The apparent age of the time dilated universe—explaining the missing intracluster media in globular clusters

Ronald G. Samec*

In creation time dilation cosmologies (e.g. Humphreys and Hartnett), while the earth experiences less than 10,000 years of recorded history (God's time clock), millions, and possibly billions, of years pass in the distant universe. In these models, one of the major questions is "What is the maximum apparent age that should be used to characterize the universe?" Should we accept the apparent age of the universe of 13.82 x10^9 years as determined by the European Space Agency based on the recent *PLANCK* space telescope results?[1,2] As mentioned in the previous paper by the author,[3] astronomical dating schemes are corrupted by the assumption that the age of the sun is 4.57 x 10^9 years. I call this the Solar Age Condition (SAC). This age is determined from radioisotope ages of 'primordial meteors'. We now know that RATE results completely discredit this age. *We are no longer bound to accept the pronouncements of the evolutionary cosmological community.* Therefore, we seek alternative *Natural Chronometers* such as Humphreys' spiral wind-up time or helium diffusion rates! Our quest is to find natural reference clocks (NRCs) like Newtonian orbital periods, the speed of light, and other well-known, well-observed physical rates or frequencies accepted by scientists, worldwide, to determine the apparent age of the time dilated universe.

Globular clusters (GCs), are spherically shaped rich assemblages of stars (usually 50,000 to millions of solar masses) that orbit their galaxies at random inclinations and eccentricities, much like comet orbits in the solar system. One of the best examples of globular clusters in the northern hemisphere is M13, located in the *Keystone* asterism of the constellation of Hercules (figure 1). A much larger assemblage is found in the southern skies, denoted Omega Centauri because it appears as a star to the unaided eye.

GCs roughly form a spherical distribution component in the galaxy, which is called the Halo. GCs are red (high colour index), high-velocity population II or 'POP II' objects. POP II objects include novae, RR Lyrae stars, and red giants, as well as GCs. They are not associated with dust and gas, as are the Pop I objects which make up the disk of the galaxy. They have a 'metalicity' of less than 1% (metalicity is the abundance of elements more massive than helium). Population I and II objects differ in their orbits. POP I objects are disk population objects (figure 2).

GCs are readily seen in images of spiral and elliptical galaxies as what appears to be still images of stars 'swarming' about the galaxy like fire flies. Of course, individual stars cannot be seen at this distance, but the GCs, made up of many thousands of stars in a compact arrangement, are clearly visible. Observations of these objects reveal they are true to their specified population. They are clear of intracluster medium (ICM); that is, dust and gas.

A major problem is easily identified. Individual stars, as they age, blow off stellar winds of gas and dust. Therefore, GCs as well as their 'twins', the dwarf spheroidal galaxies that orbit as companions to their parent galaxies, should accumulate dust and gas steadily from these winds. ICM should accumulate in the clusters. But both objects are POP II. There is a physical inconsistency here. It is hypothesized that these clusters regularly purge their ICM by crossing the dense galactic disk. According to Moore and Bildsten (M&B), the "most robust mechanism for clearing ICM is *ram pressure stripping* during disk crossings".[4] This is proposed as the primary means that the GC remains a POP II object. But this plane passage occurs about every 10^8–10^9 years! Our NRC here is derived from the well-known Newtonian/Keplerian orbital equation,

$$P^2 = \frac{a^3}{M} \; ,$$

where P is the orbital period, a the orbital semimajor axis and M is the central mass. From this, we find that crossings are too far and few between! In the meantime, between disk crossings, the ICM is accumulating, and, on the average, most of the galaxies' globular clusters should have much gas and

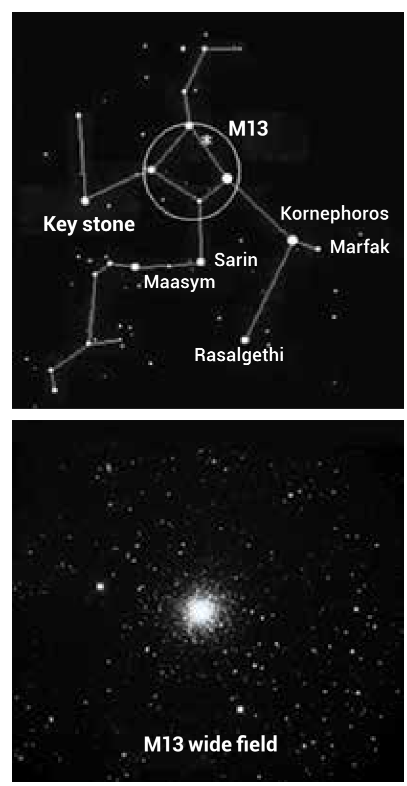

Image: Bill Snyder

Figure 1. M13 is a prominent globular cluster found in northern hemisphere skies in the constellation of Hercules in the 'Keystone' asterism.

*Astronomy Program, Bob Jones University

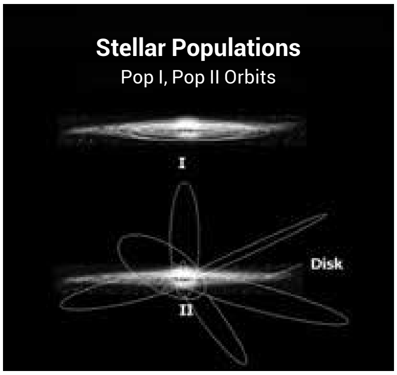

Figure 2. Population I and Population II objects differ in their orbits. Pop I objects are largely disk population while Population II objects form the Halo of spiral galaxies.

dust, in disagreement with their POP II status! What do the observations tell us? Infrared Spitzer observations place upper bounds on dust masses 10–100 times lower than expected,[5] exactly like its POP II counterparts. M&B summarize the problem:

> "Observations of the intra-cluster medium (ICM) in galactic globular clusters (GCs) show a systematic deficiency in ICM mass as compared to that expected from accumulation of stellar winds in the time available between galactic plane crossings."

