



Beyond the Cube: The Architecture of Space Frames and Polyhedra

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This book offers an in-depth look at space frame architecture, including space frame projects completed by such notable architects as I. M. Pei, Buckminster Fuller, Philip Johnson and Louis Kahn. Both theory and practice are included to offer a comprehensive overview of the history, current use, and future outlook for creating space frame structures. The 15 distinguished contributors to this book have extensive background in the architecture of space frames and offer an international perspective on the subject. The text is illustrated with hundreds of line drawings, black-and-white photos, and an eight-page color insert.

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Editorial Review

From the Publisher

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From the Inside Flap

Though human fascination with polyhedra can be traced back to the time of Pythagoras, only in the twentieth century have architects begun to fully appreciate and exploit their advantages as elements of structure and design. In *Beyond the Cube*, J. François Gabriel and a team of leading space frame experts from around the world examine the practical as well as theoretical aspects of space frames. They discuss some of the most memorable examples and practitioners of twentieth-century space frame design: Louis Kahn and the Yale University Art Gallery, Buckminster Fuller's geodesic domes, Philip Johnson's radically different approach to space frames in the Crystal Cathedral, and I. M. Pei's Javits Convention and Exhibition Center, among others. In an extended discussion on the theory of polyhedra, *Beyond the Cube* explores the ways in which coupling cube to tetrahedron produces an array of other polyhedra that enable the expansion of design sources beyond the cube. The book examines the geometric laws that govern many of these shapes-prisms, antiprisms, domes, and folded plate structures, as well as space frames-and surveys the symbolic meanings ascribed to many polyhedra. Structural aspects of polyhedra are examined from two points of view, that of the structural engineer and that of the designer using CAD for the purpose of visualization and formal transformations. The book concludes with a look toward the future of polyhedra in architecture, including tensegrity structures, in which structural elements under compression are not in direct contact with each other; space labyrinths, made of a continuous surface dividing space into two parts; and quasicrystals, three-dimensional manifestations of higher-dimensional polyhedra. The final chapter examines the architectural spaces found within space frames, including "hexmods," "star beams," and the many other spaces that have yet to be named. For architects, structural engineers, and students, *Beyond the Cube* covers the what, why, and how of space frame architecture in a comprehensive and accessible manner not available in any other book. Hundreds of line drawings, black-and-white photos, and an eight-page color insert are both instructive and inspiring. This book is more than an introduction to space frames, it is an invitation to explore, discover, and use polyhedra to create imaginative, expressive, and practical designs for buildings.

From the Back Cover

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"We use the cube as if it were the only acceptable model for our living spaces and, in doing so, we ignore countless other forms that might lead to more efficient, more beautiful, more economical, and certainly less worn-out environments." --from the Preface

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