

ALGEBRA  
SEMINAR

*Integral points on groupic varieties (work of Yang Cao and Fei Xu)*

J.L. Colliot-Thelene  
CNRS et Universite Paris-Sud

**Abstract:** Summary : Let  $G$  be a connected linear algebraic group over a field  $k$ . By definition, a groupic  $G$ -variety  $X$  over  $k$  is a smooth (left)  $G$ -variety with a dense open set isomorphic to  $G$  with its (left) action on itself. Let  $X$  be a groupic  $G$ -variety over a number field. Under a suitable noncompactness hypothesis for the simple factors of the semisimple part of  $G$  at the archimedean places, Cao and Xu show that the Brauer-Manin obstruction is the only obstruction to strong approximation for  $X$  off the archimedean places. The proof builds upon the case  $X=G$  (handled in earlier papers by Xu and the speaker, Harari, Demarche). The toric case ( $G$  is a torus) was already handled in a previous paper by Cao and Xu. For  $X$  projective, the statement is a weak approximation result and the theorem has been known for a long time (Sansuc).. The proof of the strong approximation result for an arbitrary groupic  $G$ -variety  $X$  involves novel arguments, both geometric and arithmetic.

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