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Nham Vo Ngo* (nham@uga.edu), Department of Mathematics, University of Georgia, Athens, GA 30602. *Commuting Varieties and Cohomology of Frobenius kernels.*

In this talk, we introduce results about commuting varieties of r -tuples of elements involving various sets of 2 by 2 matrices. Using methods in commutative algebra and geometry, we show that such varieties are irreducible, Cohen-Macaulay, and normal. Finally, we apply the representation theory of SL_2 to compute G -module structure for the coordinate algebra of the nilpotent commuting variety over \mathfrak{sl}_2 . (Received January 09, 2012)