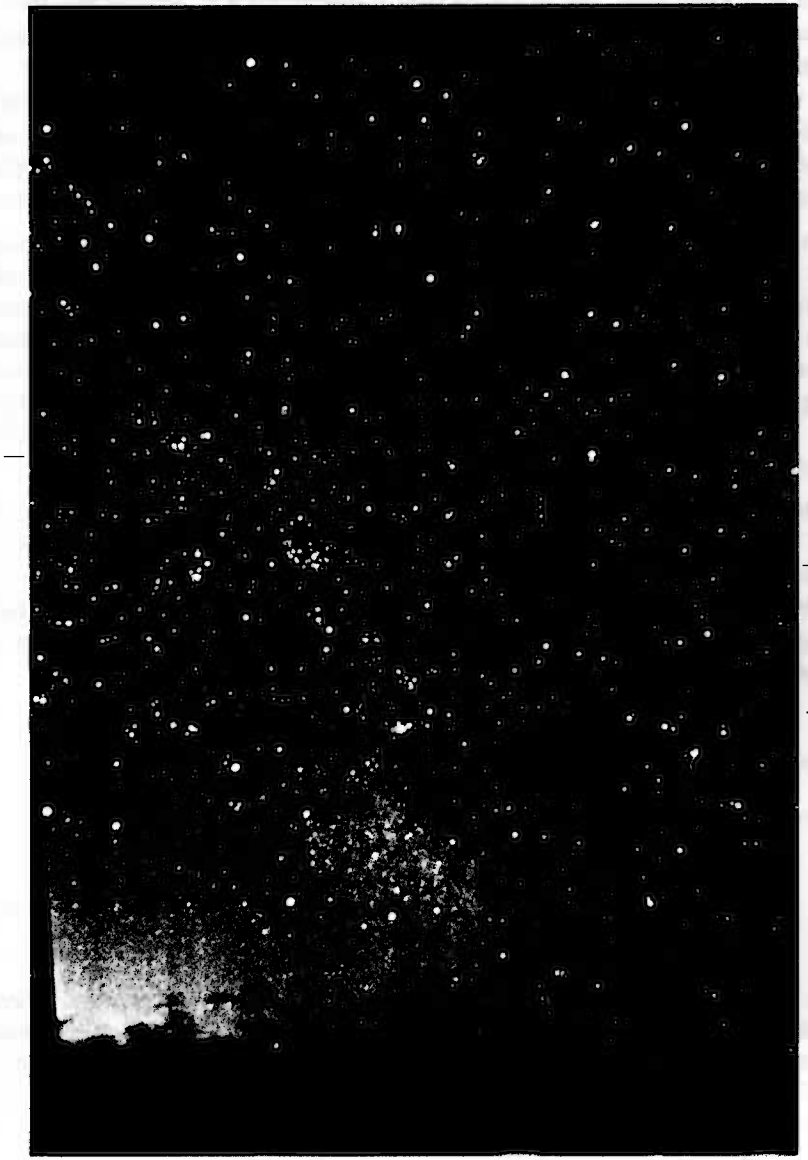
The constellations Scutum and Sagittarius photographed by Stephen Jefferys using a home-built tracking camera platform. A number of the objects described by Mark Humphrys appear in this photograph, and three of them are identified for reference. The Milky Way is clearly visible – here we are looking towards the centre of our Galaxy. North is up. Any vertical streaks are artefacts of the photocopying process.



BINOCULAR OBSERVATIONS OF THE SOUTHERN SUMMER CONSTELLATIONS

by Mark Humphrys

In Guernsey we have the benefit of good summer views of some of the most interesting of the southern constellations, including those in the direction of the centre of our Galaxy (as evidenced by the title of our newsletter). They contain many fascinating objects. Mark, living on the South China Seas, has even better views of these binocular objects than we do, and here he descibes more than 30 of them. Finder charts are provided on a separate sheet, and the area is illustrated by excellent photographs taken by Stephen Jefferys and Daniel Cave.

