

# Researchers Create DVDs With Massive Storage

by Michael Kahn, Maggie Fox, and David Cowell

*Editor's Note: Even with high-speed HD download capability there will always be a need for dense portable hard media.*

LONDON (Reuters) - "Five-dimensional" discs with a capacity 10,000 times greater than current DVDs could be on the market within 10 years, researchers reported on Wednesday.

A team from Swinburne University of Technology in Australia said that by harnessing nanoparticles and a "polarization" dimension to existing technology, storage can be massively boosted without changing the size of a current disc.

The researchers, who have signed a deal with Samsung Electronics, said the technique had allowed them to store 1.6 terabytes of data on a disc with the potential to one day store up to 10 terabytes.

One terabyte would be enough to hold 300 feature length films or 250,000 songs.

"We were able to show how nanostructured material can be incorporated onto a disc in order to increase data capacity, without increasing the physical size of the disc," Min Gu, who worked on the research, said in a statement.

"These extra dimensions are the key to creating ultra-high capacity discs." Discs currently have three spatial dimensions but using nanoparticles the researchers said they were able to introduce a spectral -- or color -- dimension as well as a polarization dimension.

The researchers, who published their findings in the journal *Nature*, created the color dimension by inserting gold nanorods -- which form so-called surface plasmons when hit by light -- onto a disc's surface.

Because nanoparticles react to light according to their shape, this allowed the researchers to record information in a range of different color wavelengths on the same place on the disc.

Current DVDs are recorded in a single color wavelength using a laser, the researchers said. The researchers also created an extra dimension using polarization, a technique in which they projected light waves onto the disc, to record different layers of information at different angles.

"The polarization can be rotated 360 degrees," another member of the research team James Chon, said in a statement. "So for example, we were able to record at

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zero degree polarization. Then on top of that we were able to record another layer of information at 90 degrees polarization, without them interfering with each other."

Some issues, such as the speed at which the discs can be written on, need further work but the scientists said their research could have immediate applications in a range of fields.

For instance, they could help store extremely large medical files such as MRIs as well as financial, military and security areas by offering higher data densities needed for encryption, they added

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