Conference 8865: Instruments, Methods, and Missions for Astrobiology XVI,
Aug. 27, 2013, San Diego, CA, USA

New Cosmology Requires Life on Cosmic Scales

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ABSTRACT

Without modern fluid mechanics to inform cosmology theory, the formation of life is virtually impossible. Dark-energy cold-dark-matter hierarchical-clustering (ΛCDMHC) models are much too slow and oversimplified to produce the early planets and stars and vast array of homogeneous life forms on cosmic space and time scales inferred from observations. Hydro-gravitational-dynamics (HGD) cosmology predicts viscous fragmentation of the primordial plasma to form proto-super-cluster voids at only 30,000 years (10^{12} seconds) following the big bang, with baryonic density matching (and explaining) the constant density ρ_0 of globular star clusters observed in all present galaxies as a persistent fossil of the event. At the plasma to gas transition time 300,000 years (10^{13} seconds) plasma-proto-galaxies fragmented with size and morphology set by the expansion rate, the large photon-viscosity, and the (weak) turbulence of the plasma. The proto-galaxies fragmented in 10^{12} seconds to Jeans mass clumps of a trillion earth-mass planets on transition to gas, which host the formation of stars, supernovae, hot water oceans, and the formation and distribution of life in a biological big bang beginning at 2,000,000 years when water condensed, and slowed at 8,000,000 years when water began to freeze.

Keywords: Cosmology, star formation, planet formation, extraterrestrial life.

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1. INTRODUCTION

Rapid advances in space telescope technology are now resolving questions that have troubled cosmology and biology for thousands of years. Where did life come from? Where did the universe come from? Because cosmology determines the conditions for life to form, the 2011 Nobel Prize in Physics is falsified by the existence of extraterrestrial life (and terrestrial life) without miracles. The generally accepted concept that life is confined to Earth is falsified by an abundance of life-infested-meteor evidence supporting the Gibson (1996) and Schild (1996) Hydro-Gravitational-Dynamics (HGD) cosmology, which predicts a Biological-Big-Bang at 2 Myr and supports the long-standing, and much-maligned, Hoyle-Wickramasinghe thesis of cometary-panspermia. From HGD cosmology, 10^{25} m voids fragmented at 10^{12} s between super-proto-galaxy-clusters and 10^{20} m voids fragmented at 10^{13} s between proto-galaxies during the plasma epoch from large photon-viscous forces and weak fossil-big-bang-vorticity turbulence, all neglected by ΛCDMHC cosmology.

At the 0.3 Myr plasma-to-gas transition, the kinematic viscosity ν decreased by a factor of 10^{13} and the fragmentation scale decreased from galaxy-mass ($\sim 10^{43}$ kg) to ~earth-mass (6×10^{24} kg). All the hydrogen and helium produced by the big bang became hot-gas-planets in Jeans-mass-clumps of a trillion planets, from which globular star clusters result if all the planets of the PGC clump have merged to form stars. These planet clumps are termed Proto-Globular-star-Clusters (PGCs). Instead of merging, most of the 10^{80} planets in the $\sim 10^6$ PGC

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clumps per galaxy have now frozen solid and persist in metastable equilibrium as the galaxy dark matter. They hosted life in its beginning, as millions of chemical reactions evolved in competition for the carbon produced by the exploding first stars. Because the planets constantly merge, information about the evolution of organic chemistry and life is shared and homogenized.

Initially the planets were hot hydrogen and helium-4 at ~3000 K, a temperature that exceeds the boiling points of stainless steel and rocks. The condensing rock gas formed the persistent spherical condrule rain-drops seen in many meteorites. Dark matter planet binary mergers produce larger planets and eventually the first stars, as well as most of the lowest frequency energy detected in the cosmic microwave background (CMB). Evidence of extraterrestrial life is overwhelming and continues to accumulate, Pflug and Heinz (1997), Engel and Macko (2001), Hoover (2011) among others. A summary of Wickramasinghe-Hoyle cometary panspermia evidence and theory is given in Volume 16 of the Journal of Cosmology (http://journalofcosmology.com). Fluid mechanics and HGD cosmology vindicate cometary panspermia in complete detail (Volumes 15 - 22). Life is virtually impossible, intermittent, and localized according to the standard ΛCDMHC cosmology, as shown in Figure 1 from Adam G. Riess (2006, fig. 1) in his Shaw prize lecture. Conversely, according to HGD-cosmology, life is inevitable, homogeneous, and exists everywhere on cosmic space and time scales.

