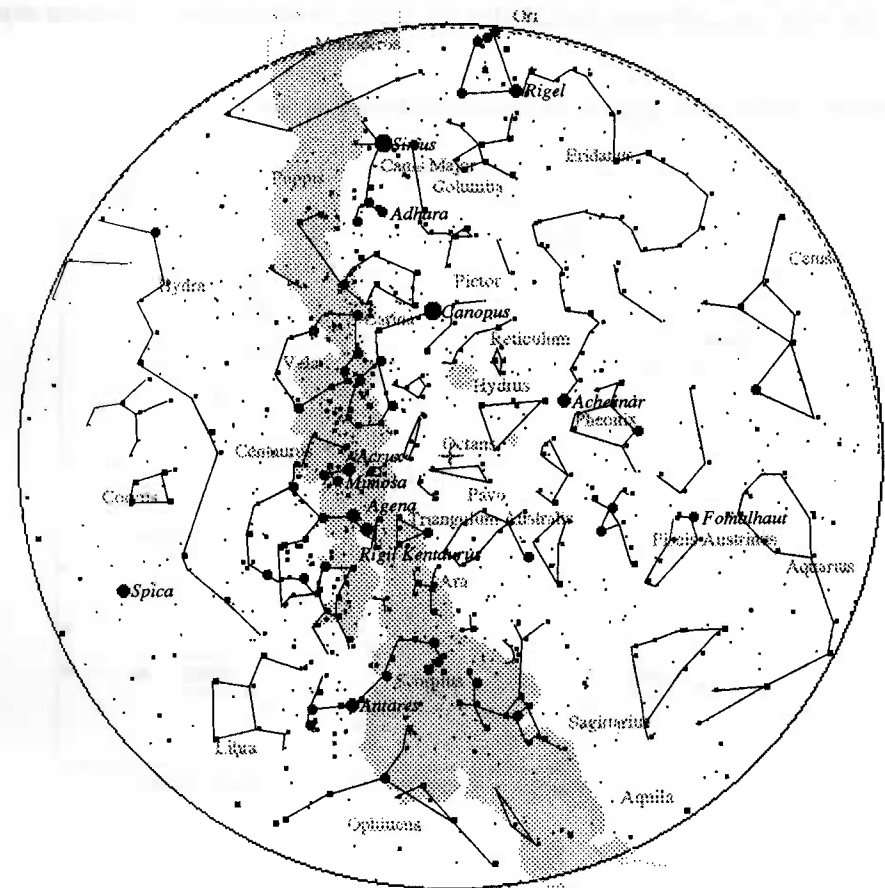


Winter Skies in the Southern Hemisphere

by David Le Conte

Astronomy Section members may recall that last winter I provided star charts and a description of good binocular objects for a party of non-astronomers travelling from Guernsey to the Falklands. The following is adapted from that information, and may be of use to anyone considering going (far) south in the winter. Although the star charts are designed for use in the Falklands, you do not have to be there - anywhere in the southern hemisphere will do. Those of us stuck in the northern hemisphere may find the descriptions of some of the fascinating southern hemisphere objects alluring enough to warrant a trip - if not this year then perhaps next?



