

Baumann Printing Research

Studio – Form & Function Toolkit:
printed electronics for unconventional interfaces



Munich, February 16th 2014



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Jens Hammerschmidt
Prof. Dr. Reinhard R. Baumann



Baumann Printing Research



Digital Printing and Imaging Technology



Printed Functionalities



The group

PhD students

PhD students

lab engineers

office manager

E&T & FP7

seccrassistant

technician

Thanks for funding



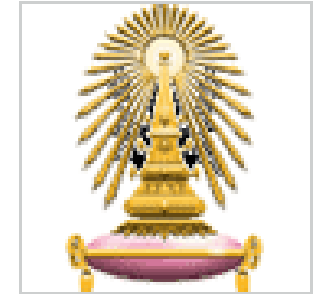
Federal Ministry
of Education
and Research



International Cooperations



Mahidol University



Chulalongkorn University



Universidade do Minho

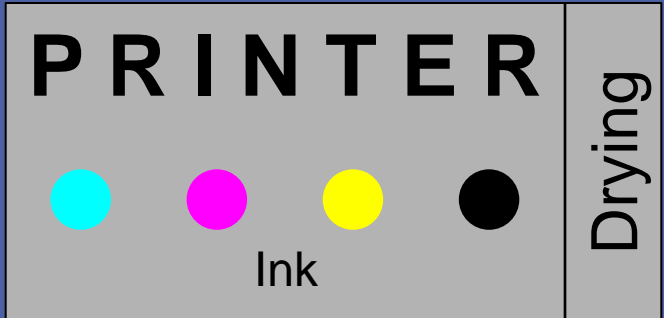
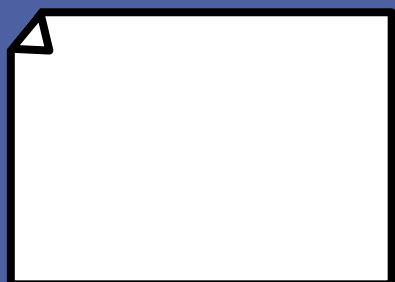


