

# Research Topics 1999



## Femtosecond Laser Ablation

### Collaborating Organisations:



Sumitomo Heavy Industry, Japan

### Objectives

To investigate the ablation characteristics of Femtosecond laser pulses on a range of materials of industrial interest.

### Expected Outcomes

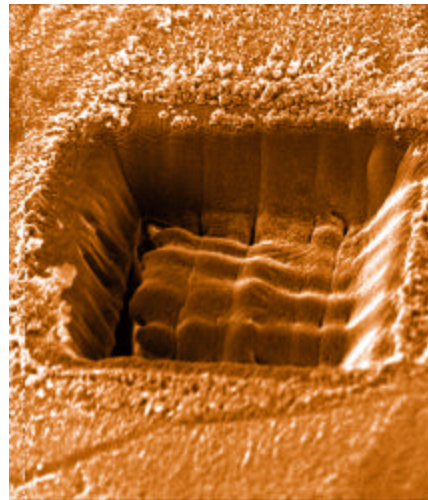
Femtosecond lasers are new sources that have only recently become available for engineering applications. It has been expected that the ultra-short pulse from the laser will enable materials to be machined with a significantly reduced Heat Affected Zone (HAZ). The high peak power from the laser may also provide effective machining in certain materials due to multi-photon interactions. Initial trials have been disappointing in terms of the edge quality of machined structures in metals, polymers and glass in that there appears to be little advantage gained over nano or picosecond laser ablation, however the work is ongoing.

### Researchers

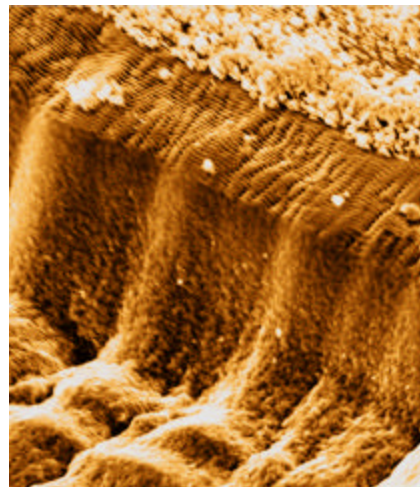
Mr. Martin Lowe (SUT), Dr. Yanping Zhang (SHI)

### Research Coordinators:

A/Prof Erol Harvey (IRIS)  
Prof. Peter Hannaford (Swin), Dr. Akira Endo (SHI)



A 30 micrometer deep etch in copper using 80 femtosecond laser pulses.



Detail of wall and upper ripples seen for femtosecond laser ablation of copper.