µLaser

Direct optical lithography system

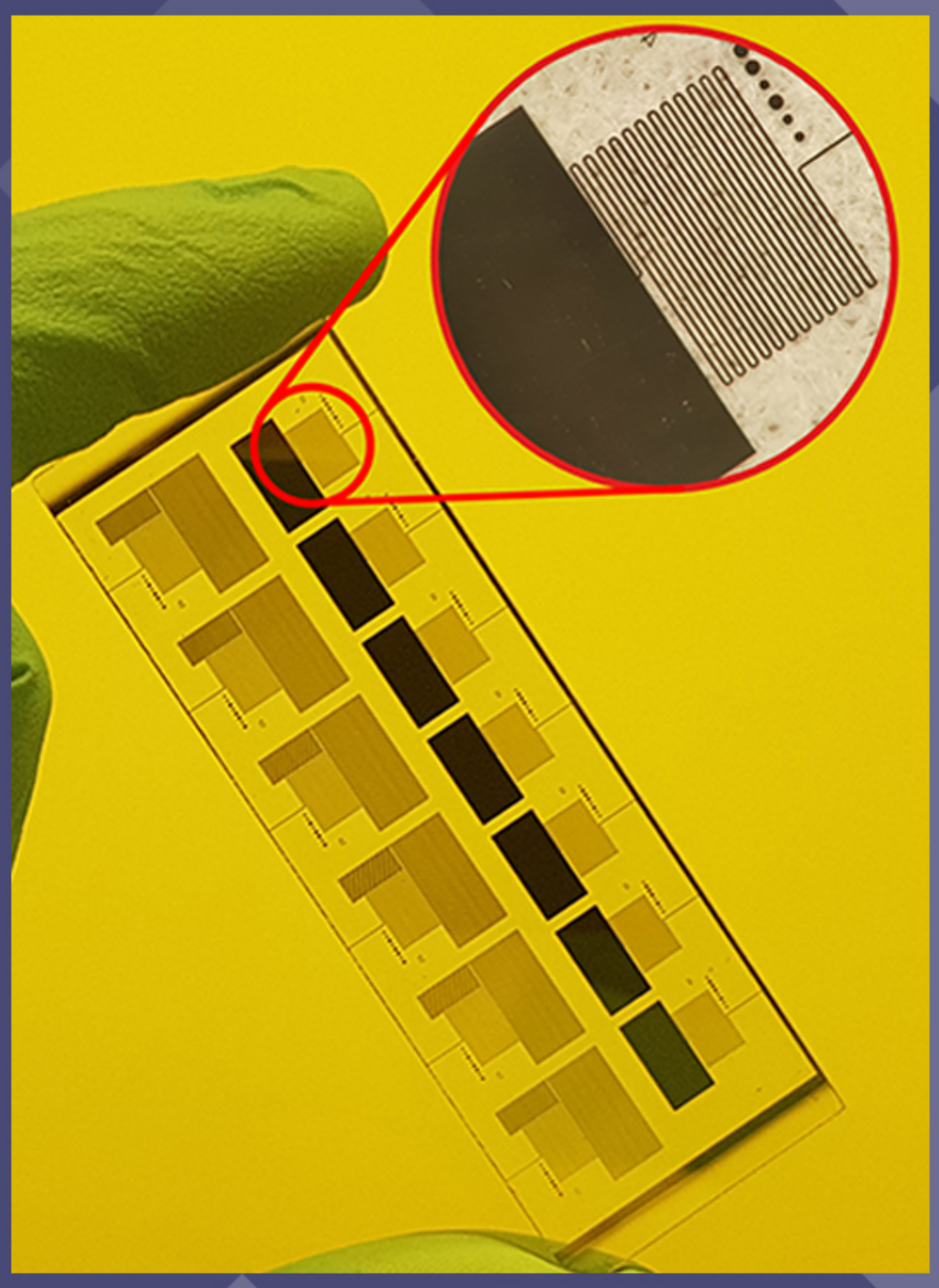
MUTECH Microsystems

INN

Instituto Balseiro

IB50K

The writer

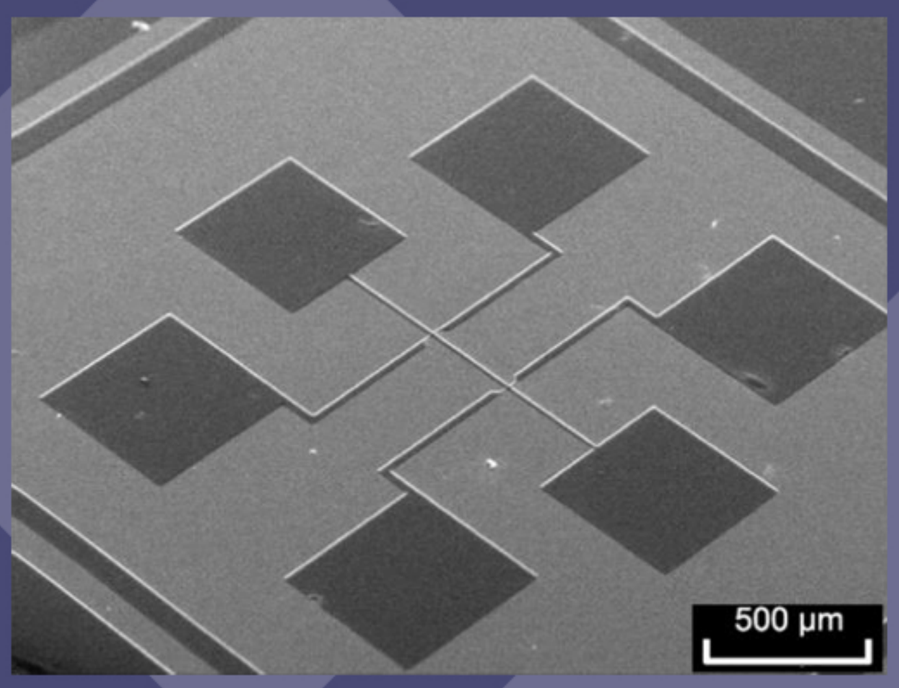


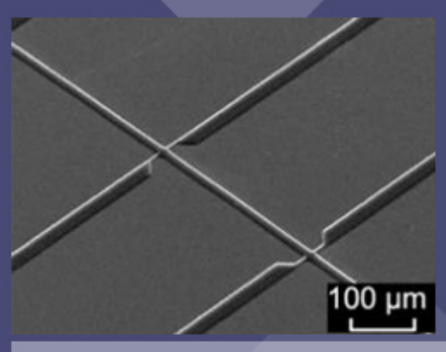
µLaser is a low cost optical lithography system oriented to universities and research facilities looking to expand their capabilities.

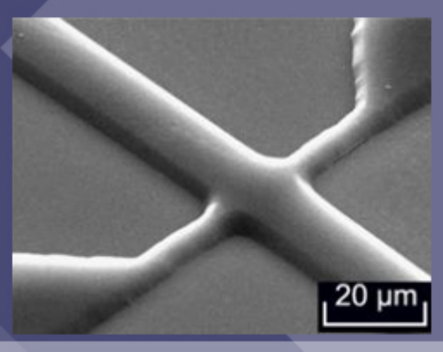
It writes on a photosensitive resin coated surface with a 405nm laser. You can write anything from photomasks to research prototypes for basic or applied science.

