

## **Does life exist on other planets?**

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## An atmosphere rich in oxygen is the most likely source of energy for complex life to exist anywhere in the Universe

Recent research argues that an atmosphere rich in oxygen is the most likely source of energy for complex life to exist anywhere in the Universe, thereby limiting the number of places life may exist. Professor David Catling at Bristol University, along with colleagues at the University of Washington and NASA, contend that significant oxygen in the air and oceans is essential for the evolution of multicellular organisms, and that on Earth the time required for oxygen levels to reach



a point where animals could evolve was almost four billion years.

Image: An artist's impression of the Phoenix Mars Lander on the arctic plains of Mars. Credit: NASA/JPL

Since four billion years is almost half the anticipated life-time of our Sun, life on other planets orbiting short-lived suns may not have enough time to evolve into complex forms. This is because levels of oxygen will not have had time to develop sufficiently to support complex life, before the sun dies. Professor Catling said: "This is a major limiting factor for the evolution of life on otherwise potentially habitable planets."

The research is published in the June 2005 issue of Astrobiology.

Professor Catling is also part of the science team for NASA's Phoenix Lander, which recently got the go-ahead to put a long-armed lander on Mars in 2007. A robotic arm on the lander will dig a meter into the soil to examine its chemistry. "A key objective is to establish whether Mars ever had an environment conducive to more simple life", said Professor Catling.

Professor Catling is one of the country's first Professors of Astrobiology and has recently returned from the USA to take up a post at the University of Bristol. He took up a prestigious 'Marie Curie Chair', an EU-funded position designed to help reverse the brain drain, particularly to the USA, and to encourage leading academics to return to and work in Europe. These posts aim to attract world-class researchers. Professor Catling is an internationally recognised researcher in planetary sciences and atmospheric evolution.

As well as his research into the surface and climate of Mars, Professor Catling aims to produce a more quantitative understanding of how the Earth's atmosphere originated and evolved.



He comments: "Earth's surface is stunningly different from that of its apparently lifeless neighbours, Venus and Mars. But when our planet first formed its surface must also have been devoid of life. How the complex world around us developed from lifeless beginnings is a great challenge that involves many scientific disciplines such as geology, atmospheric science, and biology".

Professor Catling grew up in Suffolk and received his doctorate from Oxford, but he has been working in the USA for the past decade: six years as a NASA scientist, followed by four years at the University of Washington in Seattle.

Professor Catling is now based in the Department of Earth Sciences at the University of Bristol. He said of his return to the UK: "It's great to be back and I'm looking forward to getting started at Bristol. My research will focus on how Earth and Mars evolved over the history of the solar system to produce such startlingly different environments at their surface."

Source: University of Bristol

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