Citations   From References: 56   From Reviews: 1

MR2744776 (2012b:46022)   46B15 41A58 42A65 42C15 42C30 46C05 46E30
Heil, Christopher [**Heil, Christopher E.**] (1-GAIT)
★**A basis theory primer.**
Expanded edition.
Applied and Numerical Harmonic Analysis.
Birkhäuser/Springer, New York, 2011. *xxvi*+534 *pp.* $84.95. *ISBN* 978-0-8176-4686-8

According to the author ". . . this is a text for learning the theory of bases and frames and some of their appearances in classical and applied harmonic analysis".

The book consists of five parts: Part 1: A Primer on Functional Analysis; Part 2: Bases and Frames; Part 3: Bases and Frames in Applied Harmonic Analysis; Part 4: Fourier Series; Part 5: Appendix A: Lebesgue Measure and Integration, Appendix B: Compact and Hilbert-Schmidt Operators. The amount of mathematics treated in the book is impressive. The first handwritten version of the book has served as a handbook for a certain group of mathematicians to learn about the main tools of the theory of bases and frames for Banach and Hilbert spaces. Afterwards new topics were added, amongst which are Part 1 and two appendices. Several results exposed in Part 3 are related to hot topics in wavelet analysis.

Personally I like this book. It is one of those very few mathematical books that I can read without additional difficulties arising from my limited capacity to remember facts and definitions. The sole doubt of the reviewer is related to the following affirmation of the author: "As my goal was to make a text to learn from, I have not attempted to provide detailed historical accounts or attributions of results." Keeping in mind that the author includes his own results, such a practice seems not to be very healthy. Moreover, in some places minimal norms of citation are not respected while in several other places the author has given detailed historical accounts and attributions of given results. For example, Kolmogorov's result about the existence of almost everywhere divergent Fourier series is a classical result and has considerable impact in the development of harmonic analysis. Unfortunately, on page 465 of the book this result is cited in such a form that a beginner could interpret it as Grafakos's theorem.

Let's hope that this book will have additional editions and the author will find time to modify the exposition.   *Kazaros Kazarian*