UNIVERSITÄT BONN

SI LAB Silizium Labor Bonn

FTD

Electrochemical copper growing process

Cleanroom Meeting 30.03.2026

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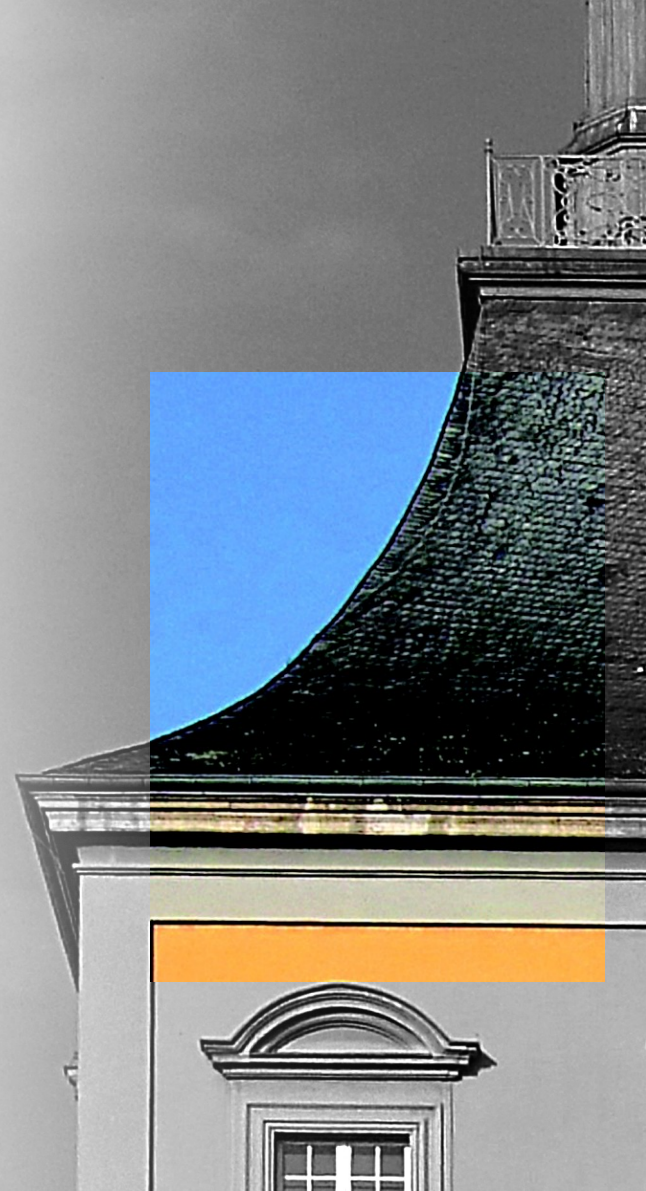
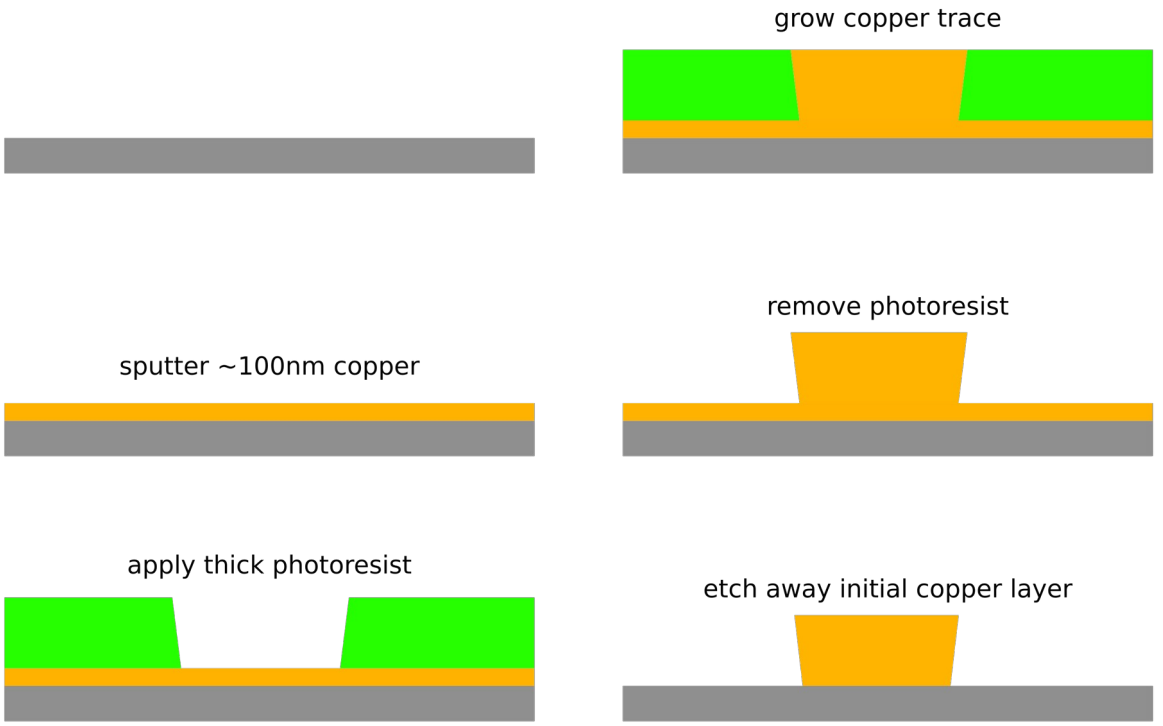


