

# Harvard-M.I.T. Algebraic Geometry Seminar

## FLASQUE TORI AND LINEAR ALGEBRAIC GROUPS

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The study of rational points on (connected) linear algebraic groups and their principal homogeneous spaces often breaks up into two parts : the study of semisimple, simply connected groups, then reductions to the latter case by means of Galois cohomology. In this context, two presentations of arbitrary linear algebraic groups have been classically used. We propose a third one ("flasque resolutions"), which is simultaneously more flexible and more natural than these earlier two. We demonstrate this by giving a more direct approach to a number of results of Sansuc, Borovoi, Gille, Kunyavskii.

We use flasque resolutions to define and study the "algebraic" fundamental group of a connected linear group and to compute the Brauer group of smooth compactifications of such a group. Over number fields and their completions, the technique enables one to compute R-equivalence on the set of rational points, to measure the lack of weak approximation, to study the Hasse principle for principal homogeneous spaces and to prove a finiteness result for the Chow group of zero-cycles over a local field. If time permits, we shall also explain how flasque tori also appear naturally in the study of general homogeneous spaces of connected linear algebraic groups.

Tuesday, April 4th  
3:00 p.m.  
Harvard Science Center 507

<http://www-math.mit.edu/ags/>