Age Of Stars Clusters

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Pre-Lab Assignment

1. The article linked above describes how to determine the age of stars in a star cluster. In your own words, how does this work?

Answer:

This is a supporter of the most basic and interesting issues in space science. Basically, it is hard to tie an individual star's age. It has taken stargazers most of this century to deal with the life cycles of stars, essentially in light of the fact that we can't live adequately long to complete a solitary star its life cycle. Be that as it may, in several distinct cases, most stars had looked the same as they do now since before individuals began looking at the sky. Be that as it may, stars move astoundingly in their physical characteristics. Some are a million times more brilliant than the Sun; others are a million times less shining. A couple, for instance, the Firearm star, are as vast as the World's circle; others are as meagre as a city.

2. In which constellations would you look to find the Pleiades and 47 Tucanae?

Answer:

47 Tucanae is a remarkable pack, the second brightest globular in the sky, and easily recognizable, with its unmistakable eye in the far southern star gathering Tucana, the Toucan. You can imagine that it's just two or three degrees west of the Little Magellanic Cloud. It's one of the closest bundles to the Sun: just 14,700 lightyears away. This star bundle crosses a district as broad as the full moon. All like the brighter Omega Centauri globular bundle, 47 Tuc appears to be more idea closer significantly. Through an 8″ or greater telescope, its inside seems to devour like fire. Steven James O'Meara says seeing 47 Tucanae through a telescope looks like "exposure away from home a geode along with suspect that it's stack with gold clean."

3. Suppose Star A has a colour index of -3 and Star B has a colour index of 2. Which star is hotter? Explain your answer.

Answer:

Intense and burning stars appear to be pale blue than cool stars. Colder stars are rosy than all the more sweltering “stars.” The “B-V shading list” is the technique for estimating using two unmistakable channels; one of the stars is pale blue (B) channel to solitary allow confined extension to utilize or signal length from side to side focused on the blue tones, notwithstanding a delineation channel to select gives the motion length a shot on close to the “green” in addition to “yellow” force completely through. The more sizzling stars have a “B negative” shading list close to “0” either Two fold negative, however cool stars have “B negative” shading record almost 2.0. Distinctive stars are somewhere in the centre. Here are the ways to choose the B-V shading record.

4. Why is it acceptable to use apparent magnitude in place of luminosity when the stars are in a cluster?

Answer:

Each one of the stars is in a gathering shape at about a comparable time. Along these lines, on the off chance that we look at a gathering, we see a pack of stars who are all a similar age. Regardless, the on-screen characters don’t all have a comparable mass: most have a tendency to have masses that are not absolutely the Sun’s, yet a couple may be altogether more tremendous. (Cacciari & Sandage, 1990; Palla & Stahler, 1999)

One inspiration to center around bunches is the essential reality that each one of the stars are for all intents and purposes a comparable partition a long way from us. That infers that their obvious splendour (or size) is almost on a standard with their incomparable sparkle (or degree). That is, the stars in the gathering, which have every one of the reserves of being brightest, are to a great degree the best; the stars in the bundle which emit an impression of being dimmest are truly exuding the base radiation. The complexity between the exact degree and the out and out size, the gathered partition modulus, is the same for each one of the stars in the bundle.

Post-Lab Assignment

1. Copy and paste your completed CMDs for the Pleiades

and 47 Tucanae clusters. What are the respective turn-off points?

Answer:

The shading degree layout of the globular gathering 47 Tucanae is overplotted with isochrones of various ages.

2. Qualitatively, by examining your CMDs, which cluster is older? How can you tell?

Answer:

The shading degree layout (CMD) for the open star gather NGC 6087 is indistinct from the H-R diagram for stars all around. Note that most stars lie on the principal gathering, not a lot of have grown “away” from the early progression. S Nor is a yellow supergiant individual from the gathering. In all actuality, it is a throbbing Cepheid variable star.

3. Copy and paste your completed plot of a colour index and log (lifetime).

Answer:

The partitions to star bundles like NGC 6087 and NGC 6830 can be evaluated, every now and again to better than 4%, by fitting a customary essential progression to the obvious little stars in the gathering.

4. As determined by your colour index and log(lifetime) plot, approximately how old are the Pleiades and 47 Tucanae clusters, respectively? Explain your work.

Answer:

In case we confide in our speculative models of stellar advancement, by then we can use these theoretical HR charts to choose the age of a particular cluster of stars. We differentiate the watched HR diagram from the speculative chart, giving cautious thought to the upper end of the key gathering.

The essential progression side street occurs at a shade of about (B-V) = – 0.1; that is blue and means there are some massive, hot, proficient stars. By and by, on the off chance that we look at a movement of stellar models of different ages, we see that amazingly energetic bundles join all the more smoking, bluer, all the more serious people, while old bunches don’t have any blue stars whatsoever:

By plotting the watched tones and degrees together with speculative models, and scanning for the best match, we can evaluate the age of the group..

References

Cacciari, C & Sandage, A. (1990).The absolute magnitudes of RR Lyrae stars and the age of the galactic globular cluster system. Astrophysical Journal, Part 1 (ISSN 0004-637X), vol. 350, Feb. 20, 1990, p. 645-661.

Palla, F., & Stahler, S. W. (1999). Star formation in the Orion Nebula Cluster.The *The Astrophysical Journal, Vol,525*, Number 2, pp # 772-783