Astronomers find microorganisms crashed into Earth

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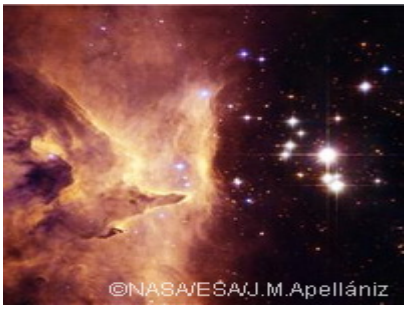

New research suggests that microorganisms on Earth emerged after distant planets orbiting other stars were close enough to exchange solid material. This further cements what astronomers have come to believe about lithopanspermia -that basic life forms are distributed throughout the Universe through meteorite-like planetary fragments triggered by asteroid collisions and volcanic eruptions.

The finding, published in the journal Astrobiology, was presented at the recent European Planetary Sciences Congress (EPSC), which was organised by Europlanet, a Research Infrastructure linking laboratories that is funded under the EU's Seventh Framework Programme (FP7).

Past studies put the spotlight on the speed at which objects move through space, making it highly impossible for space objects to be captured by another planet. But using computer simulations of the star cluster in which our Sun was born, the researchers shed light on how it is plausible, suggesting that 'weak transfer', a process in which solid objects move slowly out of orbit of one object and into another, increases the chances of capture.

'Our work says the opposite of most previous work,' explained Dr Edward Belbruno of Princeton University in the United States. Dr Belbruno developed the principles of weak transfer 21 years ago. 'It says that lithopanspermia might have been very likely, and it may be the first paper to demonstrate that. If this mechanism is true, it has

implications for life in the universe as a whole. This could have happened anywhere.'

The researchers observed that the Solar System and its nearest planetary system may have exchanged rocks around 100 trillion times before the Sun branched out on its own. Thanks to the information retrieved from existing rock, basic life forms can be considered as old as the Sun's birth cluster days and have been as tough as they needed to be to ensure that not only do they make the interstellar trip but they had to make the eventual impact as well.

'The conclusion from our work is that the weak transfer mechanism makes lithopanspermia a viable hypothesis because it would have allowed large quantities of solid material to be exchanged between planetary systems,' said Amaya Moro-Martín of the Centro de Astrobiología in Spain and of Princeton University, 'and involves timescales that could potentially allow the survival of microorganisms embedded in large boulders.'

The finding indicates that while material between different planetary systems can be swapped, there is no exchange when solid matter is trapped by the second planetary system. Lithopanspermia occurs when the material lands on an Earth-like planet because it is in such an environment that it could thrive.

'The study of the probability of landing on a terrestrial planet is work that we now know is worth doing because large quantities of solid material originating from the first planetary system may be trapped by the second planetary system, waiting to land on a terrestrial planet,' said Dr Moro-Martín. 'Our study does not prove lithopanspermia actually took place, but it indicates that it is an open possibility.'For more information, please visit:Princeton University:http://www.princeton.edu/main/European Planetary Sciences Congress (EPSC) 2012:http://www.epsc2012.eu/Astrobiology:http://www.liebertpub.com/ast

Countries

Spain, United States

Last update: 26 September 2012