

## **Laudation for 2017 Saupe Prize Laureates**

### **Wolfgang Weissflog and Gerhard Pelzl**

In memoriam Prof. Alfred Saupe, the Alfred Saupe Foundation together with the German Liquid Crystal Society, have awarded the Alfred Saupe Prizes in 2017 to Prof. Wolfgang Weissflog and Prof. Gerhard Pelzl, both former researchers at the Institute of Physical Chemistry of Martin Luther University Halle.

This award acknowledges their outstanding scientific merits, their high reputation in the scientific community, and their extraordinary lifetime achievements in liquid crystal research.

It is understood that the prize is not split, but each of the two nominees receives a 2017 prize. The Alfred Saupe medal was awarded last in 2014, to Carsten Tschierske, from the same institution, and this year's decision underlines the extraordinary role of Halle in German Liquid Crystal research. The committee's selection of a synthetic chemist and a physics oriented physical chemist for the award recognizes the close collaboration of both disciplines, which was one of the success factors in Halle (in fact, I learned only after reading his CV that Gerhard Pelzl was not a physicist). A long tradition, starting with Daniel Vorländer's work in the beginning of last century, continued until today. The two laureates have contributed to this success story in a remarkable way.

Let me give a short outline of the curricula vitae.

Both Gerhard Pelzl and Wolfgang Weissflog started to work on liquid crystals in an era when the electro-optic effect was not yet discovered. Even when the first displays were built more than one decade later, only seven-segment digits could be displayed. From this perspective, a commercial ad from the journal *Angewandte Chemie* in 1970 appears rather prophetic. From then, it took about two decades to produce the first LCD screen for the market.

Gerhard Pelzl was born in 1939. He studied chemistry at the Martin Luther University Halle-Wittenberg from 1958 till 1964. He received his PhD at the Institute of Physical Chemistry under supervision of Horst Sackmann. The topic

of his thesis was „Über Doppelbrechung und Polymorphie kristalliner Flüssigkeiten“. (On birefringence and polymorphy of crystalline liquids).

In 1986, he graduated to Dr. sc. nat. with a thesis on electro-optical effects in nematics and smectics. In combination with his qualification to lecture (*facultas docendi*) this is the equivalent of a habilitation, which he received in 1992. In the same year, he became full professor for Physical Chemistry in Halle. During his scientific career of nearly 5 decades, he co-authored more than 240 publications and book chapters, and about 20 patents.

It was Gerhard Pelzl who played a decisive role in the beginning of the 1990ies in the decision to continue liquid crystal research in Halle. As many of you may know, the reunification of the two German states shook the East German academic landscape considerably, and it was not a matter of course then that this traditional line of research would be continued, not at all! Of some help was the establishment of a Max-Planck work group, but essential prerequisite were the existing highly productive and highly evaluated research activities.

Wolfgang Weissflog was born in 1943. He also studied Chemistry at Martin Luther University, from 1962 to 1967, and received his PhD there with a thesis on the synthesis of crystalline liquids with low melting points in 1972. After that, Wolfgang Weissflog worked for 20 years in a midsize chemical company, on different topics, but with a continuous focus on the synthesis of liquid crystals. There, he acquired a profound expertise in this field. His thesis for Dr. sc. nat. in 1989 had the title “Neue Struktur-Eigenschafts-Beziehungen an flüssigen Kristallen” (New structure-property relations of liquid crystals). Note that the notation had changed from crystalline liquids to liquid crystals. Wolfgang Weissflog became the head of the Synthesis department of the Max-Planck work group in Halle from 1992-1997, this Max Planck group was led by – Alfred Saupe. Wolfgang Weissflog described that period as: “interessant, anregend, aber auch mit Reibungsflächen für jemanden der aus der Industrie kam und einem Top-Wissenschaftler, der lange in den USA geforscht hatte.” (it was an interesting and stimulating collaboration, but also with some friction between the a synthetic chemist shaped by work in industry and the academic top scientist.)

