Micro- and nanotechnologies in the spotlight: expert discussion at the 16th annual World Micromachine Summit in Dortmund

End of April, the international micro- and nanotechnology community met in Dortmund, Germany on the occasion of the 16th international Micromachine Summit. The summit is an annual conference, which shows a snapshot of industrial, scientific and political micro and nano activities worldwide.

The event was initiated in 1995 by the Micromachine Center in Japan. This year, about 100 delegates from some 20 nations held a meeting about „AAL-Ambient Assisted Living" and discussed improvements and political strategies of the countries with a view to funding and the utilization of new technologies. The aim of AAL-technologies is to open up age-based assistance systems for more quality of everyday life. In future, micro- and nanotechnologies will be able to help long-term care patients for example with telemedicine.

Only selected delegates of the world-leading high-tech nations have been invited to the 5 day conference. From April 26 to 28, the international visitors could get a general idea of micro- and nanotechnology in Germany during some technical tours, visiting companies and institutes like Robert Bosch in Reutlingen, KIT in Karlsruhe or Boehringer Ingelheim microparts in Dortmund. On April 29 and 30, the lectures, annual reports and a networking event took place in the city of Dortmund.

All experts' presentations are released to the public: Via http://www.mms10.org > program almost all reports can be retrieved and downloaded.
The Micromachine Summit was organized by the IVAM Microtechnology Network. Prof. Dr. Roland Zengerle from the University of Freiburg was chairman of this conference. The event was supported by sponsors.

Trends and Visions

The chief delegates presented the trends and relevant focus themes of their home regions in so called country or region reports. In Australia challenges to be solved include climate change as well as developments to reduce fuel consumption. As Australia is a country with remote communities, people from socioeconomically disadvantaged areas are more than twice likely to have heart disease, diabetes or a disability. Therefore approaches are in the focus to use ambient assisted living technologies to reduce the overall cost of healthcare.

In Canada a five-year project has been launched: Canada's National Design Network, involving innovative research at 45 universities and up to 1,200 researchers by 2015. It is intended to integrate electronic, photonic, mechanical and fluidic technologies in multi-discipliniary collaborations. It offers an enriched training and environment and will create a path to commercialisation. The project Emsyscan (Embedded Systems Canada) deals with rapid prototyping, characterisation and integration of microsystems.

Mainland China expands its research activities towards mobile phones and automotive applications. In 2009, the China Medical Microsystem Alliance was established. It aims at actively promoting the rapid development of medical microsystems industry, and improving the manufacturing level and the core competitive power. In addition, the "Internet of Things" plays an increasing role.

The European Commission places emphasis on public private partnerships. Micro and nanotechnologies are addressed in the European Green Cars Initiative as wall as in Factories of the Future and with it open opportunities for research and industry. The next workprogrammes and calls in NMP and ICT will be presumably published this July.

This January the so called German „Spitzenclusterwettbewerb" awarded microTEC Südwest as first cluster in the field of Microsystems technology. 40 million Euro public funding will now be available for the next 5 years to develop the cluster and another 40 million Euro matching fund from industry. The national programme within AAL "Age-based assistant systems" provide another 40 million Euro annual budget for projects. This emphases the leadership of Germany in Europe in this area.

In Japan BEANS is the 3rd generation of MEMS. It stands for bio electro-mechanical autonomous nano systems. Areas of application include environmental/energy conservation, healthcare and safety/security. The focus on the process level is laid on bio-organic integration onto organic substrates, large area continuous processes as well as 3 dimensional nano structures.

The technical scope of the Swiss nano-tera.ch initiative is micro- and nanoelectronics, sensors, MEMS/NEMS, systems and software as well as information and communication. Projects for wearable, ambient and remote systems on this technical basis are supported within nano-tera.ch.

Taiwan expands its successful consumer electronics industry to medical electronics industry. The trend „any time, any place, any where“ determines the development from design to fabrication and packaging, from chip to device, module, and system, from Si-based IC/MEMS to glass-based panel and polymer-based CD. The major portable medical instrument companies in Taiwan include Microlife, ApexBio, Rossmax, TaiDoc and Radiant. In the field of Lab-on-Chip Agnitio and Dr. Chip Biotech Inc. working on a polymer platform as well as Phalanx Biotech working on a glass platform are leaders.

Most of the country and region reports are available under www.mms10.org -> Program.

Overall impression

The national reports mainly reported on this years' special theme on ambient assisted living and MEMS and NEMS for medical applications. Healthcare is definitely one focal point for almost all countries and regions. Further highlights included consumer applications and energy efficiency themes. Today, the research in micro- and nanotechnologies is much more application or market oriented. This means that MEMS is a real business and is now expanding in more and more applications.

Finally, this summit, organised by IVAM Microtechnology Network, Germany under the chair of Roland Zengerle from IMTEK, Freiburg, Germany was considered very successful by all attendees. Next year's summit will presumably be in the Emirates organised by the Swiss delegation.

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