

IPSSC +
CMBO

STUDENTS' CONFERENCE

Jožef Stefan International Postgraduate School
and Young Researchers' Day CMBO

19 and 20 April

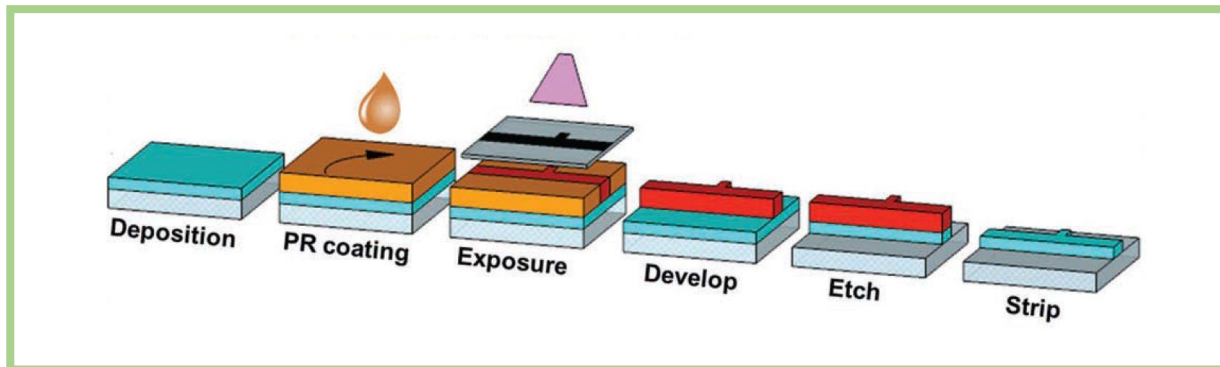
Inkjet printing of electronic devices

Aleksander Matavž,
IJS, MPŠ

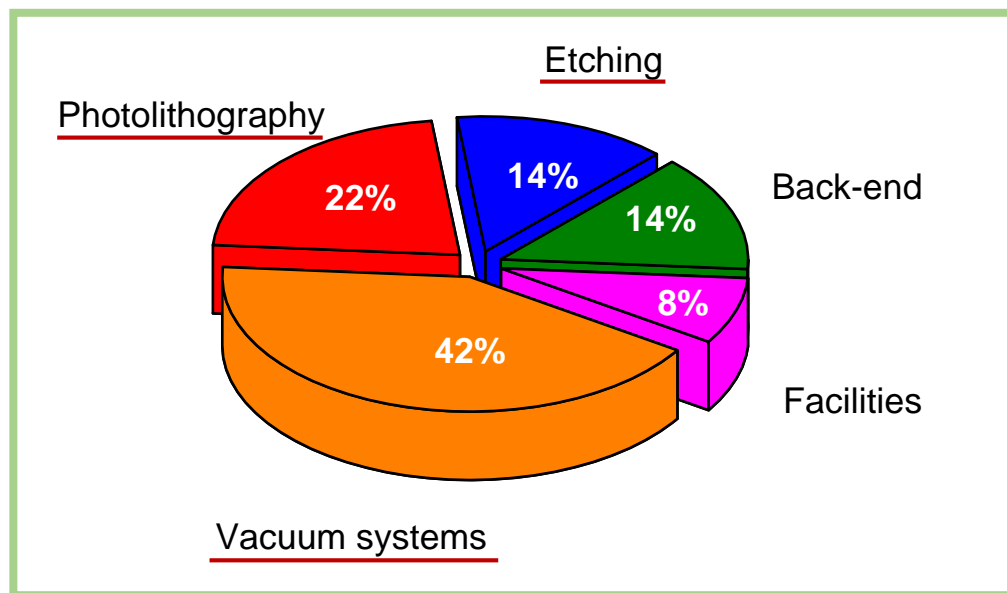
Poster number: 51

Microelectronics – conventional process

For each layer...



... 6 steps

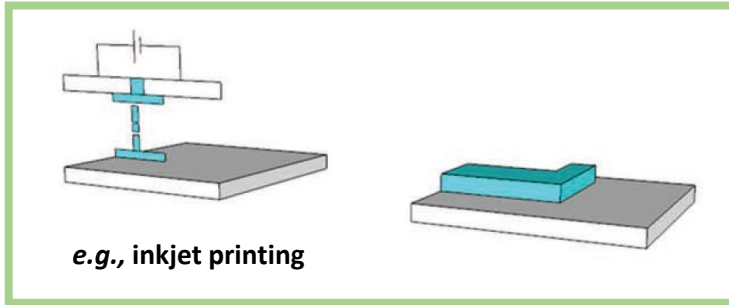


Cost break-down

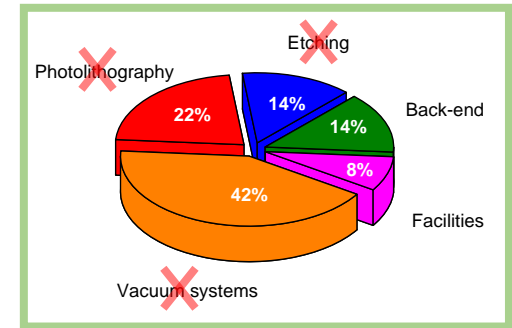
Can we do better?

Printed electronics

For each layer...