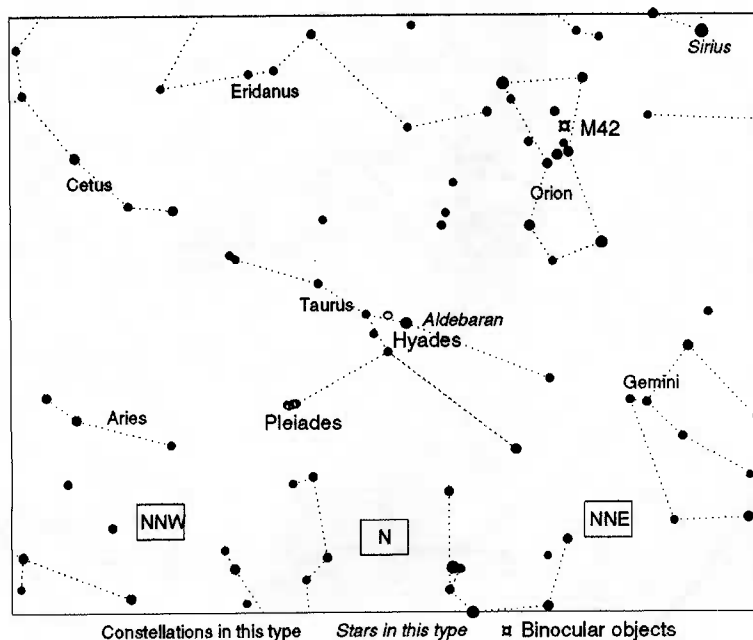
The southern hemisphere stars. The South Celestial Pole is at the centre.

The **South Celestial Pole** is not marked by any bright star, unlike the North Celestial Pole which is marked by Polaris or the Pole Star. However, note that all the stars appear to rotate around the South Celestial Pole as the Earth turns on its axis, just like the rotation of northern hemisphere stars around the North Celestial Pole. However, the direction of rotation is clockwise, unlike the rotation around the North Celestial Pole, which is anti-clockwise.

If you point a tripod-mounted camera anywhere in this area, and open the shutter for a long period of time you will see this rotation as circular traces of stars. The exposure should be between 15 minutes and 2 hours, depending on the darkness of the sky - try 30 minutes. The colours of the stars will also be evident in such a photograph.

The following charts show different parts of the sky in the evenings about Christmas time. All the objects described and identified on the charts are selected good binocular objects.

NORTH VIEW (these objects are also visible from Guernsey)



