

Our Night Sky in April 2014

Jupiter is still high in the West after dusk, and Mars will be rising and obvious in the South-East after dark; Saturn will rise in the South-East as well by 2200, and will track across the southern sky during the night, shining with a steady yellowish glow. Its rings are well placed for observation, and even a small telescope will show them well. Venus might just be visible in the dawn sky after 5am, but might be difficult to find as the sky lightens.

I think I have told you before that many Comets come from the very farthest depths of the solar system, in the Oort cloud, where they have resided mostly for the last 4.5 billion years. Thus, they should be composed of ice and dust consisting of materials that formed at low temperatures. However, study of the grains of material shed by Comet Wild, and collected during a NASA flyby mission called Stardust in aerogel material, has revealed that some of the grains contain minerals that can have only been formed in very high temperatures, approaching those of the Sun, and not in the frigid cold expected at the Solar System's edge, where most short-term comets originate. Pieces of the comet returned to Earth by NASA's spacecraft apparently formed from red hot or white hot materials near the Sun, or around another star altogether, before being flung to the outer edges of the Solar System. Even more recent studies of the grains have revealed metals such as Titanium which is only forged in temperatures of about 3000° C. So how can this have come about? Scientists theorize that in the very early stages of the Solar System, planets were moving about randomly under their mutual attraction, rather like balls in a pin ball machine; cometary material, which in these early stages might well have been very close to the Sun's outer atmosphere where it could have formed these materials; subsequent close passes by the larger planets could well have flung these proto-comets out into the outer Solar System, where they resided until drawn back into the inner Solar System by those self-same giant planets.

When ESA's Rosetta spacecraft arrives at comet 67P/Churyumov-Gerasimenko in August, it is planned for it to drop a lander on the surface which will drill into the ice, and relay panoramic pictures back to the parent spacecraft. Rosetta will then accompany the comet round its orbit of the Sun for a further year.

What I find so fascinating is that well-established theories can be demolished by the study of something as tiny as a minute grain of material captured from an object millions of miles from Earth. I just hope to be around to learn about even more discoveries, and to be able to tell you about them!

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