University of Barcelona



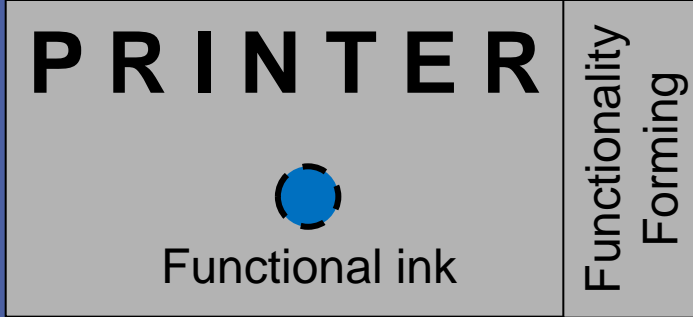
Printing of colors and functions

Printing of images, texts and figures



Individual color spots
"cheat" the eye

Printing of patterns with functionalities beyond color



Electrical conductive
pattern

In-line process for UHF-antennas

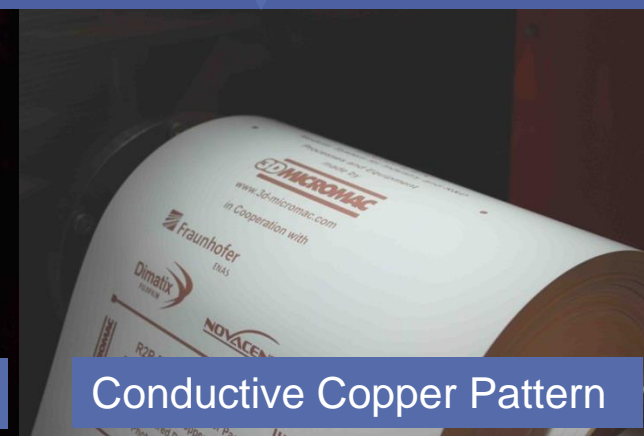


Inkjet Printing

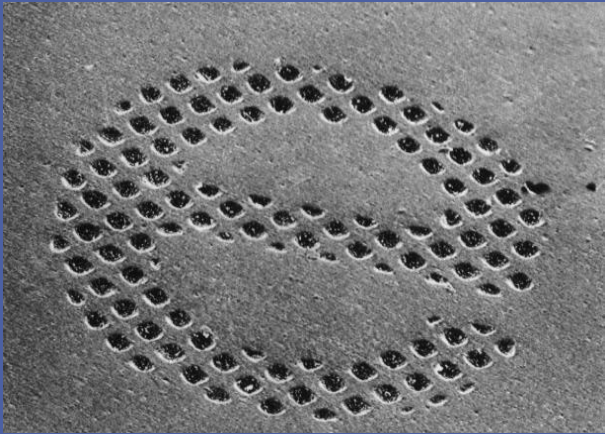
Shown @



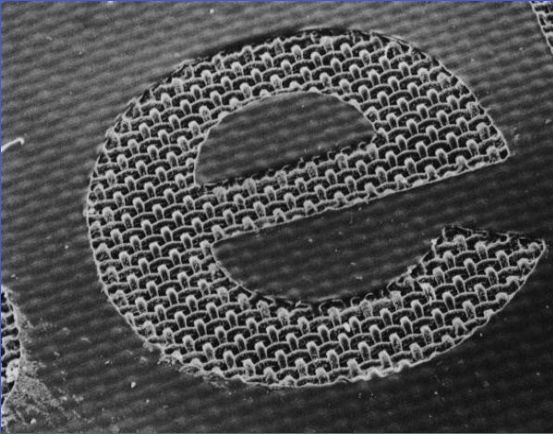
2012



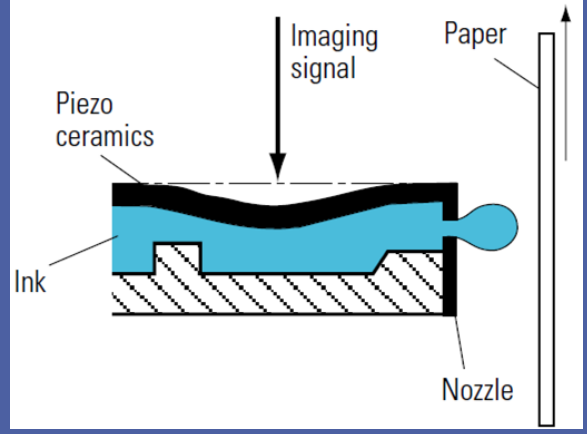
Printing is an
additive, continuous and productive
manufacturing technology



Gravure Printing



Screen Printing



Piezo Inkjet Printing

Inkjet Printing: Lab2Fab



Autodrop
Microdrop

DMP2831
Dimatix

DMP3000
Dimatix

INERT
Dimatix
XAAR

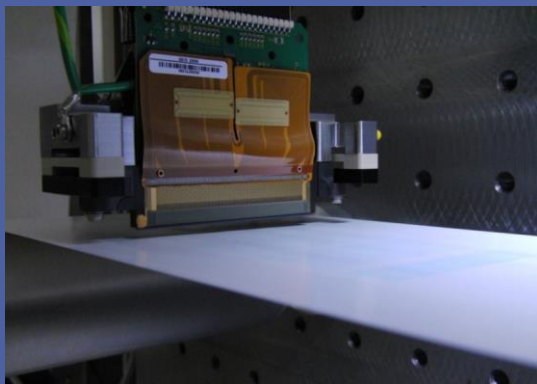
1
XYZ

16
XYZ

16 / 128
XYZ

16 / 128
XYZ

Inkjet Printing: Lab2Fab



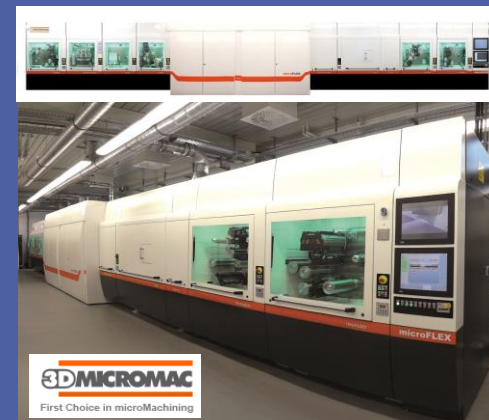
gravurMAN
(Xaar printheads)