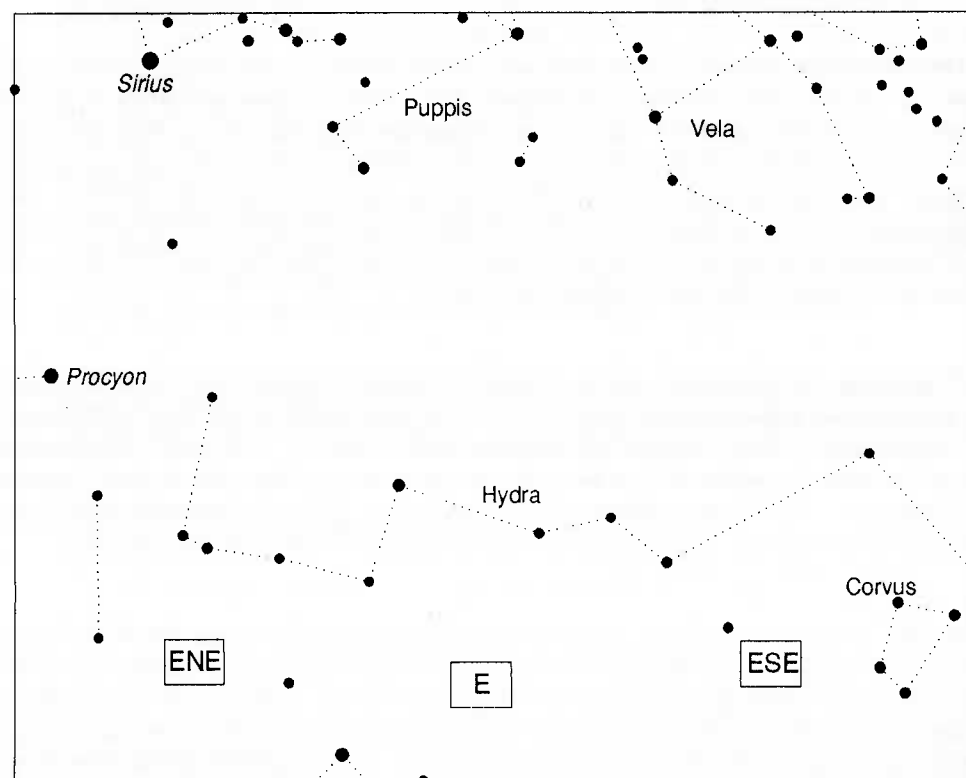
NORTH VIEW OBJECTS

M42, the Orion Nebula, is an emission nebula - the best in the sky, visible with the naked eye, and clearly distinguished in binoculars. It is a massive cloud of hydrogen gas and dust, and a birthplace of new stars. Look at the stars embedded in it - these are young stars, newly formed, and they are responsible for creating the glow in the gas surrounding them. Long time exposure photographs bring out the red colour of the hydrogen gas, excited by the energy from the hot stars - rather like a neon tube. The Nebula is about 1500 light years from us, so you are seeing it as it was 1500 years ago. See if you can discern any shape to the cloud, and any detail in it.

Pleiades, the Seven Sisters - this is an open star cluster of young stars (10 to 20 million years old), embedded in a reflection nebula. You may be able to see wisps of hydrogen cloud around the stars, which is left over from their formation. The cloud's tiny particles are illuminated by reflected light from the stars, and create a blue glow in long exposure photographs. The cluster's distance is 400 light years. There are about 50 stars in the cluster, with about 6, 7, or 8 (depending on your eyesight) visible with the naked eye.

Hyades - another open cluster, some 150 light years away. (The bright star Aldebaran is only half that distance.) The stars are much older than those of the Pleiades - about 400 million years - although still young stars (which have a typical lifetime of 10,000 million years, such as our closest star, the Sun). The Hyades cluster is also less compact than the Pleiades (partly at least because it is closer to us). It forms much of the face of the constellation Taurus, the Bull.

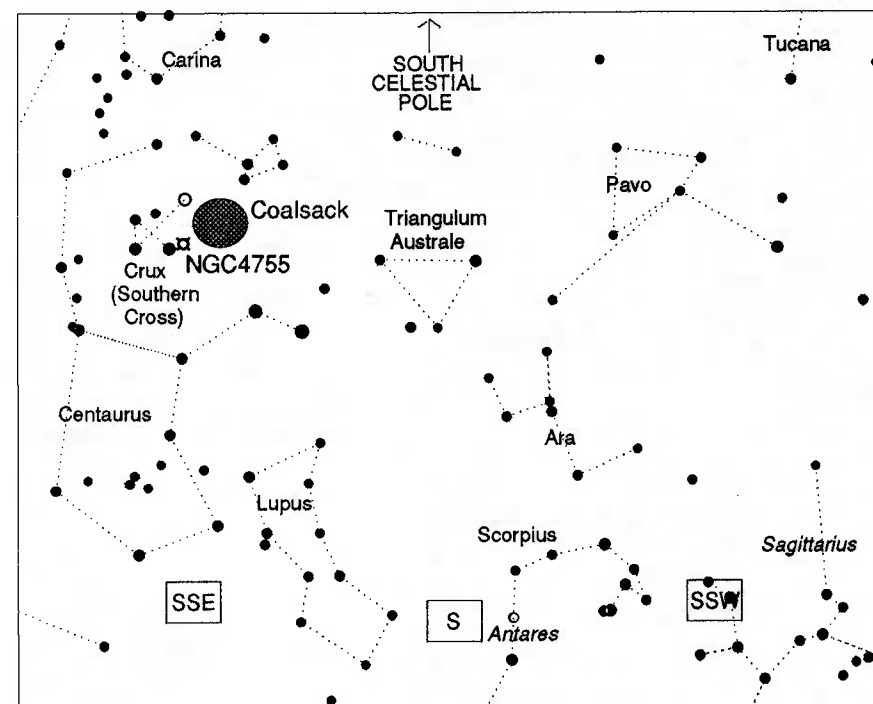
EAST VIEW



Constellations in this type.