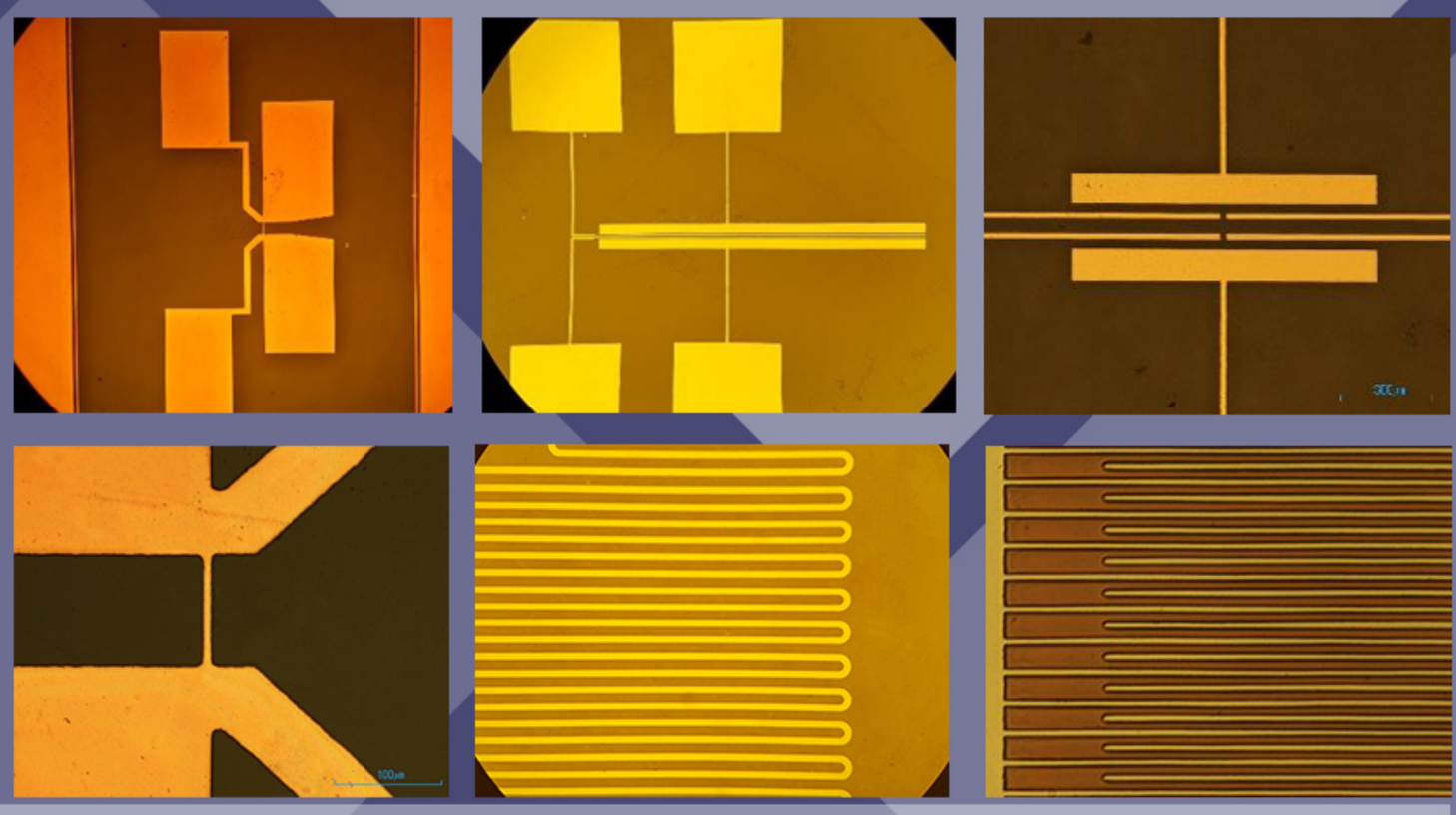
Direct laser lithography greatly reduces costs and execution times in areas such as microfluidics, microelectronics, micromechanics and material science research, by eliminating the dependence of external suppliers for the production of photomasks.

