

# 6<sup>th</sup> International Conference on Photonics & 7<sup>th</sup> International Conference on Laser Optics

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## **Petabyte optical disc and data storage challenge**

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Nowadays, we are generating more data than usual IT systems could store and manage. Storage is probably the most critical thing out there right now in terms of the hardware market. Total worldwide enterprise storage systems capacity reached 150 EB (1 EB = 1000000 PB) in 2016, according to the International Data Corporation (IDC). A breakthrough solution for 3D optical data storage media was the introduction of fluorescent photosensitive glass-ceramics which permit recording by optical means of lines with the width of 5 nm. There are mainly two novelties in this approach: 3D recording of nanostructures with a low power CW laser and nanostructures with dimension far beyond diffraction limit, were obtained by 3D quantum optical lithography using a coherent exciton mechanism. Fluorescent photosensitive glass-ceramics act as a coherent perfect absorber, a time-reversed laser, performing a function exactly opposite to that of a laser. The absorbed coherent radiation was converted by a complex process to produce 3D effects assisted by a quantum confinement effect. Data storage in glassy materials offers advantages of extremely long storage life, essential for data archiving. Petabyte optical disc offers a new perspective for future big data storage.

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