# Binary

July, 2012

## Journal of the Double Star Group

*Adviser and editor: Dr. John McCue, FRAS*

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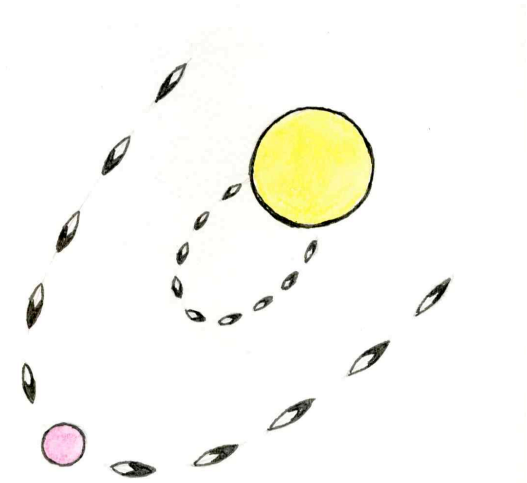

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## Double star catalogue

by John McCue

In the first issue of Binary, the Cambridge Atlas of Double Stars by Wil Tirion and James Mullaney was reviewed by Simon Johnson (CUP, ISBN 978-0-521-49343-7 in paperback). In the first part of that book, the authors present a list of showpiece doubles which everyone should see. This particular portfolio shows the wide variety and the spectacular sights that double stars bring to the observer at the telescope. Famous examples such as the Trapezium in the Orion Nebula, the Double-Double in Lyra, Regulus, Albireo, Sirius, Mizar and Alcor, Vega, Delta Cephei, Castor and Rigel are all there.

Working through this list, I realised that many of them I hadn't seen before, and some of them, like Regulus and Rigel, were so familiar as naked-eye stars that I had never looked at them through a telescope for many years. I didn't even know that some of these well-known stars were duplicate in nature. This is definitely a collection of celestial wonders to see before you die, to coin a popular phrase.

I checked which ones were visible from the UK. That left 101 in the list, out of the original 133. This reminded me of the Messier and Caldwell catalogues so I made a separate inventory, adding the position angles and checking other details. The 101 showpiece doubles from the original list by Tirion and Mullaney in the Cambridge Atlas are on pages 5 and 6 of this issue.

If any observers would like to share their experiences of observing these gems, whether with sketches, images, descriptions or measurements, I would be glad to disseminate through this publication.

In Fig.1 is an image of D6, 57 Aql, which I took with the 2m Faulkes Telescope Souh at Siding Spring, Australia, on July 8 this year. The field of view is 10' by 10', and I measured the position angle and separation using the free image analysis software Aladin, arriving at 169.6° with error 0.1°, and 35.5", error, 0.1". Using Aladin, I also downloaded the same field of view from the 2MASS and crosschecked the stars visible. No objects were visible that were not in the archive 2MASS image.

Aquila is obviously visible from the UK this summer, and at magnitudes 5.7 and 6.4 this is one the showpieces that it would be easy to find this season.