1001
R2R



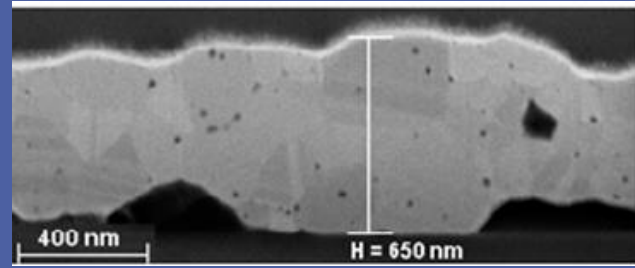
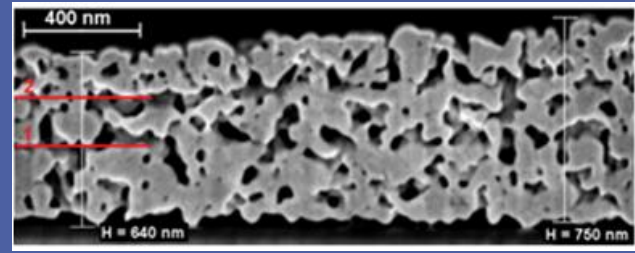
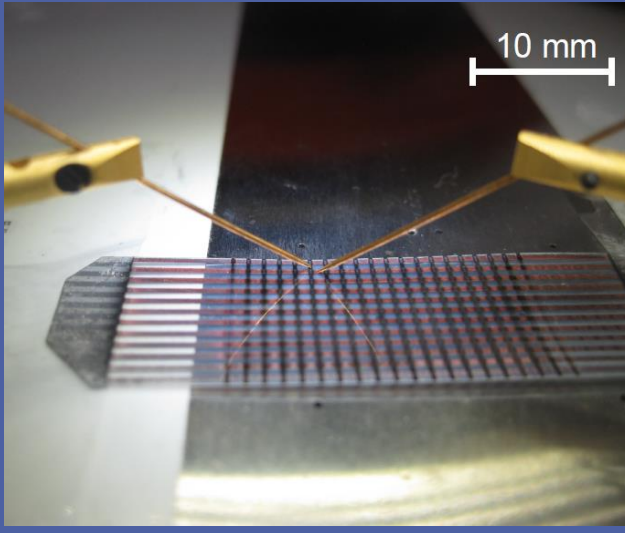
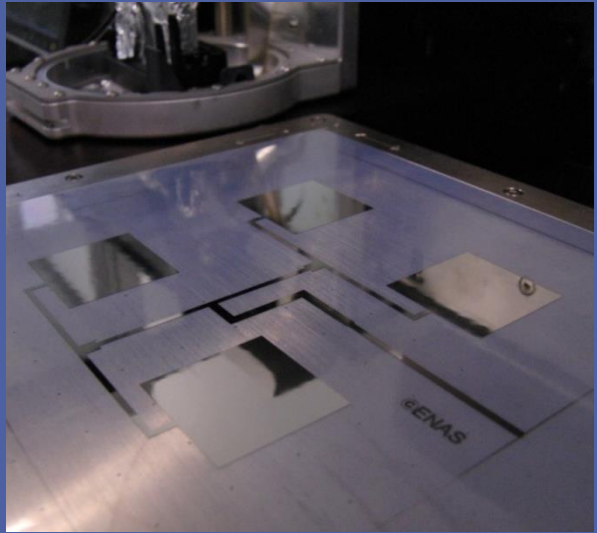
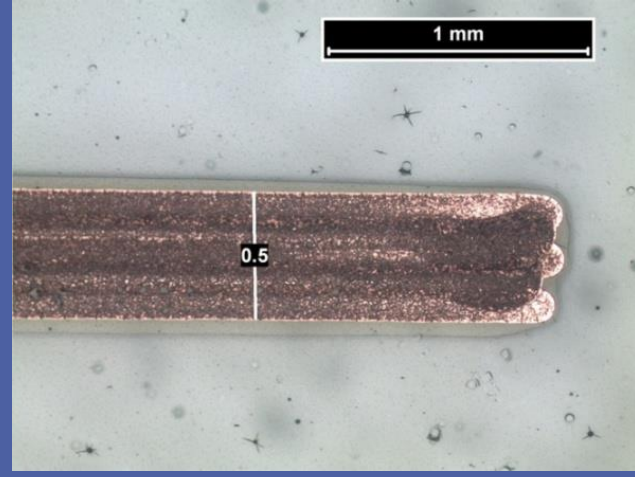
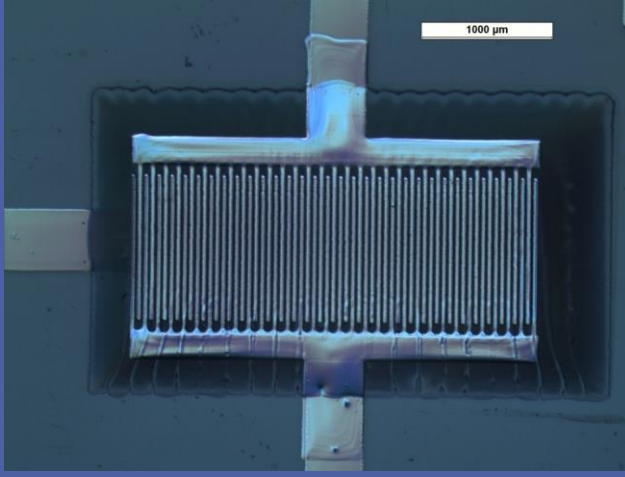
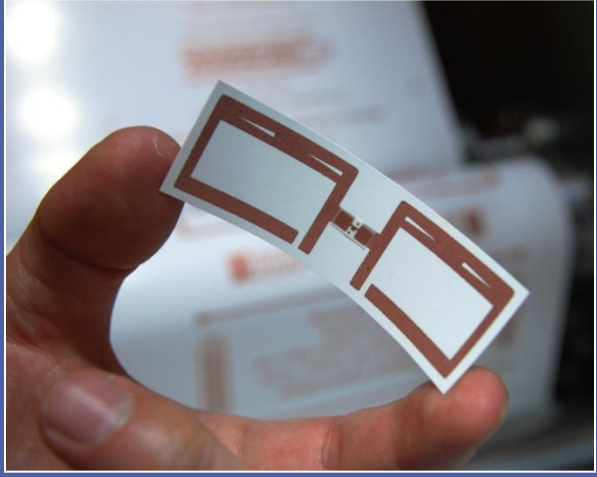
microFLEX
(Dimatix SCANPAQ)