Armed with a pair of Pentax 7x20 binoculars and the ship's 7x50 binoculars, I've made a few observations from the helideck of the ship that I'm working on, down here off the coast of Brunei. To guide me around the sky I'm using the *The Observers Sky Atlas* by E. Karkoschka, which covers most objects visible to the naked eye and with small binoculars. But perhaps more importantly it is lightweight and fits easily into a rucksack. In this article I am concentrating on constellations that can be seen from Guernsey in the summer months, namely: **Scorpius, Sagittarius, Scutum, and Ophiuchus**.

Starting with Scorpius, the brightest star is the reddish, orange **Antares**. It is a double star, with a combined magnitude of 0.9 - 1.8. It is also a variable star, with a period of 4-5 years. Between Antares and σ Scorpii lies **M4**, a globular cluster of 6th magnitude. It has a distinctive bright centre and a gradual fading to the edges. Perhaps the 14-inch SCT would resolve individual stars. Between σ Scorpii and β Scorpii, lies **M80**, another globular, slightly fainter at 7.5 magnitude. Unfortunately, I was unable to see any detail other than identify it as a splodge of light.

Travelling down the body of the Scorpion, there is a pair of stars very close together, μ^1 and μ^2. They are just under 6' apart. μ^1 is a variable with a period of about 1.4 days. Below these two lies the open cluster **NGC 6231**, bright at 3.5 mag. It is very prominent, and makes an impressive sight lying just north of ζ^2 Scorpii. To the east lies **NGC 6124**, a 6th magnitude open cluster. I could just make out a slight smudge of light, but could not see any detail at all. Travelling along, past η Scorpii, to θ Scorpii, then south about 6 or 7 degrees, one finds **NGC 6388**, a magnitude 7 globular. Up, what I think of as the tail of the Scorpion, to the 'sting' formed by γ and ν Scorpii, Shaula and Lesath, magnitudes 1.6 and 2.7 respectively, are both of the same spectral type, B2. At 600 light years, Lesath lies twice the distance away from us than Shaula.

Travelling north-east towards Sagittarius, you'll see **M6 and M7**. Occupying the same field of view in binoculars, these open clusters are an impressive sight. I was able to make out several of the stars making up M7, perhaps 15 or so, although M6 showed a few bright stars against an apparent nebulous background. M7 is one magnitude brighter than M6, at 3.5. It is also the most southerly Messier object. I was also able to make out M7 with the naked eye on really dark, clear nights.

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Sagittarius, looking towards the centre of our galaxy, offers many objects visible to the binocular user. My own search started with η Sagittarii, a third magnitude M class star, lying some 120 light years from us. Northwest lies the 1.8 magnitude star ε Sagittarii. Between ε and ζ Sagittarii lie three globular clusters, M69, M70 and M54, all at about magnitude 8. These clusters were no more than the very faintest of splodges of light in the binoculars; perhaps with a darker sky you would be able to see more detail. λ Sagittarii is the nearest bright star to **M28**, another globular cluster. To the northwest lies **M22**, a bright globular at about fifth magnitude. Being about three times the size ofM28, it is easier to pick out, and seems to be slightly mottled. Perhaps it would be possible to resolve the stars with the large 'scope.

Northwest from λ Sagittarii to μ Sagittarii, this star lies at, more or less, the centre of a rich treasure trove of deep-sky objects, most plainly visible with binoculars. Just sweeping the binoculars around this area reveals many bright nebulae and star clouds along the plane of the Milky Way. In the southwest corner lies the large emission nebula **M8, the Lagoon Nebula**, very big, some 60' across, and bright, at fifth magnitude. It is visible with the naked eye, but binoculars begin to show some of its detail. Several bright stars can be seen running along its length. North from M8 are **M20 and M21**. M20, another emission nebula, known as the **Trifid Nebula**, is split into three parts by dark, radial, dust lanes, although I could not make out this detail - it should be seen with 14-inch SCT. Several bright foreground stars can be seen in the Nebula. M21, a 6.5 magnitude open cluster, I could not resolve any stars but could make out the bright patch marking this cluster. These three objects all fall in the same field of view of the binoculars. Try using a nebula filter when viewing these gaseous objects to really bring out the detail.

