

# The Genesis project—new life on exoplanets

September 2 2016

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This artist's concept depicts a planetary system. Credit: NASA/JPL-Caltech

Can life be transplanted to planets outside our solar system that are not permanently inhabitable? This is the question with which Professor Dr. Claudius Gros from the Institute of Theoretical Physics at Goethe University Frankfurt is dealing in an essay that will appear in the scientific journal *Astrophysics and Space Science*.

In recent years, the search for exoplanets has identified very different types. "It is therefore certain that we will discover a large number of exoplanets that are inhabitable intermittently but not permanently. Life would, indeed, be possible on these planets, but it would not have the time to grow and develop independently," says Gros. Against this background, he has investigated whether it would be possible to bring life to planets with transient habitability.

From a technical standpoint, such a Genesis mission could already be achieved within a few decades with the aid of interstellar unmanned micro-spacecraft that could be accelerated and slowed down passively. On arrival, an automated gene laboratory on board the probe would synthesize a selection of single-cell organisms with the aim of establishing an ecosphere of [unicellular organisms](#) on the target planet. This could subsequently develop autonomously and possibly also into complex life forms. "In this way, we could jump the approximately four billion years that had been necessary on Earth to reach the Precambrian stage of development out of which the animal world developed about 500 million years ago," explains Gros. In order not to endanger any life that might already be present, Genesis probes would only head for uninhabited exoplanets.

The mission's actual duration played no role in the Genesis project, since the time scales for the subsequent geo-evolutionary development of the target planet lies in the range between a few tens of millions and a hundred million years. The Genesis project therefore has no direct benefit for people on Earth. "It would, however, enable us to give [life](#) something back," says Gros. In this context, he is also discussing whether biological incompatibilities would have to be expected in the case of colonization of a second Earth fully developed in terms of evolution. "That seems at present to be highly unlikely," says the physicist, dampening any excessive expectations.

**More information:** Claudius Gros; Developing Ecospheres on Transiently Habitable Planets: The Genesis Project; *Astrophysics and Space Science* (in press); DOI: [arxiv.org/abs/1608.06087](https://arxiv.org/abs/1608.06087)

Provided by Goethe University Frankfurt am Main

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