modern astronomer's conception of our Galaxy and see how it fits into the universe. Although many astronomers have contributed to the complex picture, our debt must rest ultimately with Herschel, the perceptive and diligent observer who wove the original canvas.

Structure of the Galaxy

Our Milky Way Galaxy is just one of the millions of galaxies in the universe, but it is the one galaxy we can probe in great detail, and so it becomes a standard by which we can judge others. There is, however, one unexpected drawback about our location deep inside the Galaxy; it means that we are limited to studying the sociology of its contents, rather than its large scale geography. For the latter, we must resort to observations of galaxies beyond our own, where the structure is clearly visible. Both types of observation complement each other well. Studies of external galaxies, when combined with a knowledge of the contents of our own, lead to improved understanding of the make-up of galaxies in general; and by comparing the contents of our own Galaxy with other galaxies located close by, we can build up a detailed picture of its structure.

Seen from outside, our Galaxy would look like a vast, slowly-rotating Catherine wheel or pin wheel made up of stars (Fig. 6·1). The central hub, or 'nuclear bulge', is marked by an ELLIPSOID of densely packed stars, and from it spring spiral arms, like curving spokes, threading their way through the Galaxy's disc. To an astronomer, our Galaxy is an intermediate-type normal spiral galaxy, notable only for its size.Measuring 30 kiloparsecs in diameter, and containing some 10^{11} stars, our Galaxy is bigger than most other spirals, and is classified as a giant system.

Contrary to earlier ideas, the Sun and Solar System are by no means centrally placed within the Galaxy. They lie some 10 kpc from the centre – about two-thirds of the way towards the edge – and so our view of our surroundings is rather lopsided. When we look at the Milky Way in the constellation of Sagittarius, we are facing towards the galactic centre. Here the Milky Way is at its brightest, showing how the star density increases towards the central regions. In the opposite direction (the galactic anticentre), the Milky Way in the constellation of Auriga is only faintly traceable, because we are looking straight out through the rim of our Galaxy.

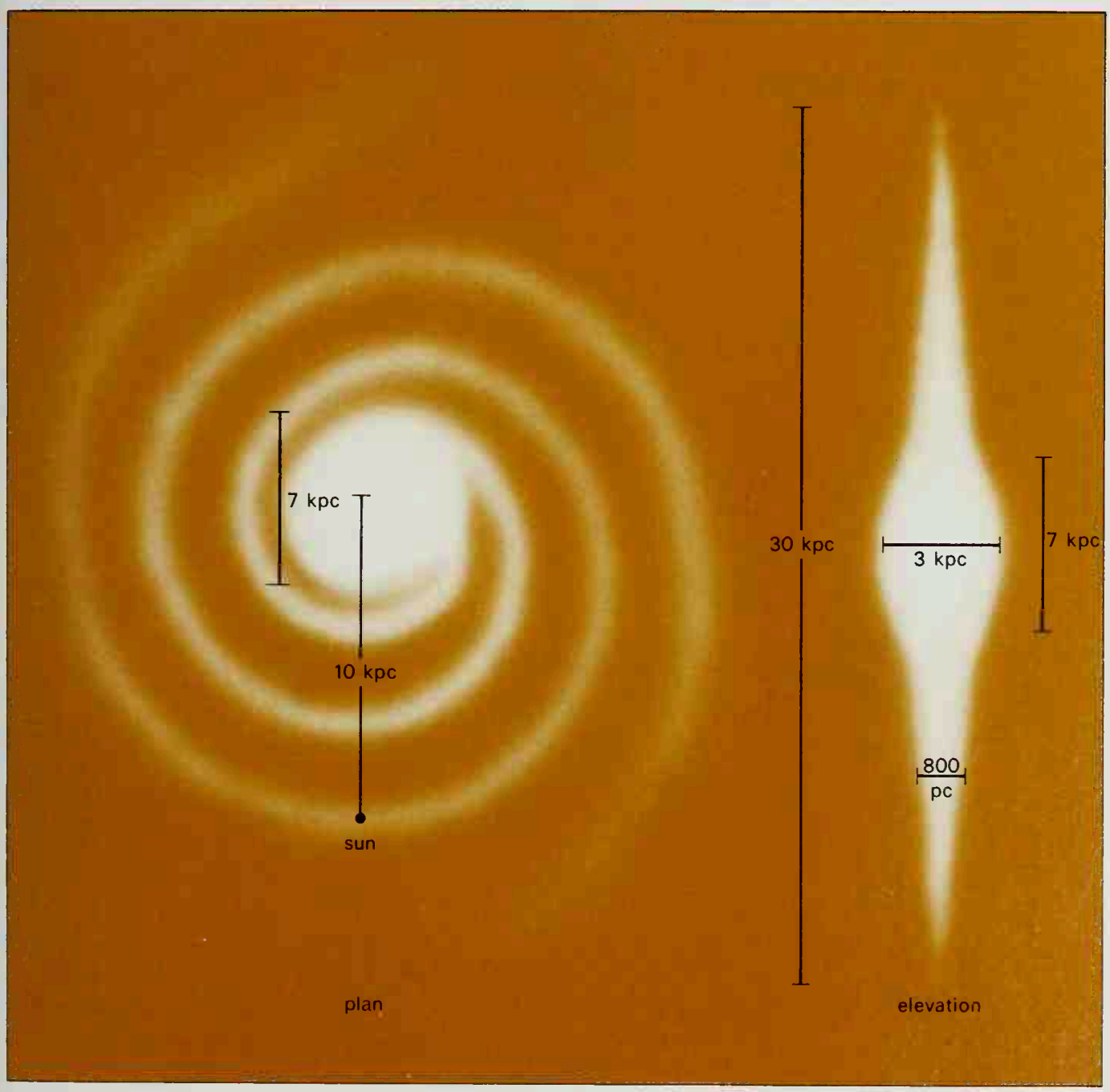

Fig. 6·1:
Our current ideas on the shape and size of our Galaxy, as seen from above (left) and edge-o.t (right).