Surprises in comet dust

by World Science

Dust gathered from a comet and brought to Earth tells a tale of a soÂ-lar sysÂ-tem that parÂ-tialÂ-ly turned itself inÂ-side out, reÂ-searchÂ-ers say.

Dust trailÂ-ing a disÂ-tant comÂ-et, and gathÂ-ered by a NASA spaceÂ-craft, has yielded a surÂ-prisÂ-ingÂ-ly varÂ-ied mixÂ-ture of maÂ-teÂ-riÂ-als, asÂ-troÂ-noÂ-mers say.Since comÂ-ets are thought to conÂ-tain maÂ-teÂ-riÂ-al left over from the earÂ-ly SoÂ-lar SysÂ-tem, this vaÂ-riÂ-eÂ-ty sugÂ-gests someÂ-thing was mixÂ-ing up the conÂ-tents of the sysÂ-tem in its youth, the reÂ-searchÂ-ers add. What caused that, they donâ€™t know.

A reÂ-searchÂ-er holds a cuÂ-be of aerÂ-oÂ-gel, a light-as-air foam used to slow down and capÂ-ture dust parÂ-tÂ-iÂ-cles from the Wild 2 comÂ-et. (Â© SciÂ-ence) â€œI think of it as the soÂ-lar sysÂ-tem parÂ-tially turnÂ-ing itÂ-self inÂ-side out,â€• said DonÂ-ald BrownÂ-lee of the UniÂ-verÂ-siÂ-ty of WashÂ-ingÂ-ton, lead auÂ-thor of one of sevÂ-en paÂ-pers deÂ-sÂ-cÂ-ribÂ-ing the findÂ-ings in the Dec. 15 isÂ-sue of the reÂ-search jourÂ-nal SciÂ-ence.One theÂ-orÂ-ized posÂ-siÂ-bilÂ-iÂ-ty is that the newÂ-born sun blastÂ-ed jets of matÂ-ter from its poles, said John BradÂ-ley of the LawÂ-rence LivÂ-erÂ-more NaÂ-tionÂ-al LabÂ-oÂ-raÂ-toÂ-ry in LivÂ-erÂ-more, CaÂ-lif. This maÂ-tÂ-erÂ-iÂ-al might then have rained far out onÂ-to the emergÂ-ing plaÂ-nÂ-eÂ-tary and coÂ-mÂ-etÂ-ary sysÂ-tem, cirÂ-cÂ-ling the starâ€™s equaÂ-tor.â€œIt apÂ-pears to have been a much more dyÂ-namÂ-ic and perÂ-haps even viÂ-oÂ-lentâ€• enÂ-viÂ-ronÂ-ment than exÂ-pected, added BradÂ-ley, head of the LiÂ-verÂ-more team inÂ-volved with the coÂ-mÂ-et dust misÂ-sion. CerÂ-tain charÂ-acÂ-terÂ-isÂ-tics disÂ-tinÂ-guish parÂ-tÂ-iÂ-cles that come from near the Sun from those that inÂ-habÂ-it disÂ-tant space, asÂ-troÂ-noÂ-mers said. The disÂ-tant parÂ-tÂ-iÂ-cles tend to be glassy, while those close to stars are more crysÂ-talÂ-line, meanÂ-ing the atoms are arÂ-ranged in a more orÂ-derÂ-ly way.This secÂ-ond type was abunÂ-dant in the anÂ-aÂ-lyzed comÂ-et dust, reÂ-searchÂ-ers said. That, they added, sugÂ-gests that as the SoÂ-lar SysÂ-tem formed 4.6 bilÂ-lion years ago, maÂ-teÂ-riÂ-al moved from the sizÂ-zling cenÂ-tÂ-ral zone to its icy outÂ-er reaches. The mixÂ-ing would have made itÂ-self felt as far as the KuiÂ-per belt, a reÂ-gion of icy bodÂ-ies orÂ-bitÂ-ing the Sun past NepÂ-tune, and from which the comÂ-et, called Wild 2, comes.SciÂ-enÂ-tists beÂ-lieve comÂ-ets conÂ-tain priÂ-morÂ-diÂ-al maÂ-teÂ-riÂ-al left over from the SoÂ-lar SysÂ-temâ€™s birth. This is beÂ-cause comÂ-ets cirÂ-cuÂ-late mostÂ-ly in disÂ-tant, cold reaches

of the sysÂ-tem, where they stay relÂ-aÂ-tively unÂ-disÂ-turbed.Wild 2 is thought to have inÂ-habÂ-ited the outÂ-er soÂ-lar sysÂ-tem unÂ-til 1974, when a close enÂ-counÂ-ter with JuÂ-piÂ-ter shifted its orÂ-bit closÂ-er to Earth. NASAâ€™s StarÂ-dust spaceÂ-craft left Earth in earÂ-ly 1999, met the comÂ-et beÂ-yond Marsâ€™ orÂ-bit five years latÂ-er and reÂ-turned last JanÂ-uÂ-ary with thouÂ-sands of dust parÂ-tÂ-iÂ-cles.

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