Stars in this type.

SOUTH VIEW



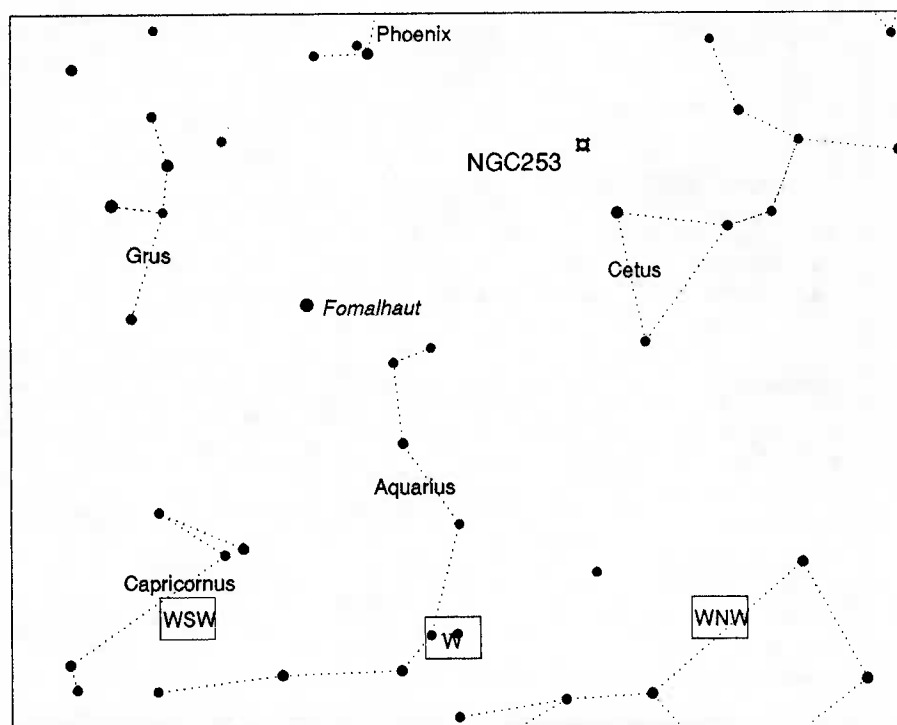
Constellations in this type Stars in this type ☒ Binocular objects

Crux, the Southern Cross, is a beautiful southern constellation, too far south to be seen from Guernsey. It is the smallest of all the constellations - the symbol of the southern sky. Notice that it is in the middle of the Milky Way, whose path across the sky is not only delineated by its milky appearance, but also by strings of bright stars, including Crux and Centaurus. The Milky Way is "The Galaxy", that is, the one in which we are located. All the stars you can see anywhere in the sky are within the Galaxy, which is like a giant pinwheel. We (our Solar System) are situated towards one edge, in one of the Galaxy's spiral arms, and so we are looking at the Galaxy from this viewpoint.

Coalsack. This is a dark nebula - a dust cloud about 500 light years away (closer than the background Milky Way stars). Looking at it, especially in binoculars, you may get a three-dimensional feeling - rather like looking through a hole in the Milky Way. However, really you are looking at a dark cloud hiding the stars behind it. Similarly, we have trouble seeing the centre of the Milky Way because of intervening dust clouds.

NGC4755 is called the **Jewel Box**, an open star cluster, 6000 light years away. Its bright stars are blue and red giants, with luminosities thousands of times brighter than our Sun. They are burning at much higher temperatures than our Sun, and will have much shorter lifetimes. Indeed, the red giants are already in the final stage of their lives.