2 x 2 x 256
R2R



microFLEX
3DMicromac
multi-technology
web fed

Devices and Applications



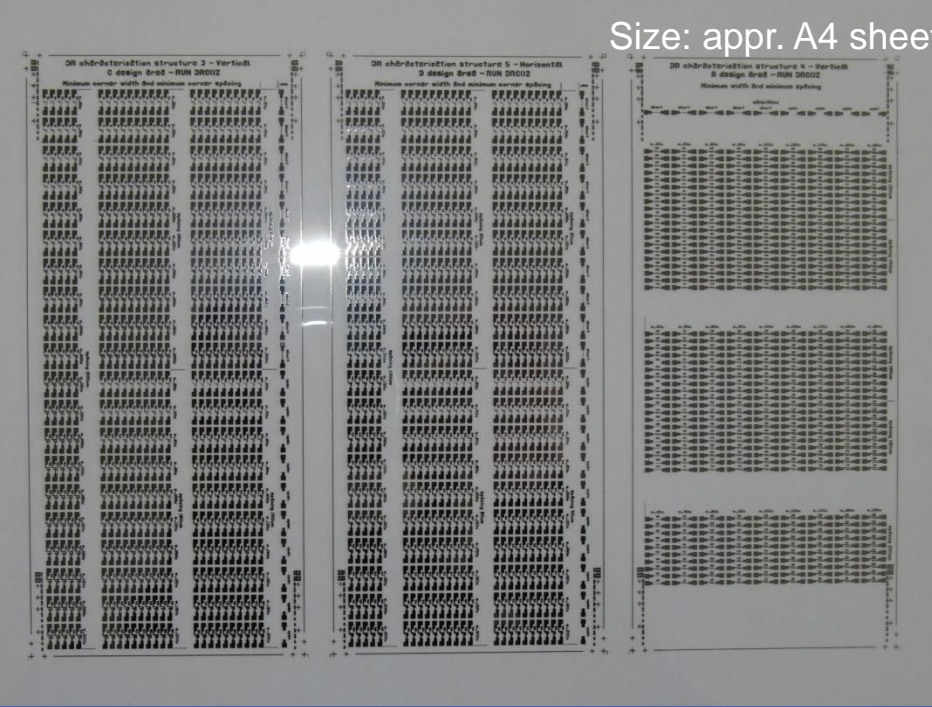
Devices and Applications



Size: appr. A4 sheet

20th Print, Antenna, DS 5D plan, layout 1.

Coils as parts of antennas



Size: appr. A4 sheet

Resistors

Conductive Tracks; Antennas; Resistors;
Transistors; Diodes; Capacitors...

