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# Mathematics Colloquium

# Homological algebra of birational and projective geometry

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**Abstract**

Algebraic geometry is the study of the geometric objects – called varieties – defined by polynomial equations. Birational and projective geometry are two of the oldest and most fundamental topics within this subject. The first aims to classify varieties, while the second aims to understand their embeddings into projective space. By a construction from homological algebra, to any variety there is an associated "derived category", which has become increasingly important in modern algebraic geometry. In this talk, I will describe some results which give striking parallels between the (birational and projective) geometry of varieties and the structure of their derived categories. I will also explain how these ideas lead to solutions to open problems that make no reference to derived categories.

**Wednesday, 28 January 2018, 4pm**

**Smith Hall 204**

Tea and refreshments will be served at 3:45pm.