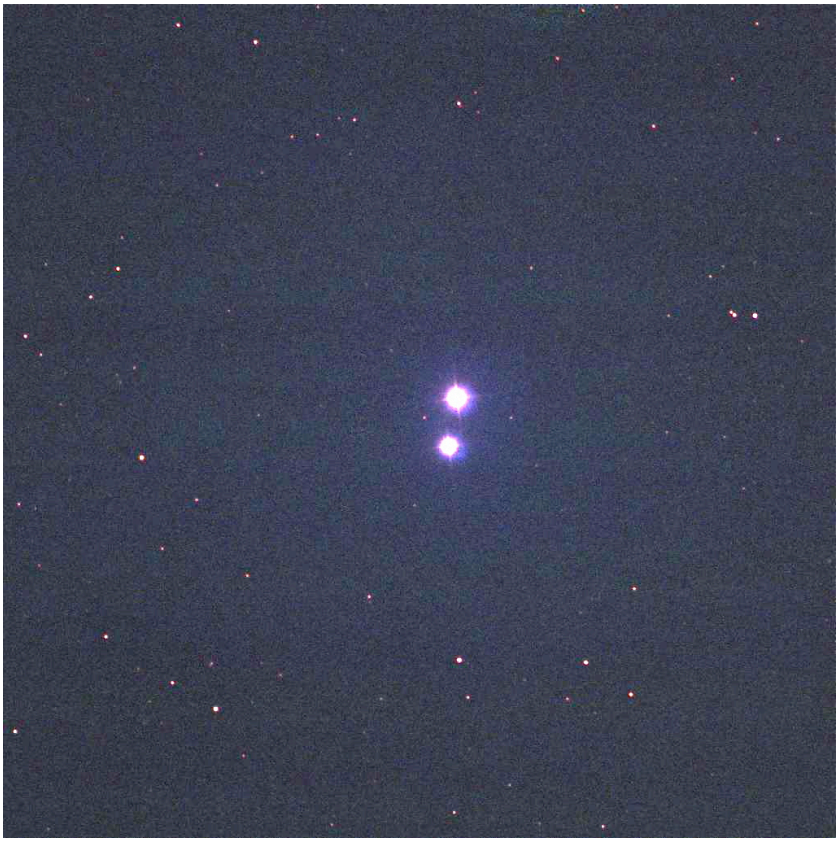

Figure 1: D6, 57Aql

## Double star discussion group on Yahoo

by John McCue

The Yahoo group of double star observers recently spotted, in the April, 2011, issue of Binary, the article on measurement of position angle and separation using a crosshair eyepiece and a stopwatch. They very kindly distributed it to their group, and allowed me to join their enterprise.

The group can be found at Yahoo with the title Double Star Imaging, where application for membership can be found.

## A New Pair to the Left of Spica

Discovered by Abdul Ahad

First observed: 24th May 2011, 2145 UT

From the USNO Image and catalog archive, I estimate this pair is located at approx. RA: 13 55 57.3, Dec: -11 57 30 and is not listed in the current edition of the Washington Double Star Catalogue.

Very faint, both stars are about mag 10.5 and I estimate a separation of roughly 30", but the position angle is not as yet decided. My own field drawing at x 100 magnification on my 8-inch Newtonian (South up):

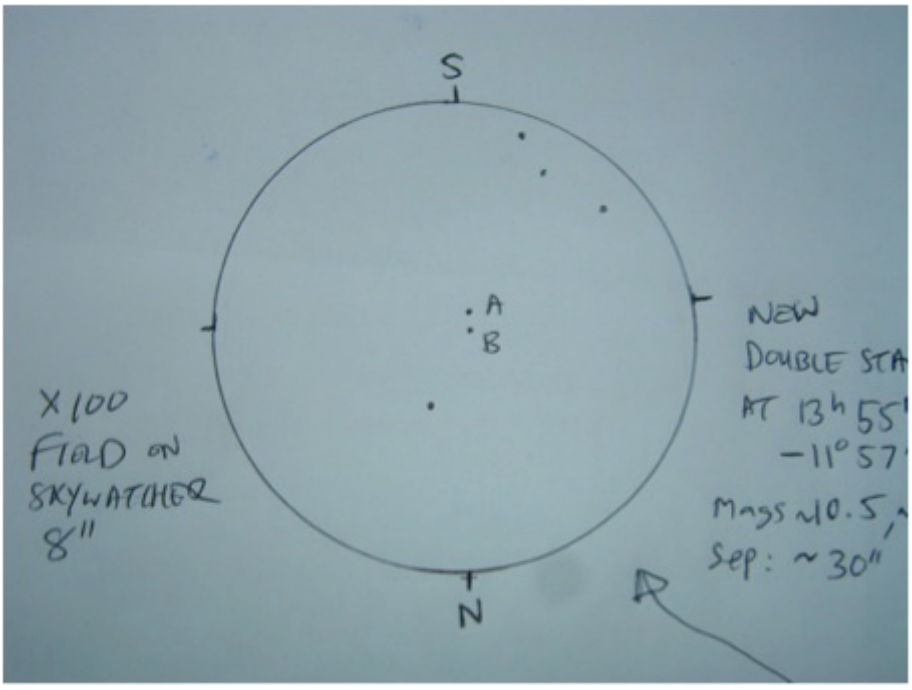


Figure 2: Sketch of new double by A. Ahad. Star A is TYC 556-1449-1, and B is TYC 556-1369-1

