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INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

# 3D FREE-FORM MICRO FABRICATION

Custom built fabrication solutions for creating high accuracy freeform 3D structures.

We deliver custom-built fabrication solutions to create high-accuracy freeform 3D structures based on CAD designs exported in .STL or spreadsheet format. Additionally we offer the service to design 3D structures from the bottom up. We optimised the fabrication for a range of different materials - from biological applications to polymer materials optimised for optical components and interconnects.

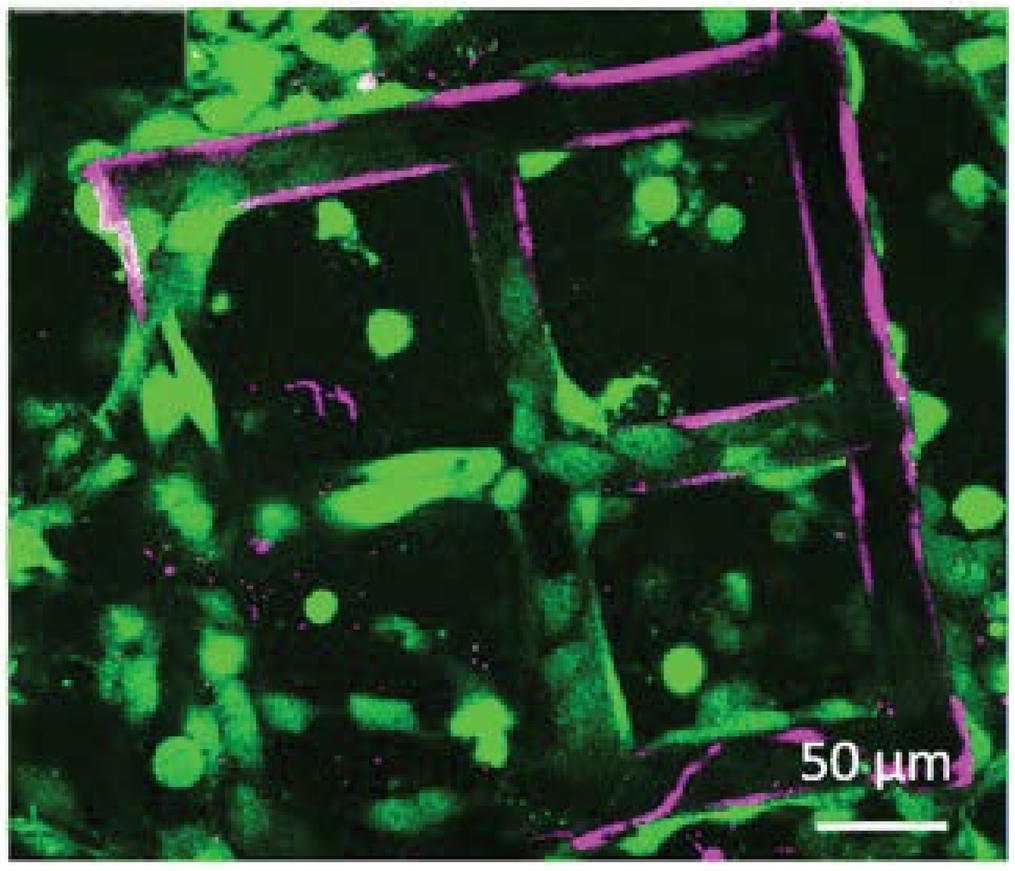
With our available hardware we can process a large variety of photo-sensitive materials. We are able to scale up the fabrication process for periodic structures using multiple parallel beams. Sub-µm size features are possible in the fabricated structures, and we can cover areas in the millimetre range.

Optical and morphological characterisation can be performed at the INL open access facilities or the structures are directly delivered to the client.

We are specialised in the fabrication of 3D microstructured surfaces for *in vitro* live cell research applications, fabrication of cell scaffolds for the growth of 3D cellular models, as well as the fabrication of optical waveguides for on-chip 3D interconnects.

