A new kind of world

ARCHIVE 2002

Philips is working on small video discs, 3 cms in diameter, that will store 25,000 digital photos, 48 hours of MP3 music or 10 hours of movies. These disks are the same thickness as DVDs, and use blue lasers. Called Small Form Factor Optical or SFFO, the disks should be available in 2005 with players costing $100. - New Scientist October 2002

Millipede nanodrive: IBM Research team promises several gigabytes of storage on a device the size of a postage stamp using nanotechnology. Thousands of tiny silicon cantilevers move across microscopic areas of a polymer plate, making little pits in the surface which can later be read like a photograph or record player. Each cantilever tip is the width of a couple of hundred atoms, or 20 nanometers. The nanomechanical system is extremely sensitive to movement and in best cases can detect bumps caused by one or two atoms. Research by Peter Vettiger and Gerd Binnig (winner of Nobel Prize for Physics) suggests that each pit can be erased or rewritten up to 100,000 times. IEEE Transactions on Nanotechnology March 2002 and Scientific American February 2003

Microelectromechanical systems (MEMS) are being developed to sort individual cells, entire laboratories compressed into something a thousandth of the size. Next generation devices are being made of silicone rather than silicon. Science vol 298, p580

An image has been stored in the atoms of a single molecule. Electromagnetic pulses were used to alter the spins of electrons in 19 hydrogen atoms contained in a liquid crystal. These new trajectories encoded a 1024 bit black and white image which was then read using nuclear magnetic resonance. Work by Bing Fung at the University of Oklahoma. Journal of Chemical Physics vol 117, p6903

Machine control by thinking is now a reality - in monkeys. First a monkey was taught to get food by pressing a lever in response to a light. Then a brain monitoring device was placed on her

head, and the brain impulses she made when moving her arm were picked up and converted into movements of a robotic arm in another room. In another experiment, a rat was trained to press a lever for water. After a few days, the lever mechanism was disconnected. For a while the rat was puzzled, and then it happened. The rat just thought about pressing the lever, and the brain pattern created was enough to activate delivery of water. The rat realised that it just needed to concentrate in the right way to make the machine work. Human studies will carry ris ks
from implantation of electrodes - which may trigger epilepsy and other problems. Work by Miguel Nicolelis and John Chapin, Duke University , US. Scientific American October 2002