[Editor: I downloaded an archive POSS image and measured the position angle as 160° with error 1°, taking B as the primary star. The stars are of equal brightness, to one decimal place. Curiously, a later image from the 2MASS of 1998 showed that A (in Abdul's sketch) now had a fainter star close to it, as in the image below. Is it a companion that has emerged from behind or in front of the star A? Or is it an asteroid that has grazed or occulted A? I tried to find another archive image of a later date to see if the interloper was still there, but I could not find such an archive image. If anyone is able to help, please let me know. Note that N is upwards in this 2MASS image.]

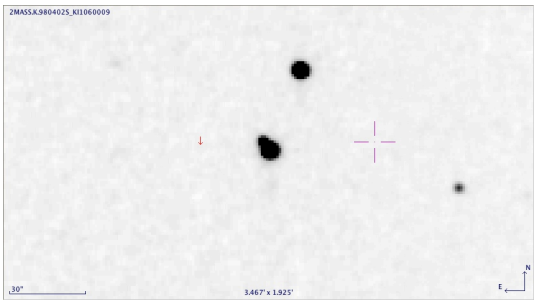

Figure 3: 2MASS archive image showing new arrival near star A

# A New Visual Double Star in Serpens

## Discovered by Abdul Ahad

First observed: 29th April 2011, midnight. This pair is located at RA: 15 46 18.197, Dec: +13 45 43.19 and is not listed in the current edition of the WDS Catalogue.

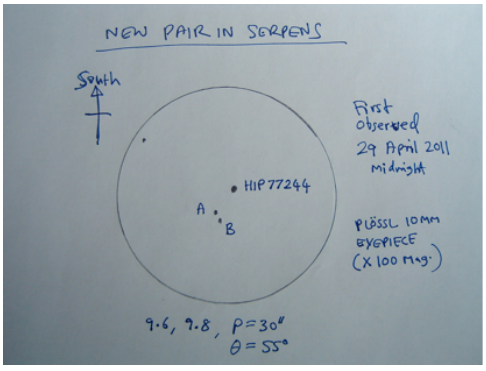


Figure 4: Sketch by A. Ahad

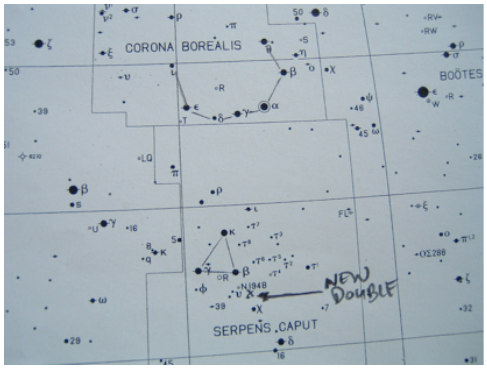


Figure 5: Star atlas showing position

Above is my sketch showing the double (labelled as A and B), close to the 8th magnitude star HIP77244 in Serpens. I made a provisional measurement of this pair using my Meade MA 12mm Astrometric Eyepiece on my Skywatcher 8-inch on 1st May 2011 as follows: position angle: 55 degrees (error 5 deg.), separation: 30 (error 0.5"). The pair is of magnitudes 9.6, 9.8 and is to be found below the Crown of Corona Borealis, as in Fig.5.

