

Are EGGs all they're cracked up to be?—a closer look at star formation

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Proplyds are tadpole-shaped objects in the Orion Nebula but they have now also been reported elsewhere.² They are supposed to be solar systems in formation with a central star and disk all enveloped in a tadpole-shaped cocoon. These are thought to be in agreement with long-standing nebular hypotheses. They are sometimes termed stellar wombs. These 'protective' wombs are believed to contain a newly born star with a disk surrounding it within which planets are forming.

However, in a recent study which examined such objects in the Carina star-forming region, it was found that they may simply be the leftover dense knots of molecular gas clouds ravaged by UV radiation by nearby hot O-B stars (O-B stars are the hottest of the spectral types, with surface temperatures of 25,000–50,000 K) and associations.^{3,4} The new term for these UV-torn gas clouds is 'Evaporating Gas Globules' or EGGs.

"EGGs are most likely the surviving high density concentrations in a cloud as the ionization front sweeps through it.

"... EGGs are unique probes of the effects of the harsh UV radiation and the strong stellar winds from massive stars ...

"... it is likely that the true nature of many or all of these objects has been misunderstood, and that some (or even all) of the previously classified proplyds in Carina, especially those which are

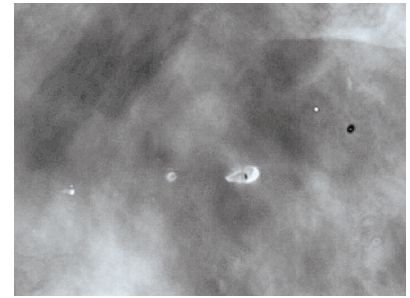


Figure 1. Proplyd, APOD, 1994 H.

significantly larger in size than the Orion proplyds, are really free EGGs [free floating EGGs]."³

It may well be that these EGGs will continue to evaporate and nothing will result as the nearby stars continue to erode these masses. Instead of stars and planets, we may have just free-floating atoms. I suggest that the Orion objects are small and more eroded complements of the ones studied here.

This is a major result that bears on the very important question as to whether star formation is occurring in the universe. This has implications for creation models of the cosmos. If stars form, and at a rate to generate new generations of stars, then the time dilation cosmologies are on the right path and others are suspect.

References

1. Astronomical Program, Bob Jones University.
2. Smith, N., Bally, J., Shuping, Y., Morris, M. and Kassisi, M., Thermal dust emission from proplyds, unresolved disks, and shocks in the Orion Nebula, *Astronomical J.* **130**:1763, 2005.
3. Sahai, R., Gusten, R. and Morris, M.R., Are large, cometary-shaped proplyds really (free-floating) Evaporating Gas Globules? *Astrophysical J. Letters* **761**(2), L21, 2012.
4. Molecular gas clouds may be quite massive; 10^3 – 10^7 times the mass of the sun, and some even 15–600 light-years in diameter.