Kent




RA: 219.9° | 14h 39.6' — DEC: -60.83° | -60° 49'

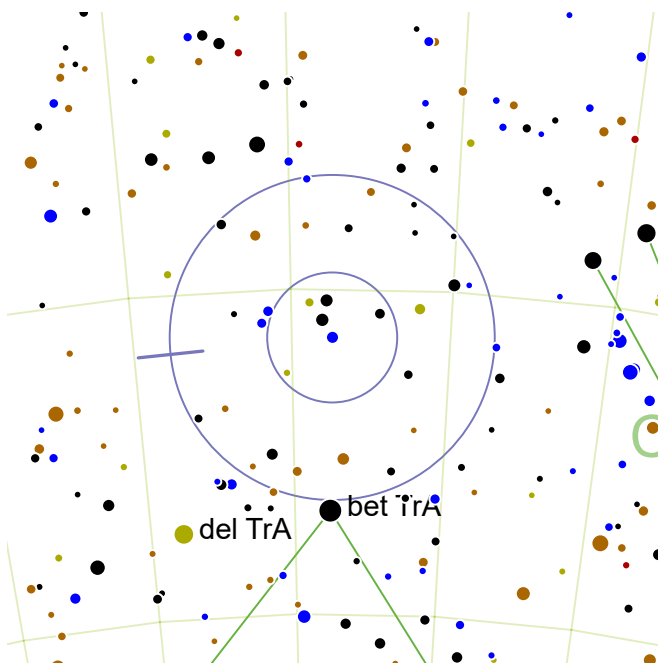
Magnitude: 0.0 | 1.3

Separation: 6.1"

Position Angle: 352°

SAO 252838 | HIP 71683 | GDR2 48286736896

-  A close, extremely brilliant pair with a yellow primary and orange secondary.
-  Less than half a degree W from magnitude 1.7 alf Cen. Less than half a degree W from magnitude 0.33 Rigel Kentaurus.
-  Famous as being the closest star system to the Sun, the third member of this system is Proxima Centauri. At Magnitude 12.7 and over 999" from the primary, Proxima is highly elusive.



SLR 11

RA: 238.73° | 15h 54.89' — DEC: -60.75° | -60° 44'

Magnitude: 6.5 | 8.8

Separation: 1.2"

Position Angle: 96°

SAO 253344 | HIP 77927 | GDR2 55424187392



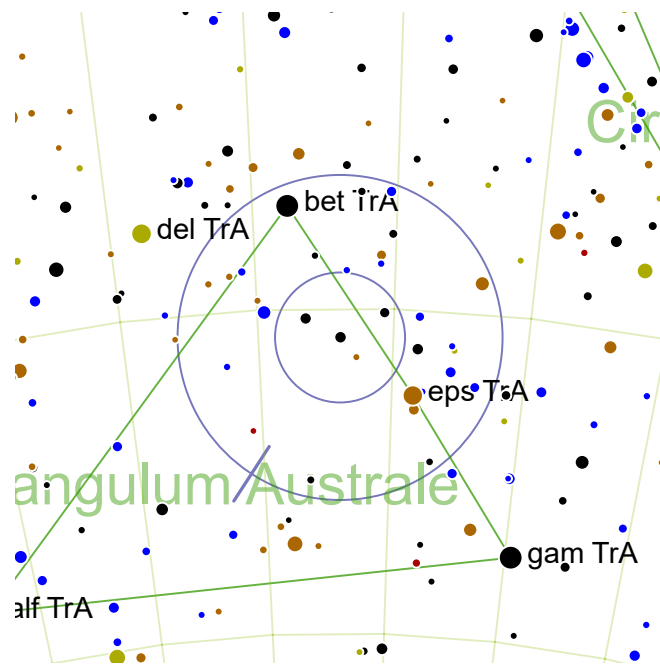
A fairly bright blue primary with an almost inseparable companion.



Half a finder circle N from magnitude 3.04 bet TrA. One and a half finder circles E from magnitude 1.7 alf Cen.



Bright open cluster Caldwell 95 (magnitude 5.1) is a degree to the east of this double.



RMK 20

RA: 236.98° | 15h 47.89' — DEC: -65.45° | -65° 26'

Magnitude: 6.2 | 6.4

Separation: 1.8"

Position Angle: 147°

SAO 253297 | HIP 77390 | GDR2 83847202176



An extremely tight, equal pair of fairly bright, white stars.



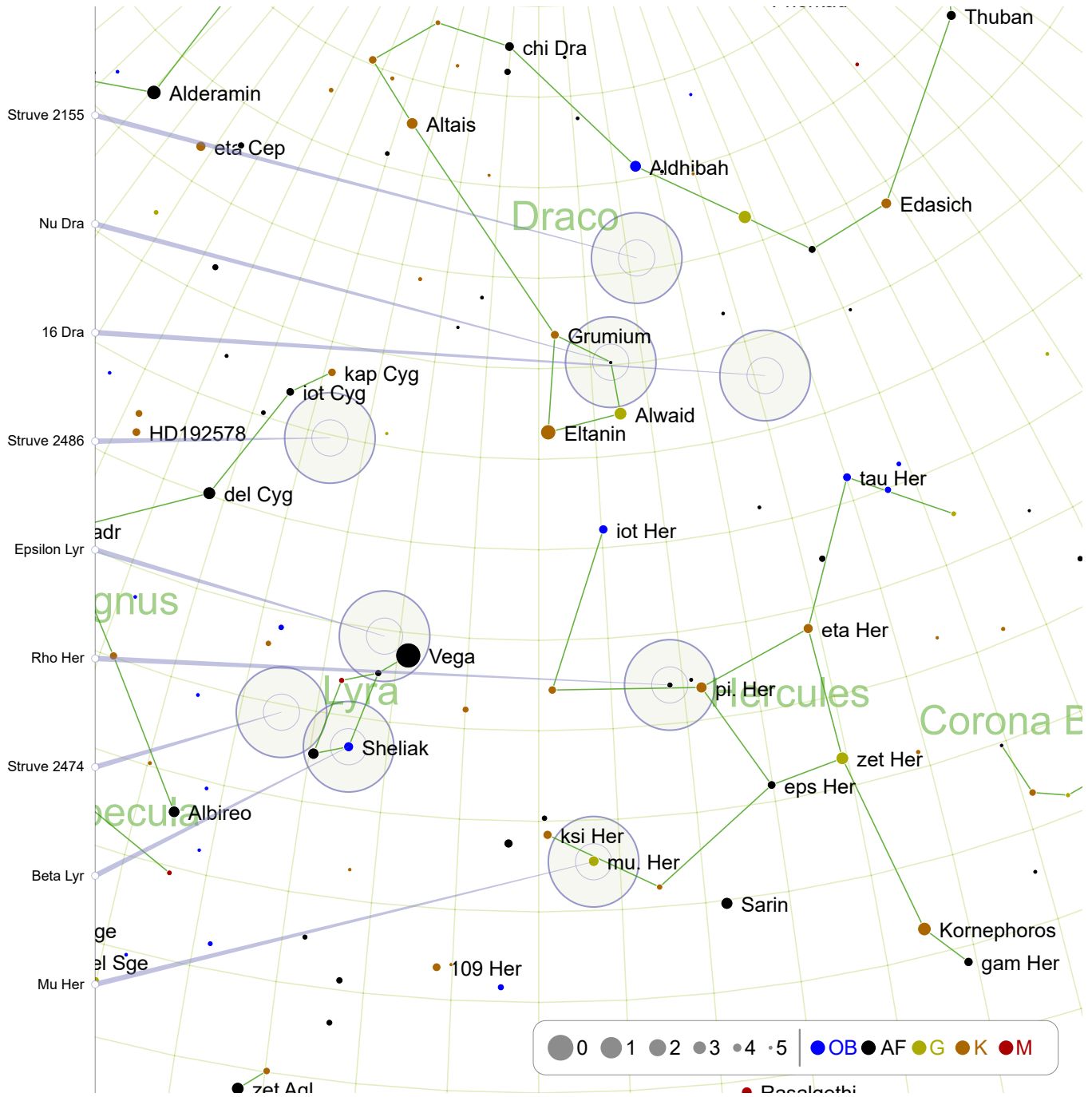
One and a half degrees SSW from magnitude 3.04 bet TrA. One finder circle SEE from magnitude 3.41 alf Cir.



This gravitationally bound pair of A-type subgiants is 365 light-years from Earth.

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July: 45° North (1)



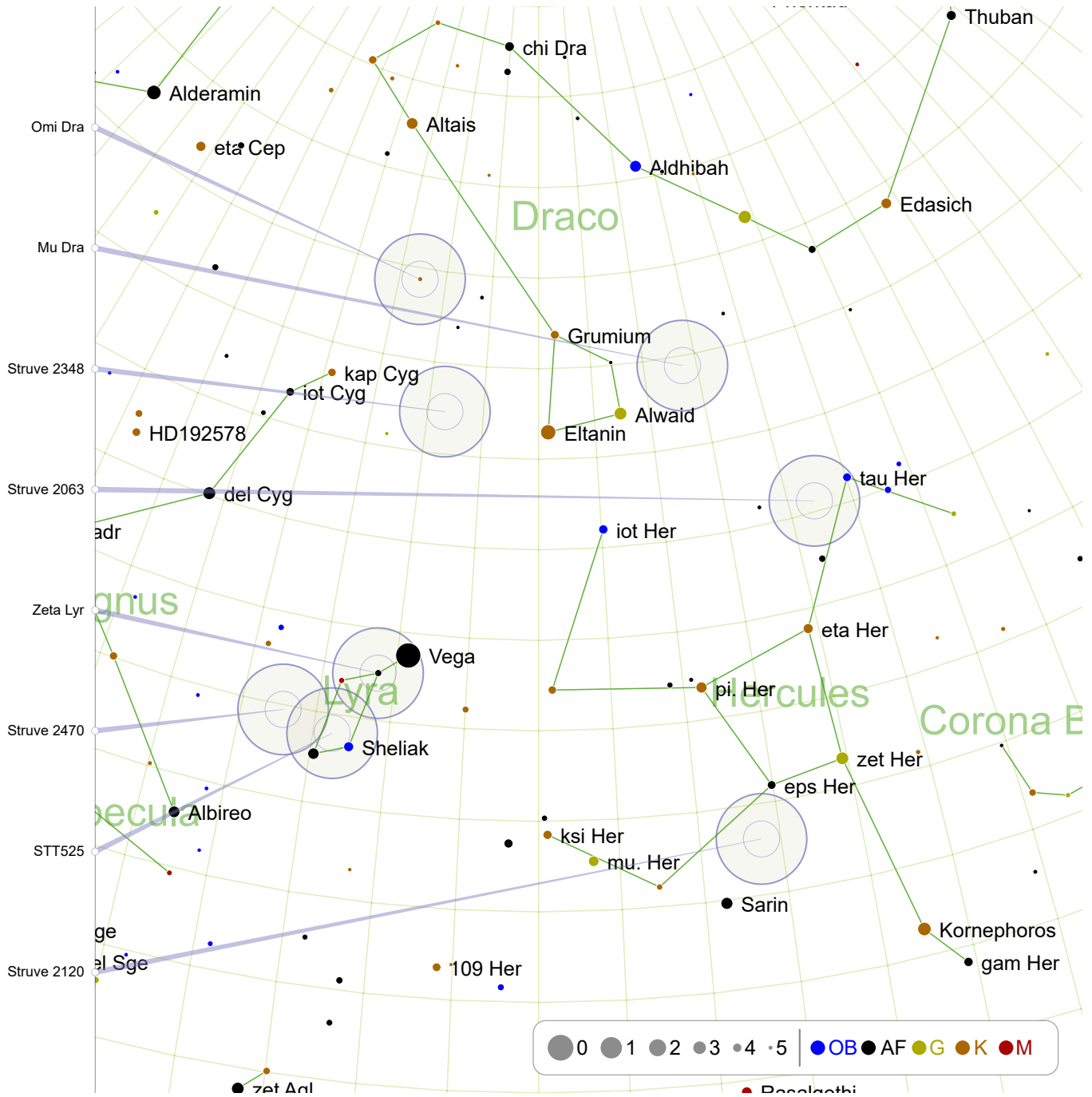
Struve 2155: page 247
 Epsilon Lyr: page 249
 Mu Her: page 251

Nu Dra: page 247
 Rho Her: page 249

16 Dra: page 248
 Struve 2474: page 250

Struve 2486: page 248
 Beta Lyr: page 250

July: 45° North (2)

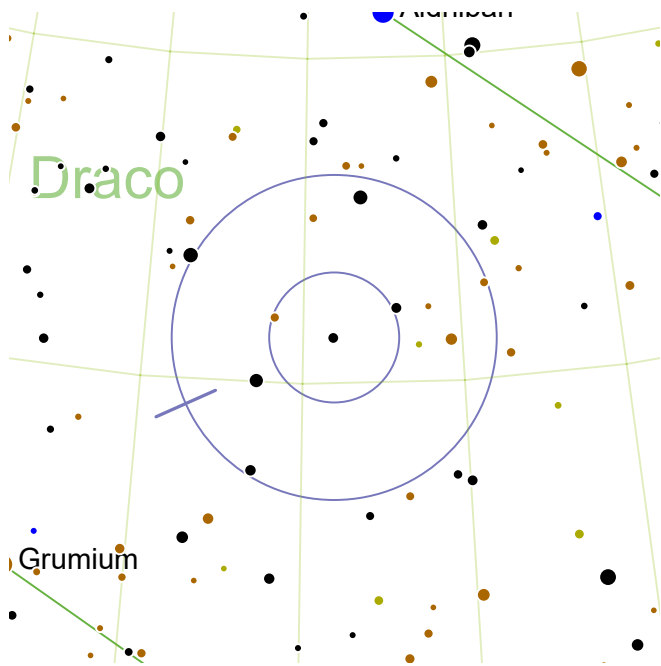


Omi Dra: page 251
Zeta Lyr: page 253

Mu Dra: page 252
Struve 2470: page 254

Struve 2348: page 252
STT525: page 254

Struve 2063: page 253
Struve 2120: page 255



Struve 2155

RA: 259.02° | 17h 16.09' — DEC: 60.72° | 60° 43'

Magnitude: 6.8 | 10.1

Separation: 9.8"

Position Angle: 114°

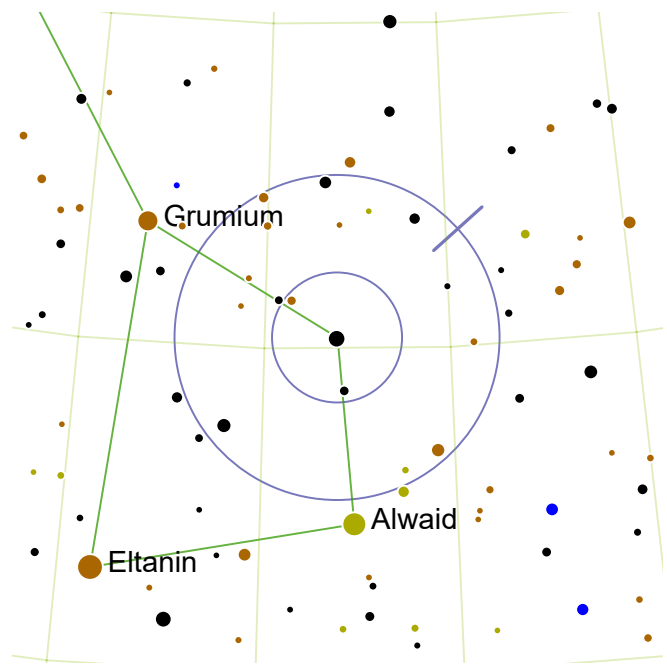
SAO 17410 | HIP 84465 | GDR2 50585937920



A yellow-blue pairing. Easily separated but the small blue component lacks brightness in smaller telescopes.



Find this star 4 finder circles NNW of magnitude 2.75 Rastaban in Draco. It forms a line-of-sight pair with variable star VW Draconis in the finder, separated by about 0.1 degrees. VW Draconis lies to the south-east of Struve 2155.



Nu Dra

RA: 263.05° | 17h 32.2' — DEC: 55.18° | 55° 11'

Magnitude: 4.9 | 4.9

Separation: 62"

Position Angle: 312°

SAO 30450 | HIP 85829 | GDR2 48150735744



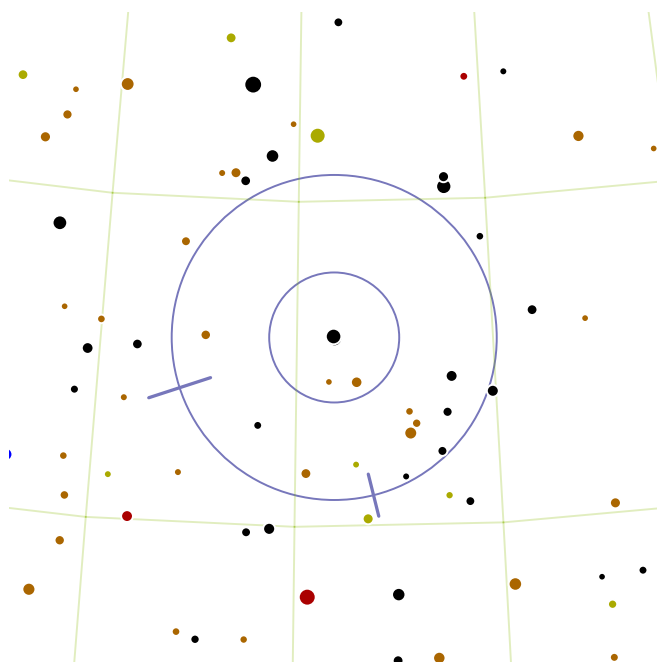
A very wide pair of balanced, very bright white stars.



Half a finder circle north of magnitude 2.79 Alwaid (also known as Rastaban).



Possibly best viewed in the finder scope!



16 Dra

RA: 249.05° | 16h 36.2' — DEC: 52.92° | 52° 55'

Magnitude: 5.4 | 6.4 | 5.5

Separation: 3.4" | 90"

Position Angle: 108° | 194°

SAO 30012 | HIP 81290 | GDR2 66351711616



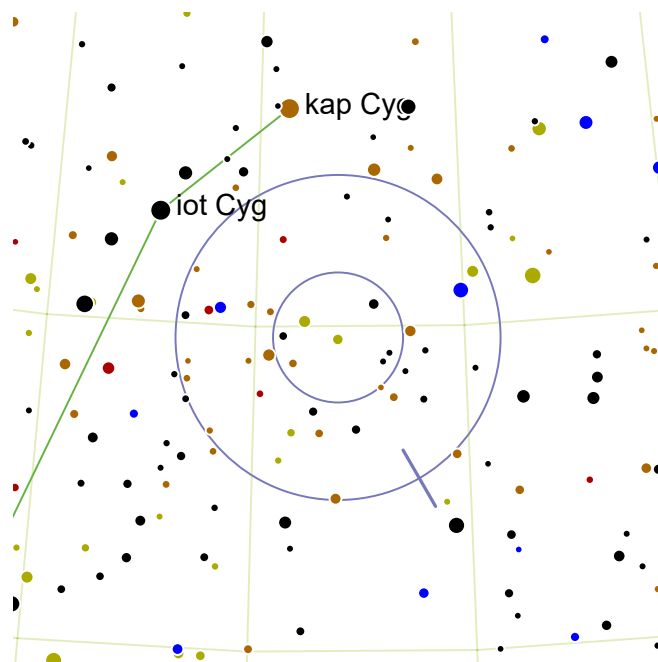
16 Draconis forms a triple with nearby 17 Draconis, which in turn is a close double.



Start at magnitude 2.2 Eltanin in the Dragon's head, and pan west past magnitude 2.75 Rastaban and continue a further two finder circles westward. 16 and 17 Draconis should appear as a double in the finder view.



16 Draconis is 427 light-years from the Sun, while 17 Draconis is 412 light-years away from the Sun.



Struve 2486

RA: 288.02° | 19h 12.09' — DEC: 49.85° | 49° 51'

Magnitude: 6.6 | 6.8

Separation: 7.9"

Position Angle: 210°

SAO 48192 | HIP 94336



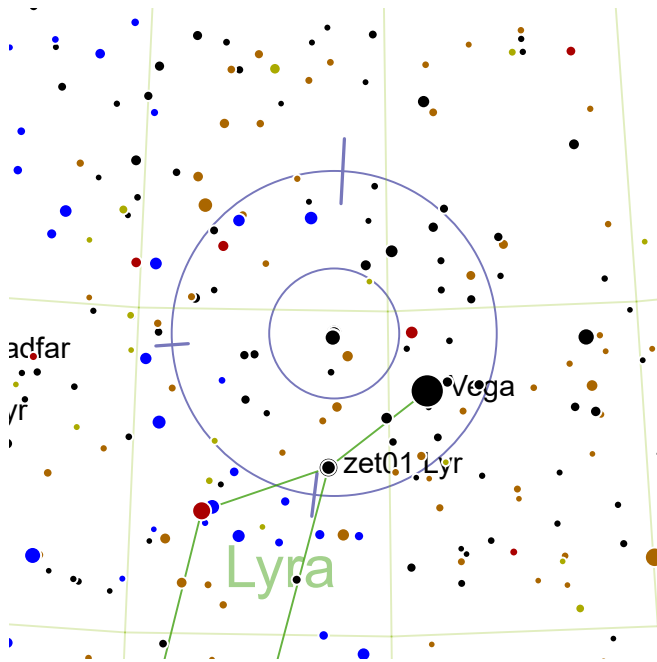
A close and equal pair of yellow suns.



Half a finder circle SWW from magnitude 3.94 iot Cyg. Half a finder circle SSW from magnitude 3.98 kap Cyg.



Both members of this system are almost exactly the same spectral class and brightness as our Sun. The system lies only 80 light-years from us.



Epsilon Lyr

RA: 281.08° | 18h 44.29' — DEC: 39.67° | 39° 40'

Magnitude: 5.0 | 6.1 | 5.2 | 5.5

Separation: 208" | 2.6" | 2.3"

Position Angle: 357° | 173° | 94°

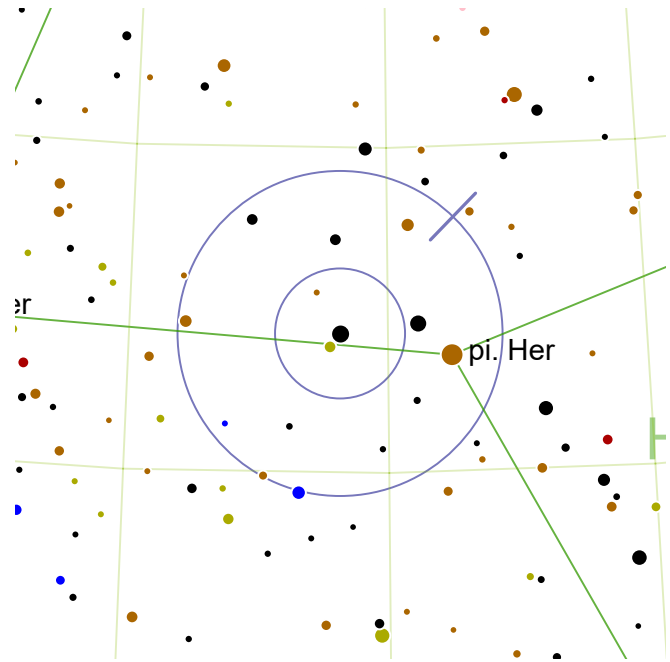
SAO 67310 | HIP 91919 | GDR2 60363229312



Two pairs of tightly bound and very well balanced bright white stars. The pairs are separated by over three arc minutes (one tenth of a full Moon), but each pair is split by only just over 2 arc seconds.



Among the most famous doubles, this Double Double can be found in the same finder circle as Vega, two degrees to the north east. It forms an equilateral triangle with Vega and the splendid double Zeta Lyrae to the south.



Rho Her

RA: 260.93° | 17h 23.7' — DEC: 37.15° | 37° 9'

Magnitude: 4.6 | 5.6

Separation: 4.1"

Position Angle: 316°

SAO 66000 | HIP 85112 | GDR2 27125084416



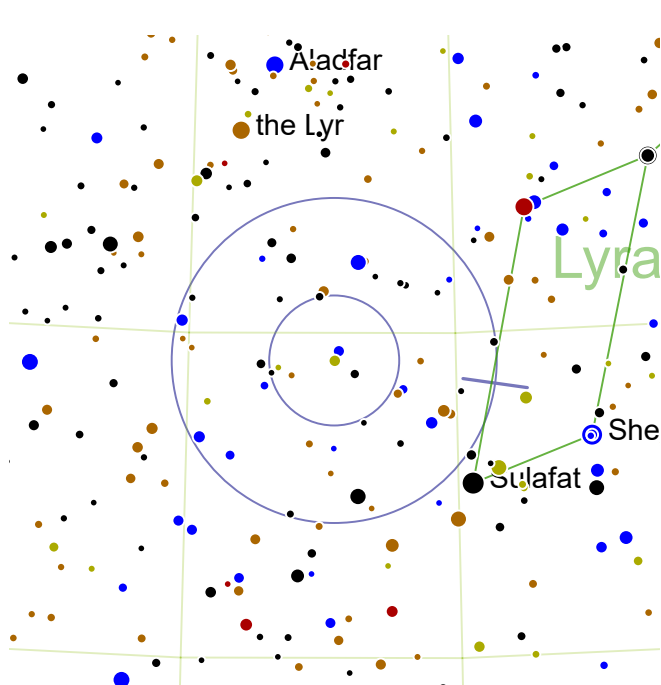
A very close equally matched pair with a brilliant white primary and slightly fainter blue companion.



Less than two degrees east of Pi Herculis.



The primary star is itself a double with a separation of 0.252", beyond the capabilities of amateur instruments. The components of the primary have been resolved using speckle interferometry.



Struve 2474

RA: 287.27° | 19h 9.09' — DEC: 34.6° | 34° 36'

Magnitude: 6.7 | 8.8

Separation: 16.2"

Position Angle: 262°

SAO 67879 | HIP 94076 | GDR2 77844183040



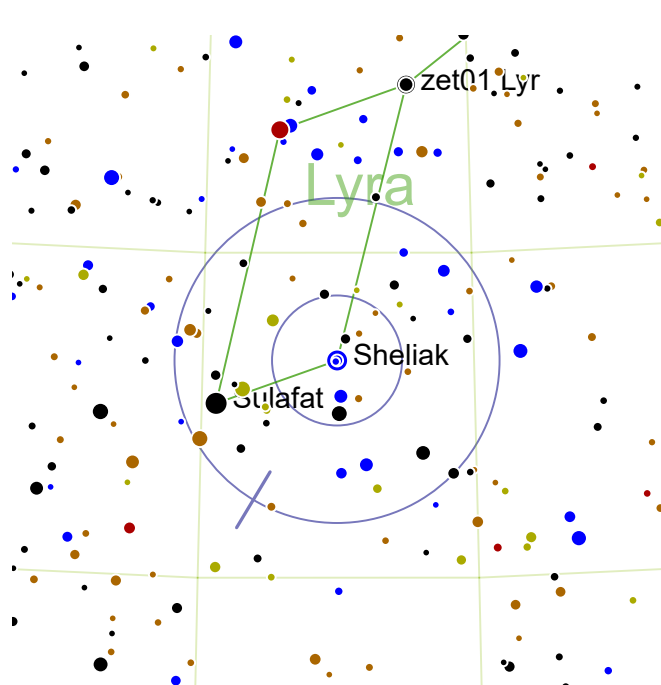
An easily split couple of yellow stars.



Position Sulafat (the south-east star of the Lyra parallelogram) in the south-west of the finder. Struve 2470 and 2474 lie three degrees NE. Struve 2470 lies to the north of Struve 2474.



Struve 2470 and Struve 2474 form the Double Double's Double, as they are easily viewed simultaneously. Together, the four stars are easier to split than the Double Double itself, and composed of many colors. However, the Double Double is brighter.



Beta Lyr

RA: 282.52° | 18h 50.09' — DEC: 33.37° | 33° 22'

Magnitude: 3.4 | 8.6

Separation: 46"

Position Angle: 149°

SAO 67451 | HIP 92420 | GDR2 95054381056



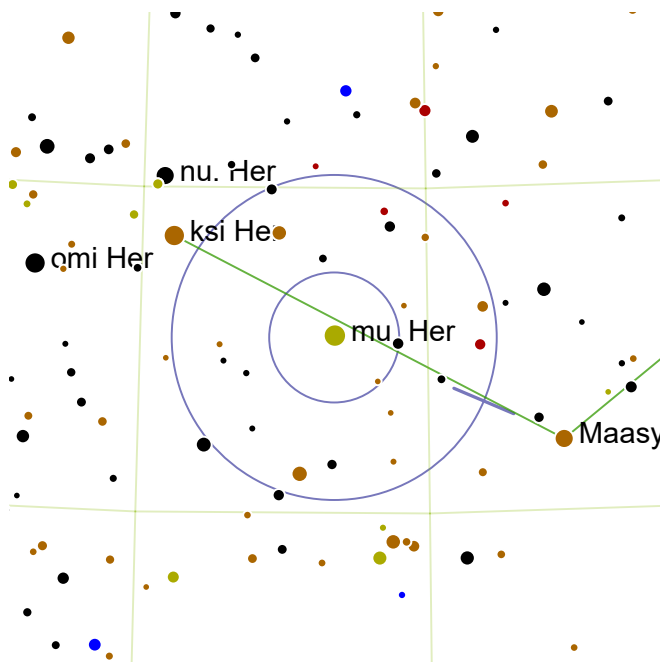
Two very widely separated white stars.



Beta Lyrae (also known as Sheliak) is the south-western star of the Lyra parallelogram.



The primary varies between magnitude 3.4 and 4.4 over a period of 13 days. Nearby Gamma Lyrae to the east is magnitude 3.2 so it acts as a yardstick. The famous Ring Nebula lies nearby, one degree to the south east.



Mu Her




RA: 266.63° | 17h 46.5' — DEC: 27.72° | 27° 43'

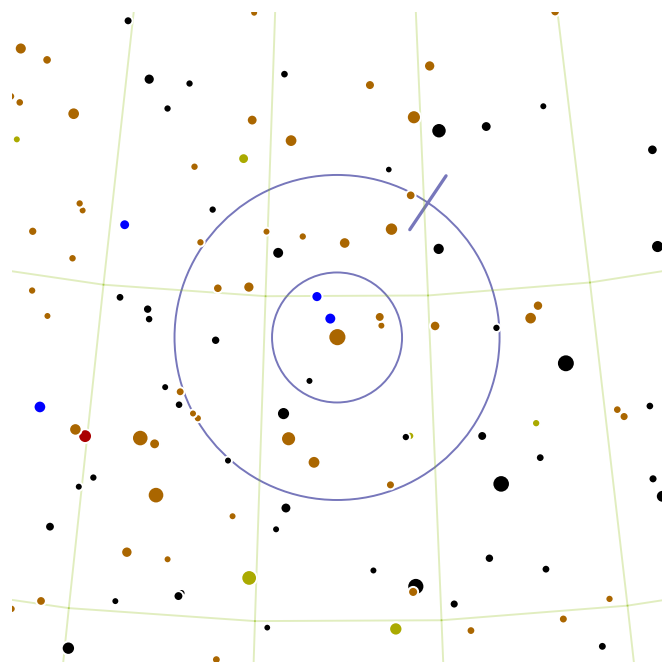
Magnitude: 3.4 | 10.1

Separation: 33.8"

Position Angle: 247°

SAO 85397 | HIP 86974

-  A brilliant yellow primary widely separated from a vastly fainter red secondary.
-  One and a half finders east and slightly north of Sarin.
-  This double is an opportunity to see a red dwarf, namely the faint secondary. Red dwarfs are ubiquitous but very faint. The primary in this system is similar in mass to the Sun but much older and becoming a giant. The primary has an another M-class companion that can be detected spectroscopically. The secondary is a double with a 43 year orbit, currently separated by 1.35".



Omi Dra




RA: 282.8° | 18h 51.2' — DEC: 59.38° | 59° 23'

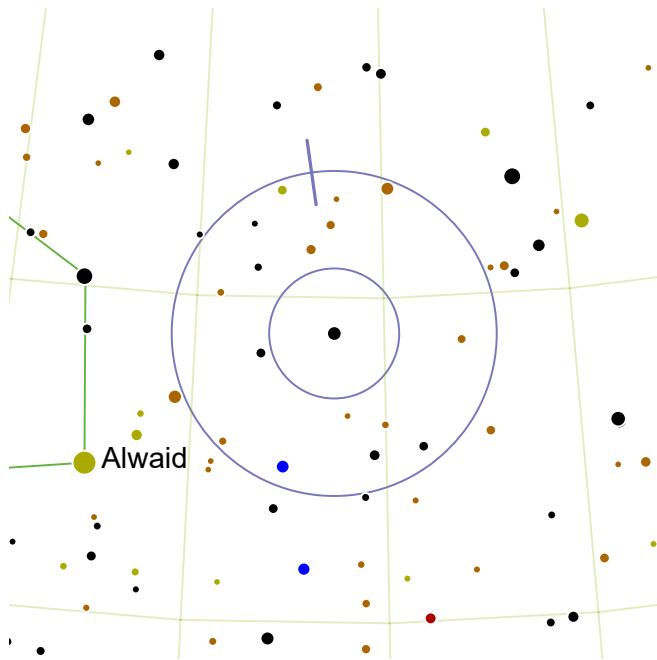
Magnitude: 4.8 | 7.8

Separation: 34.2"

Position Angle: 326°

SAO 31218 | HIP 92512 | GDR2 53382133632

-  A widely separated pair. The strongly yellow primary has an adequately bright blue companion.
-  Located two and a half finders north east of magnitude 2.2 Eltanin, Draco's bright eye.
-  Some see the companion as green!



Mu Dra

RA: 256.33° | 17h 5.29' — DEC: 54.47° | 54° 28'

Magnitude: 5.6 | 5.7

Separation: 1.9"

Position Angle: 8°

SAO 30239 | HIP 83608 | GDR2 96285626624



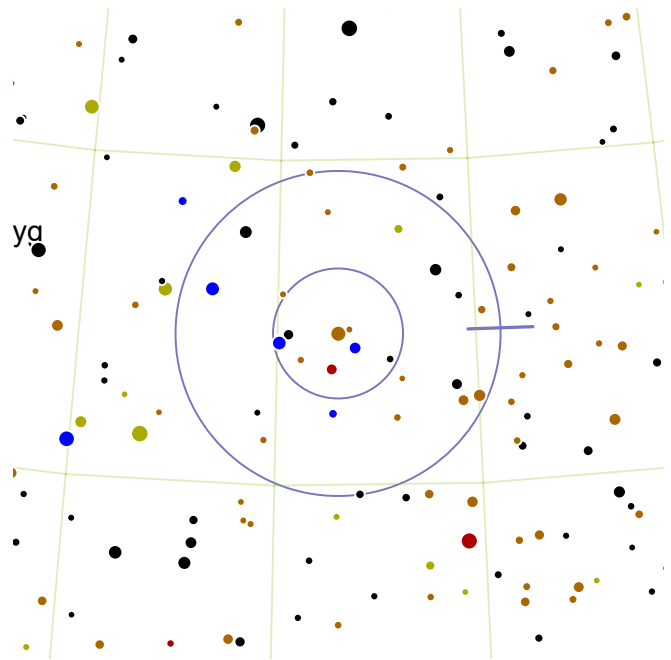
A tightly bound pair of yellow stars.



Locate magnitude 2.75 Rastaban in the Dragon's head, and then pan north west. When Rastaban reaches the south-east edge of the finder view, Mu Draconis should appear on the north-west edge.



Mu Draconis is also known as Alrakis or Arrakis, and gives its name to Frank Herbert's desert world famous for its Spice and sandworms. Mu Dra is also part of the Arabic constellation the Mother Camels.



