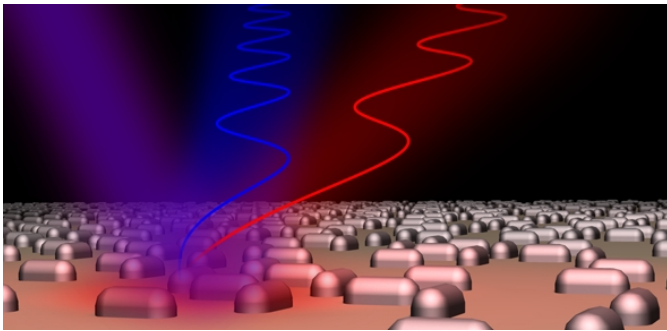


The Future of Optical Storage, in a Roman Cup?

Written by Marco Attard
07 October 2014

The secret to the higher capacity optical storage might be held within ancient Roman glassware, University of Cambridge researchers say as they develop a new means of making multicoloured holograms from a thin silver nanoparticle film.



One example of the glassware in question is the [Lycurgus cup](#). Made in the 4th century, the cup changes colour from green to red according to the position of the light due to gold and silver nanoparticles incorporated into the glass.

Of course the ancient Romans did not know of the specifics of the phenomenon, called dichroism-- in fact research into the glassware's unique properties only started round 20 years ago, and now the researchers have managed to create "nanoscale metallic nanoparticle arrays" able to form multicolour holograms.

Each hologram contains 16 million nanoparticles per square millimeter, with each nanoparticle being 1000 times smaller than the width of a human hair. Each nanoparticle scatters light in different colours, and the light from all nanoparticles interacts and combines to project a multicolour image.

"This technology will lead to a new range of applications in the area of photonics, as conventional optical components simply cannot achieve this kind of functionality," research leader Yunuen Montelongo says. "The potential of this technology will be realised when they are mass produced and integrated into the next generation of ultra-thin consumer electronics."

Currently the team is working on the optical mechanisms involved in light-matter interaction at nanoscale, and future research will also include the creation of 3D dynamic displays for consumer electronics.

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