

Proxima b: Probe swarms could explore Earth-like exoplanets up close

Thousands of picoprobes will study the neighbouring Proxima Centauri system. Laser propulsion and swarm technologies have many advantages, says Nasa.

DISPLAY



Proxima b is slightly larger than Earth and is a rocky planet

Thousands of so-called picospacecraft are to investigate the area around the planet Proxima Centauri b, or Proxima b for short, in our neighboring system Proxima Centauri. [NASA](#) writes that such laser-powered probes are "probably the only technology" to reach another star before the end of this century. The nearest one is about 40 trillion kilometres away.

An external projector will shoot the sails of the pico ships with lasers and thus bring them to relativistic speed. We are talking about 10 to 20 percent of the speed of light. The participants in the future competition NIAC 2024 expect even more advantages from the swarm dispatch.

Nasa: Autonomous swarm forms 100,000-kilometer network

A large swarm of space probes weighing only one gram combines a number of advantages. The low launch mass, the resulting low energy required and

the possibility of cooperation in communication are the main aspects of the mission.

The swarm must have an "extraordinary degree of autonomy" due to the time delay, NASA writes. The chain is to be launched in such a way that, after its 20-year journey, it will form a lenticular network with a diameter of 100,000 kilometers.

Destination of the Swarm: The next habitable planet

This network is to be stretched around the planet Proxima b, which orbits in the habitable zone of Proxima Centauri. Life could exist on the super-Earth, experts speculate. It is one of the most Earth-like exoplanets, with an Earth-likeness index of 0.87.

However, he probably has a bound rotation. This means that one side is always in the light of the red dwarf – and correspondingly hot. The other side always remains in the icy shadow. On average, the temperature is expected to be minus 37 degrees Celsius.

Entire swarm population calls home

The swarm's probes wear state-of-the-art microclocks for synchronicity. They can communicate with the Earth by emitting an extremely bright laser pulse all at the same time. This is equivalent to multiplying the transmission power.

Another advantage of swarm technology is that failures are not so significant. Scientists are already testing the procedure in simulations.