Struve 2348

RA: 278.48° | 18h 33.9' — DEC: 52.35° | 52° 21'

Magnitude: 6.1 | 8.8

Separation: 25.7"

Position Angle: 272°

SAO 31051 | HIP 91013



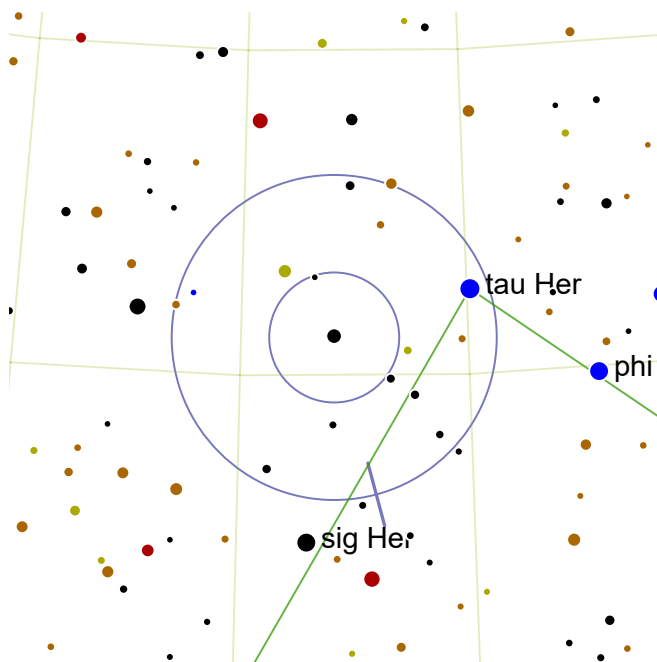
A yellow primary widely separated from a moderately faint white secondary.



One and a half finder circles due east of Eltanin, this double is the northernmost of a one-degree triangle of stars.



The system is 638 light-years from the Sun.



Struve 2063

RA: 247.95° | 16h 31.79' — DEC: 45.6° | 45° 36'

Magnitude: 5.7 | 8.2

Separation: 16.4"

Position Angle: 195°

SAO 46147 | HIP 80953 | GDR2 77983938560



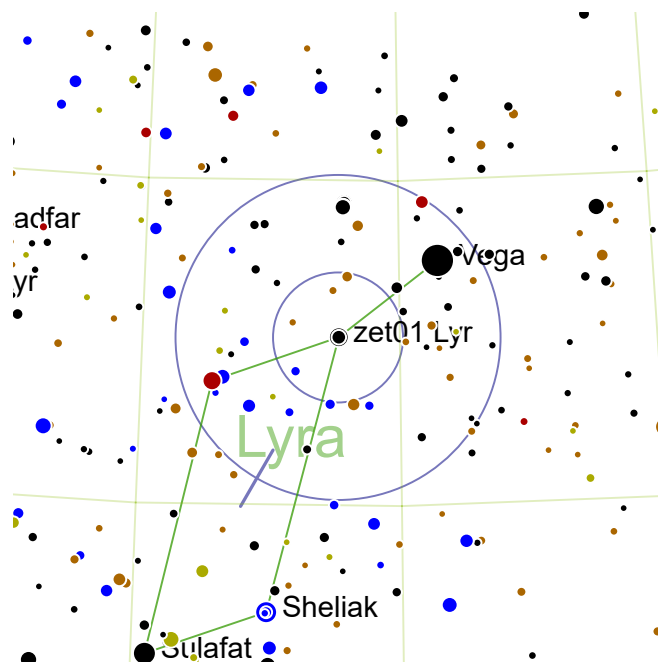
An easily separated white-yellow double.



Find Tau Herculis (it lies to the north of the Hercules keystone asterism). Struve 2063 lies 2 degrees to the south east.



Position this double in the south-western quadrant of the finder and globular cluster NGC 6229 is in the north-eastern quadrant.



Zeta Lyr

RA: 281.2° | 18h 44.79' — DEC: 37.6° | 37° 36'

Magnitude: 4.3 | 5.9

Separation: 44"

Position Angle: 150°

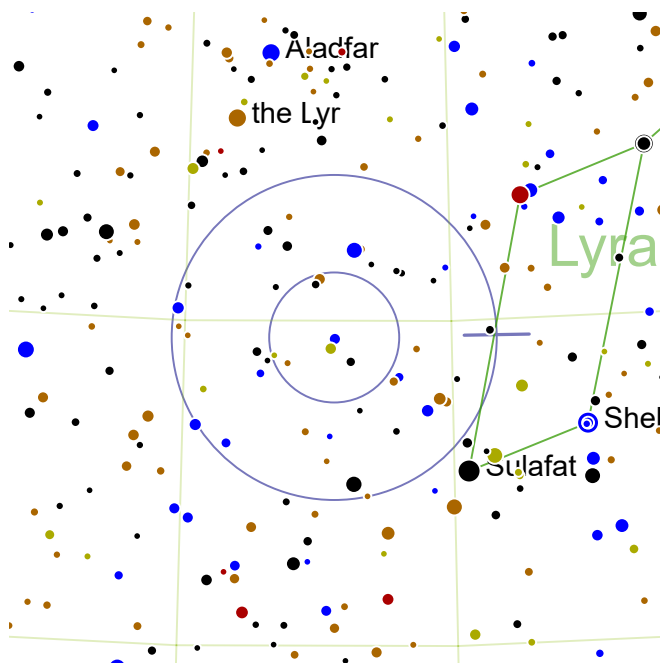
SAO 67321 | HIP 91971 | GDR2 99811529472



A very widely separated double that can be split in the finder scope. It has two bright yellow components differing in brightness by 1.6 magnitudes.



This double can be found in the same finder circle as Vega, two degrees to the south east. It forms an equilateral triangle with Vega and the spectacular Epsilon Lyrae to the north, which is very pleasing to view in a good finder.



Struve 2470




RA: 287.2° | 19h 8.79' — DEC: 34.77° | 34° 46'

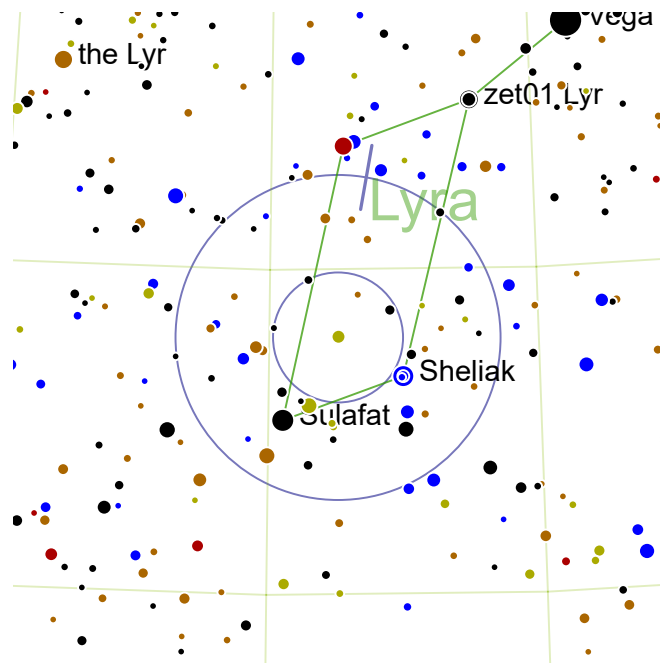
Magnitude: 6.6 | 8.6

Separation: 13.4"

Position Angle: 271°

SAO 67870 | HIP 94043 | GDR2 28593913088

-  An easily split white-blue pairing.
-  Position Sulafat (the south-east star of the Lyra parallelogram) in the south-west of the finder. Struve 2470 and 2474 lie three degrees NE. Struve 2470 lies to the north of Struve 2474.
-  Struve 2470 and Struve 2474 form the Double Double's Double, as they are easily viewed simultaneously. Together, the four stars are easier to split than the Double Double itself, and composed of many colors. However, the Double Double is brighter.



STT525




RA: 283.73° | 18h 54.9' — DEC: 33.97° | 33° 58'

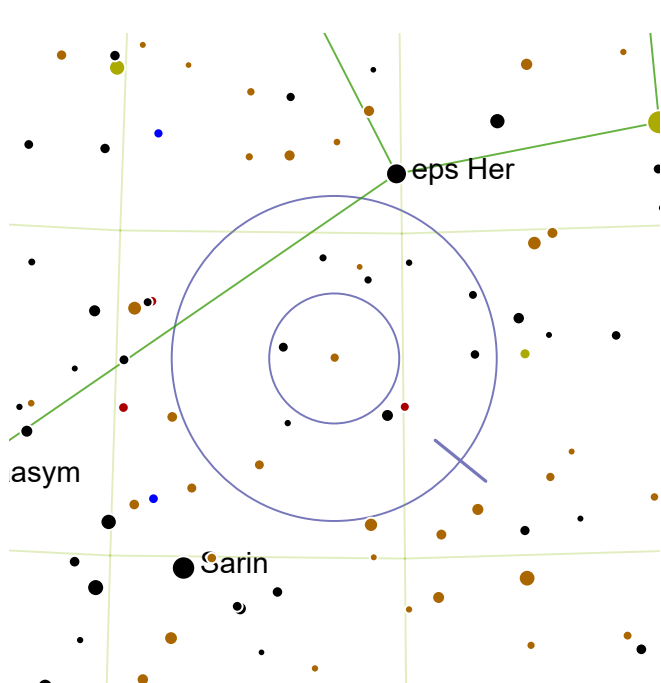
Magnitude: 6.0 | 7.7

Separation: 45"

Position Angle: 350°

SAO 67566 | HIP 92833 | GDR2 39831689088

-  A colorless pair very widely separated. In addition to the two main components, a third faint component might be glimpsed within 2" of the primary.
-  O. Struve 525 is the brightish star north of the midpoint between Sheliak and Sulafat.
-  The fine double Beta Lyrae and the bright star Sulafat share the finder view with O. Struve 525. One degree due south of O. Struve 525 is a faint smudge - the famous Ring Nebula (Messier 57).



Struve 2120

RA: 256.2° | 17h 4.79' — DEC: 28.08° | 28° 5'

Magnitude: 7.4 | 9.3

Separation: 24.5"

Position Angle: 231°

SAO 84810 | HIP 83568 | GDR2 79062840448



A wide pair with an orange primary and somewhat fainter secondary.



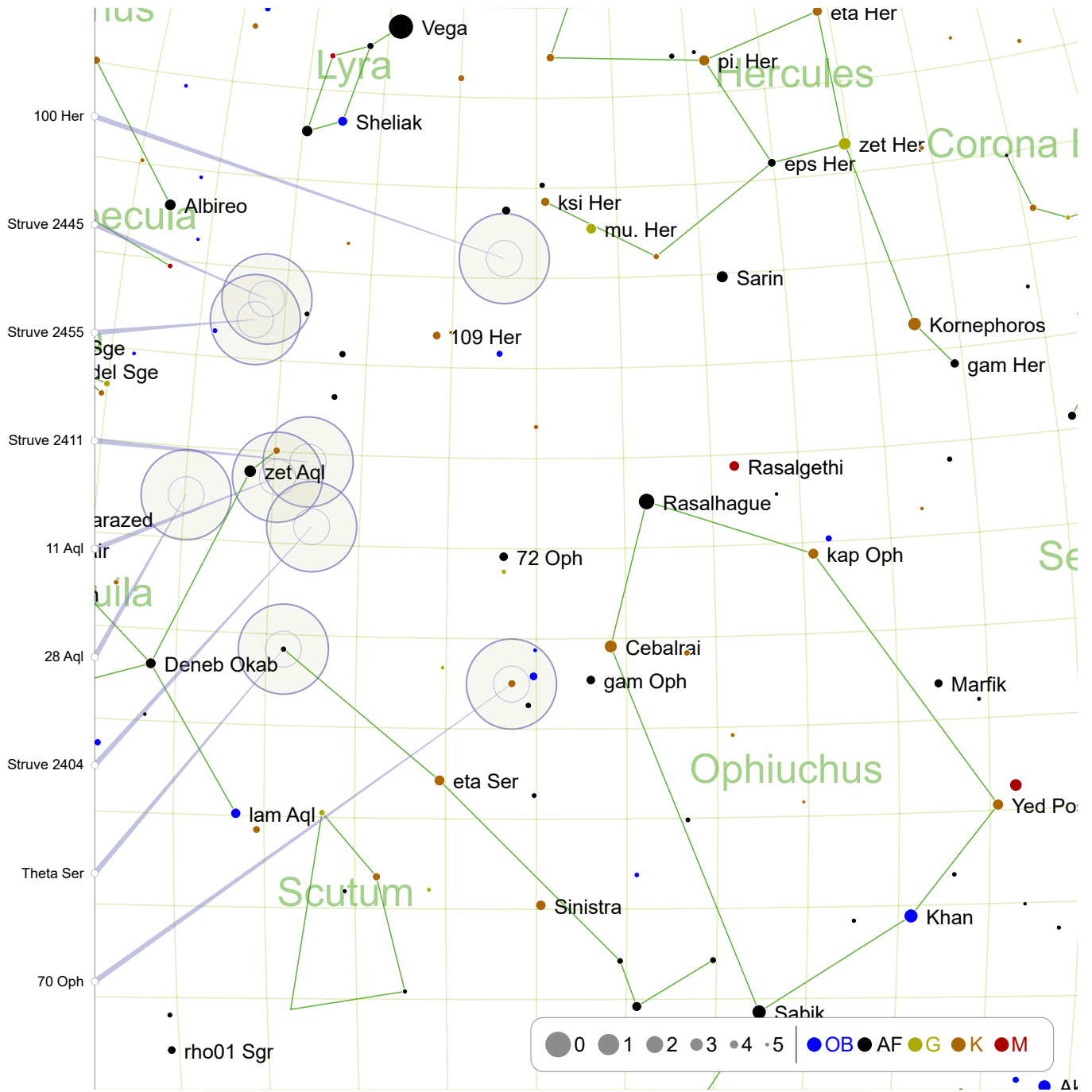
Half a finder circle SSE from magnitude 3.92 eps Her.



The primary is a K class orange giant, 480 light-years from Earth.

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July: 10° North (2)



100 Her: page 263

Struve 2445: page 264

Struve 2455: page 264

Struve 2411: page 265

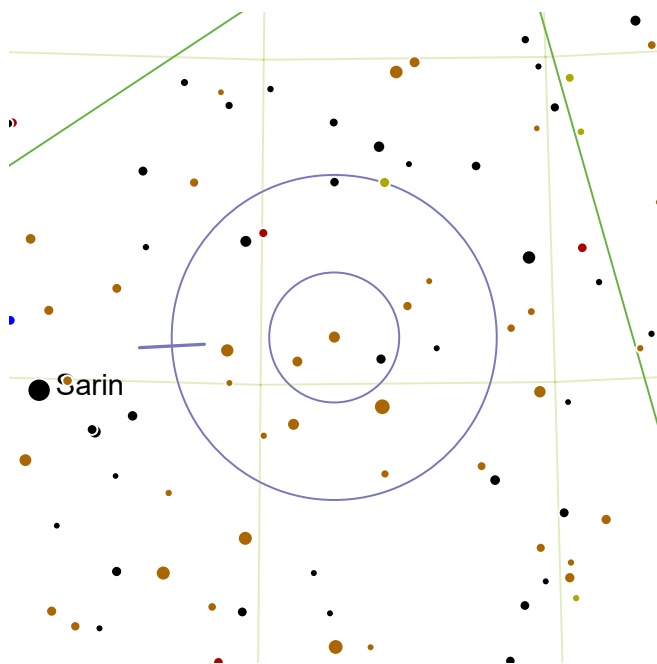
11 Aql: page 265

28 Aql: page 266

Struve 2404: page 266

Theta Ser: page 267

70 Oph: page 267



56 Her


RA: 253.75° | 16h 55.0' — DEC: 25.73° | 25° 44'


Magnitude: 6.1 | 10.6


Separation: 18.1"

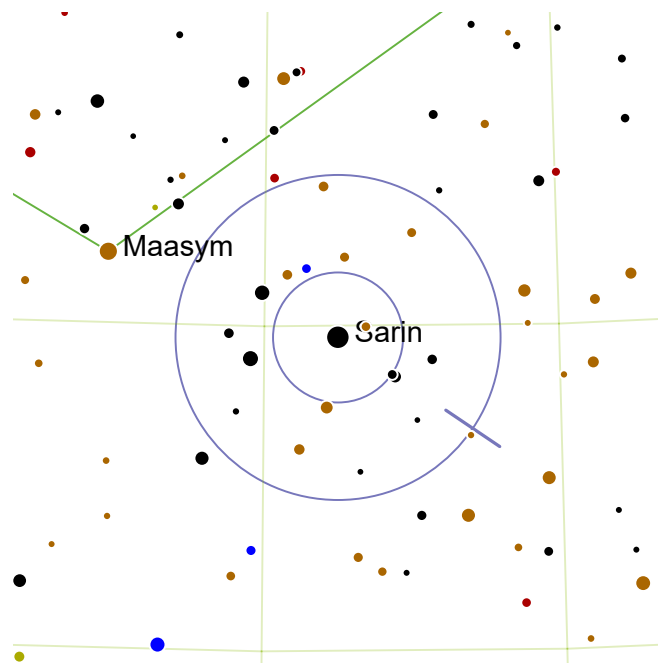
Position Angle: 93°

SAO 84692 | HIP 82780 | GDR2 57487643776

 A bright yellow-orange primary comfortably separated from very faint possibly bluish secondary. The secondary can be challenging to spot in a smaller telescope, especially with light pollution.

 One finder circle north west of magnitude 3.12 Delta Herculis.

 The primary star is somewhat cooler than the sun but being a giant star is significantly brighter.



Delta Her


RA: 258.75° | 17h 15.0' — DEC: 24.83° | 24° 50'


Magnitude: 3.1 | 8.2


Separation: 8.9"

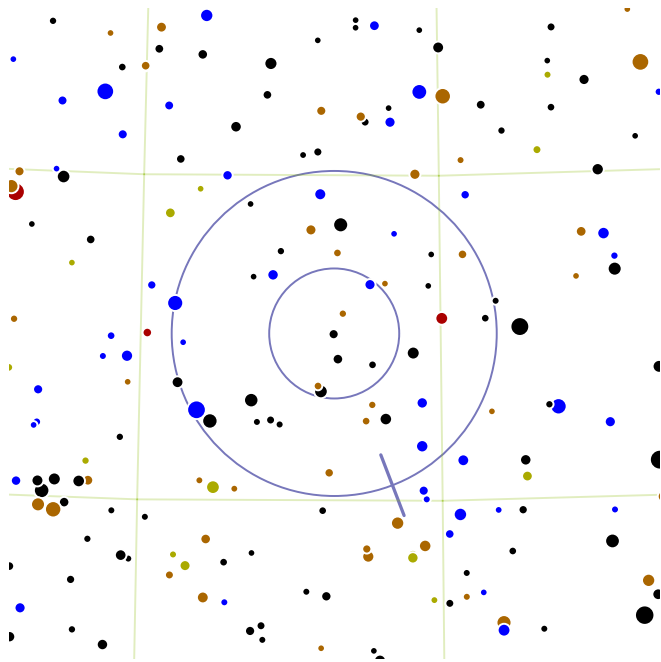
Position Angle: 236°

SAO 84951 | HIP 84379 | GDR2 35276520320

 A close white-blue pairing. The primary is brilliant but the secondary is just over 5 magnitudes fainter.

 Easily found as the third brightest star in Hercules, south-east of the Keystone asterism.

 This system is only 75 light-years from the Sun. It bears the traditional name of Sarin.



Struve 2457

RA: 286.77° | 19h 7.09' — DEC: 22.58° | 22° 35'

Magnitude: 7.5 | 9.0

Separation: 10.3"

Position Angle: 201°

SAO 86828 | HIP 93885 | GDR2 26916000000



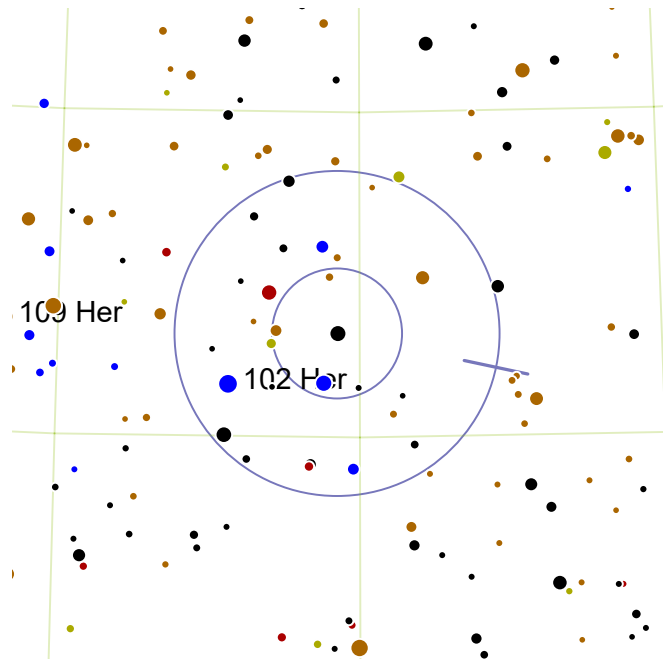
An easily separated white-blue pair.



One and a half finder circles south west of the famous double Albireo (magnitude 3.35, the head of the Swan). This unremarkable star is easily lost in its busy field.



In the same finder circle as Struve 2445 and Struve 2455. These are separated by one degree, with Struve 2455 to the south and slightly east of Struve 2445. They flank Struve 2457.



95 Her

RA: 270.38° | 18h 1.5' — DEC: 21.6° | 21° 36'

Magnitude: 5.0 | 5.1

Separation: 6.3"

Position Angle: 258°

SAO 85648 | HIP 88267 | GDR2 44112599424



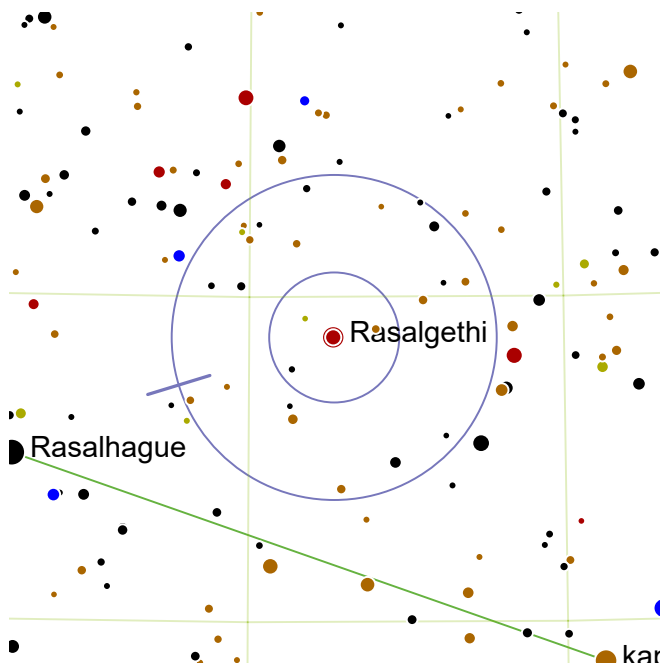
A bright white-yellow pairing with close separation.



Two and a half finder circles north east of Rasalhague. Two spans of the Keystone south east of the Keystone asterism.



About half a billion years young, this pair of large stars are separated by at least 900 astronomical units.



Alpha Her

RA: 258.65° | 17h 14.59' — DEC: 14.38° | 14° 23'

Magnitude: 3.5 | 5.4

Separation: 4.7"

Position Angle: 107°

SAO 102680 | HIP 84345 | | GDR2 95116193408



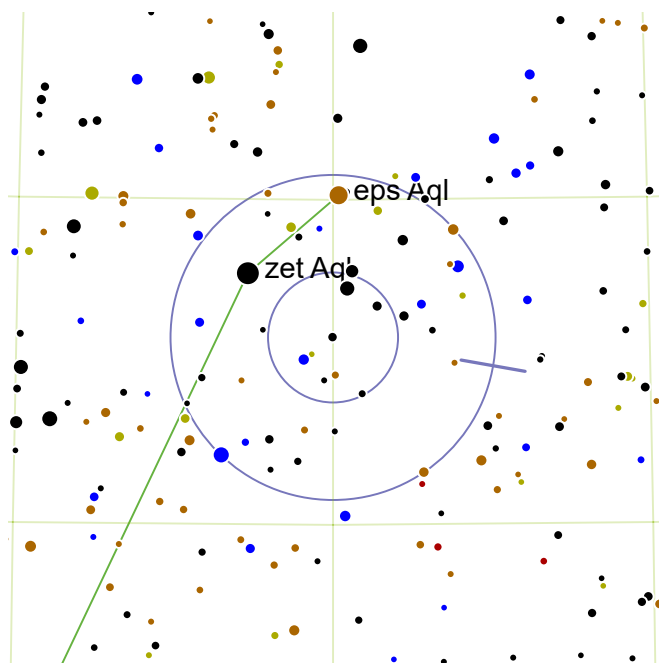
A reasonably balanced orange-blue pair, very close with a brilliant primary and bright secondary.



Alpha Herculis is far south of the Keystone asterism and might be mistaken as a member of Ophiuchus. Starting at the Keystone asterism, go two Keystone asterism spans due south, and the magnitude 3.08 star you come to is Alpha Herculis.



Some report that through some trick of the contrast, the secondary can appear greenish.



Struve 2426

RA: 285.0° | 19h 0.0' — DEC: 12.88° | 12° 53'

Magnitude: 7.4 | 8.8

Separation: 16.9"

Position Angle: 260°

SAO 104332 | HIP 93273 | GDR2 61529250944



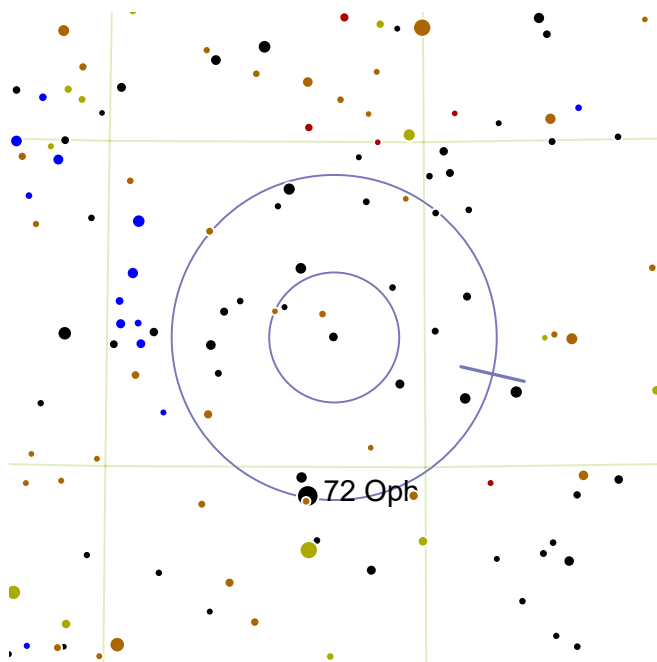
A less common white-orange pair, the two components are easily separated.



Find Okab, the magnitude 2.95 northern wingtip of Aquila and position it in the north-eastern quadrant of the finder. Struve 2426 is in the center of the view.



With Struve 2426 centered, you will find the open star cluster NGC 6738 1.5 degrees to the south.



Struve 2276

RA: 271.43° | 18h 5.7' — DEC: 12.0° | 12° 0'

Magnitude: 7.0 | 7.4

Separation: 6.9"

Position Angle: 257°

SAO 103373 | HIP 88627 | GDR2 47069328256



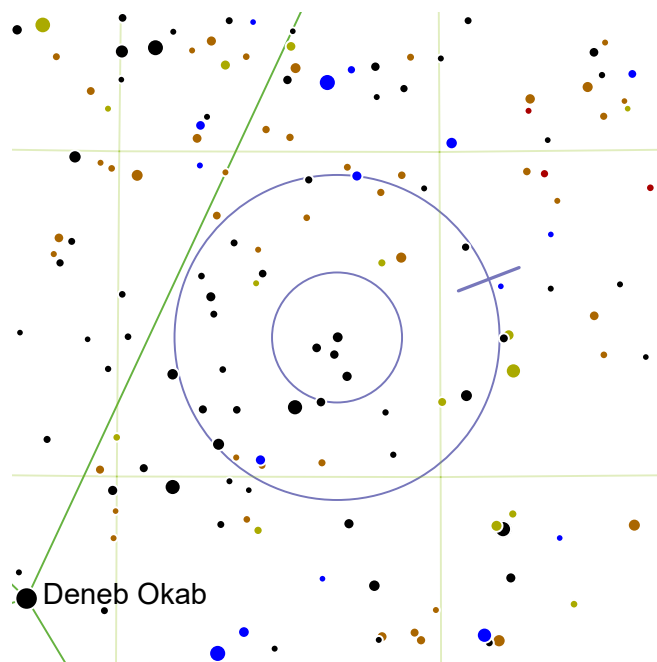
A balanced and close pair of white stars.



One and a half finder circles east of Rasalhague.



The system is 450 light-years from the Sun.



Struve 2449

RA: 286.6° | 19h 6.4' — DEC: 7.15° | 7° 9'

Magnitude: 7.2 | 7.9

Separation: 8.0"

Position Angle: 291°

SAO 124265 | HIP 93822 | GDR2 41936413312



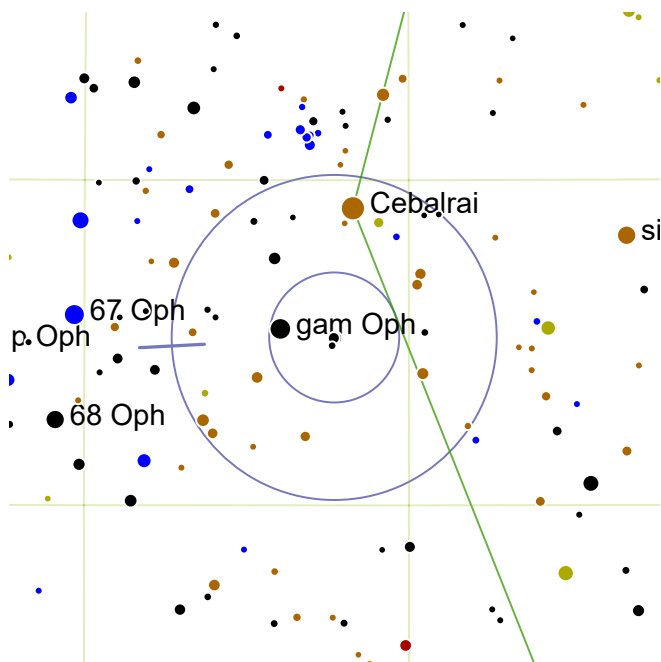
A close and well balanced yellow-blue pair.



Starting at Delta Aquilae, the heart of the Eagle, move two and a half finder circles north west.



The primary lies 344 light-years from the Sun, but it is not known if the secondary is gravitationally bound.



61 Oph




RA: 266.15° | 17h 44.59' — DEC: 2.58° | 2° 35'

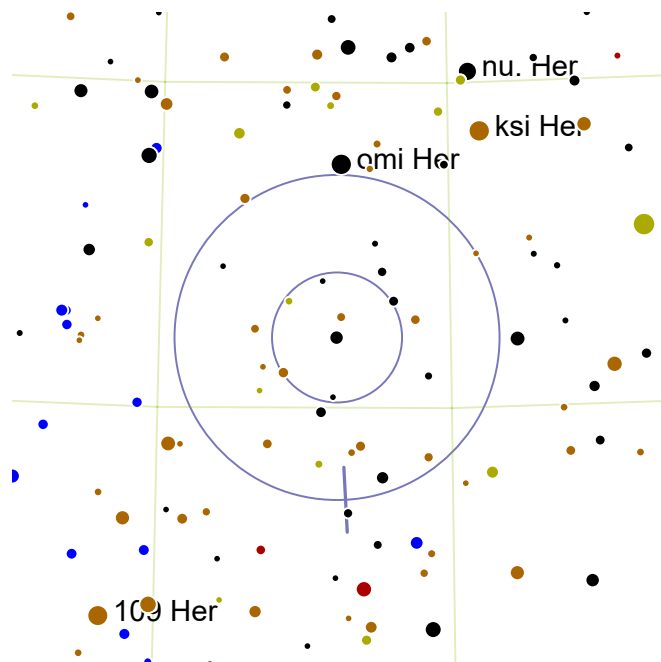
Magnitude: 6.2 | 6.6

Separation: 20.6"

Position Angle: 93°

SAO 122690 | HIP 86831 | GDR2 89983293696

-  A widely separated pair of white stars. Both components are fairly bright.
-  Located just over 2 degrees south-east of magnitude 2.7 Cebalrai. Cebalrai is the second brightest star in Ophiuchus.
-  With Cebalrai centered in the finder, globular cluster NGC 6426 lies between Cebalrai and 61 Oph, while the north eastern quadrant of the finder is filled by the Summer Beehive Cluster (IC 4665).



100 Her




RA: 271.95° | 18h 7.79' — DEC: 26.1° | 26° 6'

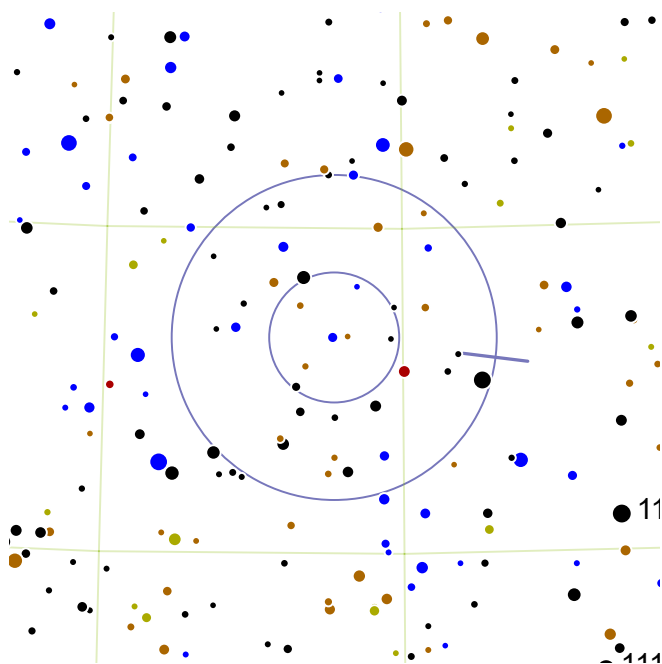
Magnitude: 5.9 | 6.0

Separation: 14"

Position Angle: 183°

SAO 85753 | HIP 88818 | GDR2 75911466624

-  Two almost identical bright white stars, comfortably separated.
-  Two and a half finder circles east of Sarin.
-  The two components are similar to Sirius, the brightest star in our sky (aside from the Sun of course). Even though the 100 Herculis system is very close (160 light-years away) the two components are barely visible without a telescope - which gives an idea of how unimpressive Sirius is in absolute terms!



Struve 2445

RA: 286.15° | 19h 4.59' — DEC: 23.33° | 23° 20'

Magnitude: 7.2 | 8.9

Separation: 12.6"

Position Angle: 263°

SAO 86774 | HIP 93680 | GDR2 77054351104



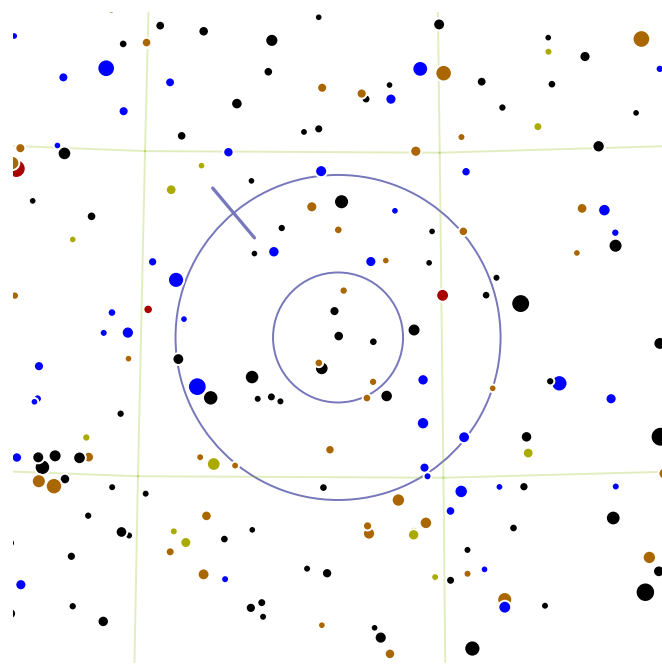
An easily separated white-blue pair.



One and a half finder circles south west of the famous double Albireo (magnitude 3.35, the head of the Swan). This unremarkable star is easily lost in its busy field.



