

REVIEW OF THE Micronarc Alpine Meeting (mAm2017)

Following the success of seven previous annual editions, the 8th Micronarc Alpine Meeting (mAm2017), held at the Eurotel Victoria Hotel, Villars-sur-Ollon on 5-7 February 2017 continued its focus on equipment and innovative processes and technologies for manufacturing microproducts. Single track sessions over two days included speakers on MEMS, Micro Manufacturing Applications, notably Medtech and Watchmaking, important sectors of local Swiss industry, Novel Manufacturing Techniques, Energy Systems, Printing and Packaging Technologies.

Participants were welcomed by representatives from the organisers, Volker Saile and David Tolfree, the President and Vice President of MANCEF, Danick Bionda, the Secretary General of Micronarc, David Kappeler from the Office for Economic Affairs, Canton of Vaud Switzerland and Christine Reilley, an ASME Director. This year it was particularly good to welcome a small delegation from ASME.

The meeting was held at the idyllic location of Villars, a ski resort village located at 1250 metres altitude in the Swiss Alps, and gave participants spectacular panoramic views extending from Lake Geneva to Mont-Blanc.

The Organisers, MICRONARC and MANCEF, with help from their media partners, CMM International, EUROTEC and MSM, were pleased to attract 80 delegates including a total of 15 sponsors and exhibitors.

In addition to the high-level technical programme, the continuing popularity of this annual meeting is due to the quality of the networking and casual atmosphere for discussion, not offered by the larger, more formal conferences. It is the most successful of MANCEF's COMETS (Commercialisation of Emerging Technologies) series of regional, sector-specific conferences.

Micro systems and MEMS-based products are now in the age of high-volume production for consumer applications, especially mobile phones, ICT and disposable medical devices. The issues associated with the production of these are of continued interest to

manufacturers. These include tooling in high-volume fabrication of precision parts, making highly efficient and reliable automated assembly lines and test systems for microproducts. The fast-growing market for such components and products is now estimated to be heading towards trillions of dollars or Euros.

Participants were welcomed by representatives from the organisers, Volker Saile and David Tolfree, the President and Vice President of MANCEF, Danick Bionda, the Secretary General of Micronarc, David Kappeler from the Office for Economic Affairs, Canton of Vaud Switzerland and Christine Reilley, an ASME Director. This year it was particularly good to welcome a small delegation from ASME.



DAVID TOLFREE, MANCEF VICE PRESIDENT EUROPE



► Pictured: mAm organisers. ►

The traditional evening dinner was held at a restaurant 1600 metres up a snow-covered mountain, known as Golf Villars. The walk along a flare-lit snowy path from the mountain train to the restaurant in misty conditions added a challenge for some people. In a convivial atmosphere delegates had the opportunity to mix and win draws for the traditional Tissot T-watch, a Swatch and other gifts.

PROGRAMME

This year, 22 talks were given by selected international speakers who maintained the high standard expected of this meeting. Brief outlines of the talks presented by the keynote speakers are given below. Particular features of the programme were the state-of-the-art reviews of various manufacturing technologies and new marketable products. The table-top exhibition featured some insights into new equipment and manufacturing processes. Being located next to the meetings room where the coffee break was held, enabled everybody to mix and network. After each session, exhibitors were given a three-minute time slot to make elevator pitches.

Future of Micro Manufacturing 1

DR. BHARAT BHUSHAN, OHIO EMINENT SCHOLAR AND THE HOWARD D. WINBIGLER PROFESSOR AND DIRECTOR, NLBB (US).

Biomimetics: Bioinspired Hierarchically Nanostructured Liphilic/phobic Surface

A well-illustrated comprehensive and detailed talk on biomimetics-imitating nature at the nano level was given. It showed how observations of nature have enabled a range of new materials to be manufactured with properties similar to those found in plants and animals. They included superliquid-phobic surfaces, interfaces, composite structures, and wear-resistant coatings for the manufacture of many useful products.

