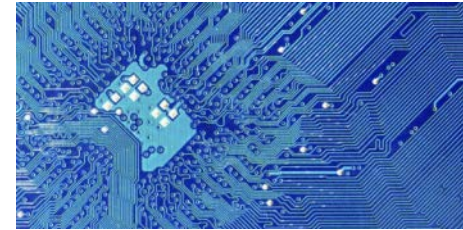
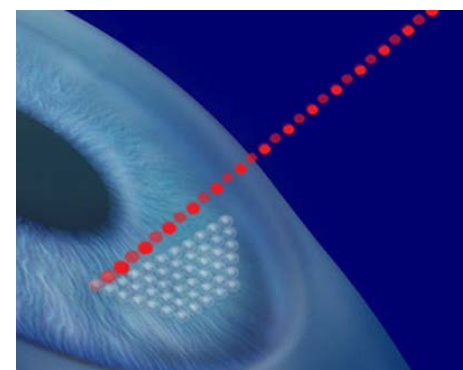
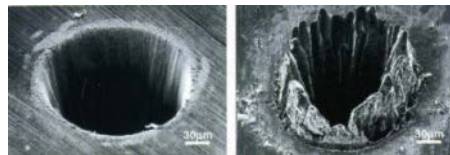
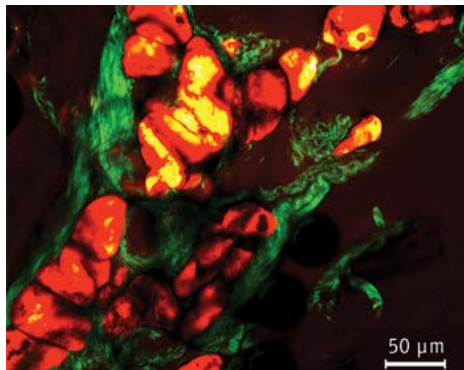


ULTRAFAST LASERS

AVANCES EN I+D Y APLICACIONES INDUSTRIALES



“Fabricación 3D basada en TPP”



Indice:

- **Proyecto FAIERA**
- **Fundamentos 2PP**
- **Trabajo experimental**
- **Aplicación industrial: Proyecto Fabimed**

**Fostering AIMEN Research Potential
in Laser Technology for Material Microprocessing**



FaiERA is a European Project promoted by AIMEN Technology Centre.
Its main objective is to reinforce the capabilities and research potential of AIMEN in the field of laser microprocessing of materials.

www.faieraproject.eu



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 316161



UNIVERSITY OF TWENTE.

Fields of action:



Project duration: 3 years

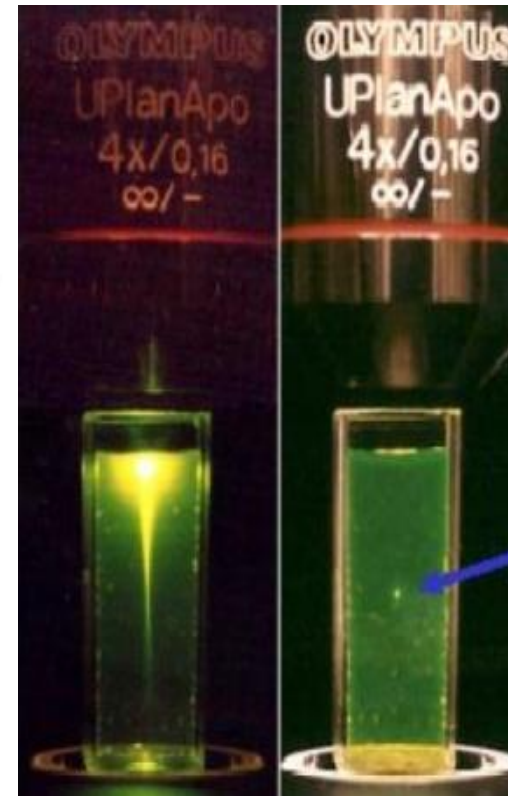
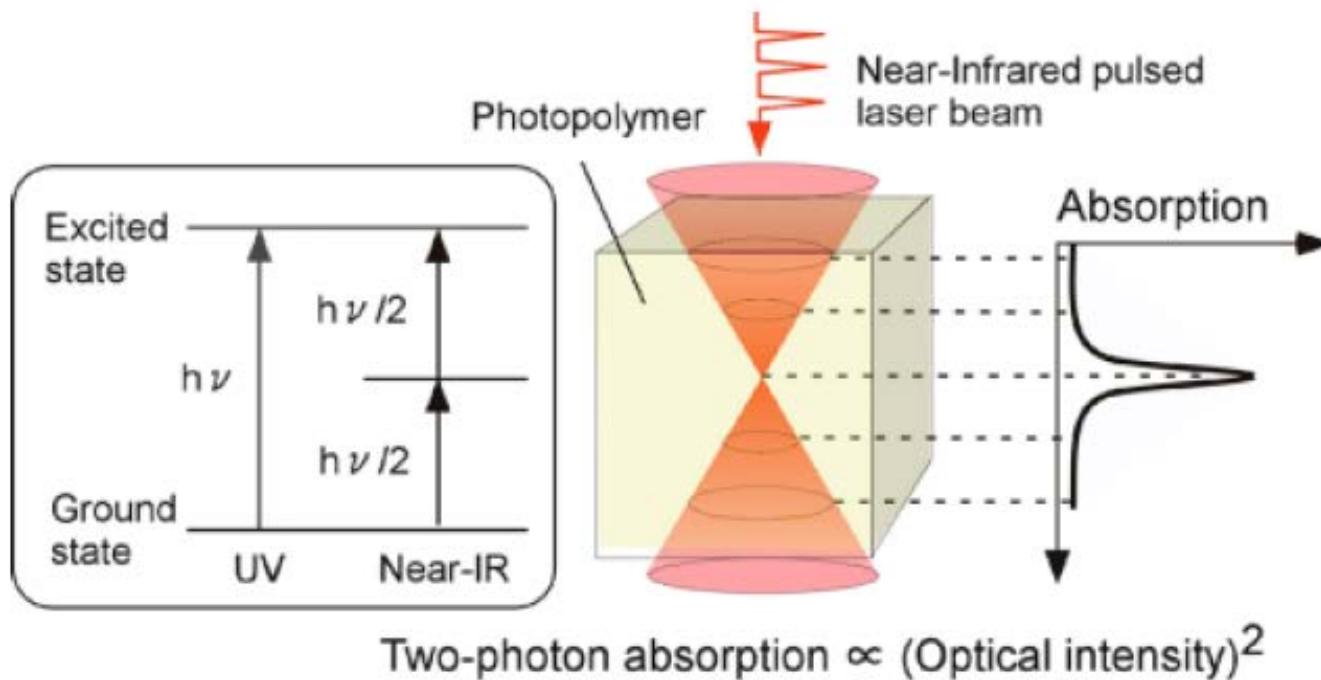
Starting Project date: September 1st, 2013

