Final Remarks MAM 2012

Volker Saile
Venue and Conference Dinner

The same high standards as last year

Great
Vincent Rivier, President, Micronarc Steering Committee

Jaquet-Droz Automata

c. 1770

VS-25-01-2012
Invited Keynote: Microproducts I

Nico de Rooj (CSEM, EPFL): Product Innovation enabled by MEMS

Microsystems Technology Platform at CSEM
Foundry Service
SiC, Environmental Monitoring, Tools for Nanoscience
Luxury Goods: Si-components
Watchmakers do not feel any economic crisis
Polymer-based Systems, smart RFID, Roll-to-Roll
Micro-manufacturing of Si MEMs

Keynote: Benedetto Vigna (ST Micro):
Mastering Art and Science for MEMS Leadership

*Fabulous ST Micro Story*
Science – Insight, Art – Creativity
Creativity = Imagination x Observation x Experience

*MEMS products*
There are nor Smartphones without MEMS
3 million pieces per day!
Accumulated 1.8 Billion = 3.5m cube!

*New markets*
Three teams: Health, Automotive, Consumer
Daniel Rosenfeld (poLight, Norway)
The challenges behind scaling-up a new optical MEMS technology to very large volume production.

Autofocus for mobile phones, fast
New technology: like artificial eye
New company

Sean Neylon (Colibrys)
A European based Silicon MEMS foundry for high end, harsh environment or high reliability applications

Niche, Rolex-type accelerometers
Small volume, high precision, high price
“MEMS foundries don’t make money”
Micro-manufacturing of Plastics and Ceramics

Keynote: Erol Harvey (Minifab, Australia)
Lessons learnt in manufacturing millions of nanolitre-scale polymer devices.

- Microfluidic devices
- Bionic eye implant 2013
- Nonofluidic biosensor for teardrops

Volker Piotter (KIT)  Micromoulding of Metals and Ceramics

- Metals, Ceramics
- Powder technology
- Micro-PIM
- Multi-component moulding
Luc Federzoni (CEA/LITEN)
Poudrinov, the platform for a new generation of multimaterial μ-devices

26 M€ for new equipment
Ceramics, metallic parts
3D complex parts
PIM and micro-PIM sintering
Micro-manufacturing of Metals

Keynote: Holger Reinecke (HSG-IMIT and IMTEK)
Micromanufacturing of Metals by Electro Discharge and Electro Chemical Machining

Innovations by old-fashioned technologies
Steel: Spark erosion, EDM-milling
Ceramics and semiconductive materials, inc. Si
ECM – metallic materials, no electrode wear

Thomas Gietzelt (KIT)
Issues of Mechanical Micromachining of Metals Using Geometrical Determined Cutting Edges

Status Diamond and hard metal tools
Coatings, speed, rpm
Micro-slotting

VS-25-01-2012
Invited Keynote: Microproducts II

Joachim Burghartz (IMS CHIPS)
Ultra-thin chips – a new paradigm in silicon technology

New technology for ultrathin chips (Chipfilm I and II)
Applications SiF (systems in foil)
Additive technology
Fine and coarse pores - sintering
Hybrid systems with organic electronics
Assembly and Automation

Keynote: Marcel Tichem (Delft University of Technology)
Micro-assembly processes exploiting potential of micro-scale fabrication

Primary processes: gripping – mature, manipulation (robots)
Self assembly (ultrathin chips)
Photonic integration
Chip to foil – smart blister
Self assembly through magnetic fields

Alain Codourey (Asyril SA)
Challenges in sorting and handling micro-parts

Systems for automated assembly
Asyril Cube: dancing floor for microparts
Feeding systems and assembly robots
Dr. Matthias Krieger (CSEM SA)
Tileye - A self-learning optical inspection system for complex production environments

Long professional experience
Lowest labor competition
Swiss women are faster than soldering robot
Between manual and mass production
Flexibility for vision concepts
No unique solutions
Training of system
Micro-Factories

Keynote: Akiko Browne (Nippon SCHNEEBERGER)
Microfactories - working towards a smaller production footprint

