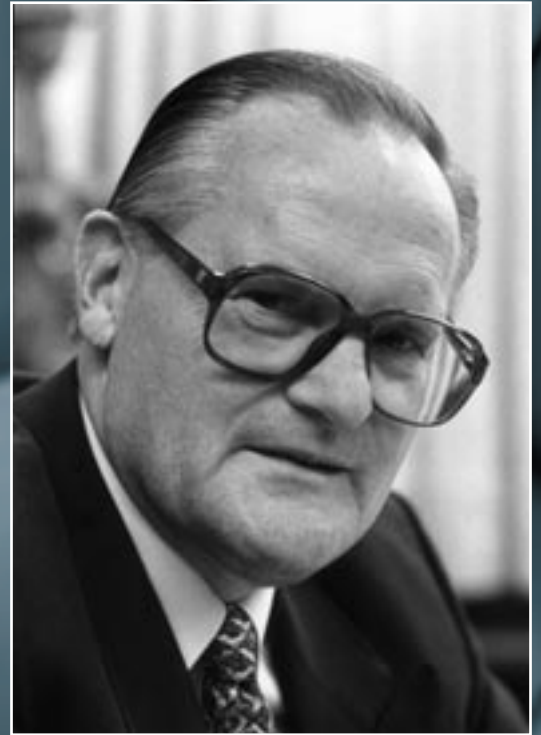


### ***How did the National Center of Competence in Research “Nanoscale Science” come into being?***

At the beginning of 1999, the initiative “National Center of Competence in Research” (NCCR) of the Swiss National Science Foundation was put out to tender with the aim of strengthening the position of Switzerland as a research center in strategically important areas of science. On reading the terms of the tender we soon realized that the nanoscale sciences had a very good chance of being included in this initiative. One of the conditions, for example, was that the sponsored research should be in the field of life sciences, social sciences, sustainability or information and communication technology. And nanoscale science has a bearing not just on one of these areas, but on all natural sciences. Another required aim was that the work should be interdisciplinary. We have practiced this from the very beginning. In addition, Switzerland is recognized as a leader in the field of nanoscale sciences, and there is no doubt that this is a strategically important area of research. In December 2000 the nanoscale sciences were selected as a National Center of Competence in Research.

### ***What are the special features of the NCCR “Nanoscale Science”?***

The first aspect to which I attach great importance is the interdisciplinary collaboration. It is in the nature of our work that we operate only as interdisciplinary teams, because without input from experts in diverse fields there would be no nanoscale sciences. Take a look for example at projects which are focused on life sciences. It is absolutely essential in this field that biologists, physicians and physicists sit down together at the same table. The physician for example may suggest analyzing plaques in arteriosclerosis; but the nanotools required for this analysis have to be developed, tested and produced by completely different groups. A further peculiarity of our NCCR is



**Professor Güntherodt – Director of the National Center of Competence in Research “Nanoscale Science”**



the outstanding close collaboration with IBM, which we have already enjoyed for some years and which has already led to many pioneering results.

***How did the scientists and institutes involved in the NCCR get together?***

We did not just start working together when the NCCR kicked off. A number of the partners for example were already involved in the MINAST (Micro- and Nanosystem Technologies) Program, and with others we had been collaborating on other projects. In general, the scientists in the NCCR now are those who are leaders in their respective research fields of nanoscale science both in Switzerland and to some extent also in the world.

***What are the aims of the NCCR "Nanoscale Science"?***

Our scientific research in the nanoscale sciences should provide impact on the life sciences, sustainability, and information and communication technologies. The nanoscale dimension needs to be researched and new pioneering principles identified and applied. These are activities that take us into the world of atoms and molecules. At this level, the classical disciplines of physics, biology and chemistry merge, be-

cause the basic principles for understanding the nanoworld are universal, even if potential applications may differ. The interdisciplinary innovative collaboration between different branches of science and institutions is therefore particularly important for us.

Ten projects are currently under way where the primary focus is on basic research. But in the course of time, this research will lead to the development of applications with a commercial potential. We aim at supporting this know-how and technology transfer. The idea of the NCCR is to foster our young scientists, and in particular also women scientists.

***Are there already any nanotechnology applications in place?***

Yes, we are already benefiting from the achievements that have been made. Light protection factors in sun creams and in particular the color effects in paints for motor vehicles are based on nanoparticles. Thanks to nanotechnology, antireflex coating on glasses and contact lenses are also being optimized. Nanotechnology also enables blood filters for dialysis patients to be reused now for the benefit of the patients and reduction costs. Without nanotechnology, the quality control of high-tech products such as integrated circuits or compact discs would also be unthinkable today.

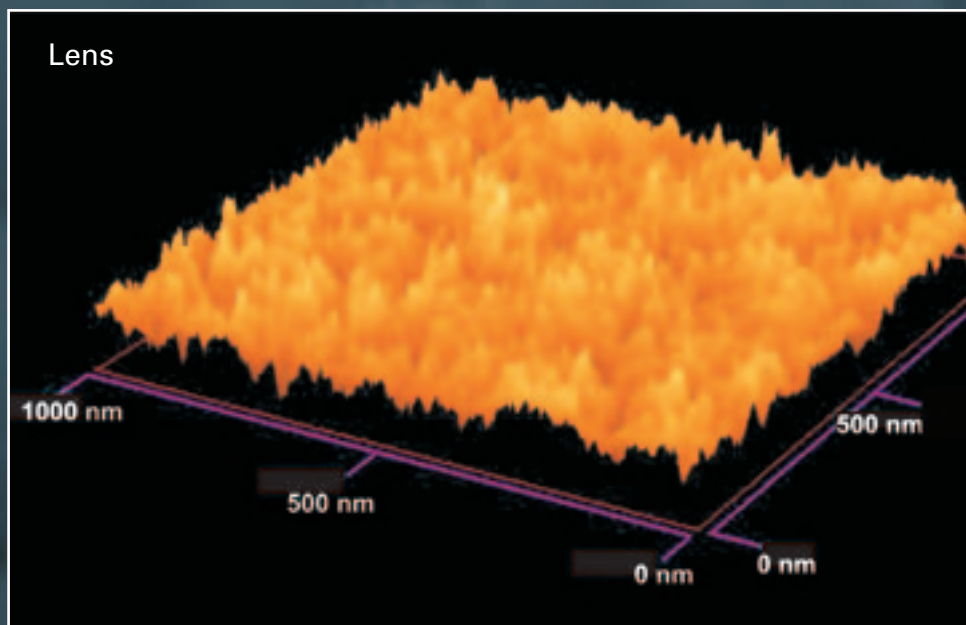
And finally, the microscopes which are used to carry out these studies also have to be built. So there is a whole range of companies that are specialized in manufacturing this equipment.

***What is your vision for the future?***

A clear distinction has to be made between pure pipe-dreams and the progress that is made on the basis of successful experiments. Since nanotechnology, rather like information technology, is a technology that cuts across all facets of life, it will also influence all areas of modern technology. We can expect information technology and the life sciences to become ever more closely entwined with nanotechnology.

As far as visions are concerned, I should like to make the comparison with the transistor and laser. Fifty years ago, when the first steps were being taken in the field of the transistor, no one predicted today's electronic chips and their use in laptops or mobile phones, and certainly no one saw applications such as the internet or e-mail coming. It is very similar with the story of the laser and the development from its use as a light display via medicine to the welding of car bodies.

For me, the real visions of the future are those aspects of nanotechnology which cannot yet be predicted.



**Under the atomic force microscope an apparently even surface becomes a wild mountain range – here an eyeglass as example (Photo: Reimann)**