

# Logic, Algebra, and Computation

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# Logic, Algebra, and Computation

International Summer School directed by  
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# Preface

The Marktoberdorf Summer Schools on Informatics were started in 1970, with the intention to convene every second or third year a group of top researchers in computing, devoted to preach their most recent results to an elite of advanced students — young and most promising people — and prepared to stand their questions, criticism and suggestions. The themes of these Advanced Study Institutes under the sponsorship of the NATO Scientific Affairs Division varied slightly over the years, oscillating more or less around Programming Methodology, as the following list shows:

- 1970 Data Structures and Computer Systems
- 1971 Program Structures and Fundamental Concepts of Programming
- 1973 Structured Programming and Programmed Structures
- 1975 Language Hierarchies and Interfaces
- 1978 Program Construction
- 1981 Theoretical Foundations of Programming Methodology
- 1984 Control Flow and Data Flow: Concepts of Distributed Programming
- 1986 Logic of Programming and Calculi of Discrete Design
- 1988 Constructive Methods in Computing Science
- 1989 Logic, Algebra, and Computation

Logic, Algebra, and Computation is the theme of the summer school to which this volume is devoted. It is the tenth in succession, but it is also the first in a new series (the “blue” series) that is intended to alternate in future with the traditional (the “red” series) arrangement; in fact the tenth summer school in the “red” series with the title “Programming and Mathematical Method”, held in 1990, was the subject of celebrating both its serial number and the twenty years of Marktoberdorf Summer Schools altogether.

The reason for the splitting into two series was the following: With growing reputation of the school, there was increasing demand for participation. For organizational as well as for pedagogic reasons, the number of participants was always limited to roughly 90, and high rejection rates, although unadvisable, happened to be unavoidable. The Summer School steering group, that evolved over the years, felt that repeating the same summer school every other year would take away a lot of the spontaneity that made the school so famous, and organising it every year with a completely new program was too much of a burden for the lecturers. On the other hand, the themes that were focused upon in the summer schools were becoming wider and wider.

Thus, it seemed to be advisable to build up a new series with a new steering group, dealing with themes that the other group most recently did not cover centrally, but allowing overlapping of themes and to some extent even of lecturers. The first summer school under the new regime thus obtained an orientation somewhat closer to logic. In the meantime, preparations for the 1991 school in the “blue” series are well under way. With the title “Logic and Algebra of Specification”, it will stay within this line which has turned out to be both useful and attractive, and still it will keep close philosophical ties to the “red” series. Applied logic is programming, programming is applied logic — this is the message the present volume can be reduced to. Computation is a common concern of logic and mathematics, as Alan Turing and John von Neumann demonstrated half a century ago.

It is my pleasure to state that the 1989 Marktoberdorf Summer School, although being the first one in the “blue” series, was already a highlight in the scientific presentation and in the exchange of ideas both by discussions and by numerous gatherings in smaller groups and in private conversation. The ambience for such successful days was provided by the experienced scientific staff from Munich and by the local Marktoberdorf crew. My thanks go to them, in particular to Dr. Werner Meixner who was in charge of the organization of the summer school and who helped me in the preparation of this volume.

Munich, March 1991

F. L. Bauer

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