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This book on recent research in noncommutative harmonic analysis treats the Lp boundedness of Riesz transforms associated with Markovian semigroups of either Fourier multipliers on non-abelian groups or Schur multipliers. The detailed study of these objects is then continued with a proof of the boundedness of the holomorphic functional calculus for Hodge–Dirac operators, thereby answering a question of Junge, Mei and Parcet, and presenting a new functional analytic approach which makes it possible to further explore the connection with noncommutative geometry. These Lp operations are then shown to yield new examples of quantum compact metric spaces and spectral triples. The theory described in this book has at its foundation one of the great discoveries in analysis of the twentieth century: the continuity of the Hilbert and Riesz transforms on Lp. In the works of Lust-Piquard (1998) and Junge, Mei and Parcet (2018), it became apparent that these Lp operations can be formulated on Lp spaces associated with groups. Continuing these lines of research, the book provides a self-contained introduction to the requisite noncommutative background. Covering an active and exciting topic which has numerous connections with recent developments in noncommutative harmonic analysis, the book will be of interest both to experts in no-commutative Lp spaces and analysts interested in the construction of Riesz transforms and Hodge–Dirac operators.