

### 15.3.1 Star charts

A map of the sky at home and at the field site is essential; these maps are called star charts and they can be generated for a particular latitude and longitude, day, hour, and direction. Star charts as well as planispheres (which are round star charts with the North or South Celestial Pole in the centre) can be purchased, or it is possible to create simple charts of black stars on white backgrounds online.<sup>1</sup> The charts can be scaled up or down in angular size and include as much or little detail as desired.

In the Northern Hemisphere the North Celestial Pole is marked by Polaris<sup>2</sup>—the Pole Star. It is part of the constellation Ursa Minor—the Little Dipper. The motion of the stars over the duration of a night is due to the Earth's rotation about its axis: the stars appear to rotate around Polaris and Polaris appears not to move. When learning the night sky in the Northern Hemisphere, Polaris/Ursa Minor and the surrounding constellations are an easy place to start. While there is no convenient star that marks the South Celestial Pole, the Magellanic Clouds and the Southern Cross are often used as starting points for finding constellations in the Southern Hemisphere. Note that the Milky Way (our galaxy) is very bright in the Southern Hemisphere. The Southern Cross lies along the Milky Way with its long axis pointing towards the South Celestial Pole (see Figs 15.5 and 15.6).

p. 349 Star charts with black stars on white backgrounds are easiest to use at night. A free software program that can be used to study the night sky before going outside is ↵ Stellarium.<sup>3</sup> Though there are several other free and commercial night sky software tools (McCool 2009), I find that Stellarium produces the most accurate night sky images. The latitude, longitude, date, and hour can be changed within the program to replicate what can be seen in the sky. In addition, it is possible to pan right/left and up/down. The representation is realistic in that there is daytime, sunset, twilight, and night with progressively fading light over time. Atmospheric effects such as a marine layer haze near the horizon can be added. However, the white stars on black background are very hard to see when working outside at night in the dark, and the night mode, which converts the white to red, is not much better.