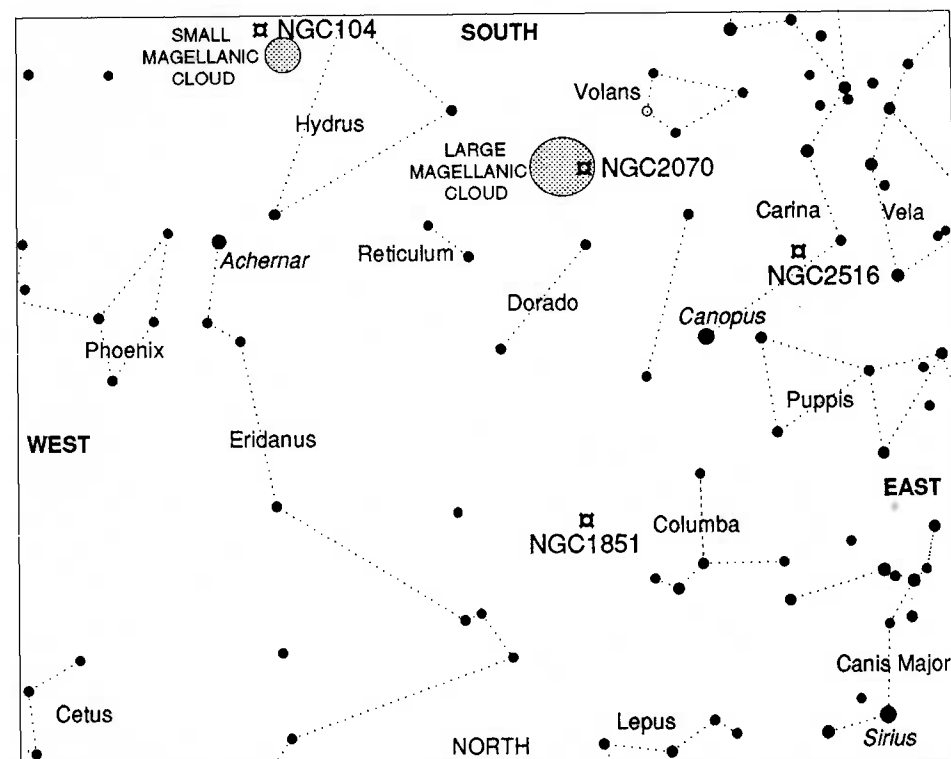
WEST VIEW



Constellations in this type Stars in this type ☐ Binocular object

NGC253 is a galaxy, the **Sculptor Galaxy**, rather like our Milky Way Galaxy, but about half its size. It should appear as a thick streak about half a degree long in binoculars, as it is viewed almost edge on. It is about 10 million light years away. You might just get a glimpse of the planet Saturn, very low in the west, before it sets.

OVERHEAD VIEW



Constellations in this type Stars in this type ☐ Binocular objects

The two major objects in this area are the **Large Magellanic Cloud (LMC)** and the **Small Magellanic Cloud (SMC)**. These are galaxies, but with an irregular rather than a spiral shape. They are satellite galaxies to our Milky Way Galaxy. The LMC is about a tenth of the size of our Galaxy - it contains about 25,000 million stars - and is 150,000 light years away. It contains a lot of stellar birthplaces, and is probably younger than our Galaxy. It was also the location of the supernova in 1987, which caused much excitement amongst astronomers (the supernova has now faded). A supernova is an exploding star.

The LMC contains **NGC2070**, the **Tarantula Nebula**, also called **30 Doradonis**. It is like the Orion Nebula, but much larger, being about 5,000 light years wide. The SMC is a bit further away than the LMC - about 200,000 light years. Very close to it in the sky (but much closer, being in our Galaxy, about 15,000 light years away) is **NGC104**, a globular cluster also called **47 Tucanae**. It is a ball of old stars, hundreds of thousands of them. Globular clusters are located in a spherical shell around our Galaxy, and can also be seen around other galaxies. Typically, young stars are in the spiral arms, while old stars are in the galactic core and in globular clusters. It is supposed to be a majestic sight, so I hope you enjoy it - I have never seen it!