

# Professor Bernd Fischer

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Bernd Fischer's mathematical interest was in the understanding of the structure of finite groups. Thereby he specially contributed to the classification of the finite simple groups.

Fischer started as a student studying distributive quasi-groups, which are not groups, but it was obvious to him that there was a group around. He was right and it led him to introduce and study 3-transposition groups. These are groups that are generated by a conjugacy class of involutions such that the product of every pair of non-commuting involutions has order 3. He characterised those groups and thereby he found and constructed three sporadic simple groups, which he named  $M(22)$ ,  $M(23)$  and  $M(24)'$  because of their connection to the large Mathieu groups  $M_{22}$ ,  $M_{23}$  and  $M_{24}$ . Nowadays these are called the Fischer groups  $Fi_{22}$ ,  $Fi_{23}$  and  $Fi'_{24}$ .

Fischer's student Franz Georg Timmesfeld obtained the difficult classification of the  $(3,4)$ -transposition groups by assuming an extra condition. Fischer was intrigued by that extra condition. By removing it he constructed another sporadic group, the 'baby monster'. Fischer did not publish much, though he was in close contact with other mathematicians. In particular, he did not publish his predictions about another sporadic group, the 'monster'.

During a conference in Bielefeld Fischer was standing with John Thompson at a blackboard and speculated about the existence of a non-split extension  $2^{1+24} \cdot Co_1$  of

a double cover of the Leech lattice modulo  $\text{GF}(2)$  by the largest Conway group  $Co_1$ . Fischer proposed also the possible existence of the group  $3^{1+12} \cdot 2Suz : 2$  and a non-split extension  $2 \cdot B$  of an involution by the baby monster. The existence of these three groups then provided the chance for the existence of a new sporadic group, which turned out to be the largest one. In fact, soon afterwards Fischer got the order of this group,

$$2^{46} \cdot 3^{20} \cdot 5^9 \cdot 7^6 \cdot 11^2 \cdot 13^3 \cdot 17 \cdot 19 \cdot 23 \cdot 29 \cdot 31 \cdot 41 \cdot 47 \cdot 59 \cdot 71,$$

which John Conway later called the 'monster'.

It was certainly his deep and broad insight into algebra, that made possible his inventions and results, for which he became internationally renown. In 2002 he obtained an honorary doctorate from the University of Giessen. He was also known for his sharpness, and for his generous hospitality. Together with his wife he often invited the participants of conferences or all the students from his class to their home for barbecue.

Bernd Fischer was educated at the University of Frankfurt where he received his PhD in 1963 under the direction of Reinhold Baer. He continued his studies at Frankfurt, including a Habilitation degree in 1967. After short periods as a lecturer at Yale and Warwick, he moved to Bielefeld in 1970 as one of the first professors of the newly established Faculty of Mathematics. Developing and keeping highest academic standards was a top priority for him from the very beginning. He did this as an academic teacher, but he had also a passion for administration. For instance, he served several times as a dean. In this way he helped to build the faculty from scratch to an internationally renown mathematical centre, in particular for group theory.

Fischer had a number of excellent students, among them Bernd Stellmacher and Franz Georg Timmesfeld. Another aspect of his success was a skill in obtaining substantial funding from the German research council (DFG). For instance, he was one of the coordinators of the first mathematical Schwerpunktprogramm (Representation theory of finite groups and finite dimensional algebras, 1984–1991), and he was also involved when the first Sonderforschungsbereich in mathematics at Bielefeld was established (Discrete structures in mathematics, 1989–2000). Fischer was not known for extensive writing. But when he wrote the style was short and concise. For instance, less than three pages were sufficient for his proposal of a project within this Sonderforschungsbereich.

The Faculty of Mathematics at Bielefeld loses one of his pioneers, who will always be remembered for his unique academic style.

Barbara Baumeister  
Henning Krause