

## Double stars

To accompany the article in the January 2002 edition of *Sagittarius* here is a list of some of the best and most interesting double stars and multiples, some more easily found than others.

<b>Constellation</b>	<b>R.A.</b>	<b>Dec</b>	<b>Magnitude</b>	<b>Sep</b>	<b>P.A.</b>
<u>Ursa Major</u>					
Mizar-Alcor Mizar	13 23	+54.9	2.3, 3.9	14.5	150
<u>Eridanus</u>					
32	03 53	-03.0	4.5, 6.3	6.7	348
<u>Orion</u>					
Theta (The Trapezium) Multiple	05 33	-05.4	5.1, 6.7, 6.7, 8.0		
Delta (Mintaka)	05 32	-00.3	2.3, 6.9	52.8	00
Zeta (Alnitak)	05 40	-01.9	2.0, 4.2	2.4	164
Sigma Multiple	05 38	-02.6			
Lambda	05 35	+09.9	3.7, 5.6	4.4	41
Beta(Rigel)	05 14	-08.2	0.1, 7.0	9.2	206
<u>Monoceros</u>					
Beta Triple	06 29	-07.0	4.6, 4.7, 5.6	7.4, 2.8	
<u>Gemini</u>					
Alpha (Castor)	07 34	+31.9	1.9, 2.9	1.8	140
<u>Leo</u>					
Gamma (Algieba)	10 20	+19.8	2.3, 3.5	4.4	122
<u>Coma Berenices</u>					
24	12 32	+18.0	6.7, 5.1	20.3	271
<u>Cygnus</u>					
Beta (Albireo)	19 30	+28.0	3.2, 5.4	34.6	55
Omicron Triple	20 15	+43.5	3.8, 4.8, 7.0		
<u>Lyra</u>					
Epsilon Double-double	18 44	+39.7	5.1, 5.1, 6.0, 5.4	208, 2.8, 2.3	172, 2, 101
<u>Delphinus</u>					
Gamma	20 47	+16.1	4.3, 5.2	10.4	269
<u>Hercules</u>					
Alpha (Rasalgeti)	17 15	+14.4	3.5, 5.5	4.6	109
<u>Andromeda</u>					
Gamma (Almaak)	02 04	+42.3	2.5, 5.0	10.0	63
<u>Aries</u>					
Gamma (Mesartim)	01 53	+19.3	4.7, 4.6	8.2	359
<u>Ursa Minor</u>					
Alpha(Polaris)	02 31	+89.2	2.0, 9.0	18.3	217

The headings in this list may need some explanation. 'R.A.' and 'Dec' will be familiar to most as Right Ascension and Declination, measured in hours and minutes, and degrees above or below the celestial equator, as marked on the setting circles of equatorial telescopes. If a double star is not easy to find, the setting circles are matched with the coordinates of a nearby brighter star in the centre of the field of view. When the telescope is then moved to the Right Ascension and Declination coordinates of the double star, it should appear in the field of view. It is best to use a low power, wide-field eyepiece first, stepping up to a higher power if necessary to resolve a close double satisfactorily.

The Magnitude of double stars gives the comparative brightness of the primary and the secondary star, remembering that each order of magnitude will be two and a half times more or less bright than the next. Sometimes the brightness of the primary star will tend to mask the secondary. The very bright star Rigel in Orion, for example, is a double star with a much fainter companion. This is not too close, and would normally be easy to see, but the brightness of Rigel makes it a more difficult challenge to view the companion star.

'Sep', the apparent separation of double stars is measured in arc seconds, with 60 arc seconds to the minute, and 60 arc minutes to a degree. To put this into perspective, and to appreciate the narrow angles involved, the separation of very close double stars of about two arc seconds will be a thousand times less than the apparent diameter of the Moon.

It is sometimes also useful to know the position of the secondary star in relation to its primary, particularly when the secondary is faint or otherwise difficult to locate. The position angle, 'P.A.' is measured in degrees from north through east. In the usual configuration of a Meade or Celestron telescope using a star diagonal, and observing an object to the south, the measurement will be clockwise, remembering that an astronomical telescope will usually reverse the image.