Passing m Sagittarii, northeastwards lies **M24**, the largest nebula in the area, some 100' across; there are several bright stars in the field. Either side of M24, almost equidistant from it, lie **M25** to the east and **M23** to the west. Both are open clusters, of magnitude 5.5 to 6, and both are of a similar size, 25' - 30'. I was able to count about 8 stars in M25. **M18**, a small, 7.5 magnitude, open cluster, lies to the north. This is quite easily made out, despite the surrounding area being bright with stars. Further along the plane of the Milky Way lies **M17, the Omega Nebula**. It seemed that there was a bright patch in the nebula at its western edge. North from here lies **M16, the Eagle Nebula**, a 6th magnitude emission nebula. The Nebula seems to be brightest in the northernmost part.

From M16 it's a short hop into Scutum, the Shield. In this constellation I was able to make out three objects: **M11, M26 and NGC 6712**. M11 is a sixth magnitude open cluster. To locate this cluster I hopped from β Scuti to R Scuti, then to two slightly fainter stars to the east. M11 lies 2 or 3 degees from the last star. It has a mottled appearance with a bright centre. Another open cluster, M26, is about the same size as M11, but slightly fainter at magnitude 8.5 - it is barely a smudge of light in the binoculars. NGC 6712, an 8.5 magnitude globular cluster, was picked up with the greatest of difficulty, and I could only make out the barest hint of it. »»

Moving across to Ophiuchus, there are several objects that were visible. Starting at β Ophiuchi, the 2.8 magnitude K2 star, Cebalrai, there is **IC 4665** lying to the northeast, an open cluster, with several bright stars present. Also in this area is the famous **Barnard's Star**. It is the fastest moving star, at about 10" per year. Can you spot it with the SCT? It's only 6 light years away, but still quite faint at magnitude 9.5. Moving into the middle of Ophiuchus, leaving the Milky Way behind, several globular clusters can be made out. **M14**, faint at 7.5 magnitude, is visible as a splodge of light against the sky. M14 I found really by chance, sweeping from β Ophiuchi. **M10 and M12** were found by hopping from γ Ophiuchi. Both are fairly large, at 12' across, and bright, at 6.5 mag. To the southwest of ζ Ophiuchi, lies **M107**, too faint to make out any detail. Southeast from η Ophiuchi, lies **M9**, at magnitude 8. Once again I could only make out the barest hint of its presence.

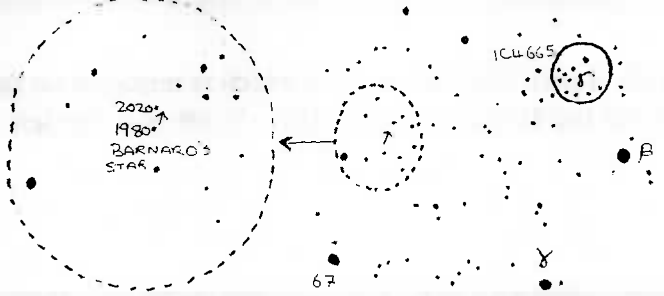
South from here lie the last three objects of this guided tour. **NGC 6369** lies some 8° northeast from θ Ophiuchi, an 11th magnitude planetary, far too faint to make out with the binoculars, but should be visible with the 14-inch SCT. West and slightly south of θ Ophiuchi is **M19**, a globular cluster of around magnitude 7. To locate this look for three pairs of stars close to 36 Ophiuchi. The cluster lies 2 or 3 degrees west of the two lower pairs. Again, in the binoculars it's another smudge. **M62**, the final object, lies to the south of M19. It's a 6.5 magnitude globular cluster, with a few bright stars against a nebulous background, almost triangular in shape.