Impresión 3D: una revolución en los procesos de fabricación

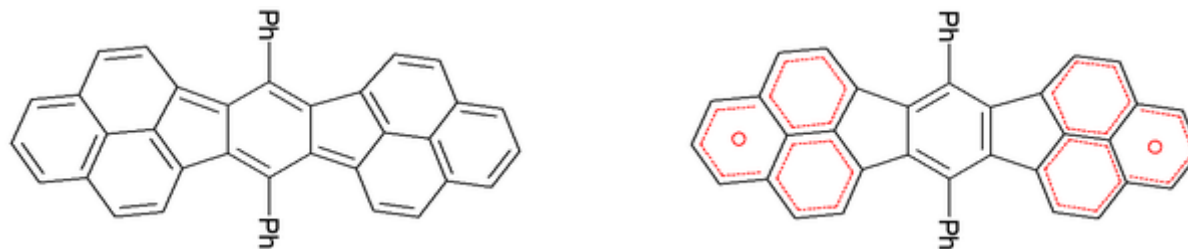


2pp fundamentals

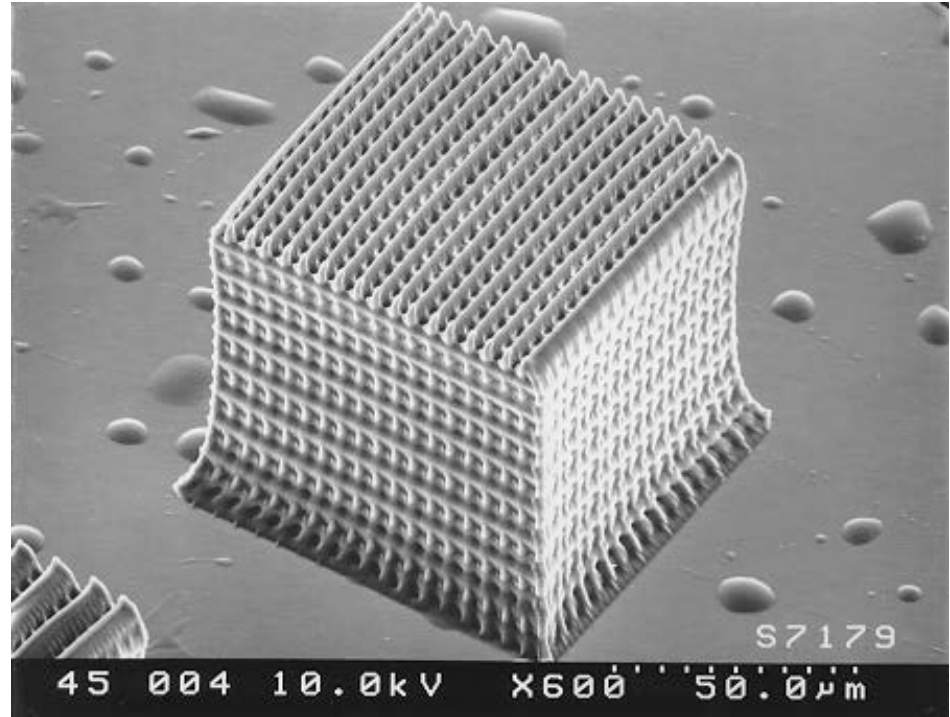
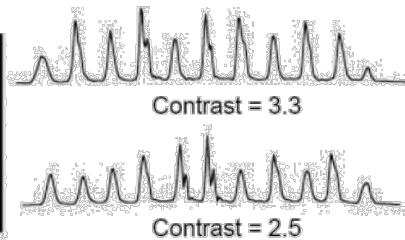
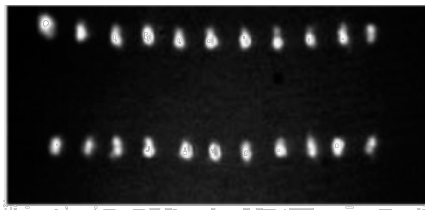
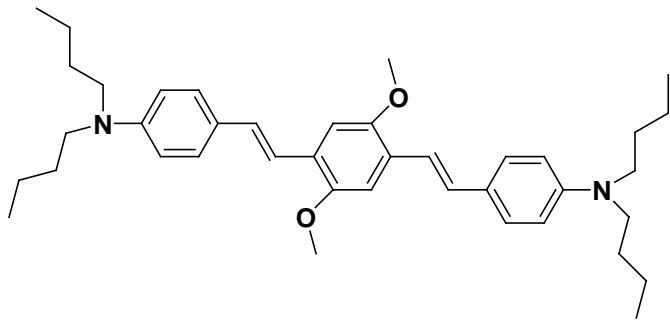
Shoji Maruo, Laser & Photon. Rev. 2, No. 1-2, 100-111 (2008) / DOI 10.1002/lpor.200710039