In the same finder circle as its Tweedledee Struve 2455. Struve 2455 lies one degree to the south and slightly east of Struve 2445. They flank another double, Struve 2457.



Struve 2455

RA: 286.73° | 19h 6.9' — DEC: 22.17° | 22° 10'

Magnitude: 7.4 | 8.5

Separation: 6.6"

Position Angle: 40°

SAO 86821 | HIP 93859 | GDR2 52674666240



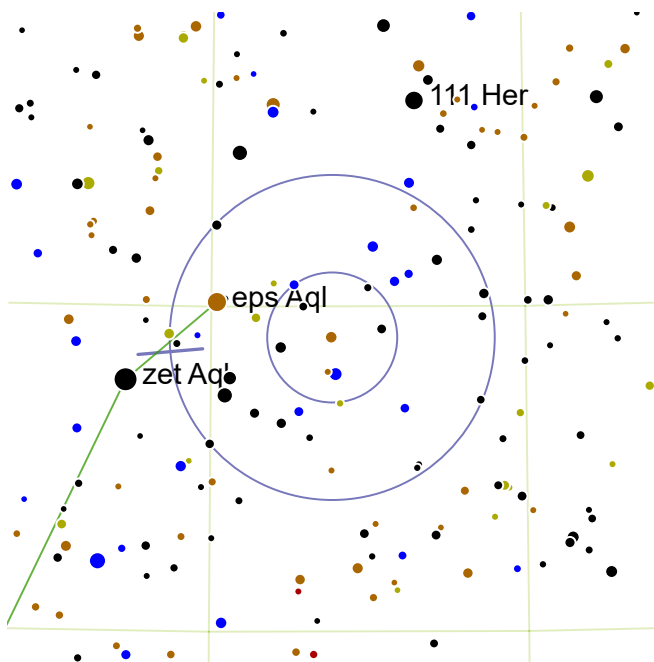
A close white-blue pair.



One and a half finder circles south west of the famous double Albireo (magnitude 3.35, the head of the Swan). This unremarkable star is easily lost in its busy field.



In the same finder circle as its Tweedledum Struve 2445. Struve 2445 lies one degree to the south and slightly east of Struve 2455. They flank another double, Struve 2457.



Struve 2411

RA: 283.08° | 18h 52.29' — DEC: 14.53° | 14° 32'

Magnitude: 6.6 | 9.4

Separation: 13.5"

Position Angle: 95°

SAO 104203 | HIP 92620 | GDR2 62086517760



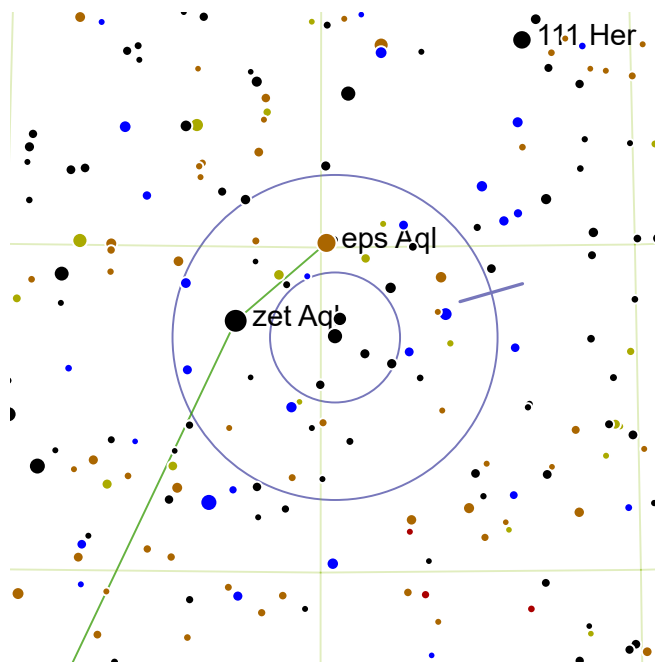
A comfortably separated pair with a yellow primary and a faint secondary.



In the same finder circle as Zeta Aquilae, 3 degrees to the west.



The yellow giant primary is only 362 light-years away. With Struve 2411 centered, open cluster NGC 6738 lies just beyond the south eastern edge of the finder circle.



11 Aql

RA: 284.77° | 18h 59.09' — DEC: 13.62° | 13° 37'

Magnitude: 5.2 | 8.7

Separation: 17"

Position Angle: 286°

SAO 104308 | HIP 93203 | GDR2 21465681536



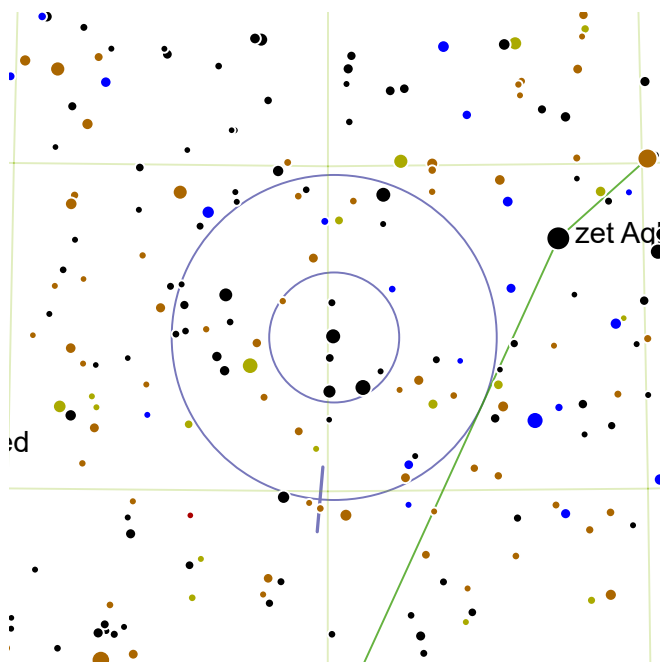
A wide pair with a white primary and a faint blue companion.



Easily found one degree due west of magnitude 2.95 Zeta Aquilae, the northernmost wingtip of the Eagle.



The two stars are not physically bound but only lie on the same line of sight. Open cluster NGC 6738 is two degrees south of this cluster.



28 Aql




RA: 289.9° | 19h 19.59' — DEC: 12.37° | 12° 22'

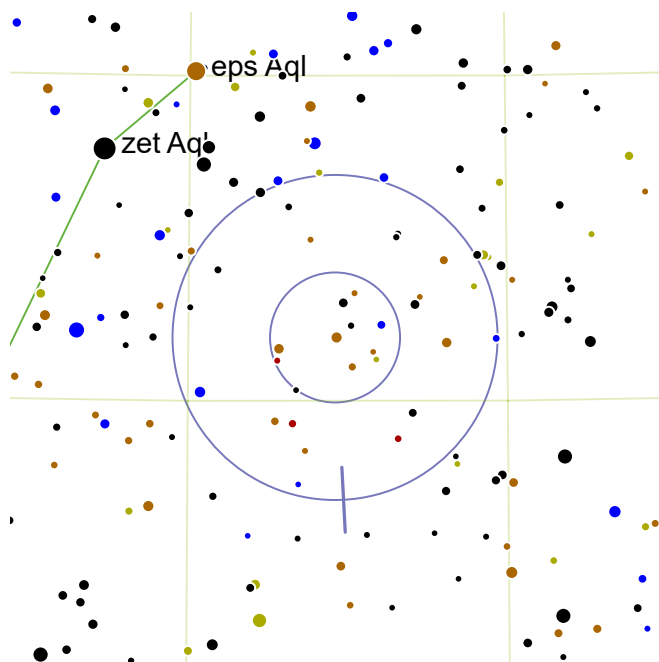
Magnitude: 5.6 | 9.0

Separation: 60.7"

Position Angle: 175°

SAO 104722 | HIP 94982 | GDR2 89873075200

-  A bright yellowish primary with a distant much fainter companion.
-  Half a finder circle SEE from magnitude 3.02 zet Aql. One finder circle NWW from magnitude 2.8 Tarazed.
-  The pair are gravitationally bound. The primary is also a variable star, V1208 Aquilae.



Struve 2404




RA: 282.7° | 18h 50.79' — DEC: 10.98° | 10° 59'

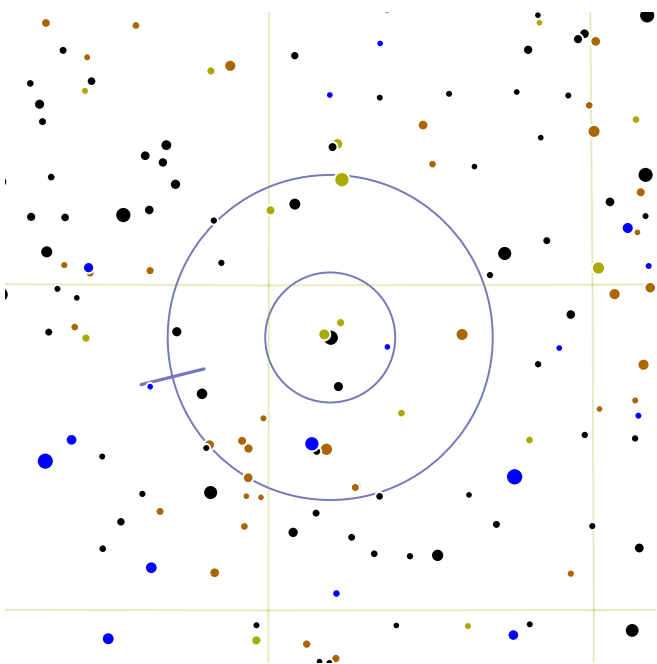
Magnitude: 6.9 | 8.1

Separation: 3.6"

Position Angle: 183°

SAO 104170 | HIP 92475 | GDR2 61225172736

-  Two orange stars with very tight separation.
-  One finder circle south west of Zeta Aquilae. This system is 1259 light-years from the Sun.
-  This pair of orange giants is 1259 light-years from the Sun.



Theta Ser

RA: 284.05° | 18h 56.2' — DEC: 4.2° | 4° 12'

Magnitude: 4.5 | 5.4

Separation: 22.3"

Position Angle: 104°

SAO 124068 | HIP 92946 | GDR2 84413726208



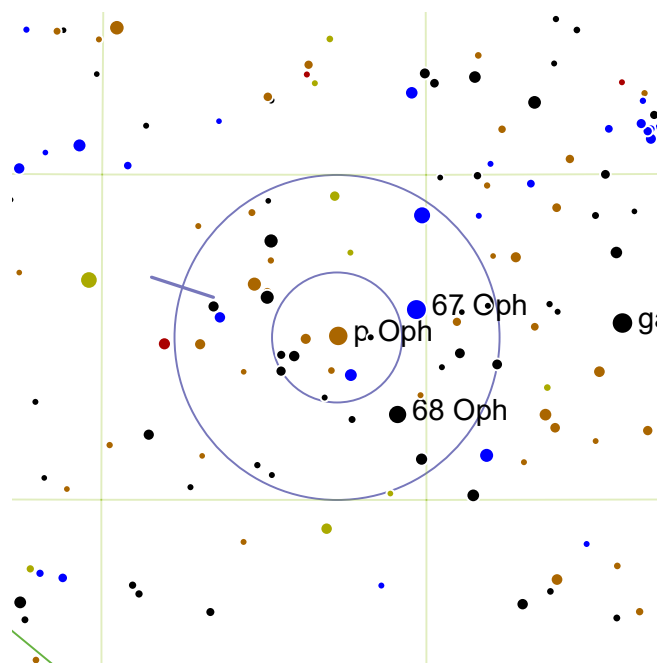
A widely separated pair of bright blue stars.



The end of the serpent's tail, nestled among the stars of Aquila. The Serpentis lies two finder circles due west from Delta Aquilae, the central star of the Eagle.



With this double centered in the finder, two open clusters lie just beyond the eastern edge of the finder circle: NGC 6755 and the much fainter NGC 6756.



70 Oph

RA: 271.38° | 18h 5.5' — DEC: 2.5° | 2° 30'

Magnitude: 4.2 | 6.0

Separation: 2.8"

Position Angle: 72°

SAO 123107 | HIP 88601 | GDR2 89937892096



A brilliant yellow star with a bright orange companion. The pair are very close, especially given their apparent magnitude. The gap is currently near the maximum.



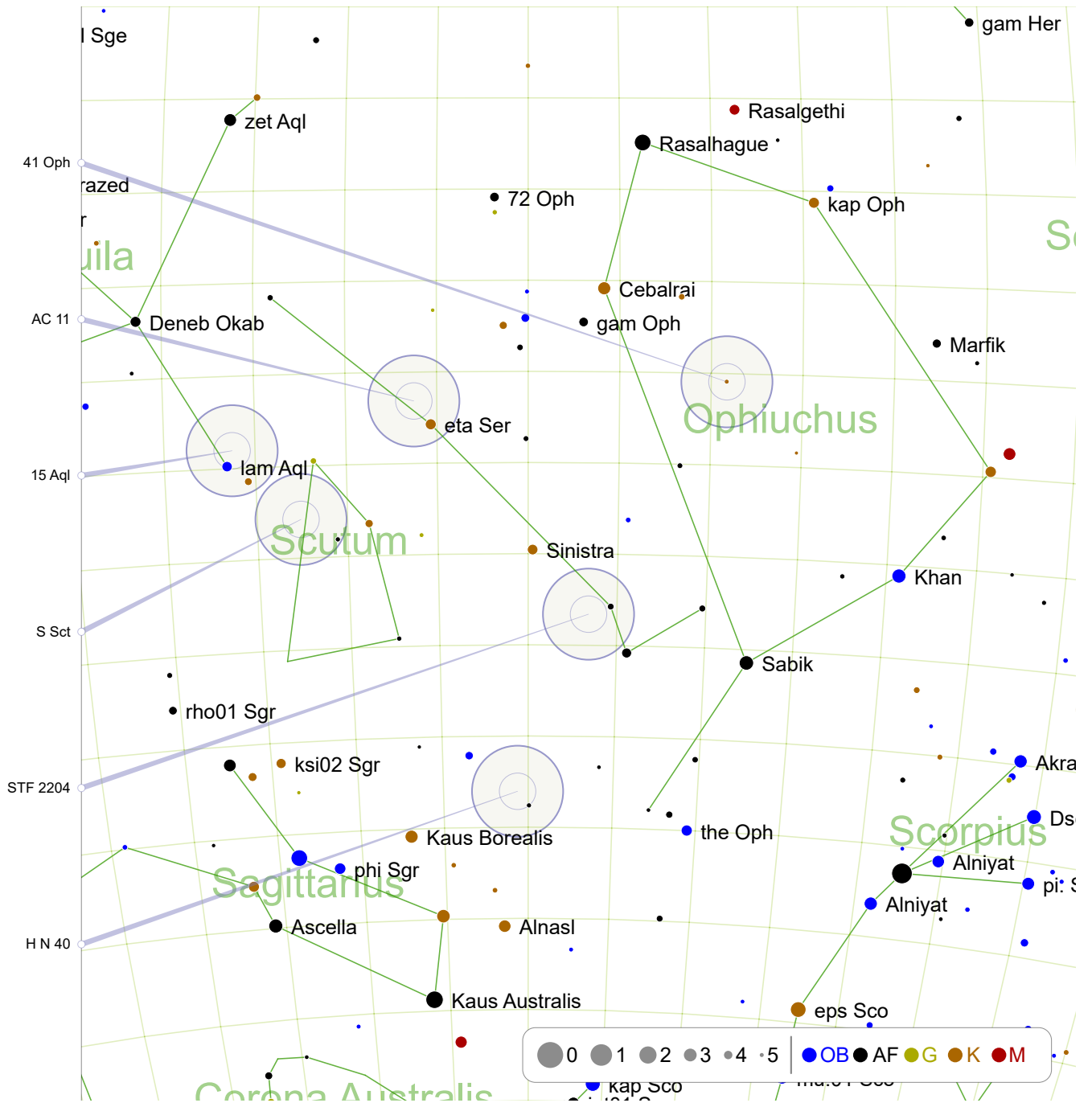
Located in the center of a brilliant star field, 70 Ophiuchi lies one and a half finder circles east and slightly south of magnitude 2.75 Celebrai of the constellation Ophiuchus.



70 Oph is only 16.6 light-years from the Sun. William Herschel calculated its 88 year orbit proving gravity applies beyond the Solar System. Behind 70 Oph looms an enormous loose group of stars, Melotte 186.

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July: -10° South (1)



41 Oph: page 271

AC 11: page 271

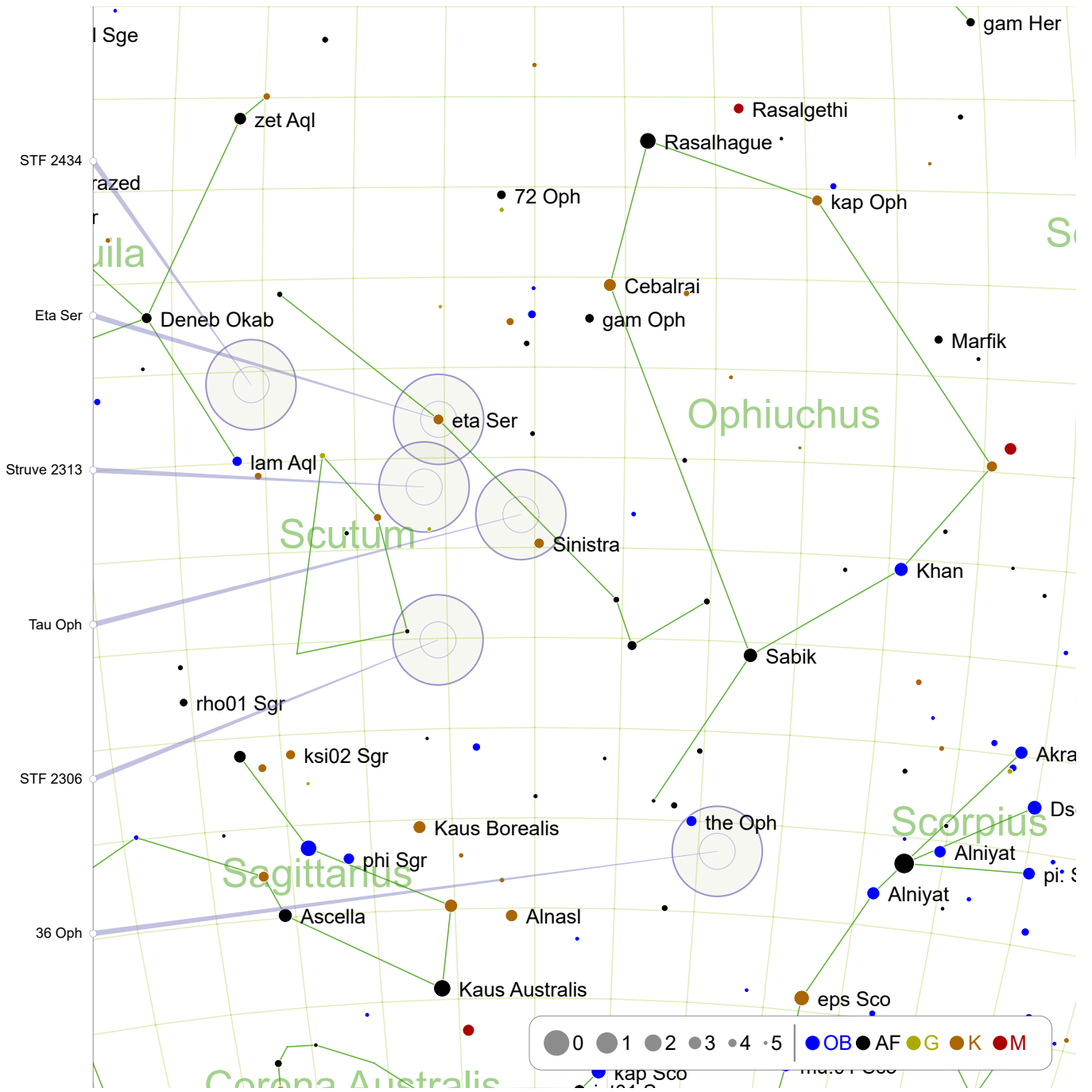
15 Aql: page 272

S Sct: page 272

STF 2204: page 273

HN 40: page 273

July: -10° South (2)

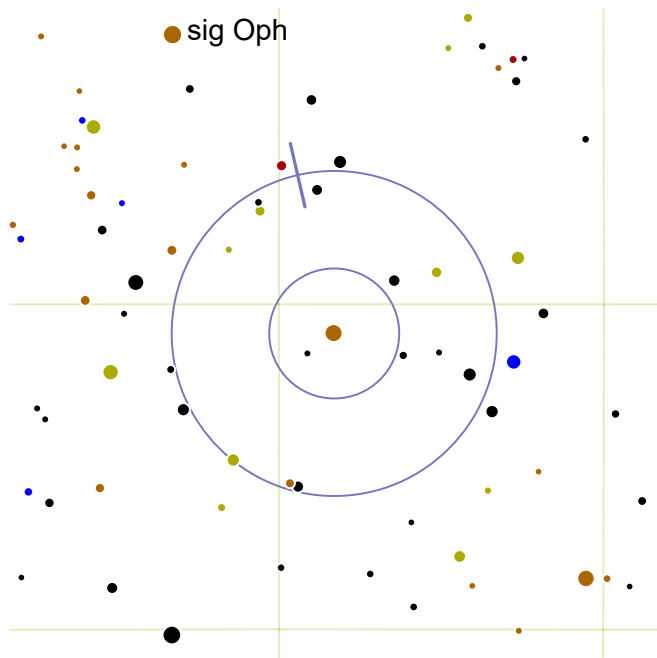


STF 2434: page 274
STF 2306: page 276

Eta Ser: page 274
36 Oph: page 276

Struve 2313: page 275

Tau Oph: page 275



41 Oph

RA: 259.15° | 17h 16.59' — DEC: -0.45° | 0° 26'

Magnitude: 4.9 | 7.5

Separation: 1"

Position Angle: 13°

SAO 141586 | HIP 84514



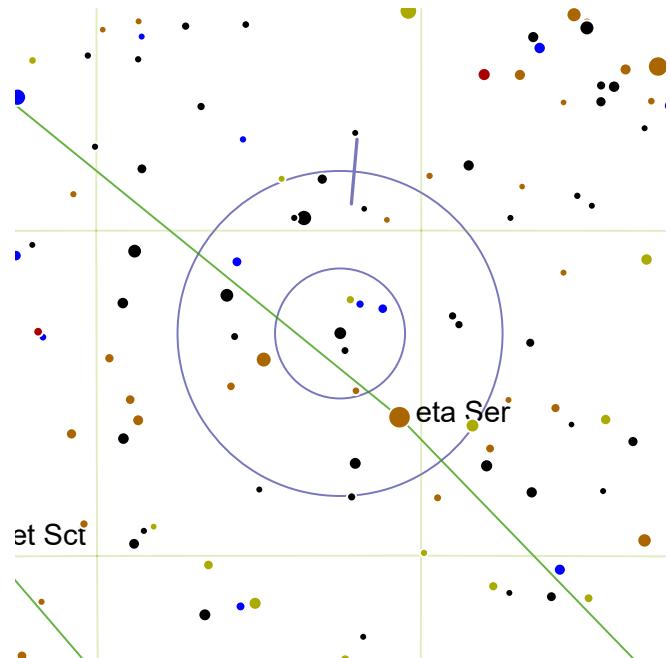
A fantastically close unequal orange-white pairing.



One and a half finder circles SW from magnitude 2.94 Cebalrai. Two finder circles SSE from magnitude 3.42 kap Oph.



The primary is an orange K-class giant approximately 3.7 billion years old. The components orbit in 141 years.



AC 11

RA: 276.25° | 18h 25.0' — DEC: -1.58° | -1° 34'

Magnitude: 6.7 | 7.2

Separation: 0.85"

Position Angle: 355°

SAO 142294 | HIP 90253 | GDR2 01112859136



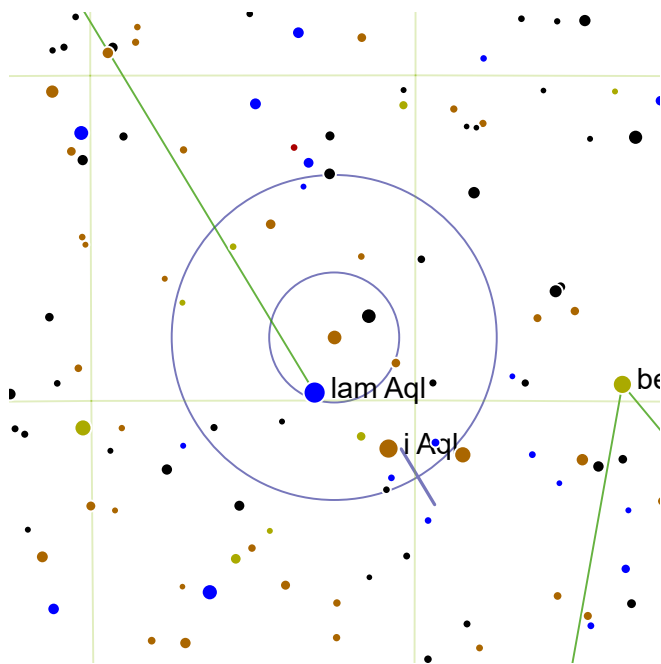
A balanced but difficult white-white double with a tiny separation.



One degree NE from magnitude 3.42 eta Ser.






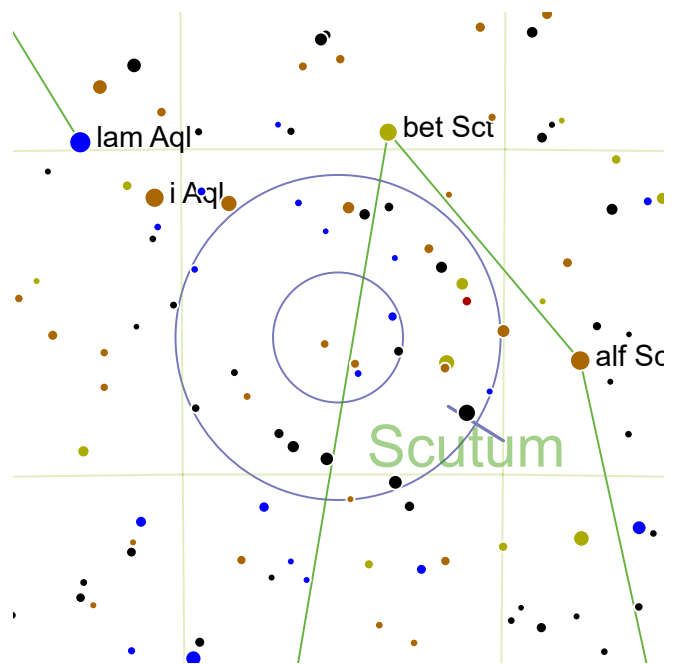
The system is 435 light-years from Earth.



15 Aql




RA: 286.25° | 19h 5.0' — DEC: -4.03° | -4° 1'
 Magnitude: 5.5 | 7.0
 Separation: 39.6"
 Position Angle: 211°
 SAO 142996 | HIP 93717 | GDR2 92802784384

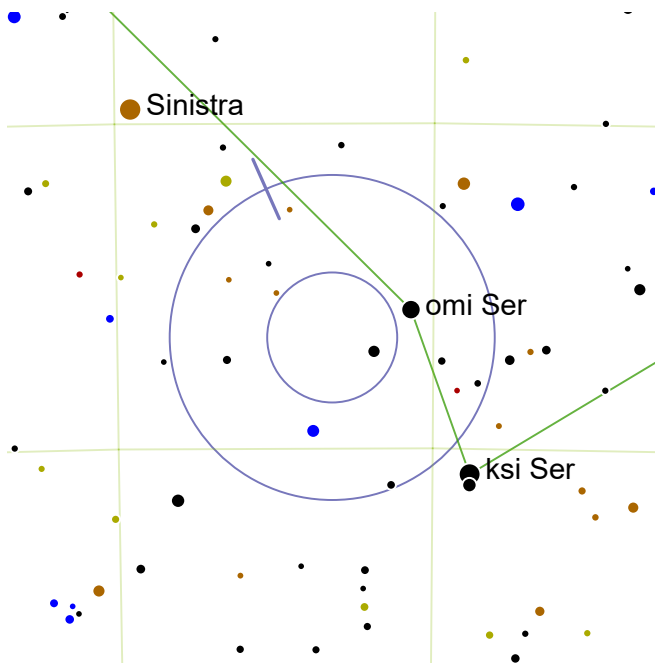
-  A very wide pair of yellow stars.
-  Located a degree to the north of Lamda Aquilae, the tail of the Eagle.
-  Good at low powers as the star lies in the Milky Way. The region is rich in dark nebulae - Barnard 132 and Barnard 120 lie to one to two degrees to the east and west respectively of this double.



S Sct

RA: 282.58° | 18h 50.29' — DEC: -7.9° | -7° 53'
 Magnitude: 7.5 | 12
 Separation: 14.4"
 Position Angle: 238°
 SAO 142674 | HIP 92442 | GDR2 71231284224

-  A deep red primary with an easily separated, tiny orange companion.
-  Half a finder circle SW from magnitude 3.55 lam Aql. One and a half finder circles SE from magnitude 3.42 eta Ser.
-  The primary is a carbon star, so it is deeply red and quite variable (Δ magnitude 4.0).



STF 2204

RA: 266.6° | 17h 46.4' — DEC: -13.3° | -13° 17'

Magnitude: 8.1 | 8.1

Separation: 14.4"

Position Angle: 24°

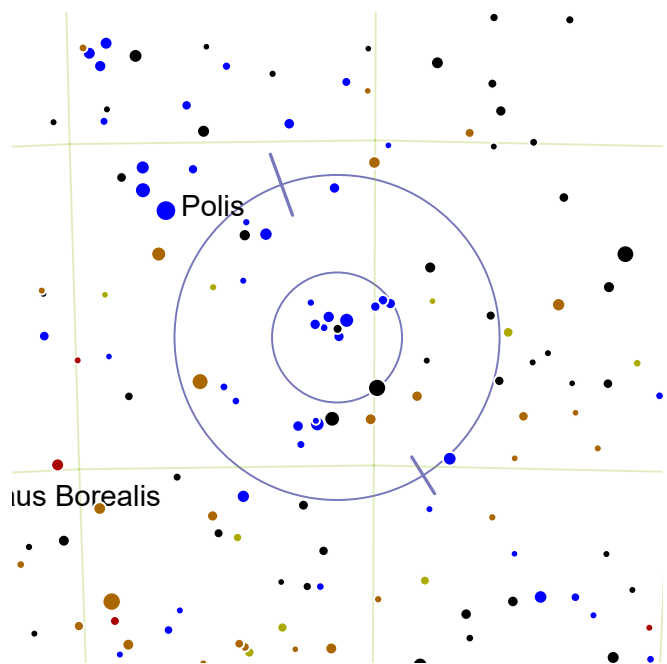
SAO 160809 | GDR2 94949053952



An equal pair of easily separated white stars.



Half a finder circle NE from magnitude 3.64 Kappa Ser. One and a half finder circles NEE from magnitude 2.63 Sabik.



H N 40

RA: 270.63° | 18h 2.5' — DEC: -23.03° | -23° 1'

Magnitude: 7.6 | 10.5 | 8.7

Separation: 6.2" | 10.7"

Position Angle: 20° | 212°

SAO 186145 | HIP 88333 | GDR2 58691324672



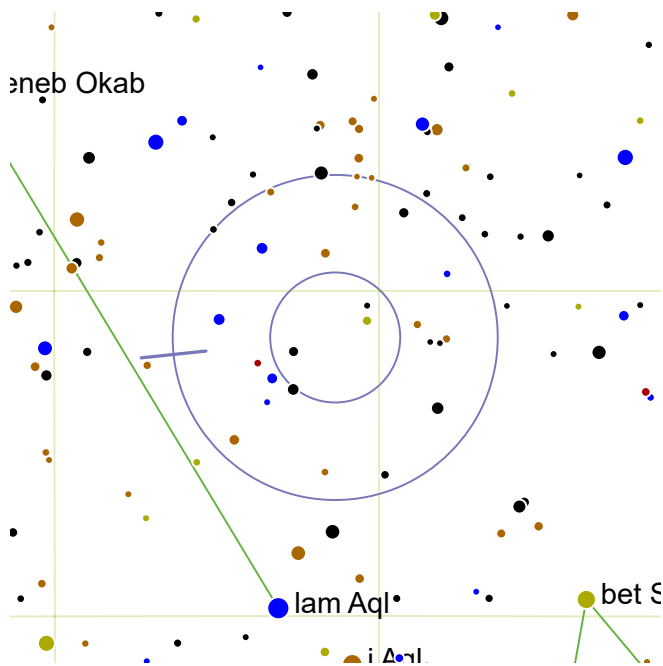
A close trio of stars, none of which are very bright. The primary is blue.



One finder circle NWW from magnitude 2.94 Kaus Borealis. One and a half finder circles NNW from magnitude 2.84 Kaus Media.



Located in the Triffid Nebula (Messier 20, magnitude 6.3). Under good skies, the Lagoon Nebula (Messier 8, magnitude 6.0) should stand out prominently in the southern quarter of the finder view. The Washington Double Star catalog lists 9 components, but most are extremely faint.



STF 2434

RA: 285.68° | 19h 2.7' — DEC: -0.72° | 0° 42'

Magnitude: 8.4 | 8.6

Separation: 26"

Position Angle: 96°

SAO 142955 | HIP 93518 | GDR2
4265524749785867008



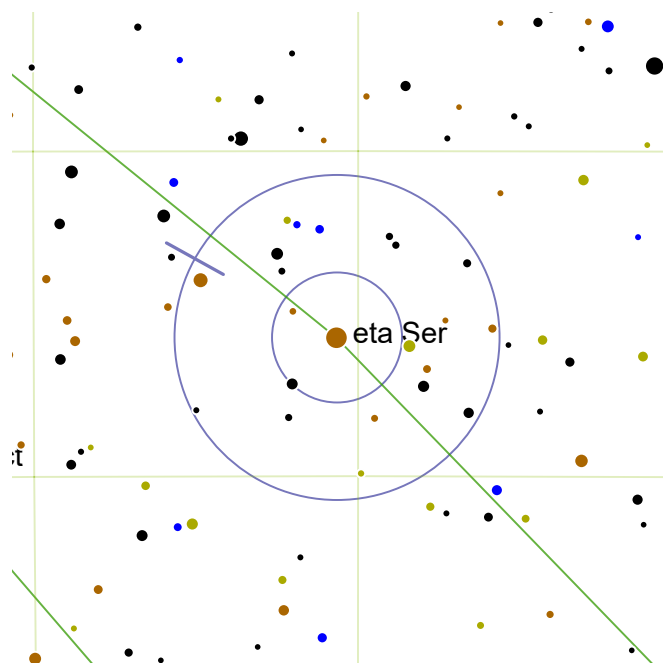
A yellow-yellow pairing, widely separated.



Half a finder circle NNW from magnitude 3.55 lam Aql. One finder circle SW from magnitude 3.44 Deneb Okab.



The secondary component is also a balanced binary with a separation of 0.78".



Eta Ser

RA: 275.33° | 18h 21.29' — DEC: -2.87° | -2° 51'

Magnitude: 3.4 | 12.1

Separation: 179.7"

Position Angle: 61°

SAO 142241 | HIP 89962



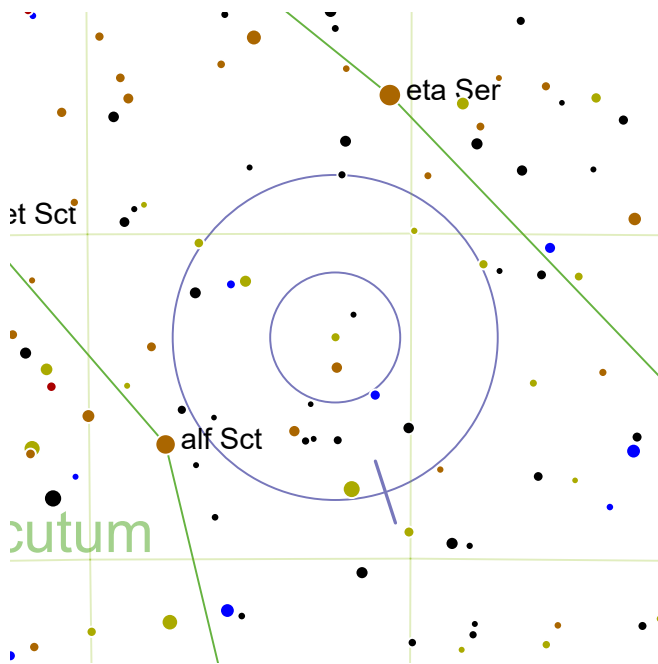
The primary is a brilliant orange but the companion is very faint indeed.



