

# Algebra/Topology Seminar

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## THE NILPOTENT COMMUTATOR OF A NILPOTENT MATRIX

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1:15 p.m. in ES-143

ABSTRACT. Let  $B$  be an  $n \times n$  nilpotent matrix with Jordan block sizes given by the partition  $P$  of  $n$ . It is well-known that the nilpotent commutator of  $B$  consisting of all nilpotent matrices that commute with  $B$  is an irreducible variety. So there is a unique partition  $Q(P)$  that is the Jordan partition of a generic element of the nilpotent commutator of  $B$ . Several authors have studied the partition  $Q(P)$  using different methods. In this talk we introduce a poset that is associated to the partition  $P$  and show how the combinatorial properties of this poset can be used to explicitly determine the partition  $Q(P)$ . We then report on a current project, joint with Anthony Iarrobino, Bart Van Steirteghem, and Rui Zhao, in which we study the set  $Q^{-1}(Q)$  for a partition  $Q$ .