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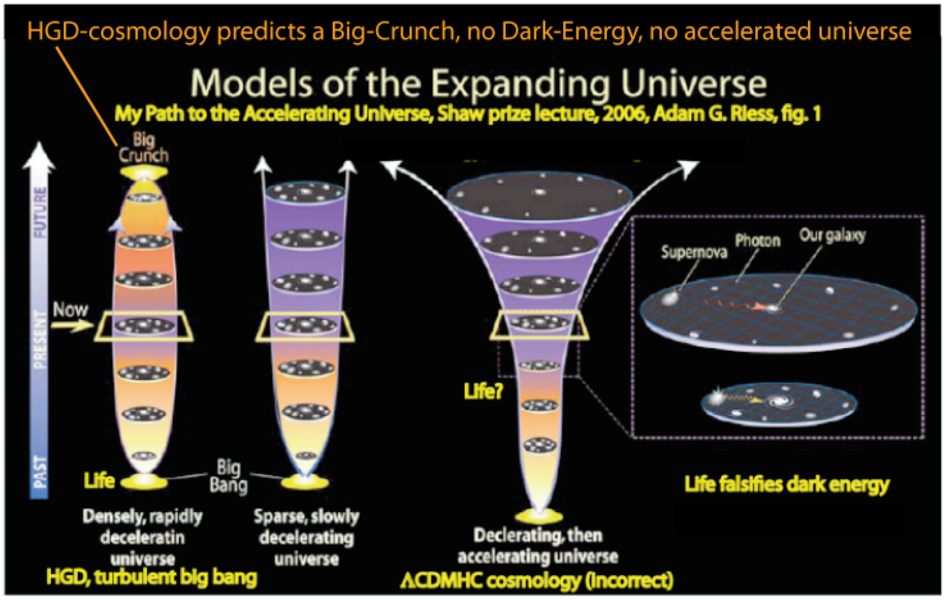

Figure 1. Models of the expanding universe, Riess (2006) fig. 1, comparing HGD cosmology (left) to ΛCDMHC cosmology predictions (right). Dark energy and the accelerated expansion of the universe are falsified by the existence of life, Gibson (2011), Gibson and Schild (2011).

Life anywhere fails in the standard CDM model because CDM structure forms slowly as small (~10^{36} kg) plasma-epoch CDM (physically impossible) condensations hierarchically cluster HC to form massive CDM halos into which the baryons (the hydrogen and helium) are assumed to gradually fall and condense. The first star appears only after 300 Myr, and the first planet even later. Temperatures by this time are < 30 K. Even if life were to form, it would be rare and local, with no means of transportation on a cosmic scale. The probability of life formation is trivial following ΛCDMHC cosmology, with impossible transportation problems. From HGD cosmology life is inevitable, with its transportation and mixing on cosmic scales assured.

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Life succeeds in HGD cosmology for fluid mechanical reasons, starting with the big bang. The Einstein cosmological constant Λ is needed during the big bang to supply the enormous (-10^{113} Pa) anti-gravitational negative stresses required by the small Planck length 10^{-35} m, Gibson (2004, 2005).

Figure 2 illustrates the mechanism. Turbulence is defined by the inertial vortex force, and always cascades from small scales to large as shown. Powerful vortex-force “dark-energy” extracts mass-energy from the vacuum as a gas of Planck particles and anti-particles, according to Einstein’s general relativity theory. Much larger negative stresses occur from gluon viscosity forces at 10^{-27} seconds, leading to inflation, Gibson, Schild and Wickramasinghe (2011). The signature of Big-Bang-Turbulence spin is found at the largest scales of the cosmic microwave background signals CMB from the space satellite WMAP-5 observations, Gibson (2010), and in the unexpected “axis of evil” Schild and Gibson (2008) and the Rudnick et al. (2008) WMAP cold spot.