Eta Ser is a bright star in Serpens.



The primary is only 60 light-years from Earth, but this double is merely a line of sight coincidence.



Struve 2313

RA: 276.18° | 18h 24.7' — DEC: -6.6° | -6° 35'

Magnitude: 7.5 | 8.8

Separation: 6.1"

Position Angle: 198°

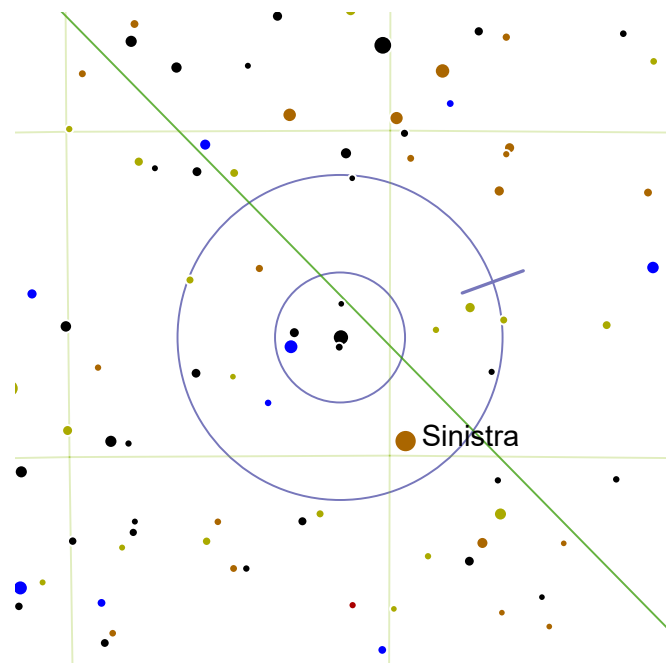
SAO 142289 | HIP 90239 | GDR2 80326713984



A close yellow and blue pair.



From magnitude 3.20 Eta Serpentis, move one finder circle south and very slightly east.



Tau Oph

RA: 270.77° | 18h 3.09' — DEC: -8.18° | -8° 10'

Magnitude: 5.2 | 5.9

Separation: 1.5"

Position Angle: 290°

SAO 142050 | HIP 88404 | GDR2 76094715520



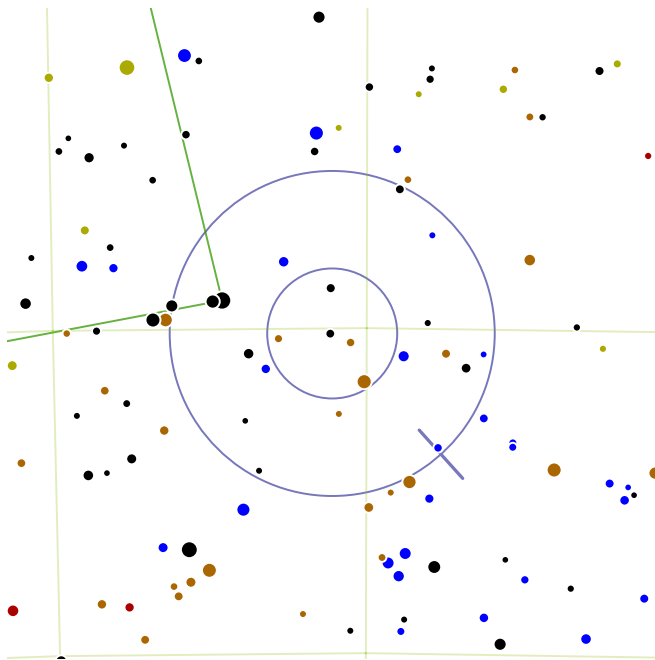
An extremely tight, balanced pair of yellowish stars.



One degree NNE from magnitude 3.5 Sinistra. One finder circle SW from magnitude 3.42 eta Ser.



The double lies between two globular clusters: NGC 6539 (mag. 8.9) lies within a degree to the north-east, and NGC 6517 (mag. 11.1) lies within a degree to the south.



STF 2306

RA: 275.55° | 18h 22.2' — DEC: -15.08° | -15° 4'

Magnitude: 8.1 | 8.6

Separation: 9.1"

Position Angle: 222°

SAO 161390 | HIP 90032 | GDR2 19300677504



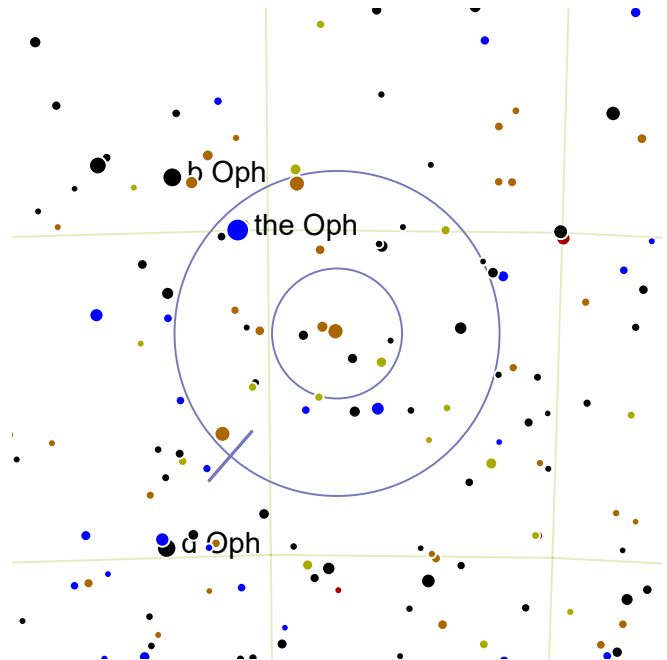
A deep yellow primary with a balanced secondary, closely separated.



One and a half finder circles SE from magnitude 3.5 Sinistra. Two finder circles NW from magnitude 3.61 ksi02 Sgr.



The finder circle is rich in nebulae. M17 (mag. 6.0) lies a degree to the south, while M16 (mag.6.0) lies a degree to the north west.



36 Oph

RA: 258.83° | 17h 15.29' — DEC: -26.6° | -26° 35'

Magnitude: 5.1 | 5.1

Separation: 4.8"

Position Angle: 139°

SAO 185199 | HIP 84405



A bright, equal pair of orange dwarfs, closely separated.

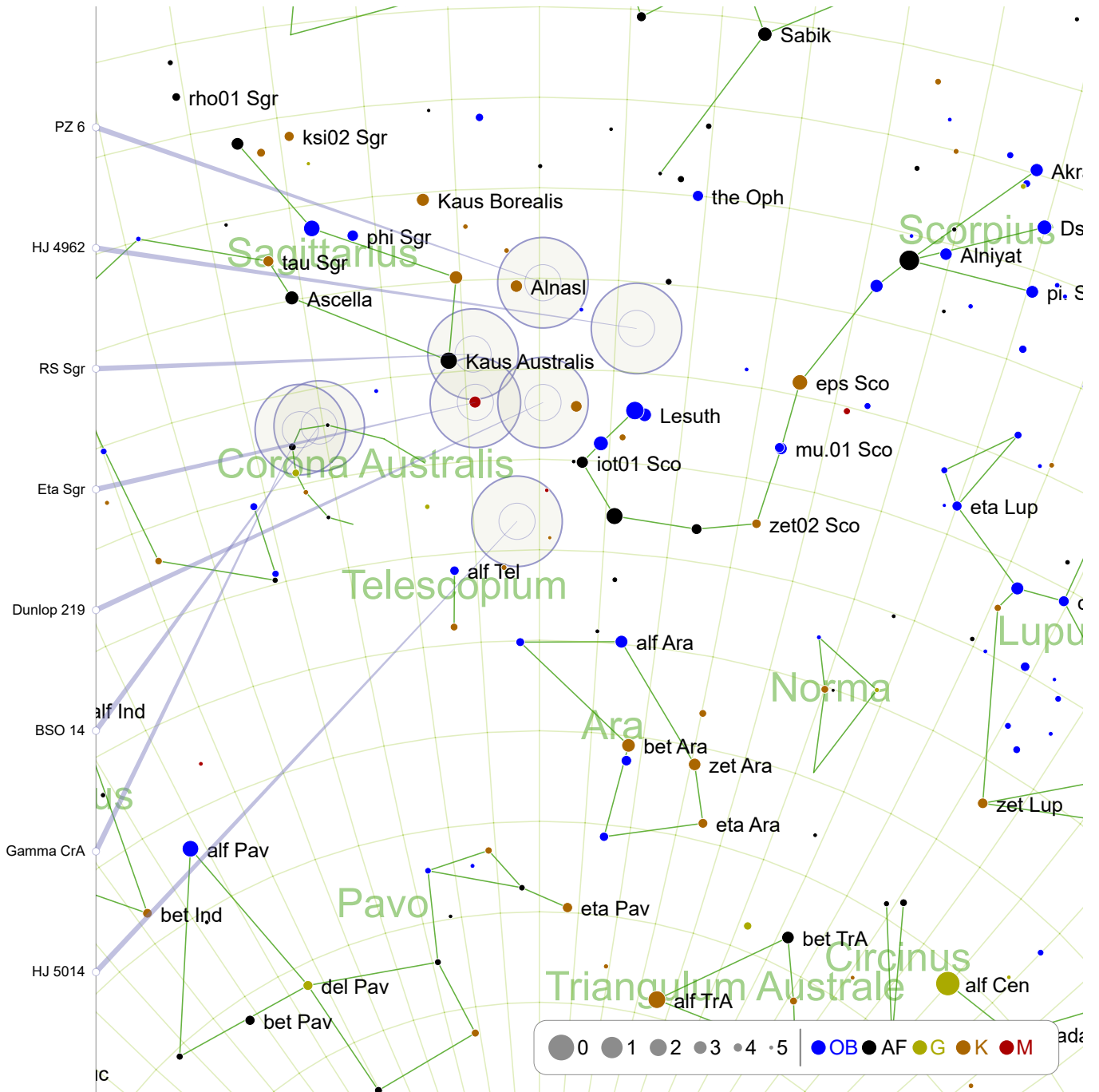


One and a half degrees SW from magnitude 3.37 the Oph. Two finder circles S from magnitude 2.63 Sabik.



There are three globular clusters in the finder view. NGC 6293 (mag. 9.0) is a degree to the west. NGC 6319 (mag. 9.0) is nearly two degree to the south. NGC 6355 (mag. 11.0) is two degrees to the east. This double is only 19 light-years from Earth.

July: -45° South

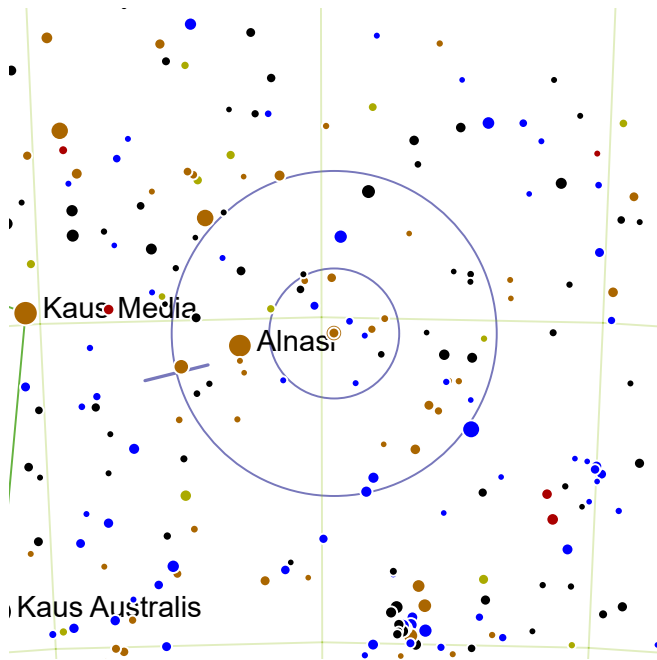


PZ 6: page 278
Dunlop 219: page 280

HJ 4962: page 278
BSO 14: page 280

RS Sgr: page 279
Gamma CrA: page 281

Eta Sgr: page 279
HJ 5014: page 281



PZ 6




RA: 269.77° | 17h 59.09' — DEC: -30.25° | -30° 14'

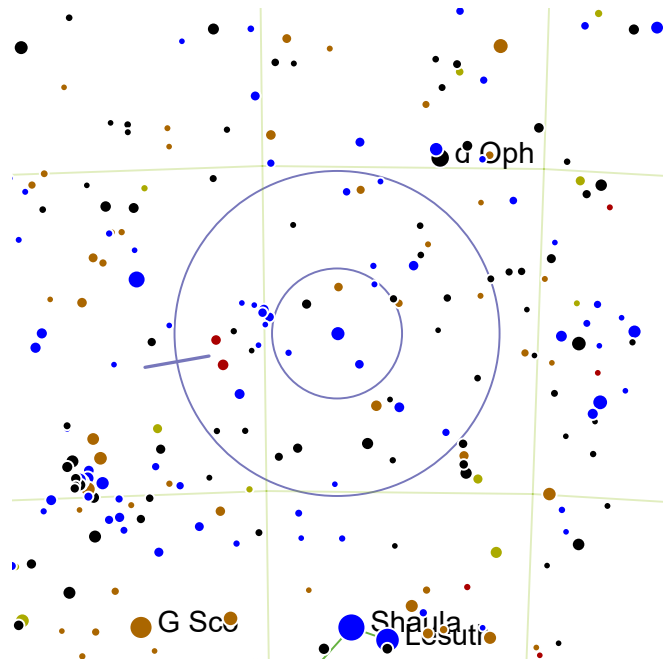
Magnitude: 5.4 | 7.0

Separation: 5.9"

Position Angle: 104°

SAO 209553 | HIP 88060 | GDR2 83404244736

-  A bright red star with a fairly bright, yellow companion close by.
-  One degree W from magnitude 3.07 Alnasi. Half a finder circle W from magnitude 2.84 Kaus Media.
-  Two globular clusters are around one degree to the east of this double. Furthest east of these is magnitude 10.7 NGC 6528, while the one to the west closest to PZ 6 is magnitude 9.5 NGC 6522.



HJ 4962




RA: 263.68° | 17h 34.7' — DEC: -32.58° | -32° 34'

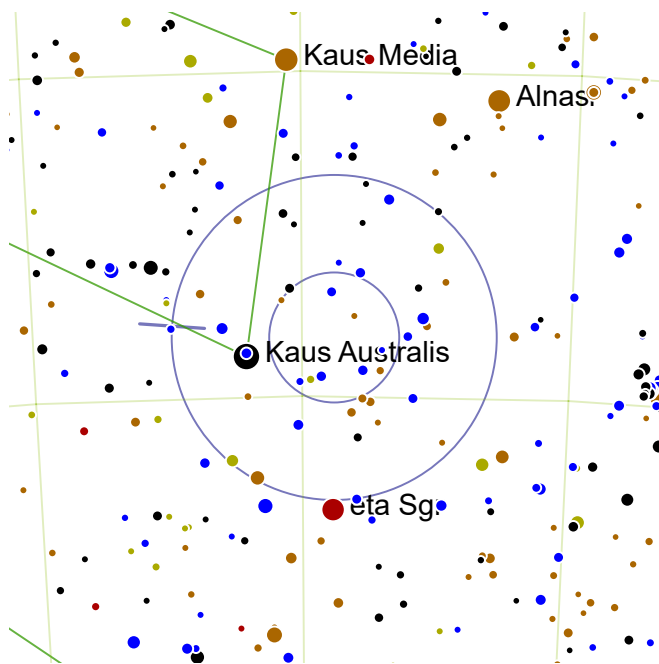
Magnitude: 5.7 | 10.5

Separation: 5.9"

Position Angle: 100°

SAO 208977 | HIP 86011 | GDR2 59611164288

-  A bright blue star with a close but faint blue companion.
-  Half a finder circle N from magnitude 1.71 Shaula. Half a finder circle N from magnitude 2.8 Lesuth.
-  The very bright open cluster Messier 6 (magnitude 4.2) fills the easter quarter of the finder view.



RS Sgr

RA: 274.4° | 18h 17.59' — DEC: -34.1° | -34° 5'

Magnitude: 6.0 | 9.5

Separation: 38.9"

Position Angle: 86°

SAO 209959 | HIP 89637 | GDR2 55085884800



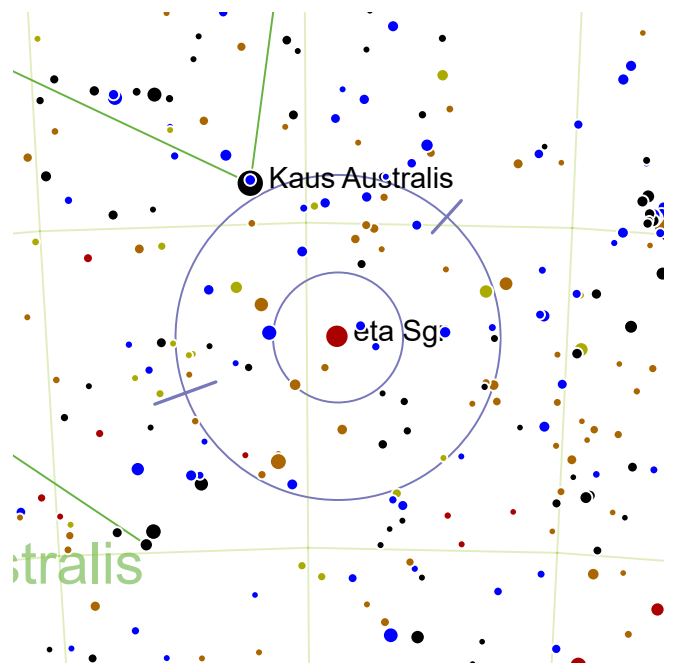
A very wide pair with a bright, blue primary and a fairly faint secondary.



One degree NWW from magnitude 1.95 Kaus Australis. Half a finder circle N from magnitude 3.16 eta Sgr.



A degree to the east is the extremely brilliant Kaus Australis (magnitude 1.75) while a degree to the west is NGC 6563, a magnitude 10.0 planetary nebula.



Eta Sgr

RA: 274.4° | 18h 17.59' — DEC: -36.77° | -36° 45'

Magnitude: 3.3 | 8.0 | 10.0

Separation: 3.5" | 93.8"

Position Angle: 110° | 318°

SAO 209957 | HIP 89642



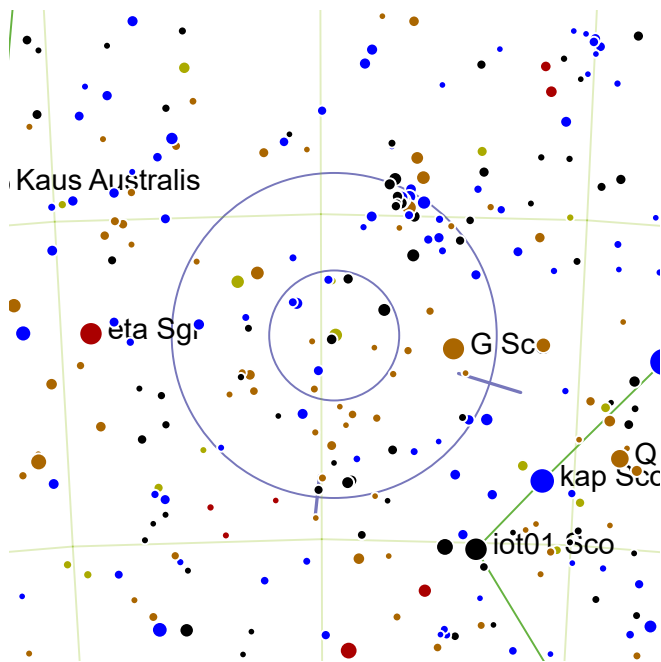
A trio of stars, a brilliant red primary and very close secondary are distantly separated from a very faint third component.



Eta Sgr is a bright star in Sagittarius.



The primary, also known as Hamalwarid or Arkab, is 145 light-years from the Earth.



Dunlop 219

RA: 269.75° | 17h 59.0' — DEC: -36.87° | -36° 51'

Magnitude: 5.8 | 7.8 | 11.3

Separation: 54.2" | 40.7"

Position Angle: 253° | 174°

SAO 209545 | HIP 88038 | GDR2 26191922688



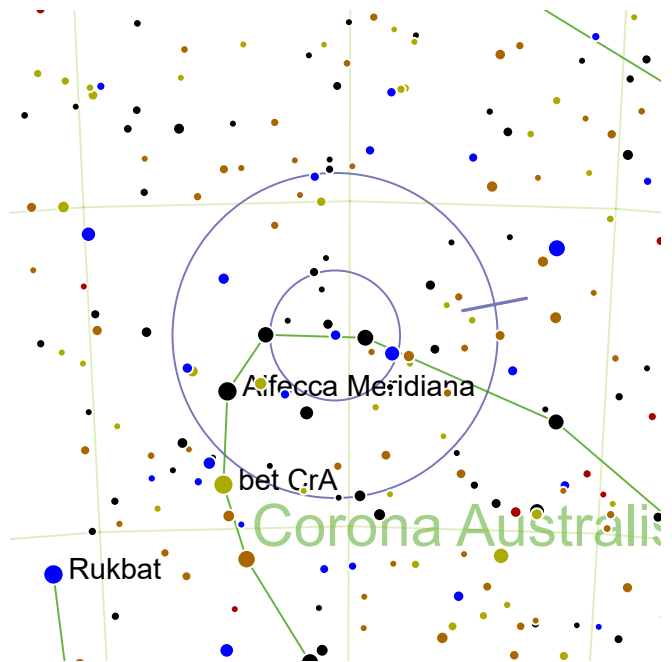
A yellow primary with two widely separated companions, one extremely faint.



One degree E from magnitude 3.25 G Sco. Half a finder circle W from magnitude 3.16 eta Sgr.



Brilliant M7, a magnitude 3.3 open cluster, is on the north-western edge of the finder view.



BSO 14

RA: 285.27° | 19h 1.09' — DEC: -37.07° | -37° 3'

Magnitude: 6.5 | 7

Separation: 13"

Position Angle: 281°

SAO 210816 | HIP 93371 | GDR2 02462393088



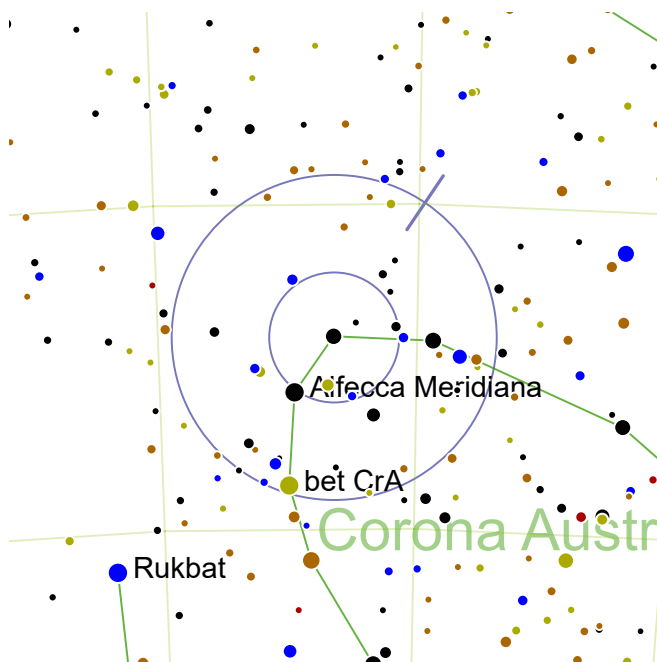
A fairly bright, balanced double, easily separated. Both components have a blue hue.



One finder circle S from magnitude 2.71 Ascella. One and a half finder circles SEE from magnitude 1.95 Kaus Australis.



The finder is richly decorated with bright stars. Less than a degree to the north west is NGC 6723, a magnitude 7.9 globular cluster.



Gamma CrA

RA: 286.6° | 19h 6.4' — DEC: -37.07° | -37° 3'


Magnitude: 4.5 | 6.4


Separation: 1.5"

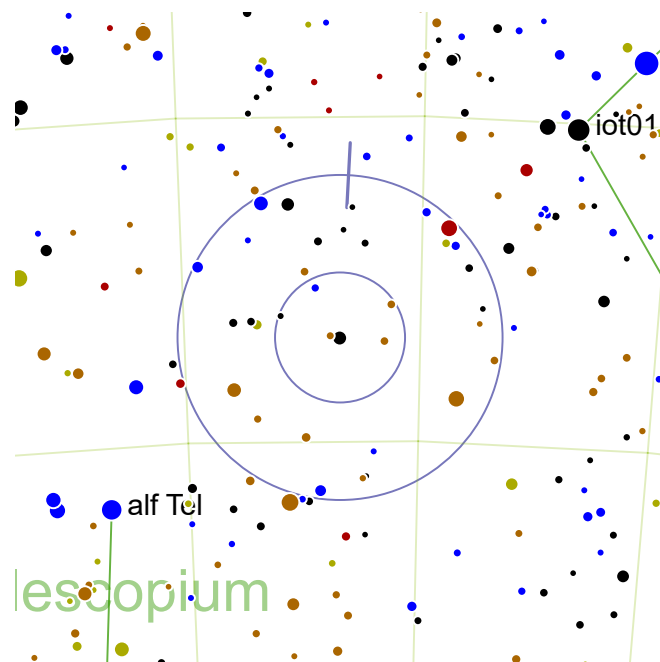
Position Angle: 326°

SAO 210928 | HIP 93825 | GDR2 45032456832

 A brilliant yellowish primary tightly bound to a fairly bright companion.

 One finder circle S from magnitude 2.71 Ascella. One and a half finder circles SEE from magnitude 1.95 Kaus Australis.

 This system is a mere 56 light-years from Earth. The system is always very tightly separated, but the separation is slowly increasing, exceeding 1.7" by 2028.



HJ 5014


RA: 271.7° | 18h 6.79' — DEC: -43.42° | -43° 24'


Magnitude: 5.7 | 5.7


Separation: 1.8"

Position Angle: 357°

SAO 228708 | HIP 88726 | GDR2 56508792576

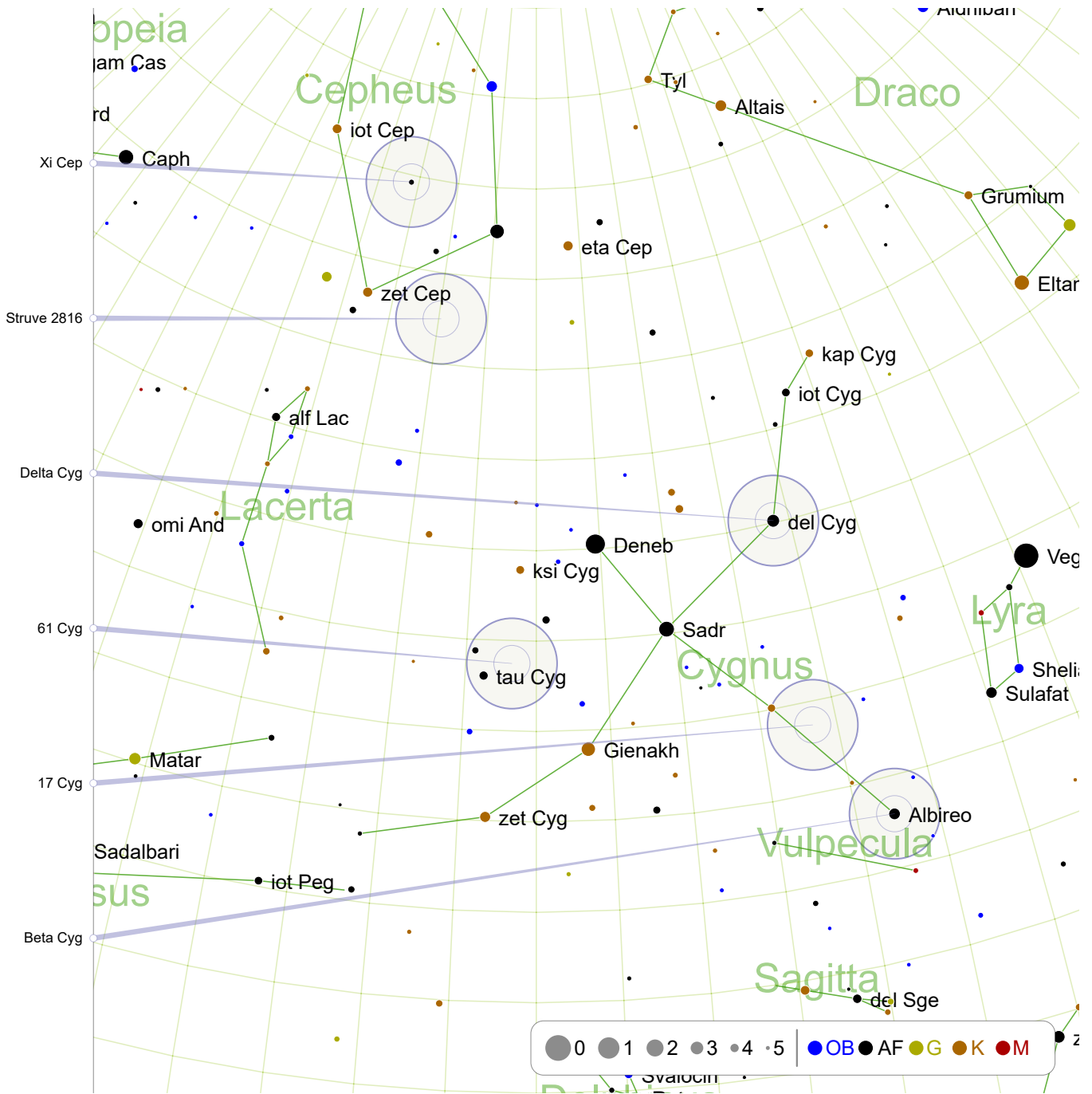
 An extremely tight pairing of two equally bright white stars.

 Half a finder circle NWW from magnitude 3.76 alf Tel. One finder circle SSW from magnitude 3.16 eta Sgr.

 Caldwell 78, a magnitude 7.3 globular cluster, is half a degree south east of this binary system. Two degrees to the south west is another globular cluster, NGC 6496 (magnitude 8.6).

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August: 45° North (1)



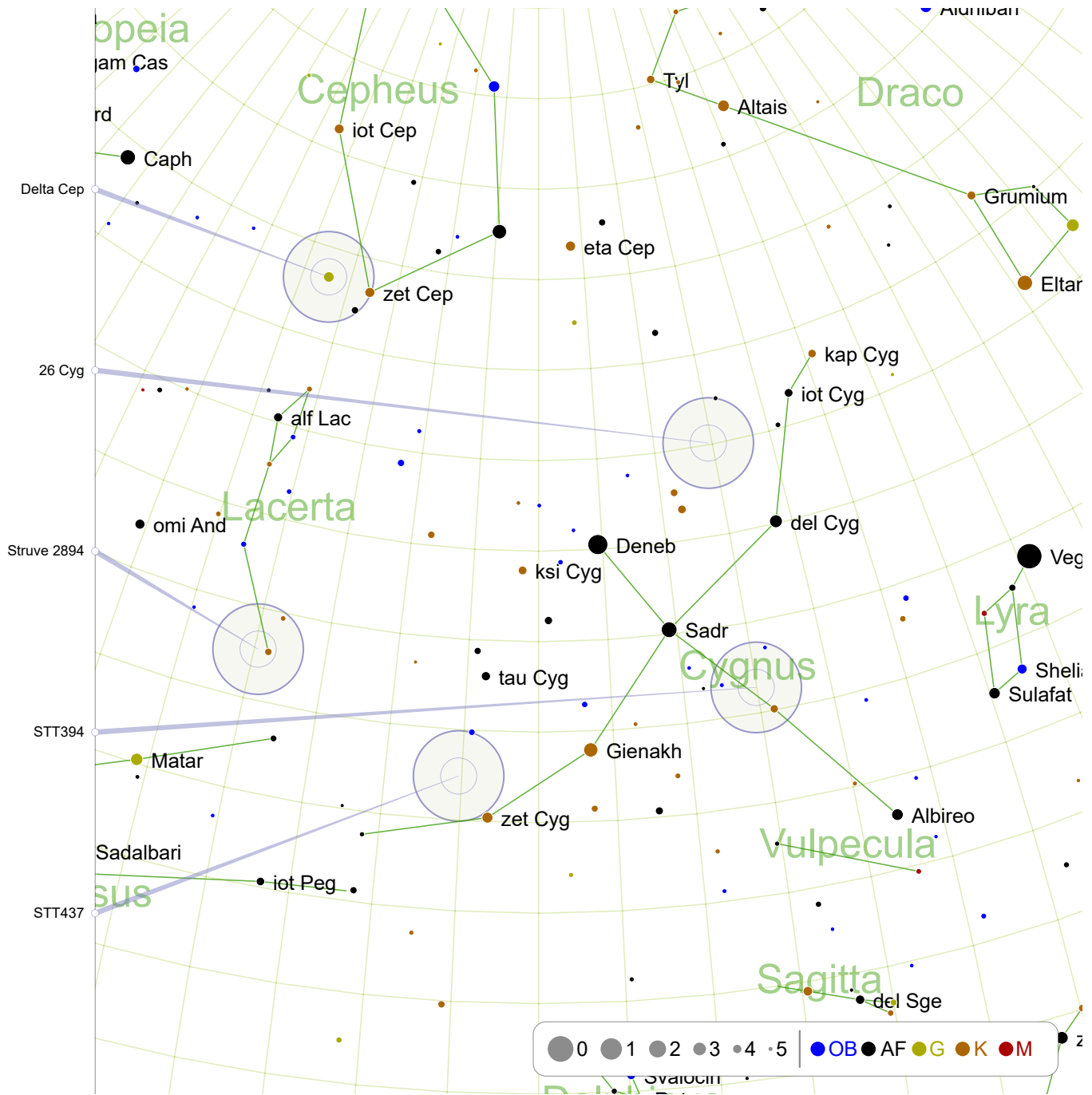
Xi Cep: page 285
17 Cyg: page 287

Struve 2816: page 285
Beta Cyg: page 287

Delta Cyg: page 286

61 Cyg: page 286

August: 45° North (2)

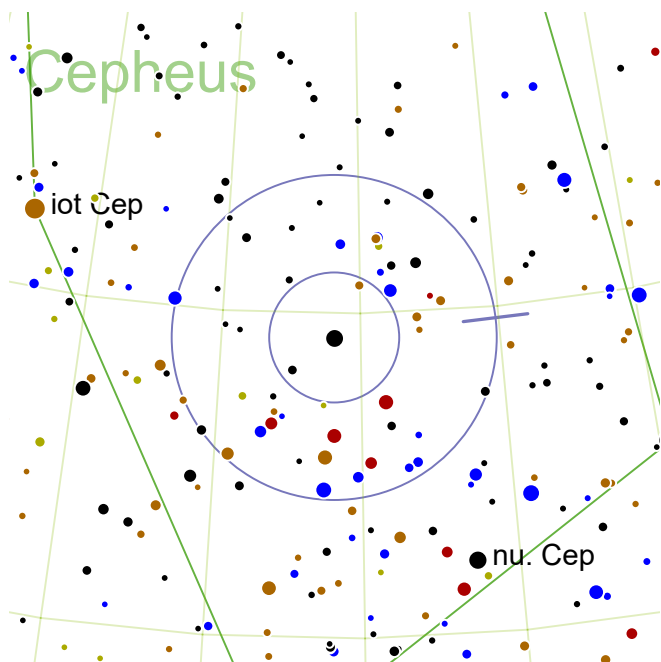


Delta Cep: page 288
STT437: page 290

26 Cyg: page 288

Struve 2894: page 289

STT394: page 289



Xi Cep

RA: 330.95° | 22h 3.79' — DEC: 64.63° | 64° 38'

Magnitude: 4.4 | 6.5

Separation: 7.7"

Position Angle: 277°

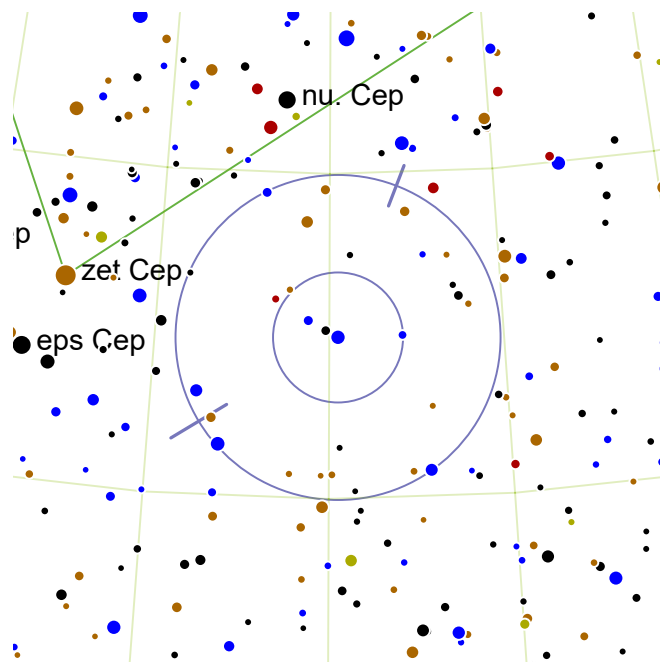
SAO 19827 | HIP 108917 | GDR2 10659419264



A bright white primary with a close moderately fainter white secondary.



