



Colour science draws on a variety of disciplines, including physics, biology, human perception, mathematics, and art. This book shows the part that geometry plays in reaching some important conclusions in colour science. Seemingly disparate mathematical objects that arise in human vision, machine vision, and electronic displays, are shown to share a common form as zonohedra. Their internal structures all arise as Minkowski sums of vectors that correspond to individual wavelengths in the visible spectrum. The processes of light production, reflection, and response provide the relationships that define those structures.

The first two chapters lay the geometric foundation for the colour science introduced in the rest of the book. Chapter 2 introduces Minkowski sums and zonohedra from first principles, in more detail than has appeared previously. The next two chapters deal with physical and perceptual aspects of colour, deriving the 1931 Standard Observer from empirical data. The final three chapters build on the first four to construct geometric objects for colour science, and to derive conclusions from them.

The book assumes no knowledge of colour science. Some linear algebra is assumed, at about the second-year undergraduate level. Even readers without this background, however, will be able to follow the book's concrete, intuitive presentation, which emphasizes spatio-visual understanding.