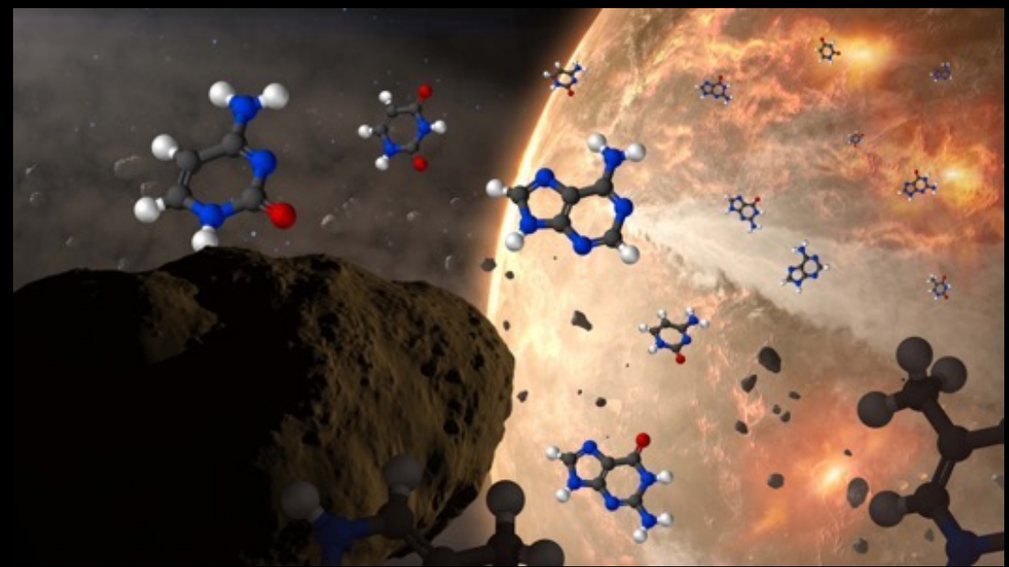
Complete Set of Life's Nucleobases Found in Meteorites

Using new techniques, an international team including NASA scientists has just found the last two of the five nucleobases found in DNA and RNA that had yet to be discovered in meteorites.

Nucleobases make up the base pairs in genetic materials and form the basis of a lifeform's genetic code and only five exist in all genetic materials on Earth: adenine, guanine, uracil, cytosine, and thymine. **Until now, only the first three were known to exist in meteorites.**

Nucleobases made in space could have contributed to the development of life on early Earth. This discovery showed that the complete set of nucleobases are found in asteroids, and these ingredients could have been delivered to ancient Earth by meteorite impacts or the infall of dust.

The new extraction and analysis technique allows for the detection of more delicate compounds and could be used for the analysis of asteroid material, such as the samples from Bennu making their way to Earth next year via NASA's OSIRIS-REx mission.



Artist's concept image of meteoroids delivering nucleobases to ancient Earth. Credits: NASA Goddard/CI Lab/Dan Gallagher

Y. Oba, Y. Takano, Y. Furukawa, T. Koga, **D.P. Glavin**, **J.P. Dworkin**, H. Naraoka (2022), "Identifying the Wide Diversity of Extraterrestrial Purine and Pyrimidine Nucleobases in Carbonaceous Meteorites", Nature Communications, 13:2008. https://doi.org/10.1038/s41467-022-29612-x