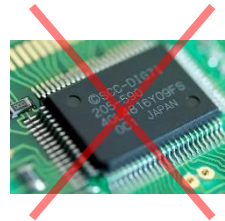


... 1 step

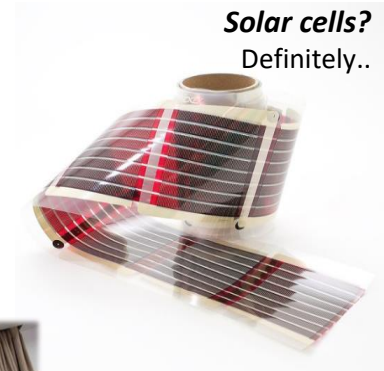


Benefits

- No physical patterning,
- Large-area devices,
- Flexible substrates,
- Extremely low production costs.



Microprocessors?
Yeah.. Probably not.



Solar cells?
Definitely..

Smart windows?
Yep..



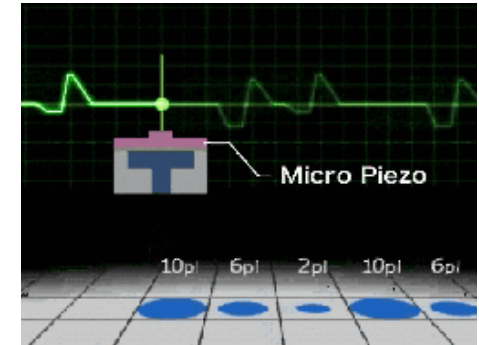
About inkjet printing



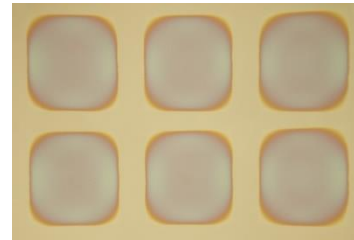
Principle: formation of small droplets of an ink and deposition onto a substrate.

Characteristics

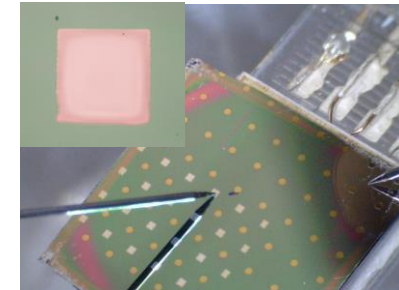
- The pattern predetermined digitally.
- Flexible and versatile.
- Suitable for rapid prototyping.



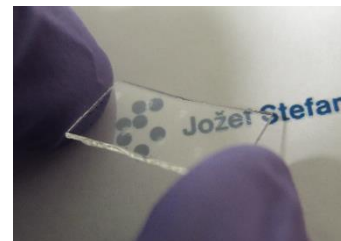
Dielectric structures



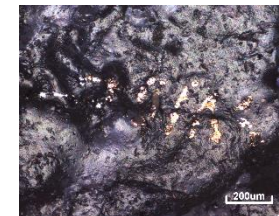
Silver electrodes



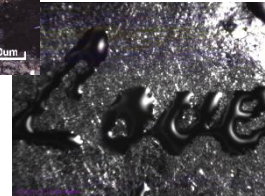
Transparent capacitors



Graffiti



Love notes



<http://www.microfab.com/>

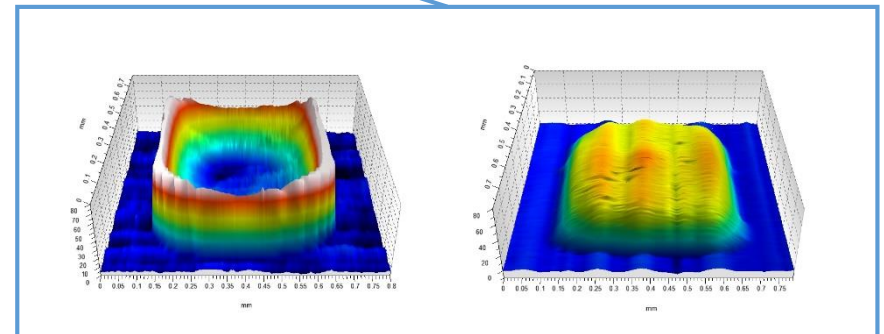
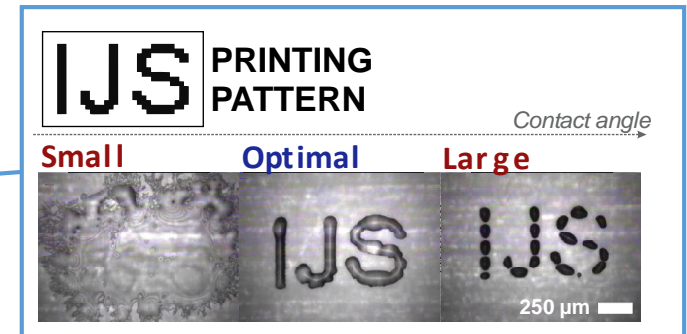
Our work

Inkjet printing *metal oxides* from solution-based inks:

- Thickness in nanometre range.
- Easy modification of material composition.

Solving fundamental issues:

- Wetting of the ink and the substrate.
- Eliminating „coffee stain“ effect.
- Evaporation-driven instabilities.



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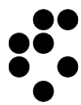
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Interested?

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