

ARTIFICIAL RETINA

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The new retina chip was designed at the University of California at Santa Cruz and fabricated by Second Sight Medical Products. The project was funded by the Artificial Retina Project at the U.S. Energy Department.

The Argus II works by implanting the artificial retina chip directly inside the eye on the old retina. It only works for patients whose retina has degenerated, but still has intact nerves connecting to the brain. The artificial retina has an array of electrodes that stimulates optic nerve cells, sending an image to the brain's vision centers. The plasticity of our brain vision allows to process and adapt to the artificially generated signals.

The first generation Argus I contained just 16 electrodes, enabling patients to detect motion, sense patterns of light and dark and to count large objects. The new model increased the array to 60 electrodes while reducing the surgical implant time has from six to two hours.

The Artificial Retina Project was designed by an ophthalmologist and a bioengineer, Mark Humayun, who pioneered the original project. The project is now a part of a DoE consortium of three universities, six national laboratories, and the commercial company, Second Sight LLC (Sylmar, Calif.)

Argus II is about four times smaller than Argus I, but still uses a sealed package. Argus III will replace the package with a much smaller bare die with a special coating only a few microns thick on a flexible substrate that allows the electrode array to conform to the curve of the inner eye.