1116-05-1563   **Jonathan Tidor*** (`jtidor@mit.edu`). *Dense binary $PG(t − 1, 2)$-free matroids have critical number $t − 1$ or t.*

The critical threshold of a (simple binary) matroid N is the infimum over all ρ such that any N-free matroid M with $|M| > \rho 2^{r(M)}$ has bounded critical number. In this talk, we study the critical threshold of the projective geometry $PG(t − 1, 2)$ as a generalization of a classical problem in graph theory. No knowledge of matroid theory will be assumed.

We resolve two conjectures of Geelen and Nelson, showing that the critical threshold of $PG(t − 1, 2)$ is $1 − 3 \cdot 2^{-t}$. We do so by proving the following statement: if M is $PG(t − 1, 2)$-free with $|M| > (1 − 3 \cdot 2^{-t})2^{r(M)}$, then the critical number of M is $t − 1$ or t. (Received September 20, 2015)