1135-VP-2660 **Eugene Han** (eugeneh@andrew.cmu.edu) and **David Offner*** (offnerde@westminster.edu). *A new result on linear polychromatic colorings of the hypercube.*

Let Q_n denote the n-dimensional hypercube. For a fixed $\ell \geq 1$, a Q_ℓ-coloring of Q_n is a coloring of the ℓ-dimensional faces. A Q_ℓ-coloring of Q_n is d-*polychromatic* if every Q_d in Q_n contains a Q_ℓ of every color. For $1 \leq \ell \leq d$, let $p^\ell(d)$ be the maximum number of colors such that any hypercube has a d-polychromatic Q_ℓ-coloring with that number of colors. Polychromatic colorings of the hypercube were first studied by Alon, Krech, and Szabó. Their work, along with subsequent work of Offner established the value of $p^1(d)$ for all $d \geq 1$. More recently, Chen introduced the notion of linear Q_ℓ-colorings. We denote by $p^\ell_{lin}(d)$ the maximum number of colors such that any hypercube has a d-polychromatic linear Q_ℓ-coloring. Chen proved an upper bound on $p^2_{lin}(d)$ for sufficiently large d. In this talk we will describe what is known about linear colorings and present a new theorem: For all $d \geq 1$, $p^d_{lin}(d+1) = 2$. (Received September 26, 2017)