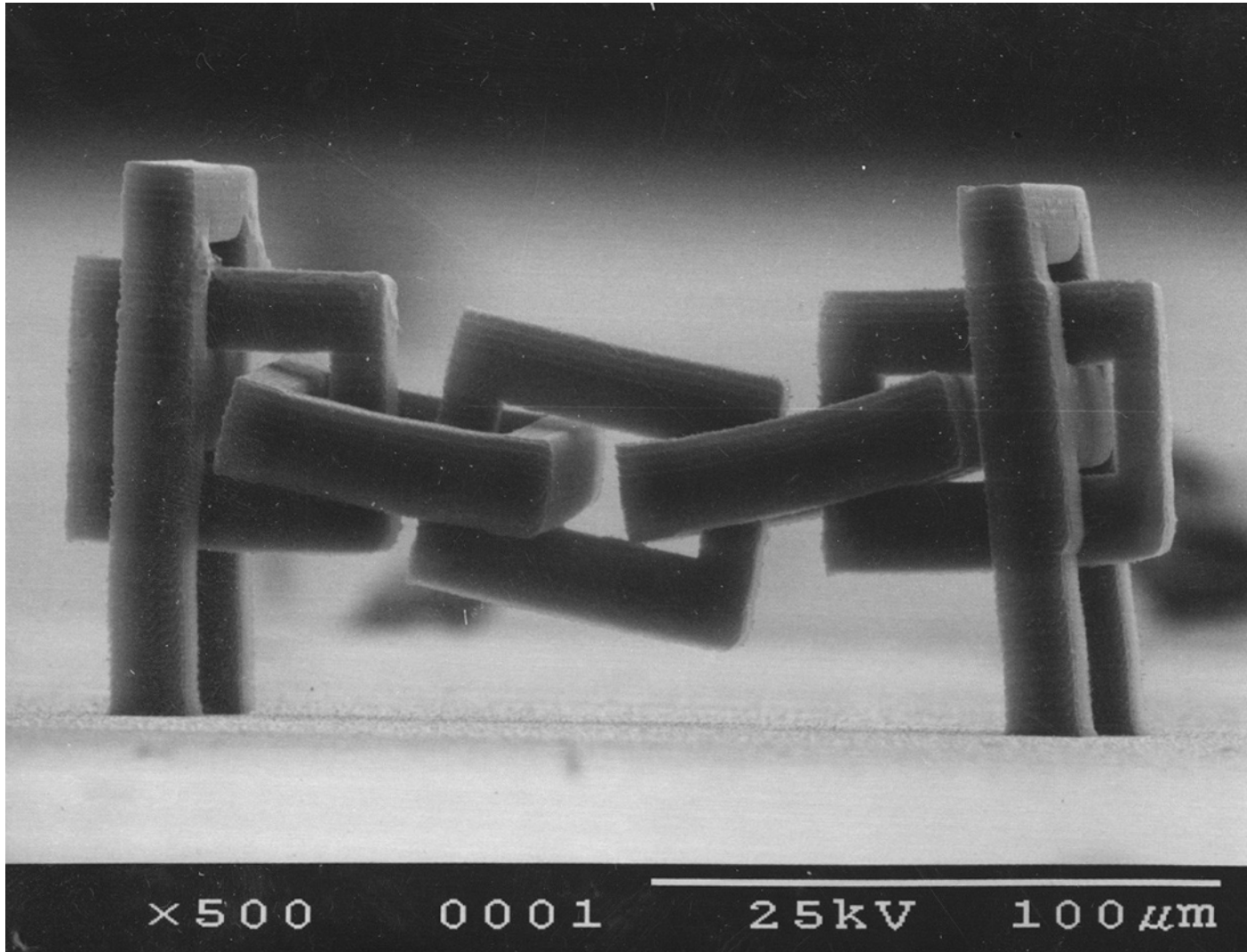
Fundamentals of multiphoton absorption generated by an ultrafast focused laser beam



Cristal fotónico tipo Woodpile producido en acrilato



Posibilidad de construir estructuras micromecánicas “flotantes” (andamiajes, resonadores, ...)