The Arabic proper name Alkurhah means the “white spot on the brow of a horse”. Both visible components are also spectroscopic binaries. The system also has a widely separated 13th magnitude C component.



Struve 2816

RA: 324.75° | 21h 39.0' — DEC: 57.48° | 57° 29'

Magnitude: 5.6 | 7.7 | 7.8

Separation: 11.7" | 20"

Position Angle: 121° | 339°

SAO 33626 | HIP 106886 | GDR2 37123250432



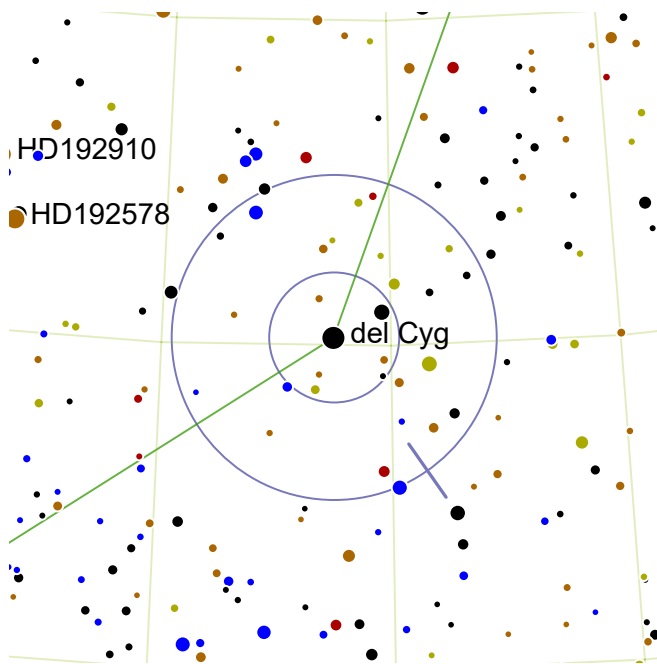
Possibly yellow and white (the yellow primary being bracketed by two fainter white stars). Alternately, the primary might be blue.



One finder circle south and slightly east of Alderamin.



The primary holds a surprise for those with large telescopes, dark skies and preternaturally keen eyes: 1.8” from the primary lies a magnitude 13.3 star. At moderate magnification, another double appears to the north-east: Struve 2819, a pair of white stars (magnitudes 7.4 and 8.6; separation: 12.9”; position angle: 59°).



Delta Cyg

RA: 296.24° | 19h 44.95' — DEC: 45.13° | 45° 8'

Magnitude: 2.89 | 6.27

Separation: 2.77"

Position Angle: 215°

SAO 48796 | HIP 97165 | GDR2 87999414656



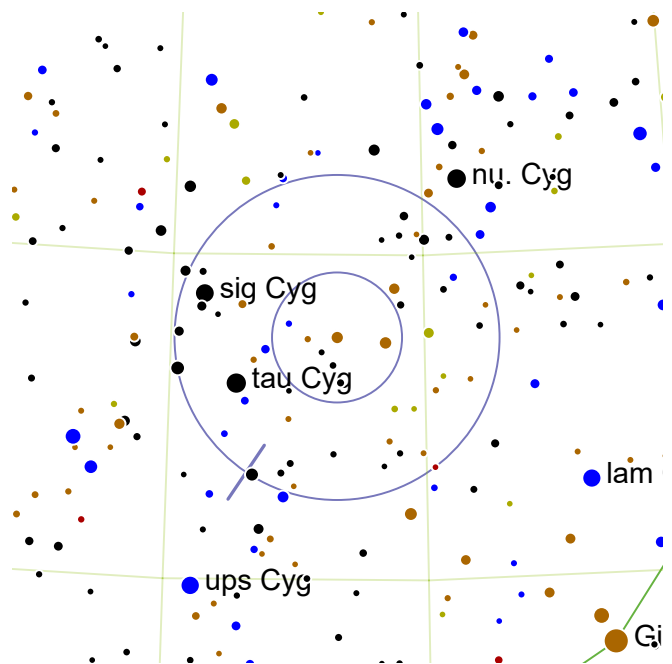
A very close and unbalanced pair with a brilliant blueish primary and reasonably bright white secondary.



Unmistakable as the bright star on Cygnus' western wing.



Delta Cygni (aka Fawaris) shares the finder circle with bright open cluster NGC 6811, which lies towards the north-western edge of the finder circle.



61 Cyg

RA: 316.73° | 21h 6.9' — DEC: 38.75° | 38° 45'

Magnitude: 5.2 | 6.0

Separation: 28"

Position Angle: 146°

SAO 70919 | HIP 104214 | GDR2 27813442688



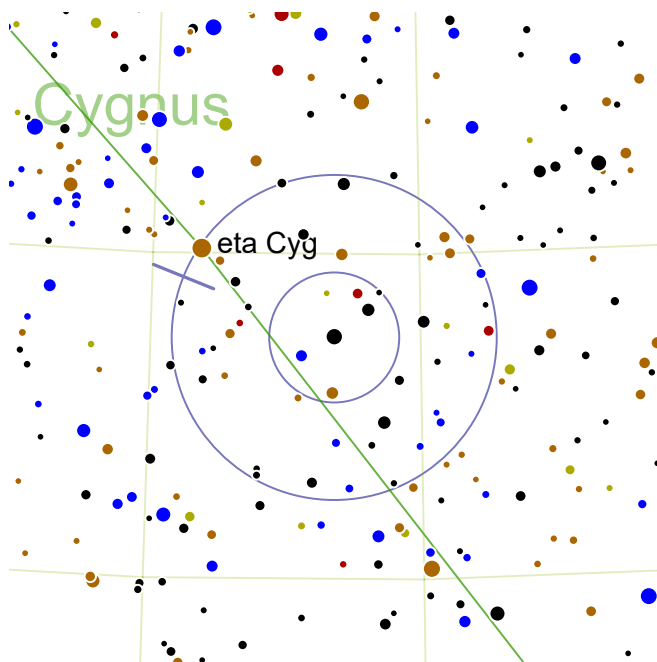
An orange-red pair with wide separation. I see both components as orange.



61 Cygni forms a parallelogram with the bright stars of Cygnus: Deneb (the tail), Sadr (the heart) and Gienakh (the brightest star of the south-eastern wing).



This double is only 11 light-years away and was the first star whose distance from Earth was measured. Astronomers had a clue it might be a close star because the system has an extremely high proper motion relative to other stars, suggesting it is nearer.



17 Cyg


RA: 296.6° | 19h 46.4' — DEC: 33.73° | 33° 44'


Magnitude: 5.1 | 9.3


Separation: 26.1"

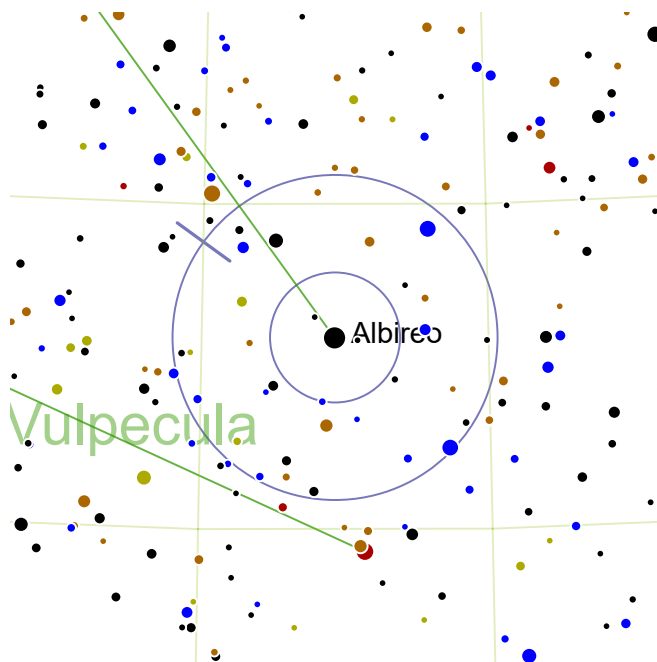
Position Angle: 68°

SAO 68827 | HIP 97295

 A bright yellowish primary widely separated from a dim secondary.

 One finder circle NNE from magnitude 3.24 183913. One finder circle NNE from magnitude 3.24 Albireo.

 Only 69 light-years from Earth, this pair are gravitationally bound.



Beta Cyg


RA: 292.68° | 19h 30.7' — DEC: 27.97° | 27° 58'


Magnitude: 3.1 | 5.1


Separation: 34.4"

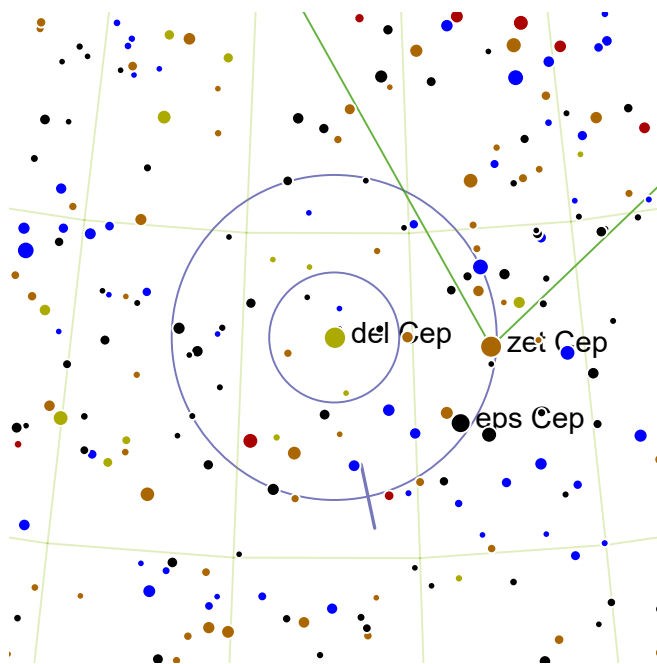
Position Angle: 54°

SAO 87301 | HIP 95947 | GDR2 60302988160

 This is the renowned Albireo, a brilliant deep yellow primary with a bright and delicate blue companion.

 The head of the Cygnus the Swan.

 Perhaps the most famous of all doubles, Albireo stands out for its strong color, bright components and easy separation. Albireo is approaching the Sun, and in several million years this double will be the brightest star in Earth's sky. Let's hope there will still be somewhere dark and quiet to look up at it.



Delta Cep

RA: 337.3° | 22h 29.2' — DEC: 58.42° | 58° 25'

Magnitude: 3.9 | 6.3

Separation: 41"

Position Angle: 192°

SAO 34508 | HIP 110991 | GDR2 54723522432



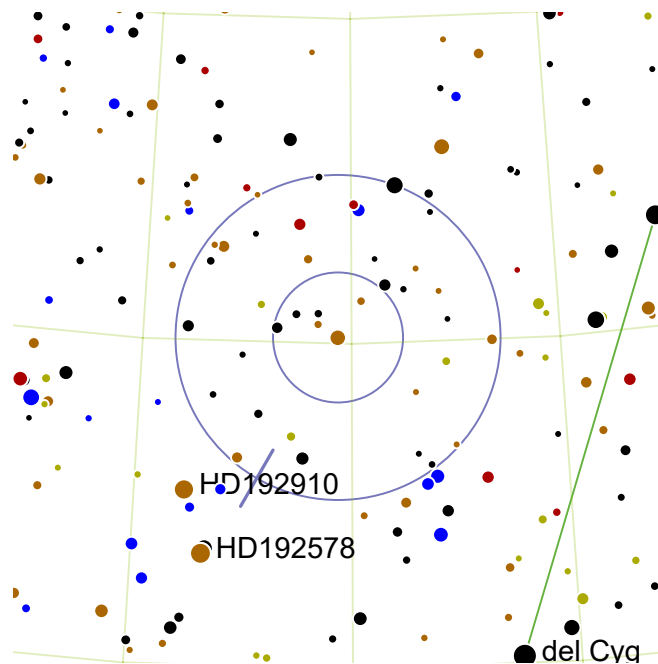
A bright, widely separated yellow and blue pair.



Half a finder east of Zeta Cephei.



The primary is the prototype of the Cepheid variables, varying strongly between magnitude 3.5 and 4.4 over 5.4 days. Cepheids proved other galaxies are island universes. Nearby Epsilon Cep is roughly magnitude 4.2 and can serve as a comparison, being sometimes brighter or fainter than Delta. Another nearby star is magnitude 3.35 Zeta Cep, roughly Delta's maximum brightness.



26 Cyg

RA: 300.33° | 20h 1.29' — DEC: 50.1° | 50° 6'

Magnitude: 5.2 | 8.9

Separation: 41.8"

Position Angle: 150°

SAO 49098 | HIP 98571 | GDR2 61746272768



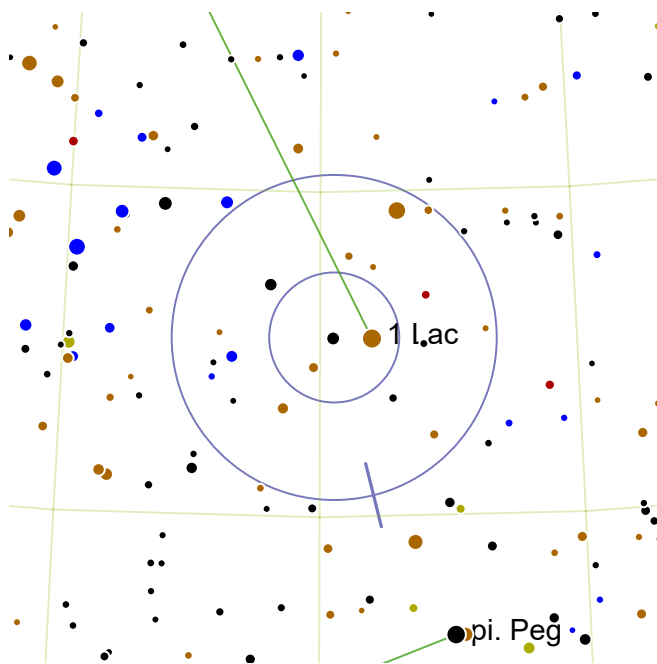
A bright orange primary very widely separated from a dim secondary.



Half a finder circle NNW from magnitude 3.95 192578. Half a finder circle NNW from magnitude 3.95 omi01 Cyg.



This is not a physical double. The primary is 434 light-years from Earth.



Struve 2894

RA: 334.73° | 22h 18.9' — DEC: 37.77° | 37° 46'

Magnitude: 6.1 | 8.3

Separation: 15.6"

Position Angle: 194°

SAO 72228 | HIP 110171 | GDR2 11212028928



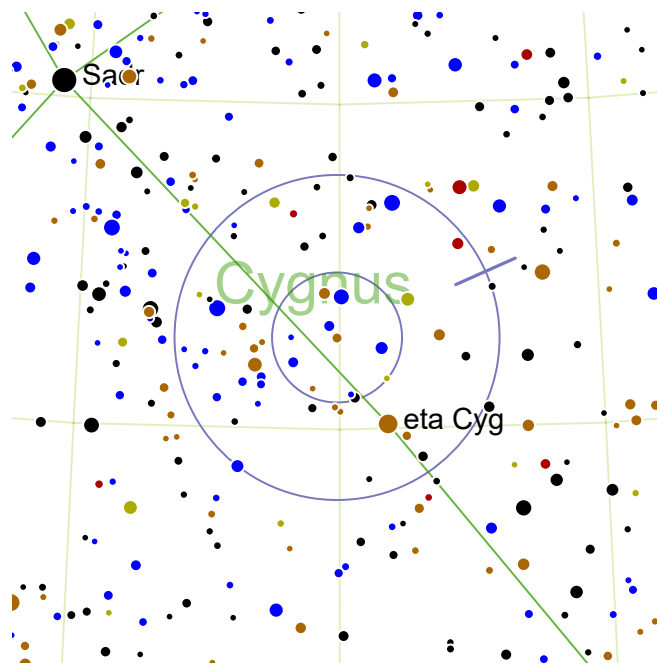
A fairly bright yellow primary comfortably separated from a faint blue secondary.



Two finder circles north and slightly west of Matar.



This is a strongly colored pair but requires a larger telescope to bring out the color of the fainter secondary.



STT394

RA: 300.05° | 20h 0.2' — DEC: 36.42° | 36° 25'

Magnitude: 7.1 | 9.9

Separation: 11"

Position Angle: 294°

SAO 69238 | HIP 98448 | GDR2 46489661568



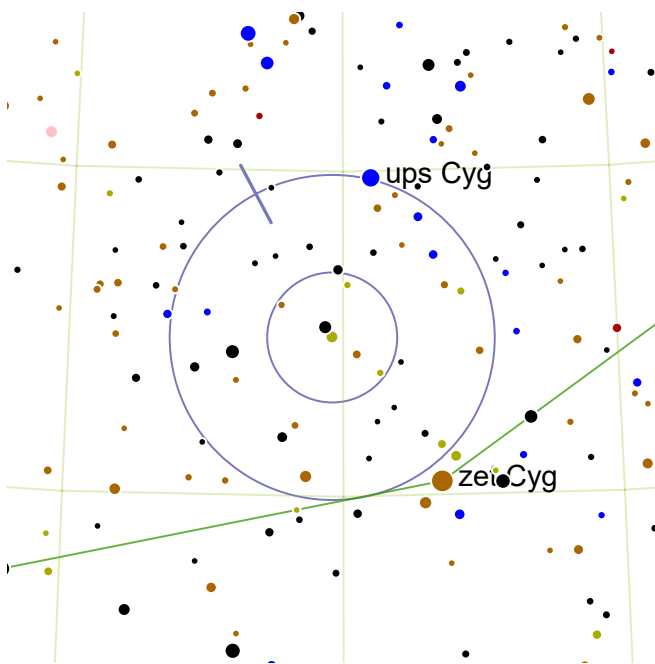
An orange primary with a faint blue secondary, easily split.



Found on the Swan's neck, one and a quarter finder circles south west of brilliant magnitude 2.2 Sadr. Three brighter stars form a one-degree right angle, and this double is a little star just south of the star at the right angle.



Easily lost in a brilliant star field, this system is 497 light-years distant and is dominated by a luminous orange giant.



STT437

RA: 320.2° | 21h 20.79' — DEC: 32.45° | 32° 27'

Magnitude: 6.2 | 6.9

Separation: 2.1"

Position Angle: 28°

SAO 71230 | HIP 105390 | GDR2 11183471104



A balanced yellow-orange pair, very narrowly separated.

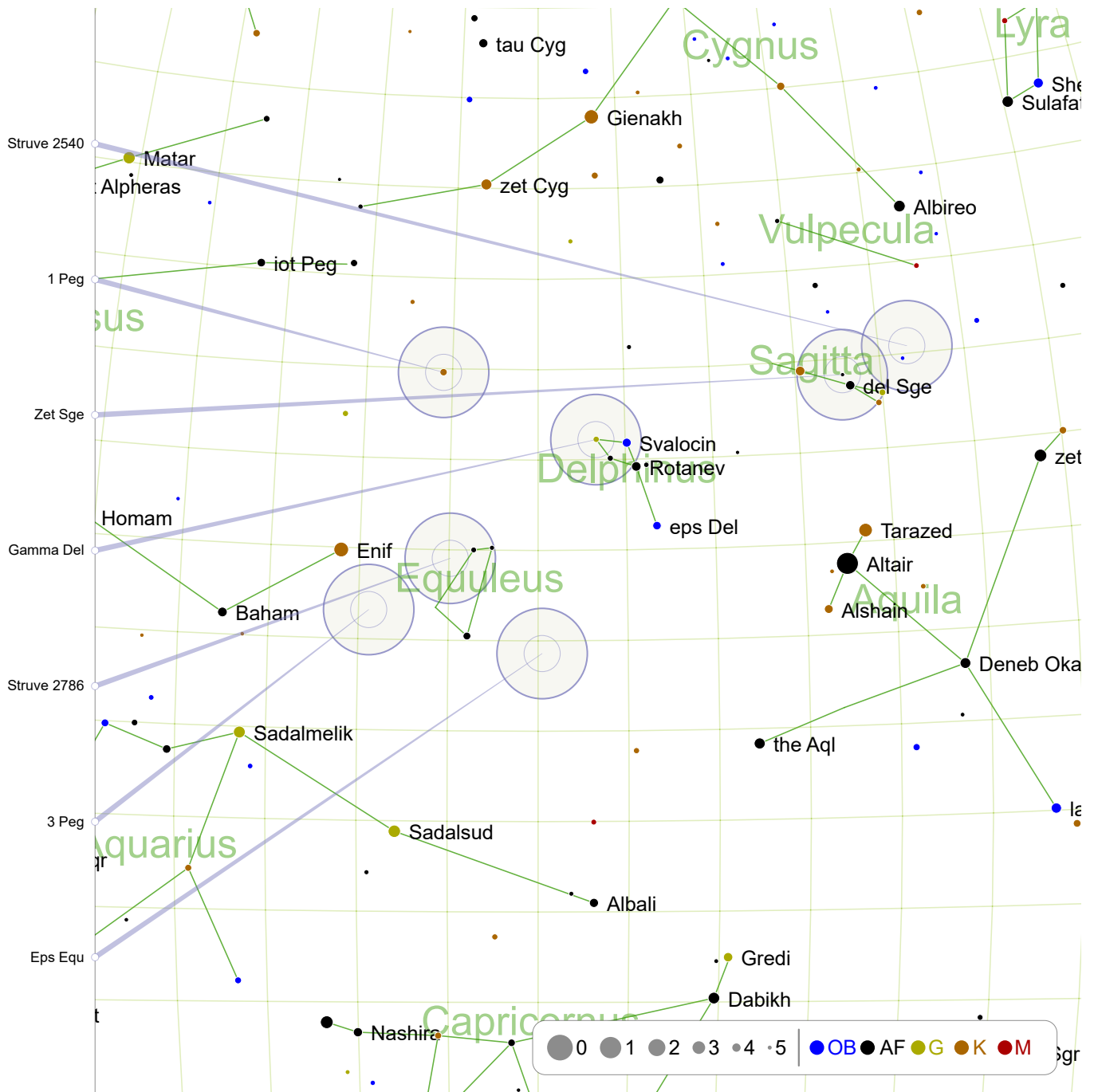


Located half a finder circle north of Zeta Cygni, which is the second star from Sadr along the south-eastern wing of Cygnus.



Only 214 light-years away, the stars are G-class main sequence stars similar to the Sun.

August: 10° North (1)



Struve 2540: page 293

1 Peg: page 293

Zet Sge: page 294

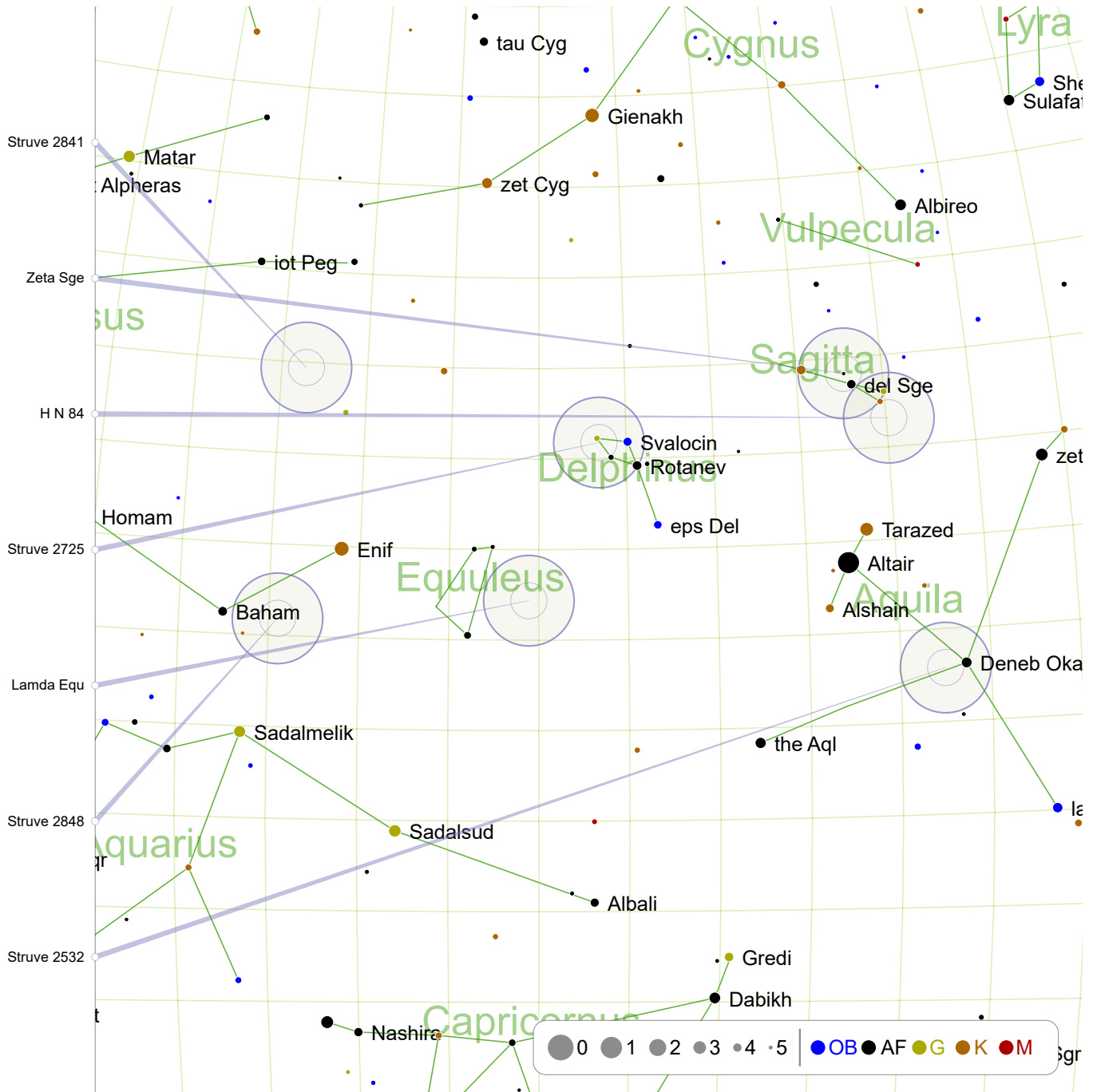
Gamma Del: page 294

Struve 2786: page 295

3 Peg: page 295

Eps Equ: page 296

August: 10° North (2)

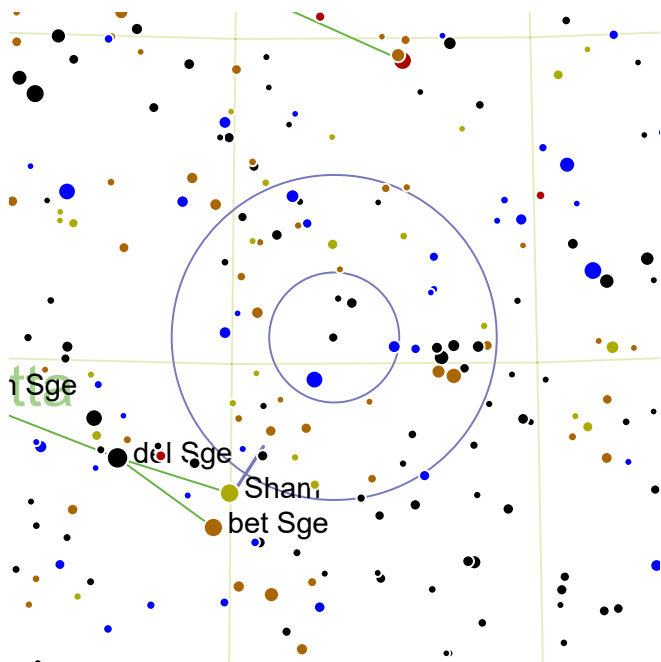


Struve 2841: page 296
Lamda Equ: page 298

Zeta Sge: page 297
Struve 2848: page 299

H N 84: page 297
Struve 2532: page 299

Struve 2725: page 298



Struve 2540

RA: 293.33° | 19h 33.29' — DEC: 20.42° | 20° 25'

Magnitude: 7.3 | 8.8

Separation: 5.1"

Position Angle: 147°

SAO 87342 | HIP 96171 | GDR2 93645258112



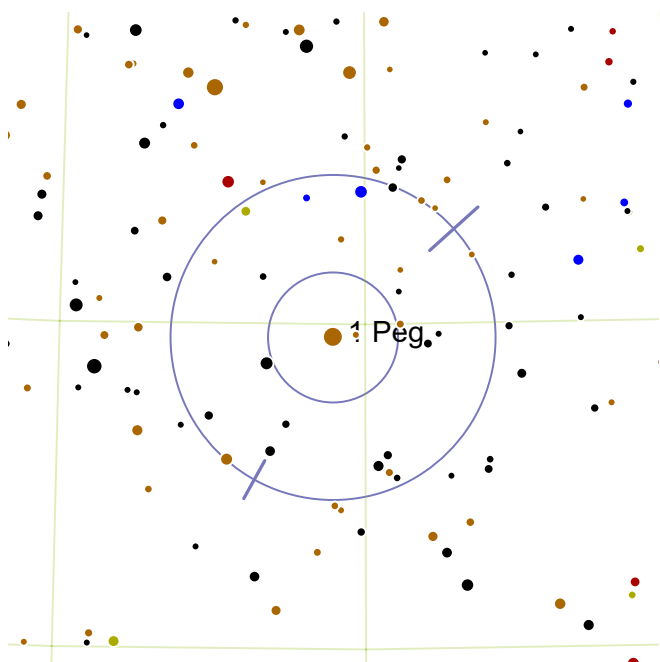
A close white-blue pair.



Two finder circles due south of Albireo (the Swan's head), a degree to the east of star cluster NGC 6802.



Immediately east of this little star cluster lies the large and impressive Coathanger asterism.



1 Peg

RA: 320.52° | 21h 22.09' — DEC: 19.8° | 19° 48'

Magnitude: 4.2 | 9.3 | 9.6

Separation: 36.1" | 5.3"

Position Angle: 312° | 151°

SAO 107073 | HIP 105502 | GDR2 65372381056



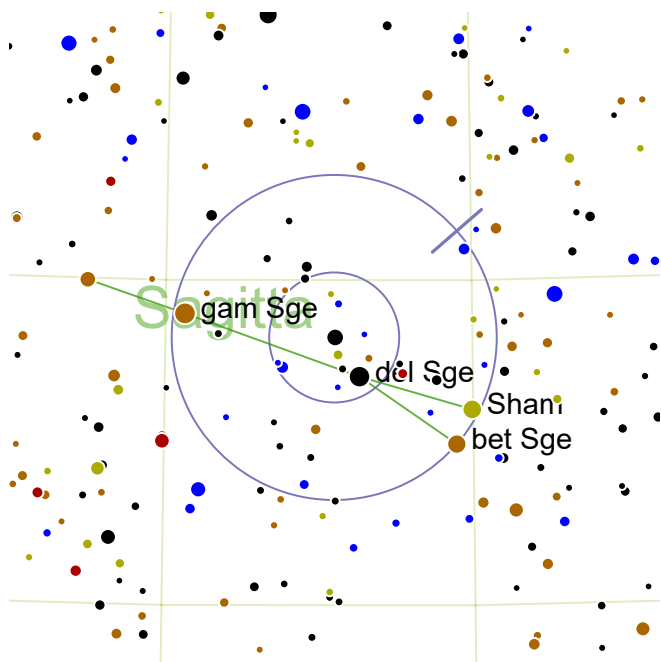
A triple system, with a brilliant orange primary with two faint companions, one very close and the other quite widely separated.



Two finder circles SSE from magnitude 3.4 zet Cyg. Two finder circles NEE from magnitude 3.86 Svalocin.



The system lies 156 light-years from the Earth.



Zet Sge




RA: 297.25° | 19h 49.0' — DEC: 19.13° | 19° 8'

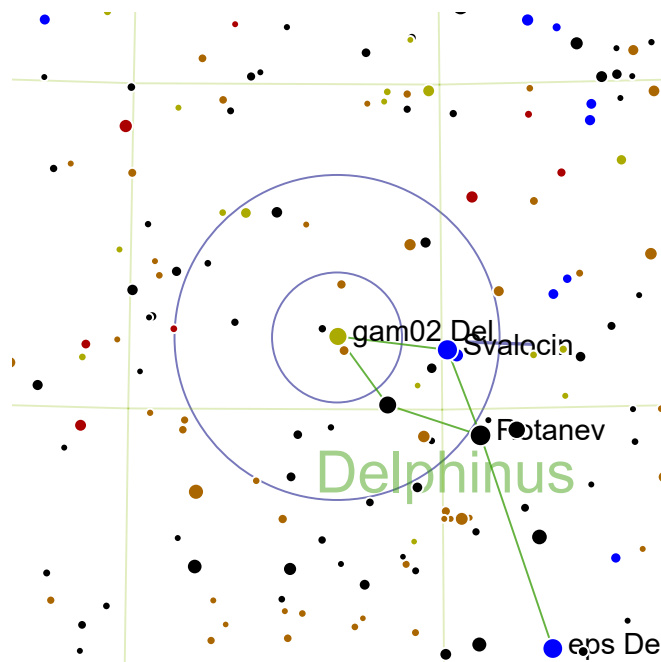
Magnitude: 5.0 | 8.3

Separation: 8.3"

Position Angle: 311°

SAO 105298 | HIP 97496

-  A bright white star with a relatively dim companion, closely separated.
-  Less than half a degree NNE from magnitude 3.78 del Sge. Less than half a degree NNE from magnitude 3.78 del Sge.
-  The white primary is actually an extreme double (a balanced pair with separation 0.19", separation angle 150°).



Gamma Del




RA: 311.68° | 20h 46.7' — DEC: 16.12° | 16° 7'

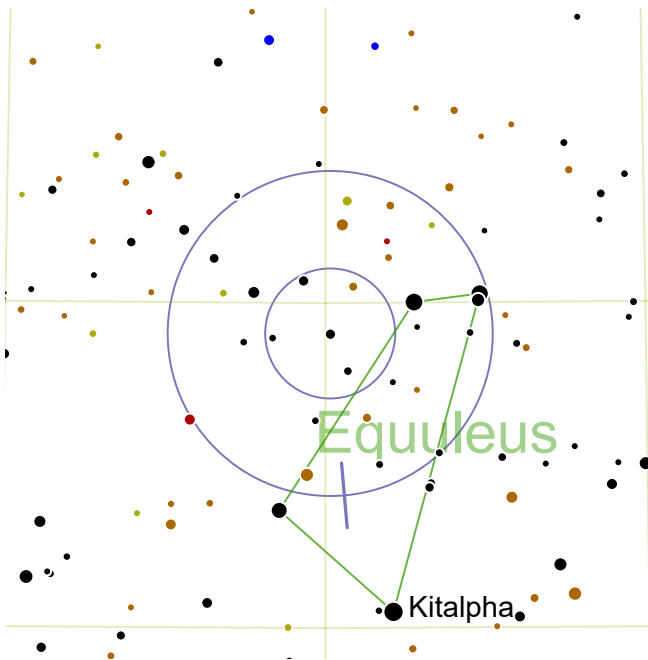
Magnitude: 4.5 | 5.5

Separation: 9.6"

Position Angle: 268°

SAO 106476 | HIP 102532 | GDR2 13341086464

-  A very bright yellow primary close to a bright blue secondary.
-  This system is the nose of the (for me) invisible dolphin. It's also very far from any bright signposts. Either wait for a dark night, or first find Lamda Equuleus, and then track two finder circles north.
-  Some claim to to see a bit of green in the secondary but green is not widely accepted as a possible star color.