Some use examples

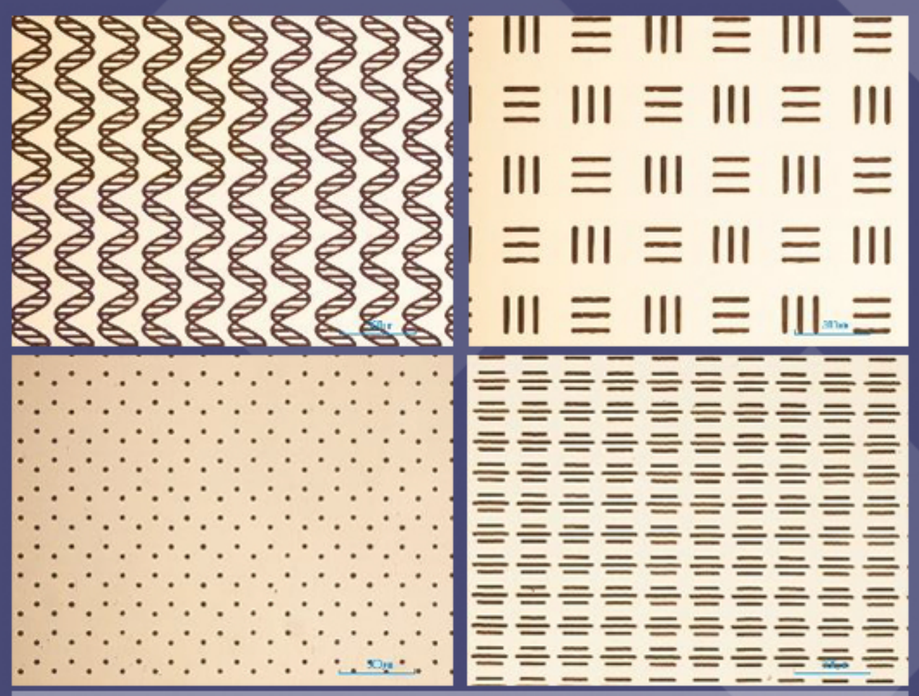




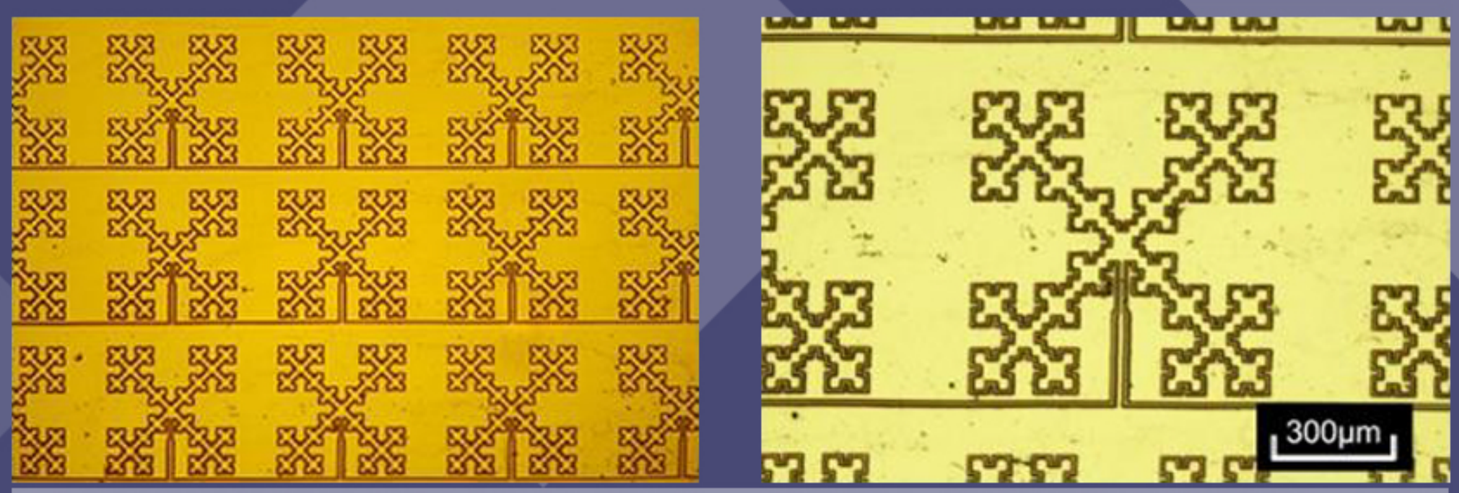