The figure shows an example of a fabricated 3D microstructure (magenta) interacting with bone marrow mesenchymal stem cells (green). With this 3D fabrication technique it is possible to generate 3D biocompatible structures, which can serve as an extracellular matrix, here incorporating morphological hierarchy, other designs can integrate vascularity.

**Bone marrow stem cells interacting with structures fabricated using two-photon polymerisation.**




## + Features

3D free-form design
Different photosensitive and biocompatible materials
Sub-µm size structures
Possibility to cover mm-size areas

## + Suggested applications

Cell scaffolding
Microfluidic devices
Optical interconnects/ waveguides
Micro-optical components

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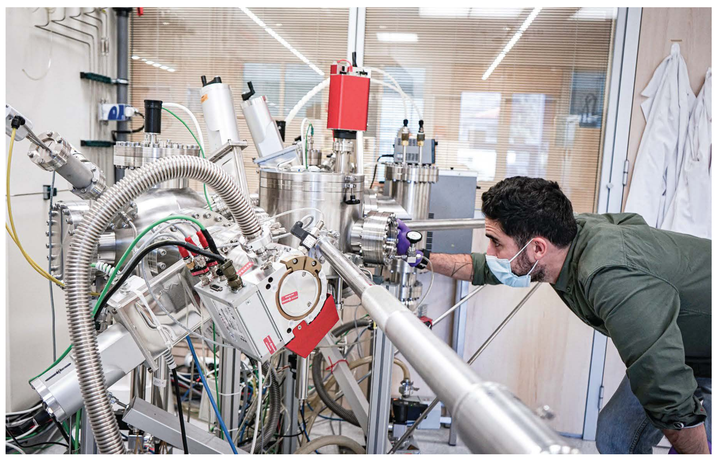

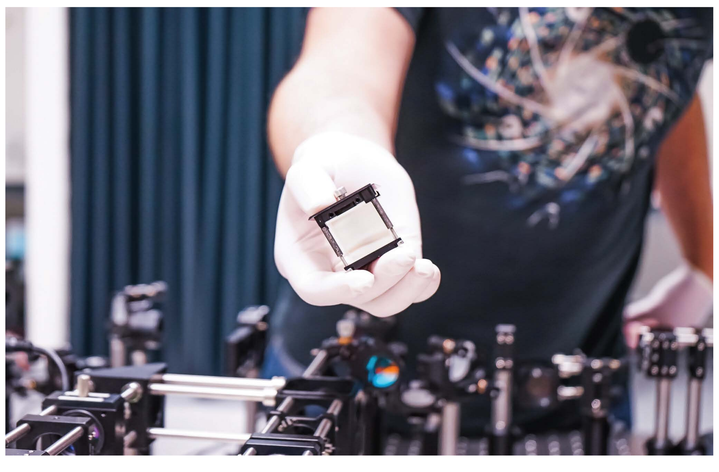

# YOUR WORLDWIDE PARTNER FOR SCIENCE & INNOVATION

Shaping the future together in Clean Energy, Food, Health, Smart Digital NanoSystems, Sustainable Environment and Advanced Materials & Computing.

## 01 SCIENCE

Discover our areas of research and expertise, where we dive into nanoscience and intermix various disciplines to transform it into nanotechnology.

## 02 TECHNOLOGY

By nourishing on our multiple disciplines in house and with partners, we develop and deploy solutions to the market.

## 03 SERVICES

INL has state-of-the-art scientific equipment which can be used by internal and external stakeholders within the research, technology, and innovation fabric. You can access this open facility with expert support, either remotely or in-person, for full-service or for independent use after initial in-house training.

## 04 SOCIETY

INL is committed to disseminating to all audiences the nanotechnology concepts, to bring society closer to our scientific developments. Visit our website and explore our activities and events.

## For more information:


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