

Research Topics 1999



New Machining Strategies Using Excimer Mask and Workpiece Dragging.

Objectives

To develop 3D excimer laser micromachining techniques based upon mask and workpiece dragging techniques. In these techniques the mask projection beam delivery system is held stationary and 3D structures are ablated by co-ordinating the motion of the workpiece with the firing of the laser using computer control.

Expected Outcomes

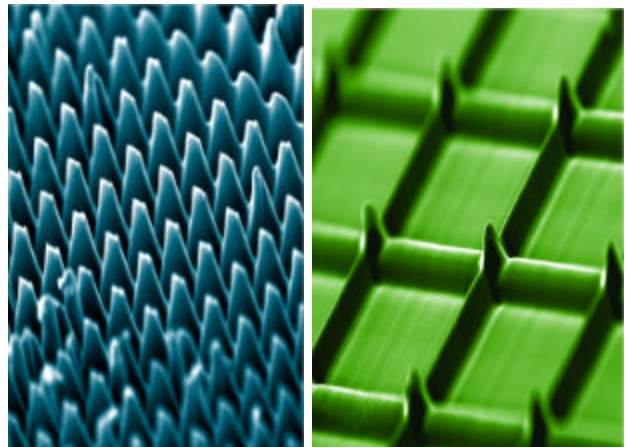
Unique 3D and multi-level machining can be performed in a single step using the co-ordinated operation of the pulsed laser and the moving workpiece in combination with excimer laser mask projection. The final shapes produced may, in their simplest form, be an intuitive extension of the 2D mask pattern, but more usually the final machined shapes are far more complex. This program is working to optimize the machining conditions, mask designs and choice of workpiece materials so as to achieve optimal 3D resolution and aspect ratio. The resulting structures have many applications and the program is initially focusing on micro fluidics, micro optics and bio-instrumentation.

Researchers

Dr. Jason Hayes, Mr. Brian Dempster

Research Coordinator:

A/Prof Erol Harvey



50 micrometer high chisels and spikes machined using mask dragging.