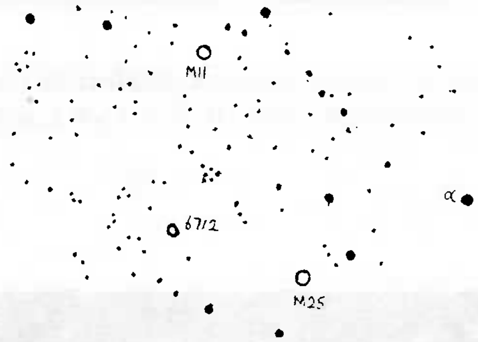
The whole sky in this area is fascinating to explore with binoculars. On many occasions I glimpsed faint splodges of light that I could not find mentioned in the little atlas that I have with me, but will have to await identification at a later date. If you get a chance this summer to explore this region I would highly recommend it. Also just because I failed to see an object does not mean that it cannot be seen with binoculars. Given different seeing conditions etc, many of these objects will be located. Give it a try!

Highly recommended:

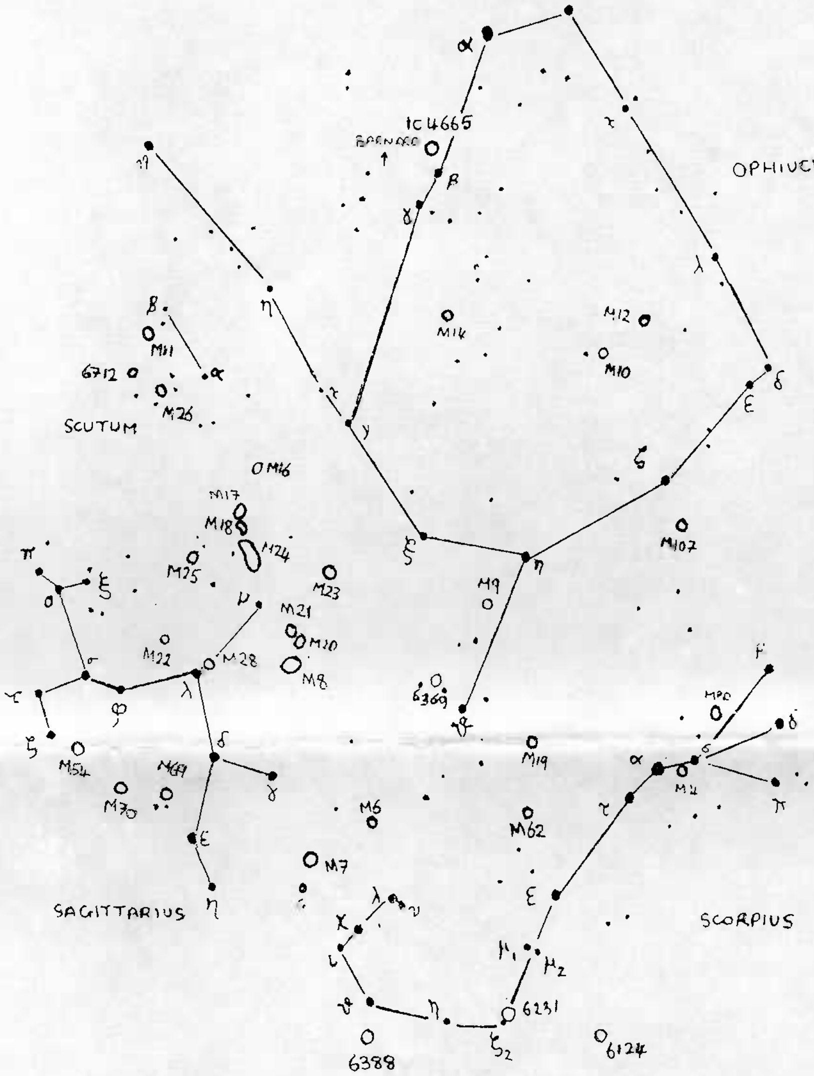
The Observer's Sky Atlas, by E. Karkoschka, published by Springer-Verlag, 1990. ¤

