Missing nanodiamonds pose problems for the evolutionary theory of the solar system

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Our sun is considered to be a member of the third generation of stars since the alleged big bang. In the standard cosmological model, dust and gas from the explosion of the previous generations of stars are the materials that form the subsequent generations. Most astronomers believe that nanodiamonds[1] are formed in supernovae, and should thus have been very abundant as minute grains in the cloud of gas and Interplanetary Dust Particles (IDPs) that supposedly collapsed to form the solar system.[2] Thus, IDPs found in comets and asteroids are believed to be remnants of the dust from the beginning of the solar system, and should thus contain many nanodiamonds.

Nanodiamonds have been recovered from carbonaceous chondrite meteorites from the inner main belt of the asteroids, with average concentrations of 750 to 1,500 ppm. And they have also been found in the famous Murchison and Orgueil meteorites, as well as in micrometeorites from the Antarctic Ice Sheet, and in 'cluster-type' IDPs collected from the stratosphere.

Rocks from the outer reaches of the solar system (i.e. comets) are expected to be less altered by interactions with the sun and planets, and should thus show the most primeval compositions. IDPs from such rocks were thus expected to contain higher concentrations of nanodiamonds. However, astronomers were surprised to discover that IDPs, which appear to be related to comets, were depleted in nanodiamonds, or contained none.[2] Richard Kerr reports from *Science*:

> 'But a group of researchers reported this week that at least some of the most primitive, unaltered rock in the solar system contains no diamond star dust at all. The finding raises questions about just how star stuff came to form the solar system.'[3]

Although there are no 'easy explanations', several answers have been suggested. However, each proposal comes at a cost to the main theory of solar system formation. One explanation is that nanodiamonds were not formed around ancient stars, but formed instead in the inner parts of the disk-shaped solar nebula as the solar system supposedly formed. However, this explanation goes against popular theories on the chemical conditions of the early solar system.[3] Alternatively, the rocks that shed the dust could have been altered. If so, these objects would not be primitive, and astronomers

> 'will lose one of their main sources of information about the formation of the solar system—a sacrifice they would hate to have to make.'[3]

I might add that such an explanation may affect the predictions of radiometric dating methods, since meteorites provide the initial isotope ratios that give ages for the earth and solar system of about 4.5 billion years. All explanations given so far throw the evolutionary theory of the solar system into disarray:

> 'Any one of these explanations has profound implications concerning our understanding of the early Solar System.'[4]

The evolutionary mechanism has difficulties at many stages, such as the gravitational contraction of dust into small particles, the accretion of small particles or small aggregates into aggregates at least 10 metres in diameter, and the daughter isotopes of short-lived radioactive isotopes in small pebbles in meteorites.[5,6]

Creationists, on the other hand, can accept the data at face value, and simply conclude that God created nanodiamonds in some objects and not in others.

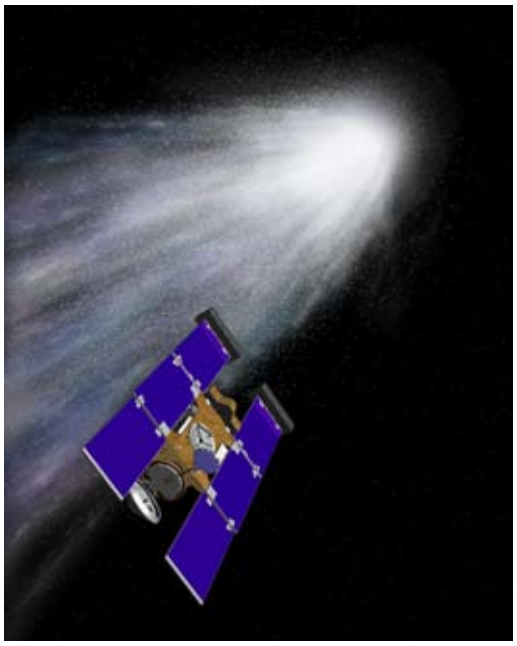

Image by NASA

Interplanetary dust particles, believed to be related to comets, are deficient in nanodiamonds, bringing into question standard models of solar system formation. Artist's concept of NASA spacecraft Stardust *approaching Comet Wild 2 in January 2004.*[7]

References

1. Nanodiamonds are exceedingly small diamonds, typically only several nanometres in diameter.
2. Dai, Z.R., Bradley, J.P., Joswiak, D.J., Brownlee, D.E., Hill., H.G.M. and Genge, M.J., Possible in situ formation of meteoritic nanodiamonds in the early Solar System, *Nature* **418**:157, 2002.
3. Kerr, R.A., Diamond dust dearth raises doubts, *Science* **297**:177, 2002.
4. Dai, ref. 2, p. 158.
5. Oard, M.J., The naturalistic formation of planets exceedingly difficult, *TJ* **16**(2): 20–21, 2002.
6. Oard, M.J., Another puzzle in the evolutionary story for the origin of the solar system, *TJ* **16**(3):17–18, 2002.
7. NASA, Stardust, NASA's comet sample return mission, <stardust.jpl.nasa.gov/photo/artist.html>, 19 October 2004.