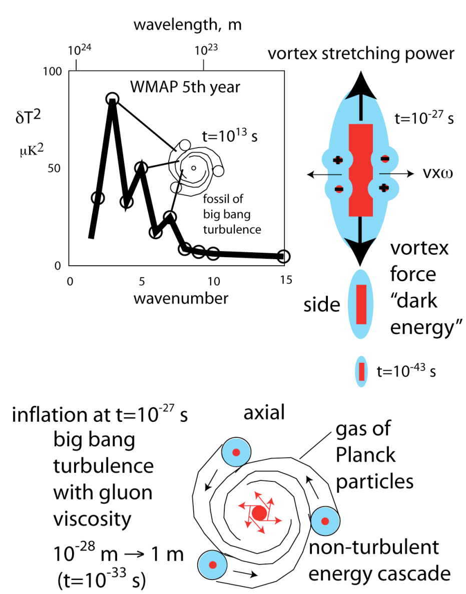

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Figure 2. HGD mechanism for extracting mass-energy from the vacuum depends on turbulent combustion at Planck scales, which is highly irreversible and temporary, Gibson (2004, 2005). Negative stresses are supplied by stretching turbulent Planck-particle-gas vortex lines. No permanent "dark energy" is needed. The cosmological constant Λ is zero. The intrinsically spinning mechanism of the big bang is preserved by the axis of evil, Schild and Gibson (2008).

The theory of planet fragmentation is reviewed in the following Section. Key observations are shown, followed by some Discussion and Conclusions.

2. THEORY

The key to understanding how life appeared in the universe is to understand how early the planets appeared and how very, very, many there are. Rather than 8 planets per star there are about 30,000,000. All these formed hot 300,000 years after the big bang, not 300,000,000 years. Only a few came from stars. Planets come from proto-galaxies, which fragmented entirely into planets at the plasma to gas transition. One must recognize the importance of the kinematic viscosity ν to gravitational structure formation. At the beginning of the gas epoch all conditions were well known. The density ρ and rate of strain γ were preserved as turbulent fossils with the values (γ_0, ρ_0) existing at the time of first fragmentation 10^{12} seconds. The composition was that of the primordial gas, 75% hydrogen and 25% helium-4, so the kinematic viscosity is easily computed from the temperature of plasma to gas transition 3000 K. From HGD cosmology the viscous gravitational scale $L_{SV} \sim (\gamma\nu/\rho G)^{1/2}$ was about 10^{14} meters because γ_0 was 10^{-12} s^{-1} and ν was

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10^{13} m^2 s^{-1}, with ρ_0 10^{-17} kg m^{-3}. Thus the mass of fragmentation L_{SV}^3 ρ_0 was 10^{25} kg, or approximately one earth mass. The Jeans mass was a million solar-mass, or about 10^{36} kg. All the ordinary baryonic mass of the universe was thus converted to gas planets at the time of transition 10^{13} seconds. These clumps of a trillion planets appeared before any stars, and were the raw material of the first star in a gravitational free fall time of 10^{12} seconds after transition at 10^{13} seconds.

Many of the merging planets will have evidence of the first planets seeded by supernova chemicals from the first exploding stars. Iron cores of planets like Earth suggest the reducing hydrogen atmospheres of the primordial gas planets. Condrule rocky-rain-drops found in many meteorites require extremely high temperatures ~3000 K of HGD cosmology planets not seen in interstellar regions where planets are formed with stars in standard models, proving stars existed promptly after the hot planets were formed. Condrule properties are shown in Figure 3 below, and in Fig. 7.