Struve 2786

RA: 319.93° | 21h 19.7' — DEC: 9.53° | 9° 32'

Magnitude: 7.2 | 8.3

Separation: 2.5"

Position Angle: 185°

HIP 105295 | GDR2 99899784320



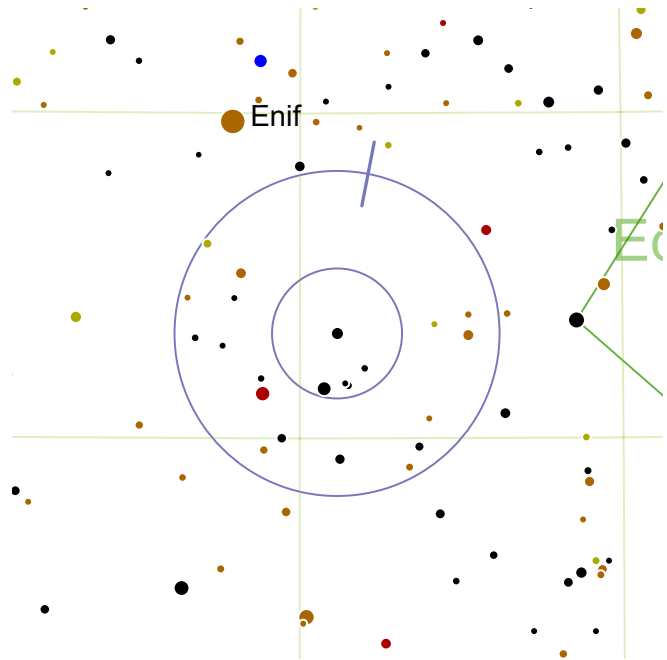
An extremely close and fairly balanced pair of white stars.



An entry point to many doubles in a dim region of the sky. From magnitude 2.35 Enif in Pegasus, track one and half finder circles west.



From Struve 2786, move one finder circle south west to Lamda Equuleus. From Lamda Equuleus, you can make more challenging hops to 12 Aqr, Epsilon Equuleus, and Gamma Delphinus.



3 Peg

RA: 324.43° | 21h 37.7' — DEC: 6.62° | 6° 37'

Magnitude: 6.2 | 7.5

Separation: 38.7"

Position Angle: 349°

SAO 126940 | HIP 106783 | GDR2 61831057792



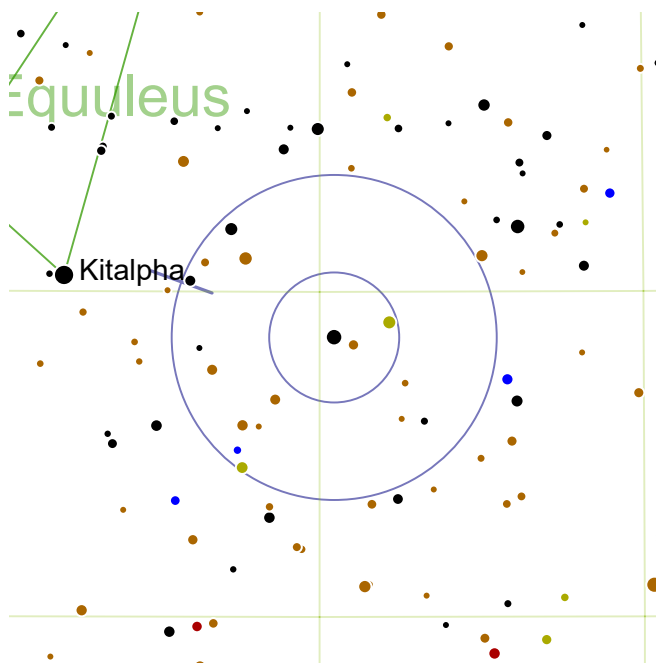
A bright white primary distantly separated from a reasonably apparent yellowish secondary.



Half a finder circle SSW from magnitude 2.54 Enif.



7 Pegasus, a very red giant, is just over a degree south east of this double.



Eps Equ

RA: 314.77° | 20h 59.09' — DEC: 4.3° | 4° 18'

Magnitude: 6.0 | 7.1

Separation: 11"

Position Angle: 70°

SAO 126428 | HIP 103569



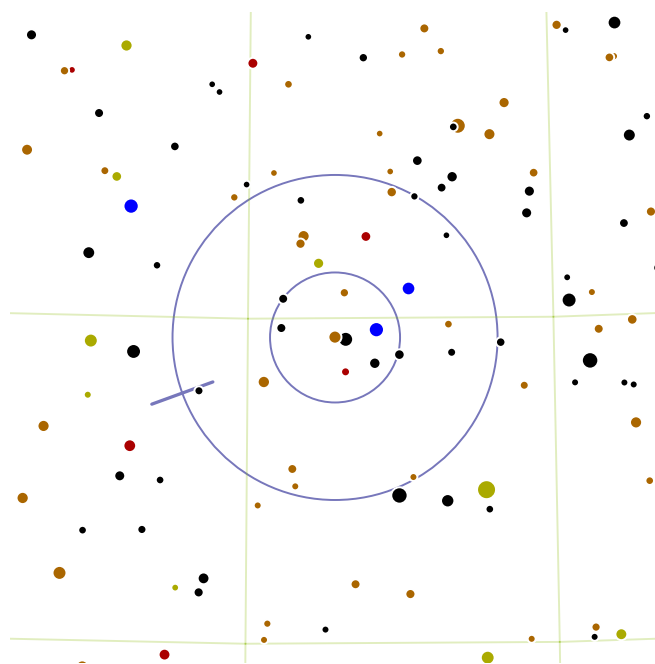
A yellow-blue combination with a moderately bright secondary. Easy separation.



Located in a difficult region of the sky, find Lamda Equuleus and track south by half a finder circle.



10 degrees to the south-east of this double is the bright globular cluster Messier 2, while 8 degrees to the north-west is another bright globular cluster, namely Caldwell 47 (NGC 6934).



Struve 2841

RA: 328.58° | 21h 54.29' — DEC: 19.72° | 19° 43'

Magnitude: 6.4 | 7.9

Separation: 22.3"

Position Angle: 110°

SAO 107489 | HIP 108119 | GDR2 05784806784



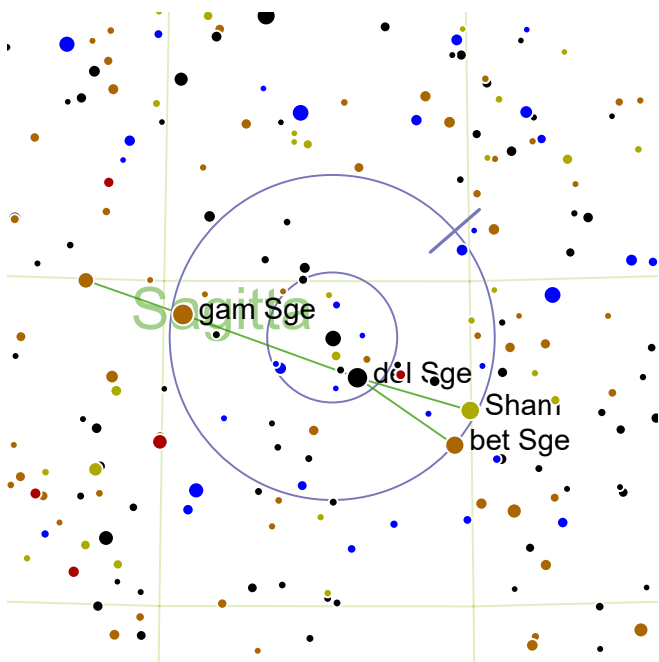
A wide yellow-blue pairing. Some see some green in the secondary.



Pan two and a half finder circles north and slightly east of magnitude 2.35 Enif in Pegasus. The finder should have many brightish stars, with Struve 2841 within 0.2 degrees east of a slightly brighter star.



The system lies 336 light-years from the Sun.



Zeta Sge




RA: 297.25° | 19h 49.0' — DEC: 19.15° | 19° 9'

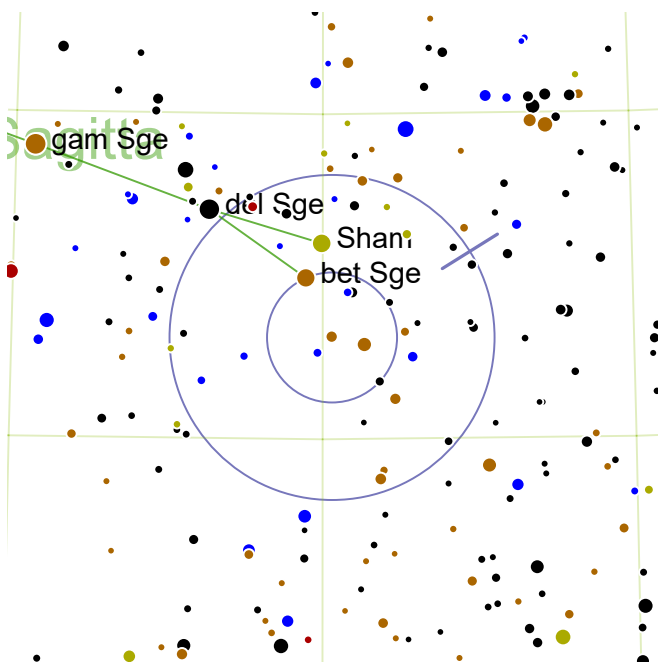
Magnitude: 5.5 | 8.7

Separation: 8.6"

Position Angle: 311°

SAO 105298 | HIP 97496

-  A bright yellow primary with a much fainter blue secondary.
-  Located a degree north east of magnitude 3.68 Delta Sagittae. Find Delta Sagittae two finder circles north of Altair.
-  Globular cluster Messier 71 is in the same finder circle as Zeta Sagittae, lying 1.5 degrees SEE.



H N 84




RA: 294.85° | 19h 39.4' — DEC: 16.57° | 16° 34'

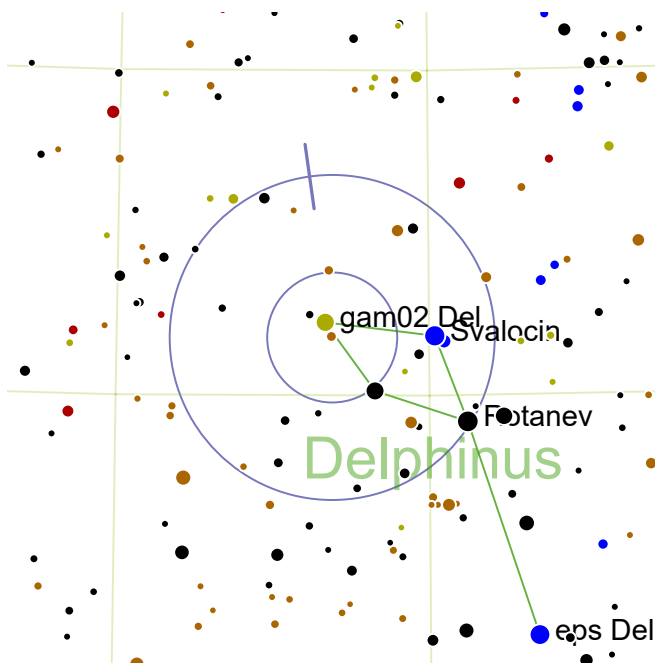
Magnitude: 6.5 | 8.9

Separation: 28.2"

Position Angle: 302°

SAO 105104 | HIP 96688 | GDR2 51899730432

-  A wide pair with a strongly orange primary and fainter blue companion.
-  Just short of three degrees to the south west of magnitude 3.68 Delta Sagittae. If Sagitta is too faint to make out in your area, start from brilliant Altair and go two finder circles north and very slightly west.
-  From William Herschel's New list of doubles compiled in the 1820s, hence the "H N" nomenclature.



Struve 2725

RA: 311.55° | 20h 46.2' — DEC: 15.9° | 15° 54'

Magnitude: 7.6 | 8.4

Separation: 5.8"

Position Angle: 8°

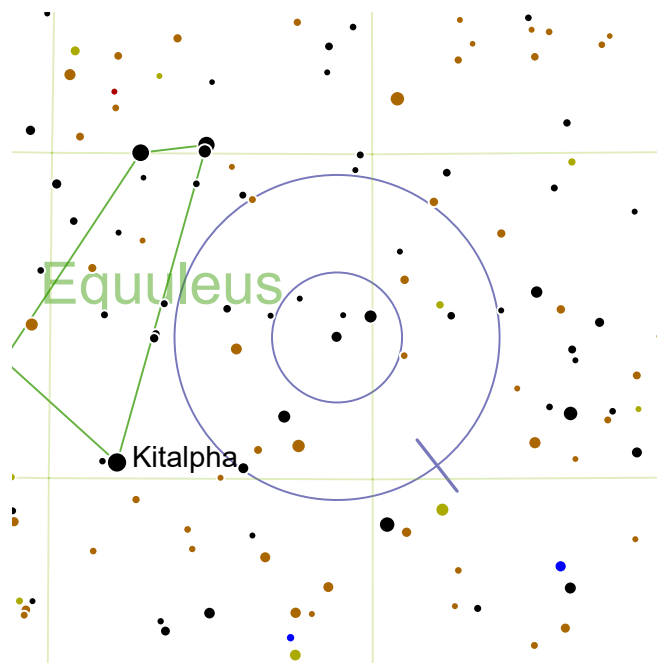
SAO 106466 | HIP 102490 | GDR2 94080694016



A close yellow and blue pair.



A quarter of a degree south west of Al Salib, the magnitude 4.25 nose of Delphinus.



Lamda Equ

RA: 315.55° | 21h 2.2' — DEC: 7.18° | 7° 11'

Magnitude: 7.4 | 7.4

Separation: 2.8"

Position Angle: 218°

SAO 126482 | HIP 103813 | GDR2 58187956224



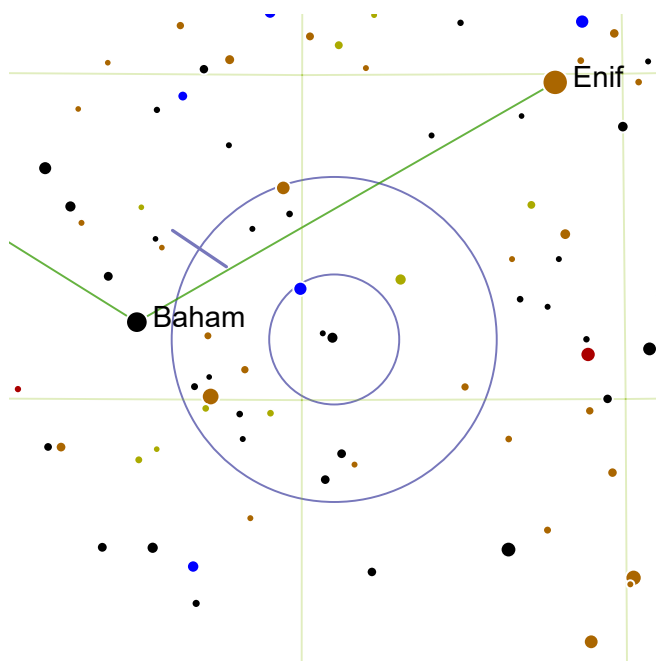
An extremely tight and exactly equal pair of yellow stars.



Find Lamda Equuleus one finder circle south west of Struve 2786.



From Lamda Equuleus, you can make more challenging hops to 12 Aqr, Epsilon Equuleus, and Gamma Delphinus.



Struve 2848

RA: 329.5° | 21h 58.0' — DEC: 5.93° | 5° 56'

Magnitude: 7.2 | 7.5

Separation: 10.7"

Position Angle: 56°

SAO 127196 | HIP 108439 | GDR2
2697317737667726976



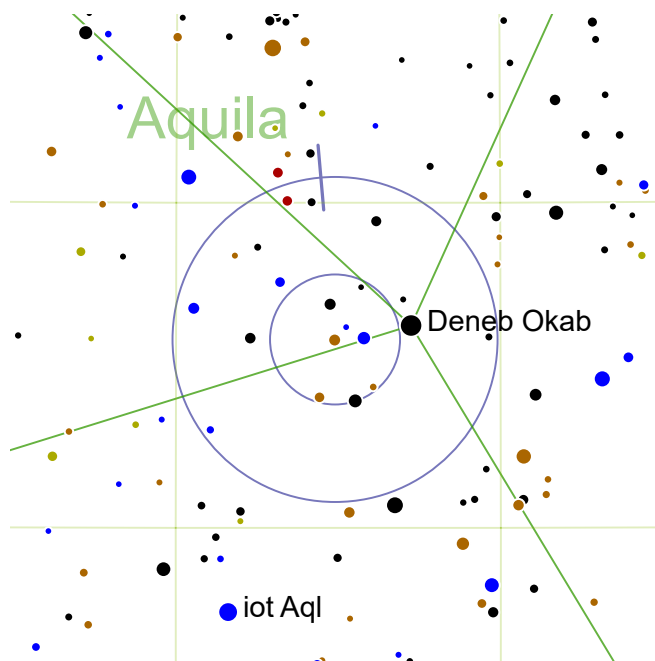
An equal and easily split pair of yellow stars.



One and a half finder circles south east of magnitude 2.35 Enif, three degrees due west of magnitude 3.50 Baham (Theta Pegasi).



Enif is a fascinating orange-red supergiant, which can vary irregularly in brightness between magnitudes 0.7 and 3.5.



Struve 2532

RA: 292.55° | 19h 30.2' — DEC: 2.9° | 2° 54'

Magnitude: 6.1 | 10.3

Separation: 33.7"

Position Angle: 5°

SAO 124698 | HIP 95898 | GDR2 37626681728



A very widely separated orange-blue duo, but the blue component is very faint.



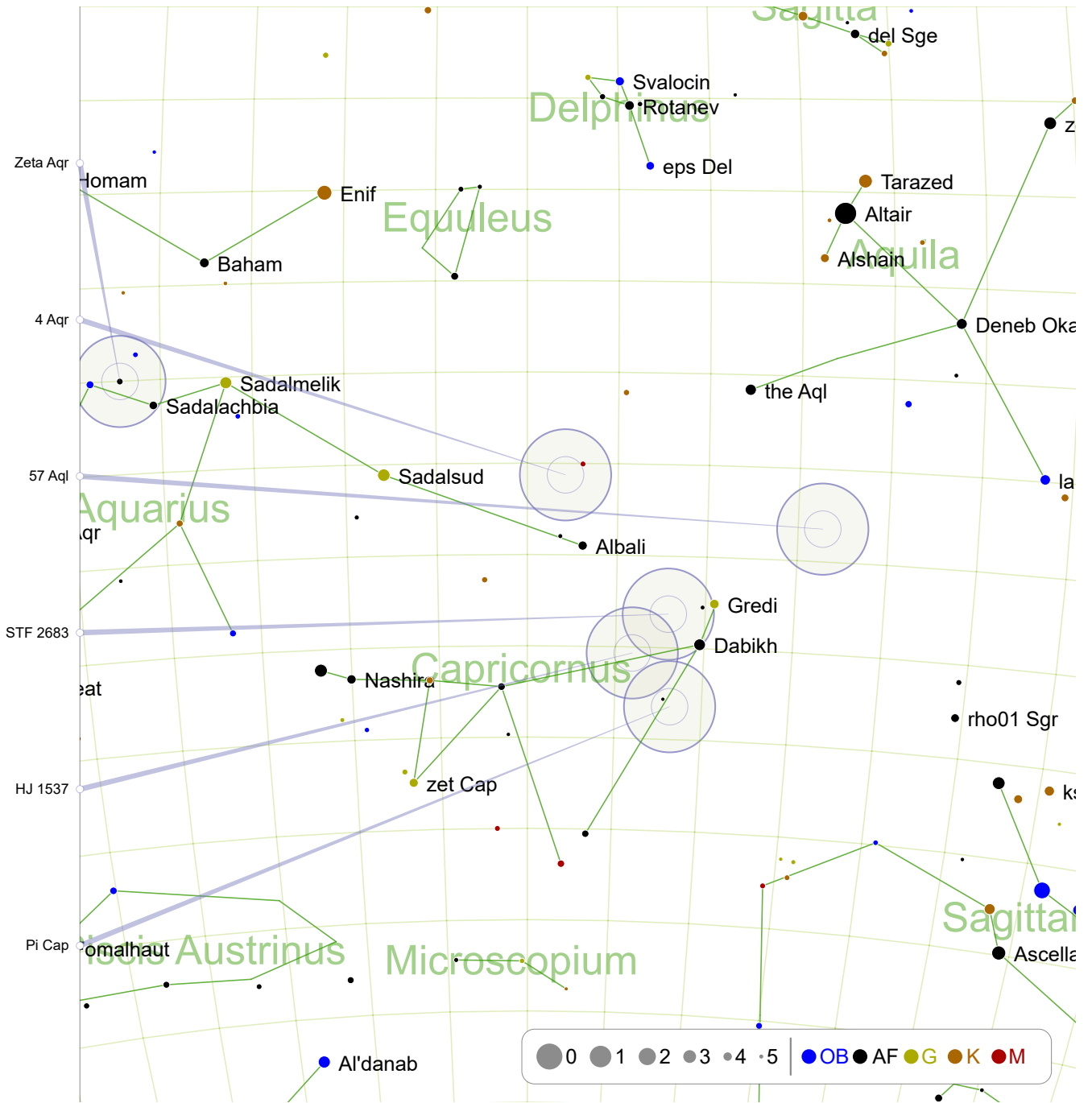
Easily found one degree due east of Delta Aquilae, the central star of the Eagle.



In the same finder circle of as Delta Aquilae and Struve 2532, you can find NGC 6790 (2 degrees south and slightly west of Delta), a small planetary nebula with high surface brightness.

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August: -10° South (1)



Zeta Aqr: page 303

4 Aqr: page 303

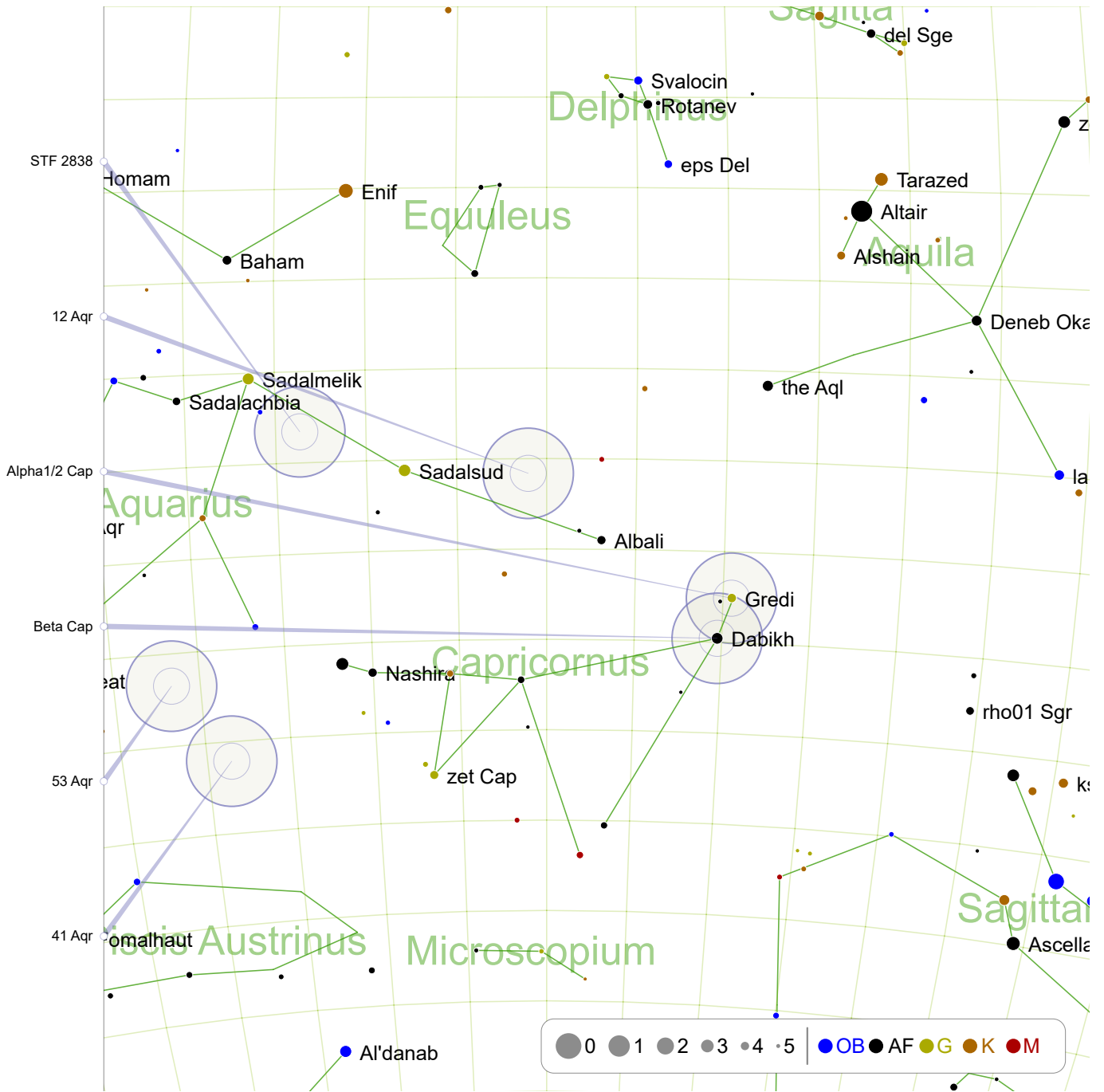
57 Aql: page 304

STF 2683: page 304

HJ 1537: page 305

Pi Cap: page 305

August: -10° South (2)

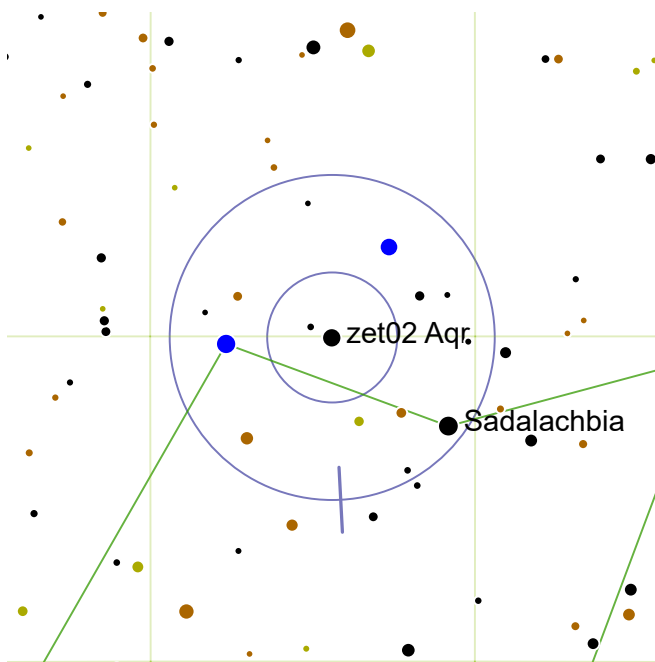


STF 2838: page 306
53 Aqr: page 308

12 Aqr: page 306
41 Aqr: page 308

Alpha 1/2 Cap: page 307

Beta Cap: page 307



Zeta Aqr

RA: 337.2° | 22h 28.79' — DEC: -0.02° | 0° 0'

Magnitude: 4.3 | 4.5

Separation: 2.3"

Position Angle: 183°

SAO 146107 | HIP 110960



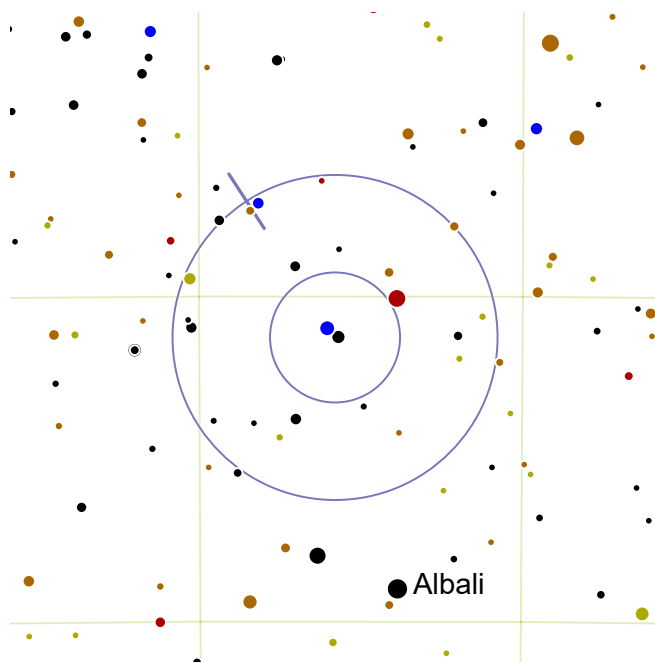
A balanced, tight pair of white stars.



One and a half degrees NE from magnitude 3.97 Sadalachbia. One finder circle E from magnitude 3.19 Sadalmelik.



Located in the center of a Y-shaped asterism of fourth magnitude stars that fills the finder view.



4 Aqr

RA: 312.9° | 20h 51.59' — DEC: -5.63° | -5° 37'

Magnitude: 6.4 | 7.4

Separation: 0.7"

Position Angle: 33°

SAO 144877 | HIP 102945



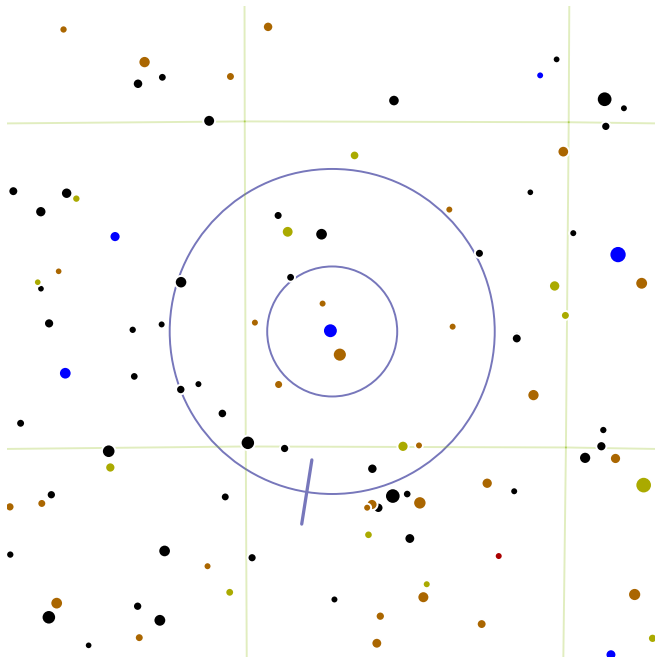
An extremely tight pair of fairly balanced yellowish stars.



Half a finder circle NNE from magnitude 3.83 Albali. Two finder circles NE from magnitude 3.77 Gredi.



The primary has 1.6 times the mass of the Sun and 11 times the luminosity.



57 Aql

RA: 298.65° | 19h 54.59' — DEC: -8.23° | -8° 13'

Magnitude: 5.7 | 6.4

Separation: 36"

Position Angle: 171°

SAO 143898 | HIP 97966 | Struve 2594



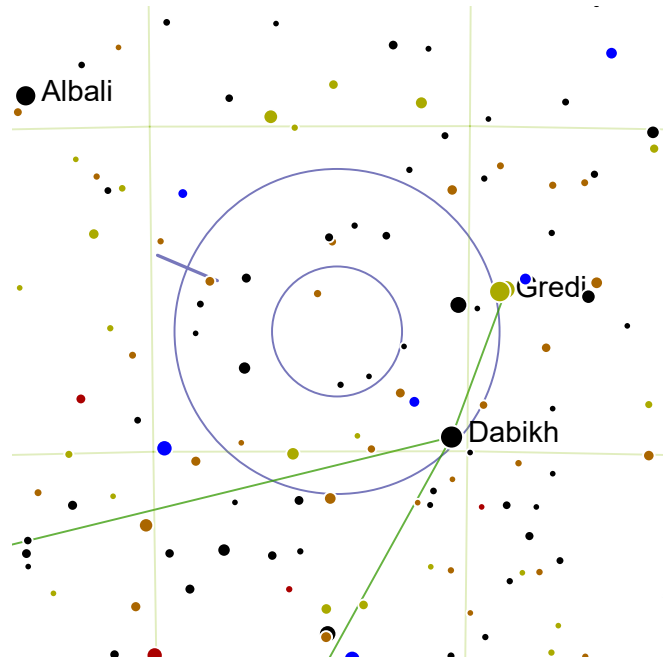
A very wide and balanced pair of bright, bluish stars.



One finder circle NW from magnitude 3.77 Gredi.



This pair of hot B-type main sequence stars are roughly 480 light-years from Earth. As with many B-type stars, they rotate extremely fast (the A component has a rotational velocity of 190 km/s).



STF 2683

RA: 307.08° | 20h 28.29' — DEC: -13.17° | -13° 9'

Magnitude: 8.5 | 8.9

Separation: 22.8"

Position Angle: 67°

SAO 163606 | GDR2 68361287040



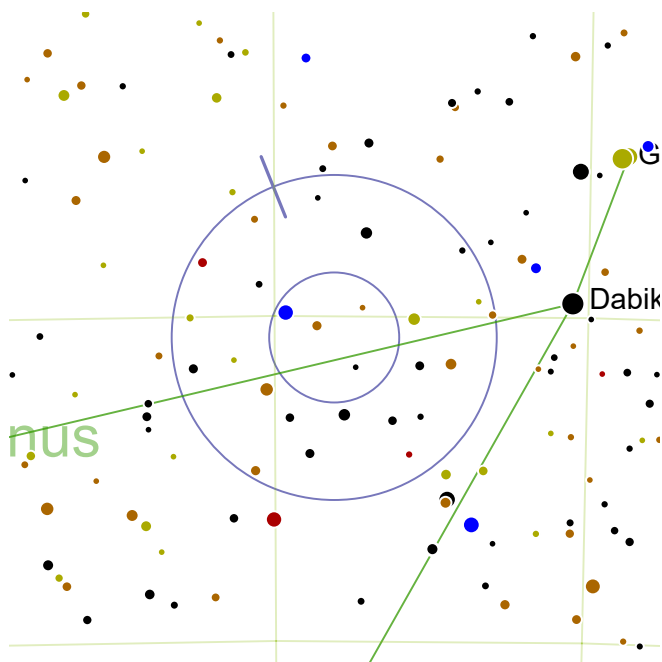
An equal pair of easily separated yellowish stars.



One and a half degrees NE from magnitude 3.25 193496. One and a half degrees NE from magnitude 3.25 Dabikh.



Globular cluster M72 (mag. 9.2) lies one finder circle east of this double. Open cluster M73 (mag. 8.9) is a further two degrees east. With M73 centered, planetary nebula C55 (mag. 8.0) lies in the middle of the north-eastern quarter of the finder.



