



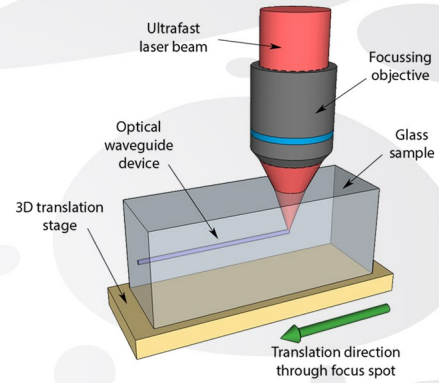
FLAGSHIP EQUIPMENT

- ✦ Ti:Sapphire Coherent RegA femtosecond laser (800nm, 300 kHz)
- ✦ CW & pulsed, widely tunable, Ti:Sapphire Coherent Chameleon femtosecond laser (800nm, 80 MHz)
- ✦ Spectra-Physics Hurricane Ti:Sapphire femtosecond laser (800nm, 1 kHz)
- ✦ High resolution motion control systems

KEY CAPABILITIES

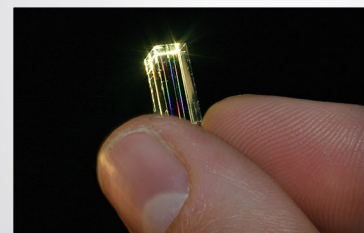
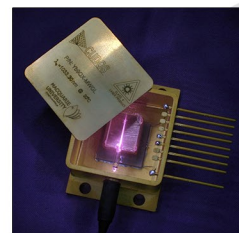
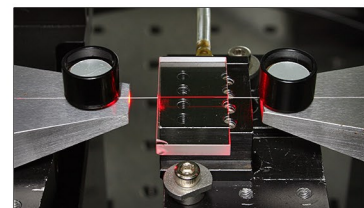
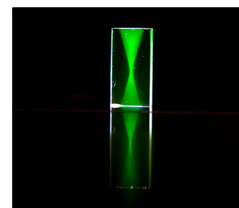
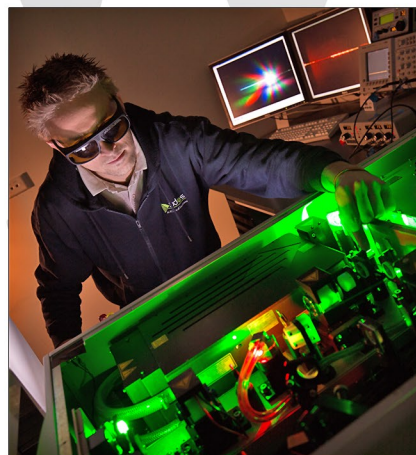
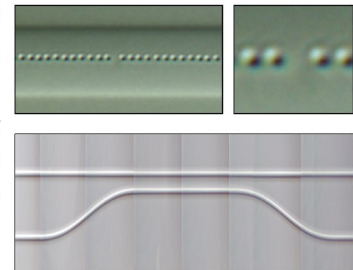
- ✦ Laser written waveguide devices in bulk materials
- ✦ Fibre Bragg Gratings
- ✦ Laser machining & marking

Focussed ultrashort laser pulses can create a permanent refractive index change inside materials such as glass, crystal and polymer. This phenomenon led to a new field in photonics whereby optical waveguide devices can be directly written *into the volume* of bulk materials simply by moving the sample through the laser focus. Not only can this direct-write technique be carried out rapidly, devices can be written at arbitrary depths inside a material and in a 3D fashion, it is readily compatible with existing fibre systems, and requires minimal sample preparation.



Ultrafast laser inscription (ULI) is a powerful technology for realising 3D integrated waveguide components for a number of applications. Significant advances have been made in quantum logic circuits, integrated photonic/microfluidic biological devices, telescope pupil remappers for astrophysics, and photonic lanterns in spatial division multiplexing.

The Ultrafast Laser Facility at Macquarie University has the capability to fabricate laser written photonic devices via its suite of femtosecond lasers coupled with high precision motion control systems. Our laser direct-write team specialises in providing customers with bespoke integrated photonic waveguide devices in a variety of materials. To complement this service, our Facility also uses the direct-write technique to fabricate user-defined Bragg gratings in many optical fibres. Such fibre Bragg gratings (FBGs) have been used in sensing, telecommunication and laser applications. Customers not wishing to take advantage of our fabrication capability can just as easily access our widely tunable femtosecond laser system specifically allocated for ultrafast laser experiments.



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