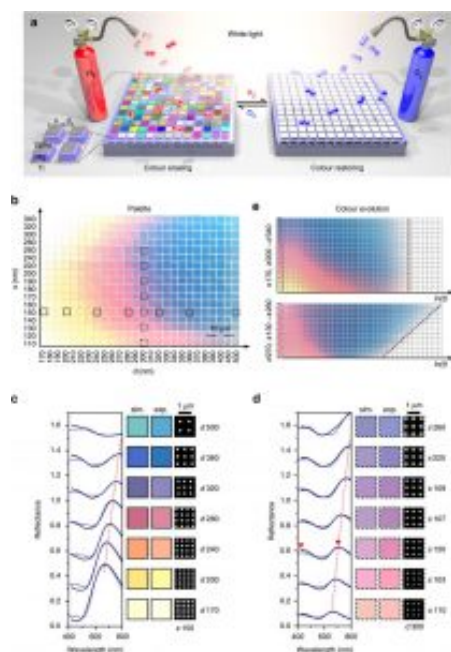


Dynamic plasmonic colour display



Plasmonic colour printing based on engineered metasurfaces has revolutionized colour display science due to its unprecedented subwavelength resolution and high-density optical data storage. However, advanced plasmonic displays with novel functionalities including dynamic multicolour printing, animations, and highly secure encryption have remained in their infancy. Here they demonstrate a dynamic plasmonic colour display technique that enables all the aforementioned functionalities using catalytic magnesium metasurfaces. Controlled hydrogenation and dehydrogenation of the constituent magnesium nanoparticles, which serve as dynamic pixels, allow for plasmonic colour printing, tuning, erasing and restoration of colour. Different dynamic pixels feature distinct colour transformation kinetics, enabling plasmonic animations. Through smart material processing, information encoded on selected pixels, which are indiscernible to both optical and scanning electron microscopies, can only be read out using hydrogen as a decoding key, suggesting a new generation of information encryption and anti-counterfeiting

applications.

Source: <https://www.nature.com/articles/ncomms14606>

Related paper: Xiaoyang Duan et al., Dynamic plasmonic colour display, *Nature Communications* **8**, Article number: 14606 (2017).