Micro Manufacturing Applications 1 - Watchmaking

CLAUDE JEANNERAT, TEAM LEADER - PRODUCTION DESIGN TEAM & MAX MONTI, PARTNERSHIPS AND VALORISATION MANAGER, HAUTE ECOLE ARC INGÉNIERIE (SWITZERLAND).

2030 - Eco-manufacturing is no longer a utopia

The talk was centred on 'Swiss Industry 2015' - a visionary look at the factory of the future in relation to elements of the 4th Industrial Revolution based on a digital economy. It included a review of technological solutions for sustainable industrial production particularly related to problems associated with miniaturisation and energy consumption.



Micro Manufacturing Applications II- Medtech

LUDGER BODENBACH, HEAD OF R&D POINT-OF-CARE AT ROCHE DIAGNOSTICS, MANNHEIM GMBH (GERMANY).

Trends in in-vitro diagnostics with microfluidics

The talk focused on the trends and consequences of centralised and decentralised diagnostics and treatments using new technologies and methods. The increased efficiency and lowering of costs by employing remote wireless monitoring and POD systems were reviewed.

MEMS

BENEDETTO VIGNA, EXECUTIVE VICE PRESIDENT, GENERAL MANAGER, ANALOG, MEMS & SENSORS GROUP, ST MICROELECTRONICS (ITALY/SWITZERLAND).

Carrying the MEMS torch in a new era

Excellent updated review of successful MEMS products and their markets over the last 10 years. The trends are now towards smart sensors and actuators in a whole range of consumer products, including wearable, environmental and home monitors for energy monitoring etc. These will advance the IoT revolution.

Future of Micro Manufacturing II

PROF. DR. JAN G. KORVINK, KARLSRUHE INSTITUTE OF TECHNOLOGY (KIT), INSTITUTE OF MICROSTRUCTURE TECHNOLOGY (GERMANY).

Micro-scale solenoidal inductors: manufacturing and application

This technical talk related to a research project for the design of components for a miniature lab-on-chip NMR microsystem. Particular reference was given to the physical and engineering issues for the design and manufacture of essential components such as micro coils and transformers.

continued on page 46

Energy Systems for Micro Products

CYRIL MARTI, TECHNICAL LEADER OF INTELLIGENT POWER SOLUTIONS (IPS), EM MICROELECTRONIC SA (SWITZERLAND).

Energy Harvesting for Autonomous Objects

This interesting talk covered the basic problems associated with harvesting energy from natural and other sources, including solar, thermal, motion and magnetic sources. These were discussed with reference to the supply for autonomous objects such as wearable devices, lighting systems and wireless sensors.

Novel Manufacturing - Printing and Packaging

PROF. DR. RER. NAT. REINHARD R. BAUMANN, DEPARTMENT OF DIGITAL PRINTING AND IMAGING TECHNOLOGY, TU CHEMNITZ, (GERMANY).

Printing Beyond Colour-Towards Integrated Manufacturing of Flexible and Printed Electronics

An informative talk on printing processes that the presenter described as a highly productive manufacturing technology. The issues of ink-jet (digital) printing of electronic devices and membranes for microfluidics systems, printing with nanoparticles and the specialised manufacturing tools and processes were explored.

Future of Micro Manufacturing II

DR. MICHEL DESPONT, MANAGER MEMS PRODUCTS, CSEM (SWITZERLAND).

Optical MEMS: The Bright Side of MEMS

A well-illustrated talk on CSEM's MOEMS devices designed for specific applications was given. Specific reference was made to micromirrors, optical accelerators and remote sensing in harsh environments.

Dr Volker Saile, Karlsruhe Institute of Technology and President of MANCEF, delivered the final remarks and closed the conference.

Many talks this year were related to the development of those processes and techniques that will advance future manufacturing for microproducts. These are always an important feature of mAm conferences and one of the reasons why they consistently attract delegates. ●

The mAm2018 conference will be held at the same venue on 4-8 February 2018.