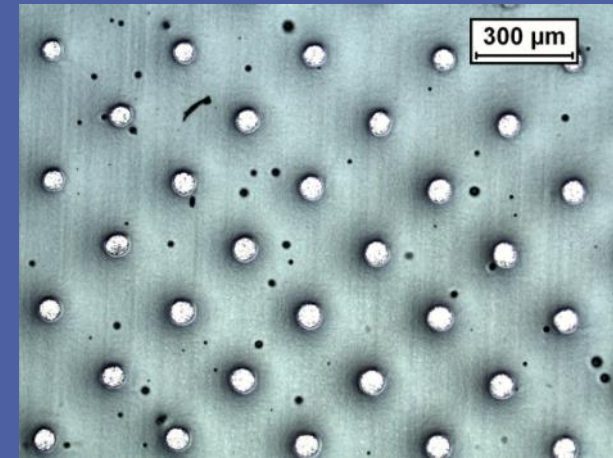
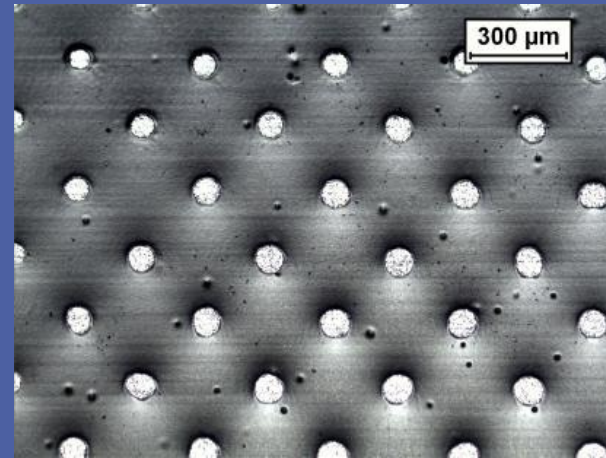
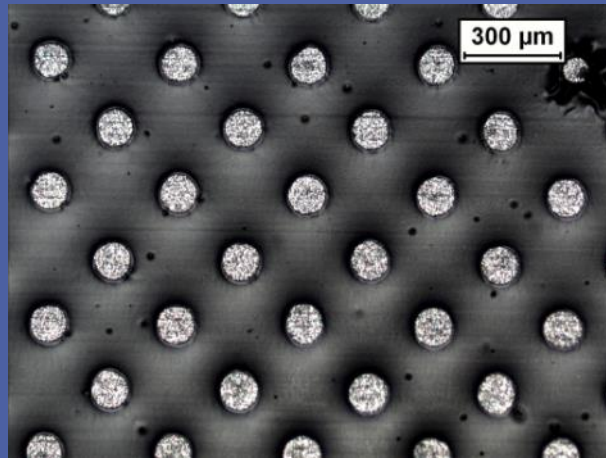
Devices and Applications



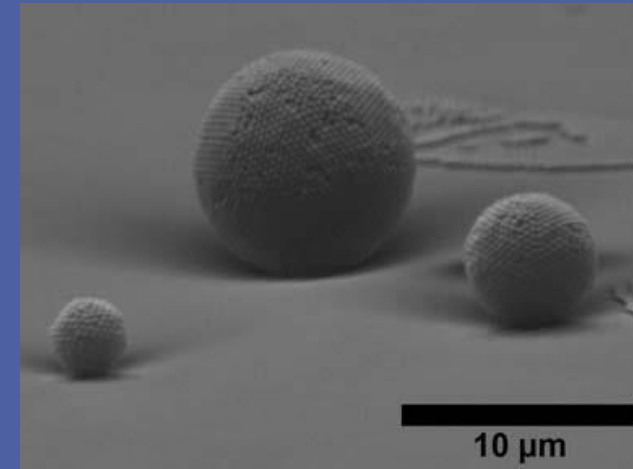
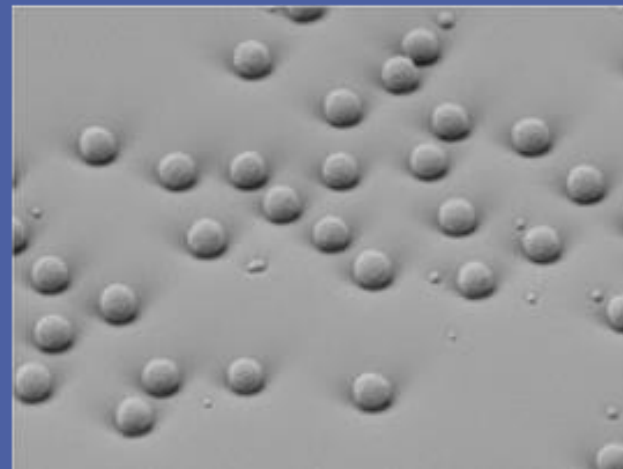
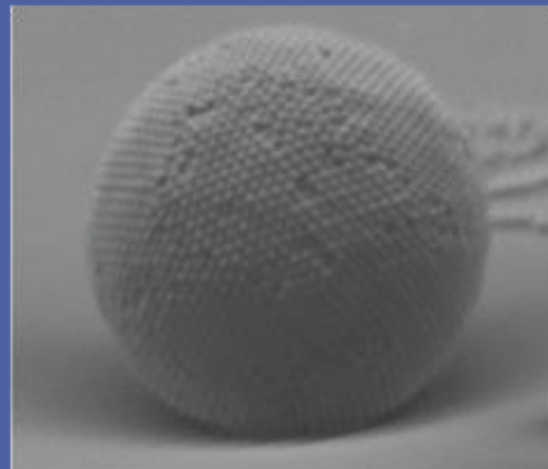
1,5 V ... 6 V capacity > 5 mAh/cm²

