

Offered Title: Why do Stars Cluster?

Remember school dances? Or, perhaps you go to school dances now. Either way, as I recall, when not dancing everyone would tend to gather into clusters. Each cluster seemed composed of similar kids, or at least kids with similar interests.

Stars don't go to dances but they do tend to be clustered with other stars having similar characteristics. Why?

Do I need to say it? Yes, it's about gravity, but why are the stars so similar?

From a previous article remember that most stars are born in molecular clouds such as M42, the Orion nebula. This hydrogen rich environment is vast and gravity condenses the hydrogen into a bunch of stars at one time, like a litter, a big litter! This litter can be composed of dozens to a few thousand stars. These litters are called open clusters. Think Pleiades. Many of the newly born stars are massive enough to have relatively short lives (tens of millions of years), but most clusters also contain lower mass stars that will live long, like our Sun. The more massive stars tend to be so hot that they disperse much of the hydrogen used in forming nearby proto-stars, resulting in the lower mass stars.

The cluster's hot stars eventually blow off the immediate hydrogen cloud and the cluster is ready for action, and viewing by us. Open clusters are weakly bound gravitationally so they drift apart after only a few hundred million years. Long ago our Sun was a star cluster member, but no more. Astronomers are still trying to figure out who the other members were...if they still exist.

Open clusters aren't the only clusters in town however, what about globular clusters?

Globular clusters are spherical collections of hundreds of thousands, even millions of stars...old, decrepit stars...way older than our Sun. They typically look like a round, speckled fuzzball in the telescope and in photos. So, why are they so big, and spherical? Oh, and why so old? How they formed is speculative but some think they formed around the same time as galaxies, about 13 billion years ago, old! The thinking is that molecular clouds were way more extensive then, so the clusters formed were much larger, and denser. With so many stars packed together, their total gravitational attraction was sufficient to arrange them in a spherical shape. Neat thing, most large galaxies have hundreds to thousands of globular clusters, and they revolve around the halo of their galaxy, in a spherical formation.

In 2005 astronomers discovered a variation on globular clusters they call Extended Globular Clusters. Bigger, but less dense.

Unlike kids at school dances, stars are born in clusters. Some clusters evaporate, some stay together, kind of like people.

What's in the Sky?

We have a full Moon on 03/12. Look to the east on 03/14 after 9 pm. The waning gibbous Moon, Jupiter, and bright star Spica (in Virgo) make a nice pattern.