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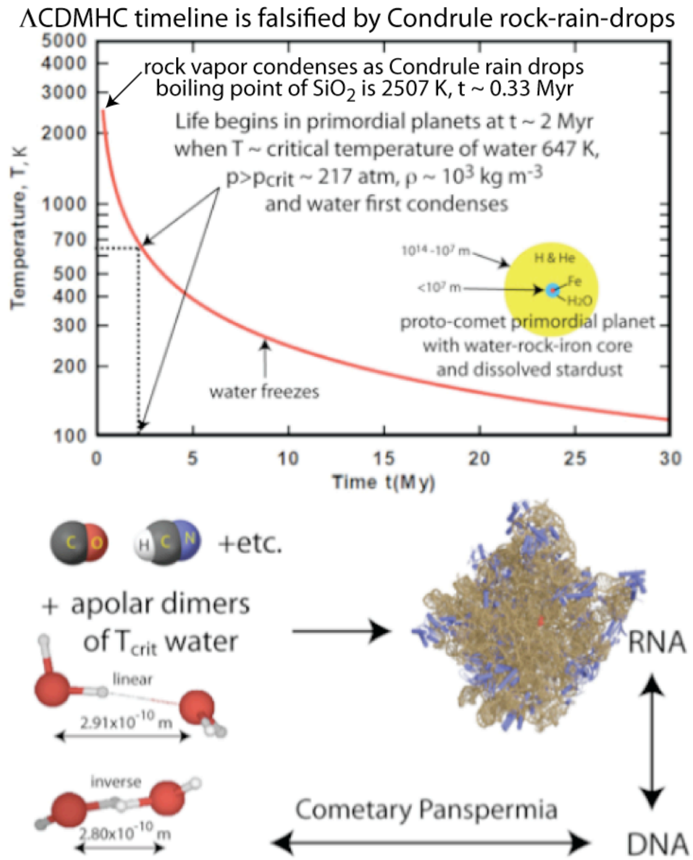

Figure 3. Formation of rock-rain Condrules and iron-nickel planet cores require first stars and supernovae before t ~ 0.33 Myr according to HGD cosmology, which falsifies ΛCDMHC where the first stars appear after ~ 300 Myr. Life requires water, Gibson et al. (2011ab). The first oceans condense at 2 Myr when the universe temperature matches the critical temperature of water 647 K. Critical temperature water is apolar, so abiotic materials of organic chemistry like carbon monoxide and hydrocyanic acid can easily dissolve. Stars form by mergers of planets in their PGC clumps. Stars die from overfeeding of stars by planets. Supernovae spread oxides to the planets, which are reduced by hydrogen atmospheres of the planets to form deep-water oceans and iron-nickel rock-coated cores and condrule rock-rain-drops. Complex self-replicating, auto-catalyzed, organic chemicals (life) such as RNA and DNA molecules

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evolve until 8 Myr when the planet oceans freeze, Gibson, Wickramasinghe and Schild (2011a).

As shown in Fig. 3, evolution continues after 8 Myr in submerged ocean layers, but at a reduced rate. Information about the millions of possible organic chemical reactions, as well as progress toward the most competitive living organisms, proceeds among the 10^{80} primordial gas planets in their PGC clumps. Within the clumps, information is shared by planet mergers from which stars are formed. Between clumps, information is shared by supernovae. Between galaxies, information about life and organic chemistry is shared by the powerful jets of active galactic nuclei. The density then was a million times what it is now. The maximum number of planets with temperatures perfect for the evolution of intelligent life as we know it on Earth occurred at 5-10 Myr. With so many eligible planets, both life and intelligent life were not only possible, but inevitable. Information about the earliest evolution is presumably locked in the DNA of extraterrestrial life that rains on the Earth in tons per day. The first place to look for communications from the earliest intelligent life is clearly in the DNA of extremophiles capable of surviving to tell the story of organisms with the technology and intelligence to lock it there.

3. OBSERVATIONS

The most telling observations about the galactic dark matter and dark energy are those from the Helix Planetary Nebula (PNe), shown in Figure 4 in both the optical and infrared frequency bands. Helix is the nearest PNe to Earth, and

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serves as a generic example of star formation from planets, galactic dark matter, interstellar life, and a clear counter-example to dark energy for HGD cosmology. The central white dwarf is surrounded by evaporating dark matter planets that may (or may not) dim the supernova event, resulting when the white dwarf mass exceeds 1.44 M_{SOLAR} by over-eating planets Dark energy is thus a systematic dimming error.

Another observation falsifying the concept of cold dark matter is Rudnick et al. (2008), showing radio telescope detection of a 10^{25} m supervoid. Such a large void could not possibly form in the context of ΛCDMHC cosmology, where voids are the last features to appear, rather than the first as predicted by HGD cosmology. From HGD cosmology, density minima near protosuperclusters begin to grow at near light speeds starting 10^{12} seconds after the big bang, at the time of first fragmentation.

