

# The Society for Micro- and Nanoelectronics (GMe — Gesellschaft für Mikro- und Nanoelektronik)

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## Goals of the Society for Micro- and Nanoelectronics

The Society for Micro- and Nanoelectronics (GMe) has been founded in 1985 as “*Society for Microelectronics - Gesellschaft für Mikroelektronik*” with the aim to “*support microelectronics technology and its applications*” in Austria. With the shift of the focus in research from micro to nano technologies the goals of the GMe changed accordingly. Therefore, the GMe has changed its name into “*Society for Micro- and Nanoelectronics — Gesellschaft für Mikro- und Nanoelektronik*” in 2003.

The GMe defines its tasks as follows:

- Support of university-based “high-tech” research in the areas of micro- and nanoelectronics, semiconductor technology, sensors, and opto-electronics;
- Operation of research facilities;
- Support and consulting for industry, in particular, for small and medium enterprises, within the area of micro- and nanoelectronics.

The central task of the GMe is to provide an internationally competitive *infra-structure* in the area of micro- and nanoelectronics technology. The GMe allocates funds to maintain research projects in the fields of semiconductor technology, sensors, opto-electronics, and ASIC design. Thus the infra-structure support generates a base for research projects that are funded by other funding agencies.

## Activities of the Society

Due to funding constraints, the present focal point activity of the GMe is the operation of university-based laboratories for microelectronics technology. Nevertheless, the GMe tries to support the other activities mentioned above in their submission and administration of certain projects.

The main task of the GMe in the area of microelectronics technology is the operation of the cleanroom laboratories in Vienna and Linz. The GMe has coordinated the construction of the Microstructure Center (MISZ — Mikrostrukturzentrum) in Vienna; the funds were supplied by the Austrian Federal Ministry of Science and Research. The GMe now finances a significant part of the operation costs for the cleanroom laboratories in Vienna and Linz.

## Microelectronics Technology — Cleanroom Vienna

The following university institutes receive support within this focal point activity:

- Vienna University of Technology (*TU Wien*):
  - Institute of Solid State Electronics (*Institut für Festkörperelektronik*)
  - Institute of Industrial Electronics and Material Science (*Institut für Industrielle Elektronik und Materialwissenschaften*)  
(since 2004: Institute of Sensor and Actuator Systems – *Institut für Sensor- und Aktuatorssysteme*)

## Microelectronics Technology — Cleanroom Linz

The following university institutes receive support within this focal point activity:

- Johannes Kepler University Linz:
  - Institute of Semiconductor and Solid State Physics (*Institut für Halbleiter- und Festkörperphysik*)

## Other Activities of the Society

One of the declared tasks of the GMe is to provide information on current Austrian academic activities in the field of microelectronics to industry, in particular to Austrian small- and medium enterprises (SMEs). To enhance the distribution of the results of the research work done with GMe support, the GMe has put the contents of its annual reports — 1995 through 2003 — and the proceedings of the latest seminars organized by the GMe on its Web server. This server provides a variety of search facilities into the reports, thus acting as a Microelectronics Knowledge Base. The GMe Web server is available under the address:

<http://gme.tuwien.ac.at/>

## The “GMe Forum 2003”

The biennial seminar of the GMe, the “*GMe Forum*”, took place at the Vienna University of Technology on April 10 and 11, 2003. The intention of the “*GMe Forum*” is to present application-oriented results of international industrial and academic research and to indicate trends for future applications of research results. The “GMe Forum 2003” focused on the technologies and issues involved in the transition from a micro to a nano technology. Ten distinguished speakers from research and industry in Europe and the USA gave plenary lectures. In five invited oral and 22 poster presentations, members of the university institutes that receive support from the GMe presented their results, which would have been impossible to achieve without the contributions of the GMe to the laboratory infrastructure.