Fabrication and Functionalization of BioMedical Microdevices

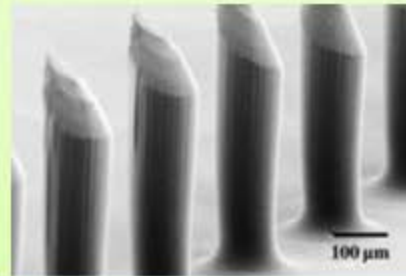
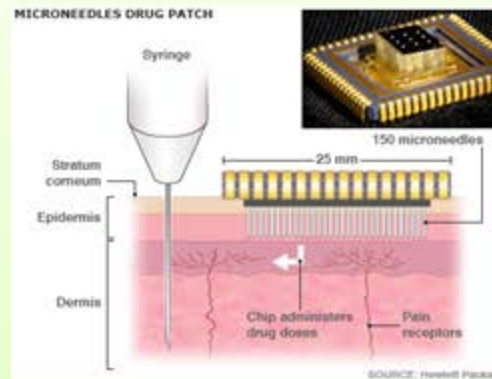
FP7-Grant Agreement 608901



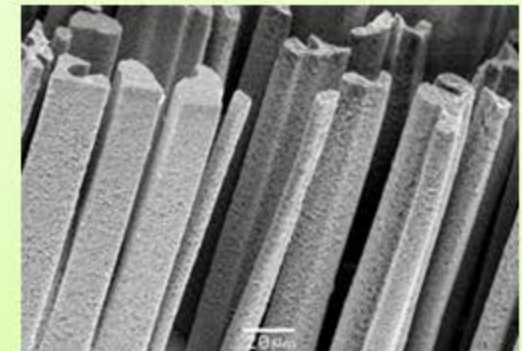
THREE DEMO LINES: Microfluidics, microneedles, piezotransducers.



