



The luminous band of our Milky Way is seen stretching across the whole sky on this map. The detached portions, lower right, are our Galaxy's closest companions, the Magellanic Clouds.

piece of research by Walter Baade. Observing with the 100-inch (2.5 metre) telescope at Mount Wilson during the blackout of World War II, Baade was partly able to resolve the Andromeda galaxy – the nearest spiral to our own – into stars. He noticed that the disc, and spiral arms embedded therein, contained only young objects. On the other hand, the nuclear bulge, and the vast SPHEROIDAL region surrounding the entire galaxy – the 'halo' – comprised only evolved red stars, with no dust and gas mixed in to build future generations. Baade termed these objects, and the globular clusters which demarcated the galaxy's halo, 'Population II'.

The two populations – old and young – were quickly identified in our own Galaxy. Although these definitions were useful as guidelines at the outset, the classification of objects slowly became more unwieldy. Terms such as 'extreme Population I', or

'intermediate Population II' crept into the literature, and now it is recognized that there is simply an AGE GRADIENT between the outermost regions of the spheroidal halo, and the innermost plane of the disc. Clearly, this gradient is telling us how and when our Galaxy was created out of the gas in intergalactic space. Let us now trace the history of our Galaxy by examining the various objects which formed at different epochs in its past.

Formation of the Galaxy

Fifteen thousand million years ago (1.5×10^{10} years), our Galaxy, as we know it today, did not exist. It is believed that it was a huge, roughly spherical volume of gas, so tenuous that its density was only 10^{-22} kg per m^3 – equivalent to one atom in a 3 cm cube! For