New Kind of Optical Storage could Last a Million Years

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A new kind of optical storage [1] is being developed. With this new technology, a DVD-sized optical memory could hold 360 Terabytes, and the memory would be good for about a million years.

Longevity and capacity are the key factors to consider in terms of data storage, but existing options are limited. “At the moment, companies have to back up their archives every five to ten years because hard-drive memory has a relatively short lifespan,” explains Jingyu Zhang of the University of Southampton, UK, who led the team that demonstrated the new technique.

Optical storage media such as DVDs are more stable, but with standard single-layer discs maxing out at 4.7 GB of data, they are an unwieldy option for vast digital archives.

Scientists have been pursuing the idea of glass as a medium for mass data storage since 1996, when it was first suggested that data could be written optically into transparent materials.

By using a femtosecond laser to alter the physical structure of fused quartz, a “dot” with a different refractive index can be created to denote the binary digit one; zeros are indicated by the absence of a dot. Japanese electronics giant Hitachi succeeded in storing data using this method back in 2009, but Zhang’s team has taken the technology a step further, by recording information in 5D – the three dimensions of space that describe the physical location of the dot, and two additional dimensions that are encoded by the polarity and intensity of the beam that creates the dot.

Well it is complicated (for now) and kind of slow. But I do look forward to the day when my hard drives didn't fail on a regular basis. That has been an ongoing problem for decades. Maybe a decade from now, it will no longer be a problem.

M. Simon's e-mail can be found on the sidebar at Space-Time Productions [2].

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