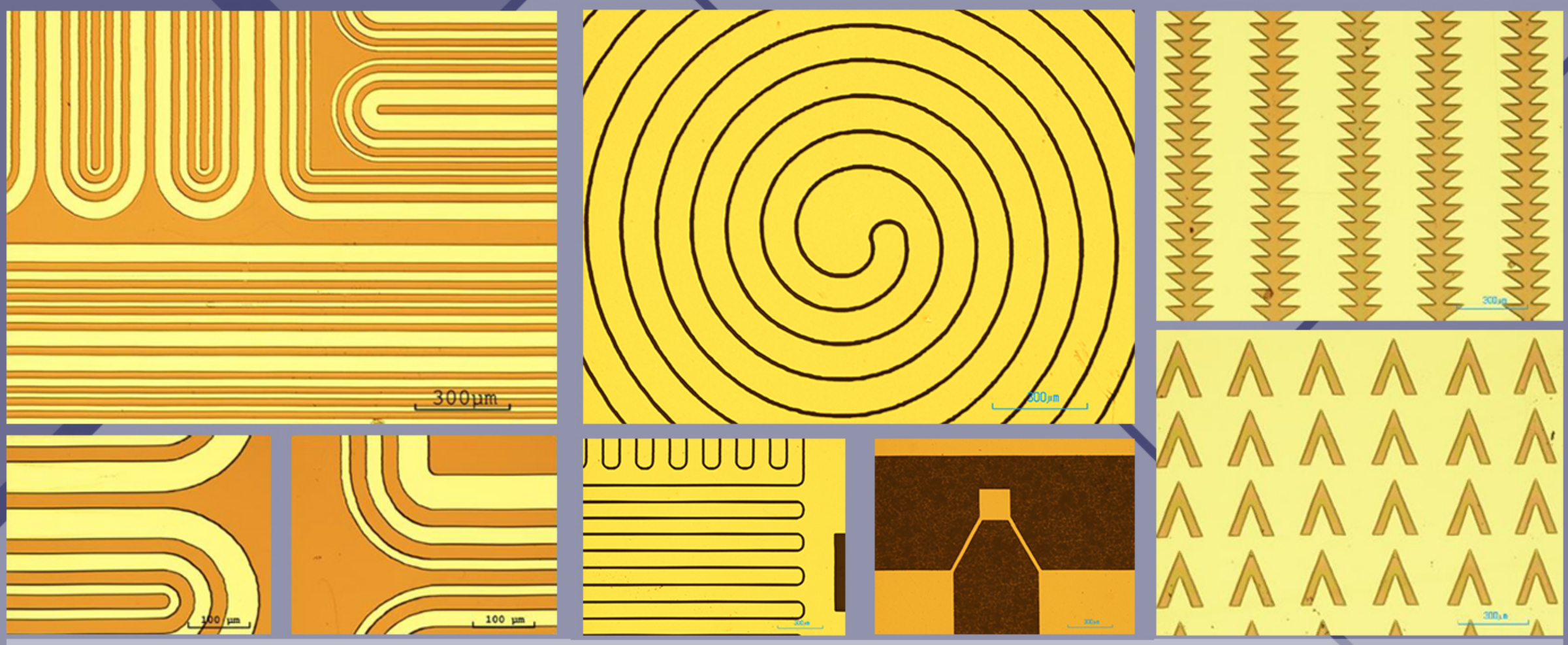
Electrical properties measurement on thin films and nanoparticles.