From 1997, Wolfgang Weissflog was an *apl. Professor*. He coauthored more than 300 publications and book chapters, and about 70 patents.

A milestone, and turning point was Wolfgang Weissflog's and Gerhard Pelzl's dedication to the newly discovered bent-shaped liquid crystals about 20 years ago. At that time, both researchers had already reached substantial achievements in their work. They had discovered and characterized new classes of mesogens. One of Gerhard Pelzl's interests was the then highly topical search for biaxial nematics. Before 1998, mainly rod-like mesogens were in the focus of research, but during the nineties, unconventional molecular shapes kept gaining attraction, such as swallow-tailed, laterally and terminally branched molecules. An exciting aspect was to find out how far one can depart from classical rod shapes without losing mesogenic properties.

This early devotion to the so-called "banana-shaped" molecules opened a very fruitful perspective. Gerhard Pelzl and Wolfgang Weissflog published more than 80 scientific papers on that subject. One of the most cited of these papers is their 1999 article in *Advanced Materials* on "Banana shaped compounds – A new field of liquid crystals". There was a well-organized distribution of tasks between both colleagues, in Wolfgang Weissflog's group, the materials were synthesized, and Gerhard Pelzl contributed a substantial part of physical characterization, in particular, electro-optical and texture studies. I should mention that the results of this work were not only of high scientific value, but also of considerable aesthetical charm.

Of course, both researchers benefited very much from an excellent team of researchers at Mühlpforte, with Siegmund Diele, Ute Baumeister, Horst Kresse, Anton Hauser, to name a few, and a large number of highly motivated and productive graduate students. I would like to mention two of them, Dr. Hajni Nadas and apl.-Prof. Alexey Eremin. I have the pleasure that both now work with me in Magdeburg! They acquired so many skills and expertise in Halle, Hajni as a chemist under supervision of Wolfgang Weissflog, Alexey as a physicist under supervision of Gerhard Pelzl. Let me add a few lines that Hajni sent me when she learned that I was writing this speech: She described the spirit of the research community in Halle Mühlpforte as extremely pleasant, the students felt warmly welcome by their supervisors. She describes Gerhard Pelzl as an enthusiastic scientist, elated by the discovery of a new property of an ordinary nematic or a newly discovered "banana" phase. She praises his interest for sports and classical music. One of the most striking features of his character is a deep modesty. Hajni also mentions his dedication to his wife,

Gisela. It is sad to know that Gerhard Pelzl could not participate in this ceremony, since he has to care for his disabled wife at this time.

And I want to add that, having the pleasure to collaborate with Wolfgang Weissflog since almost 15 years, I enjoyed working with him, discussing exciting science, or hiking in wonderful landscapes.

Both Wolfgang Weissflog and Gerhard Pelzl have devoted their scientific careers to liquid crystal research for more than 50 years. They were involved in substantial contributions to the field. Let me mention, for example,

- progress in understanding the role of molecular shape in mesophase formation
- the discovery of B5 and B7 phases
- a polar biaxial SmA Phase in a sequence SmA – SmAP – SmCP
- chiral domains in bent-core nematic phases
- field induced shifts of clearing temperatures (up to 10 K)
- field-induced inversion of chirality in SmCP
- the discovery of exotic mesomorphisms (Cr – SmC – cub – isotropic liquid – nematic – isotropic liquid)

Twin and triplet molecules and mixtures of calamitic and bent-core structures were characterized, as well as hockey-stick mesogens with synclinic – anticlinic SmC transitions. In addition, both laureates deserve invaluable merits for their efforts to preserve contemporary witnesses of 100 years of liquid crystal history in Halle, the famous “cigar boxes”. These are now preserved in the Central Collection of Natural Sciences of the university. And of course, both researchers shared their experiences with numerous young researchers who carry on their lines of research. The laureates can now enjoy their retirement.

From time to time, however, there seems to be an urgent need for their scientific advice, even in fields that are far from liquid crystal research. An indisputable evidence for this is an invitation received by Wolfgang Weissflog to review a paper on *Musa sapientum*.