HJ 1537

RA: 309.05° | 20h 36.2' — DEC: -15.33° | -15° 19'

Magnitude: 8.4 | 8.6

Separation: 3.6"

Position Angle: 22°

HIP 101649 | GDR2 64097811840



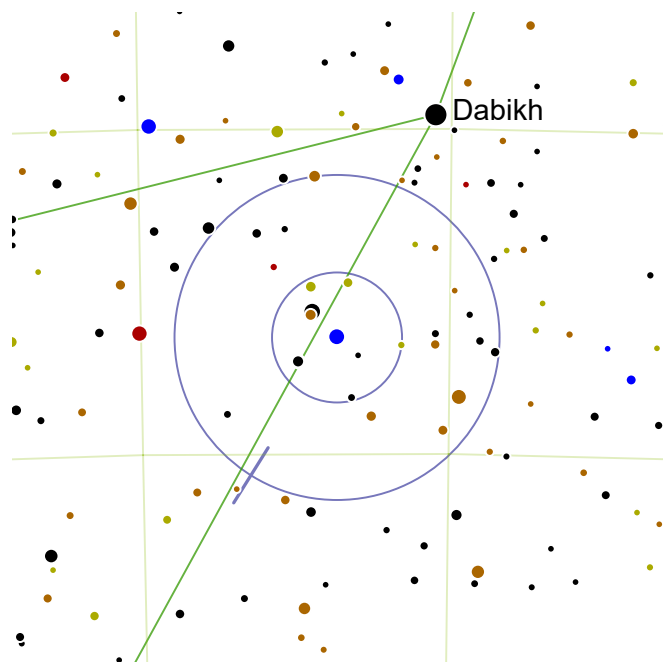
A yellow primary with a very close, faint companion.



Half a finder circle E from magnitude 3.25 193496. Half a finder circle E from magnitude 3.25 Dabikh.



The primary has a spectral class of G1V, very close to the Sun's class of G2V. The binary system lies 495 light-years from Earth.



Pi Cap

RA: 306.83° | 20h 27.29' — DEC: -18.22° | -18° 12'

Magnitude: 5.3 | 8.9

Separation: 3.2"

Position Angle: 148°

SAO 163592 | HIP 100881 | GDR2 73140593152



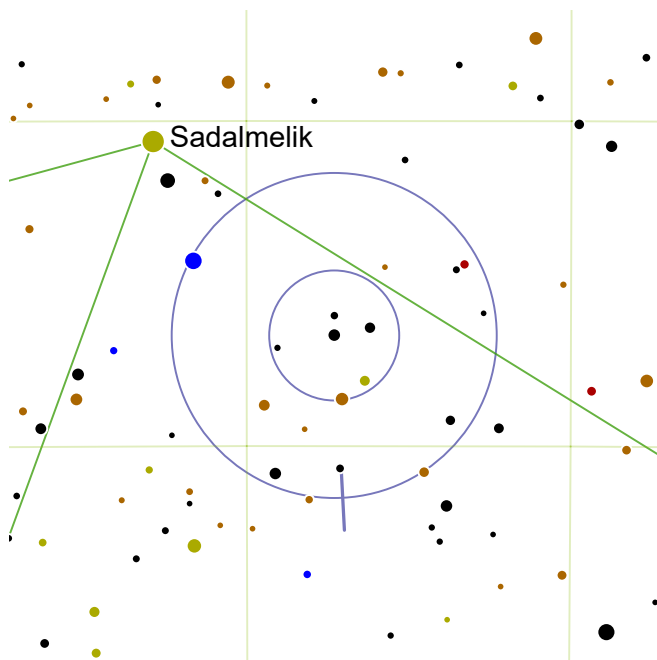
A very close pair, with a bright blue primary and fairly faint secondary.



Half a finder circle SSE from magnitude 3.25 193496. Half a finder circle SSE from magnitude 3.25 Dabikh.



The primary has six times the mass and 238 times the luminosity of the Sun.



STF 2838




RA: 328.65° | 21h 54.59' — DEC: -3.3° | -3° 17'

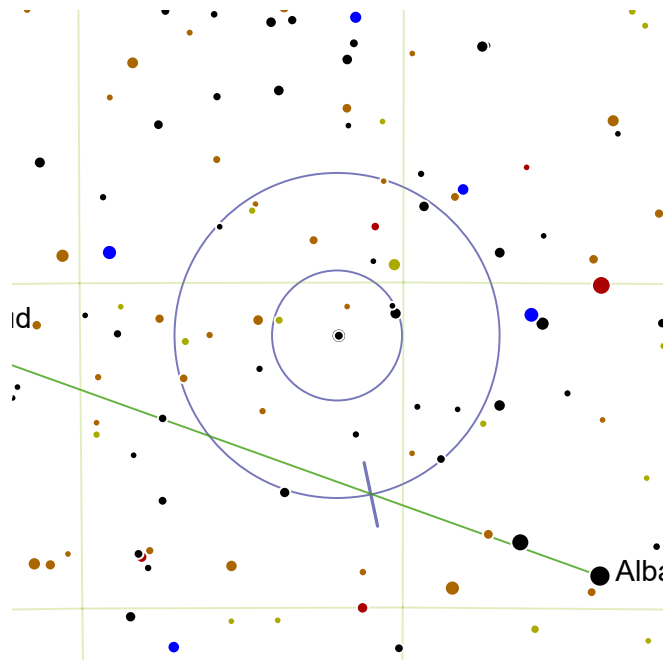
Magnitude: 6.3 | 9.1

Separation: 16"

Position Angle: 183°

SAO 145735 | HIP 108144 | GDR2 75057612800

-  An easily separated pair of white stars with a bright primary and a faint secondary.
-  Half a finder circle SW from magnitude 3.19 Sadalmelik. Two and a half finder circles N from magnitude 2.98 Sheddi.
-  This double is a line of sight coincidence; the two components are not gravitationally bound.



12 Aqr




RA: 316.02° | 21h 4.09' — DEC: -5.82° | -5° 48'

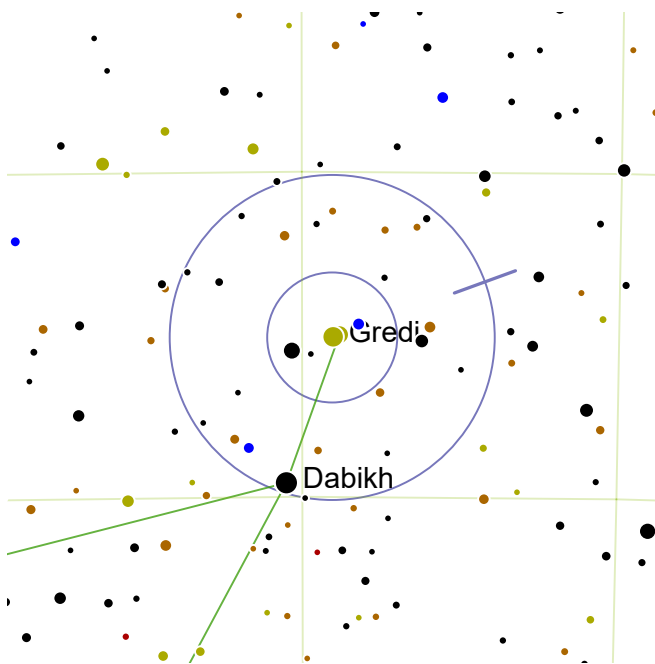
Magnitude: 5.9 | 7.3

Separation: 2.8"

Position Angle: 192°

SAO 145065 | HIP 103981 | GDR2 42353215104

-  A very tight yellow-blue system, with the small blue component sufficiently bright to show some color.
-  With few signposts to go by, find Lamda Equuleus, and track due south for three finder circles.
-  Just over one finder circle south of of this double is the bright planetary nebula, Caldwell 55 (NGC 7009).



Alpha1/2 Cap

RA: 304.52° | 20h 18.09' — DEC: -12.55° | -12° 32'

Magnitude: 3.7 | 4.3

Separation: 381"

Position Angle: 290°

SAO 163422 | HIP 100027



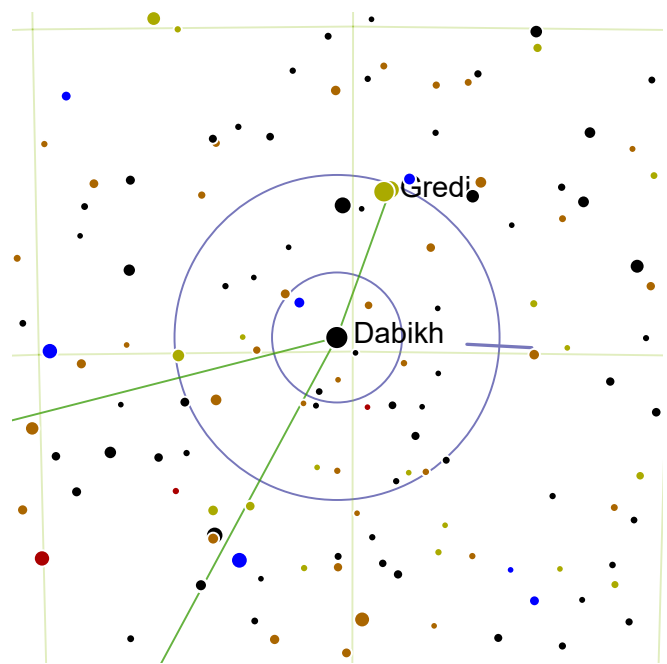
A distantly separated pair of brilliant white stars.



Alpha1/2 Cap is a bright star in Capricornus.



Superb in the finder scope.



Beta Cap

RA: 305.25° | 20h 21.0' — DEC: -14.78° | -14° 46'

Magnitude: 3.2 | 6.1

Separation: 205"

Position Angle: 267°

SAO 163481 | HIP 100345



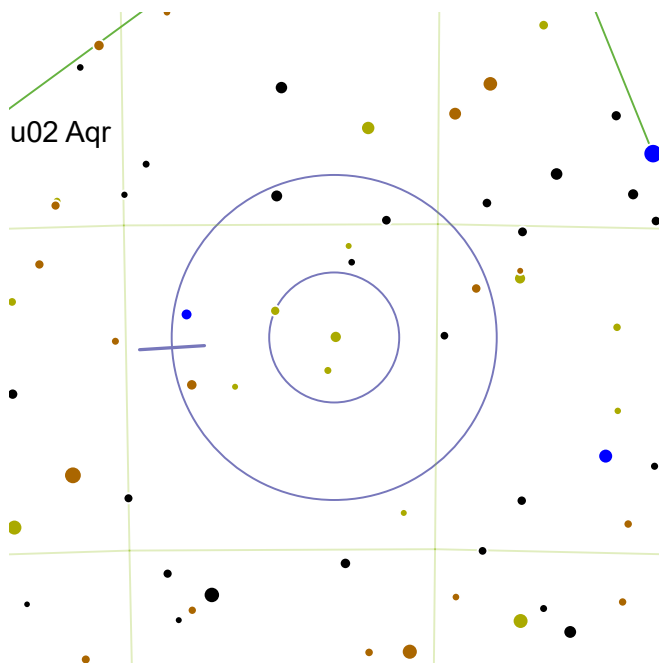
A brilliant yellow primary distantly separated from bright white secondary.



Beta Cap is a bright star in Capricornus. Beta Cap is a bright star in Capricornus.



Also known as Dabih ("butcher"), this binary system is almost exactly 100 parsecs from us (327 light-years).



53 Aqr

RA: 336.65° | 22h 26.59' — DEC: -16.75° | -16° 44'

Magnitude: 6.3 | 6.4

Separation: 1.2"

Position Angle: 93.6°

SAO 165078 | HIP 110778



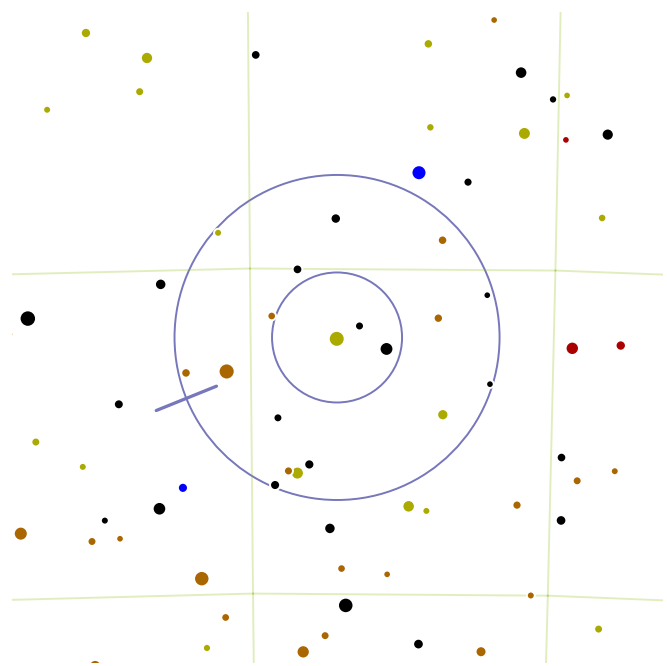
An extremely tight and exactly equal pair of yellow suns.



One finder circle W from magnitude 3.51 Scheat. One and a half finder circles E from magnitude 2.98 Sheddi.



C63, the Helix Nebula, lies one finder circle south of this double.



41 Aqr

RA: 333.58° | 22h 14.29' — DEC: -21.07° | -21° 3'

Magnitude: 5.6 | 6.7

Separation: 5.2"

Position Angle: 112°

SAO 190986 | HIP 109786 | GDR2 69260987520



A close, balanced with a bright orange primary and yellowish secondary.

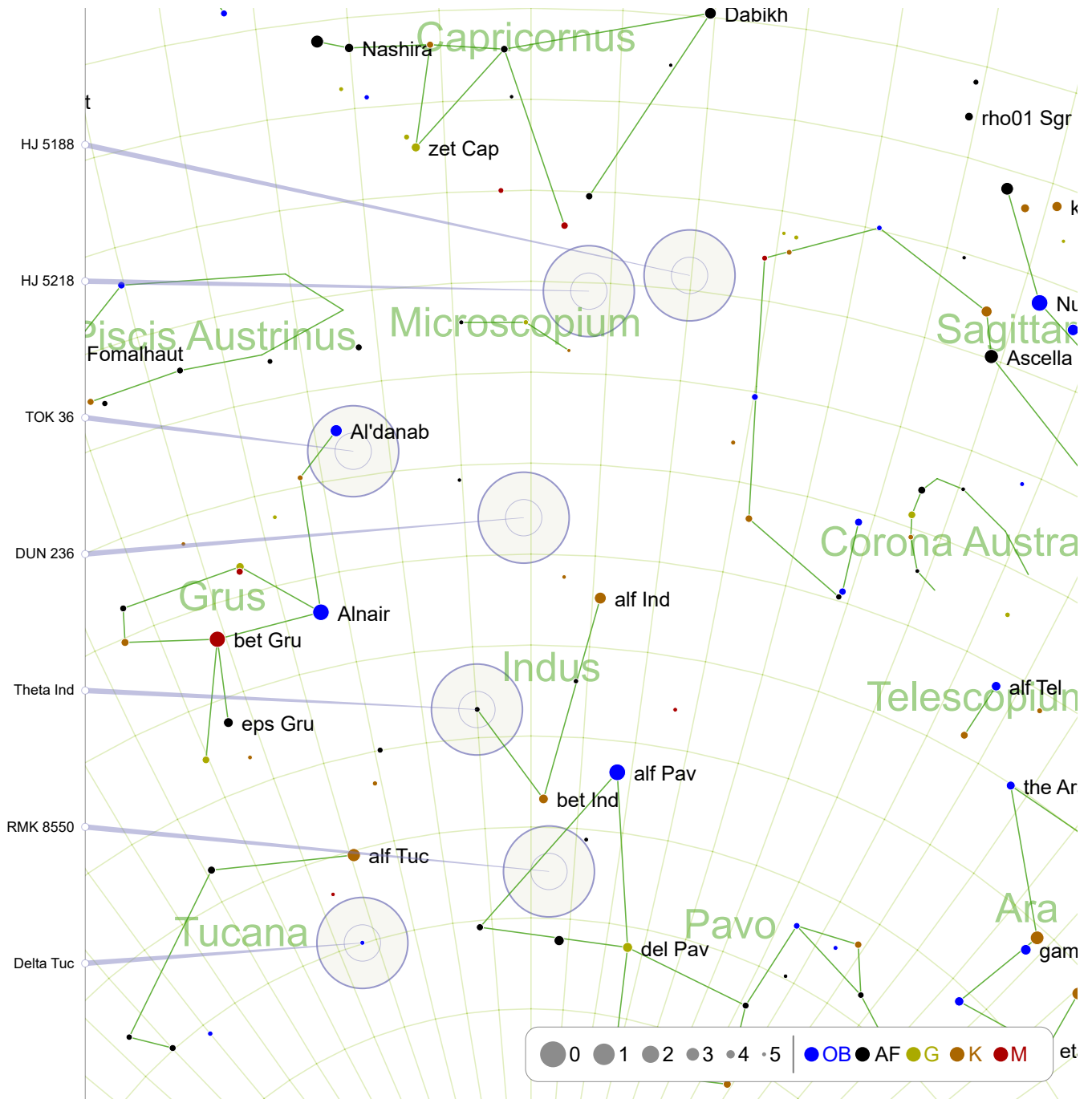


One and a half finder circles SE from magnitude 2.98 Sheddi.



It is not clear if the pair are gravitationally bound, but the orange primary is a K-type giant 233 light-years from Earth.

August: -45° South

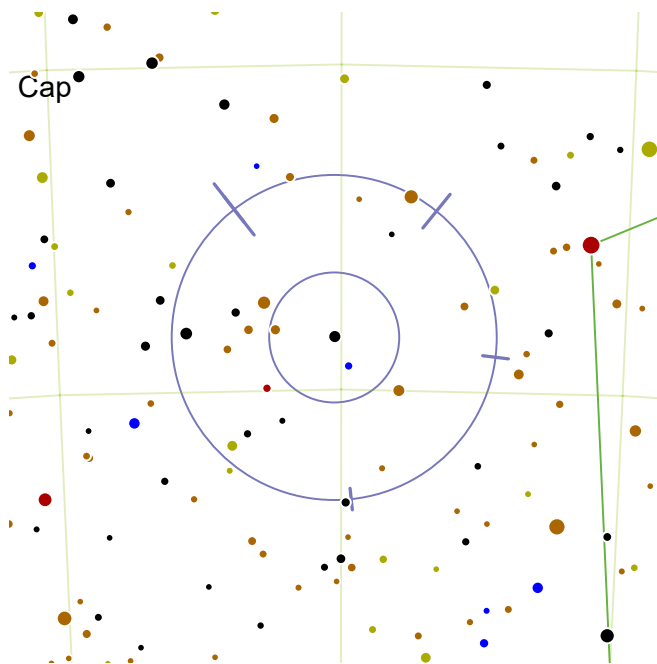


HJ 5188: page 310
Theta Ind: page 312

HJ 5218: page 310
RMK 8550: page 312

TOK 36: page 311
Delta Tuc: page 313

DUN 236: page 311



HJ 5188

RA: 305.13° | 20h 20.5' — DEC: -29.2° | -29° 11'

Magnitude: 6.7 | 10.1 | 7.6 | 10.1 | 9.9 | 10.1

Separation: 3.7" | 27.3" | 120.6" | 437.0" | 4.7"

Position Angle: 38° | 321° | 38° | 263° | 186°

SAO 189164 | HIP 100288 | GDR2 22396076928



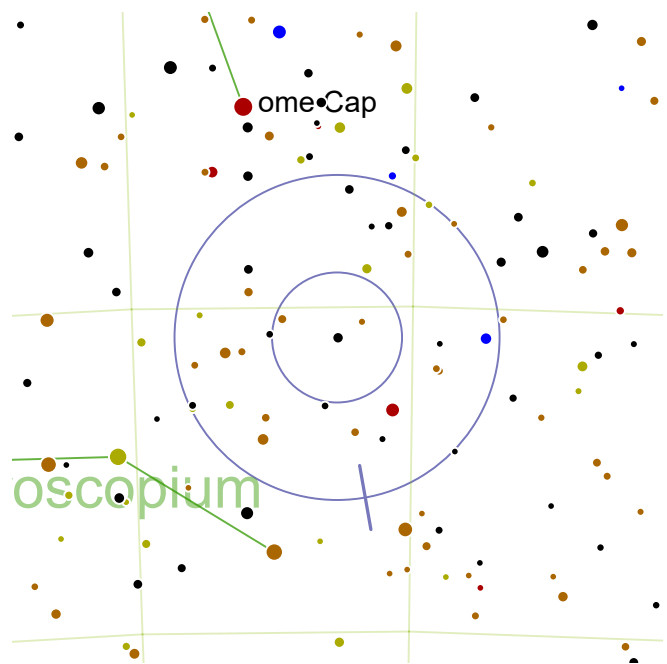
A complex of 6 stars, centered on a fairly bright white primary. The widely separated C component is moderately bright, but the remaining four members are all faint.



Two and a half finder circles S from magnitude 3.25 193496. Two and a half finder circles S from magnitude 3.25 Dabikh.



The primary is 443 light-years from Earth. It is not clear if the members are gravitationally bound together.



HJ 5218

RA: 311.35° | 20h 45.4' — DEC: -30.48° | -30° 28'

Magnitude: 6.8 | 11

Separation: 9.8"

Position Angle: 190°

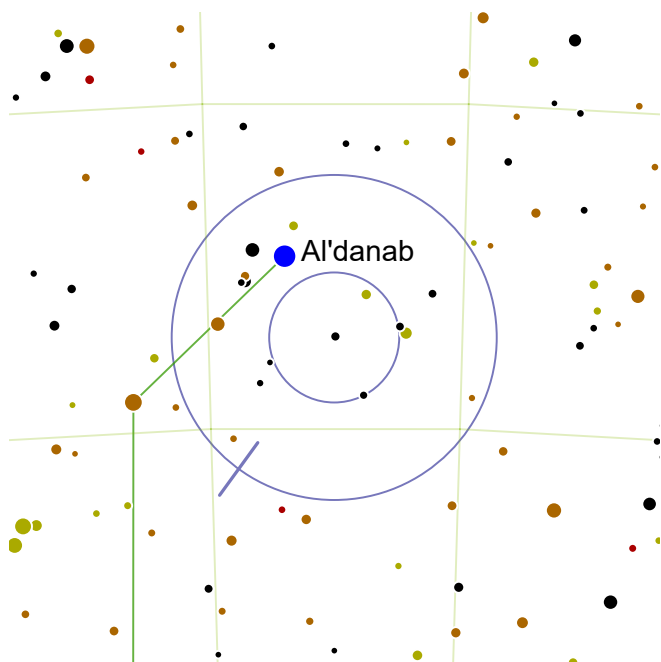
SAO 212410 | HIP 102435 | GDR2 92535208576



A fairly bright yellow primary with a very faint secondary close by.



Two finder circles SW from magnitude 3.86 zet Cap.



TOK 36

RA: 327.52° | 21h 50.09' — DEC: -38.62° | -38° 36'

Magnitude: 6.1 | 9.6

Separation: 2.2"

Position Angle: 144°

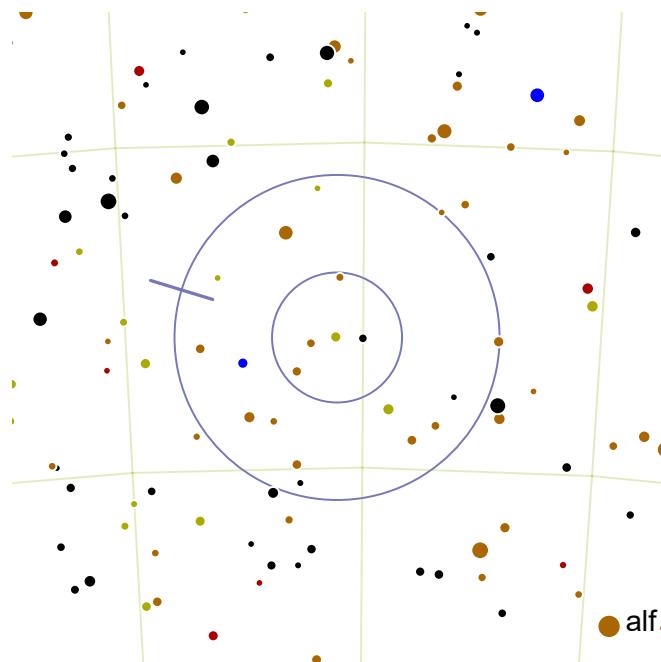
SAO 213325 | HIP 107779



A fairly bright yellow star with a tightly bound faint companion.



One degree SSW from magnitude 3.16 Al'danab.



DUN 236

RA: 315.55° | 21h 2.2' — DEC: -43.0° | -43° 0'

Magnitude: 6.7 | 7.0

Separation: 57.4"

Position Angle: 73°

SAO 230492 | HIP 103814 | GDR2 42680733824



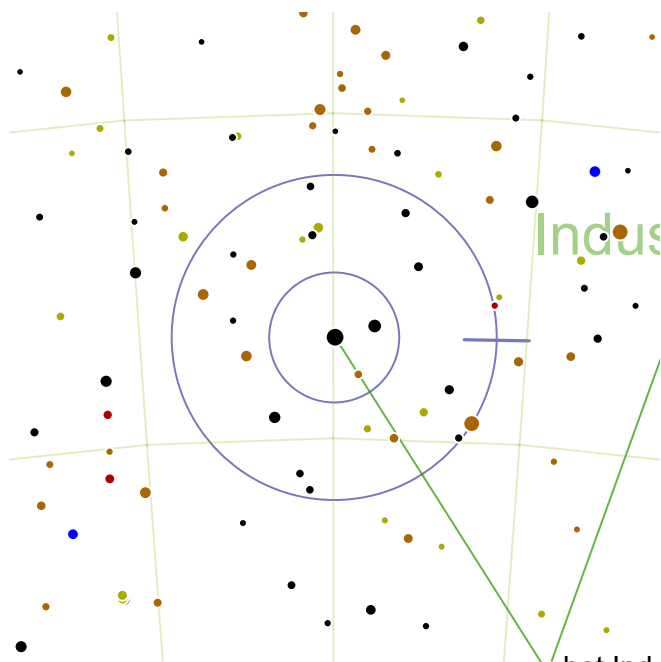
A fairly bright, nearly equal pair, with a yellow primary widely separated from an orange companion.



One finder circle NE from magnitude 3.21 alf Ind. Two finder circles SW from magnitude 3.16 Al'danab.



This gravitationally bound pair of subgiants is 268 light-years from Earth.



Theta Ind

RA: 319.98° | 21h 19.9' — DEC: -53.45° | -53° 26'

Magnitude: 4.5 | 6.9

Separation: 7.3"

Position Angle: 269°

SAO 246965 | HIP 105319 | GDR2 69563201152



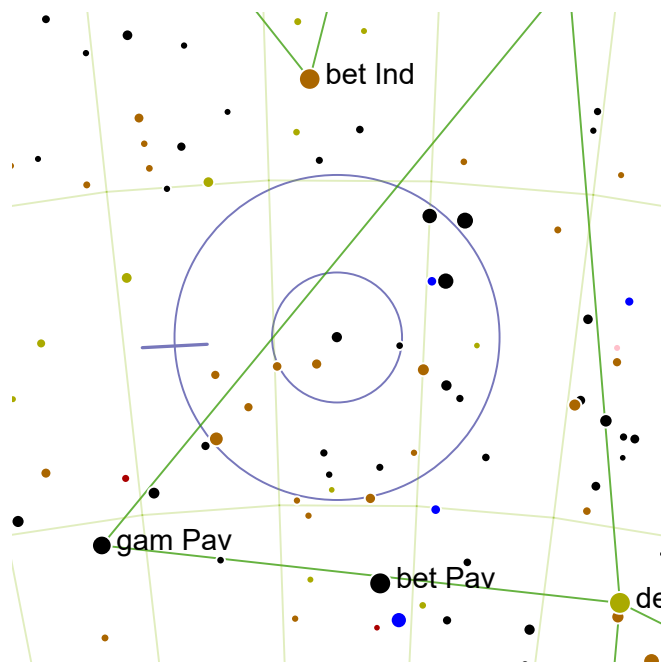
A brilliant white primary with a close fairly bright yellow companion.



One finder circle NE from magnitude 3.72 bet Ind. One and a half finder circles NEE from magnitude 2.12 alf Pav.



99 light-years from Earth, the primary is probably itself a double, with a separation of 0.06" and an orbital period of 1.3 years.



RMK 8550

RA: 312.9° | 20h 51.59' — DEC: -62.43° | -62° 25'

Magnitude: 5.8 | 5.8

Separation: 2.7"

Position Angle: 93°

SAO 254883 | HIP 102962



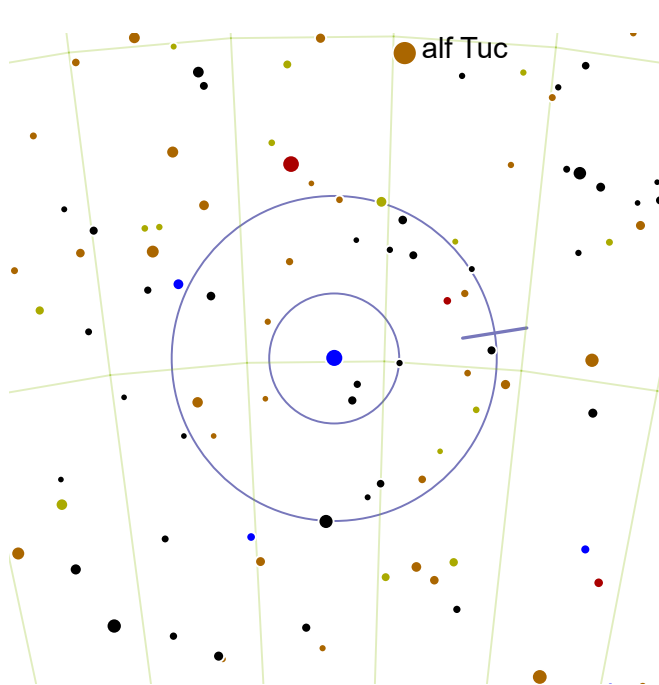
An equal and very tight pair of bright white stars.



Half a finder circle NNE from magnitude 3.6 bet Pav. One finder circle SSE from magnitude 2.12 alf Pav.



This pair of stars similar to Sirius is 249 light-years from Earth.



Delta Tuc

RA: 336.83° | 22h 27.29' — DEC: -64.97° | -64° 57'

Magnitude: 4.5 | 8.7

Separation: 6.8"

Position Angle: 279°

SAO 255222 | HIP 110838 | GDR2 08023617664



A brilliant bluish primary close to a fairly faint secondary.



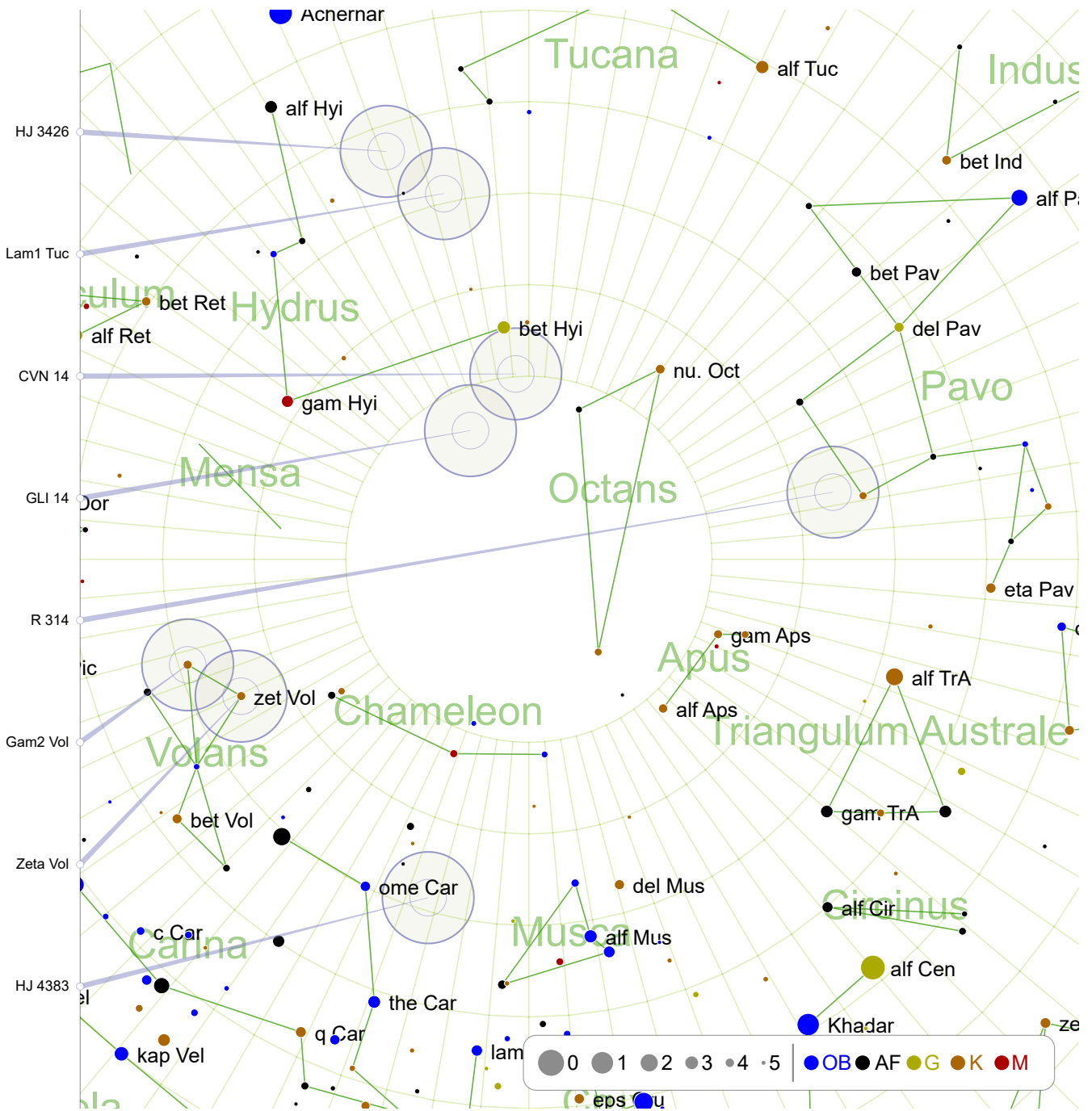
Half a finder circle S from magnitude 2.91 alf Tuc. Two finder circles E from magnitude 3.6 bet Pav.



The primary is three times the mass of the Sun and only 232 million years old. The pair appear to be gravitationally bound.

