

Preface

This issue contains a collection of papers dedicated to Professor Dr. Klaus Werner Benz on the occasion of his 65th birthday. The large number of contributions reflects his international reputation in the scientific community of crystal growth, solid state physics and crystallography. This collection of original papers is a colourful bouquet of scientific results of former collaborators, colleagues and friends from East and West honouring the scientist Klaus Werner Benz.

Professor Dr. Klaus Werner Benz

All his friends, colleagues, and his students wish him many further years of good health. The members of the Editorial Board as well as the Advisory Board of Crystal Research and Technology join with these wishes and add their gratefulness for his long-standing engagement as a Consulting Editor of our journal.

The scientific picture of our journal was mainly influenced by the scientific activities of Prof. Benz. I acknowledge with gratitude the time of inspiring common work.

May he long continue to enrich the journal Crystal Research and Technology with his advice and ideas.

W. Neumann, Berlin

Personal Reflections

Professor Dr. Klaus-Werner Benz will be retired in September three quarters of a year after his 65th birthday. This issue of Crystal Research and Technology is in honour of his scientific work in the fields of Crystal Growth and materials science.

The first day of the year 1938 started for the family Benz in Berlin with a happy event: Klaus-Werner Benz was born. Shortly after that they moved to Stuttgart where little Klaus-Werner grew up. So he combined in his characteristic trait the open and friendly nature of the Berlin inhabitants with the eager and thoughtful nature of the Swabian. He passed school and received his university education at the technical university of Stuttgart where he in 1963 got his Diploma in physics. The first employment was at the research institute of the Deutsche Bundespost in Darmstadt. After two years he left that company and joined the 3. Institute of Physics again at the technical university of Stuttgart to work on his Ph. D. thesis which he finished 1970. Here he became familiar with crystal growth and materials characterization by means of the behaviour of electronic states in organic crystals. 1972 he filled the position of the head of the laboratory for semiconductor crystal growth of the institutes of physics at university of Stuttgart. It was in that times that in the western part of Germany a lot of such service groups were founded especially in the environment of solid state physics and materials engineering. Professor Benz realized early that a successful growth of both compact crystals and epitaxial layers of high quality needs a profound understanding of the basic processes – a work which normally was beyond the possibilities of such service groups.

In the crystal growth laboratory he established a lot of growth methods like THM for semiconductor compact crystals or LPE for III-V compounds. For the physical characterization he worked close together with the solid state physicists of the university. In order to study the structural characterization and the growth processes of LPE layers he used the excellent possibilities in the MPI for Festkörperforschung, Stuttgart, in co-operation with the group of Dr. Bauser. Such co-operation he built up with numerous other colleagues in Erlangen university, Freiburg university and Fraunhofer Institute, Munich university, and Duisburg university. He used from the early beginning the chance which gave the crystal growth under reduced gravity. His strong engagement in the field of crystal growth is documented through a long term activity in the German society for crystal growth (DGKK). From 1982 to 1985 he was member in the board. In that time fell the 7th ICCG 1983 held in Stuttgart for which he did the local organization. 1986 to 1989 he was president of the DGKK and increased consequently the contacts to other crystal growers by a common meeting with the crystal growing colleagues from Italy.

In 1982 he got the State doctorate with the subject semiconductor technology from the university of Duisburg and changed 1986 from Stuttgart to university-GH-Paderborn in Paderborn as professor for experimental physics. There he increased his activities in crystal growth under micro gravity together with the continuation of the THM method with a multi zone furnace, the LPE growth methods mainly of III-V-compounds, and the characterization by physical methods. Consequently to his experience on crystal growth to be an interdisciplinary science he contributed to the new study course of a physics engineer. Two years later he was appointed to a professorship for crystallography and materials science at the crystallographic institute at university Freiburg as successor of professor Nitsche with whom he had since years fruitful co-operations especially in the field of crystal growth under micro gravity.

Now the fields of interest were explicitly broadened. The materials extended from elemental semiconductors over the III-V to the II-VI compounds. The mirror furnaces allowed new methods. The gas phase growth was added especially with wall free growth. The growth process was investigated in more detail.

Therefore the fluid dynamics in semiconductor melts were studied and the influence of static and dynamic magnetic fields on the transport properties. Simulation of the growth process was compared with specific experiments and special materials for specific use, e. g. X-ray detectors, were prepared together with the technology to built first devices.

His understanding of crystal growth as being a specific part of the broader field materials science and technology and the insight that this field is an interdisciplinary science brought him to act as a founder member of the directorate of the Freiburger Materialforschungszentrum (Freiburger Materials Research Centre FMF). The FMF is a central research institute of the university of Freiburg and is supported by the faculty of Physics, the faculty of Chemistry, Earth Sciences, and Pharmaceutical Chemistry, and the faculty of Applied Sciences. 2002 the staff was more than 150 members and the budget reached about 4 million Euro. The FMF is just being extended with a Freiburger Material & Medical Joint Research branch and has co-operations with Fraunhofer institutes in Freiburg, the seven Rhine-valley universities (EUCOR), the Research Centre in Karlsruhe, and various companies: really a great success.

On the other hand he cultivated and extended his scientific contacts systematically within Germany, Europe, and all over the world. Professor Benz brought in contact the crystal growers of compact crystals with the people doing industrial mass crystallization. He was 6 years vice president of the working party "Kristallisation" of the VDI-GVC in Germany. He socialised with colleagues in Lithuania, Poland, Russia, Czechia, Italy, France, Great Britain, United States, Japan etc. for very successful co-operations. Due to his popularity and his scientific reputation he was elected as vice president of the International Organisation of Crystal Growth (IOCG) for 6 years and for 3 years as vice president of the "Groupe Français de Croissance Cristalline" France. He became associate editor of the "journal of crystal growth" for the field of "microgravity science and technology" and consulting editor of the journal "Crystal Research and Technology". 1989 and 1991 he got the Japanese Government Award for Research at The University of Tokyo, Tokyo, Japan, and was 1999 appointed as member of the External Review Committee of the International Space Station Program in Japan by the Government of Japan. In Germany his experience in materials processing under micro gravity brought him 1998 the membership of the committee "Forschung unter Weltraumbedingungen" of the German DLR, which was followed on an international level by the election as corresponding member of the International Academy of Astronautics in 2000. His straightforward nature and his way of strategic thinking was surely the motivation of the members of the university in autonomy to elect him in 1999 as prorector for knowledge transfer and communications technologies.

His scientific work is documented in about 250 reviewed papers, in about 150 invited talks and more than 400 conference contributions. Numerous students got under his supervision their Diploma, degree of doctor or state doctorate. The above mentioned numerous positions demonstrate his popularity in the various communities. This is not only due to his scientific background and success but also due to his friendly nature and his fine human humour.

I was lucky to know Professor Benz since years and found him to be an outstanding scientist and a friendly colleague with whom one could have really stimulating collaboration. I believe his family and especially his charming wife will be glad to benefit from a reduced duty of the husband, father, and granddad. All of us wish him a good change into the new professional situation. We are sure that due to his great experience his advice will still be needed national as well as international. Hence his situation will change slowly and not suddenly, which we hope to be the reason for long years of health and vitality.

G. Müller-Vogt