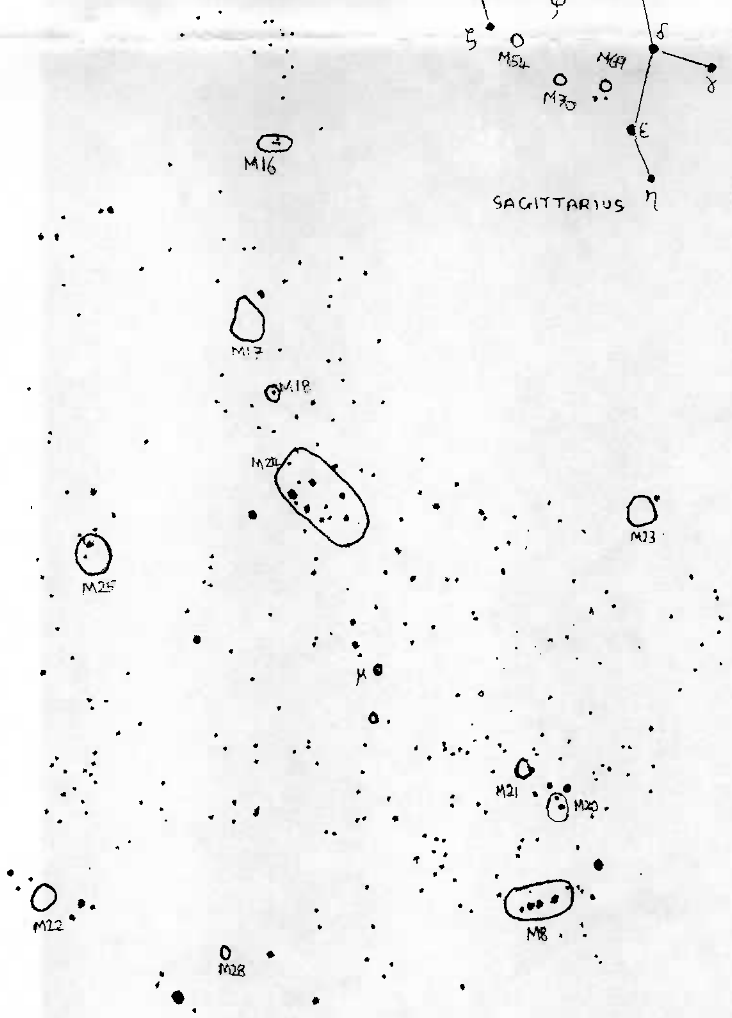
The atlas which Mark Humphrys used sold for £9.95, but is now out of print. There is a copy at the Observatory for members' use. This superb pocket-size star atlas contains 50 star charts, with lists of nebulae, galaxies, bright stars, binaries, variable stars and other objects. It is unique in incorporating finder charts with the general charts, and is laid out for convenient use by the serious observer.

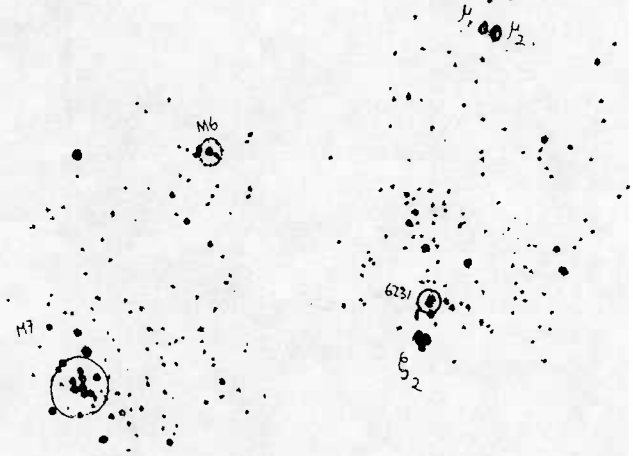




STAR CHARTS ADAPTED FROM
'THE OBSERVERS SKY ATLAS'
BY E. KARKOSCHKA.
PUB. BY SPRINGER-VERLAG







Part of Sagittarius photographed by Daniel Cave using the 8-inch Schmidt camera which is mounted on the 14-inch telescope. It shows the Lagoon Nebula (M8) and the Triffid Nebula (M20). North is to the left.

M20 M8