The program of the “GMe Forum 2003” was as follows:

**Thursday, April 10, 2003****Opening:**

- 09:00 – 09:30 E. GORNIK (President of the GMe)  
P. SKALICKY (President of the Vienna University of Technology)

**SOI and Waferbonding:**

- 09:30 – 10:15 U. GOESELE, S. CHRISTIANSEN (MPI Halle): “*Strained Si and Wafer-Bonding*”  
10:15 – 11:00 G. CELLER (Soitec, Summit, NJ, USA): “*SOI: Developments, Challenges, and Applications*”  
11:00 – 11:15 Coffee Break  
11:15 – 12:00 P. LINDNER, T. GLINSNER, V. DRAGOI, J. WEIXLBERGER, C. SCHAEFER (EV Group, Schärding): “*Key Enabling Process Technologies for Advanced Semiconductors, MEMS and Nanomanufacturing*”

**Semiconductor Intellectual Property:**

- 12:00 – 12:45 M. KÄSTNER (NewLogic, Lustenau): “*Semiconductor Intellectual Property Industry*”

- 12:45 – 14:00 Lunch – Catering

**System on a Chip:**

- 14:00 – 14:45 D. DRAXELMAYR, R. PETSCHACHER (Infineon, Villach): “*Mixed-Signal Design for SoCs*”

**Nano-Technology:**

- 14:45 – 15:30 E.J. FANTNER (IMS, Wien): “*Micro@Nano-Fabrication-Austria*”  
15:30 – 16:00 Coffee Break  
16:00 – 16:45 E. HAMMEL (Electrovac, Klosterneuburg): “*Applications of Micro- and Nano-Technologies*”  
16:45 – 17:30 H.G. CRAIGHEAD (Cornell, Ithaca): “*Nanomechanical Systems*”  
17:30 Panel Discussion: “*Can Austria Keep Up Internationally in the Area of Nano-Technology?*”

**Friday, April 11, 2003****Organic Electronics:**

- 09:00 – 09:45 G. LEISING (AT&S, Leoben): “*Integrated Organic Electronics*”

**Sensors:**

- 09:45 – 10:30 M. BRANDL, CH. FÜRBOCK, F. SCHRANK, V. KEMPE (AMS, Unterpremstätten): “*A Modular MEMS Accelerometer Concept*”  
10:30 – 11:00 B. JAKOBY (TU Wien): “*Sensors and Interface Electronics for Oil-Condition Monitoring*”

- 11:00 – 11:15 Coffee Break

**Thermal Imaging:**

- 11:15 – 11:45 D. POGANY (TU Wien): “*Local Thermal and Current Imaging of Power Devices*”

**Opto-Electronics:**

- 11:45 - 12:15 W. SCHRENK (TU Wien): “*Quantum Cascade Lasers*”  
12:15 - 12:45 T. FROMHERZ (JKU Linz): “*Light from Silicon: SiGe Quantum Cascade Structures*”  
12:45 - 13:15 K. SCHMIDEGG (JKU Linz): “*In-situ Growth Monitoring and On-Line Composition Determination of MOCVD GaN by Spectroscopic Ellipsometry*”  
13:15 Snacks and Poster Exhibition

## **The Annual Report for 2003 of the Society for Micro- and Nanoelectronics**

The GMe is currently supporting the microelectronics technology activities of the cleanroom laboratories in Vienna and Linz. All projects described in this report were, at least partly, carried out in the cleanrooms in Vienna and Linz, respectively. They are *not* specific projects of the GMe but were funded by a variety of other sources. They all have in common that they use the infra-structure provided by the GMe. It would therefore not have been possible to carry out these projects without the support by the GMe.

In addition to the two sections on the central activities in the cleanroom laboratories in Vienna and Linz, there is a "Sensor Systems" section. The sensor system activities are closely linked with the cleanroom at the Vienna University of Technology, and partly carried out using the infrastructure of this cleanroom. The piece of equipment that was co-financed with GMe funds is, in fact, located in the Microstructure Center of the TU Vienna, and available to all groups using the cleanroom facilities. Still, some sensor technology processes require separate equipment due to material or process incompatibilities, and therefore separate laboratories. For reasons of clarity, we chose to put the sensor activities into a separate section of this report.