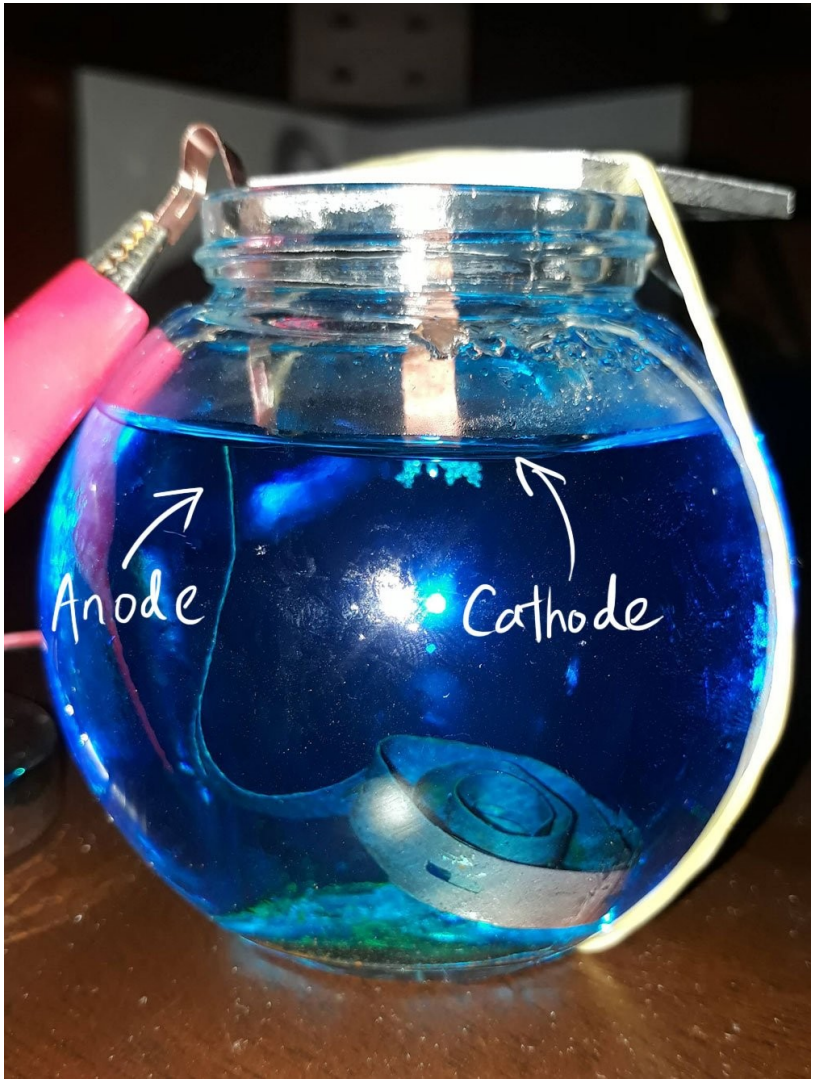
Copper trace process:

- Deposit thin layer (seed layer of ~100nm) of copper on substrate
- Apply thick photoresist (at least in thickness of trace) on copper layer
- Grow copper trace electro chemically in structured photoresist
- Remove photoresist
- Etch away seed layer thickness



Electrochemical deposition

- Deposit 2 Electrodes in Copper (II) Sulfate (50g/l) (chose material to be copper to not introduce other metal ions
- Apply voltage of few volts with lab PSU
  current limited to 10 mA – 30 mA
  (the lower the better, maybe try even less current for uniform copper layers)
- Copper ions taken from Anode and deposited on Cathode (need strong Anode as it will be ‘eaten’ away)



What needs to be investigated

- Can we grow copper on aluminum (or do we need a different target like copper or chromium)

- Copper growth uniformity
- Copper growth rate
- Adhesion on wafer/aluminum/photoresist

- Investigate dependence of
  - Current
  - Concentration of solution
  - Initial layer thickness
  - Other possible parameters