

Micronarc Alpine Meeting

mAm 2012



Equipment for microproducts
3rd edition

22-25 January 2012
+ Villars-sur-Ollon

Final Remarks MAM 2012

Volker Saile

VS-25-01-2012

Venue and Conference Dinner



The same high standards as last year

Great

VS-25-01-2012

Vincent Rivier, President, Micronarc Steering Committee

Jaquet-Droz Automata

ca. 1770



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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 no 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

Nonfluidic 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

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 (Asyрил SA)

Challenges in sorting and handling micro-parts

Systems for automated assembly

Asyрил 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

Test Equipment

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)

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

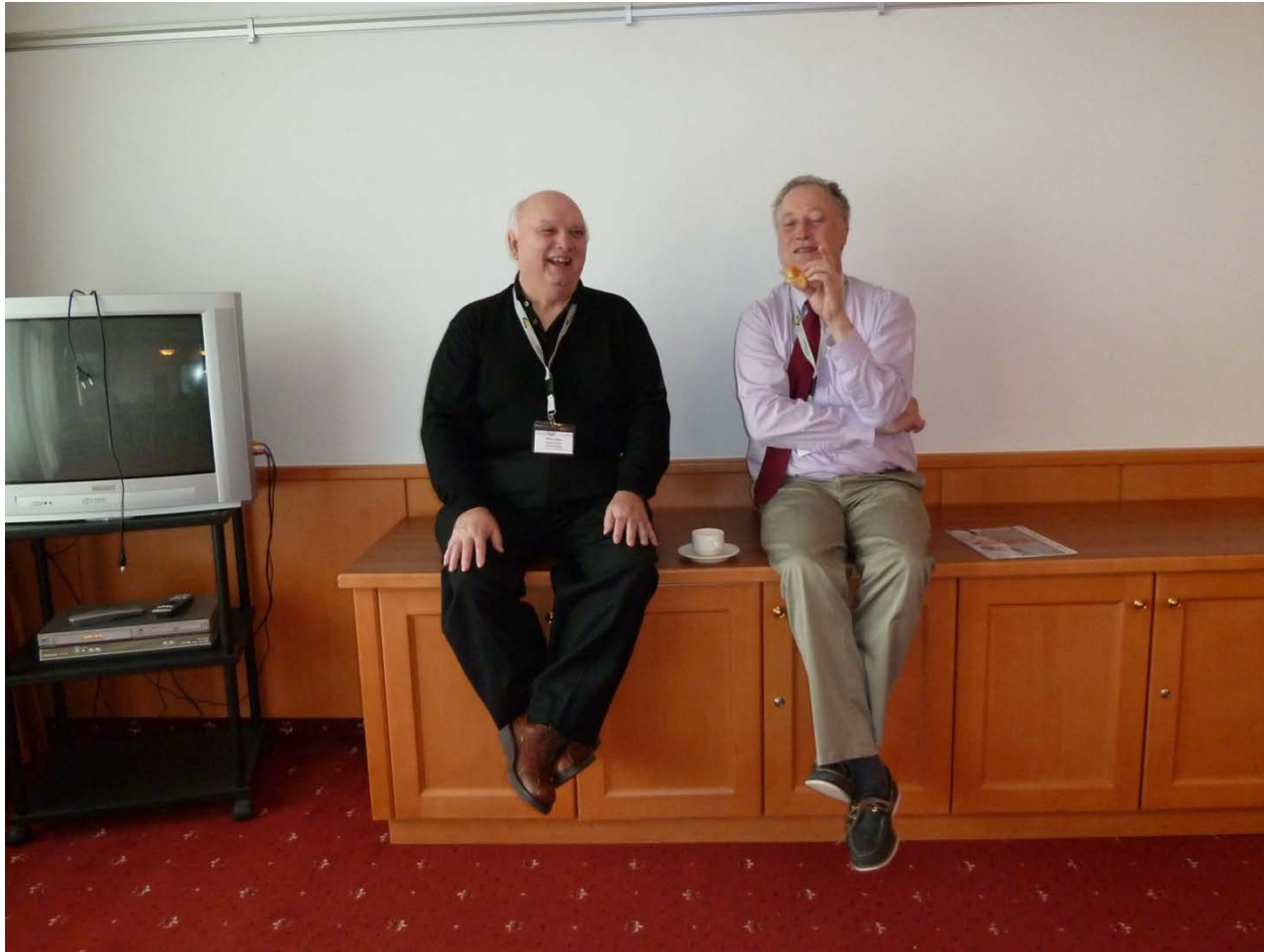
Nanopores fabrication for DNA transistor

Plasmonics

Throughput and resolution:

Ne instead of He, Ga+Laser, multi-beam (61 beams)

Hard working attendees



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Hard working attendees



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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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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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SEE YOU AT MAM 2013

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