Custom diffraction gratings.



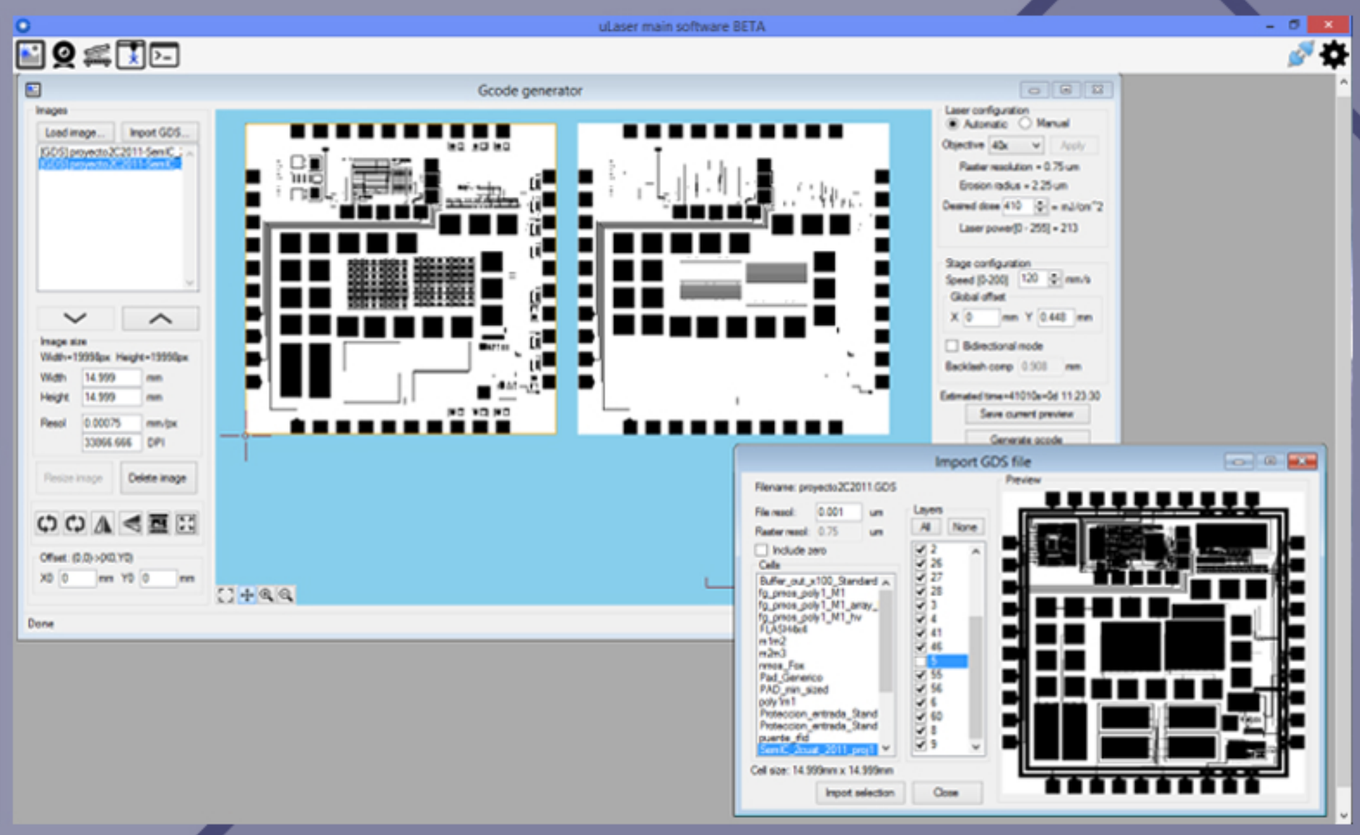
Fractal microantennas.