Double star catalogue

| | Double | RA | Dec. | Mags | PA (°) | Sep (") |
|---|---|---|---|---|---|---|
| D 1 | 56 And | 01 56 | 37 15 N | 5.7 5.9 | 299 | 190 |
| D 2 | γ And | 02 04 | 42 20 N | 2.3 5.5 6.3 | Triple | 10,0.4 |
| D 3 | ζ Aqr | 22 29 | 00 01 S | 4.3 4.5 | 169 | 2 |
| D 4 | 94 Aqr | 23 19 | 13 28 S | 5.3 7.0 | 351 | 12 |
| D 5 | 15 Aql | 19 04 | 04 02 S | 5.5 7.2 | 210 | 38 |
| D 6 | 57 Aql | 19 55 | 08 14 S | 5.7 6.4 | 170 | 36 |
| D 7 | γ Ari | 01 54 | 19 18 S | 4.5 4.6 | 1 | 8 |
| D 8 | λ Ari | 01 58 | 23 36 N | 4.9 7.7 | 47 | 37 |
| D 9 | θ Aur | 06 00 | 37 13 N | 2.7 7.2 | 309 | 4 |
| D 10 | κ Boo | 14 14 | 51 47 N | 4.5 6.6 | 235 | 14 |
| D 11 | π Boo | 14 41 | 16 25 N | 4.9 5.8 | 110 | 6 |
| D 12 | ζ Boo | 14 41 | 13 44 N | 4.5 4.6 | 293 | 0.7 |
| D 13 | ε Boo | 14 45 | 27 04 N | 2.6 4.8 | 344 | 2.9 |
| D 14 | ξ Boo | 14 51 | 19 06 N | 4.8 7.0 | 306 | 6 |
| D 15 | μ Boo | 15 24 | 37 23 N | 4.3 7.1 7.6 | 170 | 107,2.2 |
| D 16 | 32 Cam | 12 49 | 83 25 N | 5.3 5.8 | 326 | 22 |
| D 17 | ζ Cnc | 08 12 | 17 39 N | 5.3 6.3 6.2 | 73 | 0.9,6 |
| D 18 | ι Cnc | 08 47 | 28 46 N | 4.1 6.9 | 307 | 31 |
| D 19 | α CVn | 12 56 | 38 19 N | 2.9 5.5 | 229 | 19 |
| D 20 | α Cma | 06 45 | 16 43 S | 8.5 -1.5 | 92 | 7 |
| D 21 | h 3945 (CMa) | 07 17 | 23 19 S | 5.0 5.8 | 52 | 27 |
| D 22 | α Cap | 20 18 | 12 33 S | 4.2 3.7 | Quadruple | 381 |
| D 23 | σ 3053 (Cas) | 00 03 | 66 06 N | 5.9 7.3 | 70 | 15 |
| D 24 | η Cas | 00 49 | 57 49 N | 3.4 7.4 | 322 | 13 |
| D 25 | ι Cas | 02 29 | 67 24 N | 4.6 6.9 8.4 | Triple | 2.5,7 |
| D 26 | σ Cas | 23 59 | 55 45 N | 5.0 7.2 | 328 | 3 |
| D 27 | β Cep | 21 29 | 70 34 N | 3.2 7.9 | 249 | 13 |
| D 28 | Σ2816 (Cep) | 21 39 | 57 29 N | 5.7 7.5 7.5 | Triple | 12,20 |
| D 29 | Σ2840 (Cep) | 21 52 | 55 48 N | 5.6 6.4 | 196 | 18 |
| D 30 | ξ Cep | 22 04 | 64 38 N | 4.4 6.4 | 274 | 8 |
| D 31 | δ Cep | 22 29 | 58 25 N | 3.5-4.4 6.1 | 191 | 41 |
| D 32 | γ Cet | 02 43 | 03 14 S | 3.6 6.2 | 298 | 3 |
| D 33 | 24 Com | 12 35 | 18 23 N | 5.2 6.3 | 271 | 20 |
| D 34 | ζ CrB | 15 39 | 36 38 N | 5.0 5.9 | 306 | 6 |
| D 35 | σ CrB | 16 15 | 33 52 N | 5.6 6.5 | 238 | 7 |
| D 36 | δ Crv | 12 30 | 16 31 S | 3.0 8.5 | 216 | 25 |
| D 37 | β Cyg | 19 31 | 27 58 N | 3.4 4.7 | 54 | 35 |
| D 38 | δ Cyg | 19 45 | 45 08 N | 2.9 6.3 | 219 | 2.5 |
| D 39 | 16 Cyg | 19 42 | 50 32 N | 6.0 6.2 | 132 | 39 |
| D 40 | 31 Cyg | 20 14 | 46 44 N | 3.8 7.0 4.8 | Triple | 106,331 |
| D 41 | 61 Cyg | 21 07 | 38 45 N | 5.3 6.1 | 151 | 31 |
| D 42 | γ Del | 20 47 | 16 07 N | 4.5 5.0 | 265 | 9 |
| D 43 | 16,17 Dra | 16 36 | 52 55 N | 5.4 6.4 5.5 | Triple | 3,90 |
| D 44 | μ Dra | 17 05 | 54 28 N | 5.7 5.7 | 6 | 2.3 |
| D 45 | ν Dra | 17 32 | 55 11 N | 4.9 4.9 | 312 | 63 |
| D 46 | ψ Dra | 17 42 | 72 09 N | 4.6 5.6 | 16 | 30 |
| D 47 | 40, 41 Dra | 18 00 | 80 00 N | 5.7 6.0 | Triple | 19 |
| D 48 | 32 Eri | 03 54 | 02 57 S | 4.8 5.9 | 348 | 7 |
| D 49 | 40 Eri | 04 15 | 07 39 S | 4.4 9.5 11.2 | Triple | 83,9 |
| D 50 | δ Gem | 07 20 | 21 59 N | 3.6 8.2 | 228 | 6 |