*Handheld analyzer and
Microfluidic chip (SensLab)*

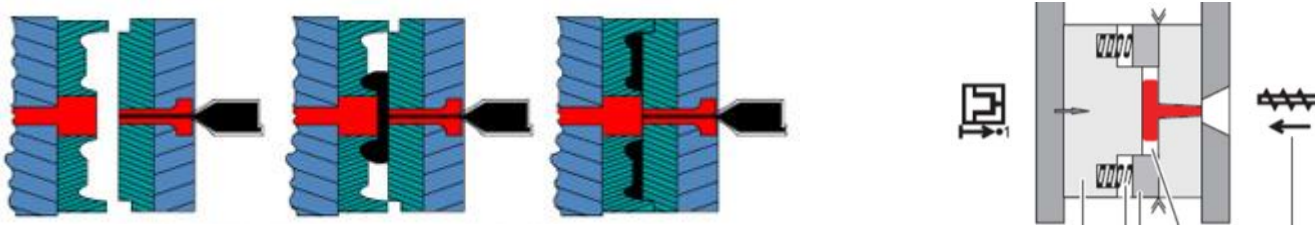


*Drug Patch Chip and
microneedle array (Crospon)*

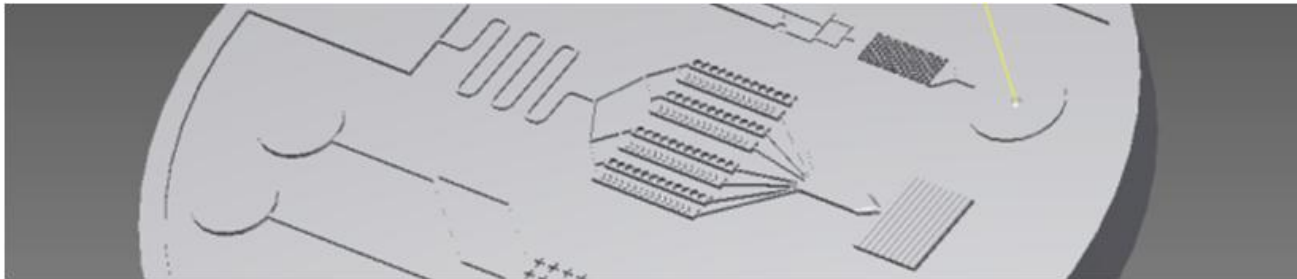


*IntraVenous US Catheter and
microPTZ transducer (AFM)*

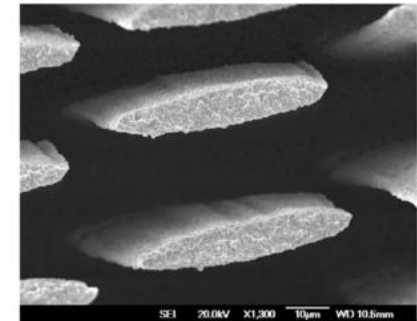
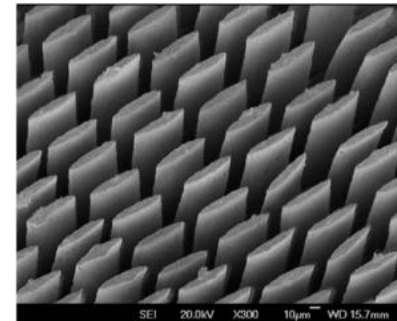
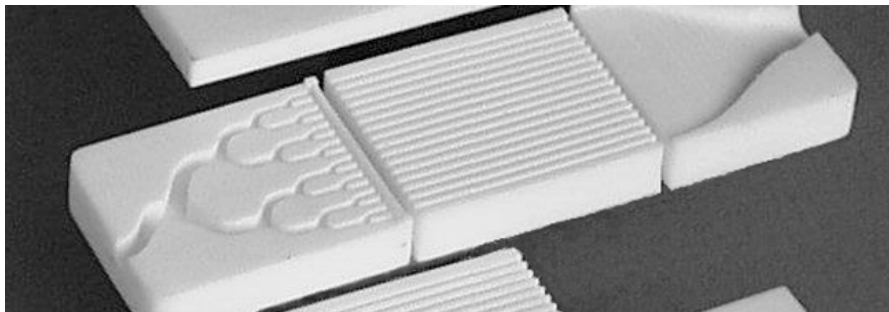
Replication Technologies: Developments for high precision flexible microreplication.



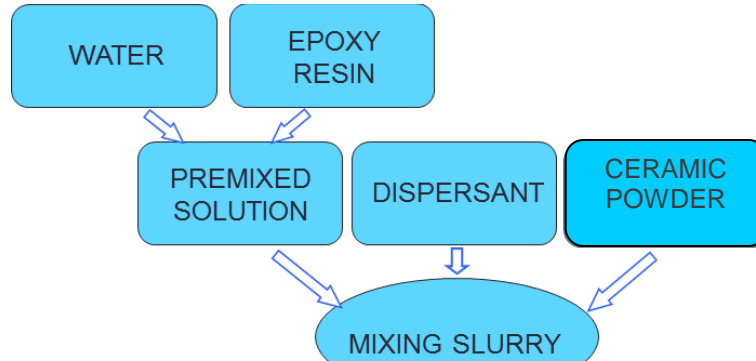
Injection Molding: Injection-compression method, high precision dosing with multipart fabrication.



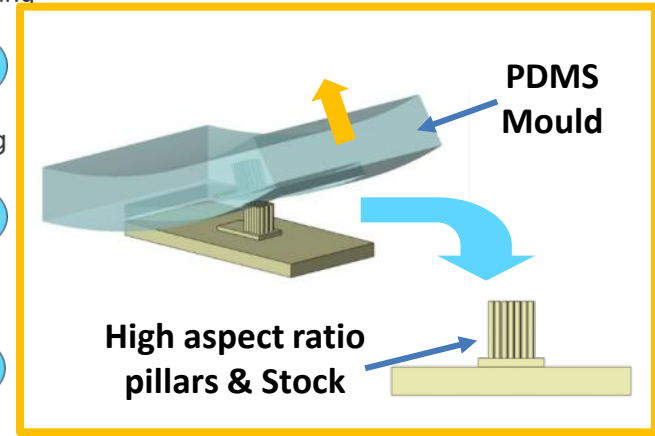
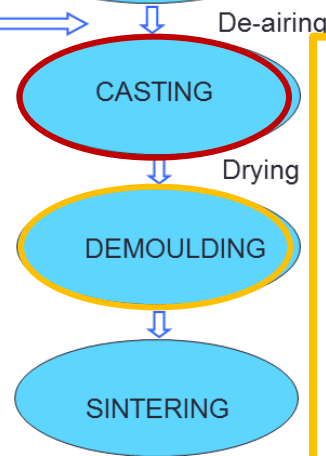
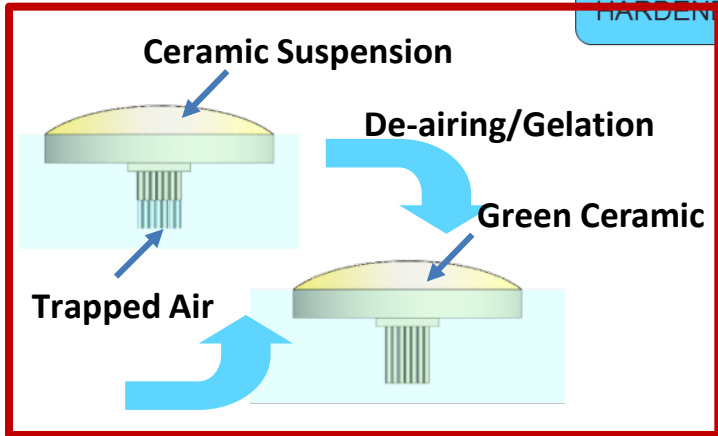
Embossing: Process and materials for thermal management and cycle time reduction.