Microfluidic structures/MEMS.

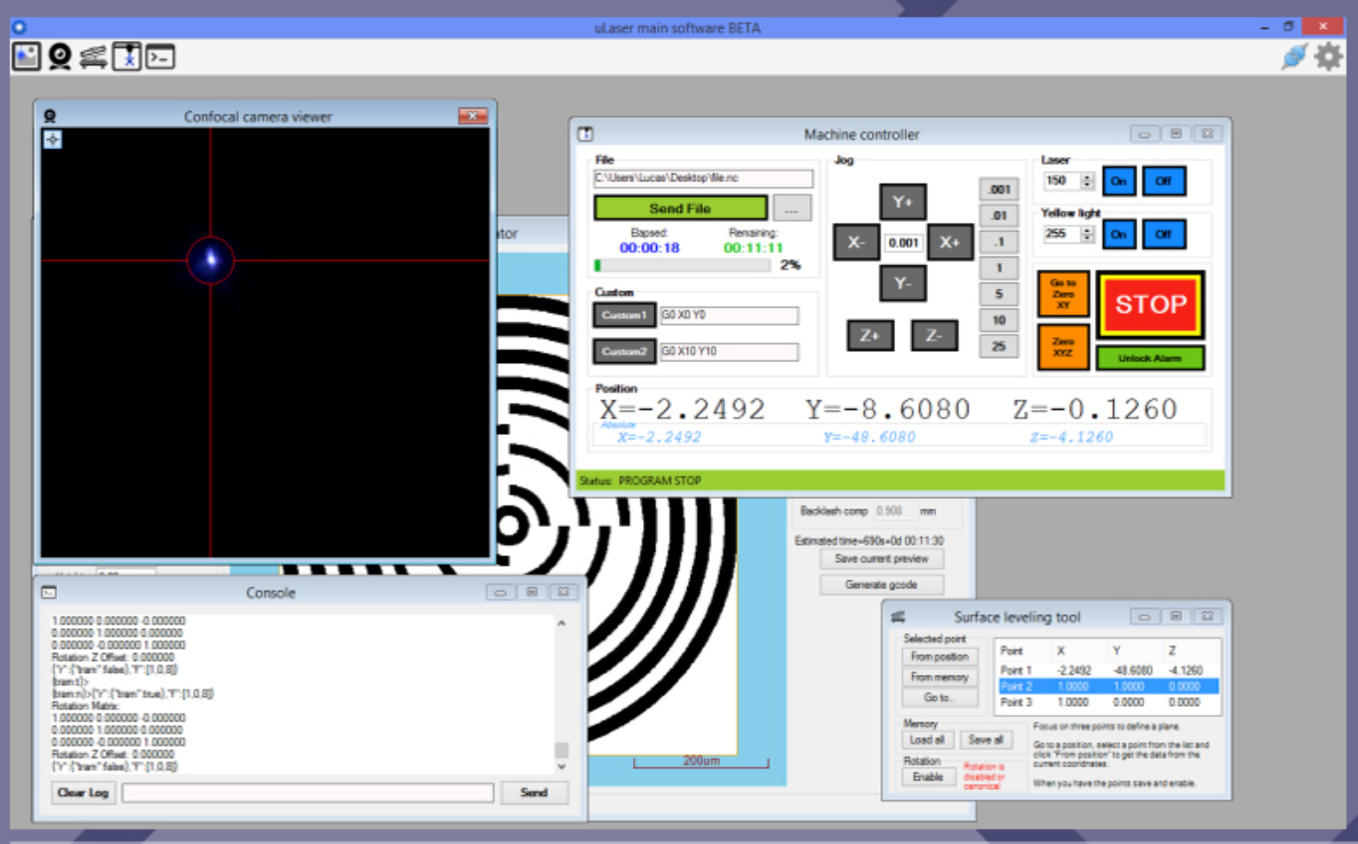
The software

µLaser is delivered with its control software on a PC. It allows you to import the designs to be written from cells of GDSII files or directly from PNG images.



Everything is done from a user friendly graphical interface that allows you preview the design to write before executing it.

