



[MEMagazine](#) > [Articles](#) > [2009](#) > [July 2009 Issue](#) > ME Bookshelf

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HANDBOOK OF FOURIER ANALYSIS AND ITS APPLICATIONS

Robert J. Marks II. Oxford University Press, 198 Madison Ave., New York, NY 10016-4308. 2009. 808 pages. \$150. ISBN: 978-0-19-533592-7.

Robert Marks, Distinguished Professor of Engineering at Baylor University, tells us that his handbook is directed more to engineers and scientists than to mathematicians. He starts by giving us an idea of the broad applications of Jean Baptiste Joseph Fourier's idea of breaking down signals into sinusoidal components, and an idea, too, of the author's aim to be thorough. We weren't sure if Marks was being scrupulously thorough or light-hearted in the opening to his introduction. He starts with "an incomplete list" of technical fields that have applied Fourier analysis, and then adds almost a dozen and a half terms that carry the thinker's name. The paragraph runs to 19 lines and we counted about 90 citations from his list of reference works. The handbook's chapter titles include "Fourier Transforms in Probability, Random Variables, and Stochastic Processes" and "Generalizations of the Sampling Theorem." The sampling theorem, Marks explains, "tells us how fast to sample an audio waveform to make a discrete time CD or an image to make a DVD." Marks warns his reader that the book may be incomplete. "No single volume can present all of the applications for Fourier's theory," he writes, because the material "is simply too voluminous." But he gives it a try.

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