

"Progress thrives on the exchange of knowledge."

Albert Einstein (1879-1955)



DI Simon Grasser, MBA, and Dr. Werner Scherf, CTR management

## [ Visit ]

### Federal minister visits CTR

Norbert Hofer, Austria's Federal Minister for Traffic, Innovation and Technology (BMVIT), inspected the laboratories and the research cleanroom at CTR for the first time. CTR has been a part of the BMVIT COMET programme from the onset and is a successful example of excellent, application-oriented research.

[ [www.bmvit.gv.at](http://www.bmvit.gv.at) ]



▲ From the left: FP regional party head Gernot Darman, CTR researcher Marcelo Ribeiro, Federal Minister Norbert Hofer, CTR researcher Michael Ortner, Villach's vice mayoress Petra Oberrauner. ©Stadt Villach

## Growth & Development

What would be a successful tomorrow be without a retrospective view? The foundations for all the projects and results we report on in this edition were laid a long time ago. We can look back on the 2017 business year with pride: The research volume grew to 8 million Euro for the first time ever; we were able to continue to increase the number of scientific publications and further expand our technological competence through the acquisition of research equipment with a value of 2.2 million Euro. Research work was carried out in 64 projects, among them European research programmes such as ECSEL or INTERREG. Around 100 scientific publications, speeches and conference contributions underscore our technological excellence and eight patents submitted in cooperation with research partners are proof of a practised technology transfer.

Our researchers are already working on the next ideas, project proposals and scientific papers to ensure the project pipeline doesn't run dry. They have already participated in a dozen grant applications in the first quarter of 2018.

In addition to incremental developments, disruptive innovations in technological development often open up new opportunities and markets. The upcoming Silicon Austria Labs Initiative could hold such a mercurial development in store for CTR.

If you would like to take a look at our knowledge balance sheet for 2017, you can find it under [www.ctr.at](http://www.ctr.at) or request a copy by email to [info@ctr.at](mailto:info@ctr.at)

## [ COMET Programme ]

### International evaluation

The K1 Competence Center ASSIC (Austrian Smart Systems Integration Research Center) represents CTR in the COMET Competence Center for Excellent Technologies programme. Research activities are continuously evaluated by international experts, most recently in March 2018, ASSIC's strategic research activities will run from 2015 to 2022 and are funded by federal grants (BMVIT, BMDW) and funds provided by the states of Carinthia and Styria. [ [www.assic.eu](http://www.assic.eu) ]



▲ The experts for evaluating CTR came from Australia, USA, Germany and Austria. The experts in the middle of CTR team and the CTR's company partners.

## [ Events ]

### Attracting interest in research



A number of events offered a chance to experience CTR research up close and personal: More than 9,000 visitors attended the Long Night of Research at the Lakeside Park in Klagenfurt and discovered the "power" of smart sensors and system integration at two CTR stations. Young people were the focal point of the career orientation project "future jobs [campus]", where more than 200 8th-grade students developed their own micro-sized table sweeping machine at the CTR. The CTR presented concrete job offers at the "Meet & Match" jobs fair held at the University of Applied Sciences. All vacant positions at CTR can be found under: [ [www.ctr.at](http://www.ctr.at) ]

## [ Smart Systems ]

### Smart sensor network makes fit for Industry 4.0

Semiconductor systems are robust and stately on the outside, but inside they perform highly complex and sensitive processes. Smart sensors should now provide information from the heart of semiconductor systems and make the machines fit for Industry 4.0.

▲ The smart sensor network and the individual microchips have to withstand a lot: high temperatures, water, pressure or acids in semiconductor production.



▲ Integrated in semiconductor production plants, the smart sensor network is intended to transmit sensitive information from the innermost part of the system via radio frequency technology.

The SensSemicon project is researching a smart sensor network that can be used to monitor highly complex semiconductor production machines. What is required for the research? A state-of-the-art semiconductor production machine, smart sensors that detect information by radio under the most extreme chemical processes, an optimised contactless detection system, a sophisticated algorithm and a great deal of research know-how.

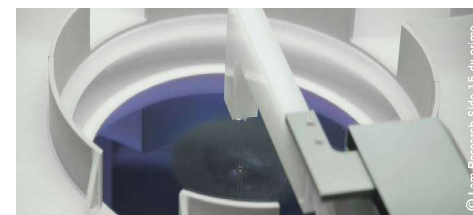
#### VIEW FROM THE HEART CONTROLS DIGITAL MAINTENANCE

The challenge is to develop a passive multi-sensor network suitable for these semiconductor industry requirements for the first time and to integrate it efficiently in semiconductor systems. The smart sensors should transmit physical information (such as temperature) by radio and in real time. This in-depth look into the heart allows not only condition-oriented but also predictive maintenance. This makes it possible to predict at which point the occurrence of a fault is to be expected. As a result, downtimes can be reduced, productivity increased and resources optimally utilised.

#### SMART RESEARCH, SMART PARTNERS

In order to achieve this, the research team of Lam Research, NXP Semiconductors Austria, erfideo Software and Identification and CTR Carinthian Tech Research (project management) will work together in a trusting and interdisciplinary manner over two years (start 01/2018). The team will ensure that Industry 4.0 remains not only a buzzword, but also a reality.

The SensSemicon project is funded by the Research Technology and Innovation initiative Silicon! Alps, R & D projects in the field of microelectronics in the federal states of Styria and Carinthia.



▲ Sophisticated systems make state-of-the-art computer chips possible through vacuum coatings, plasma etching, photoresist removal and wafer cleaning.

#### FACTS AND FIGURES:

**Project:** SensSemicon "Intelligent, highly integrated sensor systems for predictive maintenance of semiconductor production machines"

**Programme:** FTI-Initiative „Silicon!Alps“

**Project lead:** CTR Carinthian Tech Research

**Duration:** 2 years (01/2018 – 01/2020)

**Consortium:** Lam Research AG, NXP Semiconductors Austria GmbH, erfideo Software & Identifikations GmbH, CTR Carinthian Tech Research AG

