NOTES ON NONCOMMUTATIVE GEOMETRY

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Foreword

This book is not just a survey of noncommutative geometry — later NCG; rather, it strives to answer some naive but vital questions:

What is the purpose of NCG? What is it good for? Can NCG solve open problems of classical geometry inaccessible otherwise? In other words, why does NCG matter? What is it anyway?

Good answer means good examples. A sweetheart of NCG called noncommutative torus captures classical algebraic geometry of elliptic curves; it happens because the noncommutative torus is a coordinate ring of the elliptic curve. In other words, we have a functor from the classical geometry to the NCG; such functors make the core of this book.

What is NCG anyway? It is a calculus of functors on the classical spaces (e.g. algebraic, geometric, topological, etc) with the values in NCG. Such an approach complements an established tradition of recasting geometry of the classical space X in terms of the C^*-algebra $C(X)$ of continuous complex-valued functions on X, see the monograph by [Connes 1994] [5].

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