These volumes (see DE02033314X) on Experimental Mathematics present and advocate "a compelling way to generate understanding and insight; to generate and confirm or confront conjectures; and generally to make mathematics more tangible, lively, or fun" (quoted from the prefaces of both volumes). Of course for many working mathematicians the use of software support in their work has become commonplace; but even for these many of the stories told and the examples presented in the two volumes should be interesting, surprising, or challenging.

Both prefaces say "Our goal in these books is to present a variety of *accessible* examples of modern mathematics where intelligent computing plays a significant role [...]. We have concentrated primarily on examples from analysis and number theory, as this is where we have the most experience." Indeed the greatest part of the material concerns real functions a single variable, zeta functions and generalizations, π and other number-theoretic constants, special functions, sums and series, integrals, and many (apparent) coincidences. Much of the discussion is driven by number-theoretic observations and questions; the reviewer thinks that some of the excursions into other domains are less convincing than the core parts of the book.

The main emphasis is on case studies that display experimental approaches to mathematical problems, formulas, and effects. Thus there are only few systematic developments of theory, explanations or tutorials in the two volumes – though Volume II features introductions to Fourier Analysis (Chapter 2) and to the Riemann zeta function (Chapter 3). The integer relation algorithms PSQL by Helaman Ferguson (1993), which is behind some of the striking "constant identification" work by the present authors that is also displayed in these books is given explicitly, but in a rather compressed form (Section 6.3.1 of Volume I) as part of a chapter on numerical tricks and recipes apparently intended for some computing experts. This is one of the parts that are not that accessible or interesting for a general reader (such as the reviewer), and where some opportunities were lost for good explanations of important aspects of the authors' work.

The material in these two volumes is not strongly structured, and there is no apparent guiding principle for the sequencing of the material. Rather, Volume I is mostly on examples, Volume II is on more examples. The discussion is not grouped into mathematical fields, nor ordered according to difficulty and accessibility, or along a list of problems as in the "SIAM 100-Digit Challenge" by *F. Bornemann* et al. [Philadelphia, PA: Society for Industrial and Applied Mathematics (SIAM)) (2004; Zbl pre02113773)]. This also leads to some repetitions, and a few missed connections. (For example, the story about Enrico Au-Young's formula

$$\sum_{k=1}^{\infty} \left(1 + \frac{1}{2} + \cdots + \frac{1}{k}\right)^2 \frac{1}{k^2} = \frac{17\pi^4}{360}$$

is told +in Volume I on page 56 and again on page 248. A proof of the formula appears in Volume II on p. 173 under the heading "Three Proofs of an Identity" which there remains anonymous.) Despite the flexible structuring, each chapter ends with a section

"Commentary and Additional Examples" that is a quarry of further interesting material, exercises, comments, and references that apparently didn't fit into the flow of the main part of the chapter.

Even Chapter 1 of Volume I, entitled "What is Experimental Mathematics?", is mostly a sequence of not strongly connected quotes from various sources, selected stories from the history of mathematics, and discussions of various aspects. Chapter 7 "Making Sense of Experimental Mathematics" is another go at the title question of Chapter 1. It seems to the reviewer that this is indeed intentional, and that the comment (Vol. I, Chap. 7) that the editors of the journal *Experimental Mathematics* "advocate a not undramatic change in writing style" is also taken as a program for the two volumes reviewed here, which feature lots of interesting reading, but seem to intentially defy expectations for a traditional textbook. [Günter M. Ziegler (Berlin)]