Best of Breed

No team of engineers, no matter how much time they took or how many bottles of cabernet they consumed, would dream up an antenna that looked like a deer antler on steroids. Yet that's what a group at NASA Ames Research Center came up with - thanks to a little help from Darwin.

NASA's Space Technology 5 nanosatellites, which are scheduled to start measuring Earth's magnetosphere in late 2004, requires an antenna that can receive a wide range of frequencies regardless of the spacecraft's orientation. Rather than leave such exacting requirements in the hands of a human, the engineers decided to breed a design using genetic algorithms and 32 Linux PCs. The computers generated small antenna-constructing programs (the genotypes) and executed them to produce designs (the phenotypes). Then the designs were evaluated using an antenna simulator. The team settled on the form pictured here. You won't find this kind of antenna in any textbook, design guide, or research paper. But its innovative structure meets a challenging set of specifications. If successfully deployed, it will be the first evolved antenna to make it out of the lab and the first piece of evolved hardware ever to fly in space.