

Common project : *Thin and high-pitch laser-etched mesh manufacturing and bulking*
Progress report

V. Berardi, P. Colas, R. De Oliveira

RD51 – Stony Brook
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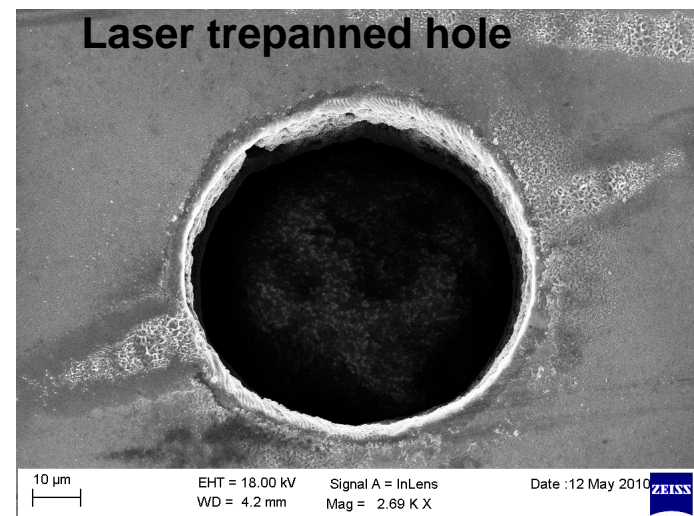
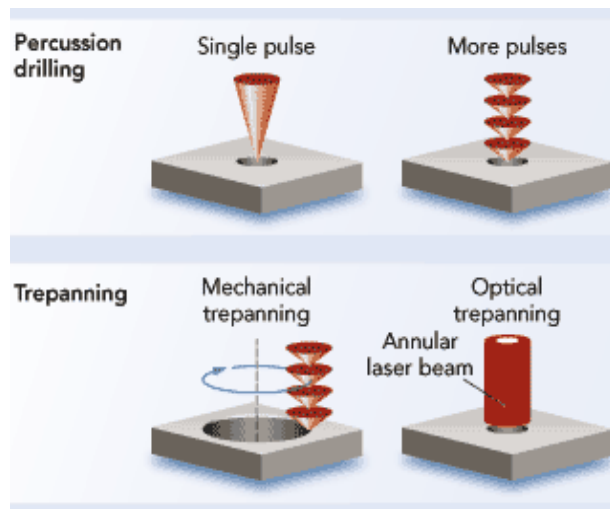
Micromegas meshes

- Woven meshes too thick for some applications
- Need high pitch ($>\sim 1000$ lpi, 25 microns) to minimize the ion backflow in the LC TPC application
- Such meshes do not exist in large surfaces (though there is progress) -> try laser etching

Ultrafast laser drilling

- New high-rate 'fs' lasers make it possible to drill more perfect holes (no melting) in quantities.
- Might replace wet etching for some materials (ceramics) or down to 10 μ diameter

Various processes at various time scales

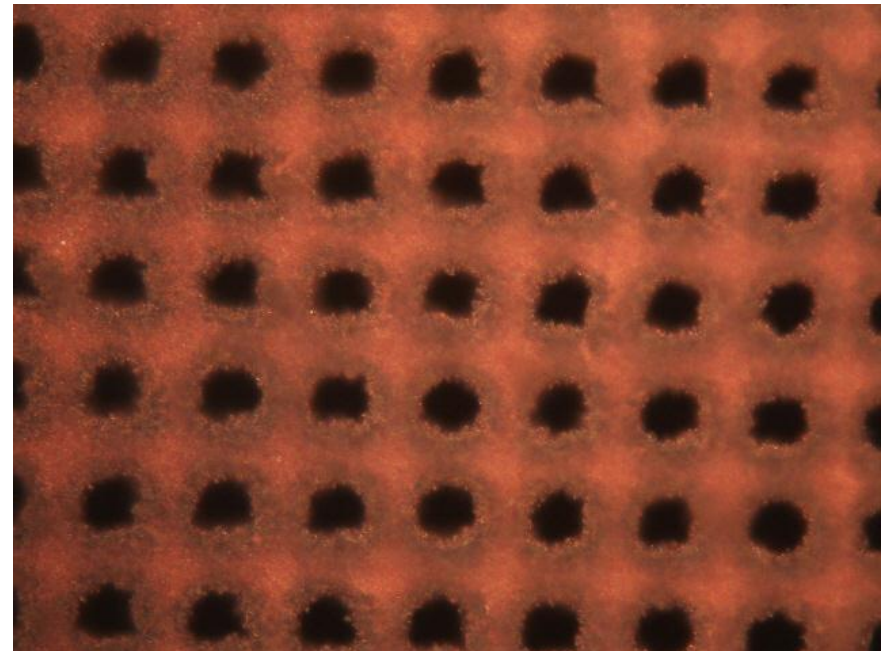
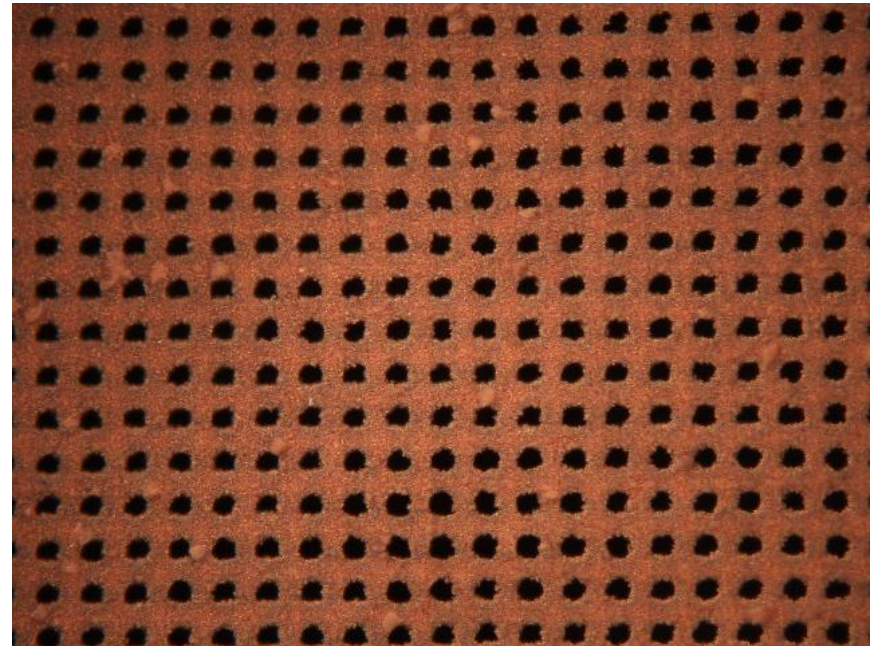