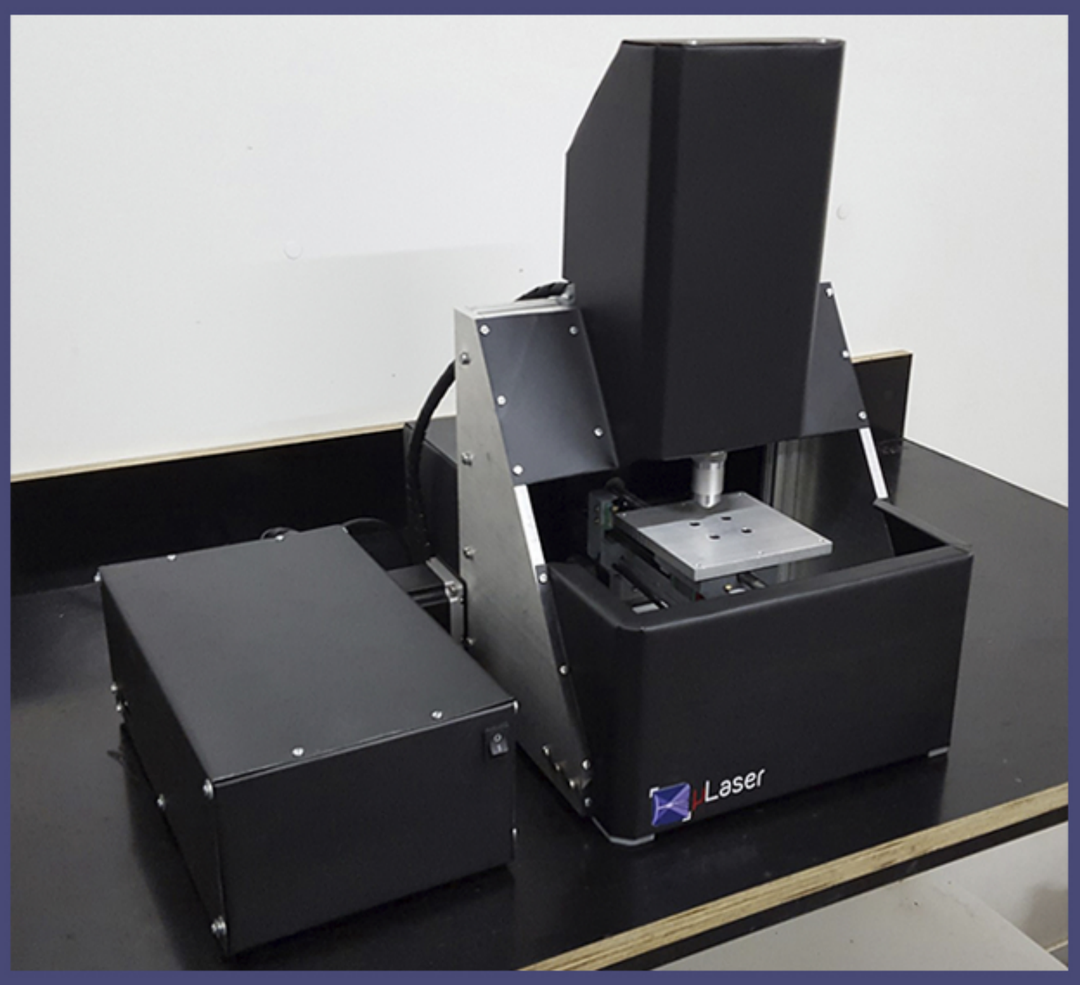
Multiple designs can be combined in a single process, in addition to applying transformations such as rotations, reflections, inversions or scale adjustments to each design.