Personal story
Mechanical machining examples in Japan
Desk-top factory consortium: Friendship Line
Green Factory Project (2012)
Ultra Damping Ceramics (UDCS)

Philippe Lutz (FEMTO-ST)
Microfactories - mechatronic tools to increase their performance

Assembly
Micro-robots in SEM/FIB for in-situ work
MEMS technology for building micro-robots

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Keynote: Wolfgang Osten (University of Stuttgart)
Prospects and Challenges for the Optical Inspection of Micro- and Nano-Structures

If you cannot measure it – you cannot make it
Advantages and disadvantages of optical systems
Challenges: CD and 3D-structures
Resolution limits (Abbe)
“Superresolution”
Combination of measurement and simulation
Multi-scale measurement machine
Benoît Dagon (Imina Technologies)
The miBot - a mobile robot for efficient manipulation and sensing under microscope

Small, mobile robots, 4DOF
Also for SEM/FIB chamber
Moving fibres
Electrical Probing

James Claverley (NPL)
Micro-co-ordinate metrology at NPL: current and future work
Areal surface texture, 3D
Produce artefacts for calibration
NPL probes – MEMS: small, cheap, disposable, HAR

Christian Janko (Alicona )
Integrated Optical 3D Measurement Technique for Laser Structuring of Surface

ALICONA focus variation technology
Laser-structuring of surfaces (sexy phones)
Printing Technologies

Keynote: Martin Raditsch (InnovationLab GmbH)
Printed Electronics for Innovation & Growth in a Green Environment

Research car, solar panels, flexible logic, printed sensors
Cluster Forum Organic Electronics
Many partners for the whole value chain: BASF, Merck,…
Portfolio of projects: backplanes, OLEDs solar, plaster or med.
Lab in Heidelberg: roll-to-roll machine, analytics equipment
InnovationLab GmbH
EU vs Asia: we are ahead in research but not in production!
Concept: virtual foundry in Europe (2013)

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Stéphanie Lacour (EPFL)
Microplotting on silicone rubber

Producing circuits to conform 3D objects and bodies
“Electronics meets the reality of the body”
Elastomer-based substrates
PDMS – hydrophobic surface – microplotting
Microstructuring of surface with pillars
Stretching - electrical properties

Mathias Borella (Ceradrop)
Towards a workflow and tools dedicated to inkjet for printed electronics

Towards workflow and tools for inkjet for printed electronics
CAD/CAM Software - nozzle: droplet quality, shape and thickness of spot, printing strategy
Printers: R&D, large area – small batch
Applications – also 3D up to 1mm height (PZT)
Invited Keynote: Future of Micro-manufacturing

Dr. Frank Stietz (Carl Zeiss Nano Technology Systems)
Innovative 3d nanopatterning

Electrons and ions – from Ga to electrons and He
100 to 1nm structures
Ga: >10nm, deposition, imaging, analysis, in-situ imaging
  Metamaterials, photonic crystals
Electrons: 0.7nm (+ gas) but proximity effects: 10nm
He: 0.3nm (imaging) and 3nm (structuring) – single atom source
  Beam sample interaction (scattering)
  Graphene patterning
  Nanopores fabrication for DNA transistor
  Plasmonics

Throughput and resolution:
  Ne instead of He, Ga+Laser, multi-beam (61 beams)
Hard working attendees
Hard working attendees
The MAM Concept

Elite event
Highly focused topic
Local interests
Highest quality speakers
Highly qualified attendees
Short Conference/workshop
Excellent venue

Tooling in high volume fabrication of precision parts
Making highly efficient and reliable automated assembly lines and test systems for microproducts.

Modifications and changes for the coming events?
Shorter, more focused, more participants?
What was different in 2012?

- Length of Meeting
- New attendees
- New talks
- Elevator Pitches:
  - MINAM
  - Lyncée Tec
  - KNMF
  - microTEC Südwest

The high quality of the event was preserved
Thanks

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You!
Speakers
Attendees
Thanks

Céline Auberson
Edward Byrne
Philippe Fischer
Suzanne Schwendener

David Tolfree
Sikha Ray
VS
A typical landscape in the Swiss Alps
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