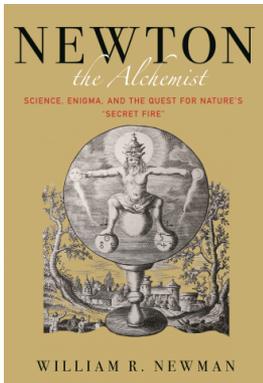




# BOOKSHELF

New and Noteworthy Titles on our Bookshelf  
March 2020

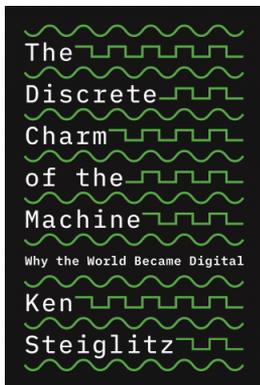


Princeton, 2019, 560 pages

**Newton the Alchemist:**  
*Science, Enigma, and the Quest for Nature's "Secret Fire"*  
by William R. Newman

Isaac Newton is rightly regarded as one of the foremost scientists in human history. It may come as a shock to many readers that he also produced extensive alchemical notes running to over a million words. This hefty book, written by a professor of history

and philosophy of science and medicine, provides a detailed and fascinating view into the alchemical experiments conducted by this enigmatic genius. This is a work of serious scholarship based upon a rigorous textual analysis and painstaking replications of Newton's alchemical experiments. It will be of interest to Newton fans and historians of mathematics or science. *Newton the Alchemist* is divided into twenty-two chapters, an epilogue, and four appendices. It is copiously footnoted and adorned with many photographs and illustrations.



Princeton, 2019, 256 pages

**The Discrete Charm of the Machine:**  
*Why the World Became Digital*  
by Ken Steiglitz

The world used to be dominated by analog devices. For example, telephones, television, radio, and vinyl records once depended upon the representation, transmission, and processing of quantities that could, in principle, assume a continuum of values. In this book,

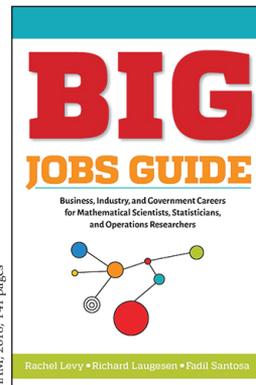
Steiglitz chronicles the analog-to-digital revolution, taking us from the mechanical world of Babbage, Lovelace, and Jacquard, through the early modern era of vacuum tubes

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and transistors, to contemporary digital computers. He also provides what may be a sneak preview of the world that is to come, in which quantum computation dominates. Historical figures, such as Babbage, Lovelace, Shannon, and Turing, take center stage, and enlightening excursions into electrical engineering, physics, computer science, and even materials science abound. Specialists in information theory, quantum computing, signal processing, and related fields may find this book too elementary for their tastes. However, the typical mathematician will learn a great deal, especially about aspects of computing that are not purely mathematical in nature. For example, what are the physical origins of analog noise? How does a semiconductor work at the quantum level? Even old favorites, such as Nyquist's principle, Turing machines, and the  $P$  versus  $NP$  problem, are given elegant and down-to-earth explanations that should appeal to any scientifically curious layperson.



SIAM, 2018, 141 pages

**BIG Jobs Guide:**  
*Business, Industry, and Government Careers for Mathematical Scientists, Statisticians, and Operations Researchers*  
by Rachel Levy, Richard Laugesen, Fadil Santosa

The enormous "BIG" in the title of this slender volume refers not to its size, but rather to Business, Industry, and Government. The BIG Math Network, an organization launched in 2016 by the AMS, MAA, SIAM, ASA, and INFORMS,

developed the book to provide a succinct and readable guide to mathematics-related jobs in the "real world." The *BIG Jobs Guide*, which is attractively printed in color, is ideal for undergraduate students, graduate students, and postdocs. Academics who wish to transition into the real world or to better prepare students for BIG jobs are also part of the target audience. The book covers a broad spectrum of important topics, such as "the elevator pitch" and developing your "special sauce," to how to write a résumé, find career mentors, and negotiate. The *BIG Jobs Guide* is a valuable source of practical information on an important topic that many academics know little about. It is a must-read title for mathematics majors who are curious about non-academic job options.