Stable Range One Theory for Rings and Elements

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The theory of stable range for rings has a long history, originating from the work of H. Bass in 1964 on the stability properties of the general linear group $\mathrm{GL}_n(S)$ over a ring S. While this work marked the beginning of the subject of algebraic K-theory, it has incidentally exerted a large influence on the theory of commutative and non-commutative rings. The case of rings of stable range one ("sr1 rings") is of special interest, due to its various connections with the problems of cancellation, substitution, and unique generation, etc. In this talk, the speaker will give a quick report on a relatively new (c. 2004) theory of "elements of stable range one" in arbitrary rings, and tell the story of how this work has led him to the discovery of a new determinantal identity for three matrices over any commutative ring. This is recent joint work with Dinesh Khurana.

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