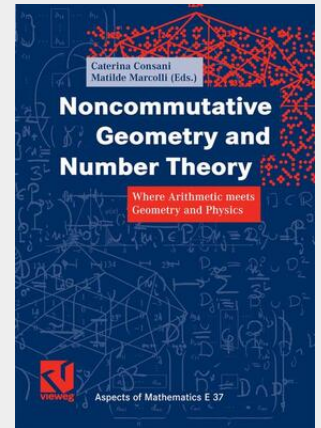


# Noncommutative Geometry and Number Theory

Where Arithmetic meets Geometry and Physics

In recent years, number theory and arithmetic geometry have been enriched by new techniques from noncommutative geometry, operator algebras, dynamical systems, and K-Theory. Research across these fields has now reached an important turning point, as shows the increasing interest with which the mathematical community approaches these topics. This volume collects and presents up-to-date research topics in arithmetic and noncommutative geometry and ideas from physics that point to possible new connections between the fields of number theory, algebraic geometry and noncommutative geometry. The contribution to this volume partly reflects the two workshops "Noncommutative Geometry and Number Theory" that took place at the Max-Planck-Institut für Mathematik in Bonn, in August 2003 and June 2004. The two workshops were the first activity entirely dedicated to the interplay between these two fields of mathematics. An important part of the activities, which is also reflected in this volume, came from the hindsight of physics which often provides new perspectives on number theoretic problems that make it possible to employ the tools of noncommutative geometry, well designed to describe the quantum world.

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