

# Astrochemistry – The Cradle of Life

By Professor Nigel Mason of the Open University

In October, Professor Nigel Mason from the OU gave us a talk “Astrochemistry – the Cradle of Life”, a tour de force of where and how life was thought to have started on Earth. He outlined some of the most popular established theories for this, how the “Primordial Soup” over time, created chemicals called amino acids. These combined to form proteins, and through some as yet unknown process, they, found themselves within cells. Even more incredibly these cells were able to reproduce.

In 1930 Harold Urey and Stanley Miller performed a famous experiment to see if the chemicals needed for life can be made in the laboratory by mimicking earth’s “Primordial Soup”. Some promising chemicals and amino acids were formed but were shown not to be present in our earth’s early atmosphere. The molecules needed for life to evolve would have taken too long to form. Current scientific models insist that we are not, as yet, here!!!

He then considered other possibilities. Could life have sprung up elsewhere in our Universe? He discussed the conditions that are required for sustaining life and how the material needed for life was possibly formed. He explained how DNA was discovered, what were its constituent parts, and its importance to life. There is still a vast gap in our knowledge as to how all this occurs. The latest scientific thinking is that the building blocks of life were in fact created in space and brought to earth by comets. It has been shown that all the essential ingredients for life exists in the void between us and other stars. All it takes is for ice coated particles of space dust along with a few basic chemicals plus starlight and lots and lots of time to allow for the formation of these essential ingredients. These dust particles having been “hoovered” up by passing comets are then, occasionally, brought to Earth.

The question still remains, how do simple molecules assemble to make DNA? We still Don’t Know. There are a number of theories involving sulphurous undersea volcanic vents, chemical reactions within clay substrates and more. Still the processes that bring this all together remain elusive.

Finally Professor Mason looked at ways that we can search for life on other worlds, and some of the up and coming projects to aid in this search not only in far flung corners of our galaxy but also within our own solar system.

Astrochemistry is a new and exciting field of science combining astronomy, biology, chemistry and physics and may allow us to answer the questions; is there life on other planets and how the chemistry of life begins?