Globular clusters should have much higher dust and gas accumulations than observed. Where is the missing ICM in globular clusters? M&B try to solve this major problem by further hypothesizing that globular clusters lose their ICM by outflows from outbursts of classical novae in the cluster.

What are classical novae?

A classical nova is a binary star consisting of a white dwarf (a compact core from a star that has lost its atmosphere) and a normal star companion which has filled its critical surface (called a Roche lobe) and is streaming gas (hydrogen) toward the white dwarf (WD). The stream spirals in and creates a disk of gas. As the disk increases in density, the stream collides with the now opaque disk and produces a hot spot. The inner disk eventually funnels the gas onto the surface of the WD and accumulates hydrogen gas on it. The temperature of the gas rises as the pressure increases and eventually the hydrogen ignites in a thermonuclear runaway—a nova outburst occurs. This causes a fast outflow of gas at about 1,000 km/s.

The rate of occurrence of novae outbursts in a GC is quite variable and is not well known. M&B assumed a rate of 20/year/10^{11} solar masses in the cluster. Further study shows more massive clusters will have a clearing problem due to 'runaway' accumulations to ICM between novae outbursts—their clearing mechanism seems only to work well in low-mass GCs. Their hopeful remark is, "A very robust mechanism to clear the ICM is Type Ia Supernovae." Of course we have been discussing novae here and not *super novae*! Super novae are some 11 magnitudes brighter than novae and eject matter at 10,000 km/s! Certainly super novae *would* help things along, but they are very, very rare indeed! They are 500 times rarer than M&B's assumed rate! In a recent study of the occurrence of type 1a supernovae in GCs, not a single SN1a supernova was found to have occurred in any of the 36 clusters studied in the archival observations![7]

Creation perspective

If the ICM is 1/10 to 1/100 the amount expected, as determined by the observations, and plane crossings are 10^8–10^9 years apart, our NRC gives a range of age limits of the globular clusters of only 10^6–10^8 years, similar to the apparent (time dilation) age predicted for spiral galaxies to wind up and lose their 'spiralness' (see Humphreys[8]). This is much less than the 13.82 x 10^9 years given by cosmologists for the age of the cosmos (100th to 10,000th of this age!). A simpler explanation is that clusters have not been orbiting long enough to accumulate much ICM! We have other evidence that the universe is young, and that the actual age in 'earth time' is only about 7,000 years. This means that GCs actually have only $1/10^3$–$1/10^4$ times the expected amount of ICM so they would fulfill their POP II status quite well.[9] According to these considerations and to Scripture, the apparent age of the cosmos is much lower than the 'astronomical' age assumed by the cosmologists: "For in six days the LORD made heaven and earth, the sea, and all that in them is, and rested the seventh day" (Exodus 20:11).

References

1. www.esa.int/Our_Activities/Space_Science/Planck/Planck_reveals_an_almost_perfect_Universe.
2. We suspect that the main reason that the results of *PLANCK* are very different than those of *COBE* and *WMAP* is the fact that the fits now include *gravitational lensing*. This change is due to a major embarrassment and oversight of previous science teams. See Samec, R.G., No sign of gravitational lensing in the cosmic microwave background, *J. Creation* **20**(20):3, 2006.
3. Samec, R.G. and Figg, E., The apparent age of the time dilated universe I: gyrochronology, angular momentum loss in close solar type binaries, *CRSQ* **49**(1):5–19, 2012.
4. Moore, K. and Bildsten, L., *Astrophysical J.* **728**:81, 2011.
5. Barmby, P., Boyer, M.L., Woodward, C.E., Gehrz, R.D., van Loon, J.Th., Fazio, G. G., Marengo, M. and Polomski, E., *Astronomical J.* **139**:207, 2009.
6. Some 500 x 10^6 years. See Humphreys, D.R., Evidence for a young world, www.icr.org/article/1842/, accessed 8 May 2013.
7. Washabaugh, P.C., Bregman, I.N., The production rate of SN Ia events in globular clusters, *Astrophysical J.* **762**:1, 2013.
8. The mass I refer to is the density of intercluster dust and is determined from reddening (scattering) and other information from X-ray and IR spectra (Spitzer gives and upper limit here). I have no reason to doubt this. The rate of production of ICM at current estimates of stellar winds an outflows is certainly tied to an evolutionary time scale via the 'solar age condition' as are all aging derivations in astronomy (applied to all stars via standard evolution through use of the HR diagram).
9. This kind of scaling relation from the actual (creationary to evolutionary) is what the whole project is about. Is the apparent age of the universe ~14 x 10^9 years as calculated by current astronomical thought or some other value? Here we have estimated the quantity to be 100th to 1,000th of this age which is on the same order as Humphreys' spiral wind up ages. As I study various other astrochronometric phenomena, I will try to hone in on the apparent timescale for the universe or a 'scaling relation'. For example, the apparent age of the universe may be '1/500th' that estimated by the evolutionary community. But it is too early to make the call.