Journal of Cosmology (2013), Vol. 22, No. 19, pp 10247-10266.

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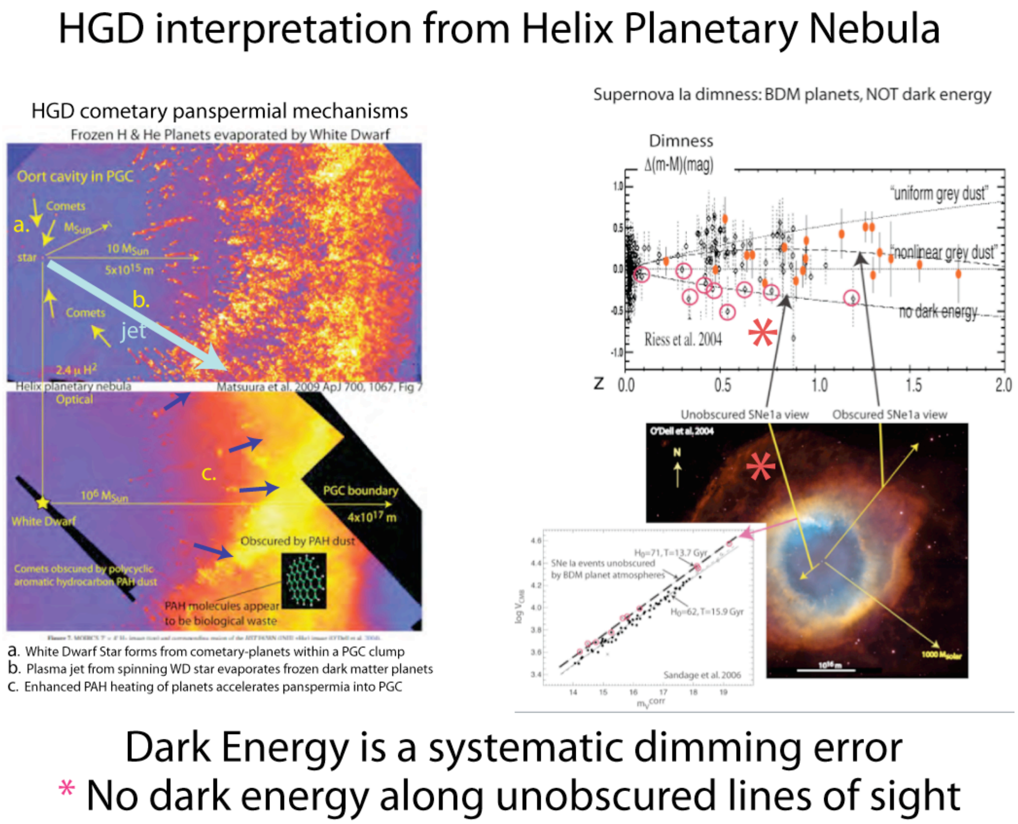

Figure 4. Helix planetary nebula and the dark energy hypothesis. A white dwarf star is at the center, which partially evaporates Oort cavity planets by a powerful plasma jet. Optical images (bottom left and right) are obscured by PAH dust formed when planets with life are fried by the jet (blue arrow). An infrared image from Spitzer space telescope (upper left) reveals thousands of PFP planets of our Earth-PGC, partially evaporated by the jet. Proto-comets of cometary panspermia can be seen moving toward the star, feeding it to supernova Ia mass of 1.44 solar. If the supernova line of sight is unobscured by any planet atmosphere (asterisks, top right) then no dark energy is indicated. Thus, dark energy is a systematic dimming error.

The concept that dark energy exists and drives the accelerated expansion rate of the universe depends on the assumption that nothing could dim supernova Ia events other than distance. However, we see from Figure 4 that a lot of material

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exists in the vicinity of the white dwarf star at the center of the Helix planetary nebula. HGD cosmology gives a clear explanation for supernova Ia event dimming. Sometimes the dark matter planets surrounding all stars are on the line of sight to the event and sometimes they are not. When they are not, no dimming error occurs and dark energy is seen as a systematic dimming error. Matese and Whitmire (2011) report a triple Jupiter mass planet (named Tyche) must exist at the Oort cavity boundary of the Earth-PGC clump of dark matter planets that includes Helix. As shown in Fig. 4, it is one of many.

