

## Theo Hahn (1928–2016)

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The German mineralogist and crystallographer Theo Hahn died in Aachen on 12 February 2016, six weeks after his 88th birthday. He was born in Duisburg, Germany, in 1928. He experienced the end of World War II at the age of 17 and started studying mineralogy and crystallography at the Universities of Marburg (as a student of Carl Hermann) and Frankfurt/Main in 1946. There he obtained a doctoral degree (Dr. rer. nat.) at the age of 24. The title of his dissertation was *Fluoberyllates as Model Compounds of Silicates*. This formed the basis for one of his early principal research fields, the study of ‘stuffed’ tetrahedral-framework structures, which he considered as models for silicates.



After his PhD, Theo Hahn worked as a postdoc for Martin J. Buerger at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts. The four-year stay at this highly respectable institution strongly influenced his scientific career. There, and at the neighbouring Harvard University, he came into contact with other (at that time still young and later very eminent) scientists, such as Sydney C. Abrahams, Norio Kato, Andrew R. Lang and Charles T. Prewitt. In Buerger’s laboratory he learned the practice of single-crystal structure determination by X-ray diffraction and developed his persistent love for symmetry in crystallography and art, and its group-theoretical treatment.

Returning to Germany at the end of 1956, Theo became an assistant to Herbert O’Daniel (his former PhD supervisor) at the Mineralogical Institute of the University Frankfurt/Main. He consequently devoted his attention to the application of computers and the development of evaluation programs for single-crystal structure determination. Theo worked on this topic for his Habilitation (entitled *Methods and Results of the Exact Crystal-Structure Research, Treated on Specific Examples*), which he finished only three years later in 1960, obtaining the *Venia legendi* for Crystallography and Mineralogy.

Another three years later in 1963, and at the age of 35, Theo was appointed full Professor as the newly installed Chair for Crystallography of the Technical University of Aachen (RWTH). He was director of this 'Institut für Kristallographie' for 30 years until his retirement in 1993. In addition to his activity as an academic teacher and researcher, he was Dean of the Faculty of Mining, Metallurgy and Geosciences of RWTH Aachen, Chair of the German Mineralogical Society, and consultant and reviewer for the German Research Foundation. Theo was a member and Chair of several bodies of the International Union of Crystallography, including:

Member of the IUCr Executive Committee 1981–1990;

IUCr President 1984–1987;

Member of the IUCr Commission on *International Tables* 1963–2007, with an interruption from 1981–1987. He was Chair of this Commission from 1972 to 1981 and again from 1993 to 2003;

Editor and author of Volume A (*Space-Group Symmetry*) of *International Tables for Crystallography* 1972–2011 (five editions), and of the *Brief Teaching Edition of Volume A* 1985–2011 (five editions).

Theo received several honours for his scientific work including, in 1997, the Abraham Gottlob Werner Medal in Silver of the German Mineralogical Society and, in 2001 (together with Hans Wondratschek), the Carl Hermann Medal of the German Association for Crystallography. He was also an Honorary Member (from 1997) of the German Association for Crystallography.

Theo's scientific opus was very broad. He predominantly used X-ray and neutron diffraction methods for crystal powders and single crystals. Under his management a very effective neutron research group (University Triple-Axes Spectrometer UNIDAS for Inelastic Neutron Scattering), affiliated to the Institut für Kristallographie, RWTH Aachen, and led by Götz Eckold, was established at the Nuclear Research Centre Jülich. An important materials-related field of Theo's research was the crystal chemistry of stuffed tetrahedral-framework compounds and various silicate–germanate binary systems. More recently, his research concerned polymorphism, phase transformations and domain formation. Owing to our expertise in this field, he and I were invited to write a review article *Twinning of Crystals* for Volume D (*Physical Properties of Crystals*, 2004) of *International Tables for Crystallography*. This review was comprehensively revised and supplemented in the Second Edition (2014) of Volume D.

Theo Hahn's greatest achievements for the worldwide crystallographic community are due to his work for the International Union of Crystallography. This started during the 1963 IUCr Congress in Rome, when a new Commission on *International Tables* was established with the aim of preparing and publishing a *Pilot Issue* in preparation for a future new

edition of the first volume of *International Tables for X-ray Crystallography*. During the 1972 IUCr Congress in Kyoto, Theo was appointed as Chair of the revised Commission on *International Tables* with the task of editing a revised and modernized Volume A (*Space-Group Symmetry*) of *International Tables for Crystallography* (hereafter abbreviated as *IT A*). The international management of the production of this comprehensive volume of nearly 900 pages, with numerous challenges regarding the coordination of the various contributions of a heterogeneous team of authors, the graphical design of the symmetry groups, the timing *etc.*, were all successfully accomplished by Theo owing to his expertise in the field of symmetry, and his persistence and strictness in discussions with the contributors. Theo himself was the author of several parts of *IT A*. It was more than ten years until, in 1983, the first edition of the volume went to press. With the same impetus and strictness he introduced numerous amendments and supplements in the following four editions. Five years after the appearance of the fifth edition of *IT A* in 2002 and after more than 35 years in the role, Theo retired as Editor of the volume at the age of 79. However, this was not the end of his work for *International Tables*: up until the end of 2015 he was engaged with the revision and update of Chapter 3.2 of the Sixth Edition of *IT A*, which is edited by his successor Mois I. Aroyo and will appear soon.

In conclusion, Theo served the International Union of Crystallography for 40 years (since 1963) as Chair of the Commission on *International Tables*, as editor of *IT A* (five editions), as author of various contributions to *IT A* and *IT D*, as a member of the IUCr Executive Committee and as President of the IUCr (1984–1987). His long service for the crystallographic community, in particular the editions of the new *International Tables* Volume A, forms a major part of his lifetime achievements.

Theo was a very enthusiastic and highly respected academic teacher, both nationally and internationally. In particular, he organized, usually together with his close friend Hans Wondratschek [who passed away in October 2014; see *Acta Cryst.* (2015), **A71**, 253–254] and under the auspices of the IUCr, about 15 international summer schools on crystal symmetries and space groups, several of them in Eastern European countries. A school in Sofia led to the publication of the book *Symmetry of Crystals* by Th. Hahn and H. Wondratschek (1994).

Theo Hahn was a creative scientist of high international reputation, and his obliging and charming nature made him a fascinating partner for discussion and conversation. The community of crystallographers worldwide will miss him as an inspiring teacher and a wonderful person. Theo is survived by his wife Jane, his son Fabian with wife Sabine, and three grandchildren Luca, Ellen and Leonard. Our sincere condolences are with them.