Christopher M Drupieski* (c.drupieski@depaul.edu) and Jonathan R Kujawa (kujawa@math.ou.edu). Support schemes for infinitesimal unipotent supergroups.

Let $k$ be a field of characteristic $p \geq 3$, and let $G$ be an infinitesimal unipotent $k$-supergroup scheme. In this talk I will report on work with Jonathan Kujawa, in which we investigate the cohomological spectrum $|G| = \text{Spec}(H^\bullet(G,k))$ of $G$, as well as the cohomological support schemes $|G|_M \subseteq |G|$ associated to each finite-dimensional rational $G$-supermodule $M$. When $G$ is infinitesimal of height 1, our results can be interpreted in terms of the restricted Lie superalgebra $\text{Lie}(G)$. Generalizing classical results of Suslin, Friedlander, and Bendel, we show that there is a homeomorphism between $|G|$ and the scheme $V_r(G)$ of Hopf superalgebra homomorphisms $\nu : \mathbb{P}_r \to kG$, where $\mathbb{P}_r$ is a certain Hopf superalgebra and $kG$ is the group algebra of $G$, and this homeomorphism restricts to a homeomorphism between $|G|_M$ and a naturally defined Zariski closed conical subscheme $V_r(G)_M \subseteq V_r(G)$. To make these identifications, we rely in an essential way on a nilpotence detection theorem for arbitrary finite unipotent supergroup schemes by Benson, Iyengar, Krause, and Pevtsova. (Received January 10, 2019)