Infrared observations from the Herschel space observatory, as well as the Planck infrared satellite, support and confirm the predictions of HGD-cosmology that the dark matter of galaxies is planets in clumps, as shown in Figure 5, from Gibson (2013). Each of the red objects at the top of Fig. 5 is interpreted as a proto-globular-star-cluster (PGC) dark matter clump of earth-mass planets, glowing in the infrared as the planets merge to form larger planets and stars. Star formation occurs at the Oort cavity scale of a proto-planetary-nebula (PPN), shown at bottom right of Fig. 5 as a cold core. The 14 K temperature of cold cores reflects the 13.8 K triple point of the frozen hydrogen planets as they merge.

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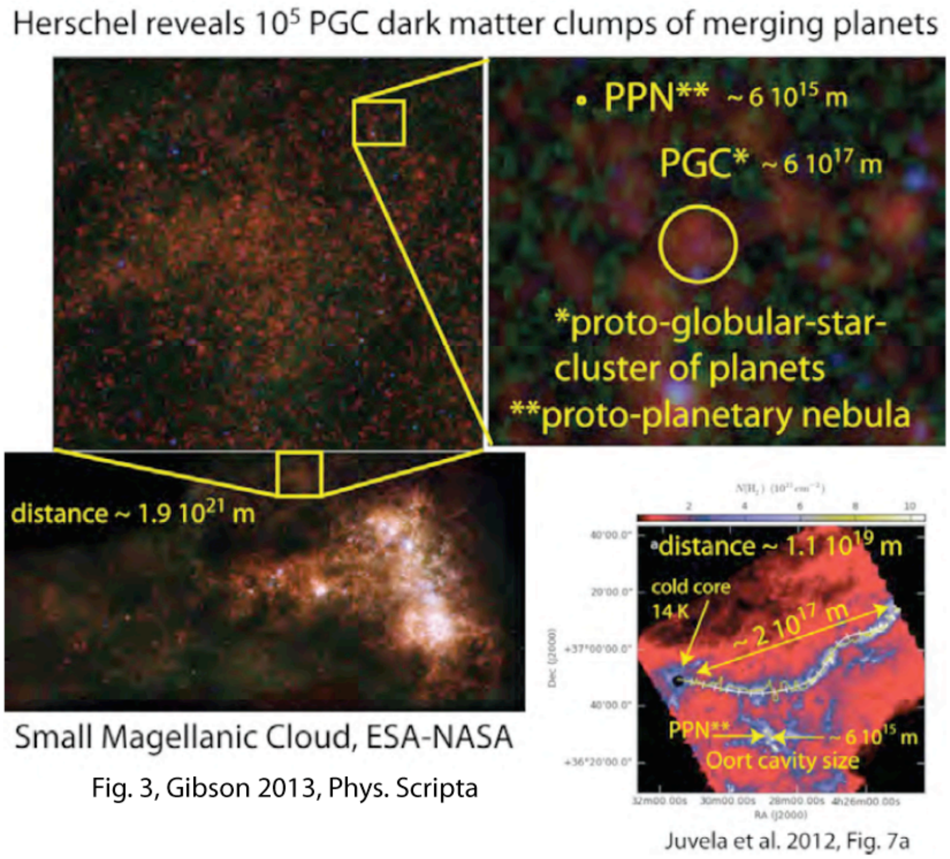

Figure 5. Herschel space observatory and Planck satellite images of PGC objects. Planet mergers are too cold to evaporate rocks to rain out as spherical Condrules (see Fig. 7).

The number of PGCs in the Small and Large Magellanic star cloud Herschel images is roughly 10^5, giving a total baryonic dark matter mass of 10^{41} kg for the two star clouds. This dark matter mass approximately equals the luminous star mass of the Milky Way galaxy, and is within the range expected by HGD cosmology. The location of the Magellanic clouds and other dwarf spherical clumps of PGCs diffused from the central Milky Way galaxy core is shown in Figure 6.