Double star catalogue

| | Double | RA | Dec. | Mags | PA (°) | Sep (") |
|---|---|---|---|---|---|---|
| D 51 | α Gem | 07 35 | 31 53 N | 1.9 3.0 8.9-9.6 | 56 | 01,04,1971 |
| D 52 | κ Her | 16 08 | 17 03 N | 5.1 6.2 | 15 | 27 |
| D 53 | δ Her | 17 15 | 24 50 N | 3.1 8.3 | 286 | 11 |
| D 54 | α Her | 17 15 | 14 23 N | 3.5 5.4 | 104 | 5 |
| D 55 | ρ Her | 17 24 | 37 09 N | 4.5 5.4 | 319 | 4 |
| D 56 | 95 Her | 18 02 | 21 36 N | 4.9 5.2 | 257 | 6 |
| D 57 | 100 Her | 18 08 | 26 06 N | 5.8 5.8 | 183 | 14 |
| D 58 | ε Hya | 08 47 | 06 25 S | 3.5 6.7 | 306 | 3 |
| D 59 | 8 Lac | 22 36 | 39 38 N | 5.7 6.3 10.5 9.1 | Quadruple | 22,49,82 |
| D 60 | α Leo | 10 08 | 11 58 N | 1.4 8.2 | 307 | 176 |
| D 61 | γ Leo | 10 20 | 19 51 N | 2.4 3.6 | 126 | 5 |
| D 62 | 54 Leo | 10 56 | 24 45 N | 4.5 6.3 | 111 | 6 |
| D 63 | γ Lep | 05 44 | 22 27 S | 3.6 6.3 | 350 | 97 |
| D 64 | α Lib | 14 51 | 16 03 S | 2.7 5.2 | 313 | 230 |
| D 65 | 12 Lyn | 06 46 | 59 27 N | 5.4 6.0 7.1 | Triple | 1.7,9 |
| D 66 | 38 Lyn | 09 19 | 36 48 N | 3.9 6.1 | 226 | 2.6 |
| D 67 | α Lyr | 18 37 | 38 47 N | 0.0 9.5 9.5 | Triple | 78,118 |
| D 68 | ε Lyr | 18 44 | 39 40 N | 5.0 6.1 5.3 5.4 | Double-double | 2.1,2.4 |
| D 69 | ζ Lyr | 18 45 | 37 36 N | 4.3 5.6 | 149 | 44 |
| D 70 | β Lyr | 18 50 | 33 22 N | 3.3-4.3 6.7 9.9 9.9 | Quadruple | 46,67,86 |
| D 71 | δ Lyr | 18 54 | 36 58 N | 4.5 5.6 | 294 | 630 |
| D 72 | ε Mon | 06 24 | 04 36 N | 4.4 6.6 | 27 | 12 |
| D 73 | β Mon | 06 29 | 07 02 S | 4.6 5.0 5.3 | Triple | 3,7 |
| D 74 | ο Oph | 17 18 | 24 17 S | 5.2 6.2 | 355 | 10 |
