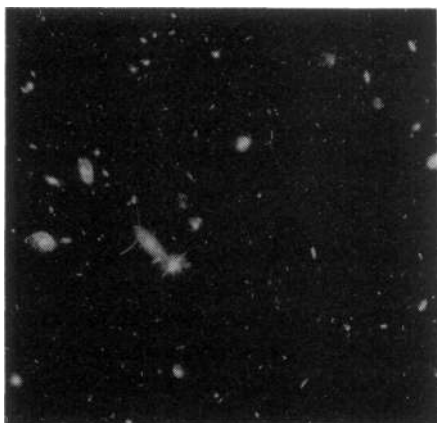


Galaxies Near the Edge of the Universe may be Mature

A number of recent telescope images are hinting that the most distant galaxies are mature. For instance, American and European groups both report they have detected a possible spiral galaxy with an amazingly large red-shift of 4.4.^{1,2} Assuming the red-shift is a Doppler effect, the object is receding very rapidly away from the Earth. Assuming also the Hubble relationship that the higher the red-shift the farther away the object, this possible spiral galaxy is located near the edge of the known universe. Consequently, the light from this far object that astronomers have detected supposedly originated within about 1 billion years of the big bang.



This composite of 276 exposures represents about 25 per cent of the Hubble Deep Field.

Two observations have prompted the suggestion that the object is a spiral galaxy:-

- (1) the spectral lines are broadened, and
- (2) the absorption spectra for carbon, oxygen, silicon and aluminum were detected.

Broad spectral lines are characteristic of the rotation of a spiral galaxy. The

astronomers infer from the amount of broadening that the object is about the size of the Milky Way Galaxy. Absorption by elements heavier than helium means that the stars in the possible galaxy are thought to be second generation, because these elements are assumed to have formed only inside a previous star, which subsequently blew up. From the debris of this ancient supernova, new stars are assumed to have formed within the possible spiral galaxy. These observations, if they hold up, tell us:

*... stars must have formed in the newly discovered galaxy sooner after the big bang than anyone thought — so soon that theorists are likely to have a few headaches trying to explain how ... Cosmologists must now explain how stars formed, blew up, and reformed again in a mere 1 to 2 billion years after the big bang.*³

All this activity is much too fast for the big bang theory.

New observations from the Hubble Space Telescope indicate that many more mature galaxies exist far out in space than anyone imagined. Astronomers chose an apparently blank patch of sky to observe over a ten day period in December, 1995. After making a composite of 276 exposures, called the Hubble Deep Field, they were surprised that the blank spot yielded over 1,500 galaxies as well as many other objects.⁴ (A picture and information on the Hubble Deep Field can be accessed on the internet at the following web site: <http://www.stsci.edu/pubinfo/PR/96/01/HDF/html>). It was

... like looking down a long tube and seeing all the galaxies along

*the line of sight.*⁵

However, this view was near the end of the tube:

*The Hubble Deep Field, on the other hand, resembles a [archaeology] dig from which sediment has already been removed, leaving its treasures in a single layer at the bottom.*⁶

Many of the galaxies are mature spiral and bar galaxies. Globular clusters also are seen. The small fuzzy objects are also believed to be galaxies, but farther away, although an object's faintness is not necessarily correlated with its distance.⁷ Regardless, the Hubble Deep Field shows mature galaxies from the near the edge of the known universe.

Astronomers are still analysing the objects in the Hubble Deep Field that are thought to be more distant.^{8,10} Some astronomers are 'seeing' aspects of the big bang verified. Others postulate 'proto-galaxies' that were well under way within a few billion years of the big bang. But if these presumably distant objects are fully-developed galaxies, then this discovery also spells trouble for the big bang theory.

Regardless of the exact distance of the objects in the Hubble Deep Field, there are many more galaxies deep in space than thought before. Many astronomers had believed that the number of galaxies would drop off

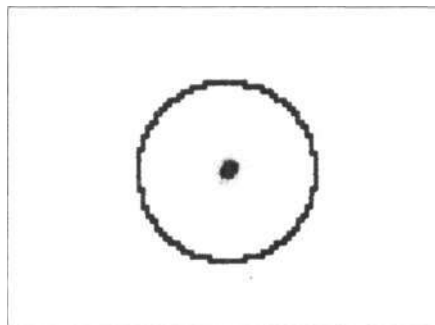


Image of a distant galaxy (in circle) taken with the Hubble Space Telescope.

with distance. But because they do not, this

'...leaves an uncomfortably short time for galaxies to form after the origin of the universe itself'

I thank Ray Strom of Calgary, Alberta, Canada, for calling my attention to the significance of the Hubble Deep Field and for reviewing an earlier draft.

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Jupiter's Moons Fascinating

Evolutionists believe that the Solar System is billions of years old. Even after all this alleged time, our own planet Earth still has not cooled. Its internal heat is evidenced by volcanic activity and the existence of a molten core. Electric currents circulate in this core, causing a magnetic field. This is already a problem for vast-age theories, and doubt exists about whether long-agers' appeal to radioactive heating is sufficient to keep the Earth from cooling down for more than a few hundred million years at the most.¹

When it comes to smaller astronomical objects like planetary moons, which should lose their heat much more quickly, there is even less

reason for long-agers to expect any heat still in their interiors.

Io, one of Jupiter's moons, has long been enigmatic in this regard, as Earth telescopes have seen evidence of volcanic activity on its surface. Evolutionists eventually responded with theories of 'gravitational pumping' by Jupiter's huge mass to try to explain why there was still heat inside Io.

Now that explanation may be stretched to the limit by the discovery that Io's volcanism is far more extensive than previously imagined. Comparing the pictures of Io taken by the Voyager fly-by in 1979 with those of the Galileo craft, it looks as if most of Io's surface has been 'transformed' by its volcanoes spewing out sulphur-rich materials in the 17 scant years between the two missions.²

Possibly even more potentially significant for the young age of the Solar System is the discovery that another of Jupiter's moons, Ganymede, has a magnetic field.³ At 835 km from the surface, the strength of magnetism detected was five times as large as if the moon was picking up Jupiter's magnetism. An outside possibility exists that the field is externally produced, from charged particles streaming past the jovian

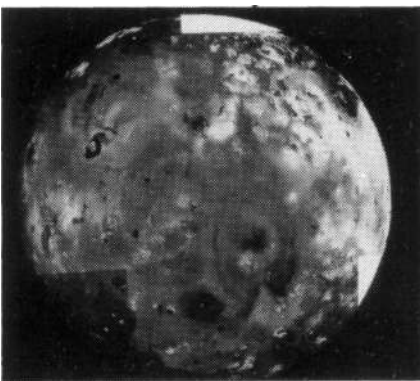
satellite.

In due course, the Galileo probe will come past Ganymede several times more, which will determine if it has a north and south pole. If it does, it will be conclusive evidence that the field is coming from inside the planet, which is more consistent with a young age.

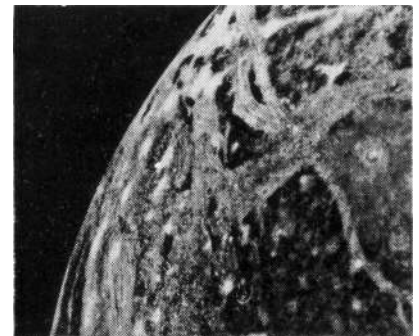
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C Wieland



Jupiter's enigmatic moon Io is covered by extensive volcanism, a lot of it in the past two decades (photo from NASA).



Jupiter's moon Ganymede has a magnetic field which has so far proven difficult to explain (photo from NASA).