Gel Casting: Reusable flexible moulds for microscale feature replication.

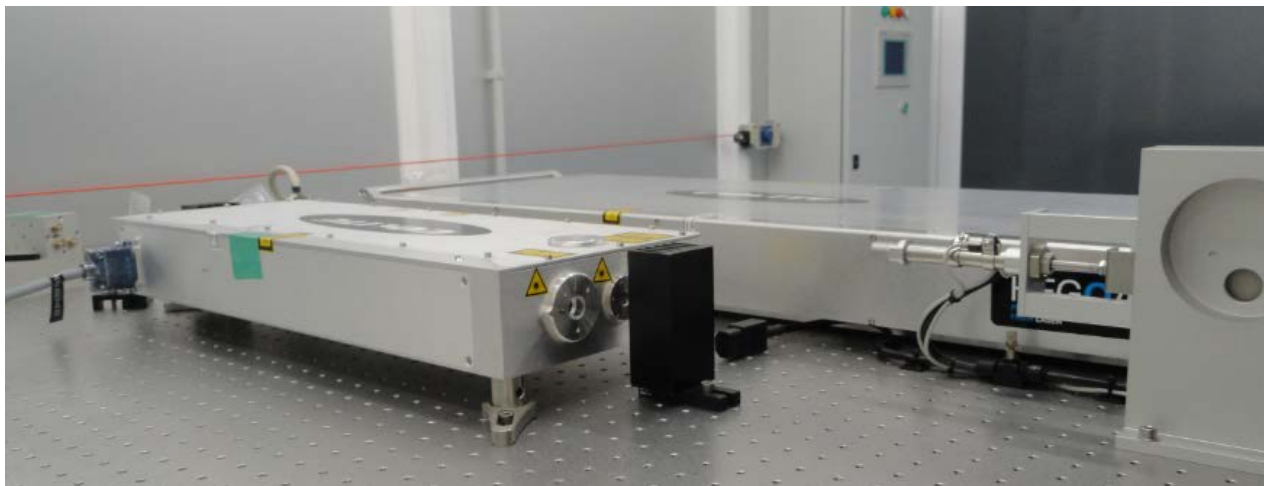


AMINE HARDENER



Process developed in a previous collaboration between UAVR and AFM

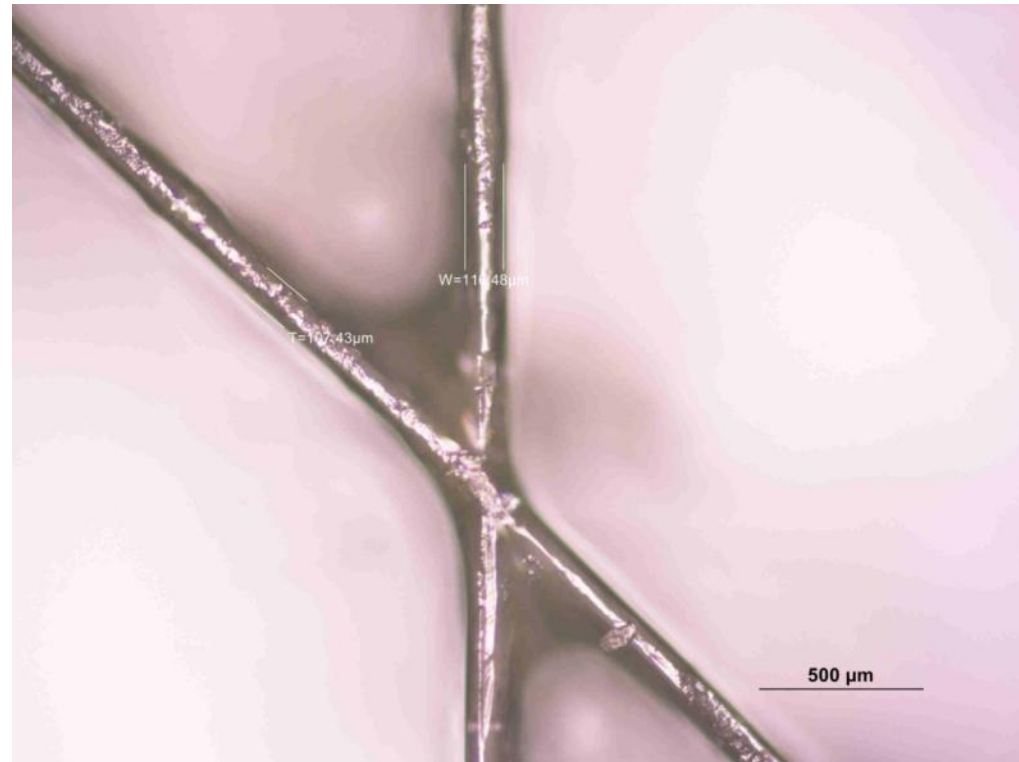
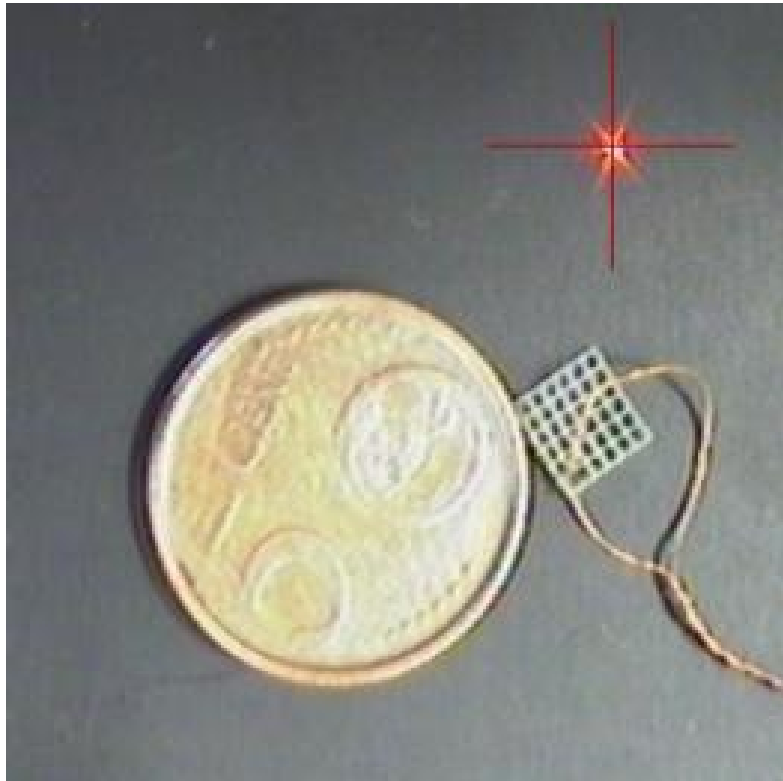
Use of Picoseconds Laser Sources – Scanner: Upscaling the TPP technology