| D 75 | 70 Oph | 18 06 | 02 30 N | 4.2 6.2 | 129 | 5 |
| D 76 | β Ori | 05 14 | 08 12 S | 0.3 6.8 | 204 | 10 |
| D 77 | η Ori | 05 25 | 02 24 S | 3.1-3.4 4.9 | 78 | 1.7 |
| D 78 | δ Ori | 05 32 | 00 18 S | 2.4 6.8 | 0 | 53 |
| D 79 | λ Ori | 05 35 | 09 56 N | 3.5 5.5 | 44 | 4 |
| D 80 | θ Ori | 05 35 | 05 23 S | 6.6 7.5 5.1 6.4 | "Trapezium" | 9,13,13 |
| D 81 | ι Ori | 05 35 | 05 55 S | 2.9 7.0 | 141 | 11 |
| D 82 | σ Ori | 05 39 | 02 36 S | 3.7 8.8 6.6 6.3 | Quadruple | 12,13,42 |
| D 83 | ζ Ori | 05 41 | 01 57 S | 1.9 3.7 8.5 | 166 | 2.5,60 |
| D 84 | ε Peg | 21 44 | 09 52 N | 2.5 8.7 | 321 | 144 |
| D 85 | η Per | 02 51 | 55 54 N | 3.8 8.5 | 301 | 28 |
| D 86 | ψ-1 Psc | 01 06 | 21 28 N | 5.3 5.5 | 159 | 30 |
| D 87 | ζ Psc | 01 14 | 07 35 N | 5.2 6.2 | 63 | 23 |
| D 88 | α Psc | 02 02 | 02 46 S | 4.1 5.2 | 263 | 1.9 |
| D 89 | ξ Sco | 16 04 | 11 22 S | 4.9 7.3 | 46 | 8 |
| D 90 | β Sco | 16 05 | 19 48 S | 2.6 4.5 | 20 | 14 |
| D 91 | ν Sco | 16 12 | 19 28 S | 4.4 5.3 6.6 7.2 | 336 | 1.3,2.4 |
| D 92 | α Sco | 16 29 | 26 26 S | 1.0 5.4 | 277 | 2.5 |
| D 93 | δ Ser | 15 35 | 10 32 N | 4.2 5.2 | 172 | 4 |
| D 94 | θ Ser | 18 56 | 04 12 N | 4.6 4.9 | 104 | 22 |
| D 95 | θ 1,2 (Tau) | 04 29 | 15 52 N | 3.4 3.9 | 348 | 337 |
| D 96 | Σ742 (Tau) | 05 36 | 22 00 N | 7.1 7.5 | 275 | 4 |
| D 97 | 6 Tri | 02 12 | 30 18 N | 5.3 6.7 | 69 | 4 |
| D 98 | ξ UMa | 11 18 | 31 32 N | 4.3 4.8 | 197 | 1.7 |
| D 99 | ζ UMa | 13 24 | 54 56 N | 2.2 3.9 4.0 | 152 | 14,708 |
| D 100 | α UMi | 02 32 | 89 16 N | 2.1 9.0 | 216 | 19 |
| D 101 | γ Vir | 12 42 | 01 27 S | 3.5 3.5 | 14 | 1 |