

Guest Editors' Foreword

Along with his courage, generosity, and boundless energy, the penetrating geometric insight and intuition of Branko Grünbaum have made him one of the leading geometers of our time. It was a pleasure to edit this collection in honor of his 70th birthday.

Branko was born in Osijek (then Yugoslavia, now Croatia) in 1929, and began his mathematical studies at the University of Zagreb in 1948/49. His studies continued at the Hebrew University in Jerusalem, where he received an M.Sc. degree in 1954 and a Ph.D. in 1958. After spending 2 years at the Institute for Advanced Study in Princeton, he held faculty positions at the University of Washington, the Hebrew University, the University of Kansas, the University of California at Los Angeles, and Michigan State University. In 1966 he settled down at the University of Washington in Seattle.

Branko is a Fellow of the American Association for the Advancement of Science. He has held a Guggenheim Fellowship and has received the Lester Ford and Carl Allendoerfer awards of the Mathematical Association of America. He has given invited addresses to the American Mathematical Society, Mathematical Association of America, Canadian Mathematical Society, Deutsche Mathematiker-Vereinigung, Australian Mathematical Society, Association for Computing Machinery, and Society for Industrial and Applied Mathematics. He serves on the editorial boards of several journals and has given series of invited lectures at research conferences and also at conferences concerned with mathematical education.

He is widely known for his more than 200 research papers, for stimulating survey articles, and for several books that have become standards in their fields. The following (some with coauthors) are among his most influential publications. Each of them is reflected in papers in the present collection.

- (1) Three survey-and-research articles in *Convexity* (American Mathematical Society, 1963) (volume 7 of Proceedings of Symposia in Pure Mathematics). The titles are “Helly’s theorem and its relatives” (with L. Danzer and V. Klee), “Measures of symmetry for convex sets,” and “Borsuk’s problem and related questions.”
- (2) *Convex Polytopes* (Interscience-Wiley, 1967). This book codified an important area of research, made many new contributions, and sparked a large fraction of subsequent developments in the field. We have heard it described as “the most stolen book in mathematics” because it is out of print and there are so many geometers who would like to have their own copy. It stimulated so many new developments that some chapters of the book are now obsolete, yet the direction

and spirit of these chapters is very much alive. Other chapters contain much material not found elsewhere.

- (3) *Arrangements and Spreads* (American Mathematical Society, 1972) was described by H.S.M. Coxeter as containing enough problems to occupy a generation of geometers. Much subsequent work on arrangements of hyperplanes (in particular, on lines and pseudolines in the plane) can be traced to this publication. Its introductory remarks provide an example of Branko's critical views of some trends in modern mathematics, and of his position as a strong defender of the spirit of geometric thinking. We applaud these views and his willingness to express them.
- (4) *Tilings and Patterns* (with G. C. Shephard) (Freeman, 1987). With its 700 pages, it is the standard work in its field. It has contributed immensely to the growth of the subject.

Branko's current research centers around polygons and polyhedra. It seems reasonable to conjecture and to hope that this will eventually result in another book.

Some of Branko's publications explore the interfaces between mathematics (especially geometry and combinatorics) and other subjects, such as crystallography, art, anthropology, and textile design. An indication of the breadth of his influence lies in the fact that more than 100 of his publications are with coauthors, and about 40 different coauthors have been involved.

There are mathematicians who save all their best problems for themselves and their students. In contrast, Branko's generosity in posing problems and his courage in making conjectures has contributed immensely to the growth of the areas in which he has worked. Proofs of some of his conjectures can be found in the present collection, as well as a refutation of one conjecture. We admire his approach to mathematics, which has been aimed not only at the direct discovery of new results but also at uncovering interesting new problems for others to work on.

Among the authors represented in this collection, many have had close connections to Branko. Rosenfeld and Burgiel were among his Ph.D. students; Katchalski and Kalai are his mathematical grandchildren. Boltyanski, Gritzmann, Huson, Klee, Kleinschmidt, Larman, Lawrence, Mani-Levitska, McMullen, Mihalisin, Reay, Rigby, and Shephard have been among Branko's coauthors, or Ph.D. students of his coauthors, or students in his classes, or have had close contact with Branko while spending extended periods at the University of Washington. Most of the remaining contributors have benefited from Branko's generosity in one way or another. (It would be interesting to have a complete picture of the interconnections!)

We are grateful to Eli Goodman and Richard Pollack, Editors-in-Chief of this journal, and to Springer-Verlag for offering to publish this collection and for making extra space available when, due to the overwhelming response, it became clear that the project would outgrow the initial bounds.

On behalf of all the contributors to this collection, and of Branko's friends from all over the world, we send him our congratulations and we look forward to his next book.

Gil Kalai

Victor Klee