February 5, 2003: George McNinch (Notre Dame), "Rationality properties of nilpotent orbits."

If G is a connected reductive group over an arbitrary field F, then under some assumptions on the characteristic one can associate a nice class of cocharacters to a rational nilpotent element X in $\mathrm{Lie}(G)$. This result has some consequences for the structure of the centralizer of X. In turn, these structural results permit one to deduce the finiteness of the number of arithmetic nilpotent orbits in $\mathrm{Lie}(G)$, in the case where F is complete with respect to a non-trivial discrete valuation and has finite residue field. One may also deduce the convergence of "nilpotent orbital integrals" on $\mathrm{Lie}(G)$ for such F. The lecture will discuss these results.