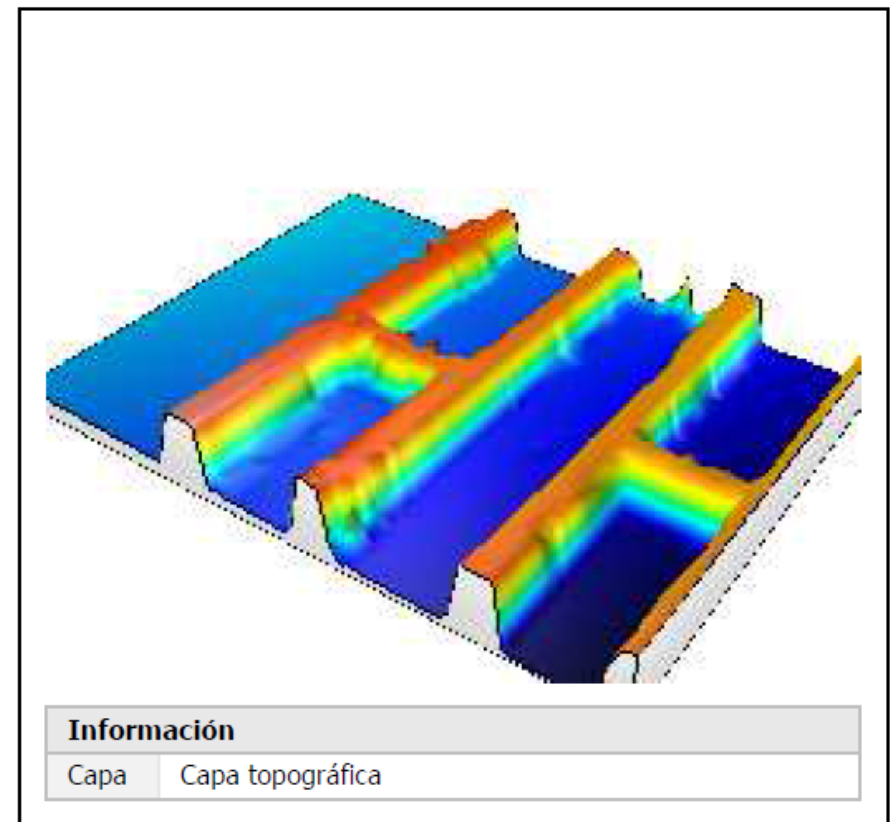
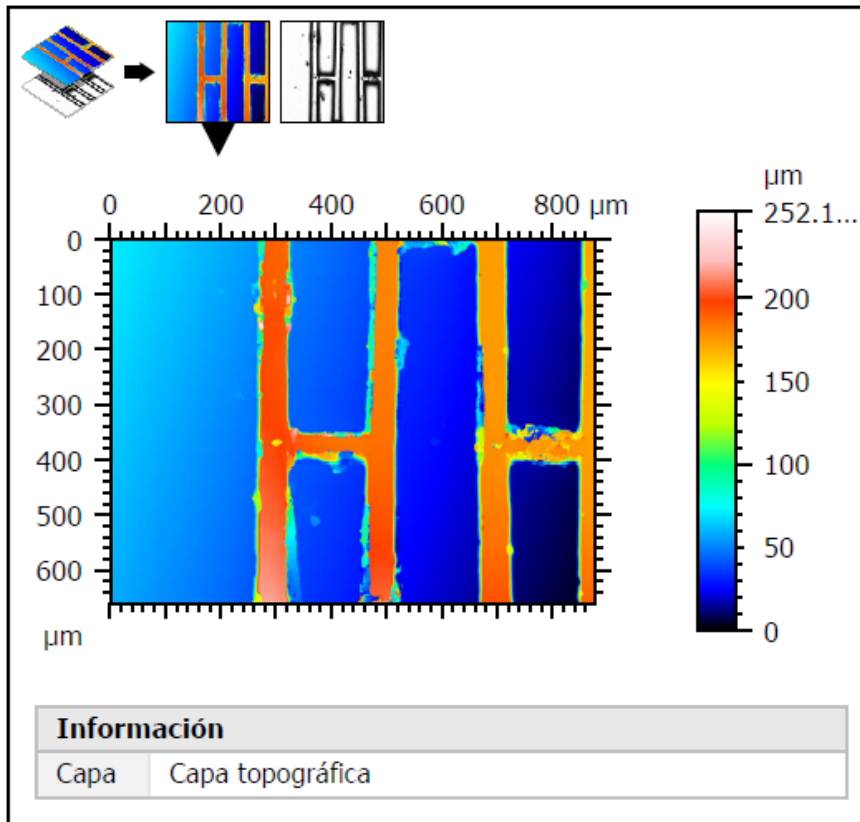
Average power	>40W @ 1030 nm >20W @ 515 nm >10W @ 343 nm
Pulse duration	< 30 ps
Pulse energy	>30 μJ @ 1030 nm
Pulse Repetition Rate	>2 MHz



