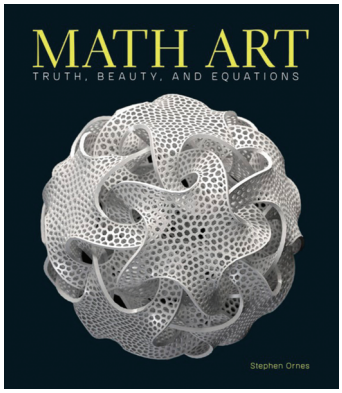
BOOKSHELF

New and Noteworthy Titles on our Bookshelf
June/July 2020



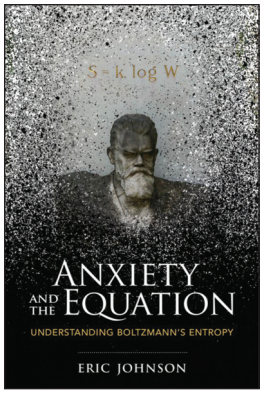
Sterling, 2019, 208 pages.

Math Art
Truth, Beauty, and Equations
by Stephen Ornes

In this book, which is approximately square in format (9 x 9.5 inches) and printed in full color, Ornes has assembled an impressive survey of modern mathematical art that should delight mathematicians of all stripes and levels. Although one might consider it a small coffee table book for the mathematically inclined, *Math Art* successfully conveys the excitement and beauty of mathematics in a visual and nontechnical manner that is accessible to a wide audience. For example, *Math Art* could be an attractive supplement or sourcebook for instructors of general education mathematics courses.

In the introduction, Ornes declares the three guiding principles that informed his selection of featured artists. First, he focuses on art with mathematical substance, art that "wouldn't exist if someone with a working knowledge of some mathematical idea—be it common or arcane—hadn't gotten some mental lightning strike about how to turn that idea into art." Second, Ornes presents pieces that go beyond mere visualization and embraces the aesthetic possibilities inherent in the mathematics. Finally, Ornes focuses primarily on work by living mathematical artists. Although this rules out familiar names like M. C. Escher, this choice keeps the book fresh and focused on contemporary pieces. Some of the works profiled have even been displayed at the Joint Mathematics Meetings in recent years.

Math Art is divided into four major parts, each of which is split into four or five chapters which are devoted to the work of a particular mathematical artist. Nineteen mathematical artists are profiled in all. The first part, "Making Sense of the Universe," explores themes such as π and infinity through the artwork of John Sims, John Edmark, Crockett Johnson, Dorothea Rockburne, and George Hart. The second part, "Stranger Shapes," delves into fractals and related topics via the work of Bathsheba Grossman, Helaman Ferguson, Robert Fathauer, and Melinda Green. The third part, "Journeys," surveys algorithms and projections and profiles work of Robert Bosch, Anita Chowdry, Roman Verostko, and Henry Segerman. The final part, "(Near) Impossibilities," studies tilings and algebraically inspired works of Daina Taimina, Frank Farris, Carlo Séquin, Bjarne Jespersen, and Eva Knoll.



MIT, 2018, 192 pages.

Anxiety and the Equation
Understanding Boltzmann's Entropy
by Eric Johnson

Anxiety and the Equation is a readable biography of Ludwig Boltzmann (1844–1906) coupled with a layperson's introduction to entropy. Although this book is ostensibly a biography of a physicist written by a chemist, mathematicians will recognize that Boltzmann's work set the stage for many future mathematical discoveries. For example, without Boltzmann, there would be no ergodic theory (he coined the term *ergodic*) and no information theory (the notion of Shannon entropy is a direct descendant of thermodynamic entropy).

The book is divided into twenty-five short chapters which proceed at a brisk pace. The author's style is witty and irreverent, which makes *Anxiety and the Equation* an engaging read. To grab the reader's attention, Johnson starts with Boltzmann's suicide at the age of sixty-two before tracing the path that led the young genius through early triumphs, bitter disputes (Ernst Mach was an implacable foe), and mental decline. This fast-paced biography of Boltzmann is interwoven with chapters that develop Boltzmann's entropy equation. The mathematics is elementary and presented at a level that calculus students should have no trouble with.

The Bookshelf is prepared monthly by Notices *Associate Editor Stephan Ramon Garcia.*

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