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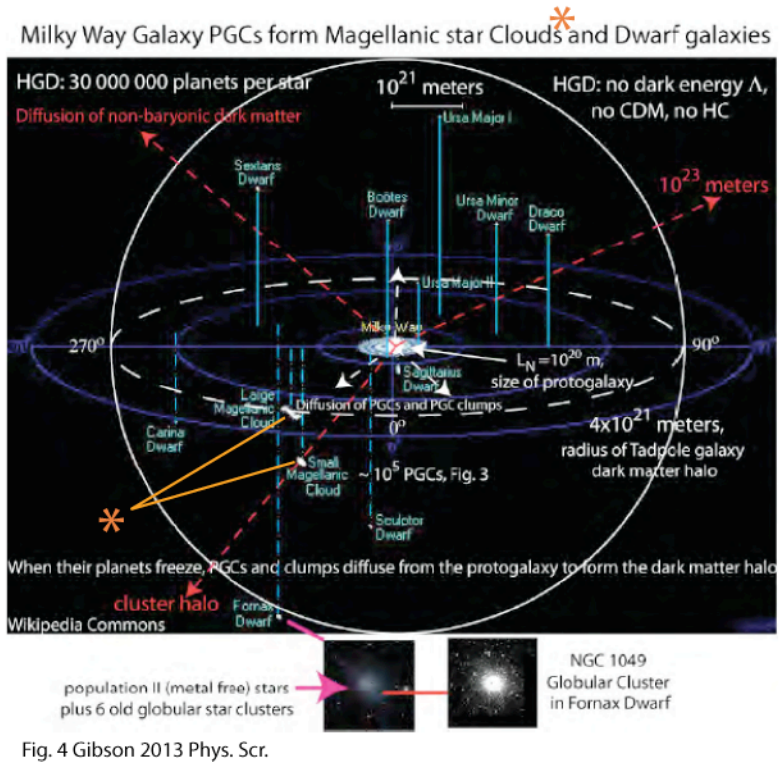

Figure 6. Location of Large and Small Magellanic star Clouds in the Milky Way galaxy, with other clumps of dark matter PGCs termed spherical dwarf galaxies. Life formation in PGCs and the biological big bang took place in the dense central protogalaxy of size $L_N = 10^{20}$ m at 2-8 Myr. PGC freezing and diffusion to form the ~10^{22} m dark matter halo began at ~40 Myr, long before the first star and first planets of ΛCDMHC.

According to HGD cosmology, life began early in the universe when the first planets and the oceans of water they formed from the oxides of the first supernovae were very hot under the pressure of thick hydrogen atmospheric pressures. Central iron and nickel cores with molten rock layers and frozen rock rain drops explain iron meteorites and condritic meteorites. The Sri Lanka meteorites, such as shown in Figure 7 (top), require a thick hot water ocean layer

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where life forms can process the carbon produced by star formation. A condritic meteorite, with about 1mm condrules, is shown for comparison (bottom).

