

Liquid crystals light way to better data storage

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As cell phones and computers continue to shrink, many companies are seeking better ways to store hundreds of gigabytes of data in small, low-power devices.

A special type of [liquid crystal](#), similar to those used in computer displays and televisions, offers a solution. Unlike CDs and DVDs, which store information only on their surface, lasers can encode data throughout a liquid crystal. Known as holographic storage, the technique makes it possible to pack much more information in a tiny space.

But attempts to use liquid crystals for [data storage](#) have had limited success. In order to reliably record and rewrite data, researchers must figure out a way to uniformly control the orientation of liquid crystal molecules. Currently, most liquid crystal technologies rely on physical or chemical manipulation, such as rubbing in one direction, to align molecules in a preferred direction.

In an important advance, scientists at the Tokyo Institute of Technology have created a stable, rewritable memory device that exploits a liquid crystal property called the "anchoring transition." The work is described in the latest issue of the *Journal of Applied Physics*.

Using either a [laser beam](#) or an electric field, the researchers can align rod-like liquid crystal molecules in a [polymer](#). Their tests show that the liquid crystal created by the team can store data, be erased and used again.

"This is the first rewritable memory device utilizing anchoring transition," said Hideo Takezoe, who led the research. And because the device is bi-stable -- the liquid crystals retain their orientation in one of two directions -- it needs no power to keep images, adds Takezoe.

More information: The article, "Heat- and electric-field-driven bistable devices using dye-doped nematic liquid crystals" by Hideo Takezoe et al will appear in the Journal of Applied Physics. See: jap.aip.org/

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