Nonnegative integer solutions of a system of linear equations

Let $A$ be an $n \times m$ matrix with integer entries. Let $S$ denote the set of all solutions $x$ to the equation $Ax = 0$, where $x$ is a vector with nonnegative integer entries. The Hilbert basis of $S$ is the minimal subset $H$ of $S$ with the property that any solution $x$ in $S$ can be written as a nonnegative integer combination of solutions in $H$. Since computing $H$ is NP-hard for any $n > 0$, one is interested in finding a geometric characterization of $H$. For $n = 1$, we have recently given such a characterization. In this talk, we plan to discuss some on-going work for the case $n > 1$. 