

Scientists have created a “quantum factory of light” in the form of a chip size of 1 square millimeter

A group of scientists has developed a “quantum factory of light” – an integrated generation system of confusing photons, placed on a silicon chip with an area of only 1 mm².

The development described in Nature Electronics uses the standard 45-nm CMOS process, similar to the usual processors used in the production of ordinary processors.

The technology is based on 12 micro-ring resonators, each of which generates pairs of confusing photons using four-wave mixture. Previously, such systems required bulky laboratory installations, but now the process is transferred to a compact chip.

Key innovation is a built-in self-correction system. Each resonator is equipped with its own photodiode and a micro-ring element that allows you to automatically adjust the frequency and stability of photons in real time.

The choice of CMOS platform means that such quantum chips can be made massively at the same factories as conventional CPU or GPU.

GlobalFoundries and Ayar Labs were engaged in the development of the process. According to experts, this opens the way to scalable quantum systems that potentially unite with AI equipment on a common technological basis.