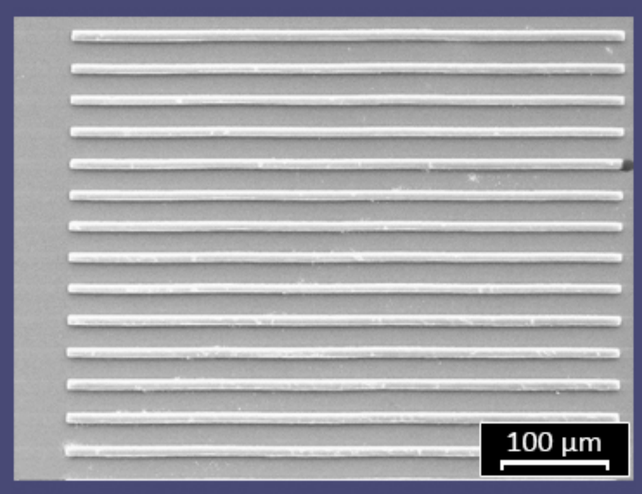


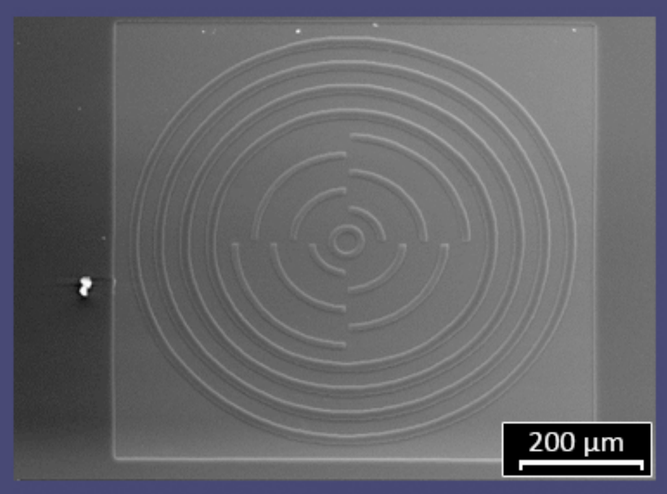
After defining the design, the included stage control modules and the confocal microscope are used.

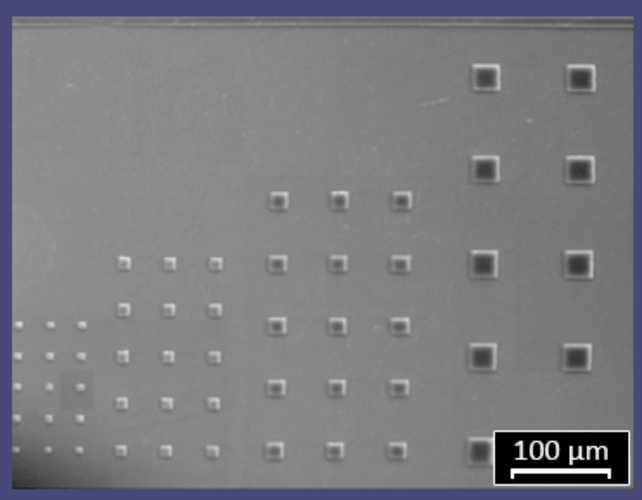
With them you set the origin position of the process on the substrate and the focal plane on the photosensitive surface. Also, the microscope can be used to align with preexisting designs.

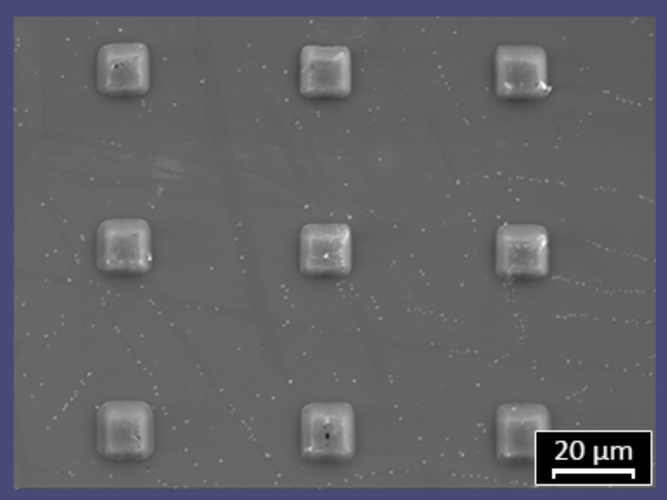
Next the process is executed and the design is written on the surface.











Specifications

XY stage

Typical writing speed	100-120 mm/s
Maximum area	100x92 mm²
Minimum area	There isn't a minimum area
Unidirectional positioning step	X = 0.16 µm, Y = 1.00 µm
Mechanical noise on writings	X ≤ 1 µm, Y ≤ 1 µm

Software

Supported formats	PNG, GDSII
In-software transformations	Rotation, Reflection, Inversion, Rescaling, Add border

- Multiple designs from different files can be written in one process
- Tilted substrate compensation via 3-point focus measurement
- Mesh type calibration for curvature compensation

Optics

- Confocal microscope for laser focusing, aligning and inspection
- Secondary independent yellow illumination
- Laser spot size can be changed using industry standard microscope objectives

	Included objectives		
	Fine	Medium	Coarse
Raster step	0.8 µm	2.0 µm	5.0 µm

Contact information

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