Applied Optics group
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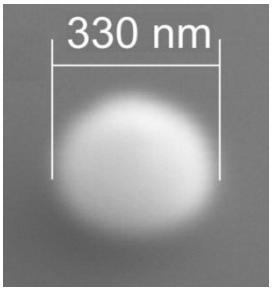
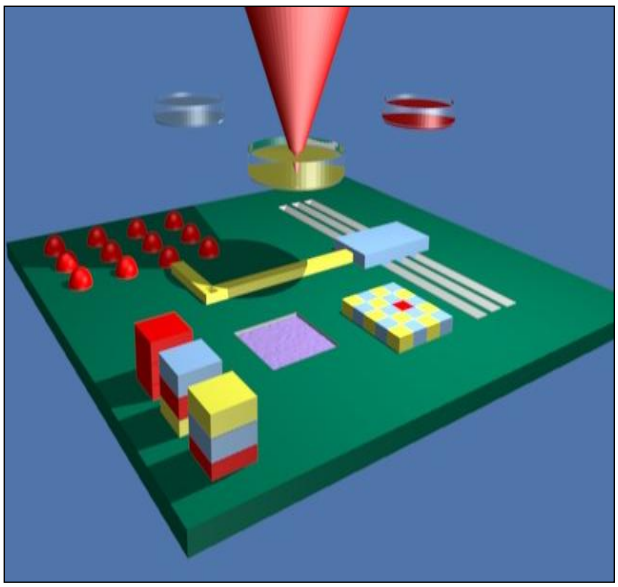
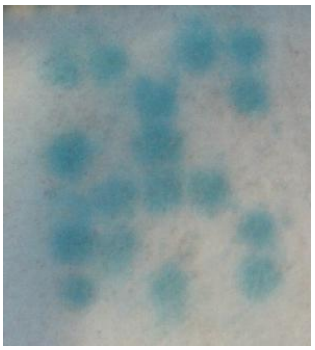
The University of Nottingham

LIFT: Laser-induced forward transfer printing of solid-phase materials for photonic and electronic applications

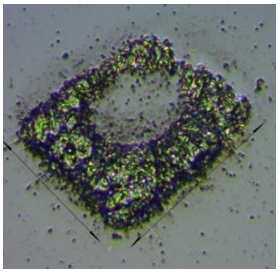
Professor Robert Eason
Optoelectronics Research Centre,
University of Southampton



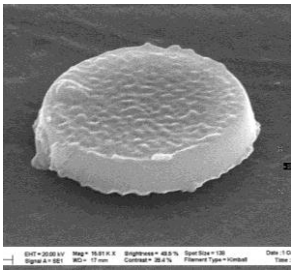




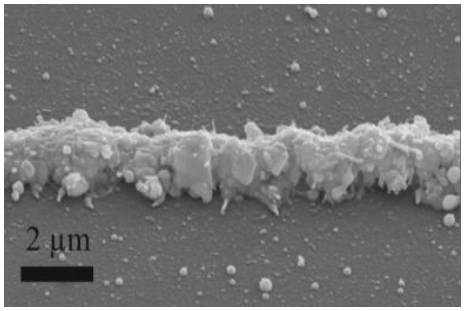
Antibodies printed as a QR code



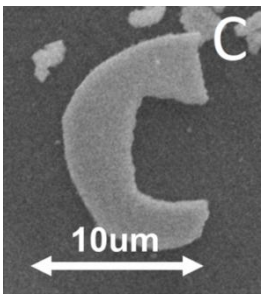
40μm²Au on Si.



4 μm ZnO pellet



Cu lines



Shaped printing of Bi_2Te_3

1.00pm Wednesday 22nd Jan 2014
2nd Floor Lecture Theatre
Tower Building. All welcome

Applied Optics Group Lunchtime Seminar:

LIFT: Laser-induced forward transfer printing of solid-phase materials for photonic and electronic applications.

LIFT is a relatively new printing technique that enables transfer from a thin-film donor material onto your chosen receiver placed nearby. Unlike conventional laser-printers, which print liquids or inks, LIFT printing can transfer solid phase materials in (ideally) an intact state, for a range of applications in photonics, electronics, displays, medicine and energy harvesting. The lasers used are short pulse systems (nanosecond to femtosecond sources), and the donors are typically ~ μm thickness, and the universal aim is to print the material you want, where you want it, and to make sure that its functionality is not degraded during the printing process.

The talk will describe the mechanics of the LIFT process, and discuss our results to date in LIFTing of metals, semiconductors, biomaterials, ceramics and also fully single-crystal discs. As always, there are some special tricks to successful LIFT-printing, so I will let you into some of the these 'secrets' as well as describing some of our more recent attempts to shape the printed pixels using digitial multimirror devices.

Professor Robert Eason is a Deputy Head of School and Professor of Optoelectronics in the Optoelectronics Research Centre at the University of Southampton. He has been working in the area of lasers, laser-produced plasmas, laser-materials interactions, ultra-short pulse laser techniques, non-linear optics and laser-assisted thin film growth for more than 30 years, and also runs 2 other research groups in the area of laser-materials interactions. He has published widely, with more than 300 publications to date, and had supervised more than 30 PhD students. During 2010-2012 he held an EU STREP grant on LIFTing of organic and inorganic materials on flexible substrates, and is also currently funded by EPSRC via several LIFT grants and a 4 year platform grant. His most recent work has focussed on LIFTing of biomaterials for development of point-of-care paper-based sensors that he hopes will establish the utility of LIFT in a commercial environment, and via a spinout company.