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Southern Circumpolar Sky (1)



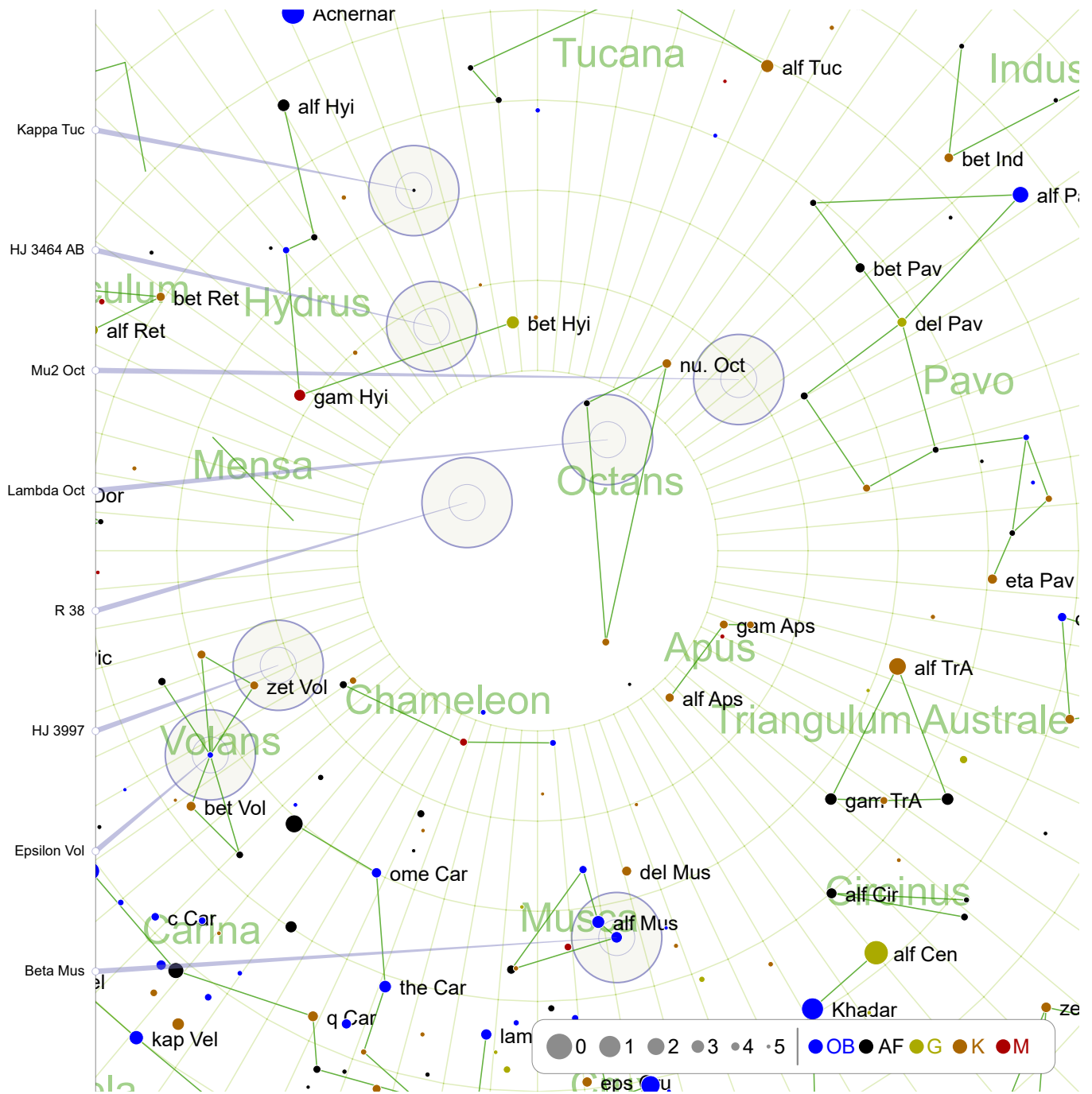
HJ 3426: page 317
R 314: page 319

Lam1 Tuc: page 317
Gam2 Vol: page 319

CVN 14: page 318
Zeta Vol: page 320

GLI 14: page 318
HJ 4383: page 320

Southern Circumpolar Sky (2)

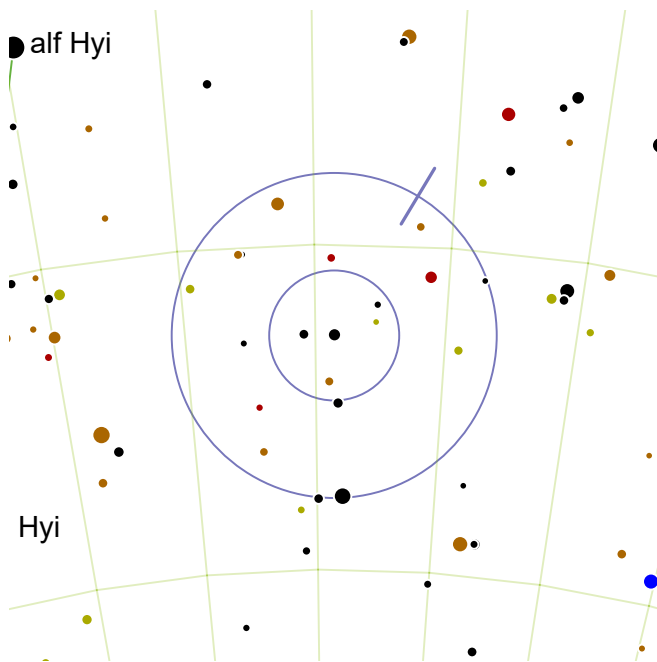


Kappa Tuc: page 321
R 38: page 323

HJ 3464 AB: page 321
HJ 3997: page 323

Mu2 Oct: page 322
Epsilon Vol: page 324

Lambda Oct: page 322
Beta Mus: page 324



HJ 3426

RA: 19.27° | 1h 17.09' — DEC: -66.4° | -66° 23'

Magnitude: 6.4 | 8.3

Separation: 2.4"

Position Angle: 329°

SAO 248350 | HIP 5992 | GDR2 35297588480



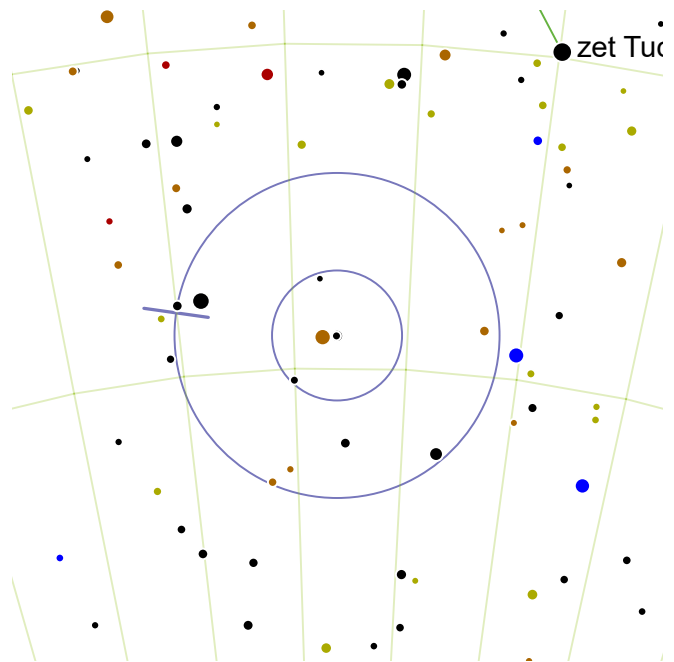
An extremely close pairing, with a fairly bright white primary and moderate secondary.



One finder circle SW from magnitude 3.02 alf Hyi. One and a half finder circles SSW from magnitude 0.6 Achernar.



The system is 307 light-years from Earth. Globular cluster Caldwell 104 (mag. 6.6) is one finder circle to the south, and the Small Magellanic Cloud is a further two degrees south of that.



Lam1 Tuc

RA: 13.1° | 0h 52.4' — DEC: -69.5° | -69° 29'

Magnitude: 6.7 | 7.4

Separation: 20.4"

Position Angle: 82°

SAO 248269 | HIP 4084 | GDR2 92046507520



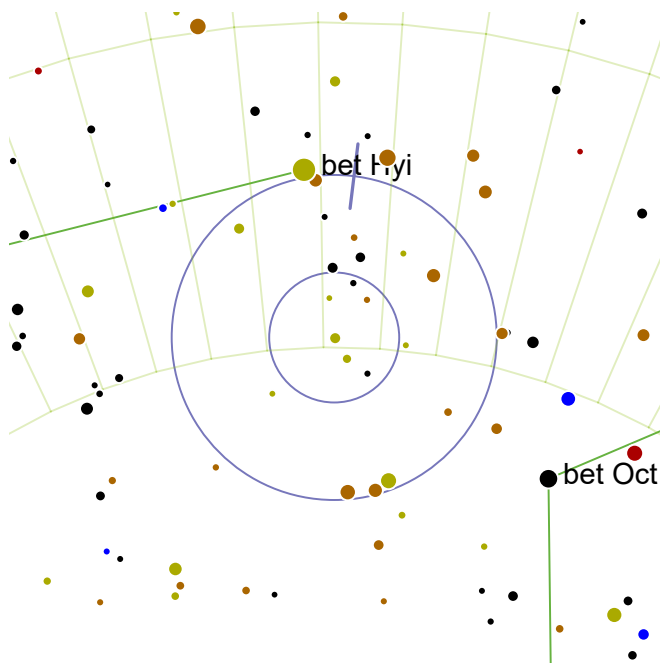
A balanced and fairly bright pair of yellow stars, easily separated.



One and a half finder circles NNE from magnitude 2.9 bet Hyi. Two finder circles SSW from magnitude 3.02 alf Hyi.



Globular cluster Caldwell 104 (mag. 6.6) is two degrees to the south east. The Small Magellanic Cloud lies just beyond the southern edge of the finder circle.



CVN 14

RA: 4.05° | 0h 16.2' — DEC: -79.85° | -79° 50'

Magnitude: 4.9 | 9.9

Separation: 4.0"

Position Angle: 353°

SAO 258219 | HIP 1292



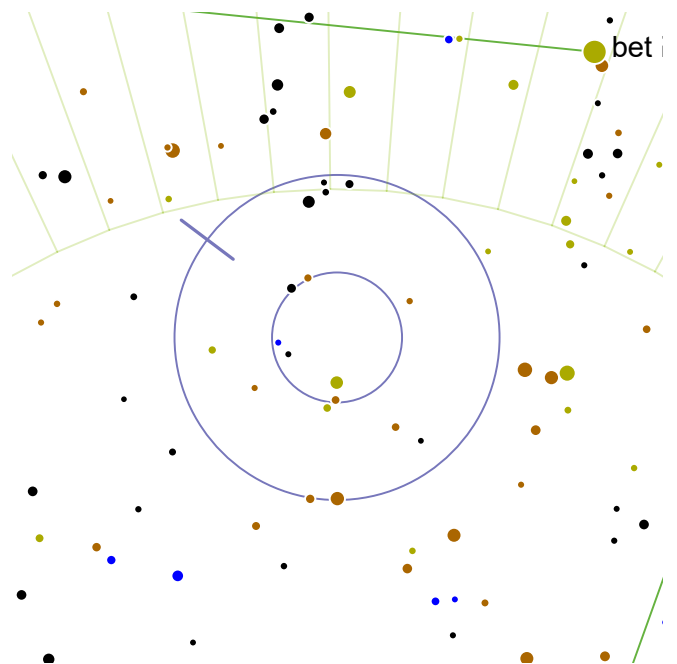
A brilliant yellow primary with a very close red companion.



Half a finder circle S from magnitude 2.9 bet Hyi. Two finder circles SW from magnitude 3.17 gam Hyi.



On the southern edge of the finder, Gamma 1, 2 and 3 Oct form a nice low power triple.



GLI 14

RA: 24.4° | 1h 37.59' — DEC: -82.28° | -82° 16'

Magnitude: 7.6 | 8.4

Separation: 5.5"

Position Angle: 53°

SAO 258270 | HIP 7560 | GDR2 81150415616



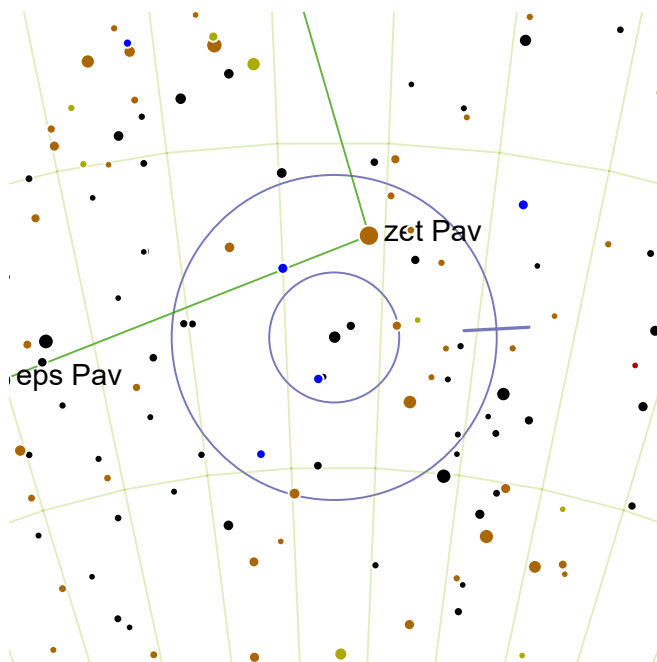
A balanced, close pair with an orange primary.



One finder circle SSE from magnitude 2.9 bet Hyi. Two finder circles SSW from magnitude 3.17 gam Hyi.



It is unknown if this pair are gravitationally bound. The primary is 400 light-years from Earth.



R 314




RA: 282.45° | 18h 49.79' — DEC: -73.0° | -73° 0'

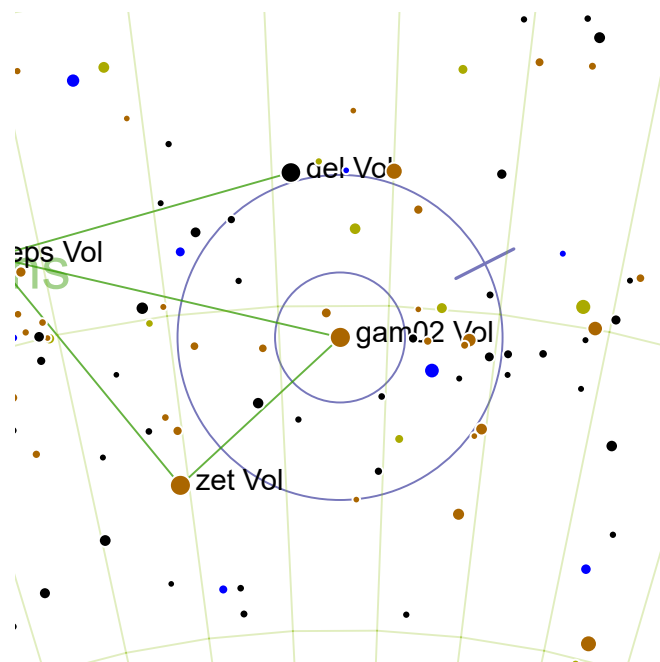
Magnitude: 6.2 | 8.1

Separation: 2"

Position Angle: 273°

SAO 257630 | HIP 92394 | GDR2 13847155712

-  A very tight double consisting of a fairly bright blueish primary and a significantly fainter secondary.
-  One and a half finder circles SW from magnitude 3.64 del Pav. One and a half finder circles NEE from magnitude 3.9 gam Aps.
-  Discovered by H C Russell, a prolific double star observer and a pioneer of photographic astronomy; he discovered over 500 southern hemisphere double stars.



Gam2 Vol




RA: 107.2° | 7h 8.8' — DEC: -70.5° | -70° 29'

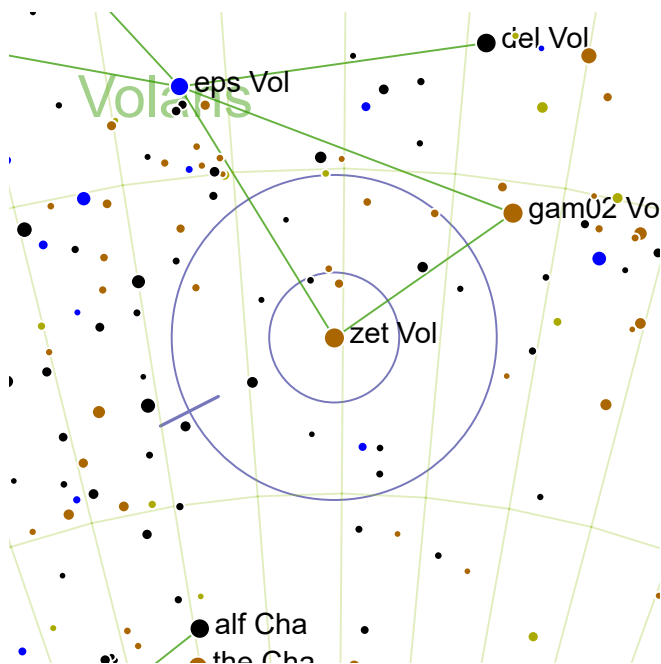
Magnitude: 3.9 | 5.4

Separation: 13.7"

Position Angle: 297°

SAO 256374 | HIP 34481 | GDR2 95348357120

-  A brilliant orange primary easily separated from a bright yellowish companion.
-  Gam2 Vol is a bright star in Volans. Half a finder circle NW from magnitude 3.89 zet Vol.
-  This physical double is 140 light-years from Earth. The brighter K-class giant is Gamma 2 Volantis, while the companion, a main sequence F star, is Gamma 1 Volantis.



Zeta Vol


RA: 115.45° | 7h 41.8' — DEC: -72.6° | -72° 35'


Magnitude: 3.9 | 9


Separation: 16"

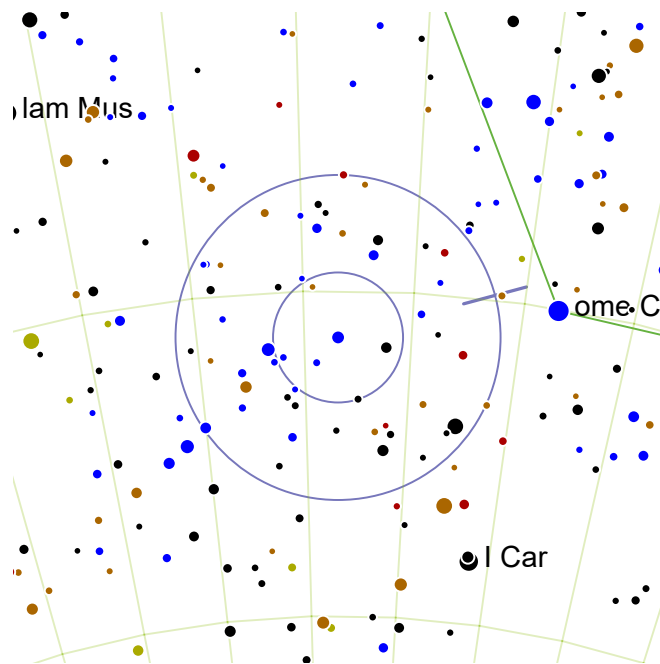
Position Angle: 117°

SAO 256438 | HIP 37504 | GDR2 88430032256

 A very bright orange primary star comfortably separated from a much fainter companion.

 Zeta Vol is a bright star in Volans. Two and a half finder circles SSW from magnitude 3.98 c Car.

 The system is also known as DUN 57, after its discoverer J Dunlop (1829). The primary is an orange giant 11 times the radius of the Sun. With Zeta Volantis centered, the double HJ 3997 lies to the southern edge of the finder circle.



HJ 4383


RA: 163.43° | 10h 53.7' — DEC: -70.72° | -70° 42'


Magnitude: 6.6 | 7.2


Separation: 1.6"

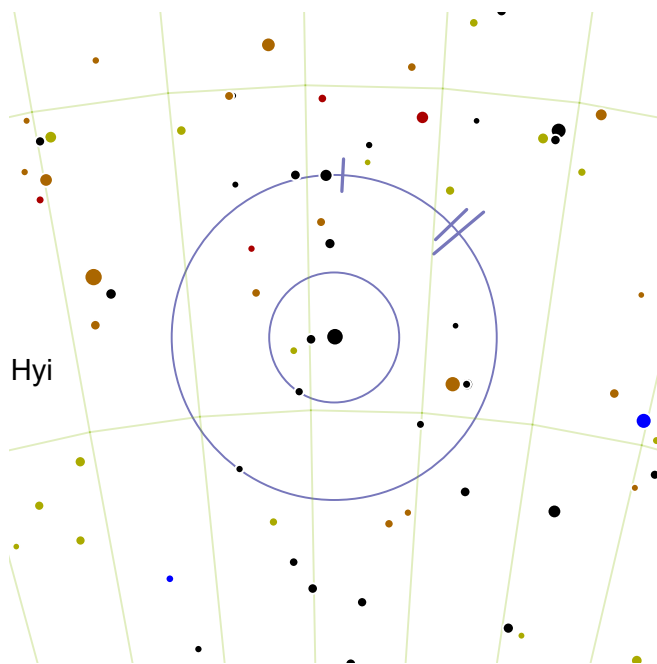
Position Angle: 285°

SAO 256770 | HIP 53272 | GDR2 70702032640

 An extremely tight and relatively balanced pair of bluish stars.

 Half a finder circle SEE from magnitude 3.56 ome Car. One finder circle SW from magnitude 3.8 lam Mus.

 The brilliant "Southern Pleiades" open cluster (IC 2602) is one finder circle north of this double. This cluster, also known as the Theta Carinae cluster after its brightest member, is the third brightest open cluster in Earth's sky.



Kappa Tuc




RA: 18.95° | 1h 15.79' — DEC: -68.88° | -68° 52'

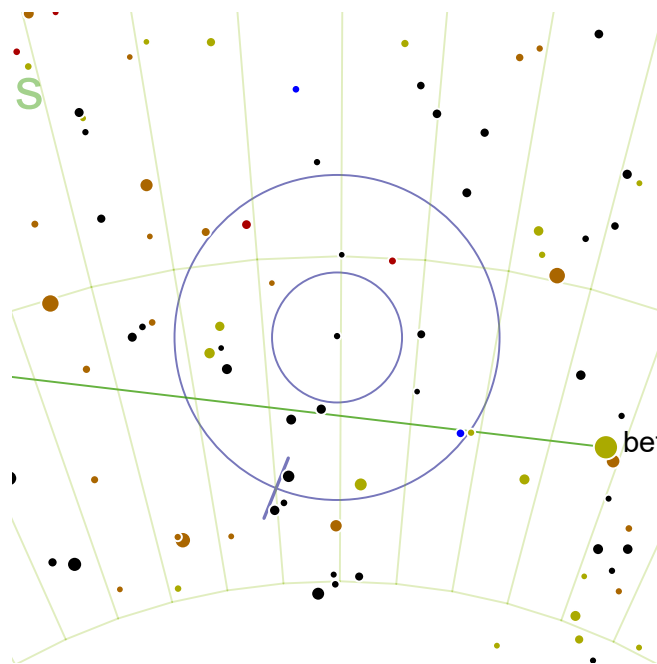
Magnitude: 4.9 | 7.5 | 7.8 | 8.3

Separation: 319" | 4.6" | 1.0"

Position Angle: 310° | 314° | 357°

SAO 248346 | HIP 5896

-  A tight pair of light yellow and yellow stars distantly separated from an extremely tight pair of orange suns.
-  One and a half finder circles SSW from magnitude 3.02 alf Hyi. Two finder circles S from magnitude 0.6 Achernar.
-  A fine triple system, even quadruple on perfect nights with a large telescope. The system is in our stellar neighborhood, being a mere 68 light-years from Earth.



HJ 3464 AB




RA: 25.25° | 1h 41.0' — DEC: -76.25° | -76° 14'

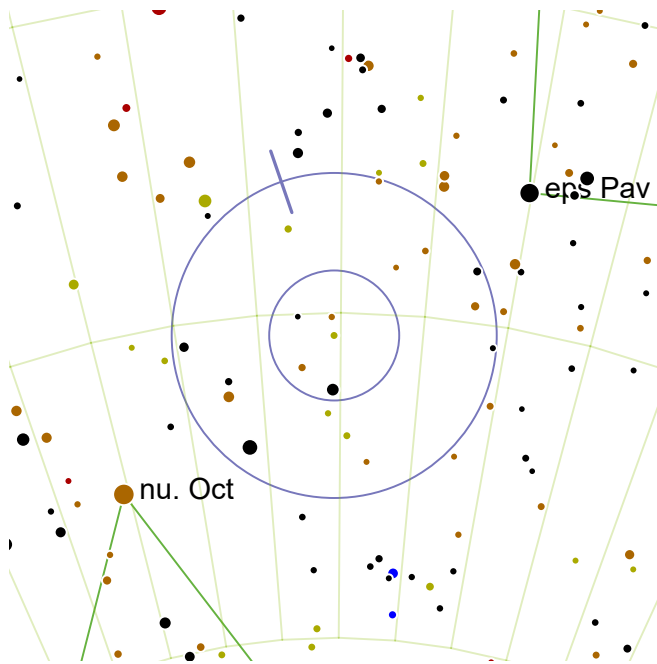
Magnitude: 8.1 | 9.9

Separation: 2.7"

Position Angle: 158°

SAO 255803 | HIP 7853

-  A yellowish primary with very close, faint secondary.
-  Half a finder circle E from magnitude 2.9 bet Hyi. One and a half finder circles SWW from magnitude 3.17 gam Hyi.
-  The Small Magellanic Cloud is one finder circle to the north west.



Mu2 Oct

RA: 310.4° | 20h 41.59' — DEC: -75.35° | -75° 20'

Magnitude: 6.5 | 7.1

Separation: 17"

Position Angle: 19°

SAO 257836 | HIP 102125 | GDR2 18965772416



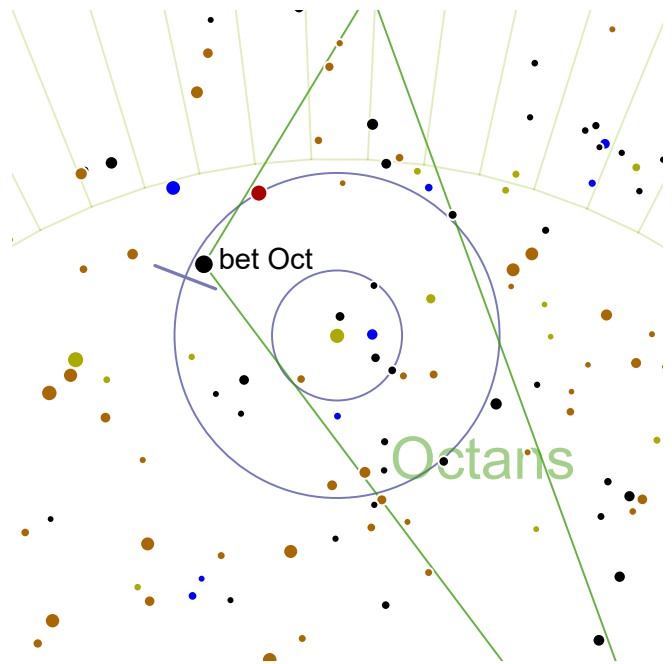
A well balanced and easily separated pair of yellow suns.



Half a finder circle NWW from magnitude 3.74 nu. Oct. One and a half finder circles S from magnitude 3.6 bet Pav.



The pair are quite similar to our Sun, although somewhat brighter (the primary is 3.7 times the Sun's luminosity). Mu2 Oct has a massive exoplanet at least 6.9 times Jupiter's mass.



Lambda Oct

RA: 327.73° | 21h 50.9' — DEC: -82.72° | -82° 42'

Magnitude: 5.5 | 7.7

Separation: 3.1"

Position Angle: 69°

SAO 258914 | HIP 107843 | GDR2 63360976256



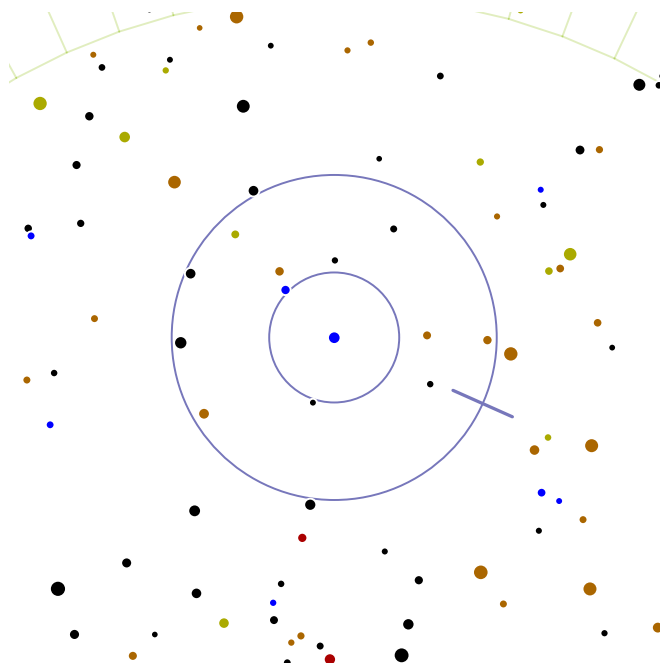
And very close pair with a bright yellow-orange primary and a white companion.



One finder circle S from magnitude 3.74 nu. Oct. One and a half finder circles SSW from magnitude 2.9 bet Hyi.



The primary star is a giant star 102 times the luminosity of the sun. It is also thirteen times the diameter of the Sun.



R 38

RA: 55.63° | 3h 42.5' — DEC: -85.27° | -85° 15'

Magnitude: 6.7 | 8.2

Separation: 2.1"

Position Angle: 246°

SAO 258356 | HIP 17328 | GDR2 82770275968



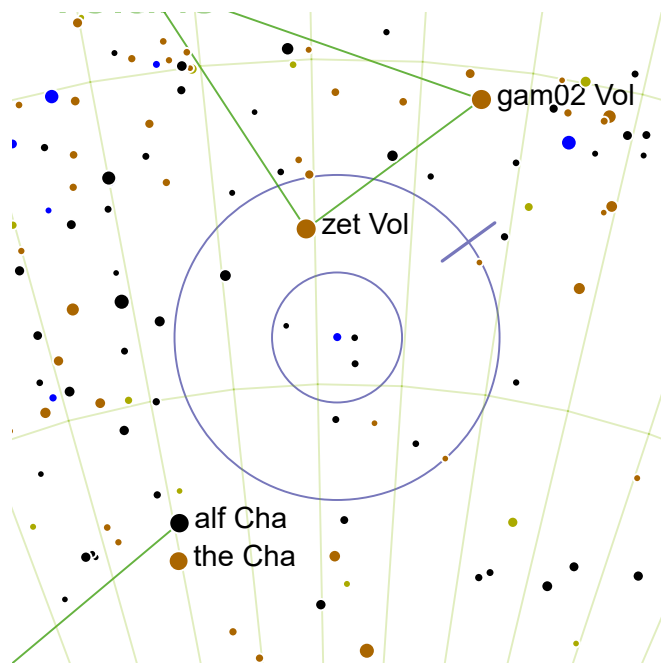
A very tight double, but the moderately bright blueish primary does not overwhelm the fainter secondary.



Two finder circles SSE from magnitude 2.9 bet Hyi. Two finder circles S from magnitude 3.17 gam Hyi.



The "R" code in the Washington Double Star Catalog refers to H C Russell's observations from Sydney in the period 1871 to 1881.



HJ 3997

RA: 113.85° | 7h 35.39' — DEC: -74.28° | -74° 16'

Magnitude: 7.0 | 7.1

Separation: 1.9"

Position Angle: 306°

SAO 256428 | HIP 36914 | GDR2 01474858624



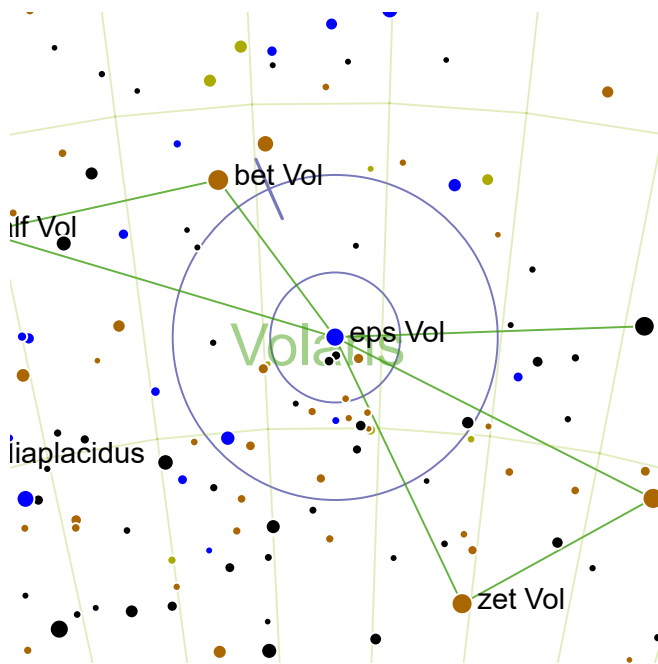
An equal and extremely tight pair of bluish stars.



One degree SSW from magnitude 3.89 zet Vol.



Bright Zeta Volantis is on the northern edge of the finder circle; it is also a fine double



Epsilon Vol




RA: 121.98° | 8h 7.89' — DEC: -68.62° | -68° 36'

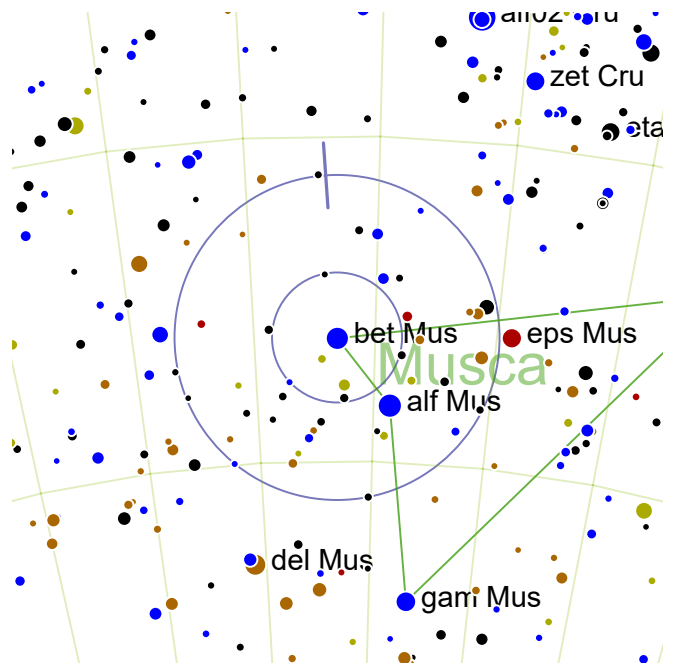
Magnitude: 4.5 | 7.4

Separation: 5.4"

Position Angle: 24°

SAO 250128 | HIP 39794 | GDR2 08289935232

-  A close, unbalanced pair with a very bright blue primary and white secondary.
-  Half a finder circle SSW from magnitude 3.65 bet Vol. Half a finder circle NNE from magnitude 3.89 zet Vol.
-  This system is composed of four stars. The primary is actually a spectroscopic pair of blue B-class stars, while the secondary is a spectroscopic pair of white A-class stars.



Beta Mus




RA: 191.58° | 12h 46.29' — DEC: -68.1° | -68° 5'

Magnitude: 3.9 | 4.2

Separation: 1.3"

Position Angle: 4°

SAO 252019 | HIP 62322 | GDR2 71032914944

-  A sub-arcsecond pair of equally bright bluish stars.
-  Beta Mus is a bright star in Musca. One degree NE from magnitude 2.94 alf Mus.
-  This pair is only possible in larger telescopes on nights of excellent seeing. The pair orbit each other in roughly 194 years. Beta Muscae is a member of the Scorpius-Centaurus Association, and in addition is a runaway star, meaning it is moving significantly faster than the average velocity of galactic rotation.

Acknowledgements

This book would not be possible without the prior work of many others, so I would like to offer my thanks here to a number of my main resources. Sadly there are other resources that I have used over the years to which I also owe thanks but which have become part of the furniture of my mind and have thus been overlooked on the following list.

Jim Kaler has provided rich information on many stars both in published works and also freely through the Internet:

<http://stars.astro.illinois.edu/>

The Washington Double Star Catalog is the prime resource for detailed data on double stars, and I referred to it via the following queryable online database:

<https://www.stelledoppie.it/>

Raw data for the Washington Double Star Catalog can be found here:

<http://www.astro.gsu.edu/wds/>

This is one of the most popular online observing lists for double stars, and got me started with serious double star observing:

<http://users.compaqnet.be/doublestars/>

The planetarium software Stellarium has been helpful, particularly in selecting double stars that are bright and easily locatable:

<http://stellarium.org/>

Wikipedia is a phenomenal resource and more trustworthy than many think - but double checking is always advisable, both for Wikipedia and any other online resource!

https://en.wikipedia.org/wiki/Main_Page

The Henry Draper catalog compiled by Annie Jump Cannon is the main resource for star positions in the charts. Some variables and high proper motion star have been manually corrected by me.

<https://ui.adsabs.harvard.edu/abs/1993yCat.3135....0C/abstract>

The charts would be labelled with incomprehensible Henry Draper numbers without the help of this catalog that cross references Flamsteed and Bayer designations with HD numbers.

<https://cdsarc.unistra.fr/viz-bin/cat/IV/27A>

In addition to the Bayer and Flamsteed designations, the IAU provides official and usually widely accepted names for a few stars:

https://www.iau.org/public/themes/naming_stars/

The Apache Software Foundation and the Apache FOP contributors provided the PDF and SVG rendering software required for this book. They said FOP 0.96 was dead, but 20 years later it is still going strong. Version 2.6 and counting!

<https://xmlgraphics.apache.org/fop/>

The World Wide Web Consortium developed the XSL FO and SVG standards used by Apache FOP. In this modern age of the shifting sands of "living standards", I want to give a shout out to good old fashioned standards hammered out by a committee and running to hundreds of pages. The work that went into creating these standards opened up technical publishing technology to the world.

<https://www.w3.org/TR/xsl/>

<https://www.w3.org/TR/SVG2/>

The cover image shows 11 and 12 Camelopardalis. The image was taken by David Ritter.

https://en.wikipedia.org/wiki/User:Dritter_wiki

This book received constructive input from the members of Stargazer's Lounge, which brought about many improvements, from diagram colors to indexing of information.

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