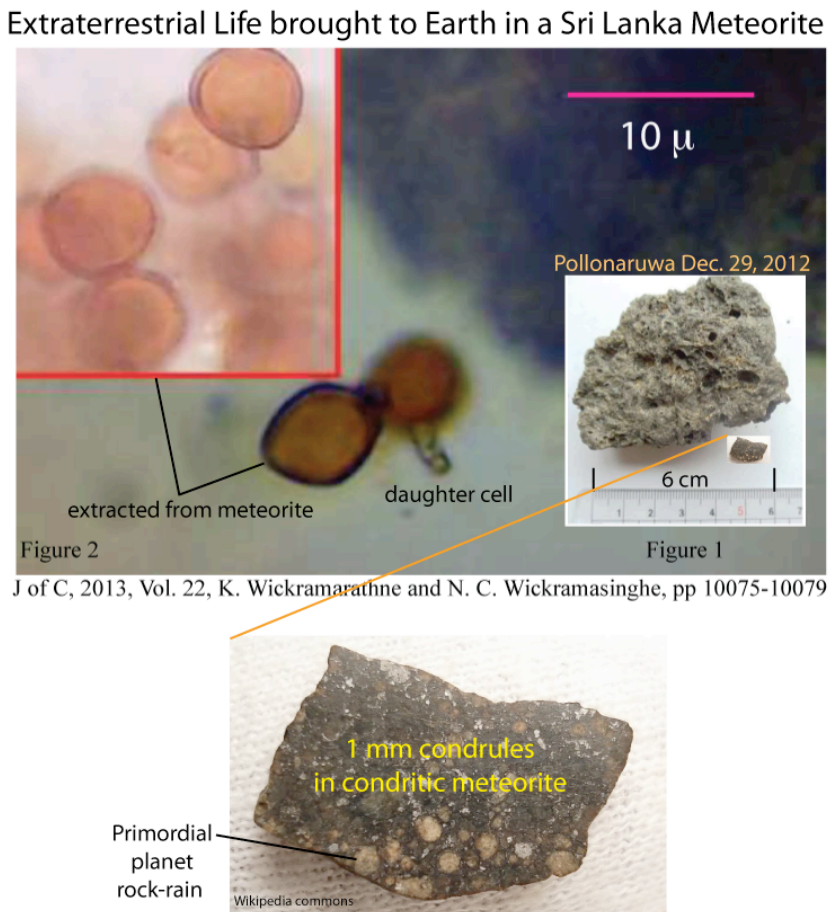

Figure 7. Red rain cells extracted from Pollonaruwa meteorite show evidence of extraterrestrial life transmitted to Earth, confirming the Hoyle-Wickramasinghe cometary panspermia hypothesis. A condritic meteorite is shown for comparison (bottom). Clearly primordial planets were very hot.

The meteorite shown in Fig. 7 (top) fell in the Pollonaruwa region of northern Sri Lanka on December 29, 2012, after a spectacular daytime appearance and break up into fragments, seen by the inhabitants and authorities. Many such pieces were

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carefully collected and preserved at the Medical Research Institute in Columbo. Injection and extraction of sterile water also extracted quantities of extraterrestrial organisms, including the thermal extremophile (thrives at 300 C and survives at temperatures > 360 C) that triggered 2001 red rain events in Kerala, India, Lewis and Kumar (2003). See preliminary reports and pictures in Volume 21, and complete reports and images in Volume 22 (journalofcosmology.com).

4. CONCLUSIONS

As shown in Fig. 1, the existence of life and HGD cosmology are closely coupled. Dark-energy cold-dark-matter hierarchically-clustering cosmology ΛCDMHC cannot explain, and cannot even permit, the existence of life, and must be abandoned. Dark energy does not exist, and has never existed. It is not 70% of the mass-energy of the universe, it is 0%. Cold-Dark-Matter does not exist, and has never existed. It is 0% of the mass-energy of the universe. Fig. 2 shows how modern turbulence theory supplies the enormous negative pressures (> 10^{113} Pa) needed to extract mass energy from the vacuum to explain the big bang. HGD cosmology, Gibson (1996) and Schild (1996), claims that the dark matter of galaxies is PGC primordial gas planets in trillion planet clumps that hosted the formation of life soon after the plasma to gas transition, as shown in Fig. 3.

The Fig. 4 Helix planetary nebula permits close-up images in the optical and infrared of star and comet formation from the dark matter planets, as well as evidence of life on the planets in the form of PAH oils released as the planets merge. More distant infrared images of PGC planet clumps in the Milky Way are

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shown in Fig. 5, from Herschel and Planck satellites, providing further support for PGC clumps of planets as the Milky Way dark matter, and the dark matter of all galaxies. Fig. 6 shows that diffusion of PGCs to form the MW halo occurs long after the biological big bang. Fig. 7 illustrates the arrival of extraterrestrial life in a meteorite. Several other life forms were found, including oceanic diatoms.

Evidence for extraterrestrial life falsifies both CDM and dark energy Λ concepts, and also falsifies the standard model for the origin of life. Life with the complexity of DNA and RNA molecules could not possibly evolve on one planet biologically isolated from all others. Earth is not the biological center of the universe, as Wickramasinghe and Hoyle have been saying for more than thirty years, and as the Greeks suggested a thousand years ago.

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