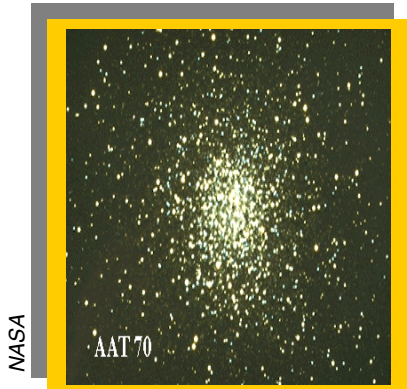


Globular Clusters

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M5 Orbits the Milky Way

Globular clusters are close groups of stars that, from a distance, resemble the puff ball of a dandelion. These clusters have had a significant role in the modern history of astronomy, as academic arguments raged about their true distances. After the turn of this century, frequent advancements in technology (such as optics, telescopes, and photography) greatly increased the data available to astronomers. But what did all this information mean?

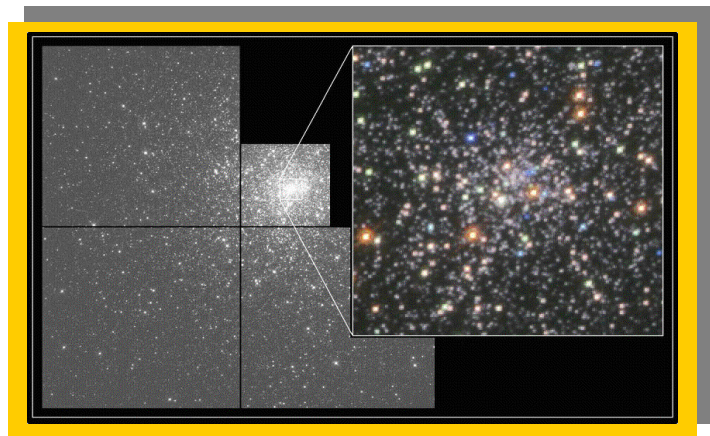
The fundamental question about any particular object in modern astronomy is, "What is the distance?" Everything depends on that. Current arguments surrounding globular clusters mirror previous arguments concerning the size of our own galaxy. Early scientists questioned whether our galaxy was the universe, or just an undistinguished part of a larger system. In many ways, this debate has

been going on for centuries. Is the Earth the only large object in the universe? Is the solar system the largest part of the cosmos? Are the nearby stars the largest part of the universe? Are there galaxies other than our own, or are we only seeing small nebulae inside this galaxy? Century after century, these debates have continued.

Finally, someone came up with a trick for determining the distances from Earth to these clusters. The details are another story, but involve recognizing a particular type of star, and knowing how much energy it ought to be emitting. If you see a light in the distance, but you don't know if it is a lit match, or a car headlight, or an IMAX movie screen, you just can't tell how far away it is. If somebody tells you that it is a car headlight, then you can guess the distance.

In a similar way, it was finally determined that many of these globular clusters were actually outside of our galaxy, and that our galaxy was really much bigger than anyone had originally thought. These calculations laid the groundwork for determining that there were other galaxies that were just as big or bigger than ours.

Globular clusters are balls of thousands and hundreds of thousands of some of the oldest stars in our galaxy. They are fairly clean of **interstellar gases**. Many globular clusters have a core containing a group of unusually young and massive stars called blue stragglers. There are enough stars in a globular cluster that they are gravitationally very stable and move as a unit, without being pulled apart. Globular clusters are much smaller than galaxies (which have hundreds of millions of stars). They form part of the spherical halo surrounding most galaxies, including the Milky Way.



M15 Globular Cluster

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The large orbits of these clusters of stars bring them far out in the galactic halo most of the time, like a swarm of bees, thousands of light-years away. Only occasionally do they move through the plane of the Milky Way, making for good viewing of these tightly-packed "galactic suburbs" from Earth.