

Rebooting Cosmology

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The Big Bang Theory's status as 'gospel' among scientists is being shaken up by a burgeoning body of facts and arguments espoused by a groundswell of astrophysicists. Is the criticism deserved? Arnie Gotfryd reports.

For those who trust the Genesis account of creation, the universe was created in 6 days, less than 6,000 years ago.

While these time frames sit well with a few billion adherents to various religions, there are others, including most cosmologists, who believe that the universe was created in an inexplicable explosion of primordial plasma, some 10 to 20 billion years ago, and gradually evolved from there.

Science is based on a "bottom-up" approach, constructing theoretical models that are constantly being modified and regularly replaced as observations and analytical methods improve. Religion, on the other hand, is based on a "top-down" disclosure or revelation. While science evolves, revelation doesn't. It originates from an unchanging, eternal source, the very same source that created the universe in the first place. Not surprisingly, believers in the Bible haven't changed their tune for thousands of years, while scientific opinion has been more dynamic.

For over half-a-century, the Big Bang has enjoyed most-favored status among the numerous models developed by scientists to describe how today's cosmos may have come into being. The theory evolved in the process of trying to explain why the wavelengths of light from distant galaxies were longer than expected. Longer wavelengths are at the red end of the visible spectrum, and astronomers coined the term "redshift" to describe the phenomenon. In 1929, American astronomer Edwin Hubble proposed that these "redshifts" could result from the motion of the galaxies receding rapidly away from us. He reasoned that since light is a wave, it could behave like sound which is also a wave.

Sound waves shift to higher or lower frequencies as the sound source moves towards or away from the listener. For example, when a speeding police siren approaches, it sounds higher pitched but immediately after it passes, its pitch sounds much lower. For light, higher frequencies are more bluish and lower ones are reddish. Over the decades, the Hubble redshifts were interpreted as evidence that the universe may be expanding. Extrapolating back over time, scientists calculated that the expansion process began with an explosion of immense force in a tiny space at the beginning of time. Hence the term "Big Bang";

Now, however, the whole theory is coming under fire from a groundswell of astrophysicists who point to a whole slew of recent (and not so recent) observations that are completely at odds with the theory's predictions.

In 2004, thirty reputable scientists from ten countries banded together and launched a position paper into the blogosphere which made a big bang of its own, especially when it landed in the pages of New Scientist magazine in May 2004. The group objects to the stranglehold of the Big Bang theory on cosmological research and funding and claims that the Big Bang explanation of the universe is scientifically untenable, patently illogical and without any solid observational support.

The letter blasted the stifling of research challenging the existence of such hypotheticals as "dark matter" and "dark energy." If these don't in fact exist, the theory won't work. And that would leave Big Bang theorists with no way to account for conundrums of their own making: Missing gravity, gross violations of thermodynamics, and galaxies that are younger than the stars within them.

Despite decades of experiments and observations, there is no sign yet of the elusive dark matter and dark energy, believed to be the major components of the cosmos. "What is more," claim the signatories, "the big bang theory can boast of no quantitative predictions that have subsequently been validated by observation."

The newly formed Alternative Cosmology Group quickly attracted hundreds of sympathetic researchers to join their ranks. With momentum mounting, the group convened their First International Crisis in Cosmology Conference, held in Moncao, Portugal in June 2005. The American Institute of Physics published informal proceedings in the December 2005 issue of its journal, Progress in Physics. Here are some highlights.

Conferee Dr. Riccardo Scarpa, of Santiago, Chile, used the most sophisticated optical-infrared observatory in the world to demonstrate 100% predictive accuracy of his alternative model of gravitational effects on spinning galaxies. The result: There is no need to invoke Dark Matter. According to Scarpa, "Dark Matter is the craziest idea we've ever had in astronomy. It can appear when you need it, do what you like, and be distributed in any way you like. It is the fairy tale of astronomy."

Russian astronomer Yuriy Baryshev, author of *The Discovery of Cosmic Fractals*, has identified nested, hierarchical structures at every scale of study, throughout the observable universe. This violates the Cosmological Principle, one of the Big Bang's central assumptions. According to that principle, large scale observations should be homogeneous, meaning they should look the same for any observer at any place, and this is not the case.

Another conference participant, physicist Mike Disney of Cardiff University, noted that while the Big Bang model contains 14 measured parameters, it also contains 17 free variables, making it virtually impossible to test, since the variables can easily be moulded to fit any observation.

So where do we go from here?