Use of Laser Sources combined with Scanner



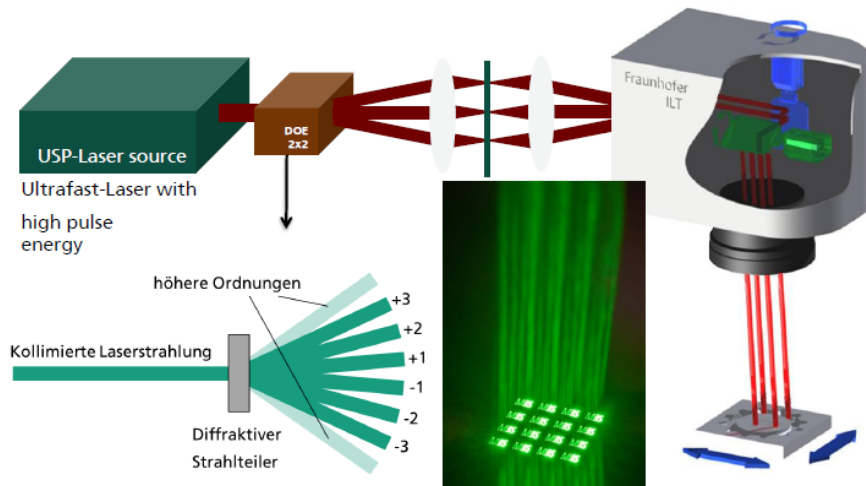
Use of Picoseconds Laser Sources – Scanner: Upscaling the TPP technology



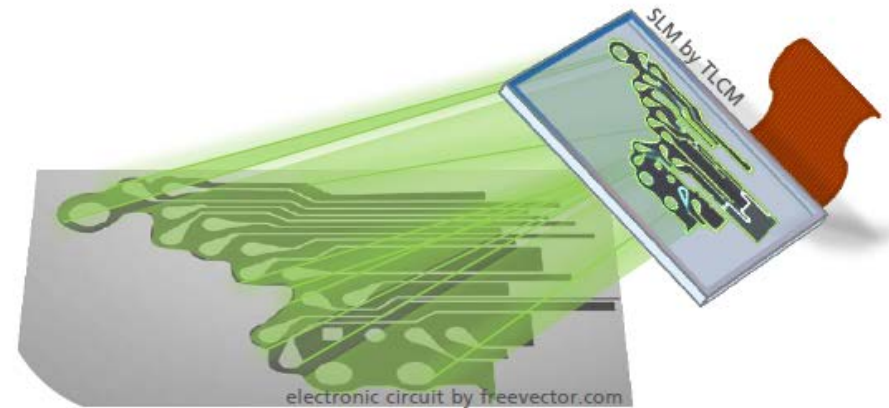
- Stable 1:3 aspect ratio fabrication
- 50 microns thick tracks, very sharp side walls

- Large productivity. Structures with 1:5 fill factor, ability to produce up to 48 cm²/min (per layer)

Estrategias para mejorar la productividad: Proyecto H2020



Escaneado con múltiples haces simultáneos



Holografía digital

Multibeam fabrication with static diffractive optics, and microlens arrays

Scanning with massive parallel beams by Diffractive Optics

Combined additive-subtractive processing

Outlook: use of digital holography

FaiERA

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FAIERA – Grant Agreement nº 316161

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Dos puestos vacantes para investigadores senior:

- Funcionalización de superficies
- Simulación procesos láser

