Prime ideals in commutative and non-commutative rings

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Prime ideals are important in commutative algebra (e.g., localization and Krull dimension), in algebraic geometry (e.g., affine schemes), and in number theory (e.g., factorization in Dedekind domains). This talk – which is about prime ideals, their generalizations, and their uses – has three parts:

In the first part, I will talk about certain aspects of prime ideals in commutative rings. In the second part, I will explain elements of Kanda’s recently developed theory of (so-called) atoms. The notion of atoms is a useful and interesting generalization of prime ideals to non-commutative rings (and to abelian categories). In the third part, I will explain work in progress, joint with R. H. Bak, on how to actually compute/determine the atoms for certain types of non-commutative rings.