Progress in laser-etched meshes

First attempt in February using double-layer of copper -> no signal. The holes were not open. Very difficult to 'peel' the mesh

Second attempt: transparency OK.
Need to be tested in gas.

With the present laser: 10 holes/s.
A factor of 5 could be gained.

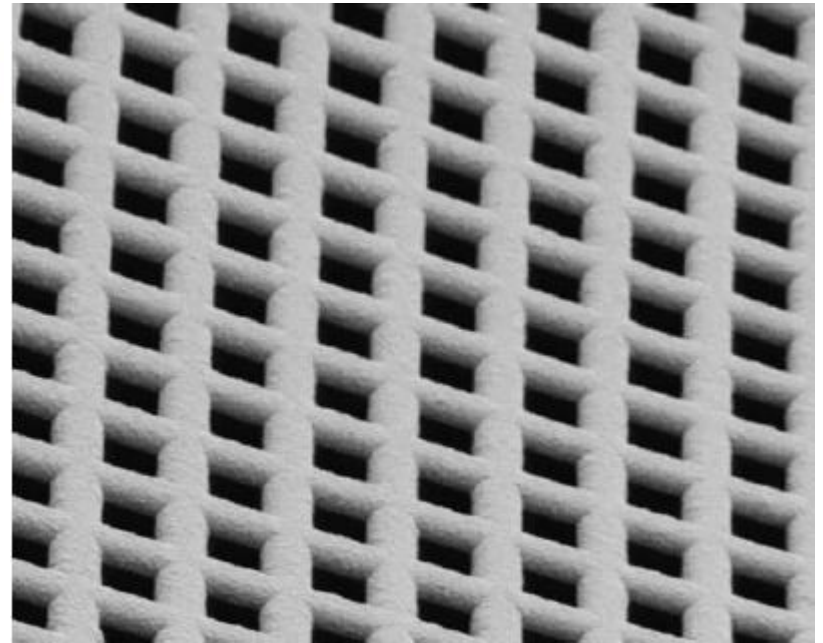


Electroformed meshes



Recently larger surface were available.
However difficult to manipulate (4 to 5
micron thick)

We bought 2x4 meshes. Will make bulks
out of them.



Cost for 8 6'' x 6'' copper meshes : 2529 euro wo tax. Payed half-half by Saclay and RD51.

| Wires Per Inch | Max Size | Space | Wire | Max Trans. | Nickel Part # | Gold Part # | Copper Part # |
|----------------|----------|---------|---------|------------|---------------|-------------|---------------|
| 1500 | 6 x 6 | 0.00044 | 0.00022 | 44.0% | MN46 | MG-46 | MC-46 |
| 2000 | 6 x 6 | 0.0003 | 0.0002 | 36.0% | MN47 | MG-47 | MC-47 |
| 750 | 6 x 6 | 0.00099 | 0.00034 | 55.0% | MN44 | MG-44 | MC-44 |
| 1000 | 6 x 6 | 0.00071 | 0.00029 | 50.0% | MN45 | MG-45 | MC-45 |

Both possibilities have to be pursued (laser etching and electroforming)