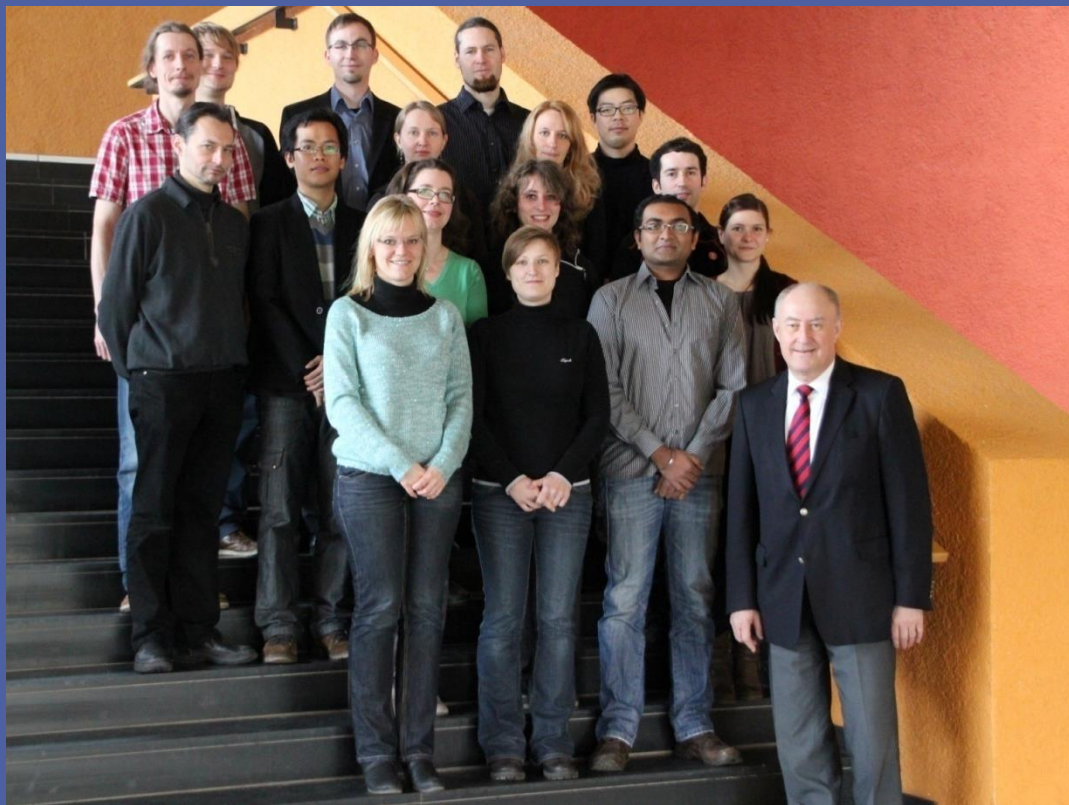
Beyond color and electronics

Sieves for Particle Filtration



Supraballs composed of Nanoparticles





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Digital Printing and Imaging Technology
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jens.hammerschmidt@mb.tu-chemnitz.de